

# Chronic Conditions Warehouse

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**Chronic Conditions Warehouse**

## Medicare-Medicaid Linked Enrollee Analytic Data Source (MMLEADS) User Guide

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## Chapter 1. — Introduction

The Chronic Conditions Warehouse (CCW) team designs and produces Medicare-Medicaid Linked Enrollee Analytic Data Source (MMLEADS) files for the Centers for Medicare & Medicaid Services (CMS). The files allow for the examination of all Medicare and Medicaid enrollment and claims data for individuals dually eligible for Medicare and Medicaid and primarily address questions regarding eligibility, enrollment, service use and payments.

The CCW team made major changes in the analytic code and key algorithms used for the MMLEADS data product due to the transition of Medicaid source data from Medicaid Statistical Information System (MSIS) Medicaid Analytic eExtract (MAX) files to Transformed Medicaid Statistical Information System (T-MSIS) Analytical Files (TAF) research identifiable files (RIFs). We developed an updated version of the MMLEADS files using the TAF RIFs for 2016,<sup>1</sup> along with Medicare data, as the source files. In addition to updated algorithms, MMLEADS has a new file format, in which all files are person-level summary files.

The objective of this document is to describe the MMLEADS data product and algorithms used to create key variables. The [CCW MMLEADS Codebook](#) contains a complete list of variables in MMLEADS.

### A. What's New in MMLEADS?

While the population groups and objectives for MMLEADS remain the same as they were for the 2006–2012 MMLEADS files, there are two noteworthy differences in the current MMLEADS file design starting with 2016 data.

1. **Source data for Medicaid:** MMLEADS files from 2006–2012 use Medicaid Analytic eExtract (MAX)<sup>2</sup> data as the source for the Medicaid data. MMLEADS using TAF data are available for the 2016 calendar year.
2. **File structure:** The 2006–2012 MMLEADS consisted of four files: a) Beneficiary/Enrollee, person-level; b) Medicaid Service-Level, annual claims rolled up to services, which could contain multiple rows per person; c) Medicare Service-Level, annual claims rolled up to services, which could contain multiple rows per person; and d) Chronic Conditions, person-level. All current MMLEADS files are person-level, with one row per person, which CMS considered a more user-friendly structure.

### B. Population

The primary population of interest is dually eligible individuals, those eligible for Medicare and Medicaid benefits. These include individuals eligible for either full or partial Medicaid benefits. As with MMLEADS V2.0, we include two comparison populations: 1) Medicare-only, not dually eligible and 2) Medicaid-only, those enrolled due to age/blindness/disability (A/B/D), not dually eligible.

The TAF data have different eligibility variables and values than what appeared in MAX files; therefore, we updated the algorithms used to identify the Medicaid-only population ([Table 1](#)).

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<sup>1</sup> TAF RIF 2016 (release 2).

<sup>2</sup> The *CCW MAX User Guide* and *CCW TAF User Guide*, at: [www2.ccwdata.org/web/guest/user-documentation](http://www2.ccwdata.org/web/guest/user-documentation). Data dictionaries and codebooks for these MMLEADS files, at: [www2.ccwdata.org/web/guest/data-dictionaries](http://www2.ccwdata.org/web/guest/data-dictionaries).

**Table 1.** Algorithm used to define the MMLEADS population

Population group	Algorithm
Full benefit dually eligible	Medicare MBSF* fields: DUAL_STUS_CD_MM <sup>3</sup> = '02' '04' '08' (full) (SAME AS V2.0)
Partial benefit dually eligible	Medicare MBSF* fields: DUAL_STUS_CD_MM = '01' '03' '05' '06' (partial) (SAME AS V2.0)
Medicare-only, not dually eligible	Medicare-only if Medicare eligible (i.e., any month where the BUYIN <sup>4</sup> variable is not '0' or null) and not dually eligible (i.e., not in the other two population groups) (SAME AS V2.0)
Medicaid - Aged/Blind/Disabled (A/B/D), not dually eligible	TAF RIF fields: ELGBLTY_GRP_CD_MM <sup>5</sup> = '11' '12' '13' '14' '15' '16' '17' '18' '19' '20' '21' '22' '23' '24' '25' '26' '37' '38' '39' '40' '41' '42' '43' '44' '45' '46' '47' '48' '49' '50' '51' '52' '59' '60' '69' (not dually enrolled) (DIFFERENT THAN V2.0)

\* CCW Master Beneficiary Summary file (MBSF A/B/C/D file).

This population group classification is a key variable in MMLEADS. We refer to this as the “Medicare-Medicaid Enrollee Type” (MME\_TYPE\_CD), and it is an annual and monthly variable. These variables have four levels: 1) full benefit dually eligible, 2) partial benefit dually eligible, 3) Medicare-only, not dually eligible, and 4) Medicaid-only A/B/D, not dually eligible.

### C. Types of MMLEADS Files

MMLEADS is a suite of two person-level SAS® analytic files ([Table 2](#)). **There is only one record in each file for each person in the MMLEADS population, regardless of the number of states they may have resided in during the year.** The CCW team organizes these files by calendar year. We assign the claims (services) to a particular year based on their end dates. For example, a claim for a hospital stay that started in December 2015 and ended in January 2016 would appear in the 2016 file.

**Table 2.** MMLEADS person-level analytic files

Person-level files	Examples of variables
Beneficiary Summary file	<ul style="list-style-type: none"> <li>Medicare Demographic (date of birth (DOB), age, race, sex)</li> <li>Medicare Geographic (state, county)</li> <li>Medicare Enrollment (summary number of months: Part A, Part B, Part C, Part D, type of managed care plan)</li> <li>Medicaid Demographic</li> <li>Medicaid Geographic (monthly state code)</li> <li>Medicaid Enrollment and Eligibility (summary number of months during the year for various managed care plan and waiver types)</li> </ul>

<sup>3</sup> The MMLEADS file includes the monthly MDCR\_DUAL\_STUS\_CD\_MM as a set of monthly variables called MDCR\_DUAL\_STUS\_CD\_01–12.

<sup>4</sup> The MMLEADS file includes the monthly Medicare entitlement indicator as a set of monthly variables called MDCR\_BUYIN\_01–12.

<sup>5</sup> The MMLEADS file includes the monthly ELGBLTY\_GRP\_CD\_MM as a set of monthly variables called MDCD\_ELGBLTY\_GRP\_CD\_01–12.

Person-level files	Examples of variables
Cost and Use Summary file	<ul style="list-style-type: none"> <li>• Total Medicare and Medicaid Use and Payments</li> <li>• Summary Medicare Service-level Use and Payment (fee-for-service claims summarized into annual counts per person)</li> <li>• Summary Medicaid Service-level Use and Payment (<b>NOTE:</b> CMS requires redaction in the payment fields for managed care services.)</li> </ul>

CMS requires redaction (suppression) of payment fields for Medicaid managed care claims. The CCW team counted all claims in the use variables; however, the summary spend variables for Medicaid include only fee-for-service (FFS) and capitated payments.<sup>6</sup> Medicare claims are only FFS claims and do not include services provided through Medicare Advantage (MA) plans (managed care).

CCW pre-sorts each file by BENE\_ID, MSIS\_ID, STATE\_CD, and SAMPLE\_GRP and indexes them for ease of use.

Descriptions of each file appear in greater detail in [Chapter 2 — MMLEADS](#) Files.

## D. Data Sources

CCW obtained the 2016 Medicare enrollment data from the CCW MBSF A/B/C/D file, where the source data comes from the CMS Common Medicare Environment (CME).<sup>7</sup> We obtained the Medicare FFS claims data from the CCW Medicare RIFs,<sup>8</sup> which the CCW creates and makes available to researchers with an approved Data Use Agreement (DUA) with CMS. CCW accessed information regarding Medicare beneficiary long-term care months from the Medicare “Timeline” file,<sup>9</sup> which CCW creates and makes available to CMS within the Virtual Resource Data Center (VRDC). CCW obtains information about MA managed care premium payments from the CCW MA Prescription Drug (MARx) SAS library within the VRDC. The CMS MARx system provided the source files. Finally, we obtained information regarding Social Security Administration (SSA) disability by querying a CME table within the CCW database because this information is not available in any CCW analytic files.

CCW obtained the Medicaid enrollment data from the CCW TAF Demographic and Enrollment (DE) RIF. Similarly, we obtained the Medicaid claims RIF data from the CCW TAF Inpatient/Long-Term Care/Other Services and Pharmacy RIF (also referred to as the TAF RIF). Additional details regarding source TAF are on the CCWdata.org website, including [data dictionaries](#) and [user guides](#) that describe these source files in detail.

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<sup>6</sup> CMS required redaction of some payment fields for Medicaid managed care claims due to the proprietary and confidential nature of this information. Additional details, including a list of fields CMS redacted for managed care claims, are in the [CCW TAF RIF User Guide](#).

<sup>7</sup> The CMS CME is the single enterprise-wide authoritative source for Medicare beneficiary enrollment and demographic data. The CME database integrates and standardizes different types of beneficiary data from CMS legacy systems. The CME database receives information from the Enrollment Database (EDB) and contains additional information not available in the EDB.

<sup>8</sup> CCW develops and produces the Medicare fee-for-service (FFS) claims RIFs. Additional information regarding the files, including the [CCW Medicare Administrative Data User Guide and codebook](#).

<sup>9</sup> The Medicare Timeline files are a data product that uses a combination of claims and assessment data to determine where each Medicare beneficiary is on each day of the year, using specifications CMS developed. CCW uses information from Medicare claims, Minimum Data Set (MDS) nursing home assessment data, and Outcome and Assessment Information Set (OASIS) home health assessment data to determine each beneficiary’s location on a daily basis, to the extent possible.



## E. Key Concepts

For the population with Medicare coverage, including dually enrolled individuals, MMLEADS gives the variables and values within the Medicare data priority over the TAF data. This is the same paradigm we used in MMLEADS V2.0. Researchers and innovators have used Medicare enrollment and claims data extensively, and shown it to be highly accurate; furthermore, Medicare data have less state-by-state variability in data quality than the Medicaid data.

### 1. Linkage and Identifier Variables

As stated previously, MMLEADS contains a single person-level record in each file for each person enrolled in Medicare and/or who meets the Medicaid population inclusion criteria during the year. The CCW team assigns a unique beneficiary identifier (BENE\_ID) to all Medicare enrolled, and nearly all Medicaid enrolled beneficiaries. For a small number of TAF DE records, insufficient identifiers are available to assign the BENE\_ID. Therefore, in such cases, it is null/missing. For the records without a BENE\_ID, we use the state-assigned MSIS\_ID, along with the state code (STATE\_CD) as the person-level identifier. The CCW team only populates those MSIS\_ID records where a BENE\_ID is missing.

An individual may be enrolled in Medicaid in more than one state during the year. This means that there may be more than one MSIS\_ID by STATE\_CD combination for the person in the source data. The CCW team applies the same BENE\_ID to each enrollment record for the beneficiary, which allows us to look across states and roll up the information for the person into a single summary record for the year within MMLEADS. This person-level data linkage allows us to gain a complete view of Medicaid enrollment and services for the year. We illustrate the MSIS\_ID to BENE\_ID concept in [Table 3](#).

**Table 3.** Example of complete Medicaid enrollment data for beneficiaries in multiple states

BENE_ID	MSIS_ID*	MDCD_STATE_CD_M M**	Months of Medicaid	Number of inpatient claims
000123	000ABCDE1357	MA	5	1
000123	0762468WXYZ	NY	4	1
000123	R99134ST8877	NH	3	2
<b>Total</b>			<b>12</b>	<b>4</b>

\* Within the data files, MSIS\_ID is 32 alphanumeric characters, shortened in this example for brevity. In MMLEADS, the MSIS\_ID will not be present if a BENE\_ID is available for the person.

\*\* Within MMLEADS, CMS includes the monthly Medicaid state code (MDCD\_STATE\_CD\_MM) to enable state-specific counts either annually or for each month (01–12, January through December).

For the example in [Table 3](#), we show that three different state Medicaid programs enrolled BENE\_ID 000123 during the year. Accordingly, there are three different MSIS\_ID and monthly MDCD\_STATE\_CD\_MM combinations in the source data. Within MMLEADS, we collapse these records and de-duplicate them so that only one BENE\_ID is associated with each individual. MMLEADS includes both the annual (STATE\_CD) and monthly state codes (MDCD\_STATE\_CD\_01–STATE\_CD\_12) allowing users to identify the distinct number of beneficiaries in a state. For the annual STATE\_CD, we use the latest state for the year. This is the same logic used in MMLEADS V2.0 and is consistent with Medicare MBSF where the last state of the year appears on the data file. In the example in [Table 3](#), since NH was the last Medicaid state in the year, the annual STATE\_CD would also equal NH.

The BENE\_ID allows MMLEADS to identify all the Medicare and Medicaid services received by a beneficiary during the year, regardless of the state.

## 2. Medicare and/or Medicaid Enrollment (MME) Type

The CCW team makes a determination each month about Medicare and/or Medicaid enrollment and the level of benefits. We call this monthly variable, which captures the type of Medicare and/or Medicaid enrollment (MME), the MME\_TYPE\_CD\_01–MME\_TYPE\_CD\_12. We derive this classification using the following algorithm, which results in five values for this monthly field ([Table 4](#)).

**Table 4.** Medicare and Medicaid Enrollment (MME) classifications

MME classifications	Algorithm
1. Medicaid-only — Aged/Blind/Disabled, not dually enrolled (in TAF)	Refer to Medicaid A/B/D in Table 1 and not dually eligible (i.e., not in MME Classification 3 or 4)
2. Medicare-only, not dually enrolled (in Medicare data file)	Medicare-only if Medicare eligible (i.e., any month where the BUYIN variable is not '0' or null) and not dually eligible (i.e., not in MME Classification 3 or 4)
3. Partial benefit dually eligible (Qualified Medicare Beneficiary [QMB])	DUAL_STUS_CD_MM = '01','03','05','06'
4. Full benefit dually eligible	DUAL_STUS_CD_MM = '02','04','08'
0. Not MMLEADS population	Medicaid or Children's Health Insurance Program (CHIP) enrolled (i.e., in TAF DE RIF), but not included in the MMLEADS population
Missing	None of the above

For the monthly MME\_TYPE\_CD\_MM variables, zero or missing/null values may appear. The zero is for months when the TAF DE file contains the enrollee but did not meet the MMLEADS population inclusion criteria (i.e., not Medicaid-only A/B/D). Null values occur for months when individuals did not have Medicare or Medicaid coverage (e.g., those who were uninsured for some of the months, those who had some other type of insurance coverage).

The monthly MME\_TYPE\_CD\_MM varies by month as beneficiaries experience a change in the benefits scope for which they qualify. From the monthly MME\_TYPE\_CD\_MM variables, the CCW team assigns a single annual MME value. We assign the type of dually eligible classification (full or partial benefits) for this annual MME data element based off of the highest status code ([Table 4](#)) during the year, regardless of the number of months spent in that status code. For example, if a dually enrolled individual were eligible for full benefits in January through June, but not dually enrolled for the remainder of the year, the annual MME\_TYPE\_CD would be '4' indicating Full Benefit Dually Eligible status. There are no missing or zero values for the annual variable. We assign all beneficiaries in the MMLEADS files a yearly MME\_TYPE\_CD of 1–4.

An individual (BENE\_ID) will have one annual MME type regardless of potentially multiple Medicaid states of residence. The annual MME\_TYPE\_CD value is not necessarily associated with the annual state code (variable called STATE\_CD), since the latter uses the state for the last month of enrollment, regardless of dual status. That is, the state code uses the latest state code during the year, and the MME type uses the highest category in the year (which may differ from the last MME type during the year) ([Table 5](#)).

**Table 5.** Example of rolling up source enrollment data for beneficiaries with more than one MME type

BENE_ID	MSIS_ID*	MDCD_STATE_CD_MM**	Months of Medicaid	MME_TYPE_CD_MM
000123	000ABCDE1357	MA	5	0
000123	0762468WXYZ	NY	4	4
000123	R99134ST8877	NH	3	3

\* Within the data files, MSIS\_ID is 32 alphanumeric characters, shortened in this example for brevity. In MMLEADS, the MSIS\_ID will not be present if a BENE\_ID is available for the person.

\*\* MMLEADS includes the monthly Medicaid state code (MDCD\_STATE\_CD\_MM) to enable state-specific counts either annually or for each month (01–12, January through December).

The annual STATE\_CD for this example would be NH, and the Annual MME\_TYPE\_CD would be 4; however, this person was not an MME\_TYPE\_CD 4 when enrolled the state of NH. Monthly fields for both MME\_TYPE\_CD\_MM and MDCD\_STATE\_CD\_MM are available in the file to use as needed.

For ease of use, we include the annual MME\_TYPE\_CD on every MMLEADS file.

### 3. Medicaid Data Quality

The Medicaid program requires states to submit electronic Medicaid claims and eligibility data files through T-MSIS to CMS. Although all states transitioned to T-MSIS on or before October 2015, some states began submitting in the new T-MSIS format earlier. The 2016 TAF RIF includes all states.

It is important to note that there is significant state-by-state variability in the quality of TAF eligibility, claims and encounter data. State and topic-level data quality information is available to users in an interactive, web-based tool called DQ (Data Quality) Atlas, available on the [Medicaid.gov website](#). The charts, maps, and tables in DQ Atlas show DQ Assessments and associated measures for each state for more than 80 topics, including enrollment, expenditures, beneficiary information, and more. DQ Assessments indicate the extent to which a state's TAF data are usable, reliable and accurate for analyzing a particular topic. DQ Assessments provide an introduction to TAF data quality and do not identify all potential data quality issues. Each topic in DQ Atlas includes a Background and Methods display, which describes the detailed methodology taken to determine DQ Assessments for each topic. Users can also download state or topic snapshots that provide a quick, high-level assessment of data quality.

Note that CCW also provides some discussion regarding data quality and limitations within the [CCW TAF RIF User Guide](#) on the CCW website.

### 4. Aggregating Use and Payments

The MMLEADS divides claims into Medicare or Medicaid file types. Claims appear in only one file type. The total counts of claims and associated payments sum to the totals for each individual in the claims files.

#### a. Medicare service categories

Our summarization of Medicare service use and payments uses the four major claim types and a category for plan capitated premium payments:

1. **Part A Institutional Claims** — generally covered by the Medicare Part A benefit. These are claims from institutions or facilities, including inpatient, skilled nursing facility, home health agency, and hospice claims
2. **Part B Institutional Claims** — generally covered by the Medicare Part B benefit. These are claims from institutions such as hospital outpatient facilities
3. **Part B Non-Institutional Claims** — generally covered by the Medicare Part B benefit. These are claims from non-institutional providers such as providers/practitioners and durable medical equipment (DME) or prosthetic/orthotics providers. These claims are from Carrier and DME source files
4. **Part D Event Data** — covered by the Medicare Part D benefit. These are final transactional records for all Medicare Part D prescription drug events.
5. **MARx** — MA Part A and Part B capitated premium payments<sup>10</sup>

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<sup>10</sup> MARx data identify the Medicare Part C payments paid to a plan in exchange for providing Medicare Part A and/or Part B coverage to Medicare beneficiaries enrolled in the plan.

The Cost and Use Summary file summarizes all of the Medicare claims for each beneficiary in two ways: 1) total payments for these four claim file types and the MA capitated premium payments, and 2) total payments only for these four claim file types (without the MA payments).

## b. Medicaid service categories

Our summarization of Medicaid service use and payments uses the four major claim types and a category for plan premium/capitated payments:

1. Inpatient (IP)
2. Long-term care (LT)
3. Other services (OT)
4. Pharmacy (RX)
5. Capitated payments (from OT, where CLM\_TYPE\_CD = '2' 'B' 'V')

The Cost and Use Summary file summarizes for each beneficiary, the total payments for these four file types (IP, LT, OT and RX) in two ways: 1) total payments for these four file types and the capitated payments, and 2) total payments only for these four claim file types (without the capitated payments from the OT file).

## 5. Sample Group

The MMLEADS files are very large. The CCW team makes it easy to test code or conduct exploratory analyses by creating a variable that identifies a 1% sample of beneficiaries/enrollees (variable called SAMPLE\_GRP). CCW designed this variable to identify a random 1% cross-sectional MMLEADS sample (i.e., when SAMPLE\_GRP = '1'). We selected this sample to be representative of the underlying population both in terms of MME type (MME\_TYPE\_CD) and state. For example, if 10% of the total MMLEADS population were in California, then 10% of the 1% sample would be from California. The distribution of MME\_TYPE among Californians within the 1% sample would be the same as the distribution of MME\_TYPE in the full MMLEADS file (e.g., if the MMLEADS data file classifies 8% of the Californians as having the MME\_TYPE “full dual,” then 8% of Californians within the 1% would be full dual). CCW selects a different sample each year; therefore, longitudinal analyses with this SAMPLE\_GRP variable are not possible. Data users may use the 1% sample for exploratory analyses or testing analytic code. Then, if desired, the data user can modify the analytic code to run against the full data files. We identify the same 1% sample population in both MMLEADS files.

## 6. Medicaid Payment Suppression

As mentioned previously, CMS requires redaction of some payment fields for Medicaid managed care claims due to the proprietary and confidential nature of this information. Therefore, the cost summaries for MMLEADS do not include all Medicaid payments. Additional details, including a list of fields CMS redacts from the source TAF for managed care claims, are in the [CCW TAF RIF User Guide](#).

Due to payment suppression, there is Medicaid service use in MMLEADS that does not have associated payments to providers. This means that, although the \*\_SPEND variable for a service setting is null/missing, the corresponding \*\_USE variable is greater than 0. For example, if Medicaid enrolls a beneficiary in managed care and redacts the payment fields for the managed care claims records, there may be utilization identified although the payments for that service will be \$0.

## Chapter 2 — MMLEADS Files

This chapter describes the two MMLEADS analytic files — the Beneficiary Summary file and the Cost and Use Summary file. Data users should refer to the corresponding MMLEADS codebook to obtain a complete list of variables and associated values.

Throughout this document, when we identify a particular data variable by the specific SAS name, we use all capital letters. When we derive a variable in MMLEADS exclusively from either Medicare or Medicaid, then we include MDCR\_\* or MDCD\_\* in the prefix of the SAS name. All other variables use a combination of Medicare and Medicaid.

### A. Scope and Contents of the Beneficiary Summary File

The CCW team designed the Beneficiary Summary file to provide person-level enrollment, eligibility, and demographic information for the study population. Data users may link this file as needed to the Cost and Use Summary file. The source Medicare enrollment (MBSF\_ABCD\_YYYY) and TAF DE data contain a wide variety of information regarding beneficiary characteristics.

For the population with Medicare coverage, including dually eligible individuals, MMLEADS gives Medicare data priority over T-MSIS data, as explained previously. There are 173 variables in the Beneficiary Summary File. Below, we describe the information in the file.

#### 1. Beneficiary Identifiers and Linkage Variables

Both MMLEADS files contain the following linkage/identifier variables:

- CCW unique beneficiary identifier (BENE\_ID)
- State-assigned MSIS\_ID (populated when BENE\_ID is not available for Medicaid-only non-duals)
- Annual STATE\_CD (from Medicare enrollment files, unless beneficiary is Medicaid-only, then it is the last state for the year)
- Monthly MME\_TYPE\_CD
- Annual MME\_TYPE\_CD and
- The 1% sampling variable (SAMPLE\_GRP) created to make it easy to test code and obtain results quickly

As stated previously, the CCW assigns a unique beneficiary identifier (BENE\_ID) to all individuals enrolled in Medicare and to nearly all Medicaid beneficiaries. Some TAF DE records do not have sufficient identifying information to assign the BENE\_ID.

#### 2. Geographic Variables

MMLEADS contains several variables to identify the geographic location of the beneficiary.

We include the monthly Medicaid submitting state code (MDCD\_STATE\_CD\_01–12). These monthly SSA state codes allow researchers to identify individuals who enrolled in Medicaid in multiple states throughout the year. If an individual is associated with only one state during the year, all months the individual enrolled in Medicaid will have the same value populated. If the beneficiary does not have a monthly Medicaid state code, then the value is missing. MMLEADS includes all states, Washington D.C., and Puerto Rico.

We also incorporate the state Federal Information Processing Standards (FIPS) code from the Medicare enrollment data (last of the year; MDCR\_STATE\_CD — first two digits of the FIPS), and the county FIPS (last of the year; MDCR\_COUNTY\_CD — last three digits of FIPS).

### 3. MME Type Code

The main population variable for MMLEADS is the MME type code, which MMLEADS includes both as a monthly (MME\_TYPE\_CD\_01–12) and as an annual variable (MME\_TYPE\_CD). This gives preference to any dual coverage during the year (refer to [Table 4](#) and the corresponding narrative).

### 4. Demographic Variables

For the following demographic variables, MMLEADS uses the Medicare value; however, when this is not available (i.e., for Medicaid-only), then MMLEADS uses the Medicaid value. Demographic variables include age at end of year (AGE), date of birth (BIRTH\_DT), gender (SEX\_CD), date of death (DEATH\_DT), and months alive during the year (ALIVE\_MOS).

The race classification from the Medicare enrollment data uses the Research Triangle Institute (RTI) race code (MDCR\_RTI\_RACE), and race from Medicaid enrollment data is the race/ethnicity code (MDCD\_RACE\_ETHNCTY\_CD).

### 5. Enrollment and Eligibility Variables

**Medicare.** MMLEADS contains monthly Medicare entitlement/buy-in variables (MDCR\_BUYIN\_01–12) and summary variables that count the number of Medicare Part A months (MDCR\_PTA\_MOS), Part B months (MDCR\_PTB\_MOS), and months with both Part A and B coverage (MDCR\_PTAPTB\_MOS) during the year. We also include the number of Part D enrolled months during the year (MDCR\_PTD\_MOS). These variables are null/missing for beneficiaries who are Medicaid-only.

**Dual Medicare-Medicaid Enrollment Variables.** We capture the monthly Medicare dually eligible status code (MDCR\_DUAL\_01–12) and calculate summary counts for the number of months for full benefit dually eligible (FD\_MOS), partial benefit dually eligible (PD\_MOS), Medicare-only, not dually eligible, during the year (MDCR\_ONLY\_MOS), and Medicaid-only A/B/D (MDCD\_ONLY\_MOS). We share an example in [Table 6](#).

**Table 6.** Example of summary enrollment counts after rolling up data for beneficiaries with more than one MME type

Beneficiary	Month	January (01)	02	03	04	05	06	07	08	09	10	11	12
A	MDCR_DUAL_MM	01 (QMB-only)	01	01	01	01	01	01	01	01	02 (QMB and full Medicaid coverage, including prescription drugs)	02	02
	MME_TYPE_CD_MM	3 (Partial)	3	3	3	3	3	3	3	3	4 (Full)	4	4
B	MDCR_DUAL_MM	NA	NA	NA	NA	NA	03 (Specified Low-Income Medicare Beneficiary [SLMB] only)	03	03	03	04 (SLMB and full Medicaid coverage, including prescription drugs)	04	04
	MME_TYPE_CD_MM	2 (MDCD only)	2	2	2	2	3 (Partial)	3	3	3	4 (Full)	4	4

The first beneficiary (A) was initially dually eligible with partial benefits (MDCR\_DUAL\_01 = '01' and MME\_TYPE\_CD\_01 = '3' [QMB]) in January. In October, the beneficiary became enrolled in full benefits (MDCR\_DUAL\_10 = '02'). When we summarize this information for the year, the FD\_MOS = 3 and PD\_MOS = 9. These two fields add up to 12 (months in the year) since the beneficiary met MMLEADS inclusion criteria for the full 12 months of the year. The annual MME\_TYPE\_CD = '4 [Full]'.

The second beneficiary was initially eligible for Medicaid A/B/D in January; therefore, (MDCR\_DUAL\_01 = 'NA' and MME\_TYPE\_CD\_01 = '1' [MDCD A/B/D]). In June, the beneficiary transitioned to SLMB-only benefits (MDCR\_DUAL\_06 = '03' and MME\_TYPE\_CD\_06 = '3' [Partial]), and in October the beneficiary transitioned to SLMB Plus with full Medicaid benefits (MDCR\_DUAL\_10 = '04' and MME\_TYPE\_CD\_10 = '4' [Full]). When we summarize this information for the year, FD\_MOS = 3 and PD\_MOS = 4.

**Medicaid.** MMLEADS contains the monthly Medicaid eligibility group variable (MDCD\_ELGLTY\_GRP\_CD\_01–12) and the latest eligibility group code during the year (MDCD\_ELGLTY\_GRP\_CD\_LTST). We derive a binary indicator (yes/no) for each month to identify whether the beneficiary enrolls in Medicaid-only A/B/D (MDCD\_ABD\_01–12) and a summary variable that counts the number of months with A/B/D enrollment during the year (MDCD\_ABD\_MOS). Individuals who are dually enrolled can also have MDCD\_ABD\_MOS. We set these variables to null/missing for beneficiaries with Medicare-only.

Some beneficiaries may meet the population inclusion criteria for MMLEADS for part of the year due to enrollment in Medicaid (not A/B/D) for part of the year, however they may enroll in CHIP for part of the year. Therefore, we derive a summary variable that counts the number of months with Medicaid or CHIP enrollment that is not A/B/D (MDCD\_CHIP\_NON\_ABD\_MOS). Note that for the population included in MMLEADS we include payment and use for **all** months of the year (i.e., even months with Medicaid/CHIP non-A/B/D). To help data users understand the Medicaid benefits for which the person was eligible, we capture the latest benefits code during the year (MDCD\_RSTRCTD\_BNFTS\_CD\_LTST).

## 6. Medicare Coverage Variables

MMLEADS contains several variables that come directly from the Medicare source data: the Medicare coverage start date (MDCR\_COVSTART), how the beneficiary became originally entitled to Medicare (MDCR\_OREC), how Medicare currently entitles the beneficiary (MDCR\_CREC), and the Medicare status code (MDCR\_MS\_CD).

We also obtain some disability information from SSA, which is available in the CMS CME data files. These disability codes are:

- MDCR\_DIB\_AWD\_CD — SSA Disability Insurance Benefit Diagnosis Award code
- MDCR\_DIB\_JSTFCTN\_CD — Disability Insurance Benefit Entitlement to Medicare Justification code
- MDCR\_DIB\_PRMRY\_IMPRMNT\_CD — SSA Disability Insurance Benefit Diagnosis Primary Impairment code
- MDCR\_DIB\_SCNDRY\_IMPRMNT\_CD — SSA Disability Insurance Benefit Diagnosis Secondary Impairment code

In MMLEADS we derive a monthly indicator of FFS Medicare (MDCR\_FFS\_MEDICAL\_01–12). We also calculate the number of months with FFS coverage (MDCR\_FFS\_MEDICAL\_MOS). We set these variables to null/missing for non-Medicare enrolled beneficiaries during the year.

**Managed Care.** MMLEADS contains a variable that indicates number of months in the year the Medicare program enrolled the beneficiary in MA rather than FFS coverage (MDCR\_HMO\_MOS). We set this variable to null/missing for non-Medicare enrolled beneficiaries during the year.

In addition, we parse the managed care months into select types of managed care plans: PACE (MDCR\_MC\_PACE\_MOS), MMP (MDCR\_MC\_MMP\_MOS), other managed care plan months such as state-specific demonstrations (MDCR\_MC\_OTHER\_MOS), and unknown type of managed care plan months where we identify beneficiaries as having managed care, but the plan type information is unknown (MDCR\_MC\_UNKNOWN\_MOS).

There are three types of MA special needs plans (SNPs), which we identify in MMLEADS. We create derived variables to count the number of months during the year the Medicare program enrolled the beneficiary in a chronic or disabling condition SNP/C-SNP (MDCR\_C\_SNP\_MOS), dual eligible SNP/D-SNP (MDCR\_D\_SNP\_MOS), and institutional

SNP/I-SNP (MDCR\_I\_SNP\_MOS). We set these variables to null/missing for non-Medicare enrolled beneficiaries during the year.

## 7. Medicaid Coverage and Waiver Variables

We construct a monthly variable to indicate whether the beneficiary has any Medicaid managed care coverage for medical care for the month. If the beneficiary has comprehensive managed care or enrolls in a health insuring organization, we consider them to have comprehensive managed care medical coverage (MDCD\_MC\_MEDICAL\_MOS). If the beneficiary does not have comprehensive managed care medical coverage, we set the monthly FFS indicator to 1 (MDCD\_FFS\_MEDICAL\_01–12). We count the number of months with FFS coverage (MDCD\_FFS\_MEDICAL\_MOS). We set these variables to null/missing for non-Medicaid enrolled beneficiaries during the year. The sum of these two variables is equal to the total months of Medicaid coverage during the year. Since a variety of Medicaid managed care plans may enroll beneficiaries, we also calculate the number of months Medicaid enrolled the beneficiary in some other non-comprehensive medical managed care plan (MDCD\_OTHR\_MC\_MOS). Examples of these Medicaid managed care plans are dental, behavioral health, and transportation.

From the source Medicaid Annual DE Managed Care Supplemental file, we obtain the number of managed care months during the year, which we parse into various types of managed care plans. Since multiple types of managed care plans can be in effect for a beneficiary for any given month, these variables do not sum to the total managed care months in the year.

Managed care plan types include:

1. Comprehensive Managed Care Months (MDCD\_CMC\_COV\_MOS)
2. Primary Care Case Management (PCCM) Months (MDCD\_PCCM\_COV\_MOS) — a derived variable as the maximum number of months in either PCCM or enhanced PCCM plan
3. Health Insuring Organization (HIO) Months (MDCD\_HIO\_COV\_MOS)
4. Prepaid Inpatient or Ambulatory Health Plan (PIHP/PAHP) Months (MDCD\_PHP\_COV\_MOS) — a derived variable as the maximum number of months in either a prepaid inpatient health plan (PIHP) or prepaid ambulatory health plan (PAHP)
5. Long-Term Care Prepaid Inpatient Health Plan (PIHP) Months (MDCD\_LTC\_COV\_MOS)
6. Medicaid Managed Care Mental Health or Substance Abuse Coverage Months (MDCD\_BEHAVIORAL\_COV\_MOS) — a derived variable as the maximum number of months in mental health prepaid inpatient health plans (PIHPs), mental health prepaid ambulatory health plans (PAHPs), substance use disorder (SUD) PIHPs or PAHPs, or mental health and SUD PIHPs or PAHPs
7. Managed Care Dental Coverage Months (MDCD\_DENTAL\_COV\_MOS)
8. Managed Care Transportation Months (MDCD\_TRANSPORTATION\_COV\_MOS)
9. Managed Care Disease Management Plan Coverage Months (MDCD\_DISEASE\_MGMT\_COV\_MOS)
10. Program of All-Inclusive Care for the Elderly (PACE) Months (MDCD\_PACE\_COV\_MOS)
11. Managed Care Pharmacy Months (MDCD\_PHARMACY\_COV\_MOS)
12. Health or Medical Home Months (MDCD\_HLTH\_MDCL\_HOME\_COV\_MOS)
13. Integrated Care for Dually Eligible Months (MDCD\_INTEGRATED\_DUAL\_COV\_MOS)

MMLEADS contains the waiver type codes for the latest 1115 and 1915(c) waivers during the year (MDCD\_WVR\_1115\_TYPE\_CD and MDCD\_WVR\_1915C\_TYPE\_CD, respectively), as well as the count of months in select types of waiver programs that enrolled the beneficiary. We obtain this information directly from the Annual DE Waiver Supplemental file:

- Count of 1915(b) Waiver Months (MDCD\_WVR\_1915B\_MOS)
- Count of 1915(c) Waiver Months (MDCD\_WVR\_1915C\_MOS)
- Count of 1915(b)(c) Waiver Months (MDCD\_WVR\_1915BC\_MOS)



## 8. Long-Term Care, Supports, and Services Variables

**Medicare.** MMLEADS calculates the total Medicare long-term care hospital (LTCH) months (MDCR\_LTCH\_MOS) from the Medicare Part A claims data. We also use data from the CCW Timeline file to calculate the number of skilled nursing facility (SNF) months (MDCR\_SNF\_MOS) and total nursing facility (NF) months (MDCR\_NF\_MOS). At most, a beneficiary has one of these three categories in a month. We base a hierarchy on level of acuity when determining which setting to count in the month: LTCH, then SNF, then NF.

**Medicaid.** MMLEADS contains information from the source Medicaid Annual DE Disability and Need Supplemental files regarding long-term services and supports (LTSS) the beneficiary received during the year. We include two types of variables related to LTSS. The first set of variables uses the monthly level of care status codes (source variables called CARE\_LVL\_STUS\_CD\_01–12). CCW counts the number of months during the year when the beneficiary needed each level of care:

1. Hospital LTSS Months (MDCD\_HOSPITAL\_LTSS\_MOS)
2. IP Psych Facility for Individuals under age 21 LTSS Months (MDCD\_IPF\_LTSS\_MOS)
3. Nursing Facility LTSS Months (MDCD\_NF\_LTSS\_MOS)
4. Intermediate Care Facility for individuals with intellectual disability LTSS Months (MDCD\_ICF\_IID\_LTSS\_MOS)
5. Other Type of Facility LTSS Months (MDCD\_OTHER\_LTSS\_MOS)

We calculate the total number of months the beneficiary had any of these LTSS months. This calculated total months field with any of the LTSS services is the total LTSS months (all levels of care) (MDCD\_CARE\_LEVEL\_MOS). For MMLEADS, a beneficiary has, at most, one of these five categories in a month. The list above is the CCW hierarchy: Hospital LTSS months first, then IP Psych Facility LTSS months, and so on.

For the second set of variables, we use the monthly LTSS level of care code for the first of up to three providers (source variable LTSS\_LVL\_CD\_1\_01–12). The CCW team counts the number of months during the year when the level of care required to meet the beneficiary's needs was:

1. Skilled Level of Care for LTSS Months (MDCD\_SKILLED\_CARE\_MOS)
2. Intermediate Level of Care for LTSS Months (MDCD\_INTERMEDIATE\_CARE\_MOS)
3. Custodial Level of Care for LTSS Months (MDCD\_CUSTODIAL\_CARE\_MOS)

We count the number of months for beneficiary had any of these level of care months. This variable is the total months from the first LTSS provider (MDCD\_LTSS\_LEVEL\_MOS). Although the source TAF allow for up to three LTSS providers for a given month, in MMLEADS, a beneficiary has, at most, one of these three categories in a month. The list above is the CCW hierarchy: skilled LTSS months first, then intermediate LTSS months, and then custodial LTSS months.

### B. Scope and Contents of the Cost and Use Summary File

The Medicare and Medicaid claims file types are the basis for the Cost and Use Summary file. It includes the service and payment totals from the Medicare and Medicaid file types.

MMLEADS uses only 2016 claims, services, and payments. Since we use the ending date of the claim for our inclusion criteria, there will be some claims/services that began in 2015 (e.g., a beneficiary's hospitalization that started in 2015) and ended in 2016.

The file is at the beneficiary level, which means that there is one record in the file for each person who appears in the Beneficiary file. These records are present regardless of whether the beneficiary used any Medicare or Medicaid services.

There are 126 variables in this file. It contains standard linkage and identifier variables: BENE\_ID, MSIS\_ID, STATE\_CD, SAMPLE\_GRP, and MME\_TYPE\_CD. In addition, we include the monthly MME type (MME\_TYPE\_CD\_01–12).

For each beneficiary, we calculate the count of claims and total payments across all Medicare FFS claims for the year. We include FFS payments plus the managed care premiums in the total spend (MDCR\_TOTAL\_FFS\_USE, MDCR\_TOTAL\_FFS\_SPEND and MDCR\_TOTAL\_SPEND, respectively). Similarly, for Medicaid, we include the total claim count (minus the capitated payments in the OT file), the total Medicaid payment amount (not including the managed care capitated premium payments), and the total Medicaid payments (MDCD\_TOTAL\_USE, MDCD\_TOTAL\_NON\_CAPTD\_SPEND, and MDCD\_TOTAL\_SPEND, respectively). The totals match the source claims values in terms of number of claims and total payments. As a reminder, CMS has redacted the Medicaid managed care payments; therefore, there may be service use without associated payment information. Additional information regarding Medicaid payment redaction appears in Chapter 1, section [C. Types of MMLEADS Files](#).

## 1. Medicare and Medicaid Annual Totals

MMLEADS provides information regarding the count of FFS claims and total payments within each claim type. For Medicare, we summarize claim counts and payments for:

- Part A claims (MDCR\_PTA\_TOTAL\_FFS\_USE, MDCR\_PTA\_TOTAL\_FFS\_SPEND)
- Part B Institutional (hospital outpatient) claims (MDCR\_HOP\_TOTAL\_FFS\_USE, MDCR\_HOP\_TOTAL\_FFS\_SPEND)
- Part B Non-Institutional claims (MDCR\_PTBNI\_TOTAL\_FFS\_USE, MDCR\_PTBNI\_TOTAL\_FFS\_SPEND)
- Medicare Part D Events (MDCR\_PTD\_TOTAL\_USE, MDCR\_PTD\_TOTAL\_SPEND)
- Medicare Part A and Part B managed care capitated payments (MDCR\_MC\_PTA\_PTB\_CAPTD\_SPEND)

We aggregate all of the payments for these five categories into the MDCR\_TOTAL\_SPEND variable.

We also summarize this information for the FFS claims only, which includes the first four categories above (i.e., all of the service use from Part A, Part B, and Part D events). The FFS totals include all of the above bulleted list except for the managed care capitated payments. MMLEADS includes the total count of FFS claims (MDCR\_TOTAL\_FFS\_USE) and corresponding payments (MDCR\_TOTAL\_FFS\_SPEND).

For Medicaid, the MMLEADS file summarizes the claim counts, and payments for:

- IP claims (MDCD\_IP\_TOTAL\_USE, MDCD\_IP\_TOTAL\_SPEND)
- LT claims (MDCD\_LT\_TOTAL\_USE, MDCD\_LT\_TOTAL\_SPEND)
- OT claims (MDCD\_OT\_TOTAL\_USE, MDCD\_OT\_TOTAL\_SPEND)
- OT managed care capitated premiums (MDCD\_OT\_MC\_CAPTD\_USE, MDCD\_OT\_MC\_CAPTD\_SPEND)
- RX claims (MDCD\_RX\_TOTAL\_USE, MDCD\_RX\_TOTAL\_SPEND)

We count all of the Medicaid claims (MDCD\_TOTAL\_USE) and aggregate all of the payments for these five categories into the MDCD\_TOTAL\_SPEND variable.<sup>11</sup> We also summarize the payment information for the four claims categories above that represent claims for services, which is all claims except for managed care capitated payments (MDCD\_TOTAL\_NON\_CAPTD\_SPEND).

## 2. Medicare and Medicaid Monthly Totals

To facilitate per-member per-month (PMPM) analyses, we calculate monthly totals. The MMLEADS file contains the monthly Medicare payments, including FFS and capitated premium payments, in the 12 monthly

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<sup>11</sup> Remember that CMS required redaction in the payment fields for managed care services.

MDCR\_TOTAL\_SPEND\_01–12 variables. Additionally, we include monthly FFS claim counts in the 12 monthly MDCR\_TOTAL\_FFS\_USE\_01–12 fields. We calculate monthly Medicare managed care Part A and Part B capitated payments (MDCR\_MC\_PTA\_PTB\_CAPTD\_SPEND\_01–12).

Similarly, we include monthly claim counts for Medicaid in the MDCD\_TOTAL\_USE\_01–12 fields. We calculate monthly Medicaid payments and make them available in the 12 monthly MDCD\_TOTAL\_SPEND\_01–12 variables. We summarize the monthly Medicaid capitated premium payment amounts in the 12 monthly MDCD\_MC\_CAPTD\_SPEND\_01–12 variables. We also include monthly totals for the Medicaid payments after removing the capitated premium payments (MDCD\_NON\_CAPTD\_SPEND\_01-12). We include all payments observed during each month of the year for the beneficiaries in the study population, regardless of MME\_TYPE\_CD. That is, we do not censor totals based on meeting the MMLEADS population criteria. As a result, for a small number of beneficiaries, MMLEADS users may observe payments for months that do not correspond with monthly Medicaid or Medicare enrollment in the MMLEADS Beneficiary file. For example, a beneficiary may have Medicaid-only non-A/B/D coverage for the first part of; therefore, they do not meet the MMLEADS inclusion criteria. If the beneficiary becomes dually enrolled in Medicare and Medicaid for the latter part of the year, we include all of the Medicare and Medicaid information available for the year in the MMLEADS file. This allows data users the flexibility to filter out monthly information not required for specific analyses.

## Chapter 3 — Where to Get Assistance

The CCW Help Desk staff provides assistance between 8:00 am and 5:00 pm ET, Monday through Friday. Contact the CCW Help Desk at [ccwhelp@ccwdata.org](mailto:ccwhelp@ccwdata.org) or 1-866-766-1915.

## Appendix A — List of Acronyms

Acronym	Definition
A/B/D	Aged/Blind/Disabled
BENE_ID	CCW's Unique Beneficiary Identifier
CCW	Chronic Condition Warehouse
CHIP	Children's Health Insurance Program
CME	Common Medicare Environment
CMS	Centers for Medicare & Medicaid Services
DE	Demographic and Enrollment
DOB	Date of Birth
DME	Durable Medical Equipment
DQ	Data Quality
DUA	Data Use Agreement
EDB	Enrollment Database
FIPS	Federal Information Processing Standards
FFS	Fee-For-Service
IP	Inpatient Claims
LT	Long-term Care Claims
LTCH	Long-term Care Hospital
LTSS	Long-term Services and Supports
MA	Medicare Advantage
MARx	Medicare Advantage Prescription Drug System
MBSF	Master Beneficiary Summary File
MDS	Minimum Data Set
MME	Medicare and/or Medicaid enrollment
MMLEADS	Medicare-Medicaid Linked Enrollee Analytic Data Source
MSIS	Medicaid Statistical Information System
NF	Nursing Facility
OASIS	Outcome and Assessment Information Set
OT	Other Services Claims
QMB	Qualified Medicare Beneficiary
RIF	Research Identifiable Files
RTI	Research Triangle Institute
RX	Pharmacy Claims
SLMB	Specified Low-Income Medicare Beneficiary
SNF	Skilled Nursing Facility
SNP	Special Needs Plan
SSA	Social Security Administration
TAF	T-MSIS Analytic Files
T-MSIS	Transformed Medicaid Statistical Information System
VRDC	CCW Virtual Research Data Center