



Chronic Conditions Warehouse Virtual Research Data Center

Medicare Enrollment Data Maturity — Information and Guidance for CCW Data Users

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Chronic Conditions Warehouse

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1.0 Background

The Centers for Medicare & Medicaid Services (CMS) collects and maintains large-scale administrative data primarily to support the operation and oversight of its programs. These data are generated through routine transactions such as claims submissions and enrollment updates. Because these data are operational in nature, they are subject to inherent timing and completeness constraints. Records are submitted over time and may be adjusted or resubmitted before reaching a relatively stable, final state. Data maturity refers to the extent to which a dataset reflects its final values at a given point in time. Understanding how CMS data mature is essential for researchers seeking to use these data appropriately. This paper describes data maturity for Medicare enrollment and coverage data, specifically the Chronic Conditions Warehouse (CCW) Master Beneficiary Summary File (MBSF).

1.1 Medicare Enrollment and Coverage Data

The CCW MBSF is a person-level file that contains demographic, eligibility, entitlement, and enrollment data for beneficiaries who meet the following criteria: 1) CMS documents show they are alive for some part of the reference year, and 2) they are enrolled in the Medicare program during the file's reference year. The reference year refers specifically to the calendar year the MBSF covers (e.g., the 2023 MBSF covers calendar 2023, which is the reference year).

The CCW team creates an immature version of the MBSF at the start of each calendar year. Then, at the end of each month, the MBSF is updated to include the latest information for all available fields. The January YYYY version of the MBSF, contains only January monthly fields (February through December remain unpopulated), along with the one-time and annual fields. As each month elapses, the monthly MBSF is updated to populate the information for all months in the year-to-date. The February MBSF is a full refresh of the January MBSF. That means if the monthly values for January changed in a later month, the information would be over-written with the current information. CMS allows a full year of additions and updates after the end of the calendar year before finalizing the MBSF. For example, the CCW team extracted the final update for the 2023 MBSF immediately after December 31, 2024, to create the final 2023 MBSF.

The Base ABCD segment of the MBSF contains essential information for most study denominators. This document uses the MBSF Base ABCD segment as the source for all enrollment data.

There are some benefit enrollment fields in the MBSF that may change during the plan year due to changes in beneficiary status. For example, beneficiaries may become eligible for dual Medicare-Medicaid benefits (due to spending down), or their kidneys may fail requiring dialysis or a kidney transplant and they become entitled to Medicare due to end-stage renal disease (ESRD).

1.2 Objectives

This document explains the completeness of Medicare enrollment records in the MBSF at various time intervals after the CCW team creates each monthly MBSF file.

When using enrollment fields that have not stabilized and become fully mature, information about enrollment in Medicare benefits (e.g., Part A or Part B coverage) or programs (Health Maintenance Organization [HMO] coverage) may be incomplete or subject to revision. This information helps researchers weigh the trade-offs between data timeliness and completeness when selecting datasets for analysis.

2.0 Examining Maturity of Enrollment Data

The CCW team used the MBSF to address key questions related to enrollment information:

- As months elapse and the MBSF matures, are there changes in which beneficiaries are considered to be enrolled in Medicare? For example, is there fluctuation in whether the MBSF considers a beneficiary enrolled in the year or not, when looking at the MBSF data month over month?
- How long after the end of the enrollment year does the count of beneficiaries in the MBSF become relatively constant?
- For the monthly enrollment and coverage variables, what changes occurred between the initial value for a month compared to the final, fully matured value? For example, does information about which beneficiaries have Part A, Part B, or HMO coverage in a given month change as the monthly data matures?

2.1 Sample

The MBSF is the source of all data used in this study. The CCW team compared the immature monthly MBSF to the final 2023 MBSF for all analyses.

2.2 Analyses

The CCW team identified all Medicare enrollment data needed for the 2023 MBSF Base ABCD and tracked each monthly version of this information over time. To demonstrate how the data changes over time, we tracked changes until 12 months after December 2023, which is the final update of the 2023 data before the MBSF Base ABCD is finalized. The CCW team then compared these monthly snapshots to the final data.

For the maturity of monthly coverage fields, the CCW team selected a month mid-way through the calendar year (i.e., July). We selected July 2023, rather than January 2023, to illustrate that mid to late-year values for monthly enrollment fields are immature at December 2023, thereby depicting the value of additional months of maturity.

3.0 Results

When using the information from this paper to make projections about the likely maturity of more recent enrollment data, keep in mind that while this analysis only provides a snapshot of enrollment, we expect the pattern of maturity to be very similar year-over-year.

3.1 Time to Final/Stable Medicare Enrollment Count

The CCW team documented the fluctuations observed in the count of Medicare beneficiaries in the monthly versions of the MBSF, and the time it took before the enrollment counts stabilized; reference [Table 1](#). For each month, identified whether a beneficiary had been added, removed, or continued/carried over from the previous month. [Table 1](#) depicts the January through December 2023 enrollment period, along with the 12 months of 2024 during which the data matures.

Table 1. Count of Medicare beneficiaries by month, 2023 MBSF

Date*	Month	Add	Remove	Continued	Denominator
January 2023	1	n/a	n/a	n/a	65,494,987
	2	286,797	4,522	65,490,465	65,777,262
	3	373,727	6,629	65,770,633	66,144,360
	4	293,926	1,985	66,142,375	66,436,301
	5	321,258	2,192	66,434,109	66,755,367
	6	335,116	2,715	66,752,652	67,087,768
	7	325,553	2,148	67,085,620	67,411,173
	8	355,908	3,513	67,407,660	67,763,568
	9	342,877	2,983	67,760,585	68,103,462
	10	339,757	6,761	68,096,701	68,436,458
	11	332,981	2,411	68,434,047	68,767,028
December 2023	12	393,876	3,919	68,763,109	69,156,985
January 2024	13	62,437	6,593	69,150,392	69,212,829
	14	92,263	3,093	69,209,736	69,301,999
	15	63,305	3,052	69,298,947	69,362,252
	16	55,340	6,926	69,355,326	69,410,666
	17	62,517	5,608	69,405,058	69,467,575
	18	52,409	4,432	69,463,143	69,515,552
	19	23,097	5,298	69,510,254	69,533,351
	20	32,055	2,685	69,530,666	69,562,721
	21	14,206	5,459	69,557,262	69,571,468
	22	15,930	1,228	69,570,240	69,586,170
	23	8,802	1,536	69,584,634	69,593,436
December 2024	24	8,253	1,338	69,592,098	69,600,351

- During the enrollment year (2023 for example) approximately 300,000 new beneficiaries were added each month to Medicare (i.e., due to becoming newly enrolled in Medicare)

- Once the enrollment year has passed, beneficiary enrollment continues to evolve with a small number of beneficiaries added and removed from the MBSF through the month that the file is finalized (12 monthly updates following the enrollment year; month 24 in [Table 1](#))
- A total of 99.32% (69,124,461/69,600,351) of beneficiaries in the final MBSF were present in the MBSF at the end of the enrollment year (i.e., in the December 2023 file; data not shown)

3.2 Changes in Monthly Coverage Values Between Initial and Final Enrollment Data

As the benefit year progresses, beneficiaries may elect to adjust their Medicare coverage and CMS may obtain updated information about beneficiary coverage from upstream data sources (e.g., SSA, state Medicaid). The CCW team examined the monthly enrollment data for July 2023 to determine whether the values for some key monthly coverage variables changed.

3.2.1 Changes in Part A or Part B Coverage Between Initial and Final Enrollment Data

The CCW team ascertained whether their understanding of: 1) which beneficiaries were covered by Medicare Part A for a given month changed (reference [Table 2](#)), and 2) which beneficiaries were covered by Medicare Part B in the monthly MBSF as the MBSF matured (reference [Table 3](#)).

These analyses included beneficiaries in the July 2023 monthly MBSF and compared their BUYIN status for July 2023 (months of lag = 0) to each successive month until the data fully matured following the December 2024 monthly update. We identified Part A coverage when MDCR_ENTLMT_BUYIN_IND_07 = 1, 3, A, or C; and Part B coverage when MDCR_ENTLMT_BUYIN_IND_07 = 2, 3, B, or C.

Table 2. Count of Part A enrolled beneficiaries for July 2023, by month of maturity of the MBSF

Date	Month	Months of lag	Add	Remove	Continued	Part A count	MBSF denominator
July 2023	7	0	n/a	n/a	n/a	65,799,825	67,411,173
	8	1	88,691	7,454	65,792,371	65,881,062	67,763,568
	9	2	55,906	4,163	65,876,899	65,932,805	68,103,462
	10	3	51,496	5,980	65,926,825	65,978,321	68,436,458
	11	4	53,378	2,958	65,975,363	66,028,741	68,767,028
December 2023	12	5	72,811	4,402	66,024,339	66,097,150	69,156,985
January 2024	13	6	34,751	4,895	66,092,255	66,127,006	69,212,829
	14	7	49,731	3,422	66,123,584	66,173,315	69,301,999
	15	8	22,839	2,568	66,170,747	66,193,586	69,362,252
	16	9	14,337	5,350	66,188,236	66,202,573	69,410,666
	17	10	14,167	5,826	66,196,747	66,210,914	69,467,575
	18	11	9,914	4,054	66,206,860	66,216,774	69,515,552
July 2024	19	12	5,609	3,553	66,213,221	66,218,830	69,533,351
	20	13	11,926	2,882	66,215,948	66,227,874	69,562,721
	21	14	6,911	3,923	66,223,951	66,230,862	69,571,468
	22	15	8,649	1,168	66,229,694	66,238,343	69,586,170
	23	16	4,497	1,052	66,237,291	66,241,788	69,593,436
December 2024	24	17	4,384	888	66,240,900	66,245,284	69,600,351

- Once the monthly MBSF matures beyond the enrollment month (i.e., months of lag > 0), source data continues to add or remove a small number of beneficiaries from the MBSF or from having Part A coverage as the file matures. This same pattern is present for Part B coverage (reference [Table 3](#))

- For beneficiaries we identified as having Part A coverage in the July 2023 monthly MBSF, 65,745,697 of the 65,799,825 beneficiaries (99.92%) appeared in each subsequent monthly file as having Part A coverage (data not shown)

Table 3. Count of Part B enrolled beneficiaries for July 2023, by month of maturity of the MBSF

Date	Month	Months of lag	Add	Remove	Continued	Part B count	MBSF denominator
July 2023	7	0	n/a	n/a	n/a	60,770,871	67,411,173
	8	1	32,709	54,523	60,716,348	60,749,057	67,763,568
	9	2	27,752	32,559	60,716,498	60,744,250	68,103,462
	10	3	12,975	57,212	60,687,038	60,700,013	68,436,458
	11	4	42,285	4,968	60,695,045	60,737,330	68,767,028
December 2023	12	5	44,916	5,683	60,731,647	60,776,563	69,156,985
January 2024	13	6	5,154	59,487	60,717,076	60,722,230	69,212,829
	14	7	63,749	2,630	60,719,600	60,783,349	69,301,999
	15	8	17,463	17,667	60,765,682	60,783,145	69,362,252
	16	9	6,761	50,862	60,732,283	60,739,044	69,410,666
	17	10	54,993	2,500	60,736,544	60,791,537	69,467,575
	18	11	20,189	12,725	60,778,812	60,799,001	69,515,552
July 2024	19	12	2,895	50,388	60,748,613	60,751,508	69,533,351
	20	13	54,382	2,632	60,748,876	60,803,258	69,562,721
	21	14	5,371	48,919	60,754,339	60,759,710	69,571,468
	22	15	47,113	2,585	60,757,125	60,804,238	69,586,170
	23	16	18,139	10,946	60,793,292	60,811,431	69,593,436
December 2024	24	17	14,987	10,775	60,800,656	60,815,643	69,600,351

- For beneficiaries we identified as having Part B coverage in the July 2023 monthly MBSF 60,596,898 of the 60,770,871 beneficiaries (99.71%) appeared in each subsequent monthly file as having Part B coverage (data not shown)

3.2.2 Changes in Medicare HMO Coverage Between Initial and Final Enrollment Data

The CCW team ascertained whether their understanding of which beneficiaries were enrolled in Medicare managed care (i.e., Medicare Advantage [MA]) rather than Original Medicare (previously referred to as Fee-for-Service) changed as the MBSF matured. Using the monthly HMO_IND_MM variable, we compared beneficiaries' HMO enrollment status for July 2023 (months of lag = 0) to each successive month (reference [Table 4](#)) until the data fully matured following the December 2024 monthly update. The team identified HMO (i.e., MA) enrollment when HMO_IND_MM_07 = 1, 2, A, B, C.

Table 4. Count of Medicare HMO-enrolled beneficiaries for July 2023, by month of maturity of MBSF

Date	Month	Months of lag	Add	Remove	Continued	HMO count	MBSF denominator
July 2023	7	0	n/a	n/a	n/a	32,251,757	67,411,173
	8	1	3,173	4,325	32,247,432	32,250,605	67,763,568
	9	2	1,325	1,744	32,248,861	32,250,186	68,103,462
	10	3	906	2,739	32,247,447	32,248,353	68,436,458
	11	4	1,206	802	32,247,551	32,248,757	68,767,028
December 2023	12	5	1,784	1,022	32,247,735	32,249,519	69,156,985
January 2024	13	6	449	2,136	32,247,383	32,247,832	69,212,829
	14	7	2,169	656	32,247,176	32,249,345	69,301,999
	15	8	585	717	32,248,628	32,249,213	69,362,252
	16	9	501	1,963	32,247,250	32,247,751	69,410,666
	17	10	1,938	13,136	32,234,615	32,236,553	69,467,575
	18	11	674	770	32,235,783	32,236,457	69,515,552
	19	12	191	1,822	32,234,635	32,234,826	69,533,351
	20	13	1,956	811	32,234,015	32,235,971	69,562,721
	21	14	354	2,162	32,233,809	32,234,163	69,571,468
	22	15	1,659	429	32,233,734	32,235,393	69,586,170
	23	16	507	490	32,234,903	32,235,410	69,593,436
December 2024	24	17	397	474	32,234,936	32,235,333	69,600,351

- The count of beneficiaries we identified as having HMO coverage in the July 2023 monthly MBSF (reference [Table 4](#)) was larger in the initial month (with no lag) than in any subsequent month
- The number of beneficiaries who were enrolled in an HMO in July 2023 and appeared in each subsequent monthly MBSF file as having HMO coverage was 32,222,821 of the 32,251,757 beneficiaries (99.91%) (data not shown)