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Evaluating Medicaid Long-Term Services and Supports Utilization

For Researchers using the Centers for Medicare & Medicaid Services' Chronic Condition Data Warehouse (CCW)

September 2012

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Abstract

Purpose: The purpose of this data brief is to provide researchers with information on how to use the Centers for Medicare & Medicaid Services' (CMS) Chronic Condition Data Warehouse (CCW) to analyze Medicaid long-term services and supports populations and their service utilization.

Methods: Using 2008 claims data from the CCW, we found users of long-term services and supports and categorized them as either a Home and Community Based Services (HCBS) or nursing facility setting. For both settings, we calculated the percentage of enrollees that utilized services by eligibility category, age category and state.

Results: User percentages of both HCBS and nursing facility services differed among eligibility and age categories as well as states. For some population groups, there is a relationship between HCBS and nursing facility utilization.

Keywords: Medicaid, Long-Term Services and Supports, Long-Term Care, Home and Community Based Services (HCBS), Nursing Facilities, Service Utilization, Medicare-Medicaid Enrollees, Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI)

1. Introduction

This data brief illustrates how researchers and policymakers can use the Centers for Medicare & Medicaid Services' (CMS) Chronic Condition Data Warehouse (CCW) to analyze utilization of long-term services and supports (LTSS) in State Medicaid programs. LTSS provide assistance to elderly and disabled enrollees with performing activities of daily living (ADL). These activities include functions such as feeding, dressing and toileting. Enrollees are assessed to determine their ability to perform ADLs and whether or not they qualify to receive LTSS.

These services are provided in two main settings, institutions and the community. Institutions include skilled nursing facilities, intermediate care facilities and mental health facilities in which the enrollee resides. In the community setting, the enrollee receives home and community based services (HCBS), which allow them to reside in the community but still receive assistance. These services include personal care attendants, adult day care, and assisted living among others. They are designed to prevent or delay institutionalization.

Each state offers a different package of LTSS. The package of HCBS is defined either through a Medicaid State Plan, or more often through a federal waiver. States like New Jersey offer certain HCBS services under their state plan, provided the enrollee is assessed as needing them to remain in the community. Other states, such as Arizona, use an 1115 waiver, or demonstration waiver, to provide LTSS. Most states use a 1915(c) waiver which specifically allows for the provision of HCBS to specific groups, in order to keep enrollees in a community setting and achieve cost effectiveness. The cost to the state Medicaid program per enrollee for HCBS is typically less than nursing facility costs.

LTSS make up a large part of overall Medicaid spending. Including both nursing facility and HCBS, LTSS accounted for 34.5 percent of total Medicaid spending in Federal Fiscal Year 2009.[1] With the exception of the initial days of a nursing facility stay, LTSS are not covered under Medicare. As a result, LTSS expenditures are the responsibility of Medicaid for both Medicaid-only and Medicare-Medicaid enrollees.

Analyzing LTSS claim data can allow researchers to gain insight into LTSS utilization patterns that drive expenditure. Data from the CCW can be used to determine the percentage of enrollees that utilize LTSS. It can also be used to identify the mix of services used between institution and HCBS and within HCBS.

This paper will examine three research questions:

- How can the CCW be used to identify Medicaid HCBS services and measure utilization across states, age groups and eligibility categories?
- How can the CCW be used to identify Medicaid nursing facility services and measure utilization across states, age groups and eligibility categories?
- How do HCBS utilization rates compare to nursing facility utilization rates?

[1] Medicaid Expenditures for Long-Term Services and Supports: 2011 Update. Eiken, Sredl, Burwell, and Gold. October 31, 2011

2. Data Sources

The CCW Chronic Condition Data Warehouse (CCW) is a CMS research database containing Medicare and Medicaid data unique to enrollees. We utilized the Medicaid Analytic eXtract (MAX), which is included in the CCW, for 2008. The CCW includes MAX data for the years 1999- 2008, as of the time of this publication.

The CCW MAX data support analyses of Medicaid eligibility, health care utilization, and spending.[2] All States process claims through their Medicaid Medical Information System (MMIS), though some may use other claims processing systems as well. After a series of edits, States submit claims data to CMS's Medical Statistical Information System (MSIS). MSIS data is then used to populate the CCW. Because of the breadth of information contained within the CCW data, researchers can use the CCW to assess health care utilization and expenditures of Medicaid enrollees.

The 2008 CCW included MAX data for 43 states at the time of data extraction. Data for the District of Columbia, Hawaii, Maine, Missouri, North Dakota, Pennsylvania, Utah, and Wisconsin were not available at that time.

A. CCW Data Files

We used the following CCW data files for this analysis:

- **Person Summary file –** The Person Summary file provides person-level information regarding Medicaid and CHIP enrollees, whether or not they used any services in the given year. We used the Personal Summary (PS) file to determine an enrollee's eligibility group, age category, county of residence, managed care enrollment (i.e., fee-for-service, managed care organization, primary care case management), and their number of months of Medicaid eligibility during 2008. Appendix B further explains our methodology and gives a more in-depth description of our enrollee classification.
- **Long Term Care file –** The Long Term Care file (LT) includes service data from long term care nursing facilities. We used the LT file to identify the number of enrollees that utilized nursing facility services, their nursing facility expenditures, and the number of days of care they utilized.
- **Other Services file** - The Other Services file includes Medicaid records for outpatient services, physician and professional services, hospice, home health, lab/ X-ray, durable medical equipment, premium payments, and all other services not included in the Inpatient Hospital file, the Long-Term Care file, or the Rx file. We used procedure codes reported on the other services file to classify visits as: physician,[3] behavioral health and substance abuse, physical and other therapies, along with other outpatient services.

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[2] For more information about the CCW and to access the data, visit the CCW website at: http://www.ccwdata.org/index.htm

[3] For the remainder of this paper we will use the term physician to refer to any visits with E&M codes that identify outpatient office or home care visits with a physician or other health care professional.

B. Study Population

The person summary file was used to define three characteristics for each enrollee; basis of eligibility, age category and managed care enrollment. Using these characteristics, enrollees were then selected for inclusion in the study to ensure that valid comparisons could be made across states. After controlling for these enrollee characteristics additional data checks were performed to identify outlier states with suspect data. States that were determined to be outliers were excluded from the study population. Appendix A provides a summarizing the included populations by State. The methodology that was used to determine an enrollee's eligibility group, age category and managed care enrollment is provided in Appendix B.

Basis of Eligibility

Medicaid covers a diverse group of enrollees, such as pregnant (but otherwise healthy) women, low-income children, persons with disabilities, undocumented individuals, low-income people above age 65, and other State-defined optional eligibility groups. The optional eligibility groups are not mandated by CMS for inclusion in each State's Medicaid program and the types of optional populations that States have elected to cover varies significantly from state to state. For this reason, Medicaid-population statistics can be quite misleading when presented without accounting for basis of eligibility. To control for the basis of eligibility the MAX person summary file was used to assign enrollees to the following eligibility categories;

- Medicare-Medicaid eligibles with full Medicaid coverage
- Medicare-Medicaid eligibles with partial Medicaid coverage
- Supplemental Security Income (SSI)
- Temporary Assistance to Needy Families (TANF)
- Medical Assistance Only (MA-Only)
- Child Health Insurance Program (CHIP)
- Waiver Expansion Populations
- Other Eligibles

In this paper, we focus on seven specific Medicaid populations that all States cover. These include:

- **Medicare-Medicaid aged enrollees**. Persons over age 65, receiving both Medicare and Medicaid, who became eligible for Medicaid on the basis of income and age
- **Medicare-Medicaid enrollees with disabilities.** Persons receiving both Medicare and Medicaid, who became eligible on the basis of income and disability. This group includes enrollees over and under the age of 65
- **SSI adults**. Non-elderly adults, receiving Medicaid only, eligible on the basis on income and disability
- **SSI children.** Children receiving Medicaid, eligible on the basis of income and disability

- **SSI elderly.** Persons over age 65, receiving Medicaid only, eligible on the basis of income and age
- **TANF adults**. Non-elderly adults, receiving Medicaid, eligible on the basis of income
- **TANF children**. Children, receiving Medicaid, eligible on the basis of income

Managed Care Enrollment

The CCW data include FFS claims and managed care encounter data. Claims data track the services provided to individuals; since provider reimbursement is conditional upon submission of accurate and complete claims, claims data for FFS enrollees tend to be quite comprehensive. Encounter data are submitted by managed care organizations to provide information about managed care enrollee utilization and expenditures. Because reimbursement is not conditional upon receipt of encounter data, these data may be less complete than FFS claims data. We found that in 2008, the quality and comprehensiveness of encounter data varied by State. It is important for researchers to identify whether these gaps are caused by issues with the encounter data process, or if there are gaps in the delivery of care to enrollees.[4]

Due to the data issues we identified in the encounter data for many States, we chose to only include FFS data in this paper. In, addition, most states provide LTSS under FFS. Our analysis includes only enrollees that received services in the FFS system during their entire period of eligibility. We excluded all individuals enrolled in a managed care program at any time during their period of eligibility.

In States with minimal managed care penetration, this decision has a minimal impact on our findings, but in States with significant use of managed care, this decision is more significant. Some States (such as Arizona) cover most of their major eligibility groups with managed care; in States such as these, estimates based on only the FFS population are not representative of the State as a whole. In addition to aggregate managed care penetration, it is important to assess whether any of the populations included in specific analyses are covered by managed care.

States Exclusions

After reviewing the CCW data, we also excluded the following states due to anomalies with either the HCBS or nursing facility data: California, Georgia, Kansas, Louisiana, Oregon, Rhode Island, South Carolina, South Dakota, Vermont and Wyoming. This resulted in 33 states included in the study data for nursing facility utilization and 34 states included in the study data for HCBS utilization.

While confining our analyses to this study population improves the interpretability of our results, it does mean that our findings may not be representative of the larger Medicaid population, as these groups comprise 25 percent of the total Medicaid population from which they are drawn, and 18 percent of the total U.S. Medicaid population.

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[4] For an in-depth discussion, see "*Evaluating Encounter Data Completeness.: For Researchers using the Centers for Medicare & Medicaid Services' Chronic Condition Data Warehouse (CCW).*"

C. Data Procedures

Identifying Users of Home and Community Based Services using the CCW

HCBS services are performed by individual providers or agencies and are billed using the same claim forms as medical services. Each service is billed using a procedure code. State plans or HCBS waiver programs implemented by each state determine which services can be provided and what codes to use to bill for these services. The codes are either national procedure codes (CPT-4 or HCPCS) or local procedure codes proprietary to a particular state. Some states provide a list of covered services and procedure codes on their Medicaid website, often in a provider portal. Procedure codes are included in the procedure code field in the CCW OT file. By using a list of known codes, researchers can specifically identify HCBS services from the CCW OT file.

The CCW OT file also has a field called the community-based long-term care (CLTC) flag. This flag indicates whether a claim is an HCBS claim, and categorizes it in a CLTC service category. The state determines whether or not a claim is HCBS and chooses the category upon submission to MSIS. If a claim is determined by the State to not be an HCBS claim, the value is "00". HCBS services provider under the State Plan will have a flag value between "11" and "20", while HCBS services provided under a waiver program will have a flag value between "30" and "40". Descriptions for all flag values can be found in the CCW data dictionary. Due to variances between state programs, however, the same procedure code could be in multiple CLTC categories. For example, in one state, a personal care service could be part of a waiver program and categorized as such. In another state, the same service could be covered under a State Plan and categorized as non-waiver.

To classify HCBS claims from the CCW, we used a hybrid approach. First, we assigned each national procedure code for HCBS to one of the following categories:

- Adult Day Care
- Assisted Living
- Care Management
- Foster Care
- Habilitation
- Home Health
- Homemaker
- Hospice
- Private Duty Nursing (PDN)
- Respite
- Therapy
- Transportation

We then selected HCBS claims using either the CLTC flag or the national procedure codes that were assigned to an HCBS category. If a claim contained a national procedure code, we used the HCBS category previously assigned. For the remaining claims that were identified by the CLTC flag, we developed a crosswalk of CLTC categories to the HCBS categories listed above. We then focused on the following four HCBS categories: Adult Day Care, Assisted Living, Home Health (home health aides, private duty nursing and post-acute services) and Personal Care. These categories were selected, because these are they key services used to support an enrollee to help them stay in the community.

To determine utilization rate of HCBS, we identified an enrollee as an HCBS user, if they had at least one HCBS claim in a month. If an enrollee utilized services in more than one of the four HCBS categories, the enrollee was assigned to each category. Once enrollees were assigned, we calculated the HCBS utilization rate by state, eligibility category, age group and HCBS category. Total enrollment was calculated for each combination of enrollee characteristics and used as the denominator to determine the percentage of enrollees that utilized an HCBS service.

Identifying Users of Nursing Facility Services using the CCW

Long-term care facility claims; including nursing facilities and intermediate care facilities, are billed by the facilities using the UB-04 claim form, usually for a week or a month at a time. These institutional claims are included in the CCW Long-Term Care file. To isolate nursing facility claims to determine nursing facility utilization, only claims with a MSIS Type of Service of "07", Nursing Facility Services (excluding Intermediate Care Facilities for Persons with Developmental Disabilities), were selected.

Enrollees with at least one nursing facility claim in a month were assigned as a nursing facility user for that month. Once enrollees were assigned, we calculated the nursing facility utilization rate by state, eligibility category and age group. Total enrollment was calculated for each combination of enrollee characteristics and used as the denominator to determine the percentage of enrollees that received a nursing facility service.

3. Results

A. How can the CCW be used to identify Medicaid HCBS services and measure utilization across states, age groups and eligibility categories?

We identified the number of unique HCBS users from the CCW using the methodology described above. We then categorized the users by eligibility and age categories, using the methodology described in Appendix B. We focused seven eligibility and age category combinations which represent 90 percent of total HCBS users. The results are shown in Figure 1.

Figure 1. Percent of HCBS Users by Eligibility and Age Category, FFS, 2008

Eligibility Category	Age Category	Total Eligible	HCBS Users	User Percentage
Medicare-Medicaid Aged	Elderly	1,937,676	545,419	28.1%
Medicare Medicaid Disabled	Adult	1,530,385	488,919	31.9%
	Elderly	440,997	150,980	34.2%
SSI	Adult	856,290	237,293	27.7%
	Child	514,700	190,624	37.0%
	Elderly	130,876	29,194	22.3%
TANF	Adult	1,143,421	40,951	3.6%
	Child	2,804,775	141,215	5.0%

Among these categories, there were 1.8 million unique HCBS users. These represent 14 percent of the overall Medicaid population of the states in the study.

The majority of enrollees (59 percent) were Medicare-Medicaid eligible. While the majority of their medical expenditures (hospitalization, physician visits, prescription drugs, etc.) are paid by Medicare, their HCBS expenditures, with the exception of Medicare covered post-acute home health services, are paid by Medicaid.

The TANF population represented nine percent of HCBS users. These enrollees generally qualify for Medicaid on the basis of income, rather than age or disability status, and are mostly children. This group would generally not qualify for LTSS. However, home health services are included in our definition of HCBS and are covered under Medicaid. As a result, TANF enrollees receiving these services would be counted. In addition, some states offer limited HCBS services, as part of their Medicaid benefit package.

HCBS user percentage also varied by age category. Adults across all eligibility categories represented 42 percent of total HCBS users, led by the Medicare-Medicaid Disabled group. These enrollees qualify for HCBS due to disability, rather than age. Elderly enrollees represented 38 percent of users, led by the Medicare-Medicaid aged group. Children represented 22 percent of total HCBS users from both the SSI and TANF categories. The SSI child population includes enrollees with developmental disabilities and many states have implemented waiver programs to support these children in the community.

In addition to differences between age and eligibility categories, there are differences between states. These differences are due to the HCBS services covered by each State Plan, the HCBS waiver programs they have implemented and the availability of waiver slots in each state waiver program. Some states have a waiting list for waiver enrollment. The differences can also be due to the availability of HCBS service providers in certain areas. We studied user percentages in the larger HCBS groups. Figure 2 shows the minimum, maximum and median user percentages from the states.

Figure 2. Percent of HCBS Users across States, FFS, 2008

Eligibility Category	Age Category	Minimum	Maximum	Median
Medicare-Medicaid Aged	Elderly	10.3%	43.4%	26.4%
Medicare Medicaid Disabled	Adult	14.8%	68.1%	31.2%
	Elderly	12.2%	54.4%	36.3%
SSI	Adult	5.8%	62.2%	27.4%
	Child	7.0%	75.5%	38.0%

We also studied the services that account for the majority of HCBS utilization. As mentioned in the methodology section above, we focused on four primary types of HCBS services; home health, personal care, adult day care and assisted living. Each enrollee was assigned to one of these service categories for every month that they had a service in that category. Enrollees with service in multiple categories during a month were assigned to both categories for that month. The months were then totaled for the entire year, and the percentage of months for each service category was calculated. The results are shown in Figure 3.

Figure 3. Percent of HCBS Months by Service, FFS, 2008

Eligibility Category	Age Category	HCBS Users	HCBS Months	Home Health Percent	Personal Care Percent	Adult Day Care Percent	Assisted Living Percent
Medicare-Medicaid Aged	Adult	358	2,318	33.3%	47.8%	31.7%	13.5%
	Elderly	548,513	3,551,358	35.2%	67.1%	12.2%	9.6%
Medicare Medicaid Disabled	Adult	490,866	3,391,609	21.6%	40.8%	43.4%	20.3%
	Child	1,896	10,694	27.5%	38.9%	35.1%	17.4%
	Elderly	151,841	1,061,445	32.6%	60.3%	18.9%	14.4%
SSI	Adult	239,034	1,432,407	28.1%	44.4%	42.1%	13.2%
	Child	190,828	815,295	31.4%	39.1%	36.4%	9.0%
	Elderly	29,264	196,132	15.5%	83.4%	6.9%	3.4%
TANF	Adult	40,997	22,185	84.2%	14.7%	3.3%	0.8%
	Child	141,243	129,215	70.9%	16.6%	4.7%	10.6%
	Elderly	12	78	14.1%	84.6%	41.0%	0.0%

The services utilized differed based on the eligibility category. The predominant HCBS category for the Medicare-Medicaid and elderly populations was personal care services, in which an attendant comes to the home to assist the enrollee with activities of daily living. For the adult population, adult day care was also utilized by a large percentage of eligibles. These enrollees live in the community but spend their days in a center where they receive assistance. Home health was the predominant category for the TANF groups. This includes private duty nursing, home infusion and other home-based medical services that enrollees require and may be used for medical treatment rather than assisting with ADLs.

B. How can the CCW be used to identify Medicaid nursing facility services and measure utilization across states, age groups and eligibility categories?

We identified nursing facility users, using the methodology presented above. These enrollees spent all or some part of the year in a nursing facility. This includes custodial stays, which are for more frail individuals and are indefinite in length, and rehabilitation stays which are usually for a fixed period of time following injury or illness and prepare the enrollee to return to the community.

We then categorized the users by eligibility and age categories, using the methodology described in Appendix B. We focused on the top three eligibility categories which represented 93 percent of total nursing facility users. The results are shown in Figure 4.

Figure 4. Percent of Nursing Facility Users by Eligibility and Age Category, FFS, 2008

Eligibility Category	Age Category	Total Eligible	Nursing Facility Users	User Percentage
Medicare-Medicaid Aged	Elderly	2,232,861	656,204	29.4%
Medicare Medicaid Disabled	Adult	1,853,593	100,001	5.4%
	Elderly	495,166	137,910	27.9%
SSI	Adult	2,298,678	74,151	3.2%
	Elderly	195,125	18,337	9.4%

These populations included 987,000 unique nursing facility users. These represented three percent of the overall Medicaid population of the states in the study.

Similar to HCBS, the majority of nursing facility users (85 percent) was Medicare-Medicaid eligible. Between the aged and disabled categories, 19 percent of Medicare-Medicaid enrollees in the study were in a nursing facility for at least part of the year, while only three percent of SSI enrollees were. Also similar to HCBS, Medicaid is primarily responsible for nursing facility expenditures. After an enrollee's Medicare-allowed nursing facility days are exhausted, Medicaid pays for the remainder of nursing facility expenditures.

The key age category for nursing facility users is elderly, as 79% of nursing facility users are over age 65. There is some utilization among disabled adults, but very little among children, unlike HCBS. Children tend to utilize more HCBS services to remain in the community.

There were also differences in nursing facility utilization between states, as illustrated in Figure 5.

Figure 5. Percent of Nursing Facility Users across States, FFS, 2008

Eligibility Category	Age Category	Minimum	Maximum	Median
Medicare-Medicaid Aged	Elderly	7.4%	61.9%	32.0%
Medicare Medicaid Disabled	Adult	1.8%	9.0%	5.4%
	Elderly	8.0%	42.7%	28.3%
SSI	Adult	0.5%	6.3%	3.3%
	Elderly	0.5%	37.7%	11.3%

There are multiple factors contributing to the variation. States with a more robust HCBS network and/or open waiver slots could have lower nursing facility utilization due to higher HCBS utilization. There are also differences among states in the criteria used to evaluate an enrollee's functional status and their eligibility for nursing facility placement. There could also be demographic differences with some states having a more frail population that requires nursing facility care. Finally, the number of nursing facility beds per capita in a state, will impact the availability and utilization of nursing facility services.

C. How do HCBS utilization rates compare to nursing facility utilization rates?

The two primary options for Medicaid LTSS are HCBS or nursing facilities. The option used by an enrollee depends on many factors, such as frailty and availability of either community or institutional supports. To identify the institutional/community mix, we compared the user percentages of each setting by eligibility and age category. If a user has both a nursing facility claim and an HCBS claim, then they were counted as a user in each. For each group, we looked at the mix across states. Figures 6 and 7 show the results for the two largest nursing facility populations. Figure 6 shows the results for the Medicare-Medicaid Aged Elderly population, and Figure 7 shows the results for the Medicare-Medicaid Disabled Elderly population.

Figure 6. Percent NH Users vs. HCBS Users, Medicare-Medicaid Aged Elderly by State, FFS, 2008

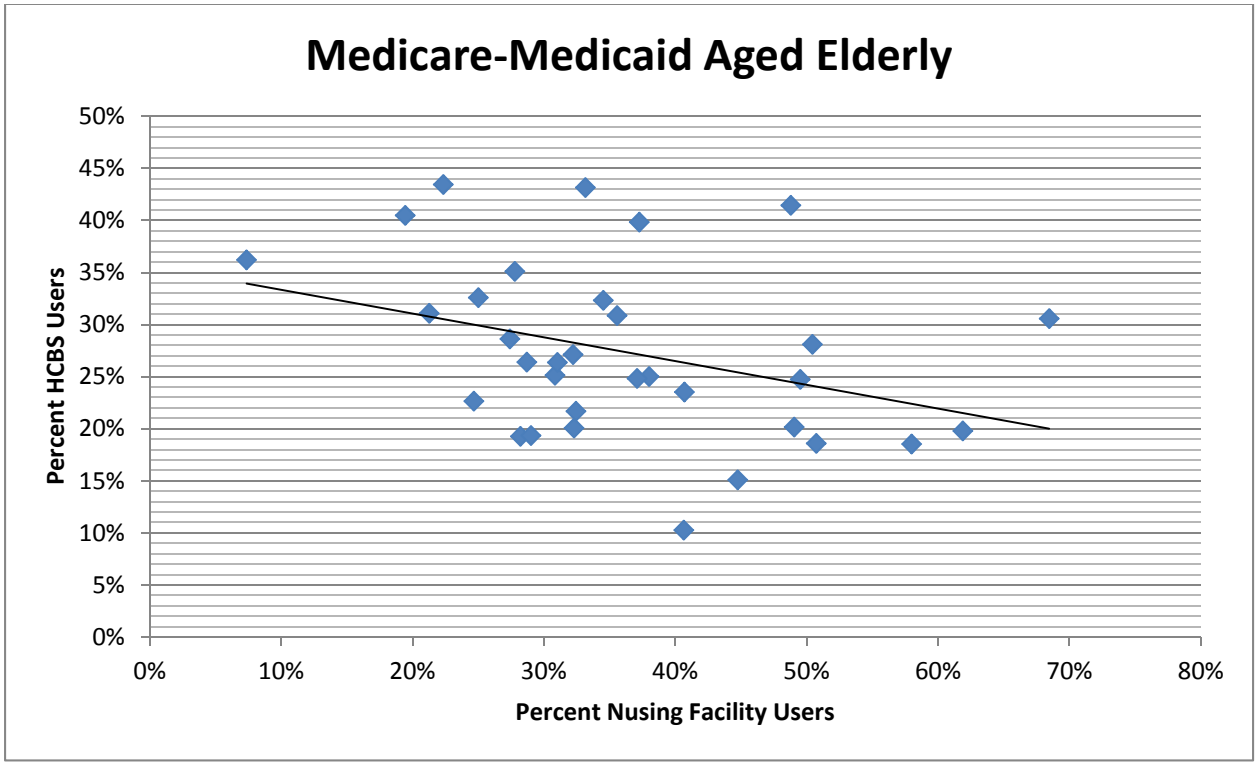
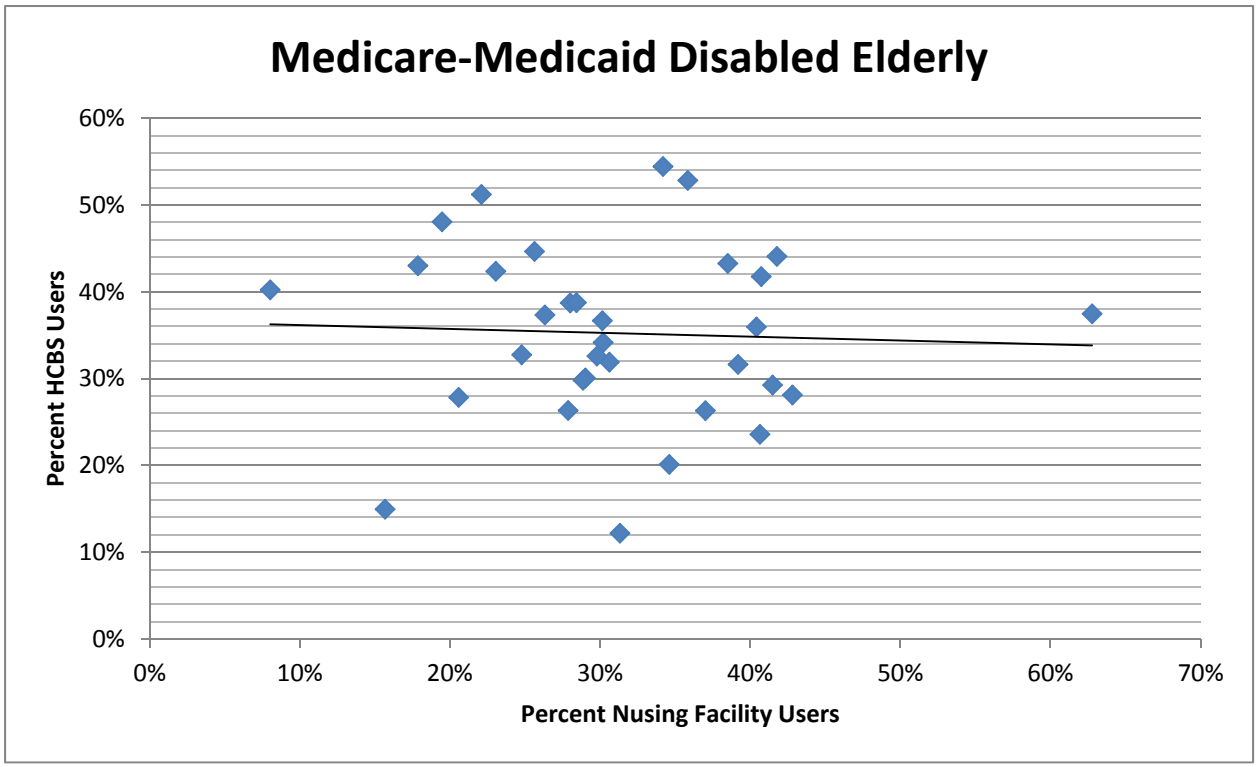


Figure 7. Percent NH Users vs. HCBS Users, Medicare-Medicaid Aged Elderly by State, FFS, 2008



The X axis represents the percentage of enrollees that are nursing facility users, while the Y axis represents the percentage of enrollees that are HCBS users. Each dot in the chart represents a different state. The line represents the linear regression results showing the relationship between the two settings. Both groups showed a slight negative correlation between nursing facility utilization and HCBS utilization. As the percentage of HCBS users increased, the percentage of nursing facility users decreased. This was more evident in the Medicare-Medicaid aged elderly population. In both populations, further research can be done to evaluate the other factors influencing utilization including; nursing facility bed supply, HCBS services covered and the availability of HCBS waiver slots and providers.

The percentage of HCBS users and nursing facility users was also compared in each state. The Medicare-Medicaid aged elderly population had a higher percentage of nursing facility users than HCBS users in 25 out of the 33 states in the study population. The Medicare-Medicaid disabled elderly population, however, had a higher percentage of HCBS users than nursing facility users in 22 of the 33 states examined.

4. Discussion

As shown above, researchers can use the CCW to get information about the use of LTSS in Medicaid. Classifying and counting enrollees who use LTSS is the first step. This provides insight in to potential factors that influence LTSS utilization, such as basis of eligibility, age and geography. It is also helpful when determining the mix of LTSS and factors that influence it.

More detailed studies can be done to gain insight into Medicaid LTSS, such as studying the rate that enrollees use HCBS services or the length of time that enrollees spend in nursing facilities.

In addition to this paper, we produced a series of State Profiles which contain specific information about each state. These profiles list the various HCBS waivers in place for each state which can be helpful when interpreting the HCBS results.

The CCW website, http://www.ccwdata.org/data-dictionaries/index.htm, provides useful information about the CCW. There are links to data dictionaries and a request page containing information about how to request additional data. There is also information about available assessment data which can provide insight into the frailty of enrollees and can be used to help interpret the utilization results.

Appendix A: Populations Included in the Analyses

State	Total Medicaid Enrollees	Analysis Population as % Total Medicaid Population	Total Analysis Population	FFS Medicare-Medicaid Enrollees, 2008	FFS SSI Enrollees, 2008	FFS TANF Enrollees, 2008
Sum of 43 States in the CCW	**52,346,291**	**25%**	**12,860,837**	**5,342,472**	**2,080,922**	**5,437,443**
Sum of Analysis States	**36,864,174**	**25%**	**9,366,509**	**3,916,182**	**1,974,595**	**3,948,461**
Subpopulations Used in Analyses						
AK	105,661	91%	95,934	12,991	10,364	72,579
AL	881,777	16%	144,008	82,578	13,485	47,945
AR	641,207	18%	115,254	61,657	10,810	42,787
AZ	1,499,967	12%	178,430	37,417	29,492	111,521
CO	512,055	64%	327,257	47,047	37,979	242,231
CT	544,403	60%	328,966	79,753	31,739	217,474
DE	190,573	8%	15,331	10,526	1,267	3,538
FL	2,949,684	26%	758,118	299,665	87,160	371,293
IA	450,696	36%	162,584	67,874	34,606	60,104
ID	188,098	13%	24,927	6,337	3,139	15,451
IL	2,333,279	19%	449,242	276,926	46,896	125,420
IN	1,087,612	18%	196,406	96,078	24,895	75,433
KS	339,573	27%	90,325	46,113	18,481	25,731
KY	799,807	24%	191,277	88,887	84,183	18,207
MA	1,373,759	23%	313,736	229,911	31,050	52,775
MD	710,926	15%	104,601	70,510	11,081	23,010
MI	1,864,407	24%	441,625	218,664	31,796	191,165
MN	780,690	25%	197,368	62,917	68,799	65,652
MS	704,065	81%	571,603	81,820	91,303	398,480
MT	100,448	30%	30,392	15,676	2,470	12,246
NC	1,569,071	22%	352,950	199,327	35,749	117,874
NE	194,728	49%	95,876	37,304	8,461	50,111
NH	138,771	75%	103,568	20,889	10,520	72,159
NJ	901,207	24%	219,399	155,517	31,062	32,820
NM	484,754	22%	104,304	37,984	7,374	58,946
NV	260,463	34%	89,479	22,048	24,543	42,888
NY	4,854,581	22%	1,055,956	634,314	169,991	251,651
OH	1,874,081	17%	325,432	199,702	95,015	30,715
OK	660,374	83%	550,835	95,413	54,811	400,611
TN	1,421,579	35%	492,313	99,085	101,130	292,098
TX	4,102,173	18%	718,099	247,143	183,069	287,887
VA	807,563	24%	193,280	116,752	18,122	58,406
WA	1,146,641	19%	212,657	108,408	32,605	71,644
WV	389,501	30%	114,977	48,949	58,419	7,609

Appendix B: Derivation of Enrollee Eligibility Category and Managed Care Status

We used the Chronic Condition Data Warehouse (CCW) Personal Summary (PS) file to determine an enrollee's eligibility group, age category, managed care enrollment, and months of Medicaid eligibility. The CCW variables and the value for each variable used to assign enrollees to categories are provided in the sections below.

Eligibility Category Assignment

We used the latest CCW eligibility code reported for an enrollee (EL_CCW_ELGBLTY_CD_LTST) to assign the enrollee to an eligibility group for those enrollees that were not eligible for both Medicaid and Medicare. For the purposes of our analyses, we assigned each enrollee to only one eligibility group. For Medicare-Medicaid Enrollees, we used the Medicare Dually Eligible code (EL_MDCR_DUAL_ANN) and the original Medicare reason for entitlement (MDCR_ORIG_REAS_CD) to assign an eligibility group. In the assignment process logic, Medicare-Medicaid Enrollees were assigned first. If an enrollee was not determined to be eligible for both Medicare and Medicaid they were assigned to another eligibility category.

Figure B-1 shows the values used to identify Medicare-Medicaid eligible enrollees. This methodology was selected based upon feedback from departments within CMS. Researchers may also want to consider other methodologies and should discuss alternatives with their project teams. Values contained in the CCW may also change in future years.

Figure B-1. Variable/Values Used to Identify Medicare-Medicaid Eligible Enrollees

Medicare-Medicaid Enrollee Category	EL_MDCR_DUAL_ANN values	MDRC_ORIG_REAS_CD values
Medicare-Medicaid Enrollee - Partially Eligible (i.e., QMB/ SLMB)	01, 03, 05, 06, 07, 51, 53, 55, 56, 57	Not used in assignment process
Full Medicare-Medicaid Enrollee - Aged	02, 04, 08, 52, 54, 58	0
Full Medicare-Medicaid Enrollee - Disabled	02, 04, 08, 52, 54, 58	1, 2, 3

Figure B-2 shows the values we used to assign non-Medicare-Medicaid enrollees to eligibility groups. We used the most recent monthly value for the EL_CHIP_FLAG series of variables to determine an enrollee's CHIP status. This methodology was selected based upon feedback from departments within CMS. Researchers may want to consider other methodologies and should discuss alternatives with their project teams. The values contained in the CCW may also change in future years.

Figure B-2. Variable/Values Used to Identify Non-Medicare-Medicaid Enrollee Eligibility Categories

Eligibility Category	EL_CCW_ELGBLTY_CD_LTST values	EL_CHIP_FLAG_latest *
SSI	11, 12, 41, 42	
TANF	14, 15, 16, 17, 34, 35	
MA- Only, SSI Related	21, 22	
MA – Only, Non SSI Related	24, 25, 44, 45	
Foster Care	48	
Waiver	51, 52, 54, 55	
CHIP	14, 15, 16, 17, 34, 35, 44, 45, 54, 55	2, 3

Age Category Assignment

We used age group codes (EL_AGE_GRP_CD) to assign enrollees to four age categories; Newborn, Children, Adult, and Elderly. Figure B-3 shows the values used to assign enrollees to each category.

Figure B-3. Variable/Values Used to Identify Age Category

Age Category	EL_AGE_GRP_CD values
Newborn	0
Child	1, 2, 3
Adult	4, 5
Elderly	6, 7, 8
Unknown	Any other value

Managed Care Status

We used three variables in the PS file to determine care delivery model status: total months of Medicaid enrollment (EL_ELGBLTY_MO_CNT), total months of enrollment in managed care (EL_PPH_PLN_MO_CNT_CMCP), and total months of enrollment in PCCM (EL_PPH_PLN_MO_CNT_PCCM). We derived the number of months an enrollee was enrolled in "FFS" by subtracting total months of enrollment is managed care and PCCM from number of Medicaid enrollment months.

We further categorize the FFS and managed care categories as 'full' or 'partial.' Full FFS refers to enrollees who were in FFS for all months of eligibility in 2008. Partial FFS indicates enrollees who were in FFS for fewer than all eligible months. A similar rationale was used for managed care enrollees: 'full managed care' refers to enrollees who were in managed care for all eligible months of eligibility in 2008; 'partial managed care' indicate enrollees who were in managed care for fewer than all eligible months.