

## Differences in Characteristics of Adult Day Services Centers, by Level of Medical Service Provision

Analytical and Epidemiological Studies



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Centers for Disease Control and Prevention  
National Center for Health Statistics

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Analytical and Epidemiological Studies

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Centers for Disease Control and Prevention  
National Center for Health Statistics

Hyattsville, Maryland  
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# Dedication

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**This report is dedicated to Lauren Harris-Kojetin, Ph.D.**

**August 19, 1963–January 29, 2020**



Lauren Harris-Kojetin was Chief of the Division of Health Care Statistics' Long-Term Care Statistics Branch for 14 years. During this time, she led four national survey waves of the National Study of Long-Term Care Providers and spearheaded multiple innovative redesigns of NCHS' long-term care surveys that captured the intricacies of each sector while

producing reliable, accurate, and timely data for researchers, policymakers, and providers of these services. Lauren's passion, insight, and dedication to survey statistics, aging, and long-term services and supports will be greatly missed by her colleagues at the National Center for Health Statistics.

# Differences in Characteristics of Adult Day Services Centers, by Level of Medical Service Provision

by Vincent Rome, M.P.H., Jessica Penn Lendon, Ph.D., and Lauren Harris-Kojetin, Ph.D.

**Abstract**

**Objectives**  
This report provides estimates of the most current nationally representative distribution of adult day services centers (ADSCs) and participants by level of the center’s medical service provision. It also examines differences in organizational characteristics, participant characteristics, and geographical characteristics of ADSCs by medical service provision.

**Methods**  
Data are from the ADSC component of the 2016 National Study of Long-Term Care Providers. ADSCs are examined by level of medical service provision, defined as ranging from nonmedical to low medical to moderate medical to high medical based on ADSC directors’ self-identification of their centers’ services and participant needs served. ADSC organizational characteristics, geographic characteristics, and participant characteristics (referred to as “case-mix”) were examined according to level of medical service provision.

**Results**  
In 2016, 16.1% of ADSCs were nonmedical, 30.6% were low medical, 39.7% were moderate medical, and 13.5% were high medical. Daily attendance, Medicaid licensure, nurse staffing levels, use of electronic health records and any health information exchange with physicians, pharmacies, and hospitals all increased with increasing level of medical service provision. Among participants, there was a significant increase by increasing level of medical service provision in the percentage of participants who were Hispanic and non-Hispanic races other than white or black, aged 65 and over, diagnosed with selected conditions, needed assistance with any activities of daily living, lived in a private residence alone, had Medicaid, and had any adverse events.

The percentage of centers located in metropolitan statistical areas and those located in the Northeast and South census regions increased with increasing level of medical service provision.

**Conclusion**  
This report’s findings provide the most up-to-date description of the spectrum of ADSC level of medical service provision. These results suggest that ADSCs are varied in the level of medical services they provide and patient characteristics differ according to service provision of an ADSC.

**Keywords:** home- and community-based • Medicaid • staffing • models of care • National Post-acute and Long-term Care Study • National Study of Long-Term Care Providers

## Introduction

Adult day services centers (ADSCs) emerged in the United States around the 1960s as a novel and cost-effective place of care, separate from institutional or home-based care for older adults and individuals with disabilities (1). Today, ADSCs offer a mix of social and recreational activities, assistance with activities of daily living (ADLs), and traditional medical care, such as skilled nursing and therapeutic services (2). Compared with other home- and community-based (HCB) long-term services and supports (LTSS) sectors, such as home health agencies and assisted living communities, ADSCs serve a more diverse population.

For example, a higher percentage of ADSC participants are racial and ethnic minorities, are under age 65, have a variety of health conditions (including intellectual or developmental disabilities [IDD]), and use Medicaid (3–6).

Unlike other home- and community-based services (HCBS), the federal government does not regulate ADSCs. Instead, state agencies may license, certify, or both license and certify ADSCs as a social model program that prioritizes the social and recreational needs of participants; as a medical model program that prioritizes the medical needs of participants; or a combination of both the social and medical service delivery models (7). As of 2014, 26 states regulated ADSCs



through licensure; 10 states through certification; 4 states through licensure and certification; 15 states had additional certifications, and 11 states did not license or certify ADSCs (7). ADSCs that receive public funding, such as from Veterans Affairs or Medicaid, are also subject to the certification requirements of the respective state agency that administers the program. The scope of participants that can be served, the level of care provided, and the types of services provided are prescribed by state regulations in states that license, certify, or do a combination of both. It is through this patchwork of state regulations and funding mechanisms that the adult day services sector provides community-based medical care.

Previous studies derived a typology of ADSC service delivery models by analyzing the organization of resources in response to fluctuations in the distribution of participant sociodemographic, health, and functional characteristics within a center (henceforth referred to as “case-mix”), and in the long-term care and post-acute care marketplaces in which ADSCs operated (1,8–10). These early studies examined various ADSC organizational characteristics, the needs of participants, and the types of services ADSCs provided. This early work identified three main types of ADSC models: (a) centers that provided health, medical, and rehabilitation services, along with some social services for participants who needed assistance with ADLs; (b) centers that provided mostly social services to participants with less need for assistance with ADLs; and (c) specialized programs that served participants with a particular diagnosis or disability, such as visual impairments or mental illness.

The regulatory, political, and operating environments of post-acute care and LTSS have transformed over time, and the social-medical dichotomy that once characterized the ADSC sector is now better characterized as a continuum. The two poles of the continuum are the mostly social-oriented service delivery model and the mostly medical-oriented service delivery model; some combination of the two define the middle of the continuum (2). This trend was first observed by Conrad, Hughes, Hanrahan, and Wang (11) in a 1986 national census of 774 ADSCs to determine whether ADSCs could be further classified using the provision of services, measures related to centers’ organizational structures, processes of care, and participant characteristics. In addition to identifying two types of specialized centers for dementia care and rehabilitation, ADSCs were clustered based on the intensity of the clinical and social services provided. The results indicated six service delivery model types ranging from high intensity of clinical services and moderate social services to ADSCs that offered only social services (11). In a second national survey of 1,771 ADSCs in 2001–2002, researchers used a broad measure of services delivery model type and found that 37% self-identified as a social model program, 21% as a medical model, and 42% were some combination of these two model types (12).

More than a decade has passed since the last national study examined variation in the characteristics of ADSCs by model

type. More recent research has focused on identifying characteristics and practices of centers among a similar subgroup of centers, such as ADSC programs that served specific populations, were of a particular model or affiliation type, or were from a particular geographic locale or state (13–18). In addition, previous nationally representative surveys, in addition to the smaller-scale studies, did not capture the variation in model type across states or by characteristics of ADSCs.

The landscape for institutional and HCB LTSS is changing and access to medically oriented HCBS has become an increasingly visible issue. There have also been several recent policy developments with the specific aim of increasing the use of ADSCs among potential LTSS users. Legislation that effectively covers medical-model adult day health services for veterans using funds from Veterans Affairs (VA) was enacted in 2017, and access to these services was broadened to all veterans residing in state-sponsored Veterans Homes nationally (19). Additionally, ADSCs were added into the Medicare Advantage supplemental benefit plan as a health-related service (20). ADSCs have also received HCBS waiver funding in recent years; about 77% of ADSCs participated in Medicaid in 2016 (5).

Based on previous literature, this report includes characteristics that describe an ADSC’s organization, participant case-mix, and geographic characteristics (2,3,15,16,18). This report examines ADSCs by level of medical service provision, defined as ranging from nonmedical to low medical to moderate medical to high medical based on ADSC directors’ self-identification of their centers’ services and participant needs served. This report estimates the most current nationally representative distribution of ADSC characteristics (i.e., organizational, participant case-mix, and geographical) by level of medical service provision, examines differences in ADSC characteristics between the levels of medical service provision and by increasing level of medical service provision, and explores the distribution of moderately and highly medicalized ADSCs by state. This report’s findings provide the most up-to-date description of the full spectrum of ADSC levels of medical service provision, which provides information on how these providers fit into the current LTSS paradigm.

## Methods

### Data Source

#### Survey eligibility criteria

This study uses nationally representative data from the ADSC survey of the 2016 National Study of Long-Term Care Providers (NSLTCP), a biennial study conducted by the National Center for Health Statistics (NCHS). To be eligible for the study, an ADSC must: (a) be licensed or certified by the state specifically to provide adult day services, or accredited

by the Commission on Accreditation of Rehabilitation Facilities, or authorized or otherwise set up to participate in Medicaid (Medicaid state plan, Medicaid waiver, or Medicaid managed care), or part of a Program of All-Inclusive Care for the Elderly; (b) have an average daily attendance of one or more participants based on a typical week; and (c) have one or more participants enrolled at the center at the designated location at the time of the survey (21). The 2016 survey had a response rate of 61.8%. The 2016 NSLTCP data are accessible in the form of reports and tables from the National Post-acute and Long-term Care Study website (<https://www.cdc.gov/nchs/npals/index.htm>). Restricted data files from each survey are available to researchers through NCHS' Research Data Center (<https://www.cdc.gov/rdc/index.htm>).

The multimode survey was administered to ADSC administrators, directors, or otherwise knowledgeable ADSC staff by mail or web, or by computer-assisted telephone interviewing follow-up for nonrespondents. The ADSC survey included two questionnaires (Version A and Version B), each containing survey items common to both versions, which were used to produce national and state estimates, and survey items unique to each questionnaire, which can only be used to produce national estimates (21).

Three different weights (adjusting for nonresponse bias and unknown survey eligibility) were used, the first for measures common to both questionnaire versions, the second for measures collected only from questionnaire Version A, and the third for measures collected only from questionnaire Version B. The majority of the characteristics included in this report are common to both questionnaire versions, with the exception of participant living arrangements and the prevalence of falls (adverse event). As a result, the sample size and variance for these characteristics differ.

## Measures

### Level of medical service provision

The 2016 NSLTCP ADSC survey used a self-reported measure of the level of center medical service provision that asked:

*"Which one of the following best describes the participant needs that the services of this center are designed to meet? (1) only social/recreational and no health/medical needs of participants; (2) primarily social/recreational and some health/medical needs; (3) equally social/recreational and health/medical needs; (4) primarily health/medical and some social/recreational; (5) only health/medical and no social/recreational needs."*

This report classifies ADSC level of medical service provision as an ordinal variable with four categories that represent increasing levels of medical service provision of ADSCs. The 4th and 5th categories of the measure were collapsed because there were too few ADSCs that only provided services for health or medical needs. [Table 1](#) provides the weighted number and percent distribution of ADSCs

and participants by the following levels of medical service provision:

1. Nonmedical centers had services designed to meet only social or recreational needs and no health or medical needs of participants;
2. Low medical centers had services designed to meet primarily social or recreational needs and some health or medical needs;
3. Moderate medical centers had services designed to meet both social or recreational needs and health or medical needs equally;
4. High medical centers had services designed to meet primarily health or medical needs and some social or recreational needs of participants or had services designed to meet only health or medical and no social or recreational needs.

To report state variation in the level of medical service provision, the four levels of medical service provision described above were further collapsed into a dichotomous variable that included one category for centers that were moderate to high medical centers and a second category for centers that were nonmedical to low medical. States were categorized by quartiles of the weighted percentages of moderate to high medical centers.

### Organizational characteristics

Average capacity was defined by averaging the maximum number of participants allowed, which may be called the allowable daily capacity and is usually determined by law or by fire code but may also be a program decision. Average daily attendance was defined as the average of the approximate daily attendance at each center based on a typical week. For-profit ownership status was defined as the percentage of ADSCs that were a private for-profit organization, publicly traded company, or limited liability company. Chain affiliation was defined as the percentage of ADSCs owned by a person, group, or organization that owns or manages two or more ADSCs, which may include a corporate chain. Medicaid licensure was defined as the percentage of ADSCs authorized or otherwise set up to participate in Medicaid (Medicaid state plan, Medicaid waiver, or Medicaid managed care).

Staffing level was measured by using the number of full- and part-time employees and contract registered nurses (RNs), licensed practical or vocational nurses (LPNs or LVNs), aides, social workers, and activities staff. Aides were defined as certified nursing assistants, nursing assistants, home health aides, home health care aides, personal care aides, personal care assistants, and medication technicians or medication aides. Both employee and contract staff full-time equivalents (FTEs) were combined for each of the staffing measures included in this analysis. Center staffing was measured using the average number of employee and contract staffing hours

per participant per day (HPPD), which is the ratio of the average number of hours providing care for a participant per day for each of the following staff types: RNs, LPNs or LVNs, nurse aides, social workers, and activities staff members. The number of FTEs for a given staff type was converted into hours by multiplying each FTE (or fraction of an FTE) for the staff type at the center by 35 hours, then dividing the total number of hours for the staff type by the average daily number of participants, and dividing that estimate by 5 days:

$$\left[ \frac{FTE \cdot 35}{\text{average daily number of participants}} \right] \div 5$$

If the derived HPPD for any of the staff types was more than 24 hours, these values were top-coded to 24. If one or more of the staff HPPD measures had a response, but others were missing, the missing values were recoded to 0. If all staff measures were coded as missing, then the case was dropped from the analytic sample on staffing. Staff HPPD is referred to as “staffing levels” in the Results and Discussion sections and is typically presented as a ratio or as hours or minutes. The staff HPPD ratio can be converted to minutes by multiplying the ratio by 60. Staff HPPD does not necessarily reflect the amount of care given to a specific participant.

Sources of revenue was measured by asking what proportion of paid participant fees comes from the following sources: Medicaid; private insurance; out of pocket; other federal, state, or local government sources; other sources; Veterans Affairs; Medicare; and Older Americans Act.

This report includes whether an ADSC specialized in providing focused care for participants with a particular condition, diagnosis, or disability. A center was considered specialized if it selected one or more of the following specializations: Alzheimer disease or other dementias, IDD, severe mental illness, post-stroke disorders, multiple sclerosis, and some other condition or disability.

ADSC health information technology use, which facilitates delivery of care to participants, was included using measurements of the use of electronic health records (EHRs) and health information exchange (HIE). EHR use was measured as a dichotomous variable by asking centers whether or not they used a computerized version of participants’ health and personal information for the management of participant health care, other than for accounting or billing purposes. HIE capability was measured as a dichotomous variable by asking whether the center exchanged computerized information with physicians, pharmacies, or hospitals.

This report includes nine variables used to examine whether or not ADSCs provided the following services to participants: daily round-trip transportation (to and from the center); dietary (dietary and nutritional services); hospice; mental health (services targeting a person’s mental or psychiatric well-being, and may include diagnosing, describing, evaluating, and treating mental conditions); nursing (must be performed by an RN or LPN or LVN and are medical in

nature); pharmacy (filling of or delivery of prescriptions); social worker (provided by licensed social workers or persons with a bachelor’s or master’s degree in social work, and may include an array of services such as psychosocial assessment, individual or group counseling, and referral services); therapy (physical, occupational, or speech or pathology); and transportation for medical or dental appointments. These services are reported as the percentage of centers that provided the services either by center employees or by arrangement with an outside vendor.

## Distribution of participant characteristics at the center level (case-mix)

This report included several types of participant case-mix characteristics—sociodemographics (race and ethnicity, age, gender, and Medicaid use), living arrangements, selected conditions, functional ability, and adverse events. These case-mix variables typically measured the percentage of participants at a center with a given characteristic (e.g., percentage male). Participant race and ethnicity categories included non-Hispanic white, Hispanic, non-Hispanic black, and non-Hispanic other. Age categories included 18–44, 45–54, 55–64, 65–74, 75–84, and 85 and over. Sex included male and female participants. Medicaid use was measured as the percentage of participants who had any services paid for by Medicaid in the last 90 days. Living arrangement was measured by asking about the number of participants who lived in a private residence with a relative, a private residence alone, a private residence with a nonrelative, an assisted living or residential care facility, a nursing home, or some other living arrangement.

Selected conditions of participants were measured in six variables as the percentage of participants diagnosed with Alzheimer disease or other dementias, depression, diabetes, heart disease, IDD, and severe mental illness. Functional ability of participants was assessed using six variables asking for the percentage of participants at the center who needed any assistance with six ADLs: bathing, walking, dressing, toileting, transferring in and out of a chair, and eating. Adverse events were measured with three variables as the percentage of participants at the center who in the previous 90 days were discharged from an overnight hospital stay, used emergency department services, or had a fall.

## Geographic characteristics

Three measures of geography were used—U.S. Census region, metropolitan statistical area status, and state. Census region (Northeast, Midwest, South, and West) was defined as groupings of conterminous states, in addition to Washington, D.C., Alaska, and Hawaii, into geographic areas corresponding to groups used by the U.S. Census Bureau. Metropolitan and micropolitan statistical areas are geographic entities defined by the Office of Management and Budget for use by federal statistical agencies in collecting, tabulating, and publishing federal statistics. A metropolitan

statistical area contains a core urban area population of 50,000 or more, and a micropolitan statistical area contains an urban core population of at least 10,000 (but fewer than 50,000). Each metropolitan or micropolitan statistical area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core (22). States included all 50 U.S. states and the District of Columbia.

## Analysis

The unit of analysis was the ADSC. The survey sample included 2,836 ADSCs. Of these, 22 centers did not have any information for model type and were excluded from the analytic sample. Additional variables with missing data were excluded from the analyses on a variable-by-variable basis. The percentage of missing data ranged from 0.4% for Medicaid licensure to 13.8% for the number of participants with a diagnosis of heart disease.

Weighted estimates and confidence intervals were calculated for all ADSCs included in the analytic sample nationally and for each of the four levels of medical service provision, using Stata SE 14.2 (23). To calculate the average capacity, average daily attendance, and sources of revenue from paid participant fees, Stata's survey mean procedure (*svy: mean*) was used. For the participant characteristics, ratios were estimated using *svy: ratio*. The *svy: proportion* procedure was used to produce both univariate and bivariate proportions of the characteristics of interest by level of medical service provision. For weighted counts of ADSCs and participants, *svy: tab* and *svy: total* were used, respectively.

Differences in the estimates of the selected characteristics between levels of medical service provision were evaluated using Stata's *lincom* post-estimation command following the execution of the survey estimation command. *Lincom* calculates contrasts of the weighted estimates and standard error of the difference, and estimates the confidence intervals, *t* or *z* statistics, and *p* values for the linear combinations of the coefficients (23). The formula for executing *lincom* after the proportion is:

$$\text{lincom}[y1]x1 - [y1]x2$$

Finally, a weighted least-squares regression method was used to identify linear trends of increasing or decreasing level of medical service provision for each of the characteristics included in the report:

$$\text{svy, subpop}(if\ y! = . \ \&\ x! = .): \text{regress } xy$$

All statistical significance tests are two-sided using *p* less than 0.05 as the level of significance. Statistically significant increases or decreases by increasing level of medical service provision are indicated in the figures and tables. In the Results section, statistically significant differences by

increasing level of medical service provision are described as "overall increases" or "overall decreases" by increasing level of medical services provided. In the tables, these linear differences by increasing level of medical service provision are described as "increase," "decrease," or "none." Pair-wise differences between each level of medical service provision are described in the text as "increased" or "decreased" to indicate statistical significance between categories when overall increases or decreases by increasing level of medical service provision were not observed or when differences between the levels of medical service provision warranted further discussion. Lack of comment regarding any differences does not mean that significance was tested and ruled out.

Tables 1 and 2 include all characteristics examined in this report. Some percentages are not presented in this report based on NSLTCP guidelines to suppress estimates with small sample sizes because it may pose a risk to the confidentiality of respondents. For example, the percentage of ADSCs that specialized in providing services to participants with "other conditions or disabilities" or the percentage of ADSCs that provided hospice services were not reported due to the small number of centers reporting these characteristics, which could pose a risk to participant confidentiality when examined in relation to geography and other characteristics.

## Results

### National Estimates

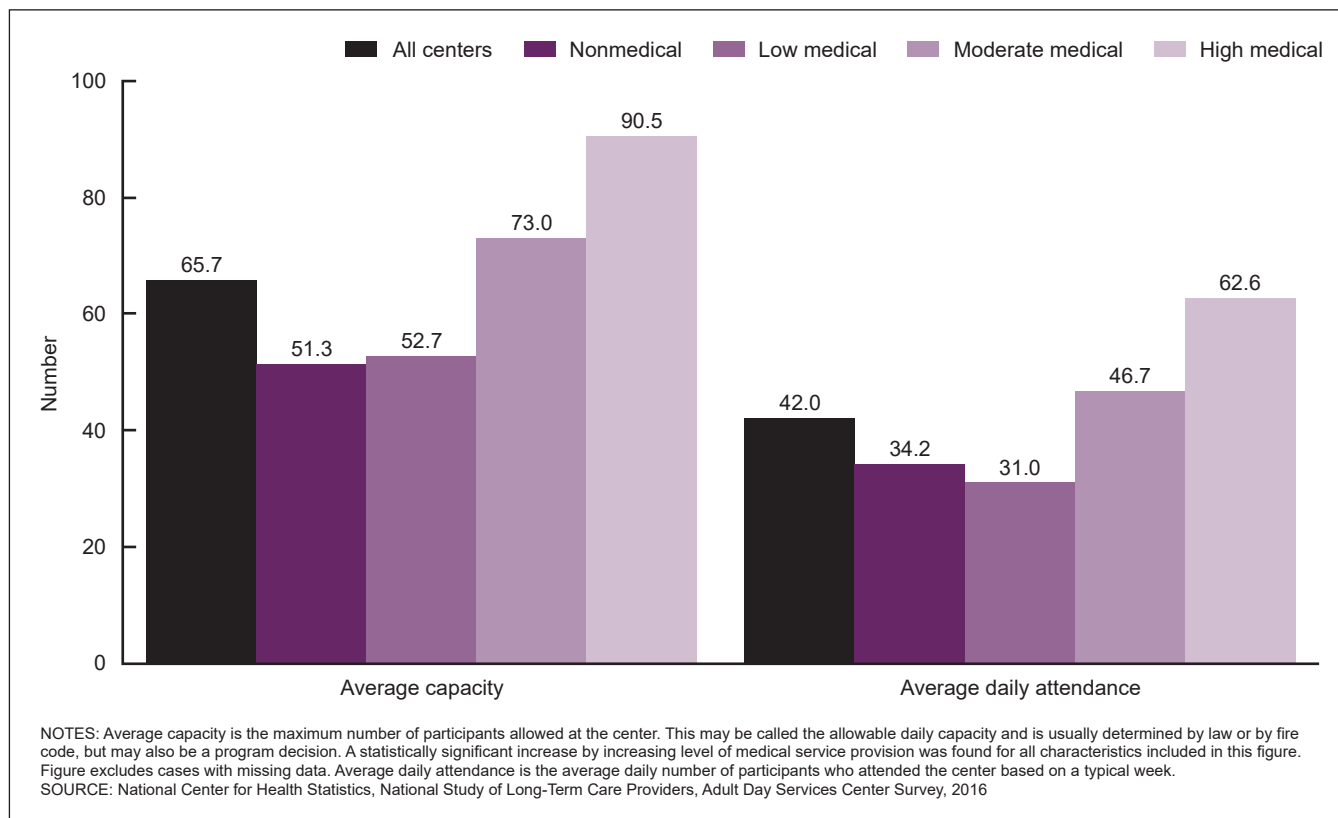
In 2016, 4,560 adult day services centers served 284,300 participants in the United States (Table 1). The highest percentage of centers were moderate medical (39.7%), followed by low medical (30.6%), nonmedical (16.1%), and high medical (13.5%). Moderate medical centers served the highest percentage of participants (45.6%), followed by low medical and high medical centers (21.7% and 21.0%, respectively), and lastly nonmedical centers (11.7%).

### Organizational Characteristics

#### Average capacity and average daily attendance

Figure 1 shows the average capacity and average daily attendance nationally and by level of medical service provision. Across all centers, the average capacity was 65.7 participants and the average daily attendance was 42.0 participants. Overall increases were observed for average capacity and average daily attendance by increasing level of medical service provision. The average capacity increased from 51.3 participants among nonmedical centers and 52.7 participants among low medical centers to 73.0 participants among moderate medical centers to 90.5 participants among high medical centers. The average daily attendance increased from 34.2 participants for nonmedical ADSCs and 31.0 participants for low medical centers to 46.7 participants

**Figure 1. Average capacity and average daily attendance of adult day services center participants, overall and by level of medical service provision: United States, 2016**



for moderate medical to 62.6 participants for high medical centers.

### Medicaid licensure, for-profit ownership, and chain affiliation

Figure 2 shows the percentage of ADSCs that were licensed by Medicaid and under for-profit ownership, nationally and by level of medical service provision. Among all ADSCs in the United States, 77.1% were licensed by Medicaid and 44.7% were for profit. Overall increases were observed in the percentage of Medicaid-certified ADSCs and the percentage of for-profit ADSCs by increasing level of medical service provision. The percentage of ADSCs with Medicaid certification increased from 53.5% among nonmedical to 69.8% among low medical to 86.9% among moderate medical to 92.7% among high medical centers. The percentage of for-profit centers decreased from 37.8% to 33.8% among nonmedical and low medical centers, respectively, but increased to 49.4% among moderate medical centers, and to 63.4% among high medical centers.

The percentage of ADSCs owned by a chain was higher among high medical centers (47.6%) compared with 41.4% among low medical and moderate medical centers (Table 2). However, the difference between high medical centers and nonmedical centers was not significant (47.6% and 43.8%, respectively).

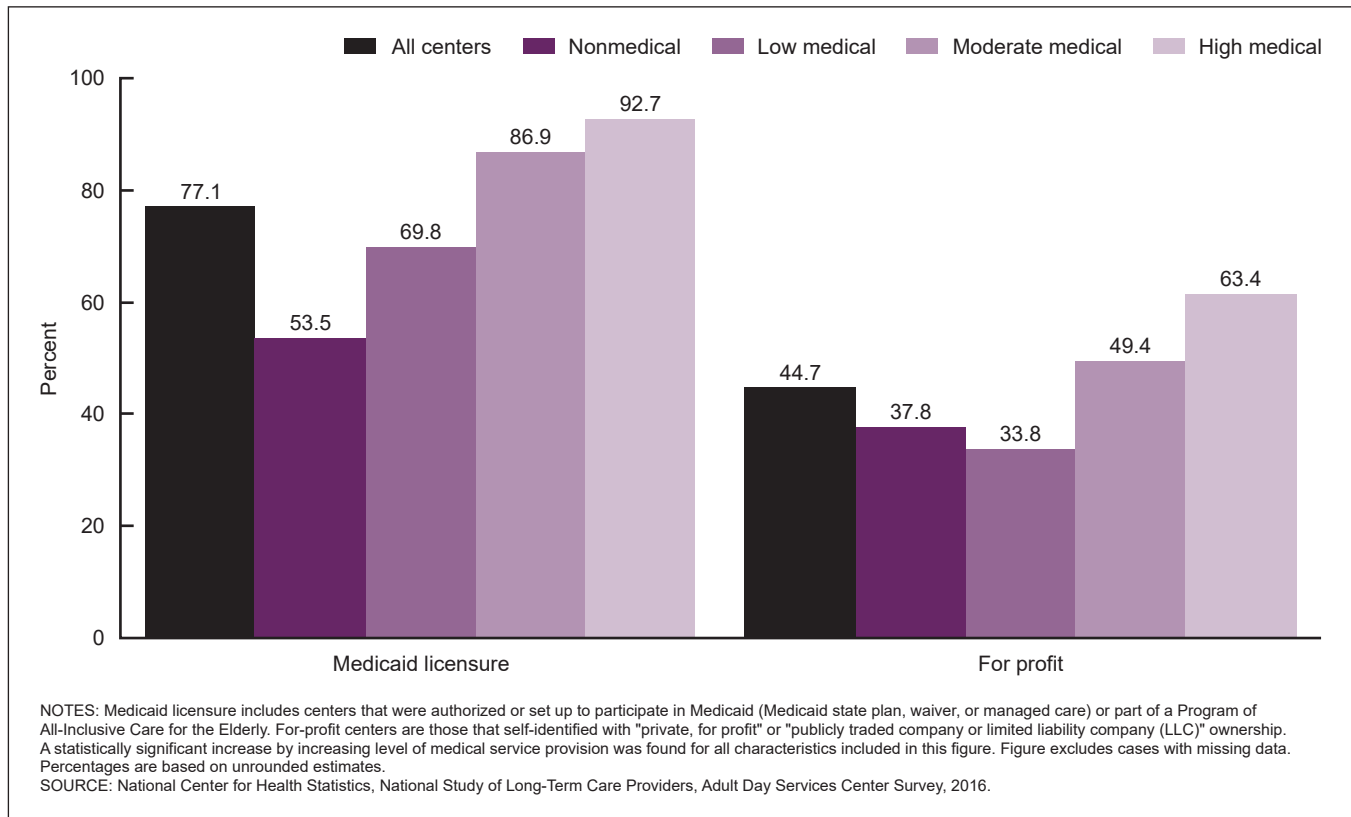
### Staffing levels

Figure 3 shows the staffing levels (i.e., HPPD) by level of medical service provision. Nationally, total staffing (RN, LPN or LVN, aide, social worker, and activity staff) levels were 2 hours and 23 minutes (2.39 HPPD). Staffing levels were 55 minutes (0.92 HPPD) for aides, 43 minutes (0.72 HPPD) for activities staff, 23 minutes (0.38 HPPD) for RNs, 13.2 minutes (0.22 HPPD) for LPNs or LVNs, and 8 minutes (0.14 HPPD) for social workers.

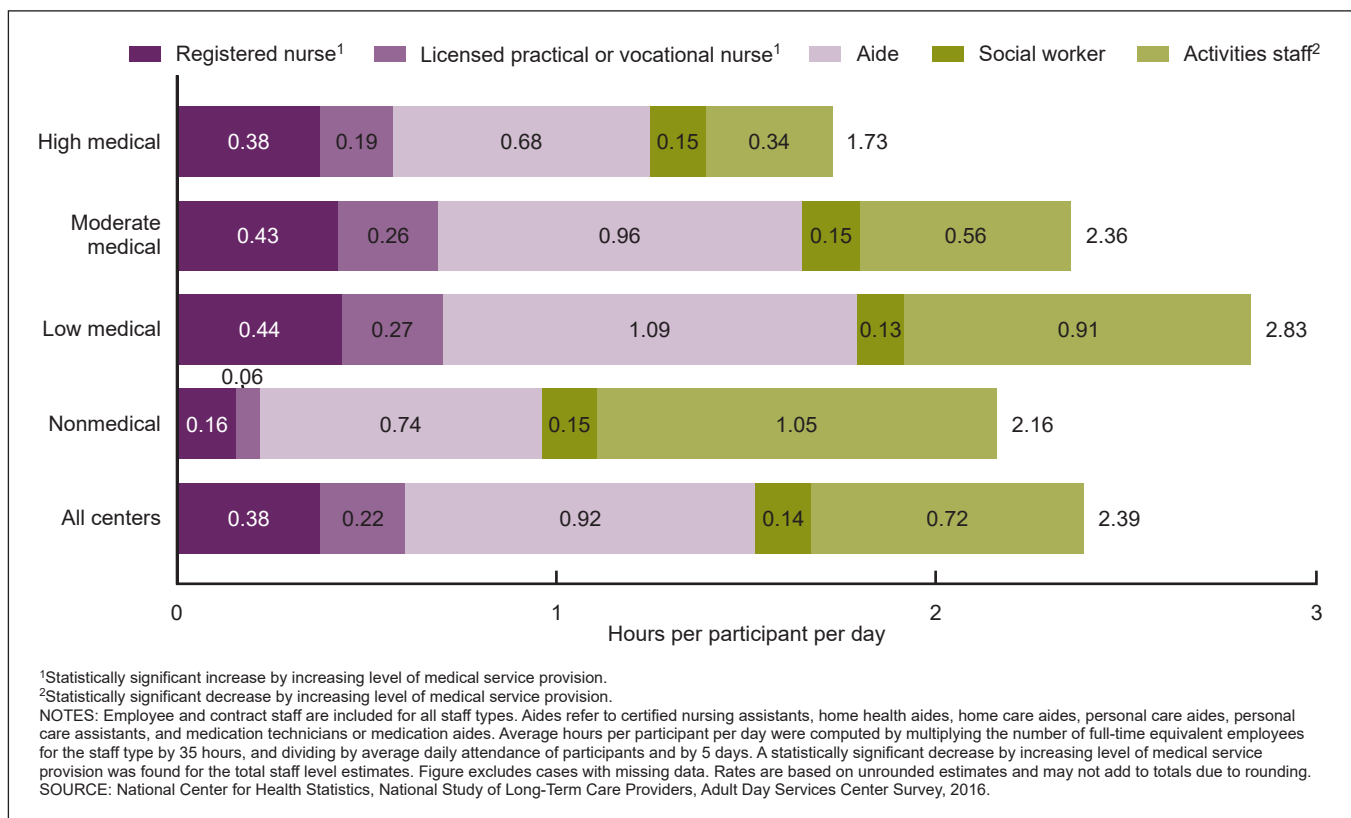
An overall decrease in total staffing levels was observed by increasing level of medical service provision—2 hours and 10 minutes (2.16 HPPD) among nonmedical centers, 2 hours and 50 minutes (2.83 HPPD) among low medical centers, 2 hours and 22 minutes (2.36 HPPD) among moderate medical centers, and 1 hour and 44 minutes (1.73 HPPD) among high medical centers. This overall decrease is largely explained by less aide time for high medical centers and higher activities staffing levels among nonmedical and low medical centers compared with moderate and high medical centers.

Compared with nonmedical centers, centers with low, moderate, and high medical provision had increased RN and LPN or LVN staffing levels. For RNs, staffing levels increased from 10 minutes (0.16 HPPD) among nonmedical centers to 26 minutes (0.44 HPPD and 0.43 HPPD) among low and moderate centers, and 23 minutes (0.38 HPPD) for high medical centers. For LPNs or LVNs, staffing levels increased

**Figure 2. Percentage of adult day services centers by Medicaid licensure and for-profit ownership, overall and by level of medical service provision: United States, 2016**



**Figure 3. Average staff hours per participant per day, overall and by level of medical service provision: United States, 2016**



from 4 minutes in nonmedical centers (0.06 HPPD) to 16 minutes (0.27 HPPD and 0.26 HPPD) among low and moderate medical centers to 11 minutes (0.19 HPPD) among high medical centers. Aide staffing levels increased from 44 minutes (0.74 HPPD) among nonmedical centers to 1 hour and 5 minutes (1.09 HPPD) among low medical centers and 58 minutes (0.96 HPPD) among moderate medical centers, and then decreased to 41 minutes (0.68 HPPD) among high medical centers.

An overall decrease was observed by increasing level of medical service provision for activities staff, from 1 hour and 3 minutes (1.05 HPPD) among nonmedical centers to 55 minutes (0.91 HPPD) among low medical centers to 34

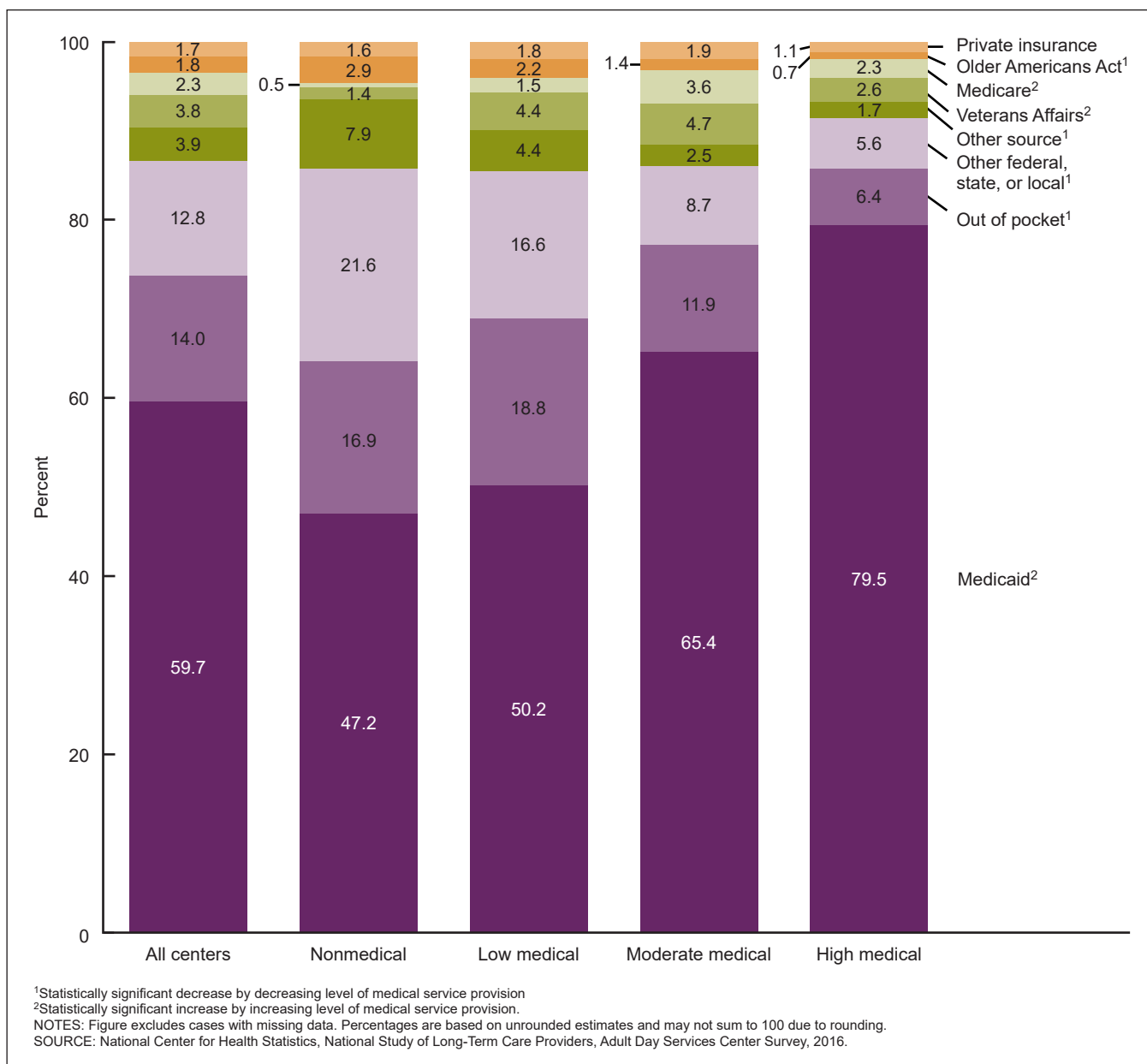
minutes (0.56 HPPD) among moderate medical centers to 20 minutes (0.34 HPPD) among high medical centers.

### Sources of revenue

About 59.7% of all revenue from paid participant fees among all centers was from Medicaid; followed by 14% of revenue from out-of-pocket spending; 12.8% from other federal, state, or local sources; 3.9% from “other” sources; 3.8% from VA; 2.3% from Medicare; 1.8% from Older Americans Act funding; and 1.7% from private insurance (Figure 4).

An overall increase was observed by increasing level of medical service provision in the percentage of Medicaid, Medicare, and VA revenue. The percentage of Medicaid

**Figure 4. Percentage of revenue from paid participant fees, overall and by level of medical service provision: United States, 2016**



revenue increased from 47.2% and 50.2% among nonmedical and low medical centers to 65.4% among moderate medical centers to 79.5% among high medical centers. Medicare revenue increased from 0.5% among nonmedical centers to 1.5% among low medical centers to 3.6% among moderate medical centers, but decreased slightly to 2.3% among high medical centers. Similarly, VA revenue increased from 1.4% among nonmedical centers to 4.4% among low medical centers to 4.7% among moderate medical centers, before dipping to 2.6% among high medical centers.

Overall decreases were observed by increasing level of medical service provision for out-of-pocket spending; other local, state, and federal government sources; “other” sources; Older Americans Act funding; and private insurance. The percentage of revenue from out-of-pocket spending decreased from 16.9% among nonmedical centers and 18.8% among low medical centers to 11.9% among moderate medical centers to 6.4% among high medical centers. Revenue from other federal, state, or local government sources decreased from 21.6% among nonmedical centers to 16.6% among low medical centers to 8.7% among moderate medical centers to 5.6% among high medical centers.

## Electronic health records and health information exchange

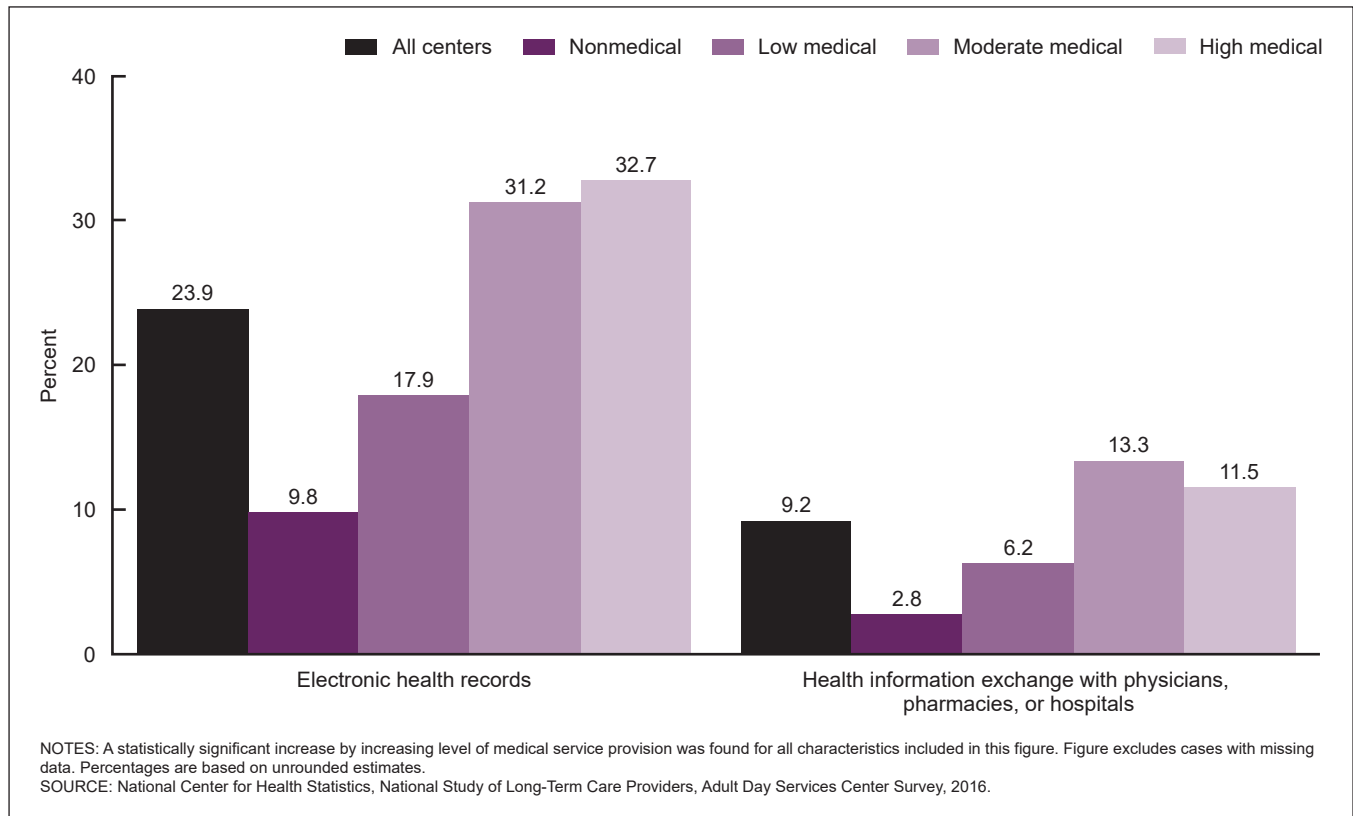
Of all ADSCs, 23.9% used EHRs and 9.2% used HIE with physicians, hospitals, or pharmacies (Figure 5). Overall increases were observed by increasing level of medical service provision for both the use of EHRs and HIE. About 9.8% of nonmedical ADSCs used EHRs, which increased to 17.9% among low medical centers, to 31.2% among moderate and 32.7% among high medical centers. About 2.8% of nonmedical centers used HIE with physicians, pharmacies, or hospitals, which increased to 6.2% among low medical centers, to 13.3% and 11.5% among moderate and high medical centers, respectively.

## Specialization

Centers that specialized in meeting the need of one or more diagnoses or disabilities nationally totaled 22.4% of all centers (Table 2). An overall decrease was observed by increasing level of medical service provision for the percentage of ADSCs that were specialized. Almost 40% of nonmedical centers were specialized, compared with 28.7% among low medical centers and 13.4% and 14.0% among moderate medical and high medical centers, respectively.

Of the 22.4% of specialized centers, 70.6% specialized in meeting the needs of participants with IDD, 44.8% in Alzheimer disease or other dementias, 20.5% in severe

**Figure 5. Percentage of adult day services centers that used electronic health records and health information exchange, overall and by level of medical service provision: United States, 2016**





mental illness, 20.1% in post-stroke disorders, and 11.5% in multiple sclerosis (Figure 6).

Among the centers that specialized, an overall increase was observed by increasing level of medical service provision for specialization in Alzheimer disease or other dementias, post-stroke disorders, severe mental illness, and multiple sclerosis. The percentage of ADSCs that specialized in Alzheimer disease or other dementias, severe mental illness, and multiple sclerosis was lower for nonmedical and low medical centers compared with moderate medical and high medical centers. About 36.9% and 41.7% of nonmedical and low medical centers specialized in Alzheimer disease or other dementias compared with 55.1% and 57.3% of moderate and high medical centers, respectively. The percentage of centers that specialized in post-stroke disorders increased from 9.5% among nonmedical centers to 18.0% among low medical centers to 28.6% among moderate medical centers to 41.7% among high medical centers. The percentage of centers that specialized in severe mental illness increased from 13.2% among nonmedical centers and 16.0% among low medical centers to 34.1% among moderate medical centers and 27.0% among high medical centers. Similarly, the percentage of centers that specialized in multiple sclerosis increased from 5.9% and 8.4% among nonmedical centers and low medical centers, respectively, to 18.5% and 24.6% among moderate medical centers and high medical centers, respectively.

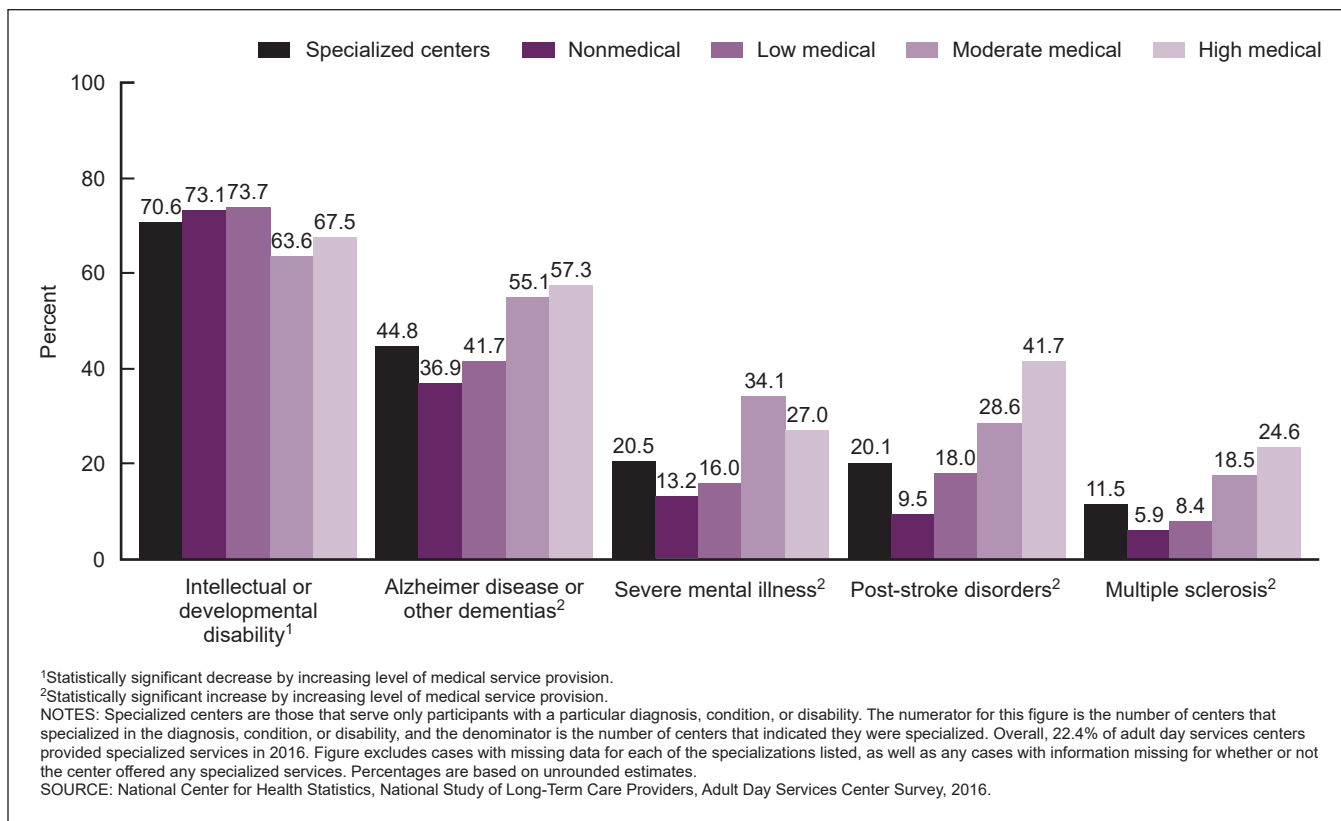
An overall decrease was observed by increasing level of medical service provision for ADSCs that specialized in IDD. However, the percentage of nonmedical, low medical, and high medical centers that specialized in IDD were similar (73.1%, 73.7%, and 67.5%, respectively), but slightly higher than the percentage of moderate medical centers that specialized in IDD (63.6%).

### Services provided

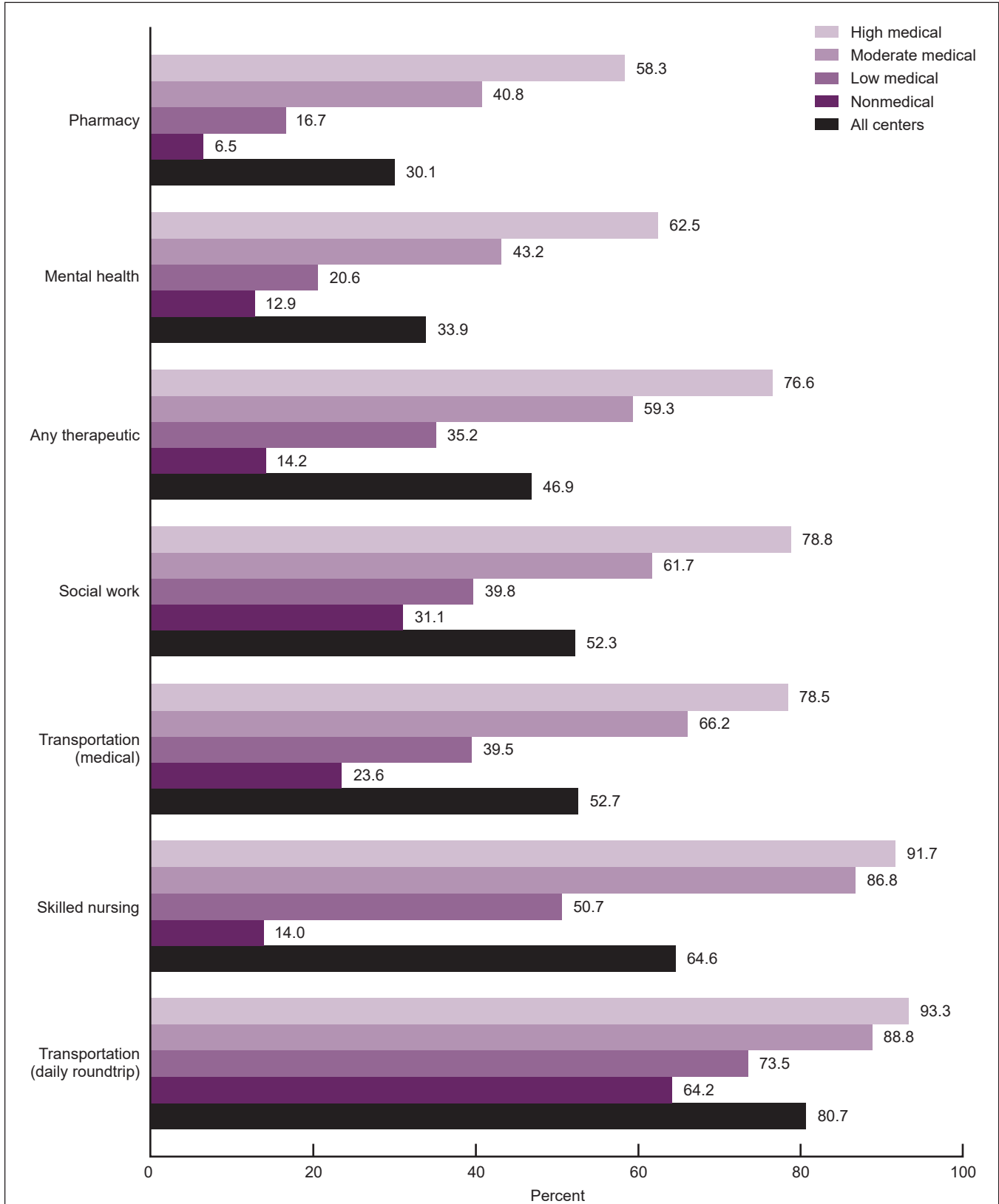
More than one-half of all ADSCs nationally provided daily roundtrip transportation (80.7%), skilled nursing services (64.6%), transportation for medical or dental appointments (52.7%), and social work services (52.3%) (Figure 7). Less than one-half of all centers provided any therapeutic (46.9%), mental health (33.9%), or pharmacy services (30.1%).

An overall increase was observed by increasing level of medical service provision for all selected services provided either by center employees or arrangement with outside vendors. Percentages were different between all levels of medical service provision for daily roundtrip transportation, transportation to medical appointments, therapeutic, social work, skilled nursing, mental health, pharmacy, and dietary services. Compared with 14.0% among nonmedical centers, the provision of skilled nursing services increased to 50.7% among low medical, 86.8% among moderate medical, and 91.7% among high medical. The provision of any therapeutic

**Figure 6. Percentage of specialized adult day services centers by specialization, overall and by level of medical service provision: United States, 2016**



**Figure 7. Percentage of adult day services centers that provided selected services, overall and by level of medical service provision: United States, 2016**



NOTES: For the purposes of this report, provision of services is defined as those provided by center employees or through arrangement with an outside vendor. A statistically significant increase by increasing level of medical service provision was found for all services included in this figure. Figure excludes cases with missing data. Percentages are based on unrounded estimates.  
 SOURCE: National Center for Health Statistics, National Study of Long-Term Care Providers, Adult Day Services Center Survey, 2016.

services increased from 14.2% among nonmedical centers to 35.2% among low medical centers to 59.3% among moderate medical centers and to 76.6% among high medical centers.

## Distribution of Participant Characteristics at the Center Level (Case-Mix)

### Sex

Overall, 58.2% of participants were female and 41.8% of participants were male in 2016 (Table 2). An overall increase was observed by increasing level of medical service provision for the percentage of female participants, and a corresponding overall decrease by increasing level of medical service provision for male participants. The percentage of female participants increased from 53.2% among nonmedical centers to 55.7% among low medical centers and to 59.8% and 60.2% of participants among moderate medical centers and high medical centers, respectively.

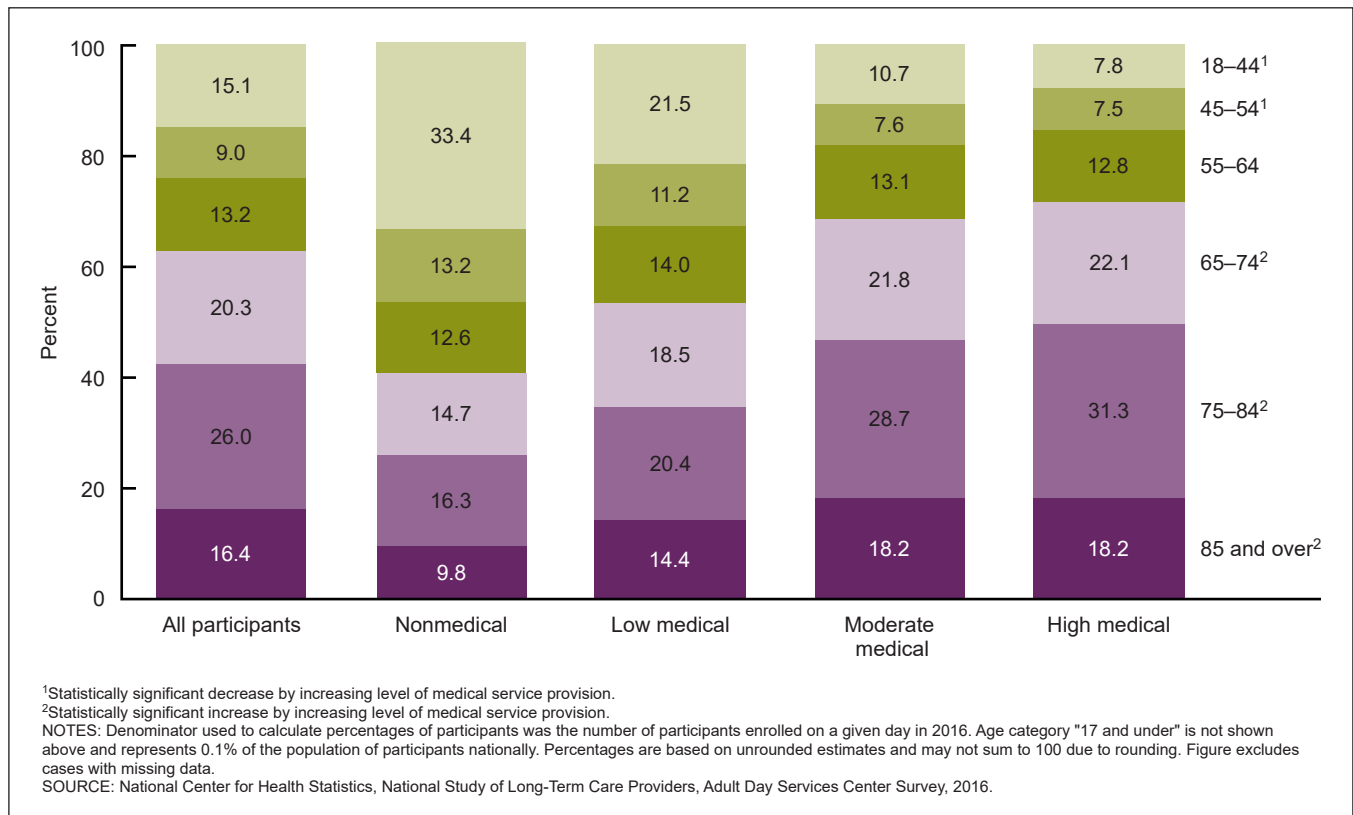
### Participant age

In 2016, the majority of participants were aged 65 or over (62.7%). About 20.3% of participants were between the ages of 65 and 74, 26.0% of participants were between the ages of 75 and 84, and 16.4% of participants were aged 85 or over (Figure 8).

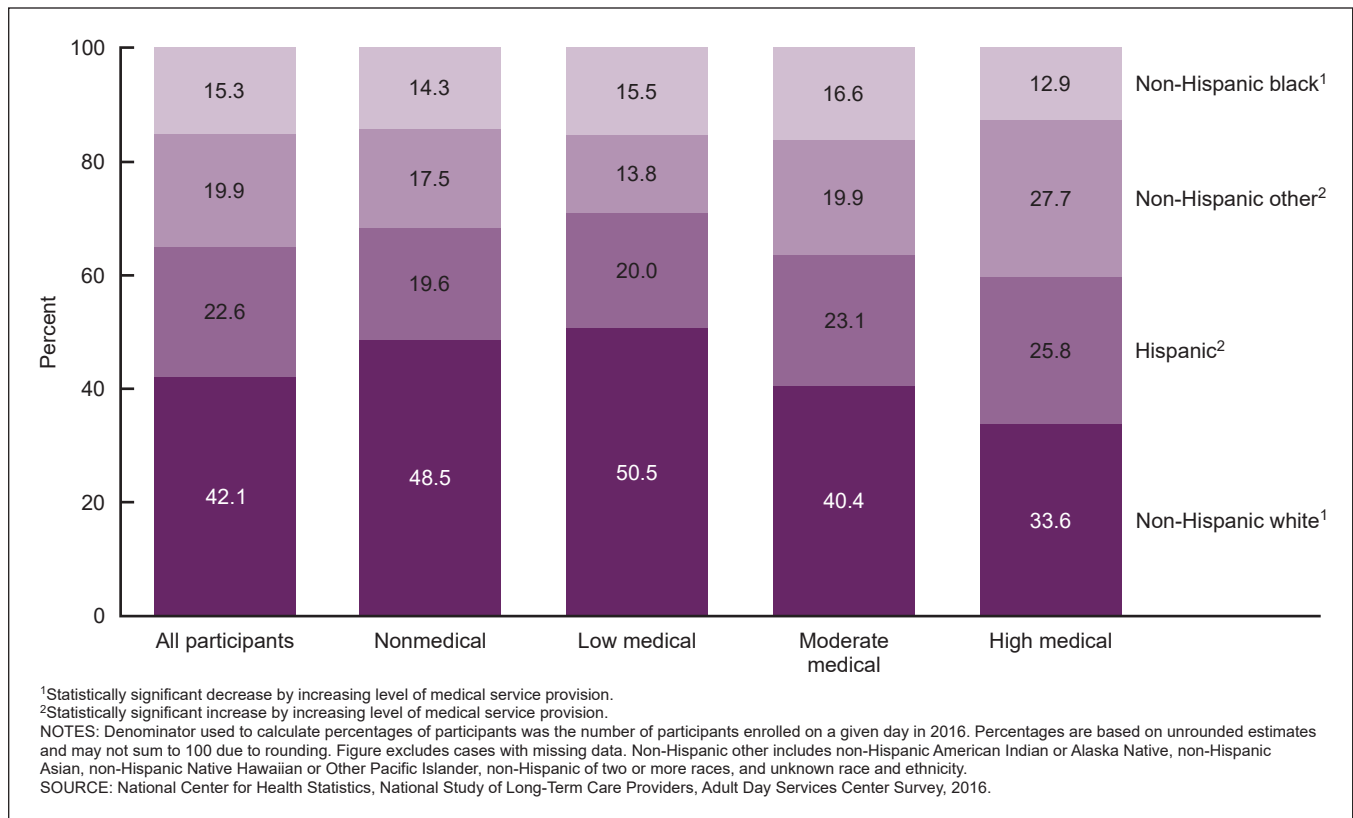
Overall decreases were observed for the percentage of participants aged 18–44 and 45–54 by increasing level of medical service provision. The percentage of participants aged 18–44 decreased from 33.4% among nonmedical centers to 10.7% among moderate medical centers and to 7.8% among high medical centers. The percentage of participants aged 45–54 decreased from 13.2% among nonmedical centers to 7.6% among moderate medical centers and to 7.5% among high medical centers, respectively.

Overall increases were observed by increasing level of medical service provision for the percentage of participants aged 65–74, 75–84, and 85 and over. The percentage of participants aged 65–74 increased from 14.7% among nonmedical and 18.5% among low medical centers to 21.8% and 22.1% among moderate medical and high medical centers, respectively. The percentage of participants aged 75–84 increased from 16.3% among nonmedical to 20.4% among low medical to 28.7% among moderate medical and to 31.3% among high medical centers. The percentage of participants aged 85 and over increased from 9.8% among nonmedical and 14.4% among low medical centers to 18.2% among both moderate and high medical centers.

**Figure 8. Percentage of participants in adult day services centers by age, overall and by level of medical service provision: United States, 2016**



**Figure 9. Percentage of participants in adult day services centers by race and Hispanic origin, overall and by level of medical service provision: United States, 2016**



### Participant race and ethnicity

Overall, 42.1% of participants were non-Hispanic white and the majority (57.9%) of participants were of a race and ethnicity other than non-Hispanic white; 22.6% were Hispanic, 19.9% were non-Hispanic other, and 15.3% were non-Hispanic black (Figure 9).

An overall increase was observed by increasing level of medical service provision for the percentage of participants that were Hispanic and non-Hispanic other. The percentage of Hispanic participants increased from 19.6% among nonmedical centers and 20.0% among low medical centers to 23.1% among moderate medical centers and 25.8% among high medical centers. The percentage of non-Hispanic other participants was 17.5% among nonmedical centers, 13.8% among low medical centers, and 19.9% among moderate medical centers, which increased to 27.7% among high medical centers.

However, an overall decrease was observed by increasing level of medical service provision for the percentage of non-Hispanic white and non-Hispanic black participants. The percentage of non-Hispanic white participants was higher for nonmedical and low medical centers (48.5% and 50.5%, respectively) compared with 40.4% among moderate medical and 33.6% among high medical centers. The percentage of non-Hispanic black participants was higher for low medical and moderate medical centers (15.5% and 16.6%,

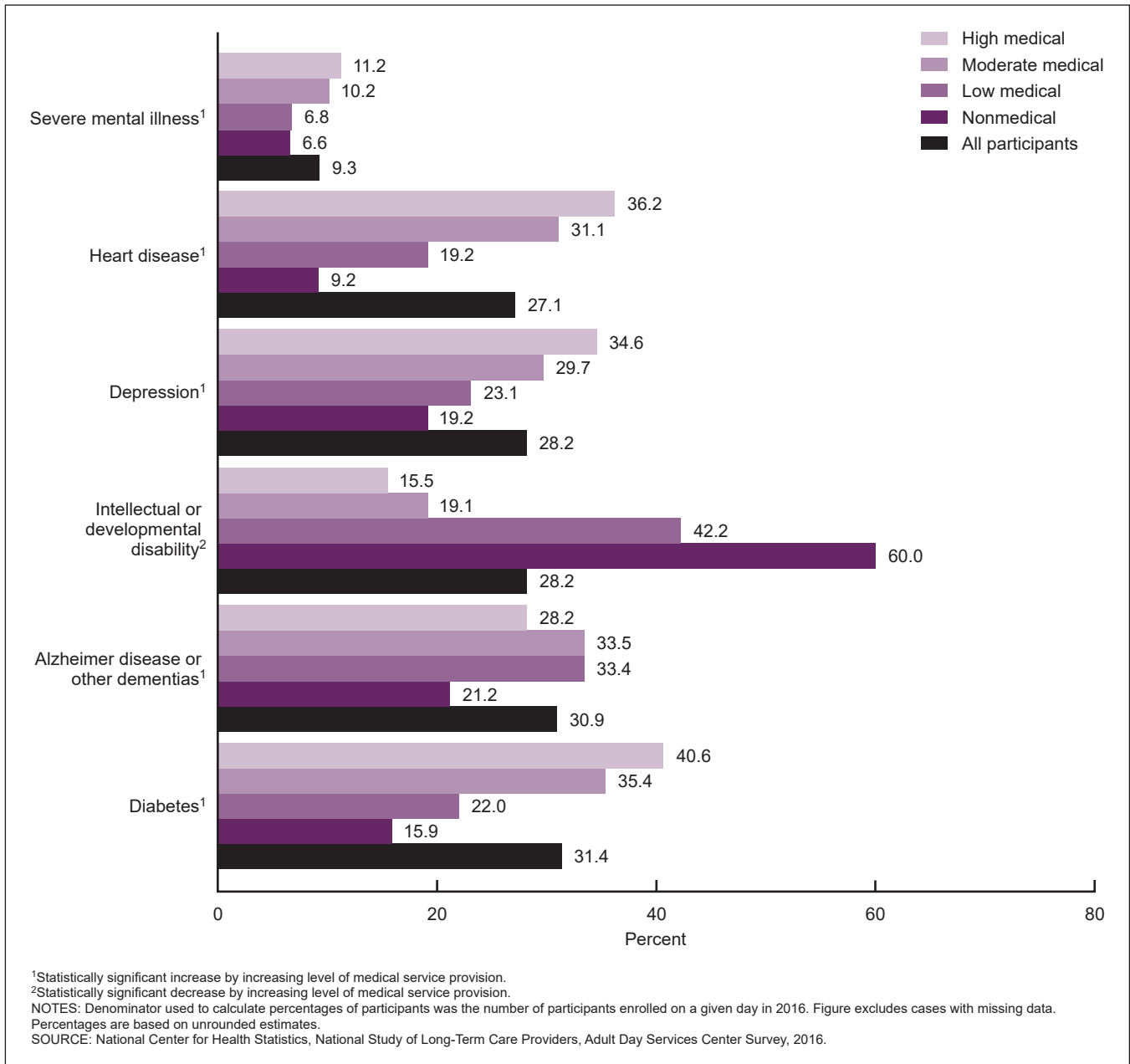
respectively) compared with 14.3% among nonmedical and 12.9% among high medical centers.

### Participant diagnoses

About 31.4% and 30.9% of participants were diagnosed with diabetes and Alzheimer disease or other dementias, 28.2% of participants were diagnosed with IDD or depression, 27.1% of participants were diagnosed with heart disease, and 9.3% of participants were diagnosed with severe mental illness in 2016 (Figure 10).

An overall increase was observed by increasing level of medical service provision for the percentage of participants with a diagnosis of diabetes, Alzheimer disease or other dementias, depression, heart disease, and severe mental illness, but an overall decrease by increasing level of medical service provision for participants diagnosed with IDD. The percentage of participants with diabetes increased from 15.9% among nonmedical centers to 22.0% among low medical centers to 35.4% among moderate medical centers to 40.6% among high medical centers. The percentage of participants with a diagnosis of Alzheimer disease or other dementias increased from 21.2% among nonmedical centers to 33.4% of participants among low medical centers and 33.5% of participants among moderate medical centers, and decreased slightly to 28.2% among high medical centers. The percentage of participants with depression increased from 19.2% among nonmedical centers to 23.1% among low

**Figure 10. Percentage of participants in adult day services centers diagnosed with selected conditions, overall and by level of medical service provision: United States, 2016**

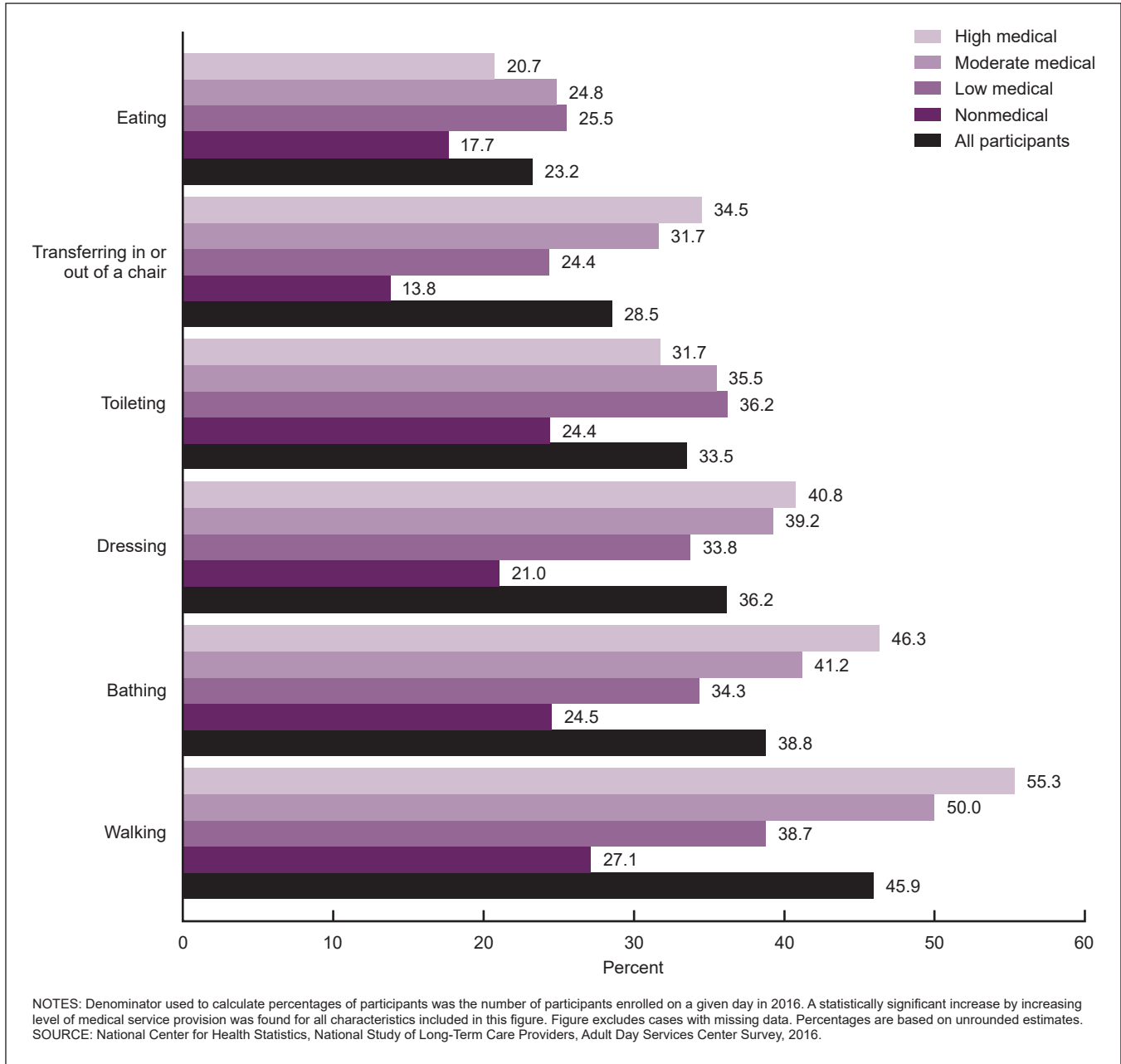


medical centers to 29.7% among moderate medical centers to 34.6% among high medical centers. The percentage of participants with heart disease increased from 9.2% among nonmedical centers to 19.2% among low medical centers to 31.1% among moderate medical centers to 36.2% among high medical centers. The percentage of participants with severe mental illness increased from 6.6% among nonmedical centers and 6.8% among low medical centers to 10.2% among moderate medical centers and 11.2% among high medical centers. The percentage of participants with IDD decreased from 60.0% among nonmedical centers to 42.2% among low medical centers to 19.1% among moderate medical centers to 15.5% among high medical centers.

### Participants with Medicaid as payer source

Among all participants, 65.8% used Medicaid to pay for any services (Table 2). An overall increase was observed by increasing level of medical service provision for the percentage of participants who had any services paid for by Medicaid. The percentage of participants using Medicaid increased from 50.6% among nonmedical centers to 56.8% among low medical centers to 68.4% among moderate medical centers to 78.5% among high medical centers.

**Figure 11. Percentage of participants in adult day services centers needing any assistance with activities of daily living, overall and by level of medical service provision: United States, 2016**



### Participant activities of daily living

Among all participants nationally, 45.9% of participants needed assistance with walking, 38.8% with bathing, 36.2% with dressing, 33.5% with toileting, 28.5% with transferring in and out of a chair, and 23.2% with eating (Figure 11).

An overall increase was observed in the percentage of participants needing assistance by increasing level of medical service provision for all ADLs. Percentages were different between all levels of medical service provision for walking, bathing, dressing, and transferring. For toileting and eating, though differences were observed between some levels of medical service provision, no increase was observed in the

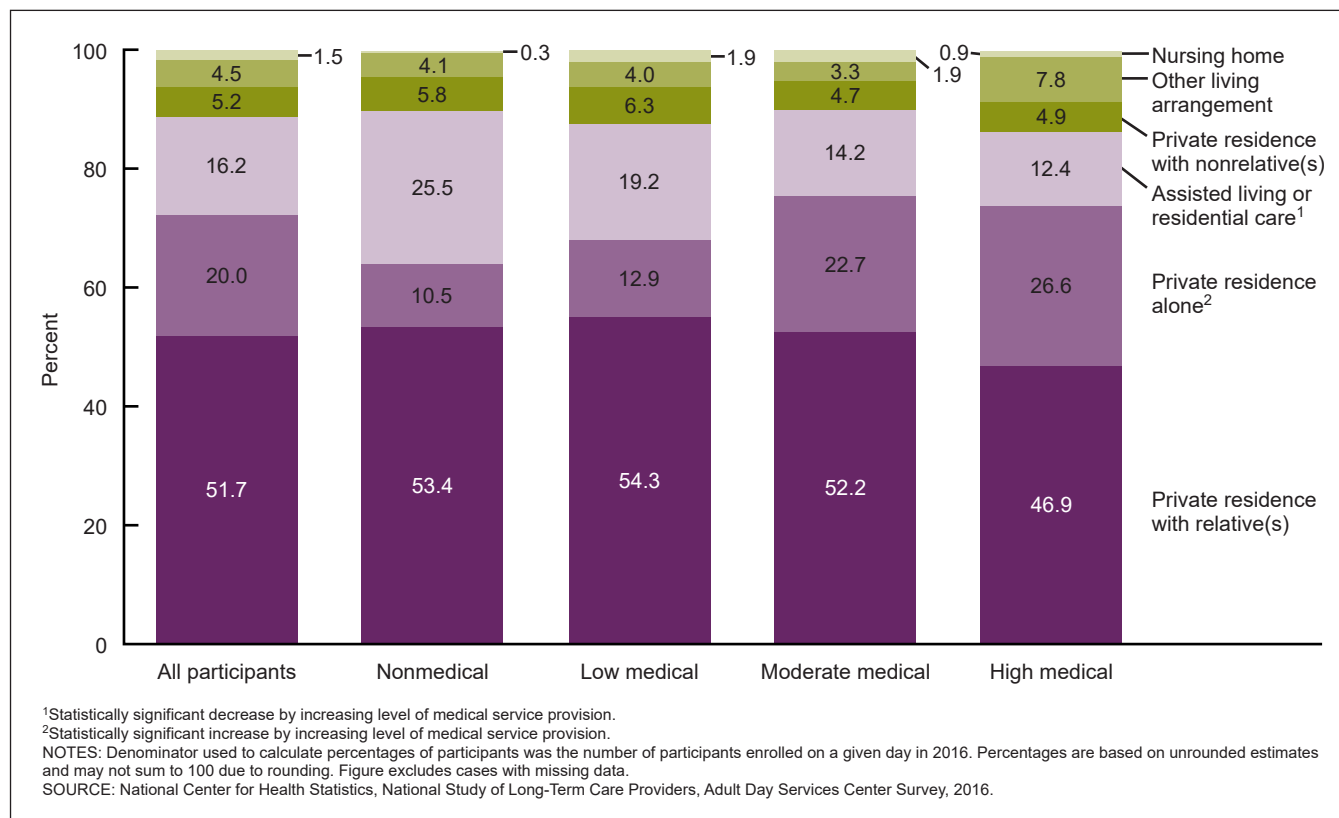
percentage of participants needing assistance by increasing level of medical service provision.

### Participant living arrangements

Overall, 51.7% of participants lived in a private residence with relatives, 20.0% lived in a private residence alone, 16.2% in assisted living or residential care, and 11.2% lived in a private residence with nonrelative(s), had other living arrangements, or lived in a nursing home (Figure 12).

An overall increase was observed by increasing level of medical service provision for the percentage of participants who lived in a private residence alone, from 10.5% and 12.9%

**Figure 12. Percentage of participants in adult day services centers among selected living arrangements, overall and by level of medical service provision: United States, 2016**



among nonmedical and low medical centers to 22.7% and 26.6% among moderate and high medical centers. An overall decrease was observed by increasing level of medical service provision for the percentage of participants in assisted living or residential care, from 25.5% among nonmedical centers to 19.2% among low medical centers to 14.2% among moderate medical centers and 12.4% among high medical centers.

The percentage of participants who lived in a private residence with nonrelative(s) was similar between nonmedical, low medical, and high medical centers (5.8%, 6.3%, and 4.9%, respectively).

### Participant adverse events

Among all participants, 7.8% had a fall, 7.2% had an emergency department visit in the last 90 days, and 4.5% had an overnight hospitalization in the last 90 days (Figure 13). An overall increase was observed by increasing level of medical service provision for the percentage of participants that had a fall, emergency department visit, and overnight hospitalization.

The percentage of participants with a fall increased from 4.2% among nonmedical centers to 6.6% among low medical centers to 9.1% among moderate medical and 8.1% among high medical centers. The percentage of participants with an emergency department visit increased from 4.0% and 5.9%

among nonmedical and low medical centers, respectively, to 8.2% among moderate medical and high medical centers. The percentage of participants with a hospitalization increased from 2.2% among nonmedical centers to 3.5% in low medical centers to 5.3% among moderate medical and 4.9% in high medical centers.

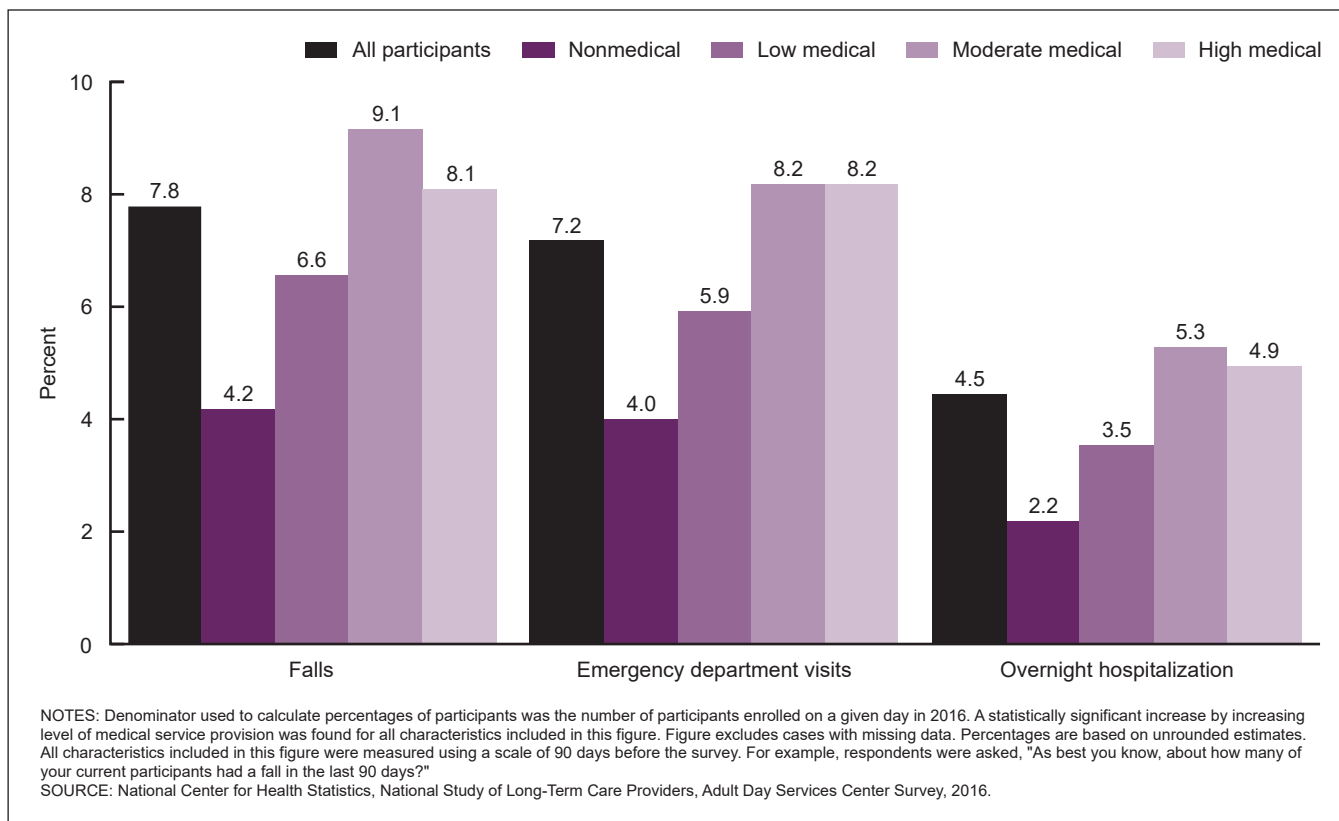
## Geographic Characteristics

### U.S. Census region

About 32.3% of ADSCs were located in the South, 30.7% were located in the West, 20.2% were located in the Northeast, and 16.8% were located in the Midwest (Figure 14). An overall increase was observed by increasing level of medical service provision for the percentage of centers located in the South and Northeast. The percentage of centers in the South increased from 22.2% and 26.7% among nonmedical and low medical centers to 40.4% among moderate medical and 32.7% among high medical centers. The percentage of centers in the Northeast increased from 12.3% among nonmedical centers and 14.2% among low medical centers to 21.8% among moderate medical centers to 38.7% among high medical centers.

An overall decrease was observed by increasing level of medical service provision for the percentage of centers located in the West and Midwest. The percentage of centers

**Figure 13. Percentage of participants in adult day services centers with falls, emergency department visits, and overnight hospitalizations in the last 90 days, overall and by level of medical service provision: United States, 2016**



in the West was higher among nonmedical centers (54.3%), which decreased to 33.6% among low medical centers and to 21.5% and 23.1% among moderate medical and high medical centers. About 11.2% of centers in the Midwest were nonmedical, which increased to 25.5% for low medical centers, and decreased to 16.3% among moderate medical centers and to 5.4% among high medical centers.

### Metropolitan statistical area

An overall increase was observed by increasing level of medical service provision in the percentage of ADSCs in metropolitan statistical areas (Figure 15), which ranged from 85.3% among nonmedical centers to 81.6% among low medical centers to 85.2% among moderate medical centers to 89.9% among high medical centers. However, an overall decrease was observed by increasing level of medical service provision in centers located in micropolitan statistical areas: 11.2% among nonmedical and 11.7% among low medical centers compared with 9.9% among moderate medical and 6.4% among high medical centers.

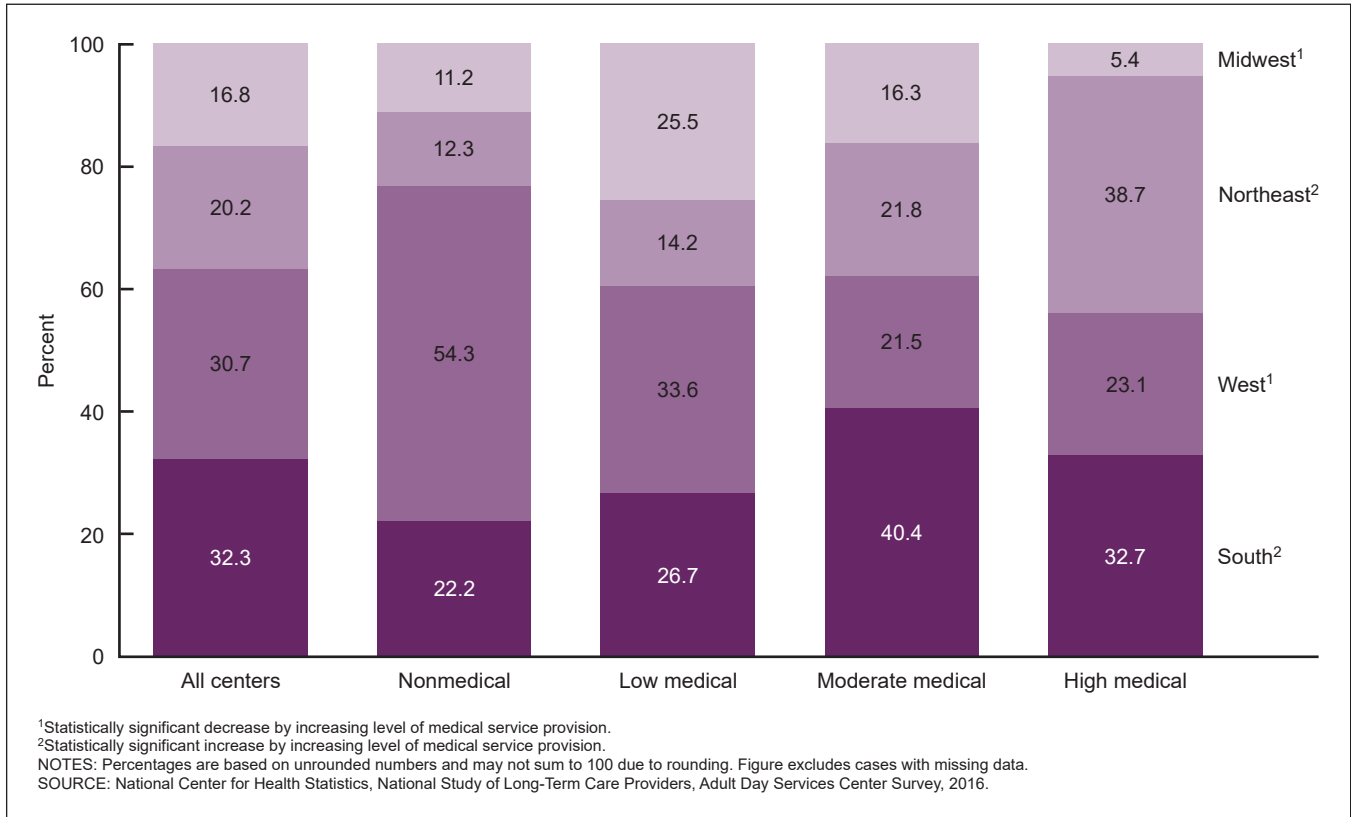
### State variation

Figure 16 shows a U.S. map of the quartile distribution of moderate and high medical ADSCs for the states that reported this information. Eight states were in the highest

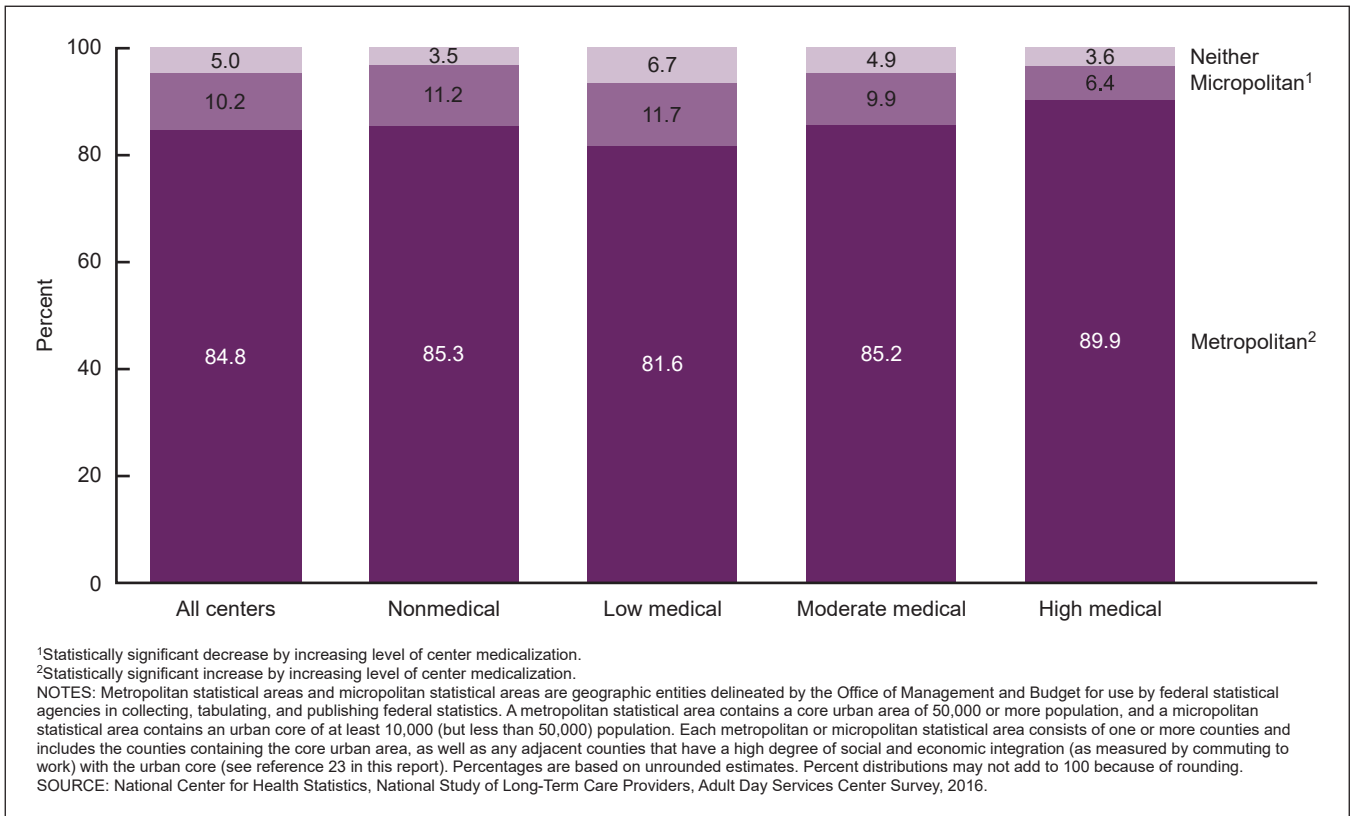
quartile, where greater than 68.2% to 100% of ADSCs were moderate or high medical centers, including Kentucky, Louisiana, Maryland, New Hampshire, New Jersey, North Carolina, Texas, and Virginia. Eight states were in the next highest quartile, where greater than 50.6% to 68.2% of centers were moderate medical or high medical, including Connecticut, Georgia, Missouri, Nebraska, Nevada, New York, Oklahoma, and South Carolina. Eight states were in the next quartile, where greater than 33.5% to 50.6% of centers were moderate medical or high medical, including California, Illinois, Indiana, Minnesota, North Dakota, Ohio, Pennsylvania, and Tennessee. Nine states were in the lowest quartile (18.2%–33.5%) of the percent distribution of moderate medical or high medical centers, including Arizona, Arkansas, Colorado, Florida, Hawaii, Idaho, Iowa, Michigan, and Wisconsin.



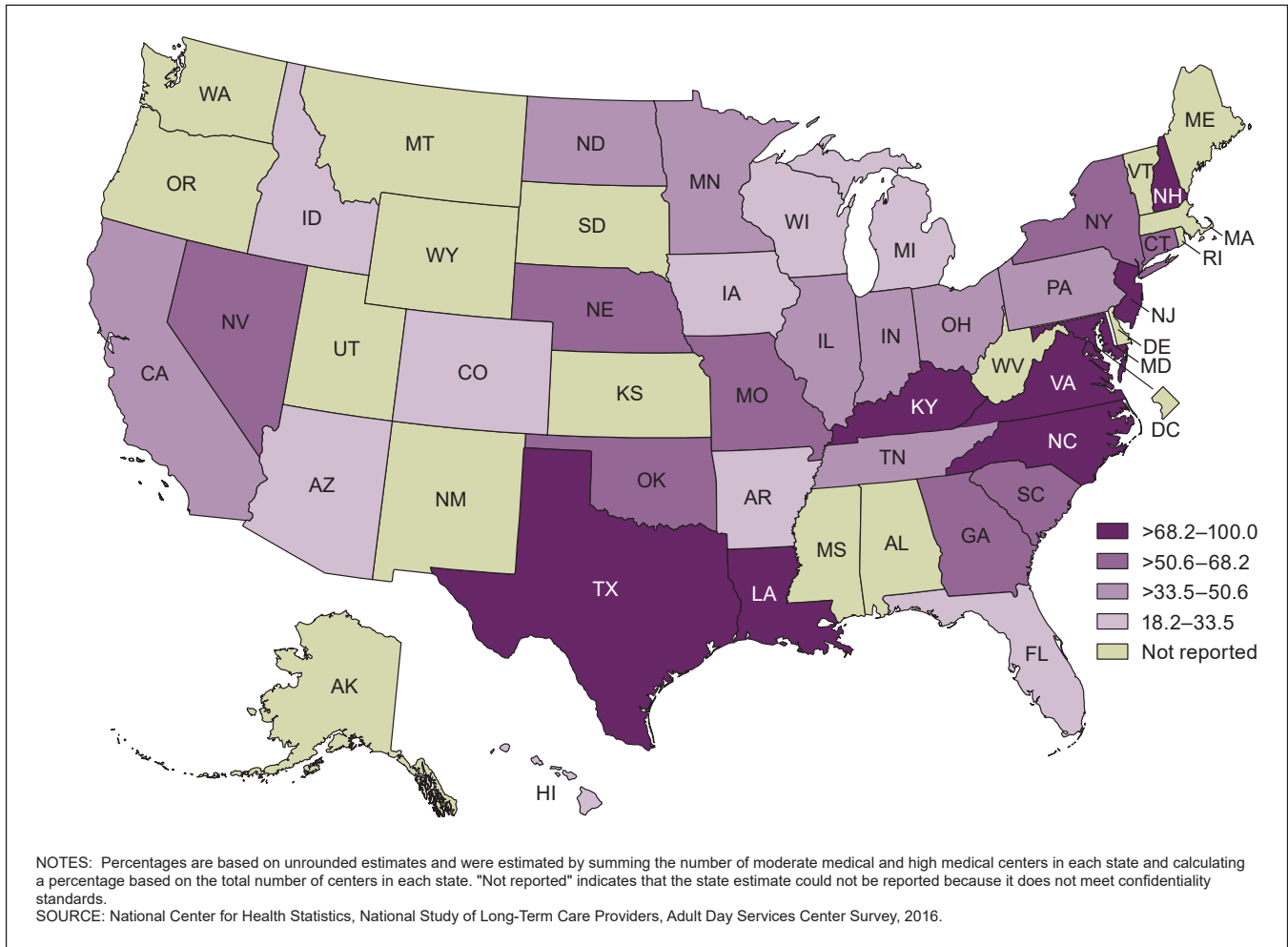
**Figure 14. Percentage of adult day services centers among U.S. Census regions, overall and by level of medical service provision: United States, 2016**



**Figure 15. Percentage of adult day services centers according to metropolitan statistical area status, overall and by level of medical service provision: United States, 2016**



**Figure 16. Percentage of moderate and high medical adult day services centers, by state: United States, 2016**



## Discussion

### Organizational Characteristics

ADSCs with higher levels of medical service provision had higher average capacity and average daily attendance than those that were less medically oriented. Compared with nonmedical centers, more medically oriented ADSCs had higher licensed nurse staffing (RNs and LPNs or LVNs) levels, reflecting the fact that a more highly skilled nursing workforce is needed to address medical needs. Activity staffing decreased as the level of medical service provision increased, likely due to their focus on social and recreational activities rather than medical care. Total staffing HPPD fell by more than one-half from low medical to high medical centers. This is largely reflective of the 74% decrease in activities staff HPPD from low to high medical centers. States tend to regulate components of medical-based providers at a more stringent level than nonmedical providers, particularly when it comes to licensed nurse staffing requirements (7). One study of nursing home staffing levels and state staffing requirements found that increases in state licensed nurse

staffing requirements led to decreases in other support staffing levels (24).

A higher percentage of moderate and high medical ADSCs were licensed by Medicaid, had a greater share of revenue from Medicaid, and a greater percentage of participants using Medicaid, compared with the less medically oriented ADSCs. This finding is reflective of Medicaid's emphasis on medical needs rather than social or recreational needs. Medicaid participants have complex health needs with poorer health outcomes, are more racially and ethnically diverse, and are often more economically disadvantaged than other users of long-term care (25). Additionally, many participants aged 65 and over may be Medicaid and Medicare eligible (i.e., dual eligible)—a well-researched segment of the institutional and community-based LTSS population. They are a group of interest because, while they are a small fraction of the total users of Medicaid, they represent a majority of Medicaid dollars (26). The percentage of ADSCs that were for profit, used EHRs, and exchanged health information with physicians, pharmacies, or hospitals also increased by increasing level of medical service provision.

The percentage of centers that specialized in meeting the needs of participants with a particular diagnosis or disability decreased by more than one-half from nonmedical to high medical. However, among the ADSCs that indicated they were specialized, the percentage of centers that specialized in a particular diagnosis or disability increased by level of medical service provision for each of the specializations, with the exception of IDD and Alzheimer disease or other dementias. Evidence suggests that ADSCs that specialize in participants with a diagnosis of IDD typically serve a less functionally impaired and younger population compared with non-IDD centers (16). In many states, such as California, centers that serve the IDD population are generally focused on socialization or recreational services rather than medical services (7).

Increases were observed by level of medical service provision in the percentage of ADSCs that provided the selected services, in particular skilled nursing, any therapeutic services, and transportation for medical or dental appointments. This finding reflects that, compared with other centers, ADSCs that self-identify as being designed to meet the medical needs of participants are more likely to provide these medically oriented services.

## Distribution of Participant Characteristics at the Center Level (Case-Mix)

High medical ADSCs had a higher percentage of racial and ethnic minorities and participants aged 65 and over. Compared with other LTSS providers, ADSCs consistently serve a higher percentage of minorities (4,27). Higher percentages of participants with diagnoses needing more medical care, such as diabetes, depression, heart disease, and severe mental illness, were found in moderate and high medical centers. However, the percentage of participants diagnosed with IDD in high medical centers was lower, consistent with the finding that a lower percentage of centers that specialized in IDD were high medical centers.

A higher percentage of participants that needed assistance with each of the ADLs were in moderate and high medical centers. The percentage of participants that lived alone in a private residence increased as the level of medical service provision increased; this may indicate that this population may be more likely to rely on ADSCs to meet their needs in the absence of support at home. The percentage of participants living in an assisted living or similar residential care community decreased by increasing level of medical service provision, potentially indicating that ADSCs may be used more for social and recreational services rather than medical. The percentage of participants with any services paid for by Medicaid was higher in high medical centers, which parallels the findings of a higher percentage of Medicaid licensure and Medicaid revenue. Increases in the percentage of participants with an adverse event, such as falls, emergency department visits, and overnight

hospitalizations increased with increasing level of medical service provision.

## Geographic Characteristics

The percentage of centers located in the South and Northeast census regions increased by increasing level of medical service provision and decreased in the West and Midwestern regions. These differences by region are likely driven by differences in funding and regulations by state. Additionally, there are differences in sources of public funding by state, particularly for public sources of funding such as Medicaid, to meet the needs of individuals with less medically focused diagnoses, such as IDD. Also, the percentage of centers located in micropolitan statistical areas decreased by increasing level of medical service provision, while the percentage of centers located in metropolitan statistical areas increased by increasing level of medical service provision.

The percentage of moderate to high medical ADSCs varied considerably among the states that reported information on ADSCs, ranging from a low of 18.2% in Idaho to a high of 100% in New Hampshire. As further evidence of the variability across states, a higher percentage of moderate and high medical centers were located in the Northeast and South census regions compared with nonmedical and low medical centers. These state estimates reflect the great variability in levels of care within the adult day services sector, which is governed by a patchwork of unique, state-based approaches to meet the needs of their respective populations.

## Conclusion

This report provides the most current national and state-level estimates of the level of medical service provision among ADSCs in the United States as of 2016, describing differences in ADSC organizational, participant case-mix, and geographic characteristics, between levels of medical service provision and by increasing level of medical service provision. The shift of LTSS from institutional to HCBS over recent decades has unfolded within an intricate and multifaceted health care delivery system. This report indicates that adult day providers have the capacity to support the social and medical needs of participants.

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**Table 1. Weighted number and percentage of adult day services centers and participants, by level of medical service provision: United States, 2016**

Characteristic	Number <sup>1</sup>	95% CI		Percent <sup>2</sup>	95% CI	
All centers	4,560	4,550	4,570	...	...	...
Nonmedical centers	740	700	780	16.1	14.8	17.5
Low medical centers	1,400	1,350	1,440	30.6	28.9	32.4
Moderate medical centers	1,800	1,760	1,860	39.7	37.9	41.5
High medical centers	620	580	650	13.5	12.3	14.9
All participants <sup>3</sup>	284,300	278,030	290,570	...	...	...
Participants in nonmedical centers	33,280	30,360	36,000	11.7	10.9	12.5
Participants in low medical centers	61,590	58,410	64,760	21.7	21.0	22.3
Participants in moderate medical centers	129,760	124,050	135,460	45.6	44.6	46.6
Participants in high medical centers	59,680	54,900	64,470	21.0	19.7	22.2

... Category not applicable.

<sup>1</sup>Estimates are rounded as whole numbers to the nearest 10.

<sup>2</sup>Percentages are based on unrounded estimates.

<sup>3</sup>The weighted number of adult day services center participants represents current participants in 2016.

NOTES: CI is confidence interval. Percent distributions may not add to 100 because of rounding.

SOURCE: National Center for Health Statistics, National Study of Long-Term Care Providers, Adult Day Services Center Survey, 2016.

**Table 2. Organizational, participant case-mix, and geographic characteristics of adult day services centers, overall and by level of medical service provision: United States, 2016**

Characteristic	All centers			Nonmedical			Low medical			Moderate medical			High medical			Difference by increasing level of medical service provision
	Mean (number)	95% CI		Mean (number)	95% CI		Mean (number)	95% CI		Mean (number)	95% CI		Mean (number)	95% CI		
Center capacity	Mean (number)	95% CI		Mean (number)	95% CI		Mean (number)	95% CI		Mean (number)	95% CI		Mean (number)	95% CI		Increase
Average capacity <sup>1,2</sup>	65.7	64.5	66.9	51.3	48.2	54.5	52.7	50.6	54.8	73.0	71.1	74.9	90.5	86.3	94.8	
Average daily attendance <sup>2</sup>	42.0	41.1	42.9	34.2	31.6	36.7	31.0	29.7	32.3	46.7	45.2	48.1	62.6	59.4	65.8	Increase
Center ownership and licensure	Percent	95% CI		Percent	95% CI		Percent	95% CI		Percent	95% CI		Percent	95% CI		None
Medicaid licensure	77.1	76.2	77.9	53.5	50.5	56.4	69.8	67.9	71.7	86.9	85.6	88.1	92.7	90.8	94.3	
For-profit ownership	44.7	43.6	45.8	37.8	34.8	40.8	33.8	31.9	35.8	49.4	47.7	51.2	63.4	60.3	66.5	
Chain	42.6	41.5	43.8	43.8	40.8	46.9	41.4	39.4	43.4	41.4	39.7	43.2	47.6	44.3	50.8	
Center staffing levels (hours per participant per day)	Mean (number)	95% CI		Mean (number)	95% CI		Mean (number)	95% CI		Mean (number)	95% CI		Mean (number)	95% CI		Decrease
Registered nurse	0.38	0.36	0.40	0.16	0.11	0.20	0.44	0.38	0.49	0.43	0.39	0.47	0.38	0.33	0.42	
Licensed practical or vocational nurse	0.22	0.20	0.24	0.06	0.03	0.09	0.27	0.22	0.31	0.26	0.24	0.29	0.19	0.16	0.22	
Aide	0.92	0.89	0.96	0.74	0.62	0.85	1.09	1.02	1.16	0.96	0.90	1.01	0.68	0.61	0.75	
Social worker	0.14	0.13	0.15	0.15	0.11	0.19	0.13	0.11	0.14	0.15	0.14	0.17	0.15	0.13	0.16	
Activities staff	0.72	0.69	0.75	1.05	0.95	1.16	0.91	0.85	0.97	0.56	0.51	0.60	0.34	0.31	0.37	
All staff	2.39	2.30	2.47	2.16	1.90	2.42	2.83	2.65	3.01	2.36	2.21	2.50	1.73	1.59	1.87	
Center sources of revenue from paid participant fees <sup>2</sup>	Mean (percent)	95% CI		Mean (percent)	95% CI		Mean (percent)	95% CI		Mean (percent)	95% CI		Mean (percent)	95% CI		Increase
Medicaid	59.7	58.8	60.6	47.2	44.4	49.9	50.2	48.5	51.9	65.4	64.1	66.6	79.5	77.6	81.3	
Out-of-pocket payment by the participant or family	14.0	13.5	14.6	16.9	15.2	18.6	18.8	17.7	19.9	11.9	11.2	12.5	6.4	5.5	7.3	
Other federal, state, or local government	12.8	12.2	13.5	21.6	19.4	23.9	16.6	15.3	18.0	8.7	8.0	9.5	5.6	4.4	6.9	
Other sources	3.9	3.5	4.2	7.9	6.5	9.3	4.4	3.7	5.1	2.5	2.1	2.9	1.7	1.1	2.4	
Veterans Affairs	3.8	3.6	4.0	1.4	1.0	1.7	4.4	4.0	4.9	4.7	4.3	5.0	2.6	2.2	3.0	
Medicare	2.3	2.1	2.6	0.5	0.2	0.8	1.5	1.2	1.8	3.6	3.2	4.1	2.3	1.7	3.0	
Older Americans Act	1.8	1.6	2.0	2.9	2.3	3.5	2.2	1.8	2.6	1.4	1.2	1.6	0.7	0.4	1.1	
Private insurance	1.7	1.5	1.9	1.6	1.1	2.2	1.8	1.5	2.2	1.9	1.5	2.2	1.1	0.7	1.4	
Center technology use	Percent	95% CI		Percent	95% CI		Percent	95% CI		Percent	95% CI		Percent	95% CI		Increase
Electronic health record use	23.9	22.9	24.9	9.8	8.2	11.8	17.9	16.4	19.6	31.2	29.5	32.9	32.7	29.7	35.9	
Any health information exchange with physicians, hospitals, or pharmacies	9.2	8.5	9.9	2.8	1.9	4.0	6.2	5.3	7.4	13.3	12.1	14.6	11.5	9.5	13.9	Increase

See footnotes at end of table.

**Table 2. Organizational, participant case-mix, and geographic characteristics of adult day services centers, overall and by level of medical service provision: United States, 2016—Con.**

Characteristic	All centers		Nonmedical		Low medical		Moderate medical		High medical		Difference by increasing level of medical service provision	
	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI		
Center specialization in particular diagnoses or disabilities												Linear difference
Any specialization	22.4	21.5 23.4	39.5	35.7 43.3	28.7	26.3 31.1	13.4	11.8 15.0	14.0	11.1 16.9	Decrease	
Intellectual or developmental disability <sup>3</sup>	70.6	68.3 72.7	73.1	68.7 77.1	73.7	70.1 77.0	63.6	58.7 68.2	67.5	58.9 75.1	Decrease	
Alzheimer disease or other dementias <sup>3</sup>	44.8	42.4 47.3	36.9	32.3 41.8	41.7	37.8 45.6	55.1	50.0 60.1	57.3	48.3 65.9	Increase	
Parkinson disease <sup>3</sup>	21.3	19.3 23.4	12.6	9.6 16.2	17.5	14.6 20.7	33.8	29.3 38.7	33.3	25.5 42.1	Increase	
Traumatic brain injury <sup>3</sup>	20.6	18.6 22.7	15.4	12.0 19.4	20.4	17.3 23.8	26.4	22.2 31.1	22.5	15.7 31.1	Increase	
Severe mental illness <sup>3</sup>	20.5	18.5 22.6	13.2	10.0 17.2	16.0	13.2 19.2	34.1	29.5 39.1	27.0	19.9 35.5	Increase	
Post-stroke <sup>3</sup>	20.1	18.2 22.2	9.5	7.0 12.9	18.0	15.2 21.2	28.6	24.3 33.3	41.7	33.2 50.7	Increase	
Multiple sclerosis <sup>3</sup>	11.5	9.9 13.2	5.9	4.0 8.6	8.4	6.4 11.0	18.5	15.0 22.6	24.6	17.6 33.2	Increase	
Some other condition <sup>3</sup>	7.8	6.6 9.3	4.9	3.1 7.7	5.7	4.1 7.8	7.4	5.1 10.5	29.0	21.7 37.6	Increase	
Center services provided by employees or through arrangement												Linear difference
Transportation (daily roundtrip)	80.7	79.8 81.6	64.2	61.0 67.3	73.5	71.5 75.4	88.8	87.6 90.0	93.3	91.3 94.9	Increase	
Dietary and nutritional	68.0	66.9 69.1	35.1	32.0 38.4	59.4	57.2 61.6	80.8	79.2 82.4	89.4	87.0 91.4	Increase	
Skilled nursing	64.6	63.5 65.7	14.0	11.9 16.4	50.7	48.4 52.9	86.8	85.3 88.1	91.7	89.5 93.5	Increase	
Transportation (medical)	52.7	51.6 53.8	23.6	20.9 26.5	39.5	37.4 41.8	66.2	64.3 68.0	78.5	75.4 81.3	Increase	
Social work	52.3	51.2 53.4	31.1	28.1 34.3	39.8	37.6 42.0	61.7	59.9 63.5	78.8	75.9 81.5	Increase	
Therapy	46.9	45.7 48.0	14.2	12.0 16.8	35.2	33.0 37.4	59.3	57.4 61.2	76.6	73.4 79.4	Increase	
Mental health	33.9	32.8 35.1	12.9	10.8 15.4	20.6	18.8 22.6	43.2	41.3 45.2	62.5	59.0 65.9	Increase	
Pharmacy	30.1	29.1 31.2	6.5	5.1 8.4	16.7	15.0 18.5	40.8	38.8 42.8	58.3	54.7 61.9	Increase	
Hospice	20.8	19.9 21.8	9.6	7.8 11.8	18.8	17.0 20.7	25.1	23.4 26.9	26.5	23.3 29.9	Increase	
Participant sex												Linear difference
Female <sup>4</sup>	58.2	57.8 58.6	53.2	52.0 54.3	55.7	54.9 56.4	59.8	59.2 60.4	60.2	59.4 61.0	Increase	
Male <sup>4</sup>	41.8	41.4 42.2	46.8	45.7 48.0	44.3	43.6 45.1	40.2	39.6 40.8	39.8	40.0 40.6	Decrease	
Participant age <sup>5</sup>												Linear difference
18–44	15.1	14.4 15.8	33.4	30.7 36.0	21.5	19.9 23.0	10.7	9.9 11.5	7.8	6.9 8.8	Decrease	
45–54	9.0	8.6 9.3	13.2	12.0 14.4	11.2	10.4 11.9	7.6	7.1 8.0	7.5	6.8 8.3	Decrease	
55–64	13.2	12.8 13.6	12.6	11.6 13.7	14.0	13.0 14.9	13.1	12.6 13.6	12.8	11.8 13.8	None	
65–74	20.3	19.9 20.8	14.7	13.1 16.3	18.5	17.5 19.5	21.8	21.1 22.4	22.1	21.1 23.2	Increase	
75–84	26.0	25.3 26.7	16.3	14.6 18.1	20.4	19.3 21.5	28.7	27.7 29.6	31.3	29.7 32.9	Increase	
85 or over	16.4	15.9 16.9	9.8	8.5 11.0	14.4	13.4 15.3	18.2	17.4 18.9	18.2	17.1 19.3	Increase	
Participant race and ethnicity												Linear difference
Non-Hispanic white	42.1	41.0 43.2	48.5	45.8 51.3	50.5	48.6 52.4	40.4	38.6 42.2	33.6	30.6 36.6	Decrease	
Hispanic	22.6	21.6 23.6	19.6	17.8 21.4	20.0	18.2 21.8	23.1	21.6 24.7	25.8	23.0 28.7	Increase	
Non-Hispanic other <sup>6</sup>	19.9	18.7 21.2	17.5	14.9 20.0	13.8	12.0 15.5	19.9	18.0 21.9	27.7	24.2 31.2	Increase	
Non-Hispanic black	15.3	14.7 15.9	14.3	12.7 15.9	15.5	14.4 16.5	16.6	15.5 17.6	12.9	11.3 14.5	Decrease	

See footnotes at end of table.



**Table 2. Organizational, participant case-mix, and geographic characteristics of adult day services centers, overall and by level of medical service provision: United States, 2016—Con.**

Characteristic	All centers			Nonmedical			Low medical			Moderate medical			High medical			Difference by increasing level of medical service provision
	Percent	95% CI		Percent	95% CI		Percent	95% CI		Percent	95% CI		Percent	95% CI		
<b>Participant diagnoses<sup>7</sup></b>																
Diabetes	31.4	30.6	32.2	15.9	14.2	17.7	22.0	20.7	23.2	35.4	34.4	36.4	40.6	38.8	42.5	Increase
Alzheimer disease or other dementias	30.9	30.0	31.8	21.2	18.4	23.9	33.4	31.4	35.5	33.5	32.2	34.7	28.2	26.1	30.4	Increase
Depression	28.2	27.3	29.0	19.2	16.6	21.8	23.1	21.5	24.8	29.7	28.5	30.9	34.6	32.4	36.7	Increase
Intellectual or developmental disability	28.2	27.0	29.5	60.0	55.6	64.4	42.2	39.7	44.8	19.1	17.7	20.5	15.5	13.6	17.3	Decrease
Heart disease <sup>8</sup>	27.1	26.2	28.1	9.2	8.0	10.3	19.2	17.8	20.6	31.1	29.8	32.4	36.2	33.5	39.0	Increase
Severe mental illness	9.3	8.7	9.8	6.6	5.4	7.7	6.8	6.0	7.5	10.2	9.4	11.0	11.2	9.8	12.6	Increase
<b>Participant activities of daily living</b>																
Walking	45.9	44.8	47.0	27.1	24.3	30.0	38.7	37.1	40.4	50.0	48.4	51.6	55.3	52.4	58.2	Increase
Bathing	38.8	37.5	40.0	24.5	21.4	27.6	34.3	32.3	36.4	41.2	39.4	42.9	46.3	43.0	49.6	Increase
Dressing	36.2	35.1	37.3	21.0	18.5	23.5	33.8	31.9	35.6	39.2	37.7	40.8	40.8	37.7	43.8	Increase
Toileting	33.5	32.5	34.5	24.4	21.8	27.0	36.2	34.5	38.0	35.5	34.0	36.9	31.7	28.8	34.7	Increase
Transferring in or out of a chair	28.5	27.5	29.6	13.8	12.0	15.7	24.4	23.0	25.7	31.7	30.1	33.2	34.5	31.3	37.7	Increase
Eating	23.2	22.4	24.1	17.7	15.2	20.2	25.5	24.0	27.0	24.8	23.5	26.2	20.7	18.6	22.8	Increase
<b>Participant living arrangements</b>																
Live with a relative	51.7	50.4	53.0	53.4	50.0	56.8	54.3	51.8	56.9	52.2	50.3	54.2	46.9	43.7	50.1	None
Private residence alone	20.0	18.7	21.3	10.5	7.8	13.3	12.9	10.7	15.1	22.7	21.0	24.3	26.6	22.9	30.4	Increase
Assisted living or residential care	16.2	15.1	17.3	25.5	22.0	28.9	19.2	17.0	21.4	14.2	12.5	15.9	12.4	10.1	14.8	Decrease
Private residence with nonrelative	5.2	4.8	5.7	5.8	4.6	6.9	6.3	5.1	7.4	4.7	4.1	5.3	4.9	4.0	5.9	None
Other living arrangement	4.5	3.7	5.2	4.1	2.3	5.9	4.0	3.0	4.9	3.3	2.3	4.2	7.8	5.2	10.4	None
Nursing home	1.5	1.2	1.8	0.3	0.2	0.5	1.9	1.3	2.6	1.9	1.3	2.4	0.9	0.6	1.3	None
<b>Participant Medicaid payment<sup>9</sup></b>																
Participants with any Medicaid payment	65.8	64.5	67.2	50.6	45.9	55.2	56.8	54.3	59.2	68.4	66.5	70.3	78.5	75.3	81.7	Increase
<b>Participant use of care and outcomes<sup>9</sup></b>																
Falls	7.8	7.3	8.3	4.2	3.6	4.8	6.6	6.0	7.1	9.1	8.4	9.9	8.1	6.5	9.7	Increase
Emergency department visits	7.2	6.9	7.4	4.0	3.5	4.4	5.9	5.6	6.2	8.2	7.7	8.6	8.2	7.5	8.9	Increase
Overnight hospitalization	4.5	4.3	4.6	2.2	1.9	2.5	3.5	3.3	3.7	5.3	4.9	5.6	4.9	4.5	5.4	Increase
<b>Center U.S. Census region</b>																
South	32.3	32.1	32.4	22.2	20.2	24.3	26.7	25.3	28.3	40.4	39.1	41.7	32.7	30.2	35.3	Increase
West	30.7	30.6	30.8	54.3	51.7	57.0	33.6	31.9	35.3	21.5	20.1	22.9	23.1	20.5	25.9	Decrease
Northeast	20.2	20.2	20.3	12.3	10.6	14.1	14.2	13.1	15.4	21.8	20.7	23.0	38.7	36.1	41.4	Increase
Midwest	16.8	16.7	16.9	11.2	9.7	12.8	25.5	24.2	26.8	16.3	15.4	17.3	5.4	4.3	6.9	Decrease

See footnotes at end of table.

**Table 2. Organizational, participant case-mix, and geographic characteristics of adult day services centers, overall and by level of medical service provision: United States, 2016—Con.**

Characteristic	All centers			Nonmedical			Low medical			Moderate medical			High medical			Difference by increasing level of medical service provision
	Percent	95% CI		Percent	95% CI		Percent	95% CI		Percent	95% CI		Percent	95% CI		Linear difference
Center metropolitan statistical area status																
Metropolitan	84.8	84.0	85.4	85.3	83.2	87.2	81.6	80.1	83.0	85.2	84.0	86.3	89.9	88.1	91.5	Increase
Micropolitan	10.2	9.6	10.9	11.2	9.6	13.2	11.7	10.6	13.0	9.9	9.0	11.0	6.4	5.1	8.0	Decrease
Neither	5.0	4.6	5.5	3.5	2.6	4.6	6.7	5.8	7.7	4.9	4.2	5.6	3.6	2.7	5.0	None

<sup>1</sup>“Average Capacity” is the maximum number of participants allowed at the center.

<sup>2</sup>Averages are based on unrounded numbers.

<sup>3</sup>The denominator used for this calculation includes adult day services centers that indicated they provided specialized services; about 22.5% of all centers indicated they were specialized in 2016.

<sup>4</sup>Cases with missing data were imputed.

<sup>5</sup>“17 and under” is not shown and represents 0.1% of the population of participants nationally.

<sup>6</sup>Includes non-Hispanic American Indian or Alaska Native, non-Hispanic Asian, non-Hispanic Native Hawaiian or Other Pacific Islander, non-Hispanic of two or more races, and unknown race and ethnicity.

<sup>7</sup>The percentage of missing data was 11.2% for Alzheimer disease, 14.3% for arthritis, 14.8% for asthma, 15.0% for chronic kidney disease, 15.3% for chronic obstructive pulmonary disease, 13.1% for depression, 11.8% for diabetes, 14.1% for heart disease, 13.1% for hypertension, and 15.8% for osteoporosis.

<sup>8</sup>Heart disease includes congestive heart failure, coronary or ischemic heart disease, heart attack, and stroke.

<sup>9</sup>Measured using a scale of 90 days before the survey. For example, respondents were asked “As best you know, about how many of your current participants had a fall in the last 90 days?”

NOTES: CI is confidence interval. Percent distributions may not add to 100 because of rounding. Percentages are based on unrounded estimates.

SOURCE: National Center for Health Statistics, National Study of Long-Term Care Providers, Adult Day Services Center Survey, 2016.

# Appendix. Technical Notes

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To calculate the appropriate design-based variance, subpopulation parameters were applied that specified the subpopulation variable of interest ( $y$ ) and any missing observations of the selected characteristics of ADSCs and participants examined ( $x$ ). Subpopulation parameters were calculated using Stata's `subpop()`, or a combination of `subpop()` and `over()`, in conjunction with the following estimation procedures:

`svy, subpop(if y!=. & x!=.): mean x, over(y)`

`svy, subpop(if y!=. & x1!=.): ratio x1 / x2, over(y)`

`svy, subpop(if y!=. & x!=.): proportion x, over(y)`

`svy, subpop(if y!=.): tab y, count ci se`

`svy, subpop(if y!=.): total x`

# Vital and Health Statistics Series Descriptions

## Active Series

- Series 1. Programs and Collection Procedures**  
Reports describe the programs and data systems of the National Center for Health Statistics, and the data collection and survey methods used. Series 1 reports also include definitions, survey design, estimation, and other material necessary for understanding and analyzing the data.
- Series 2. Data Evaluation and Methods Research**  
Reports present new statistical methodology including experimental tests of new survey methods, studies of vital and health statistics collection methods, new analytical techniques, objective evaluations of reliability of collected data, and contributions to statistical theory. Reports also include comparison of U.S. methodology with those of other countries.
- Series 3. Analytical and Epidemiological Studies**  
Reports present data analyses, epidemiological studies, and descriptive statistics based on national surveys and data systems. As of 2015, Series 3 includes reports that would have previously been published in Series 5, 10–15, and 20–23.

## Discontinued Series

- Series 4. Documents and Committee Reports**  
Reports contain findings of major committees concerned with vital and health statistics and documents. The last Series 4 report was published in 2002; these are now included in Series 2 or another appropriate series.
- Series 5. International Vital and Health Statistics Reports**  
Reports present analytical and descriptive comparisons of U.S. vital and health statistics with those of other countries. The last Series 5 report was published in 2003; these are now included in Series 3 or another appropriate series.
- Series 6. Cognition and Survey Measurement**  
Reports use methods of cognitive science to design, evaluate, and test survey instruments. The last Series 6 report was published in 1999; these are now included in Series 2.
- Series 10. Data From the National Health Interview Survey**  
Reports present statistics on illness; accidental injuries; disability; use of hospital, medical, dental, and other services; and other health-related topics. As of 2015, these are included in Series 3.
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The last Series 12 report was published in 1974; these reports were included in Series 13, and as of 2015 are in Series 3.
- Series 13. Data From the National Health Care Survey**  
Reports present statistics on health resources and use of health care resources based on data collected from health care providers and provider records. As of 2015, these reports are included in Series 3.

- Series 14. Data on Health Resources: Manpower and Facilities**  
The last Series 14 report was published in 1989; these reports were included in Series 13, and are now included in Series 3.
- Series 15. Data From Special Surveys**  
Reports contain statistics on health and health-related topics from surveys that are not a part of the continuing data systems of the National Center for Health Statistics. The last Series 15 report was published in 2002; these reports are now included in Series 3.
- Series 16. Compilations of Advance Data From Vital and Health Statistics**  
The last Series 16 report was published in 1996. All reports are available online; compilations are no longer needed.
- Series 20. Data on Mortality**  
Reports include analyses by cause of death and demographic variables, and geographic and trend analyses. The last Series 20 report was published in 2007; these reports are now included in Series 3.
- Series 21. Data on Natality, Marriage, and Divorce**  
Reports include analyses by health and demographic variables, and geographic and trend analyses. The last Series 21 report was published in 2006; these reports are now included in Series 3.
- Series 22. Data From the National Mortality and Natality Surveys**  
The last Series 22 report was published in 1973. Reports from sample surveys of vital records were included in Series 20 or 21, and are now included in Series 3.
- Series 23. Data From the National Survey of Family Growth**  
Reports contain statistics on factors that affect birth rates, factors affecting the formation and dissolution of families, and behavior related to the risk of HIV and other sexually transmitted diseases. The last Series 23 report was published in 2011; these reports are now included in Series 3.
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The last Series 24 report was published in 1996. All reports are available online; compilations are no longer needed.

For answers to questions about this report or for a list of reports published in these series, contact:

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