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State-Level Health Care Expenditures Associated With Disability

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Abstract

Objective: Given the growth in national disability-associated health care expenditures (DAHE) and the changes in health insurance–specific DAHE distribution, updated estimates of state-level DAHE are needed. The objective of this study was to update state-level estimates of DAHE.

Methods: We combined data from the 2013-2015 Medical Expenditure Panel Survey, 2013-2015 Behavioral Risk Factor Surveillance System, and 2014 National Health Expenditure Accounts to calculate state-level DAHE for US adults in total, per adult, and per (adult) person with disability (PWD). We adjusted expenditures to 2017 prices and assessed changes in DAHE from 2003 to 2015.

Results: In 2015, DAHE were $868 billion nationally (range, $1.4 billion in Wyoming to $102.8 billion in California) accounting for 36% of total health care expenditures (range, 29%-41%). From 2003 to 2015, total DAHE increased by 65% (range, 35%-125%). In 2015, DAHE per PWD were highest in the District of Columbia ($27 839) and lowest in Alabama ($12 603). From 2003 to 2015, per-PWD DAHE increased by 13% (range, −20% to 61%) and per-capita DAHE increased by 28% (range, 7%-84%). In 2015, Medicare DAHE per PWD ranged from $10 067 in Alaska to $18 768 in New Jersey. Medicaid DAHE per PWD ranged from $9825 in Nevada to $43 365 in the District of Columbia. Nonpublic–health insurer per-PWD DAHE ranged from $7641 in Arkansas to $18 796 in Alaska.

Conclusion: DAHE are substantial and vary by state. The public sector largely supports the health care costs of people with disabilities. State policy makers and other stakeholders can use these results to inform the development of public health programs that support and provide ongoing health care to people with disabilities.

Keywords

state estimates, disability costs, disability expenditures, health care, Medicare, Medicaid

People with disabilities face an array of health and support needs.[1-3] Not only do they need more health care services than people without disabilities, they often require long-term services and supports to address functional limitations and actively participate in society.[4,5] Both access to care and supply of services and supports vary by state. In a recently updated analysis of disability-associated health care expenditures (DAHE), national DAHE, adjusted to 2017 prices, increased substantially from $527 billion in 2003 to $868 billion in 2015, increasing from 27% to 36% as a percentage of total health care spending.[6]

Given the growth in national DAHE and the changes in health insurance–specific DAHE distribution,[6] updated estimates of state-level DAHE are needed. The burden of diseases, injuries, and risk factors, many of which contribute to disability, varies widely across states, and several factors drive these differences.[7] For example, differences in state-level prevalence and costs of chronic conditions, such as

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asthma, chronic obstructive pulmonary disease, diabetes, and obesity, can be explained by sociodemographic composition of the state population, general health status, and access to and quality of care.[8-13] Consequently, state-level DAHE are also expected to vary widely.

The goal of this analysis was to update state-level estimates of DAHE generated more than a decade ago.[14] We calculated total and health insurance–specific DAHE by state. States and other stakeholders can use state-level DAHE estimates to inform the development of public health policies and programs that support and provide health care to people with disabilities.

Methods

For consistency with previously published state-level DAHE, we followed the methodology of Anderson et al.[14,15] Given a lack of data on health care expenditures and disability status at the state level from a single source, we combined 3 data sources. First, we used data from the 2013-2015 Medical Expenditure Panel Survey (MEPS)[16] to estimate national DAHE for noninstitutionalized adults. MEPS is administered by the Agency for Healthcare Research and Quality and is a nationally representative sample of medical expenditure data for the noninstitutionalized population. We used data from the MEPS Household Component, which contains payment data, including expenditures for outpatient and inpatient services, emergency department and physician office visits, and prescription medication. In MEPS, these expenditure data are obtained from the MEPS Medical Provider Component, where available, and imputed otherwise.

Second, we used the 2013-2015 Behavioral Risk Factor Surveillance System (BRFSS)[17] to obtain state-level data on disability and characteristics of people with disabilities. BRFSS is an annual, state-based, cross-sectional telephone interview survey conducted by the Centers for Disease Control and Prevention and state health departments. The survey represents the civilian noninstitutionalized adult population in the 50 states and the District of Columbia.

Third, we used the 2014 National Health Expenditure Accounts (NHEA)[18] to obtain data on health care expenditures not captured in MEPS and health care expenditures for adults in institutions (eg, nursing home residents). NHEA are produced by the Office of the Actuary at the Centers for Medicare & Medicaid Services. NHEA cover the entire US population and a full range of health care expenditures, making it the most comprehensive collection of data on health care expenditures.

In the first part of the analysis, we used MEPS data to estimate national-level DAHE for noninstitutionalized adults. In MEPS, disability was defined as receiving help with activities of daily living (eg, bathing) or instrumental activities of daily living (eg, shopping) or being limited in the ability to work, do housework, or go to school because of an impairment or a physical or mental health problem. We estimated a 2-part regression model of per-person DAHE using MEPS.[19,20] Our model is detailed elsewhere.[6] We controlled for sociodemographic characteristics but did not control for other health conditions to capture data on health care spending on diseases for which disability may be a risk factor.[21,22] We estimated DAHE per person with disability (PWD) using the counterfactual approach.[6] We also used MEPS data to estimate a multinomial logit model predicting health insurance category. We used the same control variables as in the expenditure regressions (plus health and employment status) to estimate health insurance category.

In the second part of the analysis, we combined results from the MEPS regressions with BRFSS data to generate state-level estimates of DAHE for noninstitutionalized adults. In BRFSS, disability was defined as being limited in any way in any activities because of physical, mental, or emotional problems. The BRFSS does not collect data on category of health insurance coverage. Thus, we used coefficients from the MEPS regression estimating health insurance category and covariates of BRFSS respondents to predict the probability of having each health insurance category for BRFSS respondents. We used these probabilities as indicators of health insurance category for BRFSS respondents.

To estimate DAHE for each BRFSS respondent, we applied coefficients from the MEPS expenditure regressions to covariates of each BRFSS respondent. We predicted total health care expenditures and DAHE for each BRFSS respondent and summed across respondents in each state to generate state-level total health care expenditures and DAHE for each health insurance category. We calculated DAHE as a percentage of total expenditures in each state for each health insurance category.

In the third part of the analysis, we used NHEA data to reconcile health care expenditures and include DAHE for institutionalized adults. We multiplied our estimated state-level DAHE percentages by state-level total health care expenditures for noninstitutionalized adults from NHEA. These estimates of state and health insurance–specific DAHE accounted for expenditures that were missing from MEPS but included in NHEA.[23] We also added state-level estimates of DAHE for institutionalized adults to estimate total DAHE in each state.[6]

We adjusted state DAHE to sum to national DAHE that resulted from reconciliation of MEPS and NHEA expenditures.[6] We applied a ratio of the national health insurance–specific DAHE from MEPS/NHEA to the sum of state-level health insurance–specific DAHE from BRFSS/NHEA. We used the adjusted DAHE to calculate the DAHE percentage of state total expenditures by health insurer.

We estimated per-capita DAHE and DAHE per PWD in each state. We estimated the numbers of noninstitutionalized adults with and without disabilities and by health

insurance category from the BRFSS. We estimated the numbers of institutionalized adults by state and by health insurance category using the Eiken[24] counts of enrollees in nursing homes for Medicaid, and for Medicare and nonpublic health insurers, using fractions of nursing home costs paid by each health insurer.[25]

Following recommendations by Dunn et al,[26] we converted DAHE based on 2013-2015 data and 2003 DAHE generated by Anderson et al[14] to 2017 prices using the Personal Consumer Expenditures Health Component,[27] which adjusts for general medical price changes. We calculated percentage changes in state-level DAHE in total, per capita (adult population), and per PWD (adults only) and in prevalence of disability among adults from 2003 to 2015.

We based this analysis on de-identified, publicly available data. As such, the study does not constitute human subjects research. We conducted analyses of MEPS and BRFSS data using Stata version 15 (StataCorp).

Results

In 2015, the DAHE percentage of total expenditures was 36% nationally, ranging from 29% in Utah to 41% in Arkansas and Kentucky (Table 1). Nationally, DAHE represented 54% of all Medicare expenditures, 72% of all Medicaid expenditures, and 19% of all expenditures paid by nonpublic sources. By state, the DAHE percentage of all Medicare expenditures ranged from 46% in Hawaii to 60% in Alabama; the DAHE percentage of all Medicaid expenditures ranged from 67% in Hawaii and Illinois to 79% in Alabama; and the DAHE percentage of all nonpublic health insurance expenditures ranged from 15% in the District of Columbia to 22% in Oregon and Washington.

In 2015, DAHE for all US adults were $868 billion (at 2017 prices) and state-level expenditures ranged from $1.4 billion in Wyoming to $102.8 billion in California, with a median of $12.2 billion in South Carolina (Table 1). Public sources paid for 69% of DAHE, ranging from 52% in Alaska to 78% in New York, but the main DAHE payer varied across states. The highest portion of DAHE paid by Medicare was in Florida (48%), by Medicaid was in the District of Columbia (52%), and by nonpublic sources was in Alaska (48%). Medicare DAHE ranged from $428 million in Alaska to $36.6 billion in California, with a median of $4.2 billion in Oklahoma. Medicaid DAHE ranged from $330 million in Wyoming to $36.9 billion in California, with a median of $3.8 billion in Colorado. Nonpublic health insurance DAHE ranged from $598 million in Wyoming to $29.3 billion in California, with a median of $3.7 billion in Oregon.

The mean state-level DAHE per PWD in 2015 was $17 431 and the median was $16 489 in South Dakota (Figure). The highest mean per-PWD DAHE (District of Columbia, $27 839) was more than double the lowest mean per-PWD DAHE (Alabama, $12 603). States in the Northeast and Midwest, along with California and Alaska, were in the top third of the per-PWD DAHE distribution (DAHE >$18 000), whereas most states in the West and Southeast were in the bottom third (DAHE <$15 000).

DAHE per PWD paid by Medicare in 2015 ranged from $10 067 in Alaska to $18 768 in New Jersey, with a median of $12 918 in Virginia (Table 2). Per-PWD DAHE paid by Medicaid ranged from $9825 in Nevada to $43 365 in the District of Columbia, with a median of $17 155 in Maine. Nonpublic health insurance DAHE per PWD ranged from $7641 in Arkansas to $18 796 in Alaska, with a median of $11 630 in Virginia.

From 2003 to 2015, total DAHE increased by an average of 65%, ranging from 35% in New York to 125% in Hawaii and a median of 68% in Indiana (Table 3). DAHE per capita, which represents DAHE spread across the entire state population, increased by an average of 28%, ranging from 7% in Illinois to 84% in California, and a median increase of 29% in Alaska, Virginia, West Virginia, and Wisconsin. Both DAHE per PWD and prevalence of disability among adults increased by an average of 13% from 2003 to 2015. Change in per-PWD DAHE ranged from a 20% decrease in Tennessee to a 61% increase in California, with a median increase of 12% in Delaware, Montana, and New Jersey. Change in disability prevalence ranged from a 13% decrease in Minnesota to a 38% increase in Tennessee, with a median increase of 15% in Kentucky, Maine, Ohio, Pennsylvania, and Vermont.

Discussion

Changes in total DAHE from 2003 to 2015 reflect changes in the number of people with disabilities, which is a function of total population and disability prevalence, and changes in per-PWD DAHE. On average, both prevalence of disability and per-PWD DAHE increased from 2003 to 2015; however, disability prevalence decreased in 3 states and per-PWD DAHE decreased in 10 states during this period. None of the states had a reduction in both prevalence and per-PWD DAHE, and total DAHE increased in every state. In general, states with relatively low growth in total DAHE had low growth in both per-PWD DAHE and prevalence. However, in some states, growth in total DAHE was relatively low even if one of these components increased at a relatively high rate because the other component had a relatively low increase or even a decrease. For example, Minnesota had a relatively low increase in total DAHE even with a relatively high increase in per-PWD DAHE, because its disability prevalence decreased from 2003 to 2015. In Tennessee, total DAHE also increased at a relatively low rate even with a high increase in disability prevalence, because per-PWD DAHE in this state decreased from 2003 to 2015. States with relatively high growth in total DAHE had high growth in either or both disability prevalence and DAHE per PWD.

Table 1. Total disability-associated health care expenditures (DAHE), by health insurer and state, United States, 2015[a]

State	Total		Medicare			Medicaid			Nonpublic sources		
	% of total expenditures[b]	Expenditures, millions, $	% of total expenditures[b]	Expenditures, millions $	% of total DAHE[b]	% of total expenditures[b]	Expenditures, millions $	% of total DAHE[b]	% of total expenditures[b]	Expenditures, millions $	% of total DAHE[b]
United States	36	868 037	54	324 709	37	72	277 183	32	19	266 145	31
Alabama	39	13 179	60	6053	46	79	3191	24	20	3935	30
Alaska	30	2247	55	428	19	71	736	33	19	1082	48
Arizona	37	14 849	52	5984	40	71	4746	32	18	4120	28
Arkansas	41	8616	59	3388	39	77	3037	35	19	2191	25
California	38	102 811	54	36 633	36	69	36 897	36	19	29 281	28
Colorado	35	12 013	53	3908	33	71	3802	32	20	4303	36
Connecticut	37	12 450	52	4052	33	72	4569	37	19	3830	31
Delaware	34	3131	52	1094	35	73	956	31	19	1080	35
District of Columbia	35	2654	55	587	22	72	1376	52	15	692	26
Florida	35	53 147	51	25 505	48	75	11 673	22	18	15 968	30
Georgia	32	20 298	55	8784	43	75	4622	23	17	6891	34
Hawaii	31	3035	46	982	32	67	1067	35	16	986	32
Idaho	33	3543	53	1303	37	73	895	25	19	1345	38
Illinois	33	32 751	52	12 225	37	67	9189	28	18	11 336	35
Indiana	36	18 659	55	6953	37	77	6200	33	18	5506	30
Iowa	35	8308	50	2718	33	70	2547	31	20	3042	37
Kansas	33	6874	52	2644	38	73	1411	21	20	2819	41
Kentucky	41	13 951	59	5377	39	77	4927	35	20	3648	26
Louisiana	38	13 315	57	5409	41	74	4478	34	18	3427	26
Maine	37	4490	53	1548	34	73	1516	34	20	1425	32
Maryland	35	16 965	51	5836	34	72	5598	33	18	5531	33
Massachusetts	37	24 841	53	7896	32	72	9376	38	19	7570	30
Michigan	37	28 174	56	12 180	43	75	8050	29	19	7943	28
Minnesota	34	15 457	48	4439	29	68	5780	37	19	5238	34
Mississippi	40	8695	58	3640	42	75	2875	33	19	2180	25
Missouri	39	17 830	56	6867	39	75	5391	30	21	5573	31
Montana	33	2581	53	893	35	73	581	23	20	1107	43
Nebraska	31	4628	51	1625	35	71	1045	23	19	1958	42
Nevada	34	5995	54	2635	44	70	1450	24	18	1911	32
New Hampshire	31	3740	52	1328	36	77	926	25	18	1486	40
New Jersey	33	24 784	51	9765	39	69	7502	30	17	7517	30
New Mexico	36	5070	55	1780	35	70	1745	34	19	1546	30
New York	39	71 811	53	21 984	31	70	33 829	47	17	15 998	22
North Carolina	36	25 033	56	10 249	41	73	7125	28	19	7659	31
North Dakota	30	2043	47	543	27	69	578	28	19	922	45
Ohio	37	35 021	53	12 997	37	73	11 617	33	19	10 408	30
Oklahoma	37	10 529	58	4213	40	77	2815	27	20	3501	33
Oregon	40	11 900	56	3791	32	72	4449	37	22	3660	31
Pennsylvania	37	41 527	52	15 175	37	75	13 997	34	19	12 355	30
Rhode Island	38	3670	54	1226	33	72	1437	39	19	1007	27
South Carolina	36	12 237	56	5453	45	75	2976	24	19	3808	31
South Dakota	31	2201	51	752	34	71	436	20	20	1013	46
Tennessee	38	17 509	58	7587	43	77	4718	27	19	5205	30
Texas	32	56 664	52	22 639	40	70	15 700	28	16	18 325	32
Utah	29	4833	54	1697	35	69	1018	21	18	2117	44
Vermont	36	2197	52	637	29	71	839	38	20	721	33
Virginia	31	18 359	52	6829	37	73	4200	23	18	7330	40
Washington	37	19 524	58	6212	32	73	5777	30	22	7535	39

(*continued*)

Table 1. (continued)

State	Total		Medicare			Medicaid			Nonpublic sources		
	% of total expenditures[b]	Expenditures, millions, $	% of total expenditures[b]	Expenditures, millions $	% of total DAHE[b]	% of total expenditures[b]	Expenditures, millions $	% of total DAHE[b]	% of total expenditures[b]	Expenditures, millions $	% of total DAHE[b]
West Virginia	40	6665	58	2547	38	77	2228	33	20	1891	28
Wisconsin	34	15 843	51	5260	33	73	4958	31	19	5625	36
Wyoming	31	1387	53	459	33	74	330	24	19	598	43

[a]Expenditures based on 2013-2015 data were converted to 2017 medical prices. Data sources: 2013-2015 Medical Expenditure Panel Survey,[16] 2013-2015 Behavioral Risk Factor Surveillance System,[17] and 2014 National Health Expenditure Accounts.[18]
[b]Percentages of total expenditures and of total DAHE were calculated using expenditures rounded to the nearest dollar and, as a result, may be different from percentages calculated based on the expenditures presented in the table that are expressed in millions $.

Per-PWD health care spending is determined by the prices of services and the number of services used. Both are likely to vary across states and over time, thus contributing to variation in spending and growth across states.[28] Differences in sociodemographic composition across states explain some of this variation in prices and utilization and their changes over time. For example, because per-PWD DAHE increase with age, states with higher proportions of older adults will have higher per-PWD DAHE. Similarly, states that have higher growth in the proportion of older adults may also have faster growth in per-PWD DAHE.

Beyond sociodemographic characteristics, however, differences in health status, access to health care, quality of care, and health care systems and payment structures likely contribute to state-level differences in DAHE and its growth.[8-11] These factors vary substantially across states and over time and may drive DAHE in different directions. Thus, increased DAHE are not necessarily undesirable, and caution should be used when comparing expenditures and increases across states. For example, improved access to and quality of preventive care for people with disabilities may increase health care use and, as a result, DAHE.[29] Because growth in prevention spending may improve access to and quality of care for people with disabilities,[29] it can offset downstream medical spending on treatment and care. Lower-than-average DAHE may also reflect barriers to care and poor quality of preventive care and indicate that resources spent on people with disabilities are inadequate. Higher-than-average DAHE could reflect higher-than-average severity of disability or

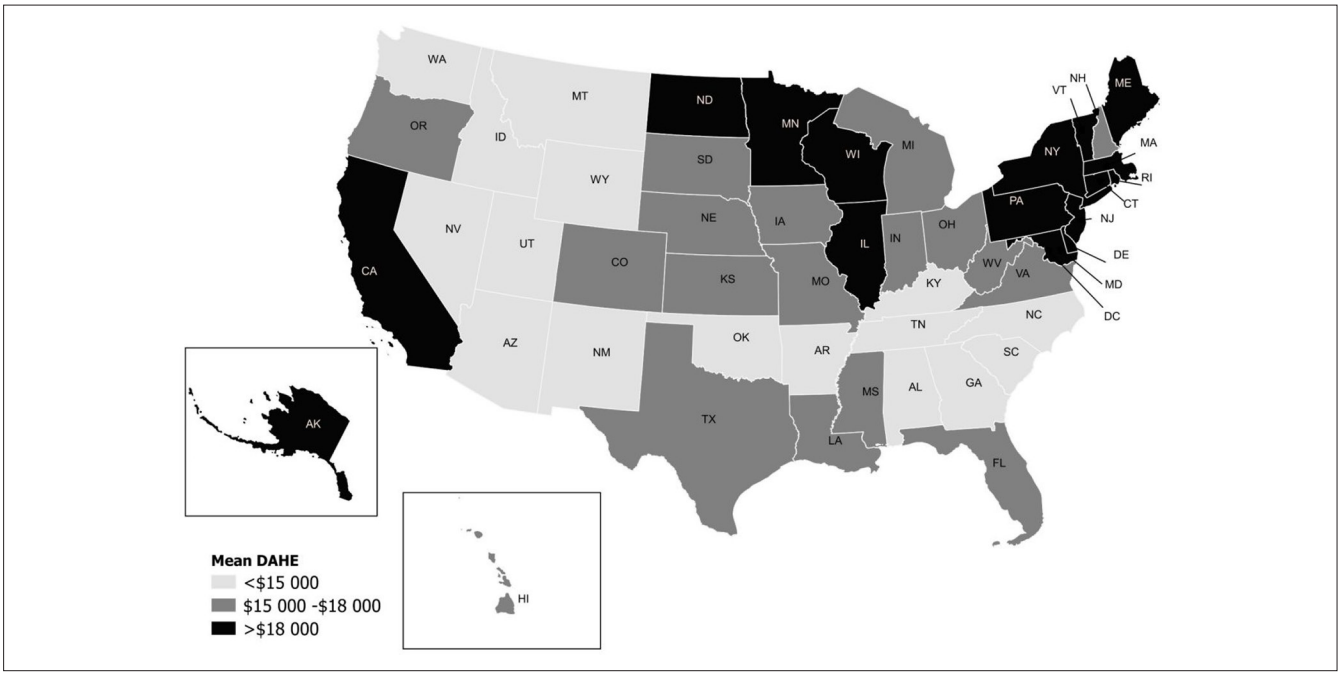

Figure. Mean disability-associated health care expenditures (DAHE) per person with a disability (2017 prices), United States, 2015. Mean DAHE for United States is $17 431. The median DAHE is $16 489 (South Dakota). Expenditures based on 2013-2015 and 2002-2003 data were converted to 2017 medical prices. Data sources: 2013-2015 Medical Expenditure Panel Survey,[16] 2013-2015 Behavioral Risk Factor Surveillance System,[17] and 2014 National Health Expenditure Accounts.[18]

Table 2. Disability-associated health care expenditures per person with disability, by health insurance category and state, United States, 2015[a]

State	Medicare expenditures, $	Medicaid expenditures, $	Nonpublic expenditures, $
United States	14 063	17 887	11 289
Alabama	11 624	11 137	7995
Alaska	10 067	21 751	18 796
Arizona	12 487	13 178	8828
Arkansas	10 976	17 660	7641
California	16 170	19 774	12 468
Colorado	12 731	17 452	10 765
Connecticut	16 489	22 896	14 693
Delaware	15 481	27 268	13 698
District of Columbia	13 970	43 365	15 243
Florida	14 755	13 740	9709
Georgia	12 355	10 895	9554
Hawaii	12 775	17 565	12 242
Idaho	11 532	11 387	11 119
Illinois	15 637	17 576	12 933
Indiana	14 241	17 003	10 770
Iowa	12 440	20 282	12 667
Kansas	13 197	11 434	12 671
Kentucky	12 354	20 690	8071
Louisiana	13 966	19 270	9311
Maine	12 881	17 155	13 453
Maryland	15 917	32 170	12 513
Massachusetts	16 424	21 830	15 430
Michigan	14 616	14 173	9481
Minnesota	14 393	30 684	13 152
Mississippi	12 994	15 954	9001
Missouri	12 711	14 456	10 164
Montana	10 080	9993	12 320
Nebraska	13 275	14 710	14 173
Nevada	13 509	9825	10 113
New Hampshire	13 836	12 717	15 050
New Jersey	18 768	17 980	14 459
New Mexico	11 212	12 716	10 554
New York	15 613	26 164	12 935
North Carolina	12 373	16 936	9649
North Dakota	11 897	21 875	17 279
Ohio	14 692	17 782	11 295
Oklahoma	11 335	14 391	9456
Oregon	11 042	18 857	10 668
Pennsylvania	15 332	16 947	13 843
Rhode Island	14 969	20 341	13 284
South Carolina	12 402	12 608	8875
South Dakota	12 185	12 401	14 396
Tennessee	12 339	13 823	8674
Texas	14 532	18 369	11 026
Utah	12 187	10 649	11 577
Vermont	13 067	22 928	14 175

(*continued*)

Table 2. (continued)

State	Medicare expenditures, $	Medicaid expenditures, $	Nonpublic expenditures, $
Virginia	12 918	15 727	11 630
Washington	10 888	15 023	11 497
West Virginia	11 697	20 194	9308
Wisconsin	13 742	19 344	12 860
Wyoming	11 158	11 398	13 149

[a]Expenditures are converted to 2017 medical prices. Data sources: 2013-2015 Medical Expenditure Panel Survey,[16] 2013-2015 Behavioral Risk Factor Surveillance System,[17] and 2014 National Health Expenditure Accounts.[18]

higher-than-average prevalence of other chronic conditions, such as diabetes, among people with disabilities. Our findings demonstrate that nursing home care is also an important contributor to DAHE. In states with high nursing home costs, providing access to less expensive nursing home care, such as home- and community-based services for long-term services and supports, may reduce these costs. Receipt of more targeted, timely, and efficient care to reduce inpatient readmission and emergency department visits for ambulatory care–sensitive conditions may also reduce DAHE.[30]

We also found that distribution of DAHE and per-PWD DAHE across health insurers varied substantially by state. National DAHE per PWD was the highest for Medicaid. Across states, Medicaid DAHE varied more than Medicare or nonpublic health insurer DAHE, which possibly reflects state policy differences in Medicaid generosity. Differences in Medicaid enrollment and coverage may explain the difference in the mix of DAHE payers across states, because Medicaid policies vary by state. The timing and implementation of state-level health care policies, such as Medicaid expansion and Medicaid payment policies, may also contribute to varying changes in DAHE over time.[31-34]

Our estimates may be helpful for informing discussions of public health policies, programs, and resources needed to provide ongoing quality health care and improve quality of life for people with disabilities. Our results highlight the need for interventions that aim to improve health behaviors, prevent secondary conditions, and provide ongoing quality health care to people with disabilities. The Medicaid expenditure estimates, in particular, may provide valuable information for Medicaid health care resource planning and program evaluation. For example, 67% to 79% of all Medicaid expenditures in each state were DAHE. These results reinforce the importance of implementing public programs and policies that support this vulnerable population and help people with disabilities avoid complications and associated health care expenditures.

Several factors could explain differences in total, per-PWD, and per-capita DAHE across states and over time, including access to and quality of care, severity of disability, prevalence of chronic conditions, and coverage and payment policies. Although our results alone cannot be used to interpret and identify factors driving changes in DAHE in each state, they provide a starting point for further research in trying to understand those factors and develop policies to address them. Our results highlight another important topic for future research, which is assessing whether DAHE increases were associated with improvements in health or survival for people with disabilities.

Limitations

Our study had several limitations. First, because we lacked state-level data on both disability status and health care expenditures from a single source, we combined data from multiple sources. Specifically, we predicted health insurance category and health care expenditures by applying coefficients from an analysis using national MEPS data to state-level BRFSS data. Because of the differences between MEPS and BRFSS survey designs and the questions used to define disability, the prevalence of disability was higher in BRFSS than in MEPS. Some of the characteristics of the disability samples from the 2 surveys were also different. For example, BRFSS respondents with disabilities were younger, more educated, and more likely to be married than adults with disabilities responding to MEPS. However, reconciling the sum of state DAHE with national DAHE largely eliminated differences in the survey populations.

Our definition of disability was similar to the one used in the analysis by Anderson et al,[14,15] because our goal was to produce DAHE estimates that could be compared with previous estimates. Our definition of disability assessed deficits in activities of daily living, instrumental activities of daily living, and general activity limitations. Although parts of this definition have been frequently used in many other studies, a second limitation of our analysis is that a different definition or data might produce different results. Third, our definition of disability was based on self-reported data and is subject to self-report bias; however, self-reported data are routinely used to assess disability at the national and state levels.[35]

Finally, we did not assess age of onset, severity, permanence, duration, or underlying health conditions or causes of

Table 3. Changes in disability-associated health care expenditures (DAHE) and prevalence of disability by state, United States, 2003-2015[a]

	Total DAHE			DAHE per capita			DAHE per person with disability			Prevalence of disability, %		
State	2015, millions $	2003, millions $	Change, %[b]	2015, $	2003, $	Change, %[b]	2015, $	2003, $	Change, %[b]	2015	2003	Change[b]
United States	868 037	527 112	65	3716	2902	28	17 431	15 422	13	21	19	13
Alabama	13 179	8191	61	3605	2859	26	12 603	12 619	0	29	23	26
Alaska	2247	1282	75	4183	3241	29	20 497	17 237	19	20	19	9
Arizona	14 849	6769	119	3042	1987	53	14 326	10 569	36	21	19	13
Arkansas	8616	4868	77	3915	2781	41	13 955	12 617	11	28	22	27
California	102 811	50 679	103	4044	2200	84	19 949	12 414	61	20	18	14
Colorado	12 013	5815	107	3217	1973	63	15 935	11 415	40	20	17	17
Connecticut	12 450	8403	48	4509	3886	16	21 927	22 574	−3	21	17	19
Delaware	3131	1621	93	4378	3360	30	20 889	18 643	12	21	18	16
District of Columbia	2654	1658	60	5078	4453	14	27 839	29 810	−7	18	15	22
Florida	53 147	30 674	73	3491	2822	24	15 811	14 209	11	22	20	11
Georgia	20 298	13 453	51	2788	2498	12	13 543	13 841	−2	21	18	14
Hawaii	3035	1349	125	2845	2252	26	17 721	17 296	2	16	13	23
Idaho	3543	1983	79	3048	2304	32	14 059	11 295	24	22	20	6
Illinois	32 751	21 216	54	3457	3223	7	18 881	19 680	−4	18	16	12
Indiana	18 659	11 081	68	3806	2820	35	16 973	15 476	10	22	18	23
Iowa	8308	5198	60	3571	2693	33	17 819	15 753	13	20	17	17
Kansas	6874	4484	53	3293	2634	25	15 746	14 852	6	21	18	18
Kentucky	13 951	7713	81	4220	3233	31	15 177	13 362	14	28	24	15
Louisiana	13 315	8738	52	3986	3355	19	16 752	18 559	−10	24	18	32
Maine	4490	3204	40	4309	3722	16	18 219	18 023	1	24	21	15
Maryland	16 965	9648	76	3773	2803	35	21 118	16 604	27	18	17	6
Massachusetts	24 841	15 451	61	4800	3825	25	22 017	21 091	4	22	18	20
Michigan	28 174	18 058	56	3736	2883	30	15 868	13 937	14	24	21	14
Minnesota	15 457	10 343	49	3791	3138	21	21 267	15 318	39	18	20	−13
Mississippi	8695	6025	44	4044	3451	17	15 483	15 328	<1	26	23	16
Missouri	17 830	11 796	51	3887	3176	22	15 359	14 746	4	25	22	18
Montana	2581	1442	79	3283	2493	32	13 638	12 136	12	24	21	17
Nebraska	4628	3101	49	3387	2835	19	17 500	16 025	9	19	18	9
Nevada	5995	2775	116	2855	1946	47	14 225	10 381	37	20	19	7
New Hampshire	3740	2193	71	3620	2646	37	17 463	14 344	22	21	18	12
New Jersey	24 784	16 477	50	3738	3127	20	21 415	19 200	12	17	16	7
New Mexico	5070	2865	77	3371	2433	39	14 518	12 249	19	23	20	17
New York	71 811	53 166	35	4786	4416	8	23 101	24 747	−7	21	18	16
North Carolina	25 033	14 863	68	3393	2908	17	15 230	16 185	−6	22	18	24
North Dakota	2043	1152	77	3635	2755	32	20 352	17 132	19	18	16	11
Ohio	35 021	25 110	39	3980	3431	16	17 732	17 528	1	22	20	15
Oklahoma	10 529	6230	69	3724	2800	33	13 946	12 207	14	27	23	16
Oregon	11 900	5670	110	3989	2429	64	16 127	10 424	55	25	23	6
Pennsylvania	41 527	27 192	53	4207	3371	25	19 241	17 799	8	22	19	15
Rhode Island	3670	2368	55	4454	3473	28	20 174	19 677	3	22	18	25
South Carolina	12 237	7335	67	3349	2807	19	13 807	15 010	−8	24	19	30
South Dakota	2201	1346	63	3458	2711	28	16 489	14 196	16	21	19	10
Tennessee	17 509	11 675	50	3653	3334	10	13 925	17 496	−20	26	19	38
Texas	56 664	31 883	78	2972	2400	24	17 189	13 553	27	17	18	−2
Utah	4833	2658	82	2562	1913	34	14 112	10 430	35	18	18	−1
Vermont	2197	1248	76	4449	3036	47	20 096	15 715	28	22	19	15
Virginia	18 359	10 571	74	2928	2271	29	15 766	12 595	25	19	18	3
Washington	19 524	10 719	82	3671	2712	35	15 068	11 766	28	24	23	6
West Virginia	6665	4306	55	4555	3536	29	15 494	13 211	17	29	27	10

(*continued*)

Table 3. (continued)

	Total DAHE			DAHE per capita			DAHE per person with disability			Prevalence of disability, %		
State	2015, millions $	2003, millions $	Change, %[b]	2015, $	2003, $	Change, %[b]	2015, $	2003, $	Change, %[b]	2015	2003	Change[b]
Wisconsin	15 843	10 272	54	3728	2882	29	18 320	16 041	14	20	18	13
Wyoming	1387	793	75	3158	2398	32	14 821	12 726	16	21	19	13

[a]Expenditures based on 2013-2015 and 2002-2003 data were converted to 2017 medical prices. Data sources: 2013-2015 Medical Expenditure Panel Survey,[16] 2013-2015 Behavioral Risk Factor Surveillance System,[17] and 2014 National Health Expenditure Accounts.[18]
[b]Percentage changes for total DAHE were calculated using expenditures rounded to the nearest dollar and, as a result, may be different from percentage changes calculated based on the expenditures presented in the table that are expressed in millions $. Similarly, percentage changes for disability prevalence were calculated using prevalence rounded to one decimal point and, as a result, may be different from percentage changes calculated based on the prevalence presented in the table and rounded to the nearest percentage point.

reported disability and the extent to which those factors may explain DAHE increases. We intentionally did not control for health conditions when estimating DAHE because we wanted to capture downstream cost effects of those conditions among people with disabilities, who may be at a higher risk of developing certain chronic conditions.[21,22]

Conclusions

Results of this study provide policy makers, health insurers, and public health officials with an updated analysis of state-level health care expenditures associated with disability. Results indicate that DAHE were substantial, varied extensively across states, and changed at varying rates from 2003 to 2015. The public sector largely supports the costs of health care for people with disabilities. States and other stakeholders may use these state-level estimates to better design public health policies and planning efforts that support people with disabilities and provide ongoing, accessible, and quality health care to this vulnerable population.

Authors' Note

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