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Maryland Full-Benefit Dual-Eligible Beneficiaries' Use of Medicare and Medicaid Services Preceding and Following a Medicare Inpatient Stay

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Overview

At the request of the Maryland Department of Health and Mental Hygiene (DHMH), The Hilltop Institute conducted a series of analyses on the health care utilization of Maryland's full-benefit Medicare-Medicaid dual-eligible beneficiaries. Together, these analyses provide an overview of how this population accesses health care services, the types of services being used, and where the services are provided. This information will inform the state's decision-making process in the development of a strategy to integrate care delivery for Maryland's dual-eligible beneficiaries under the Centers for Medicare and Medicaid Services (CMS) State Innovation Model (SIM) grant.

Dual-eligible beneficiaries often receive specialized post-acute care following a Medicare inpatient hospital stay; some of these beneficiaries require multiple levels of care in a variety of settings. These services support patients who require ongoing medical management, therapeutic, rehabilitative, or skilled nursing care and are collectively referred to as post-acute care (PAC) services. This analysis will explore the use of PAC services by full-benefit dual-eligible beneficiaries in the days preceding and following an inpatient hospital stay. Specifically, this analysis determines the use of select Medicare and Medicaid PAC, such as skilled nursing, inpatient rehabilitation, nursing facility (NF) services, hospice, and home health services. In addition to the identification of PAC services, this analysis also includes indicators of services used before the inpatient stay. The analysis timeframe is calendar year (CY) 2012 (January 1, 2012, through December 31, 2012).

Methodology

Hilltop used Maryland Medicaid Management Information System (MMIS2) files and Medicare files to examine service utilization patterns for full-benefit dual-eligible beneficiaries in the seven days prior to and thirty days following a Medicare inpatient hospital stay. The study population was defined as individuals eligible for both full Medicaid benefits and Medicare benefits, with at least one Medicare inpatient hospital stay in CY 2012. Hilltop used MMIS2 eligibility files to identify individuals with at least one month of Medicaid eligibility and at least one month of Medicare eligibility, so that the study cohort includes individuals who were dually eligible for the full year as well as individuals who were dually eligible for only part of the year. Hilltop then used Medicaid coverage group designations to identify full-benefit dual-eligible beneficiaries. Dual eligibles enrolled in one of the four Medicare Savings Program—Qualified Medicare Beneficiary (QMB), Specified Low-Income Medicare Beneficiary (SLMB), Qualified Individuals (QI), and Qualified Disabled Working Individual (QDWI)—coverage group designations were excluded from the analysis, and services rendered through a Medicare Advantage plan were not included.

Hilltop used CY 2012 Medicare inpatient claims to identify the study population's Medicare inpatient hospital stays. Inpatient hospital stays for the same individual at the same provider with a gap of one day or less were considered a single stay. Stays for the same individual with a gap of more than one day or with a change in provider were considered separate stays. To account for hospital stays that may overlap into CY 2011 or CY 2013, as well as to accommodate the look-back and look-forward logic used to determine pre- and post-settings, only stays occurring between January 8, 2012, and December 1, 2012, were included in the analysis.

Hilltop then combined CY 2012 Medicaid long-term care, NF, home- and community-based services (HCBS), and hospice claims to create a Medicaid services data file. Similarly, Medicare inpatient, home health, hospice, and outpatient claims[1] were combined to create a Medicare services data file.

Medicaid and Medicare services occurring on the day of admission or within seven days prior to a Medicare inpatient hospital stay were identified as "pre-stay" services. Those occurring on the day of discharge or within thirty days following a Medicare inpatient hospital stay were flagged as "post-stay" services. Medicare services used in this analysis included subsequent Medicare inpatient stays, skilled nursing facility (SNF) stays, home health services, emergency department (ED) visits, and hospice services. Medicaid-flagged services were NF stays, hospice services, and HCBS. Individuals with no identified services in the seven days prior to or the thirty days subsequent to an Medicare inpatient stay or who died on the day of discharge or within thirty days after the end of the inpatient stay were categorized accordingly.

Data Sources

Maryland Medicaid Management Information System (MMIS2) Eligibility and Claims Files

The MMIS2 system contains key Medicaid eligibility, enrollment, program, utilization, and expenditure data for the Maryland Medicaid and Children's Health Insurance Program (CHIP). The MMIS2 eligibility file contains dates of Medicaid eligibility, coverage group information, and basic demographic information. MMIS2 claims files contain service utilization and expenditure data for Medicaid enrollees served through a fee-for-service delivery model. All MMIS2 files can be linked using a unique Medicaid beneficiary identification number.

[1] Medicare emergency department (ED) visits are captured in both inpatient and outpatient files.

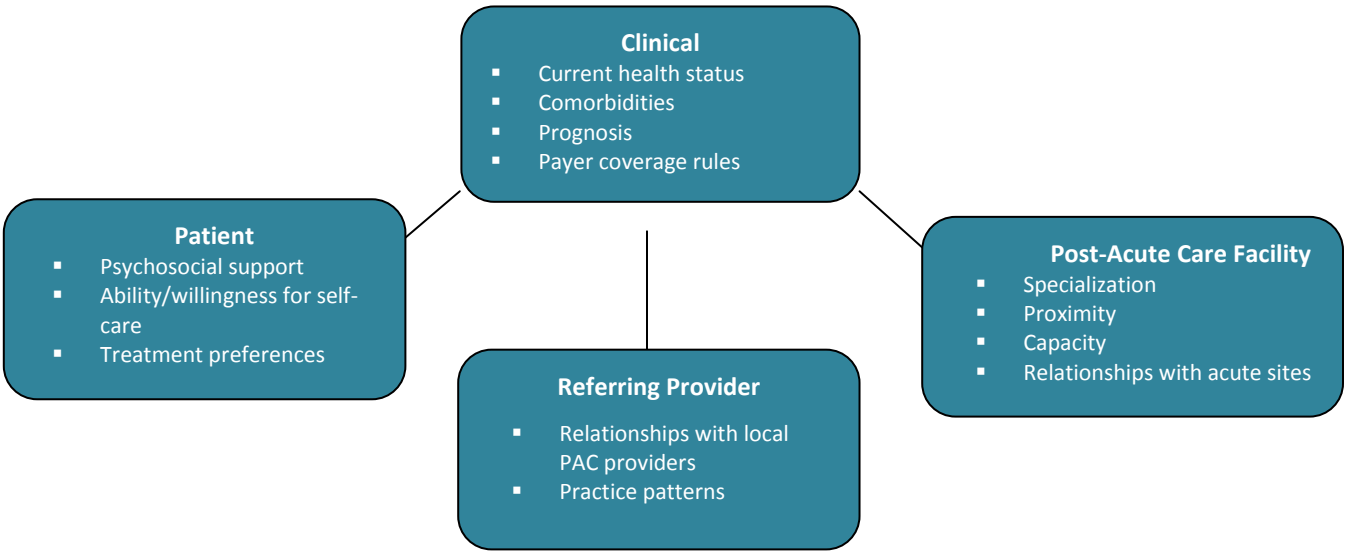
Medicare Beneficiary and Claims Files

In response to the Medicare Modernization Act of 2003 (MMA), CMS makes available to researchers the Chronic Conditions Data Warehouse (CCW). Available Medicare data include enrollment and eligibility files, fee-for-service institutional and non-institutional claims, and assessment data. The claims-level research identifiable files (RIF) are linked by a unique beneficiary identification number that allows analysis across multiple care settings. Hilltop has developed a Medicaid-Medicare beneficiary identification crosswalk to link MMIS2 and Medicare data for analysis.

Findings

Post-acute care services are provided in a variety of settings such as SNFs, inpatient rehabilitation facilities, NFs, and patient homes. As the primary payer for dual-eligible beneficiaries, Medicare pays each provider type a different rate even though different provider types may be treating patients with similar medical conditions and care needs. Currently, there is no standardized process for identifying the most appropriate PAC setting for patients. However, as shown in Figure 1, the American Hospital Association has identified clinical and non-clinical factors that may influence the PAC selection process. Consideration of these factors during the patient discharge process may avoid unnecessary complications or hospital-related illnesses or injuries that can result inpatient readmissions.

Figure 1. Clinical and Non-Clinical Factors Influencing PAC Setting Selection



Source: Maximizing the Value of Post-Acute Care, American Hospital Association, November 2010.

Between January 8, 2012, and December 1, 2012, 19,232 Maryland full-benefit dual-eligible beneficiaries incurred 37,070 Medicare fee-for-service inpatient hospital stays. Table 1 shows that over half (56 percent) of the study population had at least one inpatient hospital stay during the study period. Table 2 shows that the largest percentages of stays were incurred by individuals aged 65 and older, Blacks, and females. Inpatient hospital stays for females outnumbered those for males by 24 percentage points. Blacks and Whites accounted for 44 percent and 40 percent of the inpatient hospital stays, respectively. When examined by age, nearly six out of every ten inpatient hospital stays were for individuals aged 65 and older.

Table 1. Number of Medicare Inpatient Hospital Stays for Full-Benefit Dual-Eligible Beneficiaries between January 8, 2012, and December 1, 2012

Number of Stays	Number of Persons	Percentage
1	10,865	56%
2 to 3	6,219	32%
4 to 6	1,729	9%
7 to 9	306	2%
10 to 12	62	<1%
13 or more	51	<1%
Total	**19,232**	**100%**

Table 2. Number of Medicare Inpatient Hospital Stays by Selected Demographics, CY 2012

	All Ages		Under 65		65 and Older	
	N	%	N	%	N	%
Total	37,070	100%	15,025	41%	22,045	59%
Gender						
Male	13,929	38%	6,519	43%	7,410	34%
Female	23,141	62%	8,506	57%	14,635	66%
Race						
Asian	1,431	4%	143	1%	1,288	6%
Black	16,133	44%	7,624	51%	8,509	39%
White	14,950	40%	6,079	40%	8,871	40%
Hispanic	813	2%	217	1%	596	3%
Native American	64	<1%	46	<1%	18	<1%
Pacific Islands/Alaskan	26	<1%	*	*	23	<1%
Unknown	3,653	10%	913	6%	2,740	12%

*Not shown due to small cell size.

Table 3 shows the distribution of inpatient hospital stays by county and by age group. The largest percentage of inpatient stays across all age groups were noted in the most populous areas: Baltimore City, Baltimore County, Montgomery County, and Prince George's County.

Table 3. Percentage of Medicare Inpatient Hospital Stays by County, CY 2012

	All Ages		Under 65		65 and Older	
	N	%	N	%	N	%
County						
Allegany	1,052	3%	312	2%	740	3%
Anne Arundel	2,065	6%	978	7%	1,087	5%
Baltimore City	8,925	24%	4,295	29%	4,630	21%
Baltimore County	5,127	14%	2,096	14%	3,031	14%
Calvert	408	1%	140	1%	268	1%
Caroline	475	1%	149	1%	326	1%
Carroll	759	2%	299	2%	460	2%
Cecil	671	2%	321	2%	350	2%
Charles	886	2%	300	2%	586	3%
Dorchester	421	1%	174	1%	247	1%
Frederick	986	3%	375	2%	611	3%
Garrett	280	1%	107	1%	173	1%
Harford	1,070	3%	449	3%	621	3%
Howard	1,105	3%	378	3%	727	3%
Kent	228	1%	64	<1%	164	1%
Montgomery	4,484	12%	1,175	8%	3,309	15%
Prince George's	4,258	11%	1,890	13%	2,368	11%
Queen Anne's	228	1%	82	1%	146	1%
St. Mary's	571	2%	213	1%	358	2%
Somerset	299	1%	78	1%	221	1%
Talbot	212	1%	67	<1%	145	1%
Washington	1,084	3%	505	3%	579	3%
Wicomico	961	3%	373	2%	588	3%
Worcester	356	1%	129	1%	227	1%

Source: The Hilltop Institute, Medicaid and Medicare eligibility and claims data, CY 2012.

Table 4 presents the distribution of Medicare and Medicaid pre-stay services received on the date of admission or in the seven days prior to an inpatient hospital stay. The pre-stay settings shown in Table 4 are not mutually exclusive (e.g., a person using more than one of these services on the date of admission or within seven days prior to a Medicare inpatient stay are included in each of those service counts). Medicare ED visits include both inpatient stays beginning as an ED visit and ED visits not resulting in an inpatient stay. Medicare ED visits occurred within seven days

prior to 88 percent of the inpatient hospital stays.[2] This percentage increased to 91 percent for stays incurred by the aged 65 and older cohort.

Table 4. Pre-Stay Settings, by Age Group, CY 2012

Pre-Stay	All		Under 65		65 and Older	
	N	%	N	%	N	%
Medicare ED Visit	32,724	88%	12,739	85%	19,985	91%
Medicare Hospice	138	<1%	27	<1%	111	<1%
Medicare Home Health Agency	1,090	3%	346	2%	744	3%
Medicare Skilled Nursing Facility	4,148	11%	976	6%	3,172	14%
Medicare Inpatient Stay	4,516	12%	2,099	14%	2,417	11%
Medicaid Home and-Community Based Services	5,907	16%	2,265	15%	3,642	17%
Medicaid Nursing Facility	3,470	9%	637	4%	2,833	13%
No Previous Service	2,914	8%	1,705	11%	1,209	5%

Notes: Pre-stay settings are not mutually exclusive (e.g., a person using more than one of the above services on the day of admission or within seven days prior to a Medicare inpatient stay is included in each of those service counts). Medicare ED visits include both inpatient stays that began as an ED visit and ED visits not resulting in an inpatient stay.
Source: The Hilltop Institute, Medicaid and Medicare eligibility and claims data, CY 2012.

Table 5 shows the distribution of post-stay services. Post-stay settings are not mutually exclusive (e.g., a person using more than one of the post-stay services on the day of discharge or within thirty days following a Medicare inpatient stay is counted in each of those service counts). Admission to a SNF, a subsequent inpatient hospital stay, or a ED visit were the most prevalent post-stay services used on the day of discharge or within 30 days of an inpatient hospital stay (Table 5). Over one-third of the inpatient hospital stays were followed by a SNF admission that occurred either on the day of discharge or within 30 days following a stay. For individuals aged 65 and older, 44 percent of their post-stay visits were for subsequent SNF admissions. Over one-quarter of the inpatient hospital stays met the CMS classification of a readmission, which is defined as "an admission to a hospital within 30 days of a discharge from the same or another hospital."[3] Readmissions were more likely for individuals under the age of 65 than for those aged 65 and older.

[2] This includes situations in which the inpatient stay record itself includes ED revenue codes.
[3] https://www.cms.gov/medicare/medicare-fee-for-service-payment/acuteinpatientpps/readmissions-reduction-program.html

Table 5. Post-Stay Settings, by Age Group, CY 2012

Post-Stay	All		Under 65		65 and Older	
	N	%	N	%	N	%
Medicare ED Visit	11,893	32%	5,884	39%	6,009	27%
Medicare Hospice	1,454	4%	224	1%	1,230	6%
Medicare Home Health Agency	4,771	13%	1,602	11%	3,169	14%
Medicare Skilled Nursing Facility	12,393	33%	2,630	18%	9,763	44%
Medicare Inpatient Stay	10,159	27%	4,644	31%	5,515	25%
Medicaid Home and-Community Based Services	5,500	15%	2,251	15%	3,249	15%
Medicaid Nursing Facility	5,092	14%	1,053	7%	4,039	18%
No Post-Stay Service	6,420	17%	3,807	25%	2,613	12%
Died	2,809	8%	530	4%	2,279	10%

Note: Post-stay settings are not mutually exclusive (e.g., a person using more than one of the above services on the day of discharge or within thirty days following a Medicare inpatient stay is counted in each of those service counts).
Source: The Hilltop Institute, Medicaid and Medicare eligibility and claims data, CY 2012.

Following an inpatient hospital stay, full-benefit dual-eligible beneficiaries use a multiplicity of services along the long-term services and supports (LTSS) continuum. For each of the pre-stay service categories, varying percentages of services received post-stay (Table 6). While there are no discernible patterns in the use of post-stay services when analyzed by pre-stay service, it is worth mentioning that—regardless of the pre-stay service—Medicare ED visits, subsequent inpatient stays, and SNF stays were frequently used services following an inpatient hospital stay. Additional information on the number of post-stay services is available in Appendix A.

Table 6. Post-Stay Service, by Pre-Inpatient Stay Services, CY 2012

	Medicaid Post-Stay Services			Medicare Post-Stay Services					Other	
Pre-Stay Service	HCBS	Hospice	NF	ED	Home Health	Hospice	Inpatient	SNF	No Post Services	Died
Medicaid HCBS	87%	<1%	1%	30%	20%	4%	25%	21%	1%	7%
Medicaid Hospice	<1%	57%	50%	22%	<1%	59%	17%	29%	<1%	28%
Medicaid NF Stay	<1%	5%	59%	22%	<1%	8%	22%	49%	1%	19%
Medicare ED Visit	15%	2%	14%	35%	12%	4%	28%	34%	16%	8%
Medicare Home Health	17%	1%	5%	39%	19%	6%	33%	50%	6%	12%
Medicare Hospice	7%	23%	23%	28%	4%	54%	22%	28%	1%	27%
Medicare Inpatient	12%	2%	10%	79%	14%	4%	42%	39%	3%	10%
Medicare SNF Stay	3%	3%	27%	43%	5%	7%	32%	78%	1%	17%
No Previous Service	<1%	<1%	2%	6%	10%	<1%	10%	9%	19%	1%

Source: The Hilltop Institute, Medicaid and Medicare eligibility and claims data, CY 2012.

Great variation exists in the Medicare severity diagnosis-related groups (DRGs) assigned to the 30,070 inpatient stays. Tables 7 provide information by age group on the top five DRGs for inpatient hospital stays incurred by the study population. Psychosis—defined as mental health conditions such as schizophrenia, bipolar disorder, depression, and other unspecified mood disorders—was the most frequently assigned DRG. Individuals under the age of 65 were more likely to have an inpatient hospital stay with a resulting psychosis DRG.

Table 7. Top Five Medicare Severity Diagnosis-Related Group, by Age Group

Diagnosis-Related Group	All Ages		Under 65		Age 65 and Older	
	N	%	N	%	N	%
Psychosis	2,050	6%	1,715	11%	335	2%
Septicemia or Severe Sepsis*	1,749	5%	516	3%	1,233	6%
Kidney and Urinary Tract Infections**	970	3%	166	1%	804	4%
Heart Failure and Shock*	715	2%	251	2%	464	2%
Simple Pneumonia and Pleurisy*	681	2%	207	2%	474	1%

Note: Excluded from this table is an unidentifiable DRG (coded as '000' in the Medicare data, with no corresponding descriptive label available) that was assigned to 3 percent of the stays.
* With major complications or comorbidities.
** Without major complications or comorbidities.
Source: The Hilltop Institute, Medicaid and Medicare eligibility and claims data, CY 2012.

Summary

Over 37,000 Medicare inpatient hospital stays were incurred by 19,232 full-benefit dual-eligible beneficiaries between January 8, 2012, and December 1, 2012. The largest percentage of these stays was incurred by individuals aged 65 and older, Blacks, and females. Among geographic entities, Baltimore City, Baltimore County, Montgomery County, and Prince George's County had the largest percentage of the inpatient hospital stays.

Emergency department visits were identified on the day of admission or in the seven days prior to the admission for 88 percent of the inpatient hospital stays. This percentage increased to 91 percent for the aged 65 and older population. Medicare inpatient readmissions accounted for more than one-fourth of inpatient hospital stays, with the percentage of readmissions being slightly higher for individuals under the age of 65.

Admission to a SNF, a subsequent inpatient stay, or an ED visit was the most prevalent post-stay service following an inpatient hospital stay. One-third of the inpatient hospital stays were followed by a SNF admission, while just over one-fourth were followed by a subsequent inpatient readmission. The American Hospital Association, recognizing the lack of a standardized process for identifying the most appropriate post-acute care setting for patients, has identified clinical and non-clinical factors that may guide this PAC selection process. These

clinical, patient, provider, and facility-related factors—when integrated into the patient discharge planning process—may help prevent avoidable injuries, illnesses, and inpatient readmissions.

Appendix A. Number of Post-Stay Services, by Pre-Inpatient Stay Services, CY 2012

	Medicaid Post-Stay Services			Medicare Post-Stay Services					Other	
Pre-Stay Service	**HCBS**	**Hospice**	**NF**	**ED**	**Home Health**	**Hospice**	**Inpatient**	**SNF**	**No Post Services**	**Died**
Medicaid HCBS	5,158	18	79	1,763	1,205	239	1,449	1,248	32	408
Medicaid Hospice	*	33	29	13	*	34	*	17	*	16
Medicaid NF	15	186	2,037	755	16	293	750	1,714	21	649
Medicare ED	5,007	499	4,715	11,305	3,883	1,385	9,131	11,201	5,113	2,657
Medicare Home Health	187	*	56	428	204	70	364	549	68	129
Medicare Hospice	*	32	32	39	*	75	31	38	*	37
Medicare Inpatient	551	68	472	3,550	637	199	1,917	1,746	133	458
Medicare SNF	137	133	1,131	1,785	226	307	1,330	3,227	49	688
No Previous Service	22	*	142	355	614	28	615	575	1,228	68

*Not shown due to small cell size.

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