Differences in nursing home usage and services across the United States

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Medicaid and Medicare covered over half of the approximately $172.7 billion spent on nursing home and continuing care retirement community services in the United States in 2019.[1]

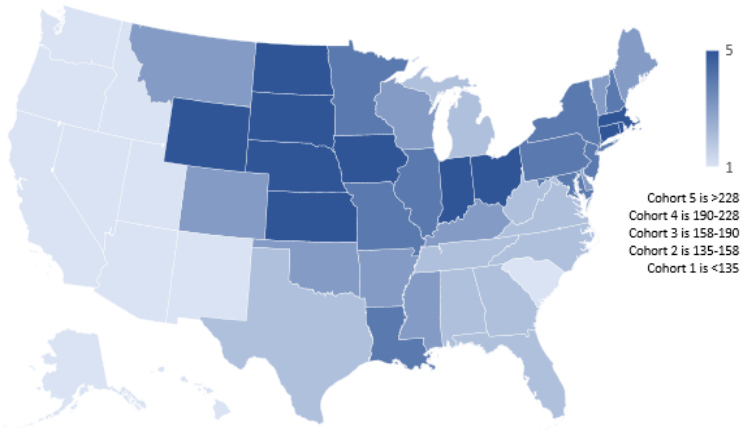
As the population needing long-term care services continues to grow over the next several years due to the aging of the population, Medicaid and Medicare will experience more cost pressure related to long-term care services, including services provided in a nursing home setting. To control costs and respond to patients' preferences for care in the home versus institutional settings, the industry must promote best practices and innovations in several important areas including care management and coordination, financing, and policy.[2]

The Centers for Medicare and Medicaid Services (CMS) Minimum Data Set (MDS) 3.0 Frequency Report[3] summarizes MDS assessment records for all residents in Medicare- or Medicaid-certified nursing homes on a quarterly basis. For this brief, we analyzed this data to gain an understanding of how much nursing home usage varies by state and by demographic characteristics. We also explored differences in the types of assistance needed and services provided in nursing homes across the states.

Nursing home penetration by state

First, we looked at nursing home penetration, defined as the number of nursing home residents as a percentage of the population reporting self-care difficulty. The nursing home penetration rates were estimated based upon information in the fourth quarter (4Q) 2018 MDS Frequency Report and the U.S. Census Bureau American Community Survey (ACS) for 2018.[4] The ACS population was limited to people with self-care difficulty because these respondents indicated they have difficulty with dressing or bathing, which are two of the activities of daily living (ADLs) often used to assess patient needs. Both the ACS and MDS populations were limited to people over the age of 30 because over 99% of the nursing home residents included in the MDS were over the age of 30.

FIGURE 1: ESTIMATED 4Q 2018 NURSING HOME RESIDENTS PER 1,000 STATE RESIDENTS WITH SELF-CARE DIFFICULTY



The states with the lowest nursing home penetration rates are in the Western United States, with Alaska having the lowest rate of approximately 5%. Arizona and Oregon are also very low, with nursing home penetration rates of approximately 8%. These penetration rates are less than one-quarter of the highest penetration rates of 35% and 37% in South Dakota and North Dakota, respectively. This difference demonstrates that there is significant variation in nursing home penetration rates by state. The states with the highest nursing home penetration rates are concentrated from the northcentral states to the northeastern states.

[1] CMS. National Health Expenditure Data: Historical. Retrieved March 3, 2021, from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.

[2] Binette, J. & Vasold, K. (July 2019). 2018 home and community preferences: A national survey of adults ages 18-plus. AARP. Retrieved March 3, 2021, from https://www.aarp.org/research/topics/community/info-2018/2018-home-community-preference.html.

[3] https://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/Minimum-Data-Set-3-0-Public-Reports/Minimum-Data-Set-3-0-frequency-report

[4] U.S. Census Bureau. American Community Survey (ACS). Retrieved March 3, 2021, from https://www.census.gov/programs-surveys/acs.

State cohorts for nursing home penetration

To further explore the wide variation in nursing home penetration across the states, we grouped the 50 states and the District of Columbia into three cohorts based upon their nursing home penetration rates.

- Low cohort: States (11) with nursing home penetration rates less than 13.5%. The mean penetration rate is approximately 10%.
- High cohort: States (20) with nursing home penetration rates greater than 19.0%. The mean penetration rate is 24%.
- Mid cohort: States (20) with nursing home penetration rates between 13.5% and 19.0%. The mean penetration rate is approximately 16%.

Figure 2 shown below includes the estimated 4Q 2018 nursing home penetration rates for each state along with the cohort designation used in our analyses.

FIGURE 2: ESTIMATED 4Q 2018 NURSING HOME PENETRATION RATES BY STATE

State	4Q2018 Nursing home residents[1]	2018 state residents with self-care difficulty[2]	Nursing home residents per 1,000 state residents with self-care difficulty	Cohort for this report[3]	State	4Q2018 Nursing home residents[1]	2018 state residents with self-care difficulty[2]	Nursing home residents per 1,000 state residents with self-care difficulty	Cohort for this report[3]
Alabama	23,249	159,143	146.1	Mid	Montana	4,197	22,970	182.7	Mid
Alaska	626	11,775	53.2	Low	Nebraska	11,321	37,717	300.2	High
Arizona	12,407	151,785	81.7	Low	Nevada	5,895	73,183	80.6	Low
Arkansas	17,538	107,582	163	Mid	New Hampshire	6,501	31,214	208.3	High
California	105,854	934,017	113.3	Low	New Jersey	45,085	215,198	209.5	High
Colorado	17,012	96,343	176.6	Mid	New Mexico	5,800	55,793	104	Low
Connecticut	23,040	83,084	277.3	High	New York	106,828	513,194	208.2	High
Delaware	4,182	22,806	183.4	Mid	North Carolina	37,307	258,741	144.2	Mid
District of Columbia	2,389	12,770	187.1	Mid	North Dakota	5,421	14,672	369.5	High
Florida	76,972	557,381	138.1	Mid	Ohio	74,390	327,035	227.5	High
Georgia	34,215	224,141	152.7	Mid	Oklahoma	18,479	114,418	161.5	Mid
Hawaii	3,742	29,425	127.2	Low	Oregon	7,809	98,249	79.5	Low
Idaho	4,117	38,647	106.5	Low	Pennsylvania	77,790	355,780	218.6	High
Illinois	67,436	302,288	223.1	High	Rhode Island	7,997	33,185	241	High
Indiana	39,712	174,021	228.2	High	South Carolina	17,439	138,533	125.9	Low
Iowa	23,320	77,777	299.8	High	South Dakota	5,833	16,719	348.9	High
Kansas	17,201	73,724	233.3	High	Tennessee	28,062	191,652	146.4	Mid
Kentucky	23,067	146,416	157.5	Mid	Texas	95,641	639,541	149.5	Mid
Louisiana	26,437	136,454	193.7	High	Utah	5,709	42,777	133.5	Low
Maine	5,940	35,126	169.1	Mid	Vermont	2,468	14,617	168.8	Mid
Maryland	24,911	129,606	192.2	High	Virginia	28,687	198,478	144.5	Mid
Massachusetts	39,352	168,934	232.9	High	Washington	16,552	167,501	98.8	Low
Michigan	40,062	276,325	145	Mid	West Virginia	9,506	67,512	140.8	Mid
Minnesota	24,742	118,751	208.4	High	Wisconsin	23,456	127,804	183.5	Mid
Mississippi	16,095	101,779	158.1	Mid	Wyoming	2,340	9,546	245.2	High
Missouri	37,882	181,090	209.2	High					

Notes:

1. The number of nursing home residents by state are based upon the Minimum Data Set 3.0 Frequency Report for the fourth quarter of 2018.
2. The number of residents over age 30 with self-care difficulty by state are based upon the U.S. Census Bureau American Community Survey for 2018.
3. The cohort used for this report is based upon the number of nursing home residents per 1,000 state residents over the age of 30.

Demographic variations in nursing home penetration

To understand how nursing home penetration varies by demographic characteristics and may contribute to the large variation in nursing home penetration rates across the states, we analyzed identification information metrics available on the MDS. Figure 3 presents the mean nursing home penetration rate for males and females by state cohort. Females have higher nursing home penetration rates than males. Additionally, states in the high cohort have a larger difference between their female and male nursing home penetration rates than states in the mid and low cohorts. Female nursing home penetration rates vary more across the states than male nursing home penetration rates.

FIGURE 3: MEAN NURSING HOME PENETRATION RATE BY GENDER AND STATE COHORT

Gender	Low	Mid	High
Male	9.4%	14.1%	20.9%
Female	10.8%	17.5%	27.2%
Composite	10.1%	16.1%	24.5%

Figure 4 presents the mean nursing home penetration rate by age group for each state cohort. Nursing home penetration rates increase with age for each cohort, and the difference in nursing home penetration rates across the three state cohorts also increases with age.

FIGURE 4: MEAN NURSING HOME PENETRATION RATE BY AGE GROUP AND STATE COHORT

Age Range	Low	Mid	High
31-64	4.6%	5.9%	8.8%
65-74	11.8%	17.8%	24.8%
75-84	14.5%	24.0%	35.9%
85+	15.2%	28.5%	39.7%

Nursing home penetration rates also vary by race and ethnicity. Hispanic/Latinx (34%) and Native Hawaiian or Other Pacific Islander (36%) groups have meaningfully higher nursing home penetration rates than average, while Asian (11%) and American Indian or Alaska Native (8%) groups have meaningfully lower rates than average. Nursing home penetration rates for Blacks and whites are similar and drive the national average.

States may benefit from analyzing their nursing home penetration rates by demographic characteristics. The states with low nursing home penetration rates show much less variation in nursing home penetration rates by demographic characteristics than states in the mid and high cohorts. For example, as shown in Figure 3, the difference in nursing home penetration rates between females and males is only 1.4% for the low cohort states. The difference increases to 3.4% for the mid cohort states and 6.3% for the high cohort states.

Given the variation in nursing home penetration rates across demographic characteristics, we normalized the nursing home penetration rates by state to reflect the nationwide population. We did this for each characteristic separately, not collectively, due to the availability of information in the MDS frequency reports. For each characteristic, the mean normalized nursing home penetration rate for each of the three state cohorts was within 1% of the mean pre-normalized nursing home penetration rate. This small difference suggests that demographic characteristics explain very little of the large variation in nursing home penetration across the states.

Assistance with activities of daily living

To understand the variation across the states in nursing home resident levels of ADL assistance, we analyzed the self-performance functional status metrics available on the MDS. These metrics assess residents as being independent, requiring supervision, requiring limited assistance, requiring extensive assistance, being totally dependent, activity occurred only once or twice, or activity did not occur for each ADL.[5] See the tables in Figure 5 and 6 for definitions of these status metrics.

[5] Definitions for these ADLs can be found on pages G-3 to G-4 of the CMS assessment manual at https://downloads.cms.gov/files/mds-3.0-rai-manual-v1.17.1_october_2019.pdf.

FIGURE 5: STATUS METRICS DEFINITIONS

Independent	If resident completed activity with no help or oversight every time during the seven-day look-back period and the activity occurred at least three times.
Supervision	If oversight, encouragement, or cueing was provided three or more times during the last seven days.
Limited Assistance	If resident was highly involved in activity and received physical help in guided maneuvering of limb(s) or other non-weight-bearing assistance three or more times during the last seven days.
Extensive Assistance	If resident performed part of the activity over the last seven days and help of the following type(s) was provided three or more times: weight-bearing support provided three or more times, *or* full staff performance of activity three or more times during part but not all of the last seven days.
Total Dependence	If there was full staff performance of an activity with no participation by resident for any aspect of the ADL and the activity occurred three or more times. The resident must be unwilling or unable to perform any part of the activity over the entire seven-day look-back period.
Activity Occurred Only Once or Twice	If the activity occurred fewer than three times.
Activity Did Not Occur	If the activity did not occur or family and/or non-facility staff provided care 100% of the time for that activity over the entire seven-day lookback period.

FIGURE 6: ACTIVITIES OF DAILY LIVING DEFINITIONS

Bed mobility	How resident moves to and from lying position, turns side to side, and positions body while in bed or alternate sleep furniture.
Transfer	How resident moves between surfaces including to or from: bed, chair, wheelchair, or standing position (excludes to/from bath/toilet).
Locomotion on unit	How resident moves between locations in his or her room and adjacent corridor on same floor. If in wheelchair, self-sufficiency once in chair.
Locomotion off unit	How resident moves to and returns from off-unit locations (e.g., areas set aside for dining, activities, or treatments).

Figure 7 shows the distribution of residents across these assessment levels for each state cohort for four ADL metrics: locomotion off unit, locomotion on unit, transfer, and bed mobility (see Figure 6 for description). The metrics indicate that on average nursing home residents in states with low nursing home penetration rates receive more assistance with ADLs than nursing home residents in states with high nursing home penetration rates. For example, nursing homes in the states with low nursing home penetration rates provide assistance beyond supervision for these ADLs to roughly 4% to 6% more of their nursing home residents than nursing homes in the states with high nursing home penetration rates while nursing homes in mid cohort states provide assistance with locomotion on unit to a similar portion of their nursing home residents as do nursing homes in high cohort states.

FIGURE 7: ADL SELF PERFORMANCE BY STATE COHORT, MOBILITY METRICS

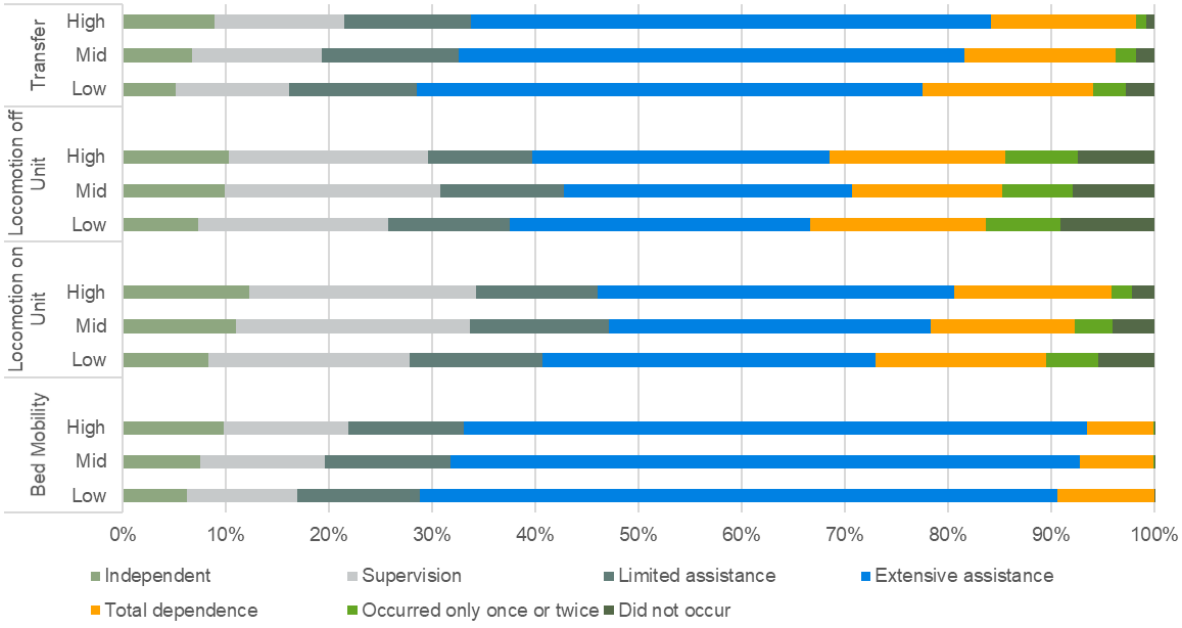
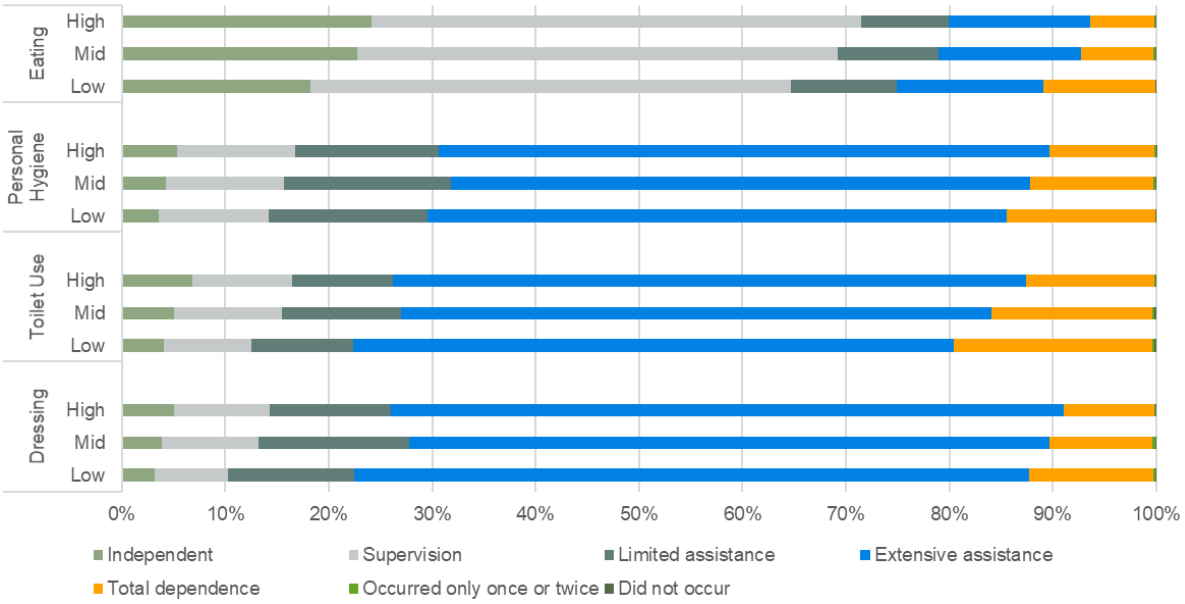


Figure 8 shows the distribution of residents across the assessment levels for each state cohort for four other functional status metrics: eating, personal hygiene, toilet use, and dressing. The states with low nursing home penetration rates provide assistance with personal hygiene, toilet use, and dressing to roughly 2% to 4% more of their nursing home residents than the states with high nursing home penetration rates. Assistance with eating had the most variation, with the states with low nursing home penetration rates providing assistance with eating to roughly 7% more of their nursing home residents than states with high nursing home penetration rates.

FIGURE 8: ADL SELF PERFORMANCE BY STATE COHORT



Types of services

To understand the variation in types of services needed by nursing home residents across the states, we analyzed special treatments, procedures, and program metrics available on the MDS. Figure 9 shows the percentage of nursing home residents receiving services for each state cohort. The states in the low cohort provided services to support breathing (oxygen therapy, suctioning, tracheostomy, ventilator, or respirator), IV medications, and dialysis to a higher percentage of their nursing home residents than the states in the mid and high cohorts. States in the mid cohort provide hospice care to a higher percentage of their nursing home residents than the states in the low and high cohorts. Chemotherapy, radiation, transfusions, respite care, and isolation or quarantine were provided to less than 1% of nursing home residents, so material differences across the three state cohorts are not readily apparent for these services.

FIGURE 9: PERCENTAGE OF NURSING HOME RESIDENTS RECEIVING SERVICES BY STATE COHORT

Service	Low	Mid	High
Chemotherapy	0.3%	0.3%	0.5%
Radiation	0.1%	0.1%	0.1%
Oxygen Therapy	14.4%	13.6%	11.8%
Suctioning	3.4%	0.9%	1.2%
Tracheostomy	3.4%	0.9%	1.3%
Ventilator or Respirator	1.7%	0.3%	0.6%
BIPAP/CPAP	1.9%	1.9%	2.2%
IV Medications	3.6%	2.4%	2.1%
Transfusion	0.1%	0.1%	0.1%
Dialysis	2.9%	2.3%	2.1%
Hospice Care	4.3%	6.0%	4.7%
Respite Care	0.1%	0.1%	0.1%
Isolation or Quarantine	0.6%	0.5%	0.3%

Other metrics

I reviewed several other metrics available on the MDS that had responses for most assessments. While most of the metrics did not demonstrate meaningful differences across the three state cohorts, two additional metrics stood out. First, a mood interview of the residents indicated a materially higher rate of depression in high cohort states (16%) than mid (11%) and low (8%) cohort states. Additionally, more residents had discharge plans to return to the community in high (85%) and mid (85%) cohort states than low cohort states (76%). This may indicate lower usage of nursing home services for short-term needs in low cohort states.

Conclusion

Based upon my analysis of the MDS frequency reports, nursing home penetration rates for people with self-care difficulty across the United States vary widely by state from a low of approximately 5% to a high of approximately 37%. The demographic characteristics of a state's population that we examined for this analysis explain very little of this variance. Additionally, states with low nursing home penetration rates provide assistance with ADLs to higher portions of their nursing home residents and smaller portions of their nursing home residents have depression and short-term needs. These findings suggest that states with higher nursing home penetration rates may have significant opportunity to reduce their nursing home penetration rates, which may reduce long-term services and supports (LTSS) costs and improve patient satisfaction. Further, it may be insightful for states with high nursing home penetration rates to look for variation in their nursing home penetration rates by demographic characteristics in order to identify target populations whose ADL needs may be able to be met with noninstitutional services, such as personal care services.

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