

# Chronic Condition Data Warehouse

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

### User Guide

Version 1.0  
May 2013

## Executive Summary

The Chronic Condition Data Warehouse (CCW) was developed in response to one of the goals of Section 723 of the Medicare Modernization Act of 2003. This mandate required the Centers for Medicare & Medicaid Services (CMS) to develop a research database to facilitate research on chronic illness in the Medicare population and ultimately improve the quality of care and reduce program spending. CCW clinical condition indicators, or “flags”, have been developed from the claims data for 27 chronic conditions that were deemed to be relevant to the study of Medicare-only beneficiaries. Since its inception, the CCW has been in a continual state of improvement including the refinement and expansion of condition flags for Medicare beneficiaries, and the addition of Medicaid Analytic eXtract (MAX) claims, eligibility and enrollment data. The addition of Medicaid data to the CCW has vastly improved the ability of researchers to link Medicare and Medicaid data to study dually eligible Medicare-Medicaid enrollees. However, the ability to quickly and efficiently study this population has still been limited.

Recognizing this handicap, and fueled by the Patient Protection and Affordable Care Act (ACA) mandate to provide the tools necessary for improving the care of Medicare-Medicaid enrollees, the CMS Medicare Medicaid Coordination Office (MMCO) initiated an effort to improve the CCW’s capacity for research on the Medicare-Medicaid dually eligible population. *This effort extends the opportunities offered by the CCW to the study of Medicaid-only and Medicare-Medicaid enrollees in the following ways:*

1. The 27 existing CCW condition algorithms that were originally applied to Medicare claims data were expanded to Medicaid-only beneficiaries using Medicaid data, as well as to Medicare-Medicaid enrollee data gleaned from both Medicare and Medicaid claims data for calendar year 2000 forward;
2. Additional condition flags were added to all Medicare, Medicaid, and Medicare-Medicaid enrollees beneficiary data for conditions that are critical to the study of Medicaid-only and Medicare-Medicaid dually enrolled beneficiaries (e.g., mental health and tobacco-use conditions; intellectual and developmental disabilities; and other conditions often related to physical disability);
3. The summary information previously available on the CCW website ([www.ccwdata.org](http://www.ccwdata.org)) has been expanded to provide information regarding the new flags developed as a part of #1 and #2 above; and
4. The Medicare-Medicaid Linked Enrollee Analytic Data Source (MMLEADS) has been developed. This new suite of linked files is considered version #3 and is based on previous versions of the Medicare-Medicaid Linked Data Files to allow for the examination of all Medicare and Medicaid enrollment and claims data for those who were dually enrolled in both programs. The current files are intended for both CMS and external researcher use. They are primarily designed to address questions regarding eligibility, enrollment, cost, use, and select physical and mental health conditions. Building upon points #1 through #3 above, this comprehensive suite of annual, calendar year data files contains:
  - Medicare Beneficiary File
  - Medicaid Beneficiary Files

- Medicare Service Files
- Medicaid Service Files
- Conditions File
  - 27 CCW chronic conditions
  - Nine mental health and tobacco-related conditions
  - Additional conditions including those often related to intellectual, developmental and physical disability (pending)

# TABLE OF CONTENTS

**EXECUTIVE SUMMARY ..... I**

**CHAPTER 1. DATA FILES OVERVIEW ..... 1**

    A.    BACKGROUND ..... 1

    B.    DATA FILE STRUCTURE..... 2

    Figure 1. MMLEADS Source Data ..... 2

    Figure 2. MMLEADS Files Architecture ..... 3

    C.    POPULATION..... 4

    D.    ADDITIONAL RESOURCES FOR MEDICARE AND MEDICAID DATA..... 5

        1. Medicare Resources..... 5

        2. Medicaid Resources ..... 6

**CHAPTER 2. MEDICARE AND MEDICAID ELIGIBILITY CLASSIFICATIONS.....8**

    Table 1. Medicare and Medicaid Eligibility (MME) Classifications ..... 9

**CHAPTER 3. CONTENTS OF LINKED DATA FILES.....11**

    A.    PERSON-LEVEL FILES ..... 11

        1.    Medicare Beneficiary-Level File ..... 11

            a. Demographics. .... 11

            b. Eligibility..... 12

            c. Spending..... 16

            d. Utilization..... 18

        2.    Medicaid Beneficiary–Level File..... 20

            a. Demographics. .... 21

            b. Eligibility..... 22

            c. Spending..... 31

            d. Utilization..... 32

        3.    Chronic / Clinical Condition File ..... 34

    Table 2. Condition Variables ..... 37

    B.    SERVICE-LEVEL FILES ..... 39

    Table 3. Medicare Service Types ..... 40

    Table 4. Medicaid Service Types ..... 42

        1.    Medicare Service-Level File ..... 44

            a. Counter variables. .... 44

            b. Medicare Payments..... 46

- c. Medicare Utilization ..... 47
- 2. Medicaid Service-Level File ..... 47
  - a. Counter variables. .... 48
  - b. Medicaid Payments..... 50
  - c. Medicaid utilization..... 51
- CHAPTER 4. METHODS AND TIPS FOR WORKING WITH THE MMLEADS DATA FILES .....53**
  - A. IDENTIFYING THE UNIVERSE OF DUALY ENROLLED..... 53
    - Code Example 1: Count the Medicare Only, Dually Enrolled and Medicaid Only ..... 53
  - B. SUBSETTING DATA TO IDENTIFY A POPULATION OF INTEREST ..... 54
    - Code Example 2: Define a Sample of People Dually Enrolled and with FFS Coverage..... 55
  - C. MERGING AND AGGREGATING DATA FOR MEDICARE-MEDICAID ENROLLEES ..... 57
    - Code Example 3: Identify All Utilization and Payment Information for Medicare-Medicaid Enrollees by Merging Files ..... 57
  - D. EXAMINING SERVICES USED FOR SPECIFIC POPULATIONS ..... 60
    - Code Example 4: Demonstrate Calculation of Per User Statistics for Specific Types of Care Settings ..... 60
  - E. CALCULATING UTILIZATION AND PAYMENT STATISTICS..... 65
    - Code Example 5: Use the Medicare Beneficiary and Medicaid Beneficiary ..... 65
    - Code Example 6: Use the Medicare and Medicaid Service Files to Calculate Per Capita Spending .69
    - Code Example 7: Use the Medicare and Medicaid Beneficiary-Level Files to Calculate Per Capita Spending ..... 70
- CHAPTER 5. REQUEST ACCESS / TECHNICAL SUPPORT .....74**
  - [Attachment A](#) – Acronym list ..... 72
  - [Attachment B](#) – Resource list ..... 74

## Chapter 1. Data Files Overview

### A. Background

Medicare is the primary health insurance program for people age 65 or older, people under age 65 with disabilities, and people of all ages with End-Stage Renal Disease (ESRD). In 2008, Medicare provided coverage for 47.8 million people<sup>1</sup>. Nearly all Medicare beneficiaries receive Part A hospital insurance benefits, which helps cover inpatient hospital care, skilled nursing facility stays, home health services, and hospice care. Most Medicare Part A beneficiaries also subscribe to Part B medical insurance benefits, which help to cover physician services, outpatient care, durable medical equipment (DME), and some home health care. Additionally, many Medicare beneficiaries elect to purchase Medicare Part D prescription drug coverage (available since 2006). Beneficiaries may elect to receive fee-for-service (FFS) Medicare or, as an alternative, enroll in Medicare Part C (Medicare Advantage [MA]). These are private plans similar to health maintenance organizations (HMOs) which provide Medicare Part A and Part B services. Many plans offer prescription drug coverage options.

In 2008, more than 60 million people in the U.S. were covered by Medicaid or the Children's Health Insurance Program (CHIP).<sup>2</sup> Medicaid is a state-administered benefit with guidance/requirements and shared funding from the federal government and individual state governments (Title XIX of Social Security Act from 1965). Each state must provide the minimum federally mandated services and coverage for federally mandated eligibility groups; however, benefits vary from state to state. Many groups of people are covered by Medicaid, depending on the state's requirements (e.g., age; whether pregnant, disabled, blind, or 65+; income level and resources; U.S. citizenship or lawful immigration status). There are also special rules for those who live in nursing homes and for children with disabilities living at home. For more information on the Medicaid program, see the CMS website (<http://www.medicaid.gov/>).

In 2008, more than 9 million persons were covered by both Medicare and Medicaid. Most of these "Medicare-Medicaid enrollees" qualified for both programs by being either very low income and age 65+ or very low income and disabled. MMLEADS was developed to integrate the Medicare and Medicaid data described above in order to facilitate researchers in studying the health care experiences of Medicare-Medicaid dually enrolled beneficiaries.

The goal of this guide is to document and describe the contents of the person-level and service-level analytic files. Details regarding overall file creation as well as creation of derived variables are included. We also demonstrate helpful hints for working with these data files.

---

<sup>1</sup> <http://www.cwdata.org/summary-statistics/demographics/index.htm>

<sup>2</sup> *ibid.*

## B. Data File Structure

The Medicare-Medicaid Linked Enrollee Analytic Data Source (MMLEADS) consists of five linkable beneficiary, service and clinical condition data files. The MMLEADS beneficiary-level and service-level data files are partitioned into either Medicare files or Medicaid files. These files are intended to be linked together, as needed, for a variety of analytic purposes. Files are created as annual files beginning with 2006. For each year, there are five files:

Medicare Files	Medicaid Files
Medicare Service-Level File	Medicaid Service-Level File
Medicare Beneficiary-Level File	Medicaid Beneficiary-Level File
Chronic / Clinical Condition File (person-level)	

The MMLEADS files were produced from manipulated CMS source data and may be used as stand-alone files for a range of analytic purposes. However, it is also easy to join the files together by using the unique person-level identifier called the beneficiary identification number (BENE\_ID). This CCW-assigned number allows for linkage between the Medicare and Medicaid data files, as well as linkage between the data files over time for longitudinal and trend analytics. It is possible to link these files to other CCW data sources, as allowed by the investigator's data use agreement (DUA).

A key feature of the MMLEADS files is that they contain value-added derived data fields, including numerous summary variables and other derived variables to use for aggregating data (e.g., determining full/partial benefit Medicare-Medicaid enrollment, number of months of Medicare-Medicaid dual coverage, summary service use/payment variables).

The CCW source data files used to generate the MMLEADS files are listed below in Figure 1.

**Figure 1. Medicare-Medicaid Linked Enrollee Analytic Data Source**

Medicare	Medicaid (MAX)
Master Beneficiary Summary File (enrollment and conditions)	Person Summary File (PS)
Part A Institutional Claims: <ul style="list-style-type: none"> <li>• Inpatient (IP)</li> <li>• Skilled Nursing Facility (SNF)</li> <li>• Home Health (HH)</li> <li>• Hospice</li> </ul>	Inpatient File (IP) Long-term care File (LT)
Part B Institutional Claims (Hospital Outpatient; HOP)	Other File (OT)
Part B Non-Institutional Claims (Carrier and DME)	Other File (OT)
Part D Events (PDE; prescription fills)	Drug File (RX)

The types of information available in the MMLEADS files are indicated in Figure 2. There are two different levels of data available: person-level files and service-level files.

**Figure 2. Medicare-Medicaid Linked Enrollee Analytic Data Source Files Architecture**

**1. Person-Level Files**

<b>Medicare Beneficiary-Level File</b>	<b>Medicaid Beneficiary-Level File</b>	<b>Chronic/Clinical Conditions File</b>
Demographics (age, gender, race)	Demographics (age, gender, race)	CCW chronic conditions (27 at the time of publication)
Enrollment/coverage (months of FFS; MME classification, reasons for enrollment)	Enrollment/coverage (months of FFS; MME classification, reasons for enrollment, waivers)	
<i>(No corresponding Medicare file)</i>	LT care supports and services enrollment	CMS/MMCO clinical conditions (9 at the time of publication)
Summary payment/spending (monthly and by MME category)	Summary payment/spending (monthly and by MME category)	
Summary utilization (monthly by setting and annually by MME category)	Summary utilization (monthly by setting and annually by MME category)	

**2. Service-Level Files**

<b>Medicare</b>	<b>Medicaid (MAX)</b>
2 levels of service types	3 levels of service types
User Counts	User Counts
Monthly Payment Summaries	Monthly Payment Summaries
Annual Payment Summaries	Annual Payment Summaries
Monthly Utilization Summaries	Monthly Utilization Summaries
Annual Utilization Summaries	Annual Utilization Summaries
Annual Payment Summaries by Dual Category	Annual Payment Summaries by Dual Category
Annual Utilization Summaries by Dual Category	Annual Utilization Summaries by Dual Category
<i>(No corresponding Medicare file)</i>	Federal Rates (by year)

As we describe this data product, we will often refer to a variable with regard to its original source (e.g., reference to a MAX variable such as EL\_DOB; or a Medicare variable such as BENE\_BIRTH\_DT). In general, variables in the Medicare files should be assumed to have Medicare sources, and MAX files should be assumed to have MAX sources, unless otherwise specified. Throughout this document, when a specific variable is described, it will be in bold and all capitals (e.g., **D\_AGE**). All other references to specific variables will not be capitalized so that is clear to users which particular variable is being described in a given section, as opposed to when a variable is being used to define an algorithm for a different variable.

The data files are very large, and it may take several minutes for your desired program to run against the data. To address this difficulty, we recommend users create a small test data set to use for exploratory analyses or testing analytic code (e.g., select a 1% random sample of beneficiaries, or a certain number of service records). Then, if desired, the analytic code can be modified to run against the full data files.

### C. Population

The 2008 MMLEADS files consist of 53,378,728 unique individuals, comprising the following mutually exclusive categories: Medicare-Medicaid dually enrolled (8,961,506), Medicare-only (38,888,163), and Medicaid-only with a disability (5,529,059).

Since the overarching objective of MMLEADS is to facilitate examination of services for Medicare-Medicaid dual enrollees, MMLEADS includes all people who were dually enrolled at any time during the calendar year. In addition, to facilitate comparisons, MMLEADS includes the Medicare-only and the Medicaid-only with disability populations. Please note that MMLEADS does not contain information for the Medicaid-only *without* disability population (48,071,420 total individuals largely consisting of women and children) because this group does not particularly resemble the Medicare-Medicaid population, and therefore is not appropriate to serve as a comparison group for Medicare-Medicaid dual enrollees.

To identify the subpopulations contained in the MMLEADS, we developed an algorithm to identify these three broad eligibility groups, as follows:

1. **Dually enrolled in Medicare and Medicaid.** We used a monthly variable to identify individuals who were dually enrolled in Medicare and Medicaid at any given time over the course of the calendar year. The CCW variable names are DUAL\_STUS\_CD\_01 - DUAL\_STUS\_CD\_12; the original source of these variables is the state Medicare Modernization Act (MMA) files, which states send to CMS on an at least monthly basis. These state-reported DUAL\_STUS\_CD\_XX variables are considered the “gold standard” for identifying people who are dually enrolled in Medicare and Medicaid since information from this variable is used to determine the level of Medicaid benefits or Medicare Part D low-income subsidies. The CCW receives this information from CMS with the Medicare enrollment data.  
  
A person with any month indicating “full” (values 02, 04, 08), “partial” (values 03, 05, or 06), or qualified Medicare beneficiary (“QMB-only”) dual status (value 01) were identified as Medicare-Medicaid dual enrollees.
2. **Medicare-only.** If an individual was Medicare enrolled and was not classified as Medicare-Medicaid dual eligible based on criteria listed in #1 for any month in the calendar year, the individual was classified as Medicare-only.
3. **Medicaid-only Blind or with Disability.** We used the monthly MAX uniform eligibility code variables (i.e., MAX\_ELG\_CD\_MO\_1 - MAX\_ELG\_CD\_MO\_12) to identify any person without dual eligibility for Medicare benefits who has any month indicating eligibility due to blindness or disability (values 12, 22, 32, 42, or 52) or enrolled due to Breast and Cervical Cancer Act (value 3A).

There is a single person-level record in the Medicare Beneficiary File for each person enrolled in Medicare during the year. Each person is uniquely identified with a BENE\_ID. **All Medicare beneficiaries, and as a result all who are dually enrolled in Medicaid, have a BENE\_ID.** A person might be enrolled in Medicaid in more than one state during the course of a year. These people will have more than one record in the Medicaid Beneficiary File; however, even if the person has more than one record, the BENE\_ID will uniquely identify a person.

For people with Medicaid enrollment, using the MSIS\_ID and state (i.e., variable STATE\_CD) alone, even for a single year, might result in duplicate records for a person; it is possible for someone who is eligible for Medicaid to be ineligible at a later point in time. It is also possible that the person becomes eligible again within the same year. This discontinuous enrollment may result in the person having more than one MSIS\_ID. If BENE\_ID were completely populated, this variable, in combination with the STATE\_CD variable, would precisely identify a unique person; however, the BENE\_ID is missing for a small number of people in the Medicaid files ( $n=217,197$  in 2008). The people considered Medicaid-only Blind or with Disability would be the only ones who may have a missing BENE\_ID. To be able to identify the eligibility information for unique people within a state, it is recommended that investigators aggregate information using BENE\_ID (when populated), MSIS\_ID, and STATE\_CD.

*Note:* For people with more than one record in the Medicaid Beneficiary File for the year, the small amount of Medicaid information within the Medicare data files is rolled up or summarized to collapse the state-specific rows of Medicaid enrollment information into a single record for the Medicare Beneficiary File.

In Chapter 4, there is an example demonstrating how to efficiently and accurately obtain population counts (see Code Example 1).

## **D. Additional Resources for Medicare and Medicaid Data**

Working with Medicare and Medicaid MAX administrative data files can be challenging. There is much to be understood regarding the nuances of the Medicare and Medicaid benefits, as well as details regarding how medical service utilization is represented in the source data files. While details on the source data are beyond the scope of this document, we direct the user to the following helpful resources.

### **1. Medicare Resources**

CCW Technical Guidance: Getting Started with CMS Administrative Research Files (<http://www.ccwdata.org/web/guest/technical-guidance-documentation>).

Source data file record layouts, which appear on the CCW website under the “Data Dictionaries” tab (<http://www.ccwdata.org/web/guest/data-dictionaries>).

CCW condition categories, which appear on the CCW website under the “Condition Categories” tab (<http://www.ccwdata.org/web/guest/condition-categories>).

## 2. Medicaid Resources

Each state compiles information regarding enrollment, service utilization, and payment into their Medical Statistical Information System (MSIS). The resulting files are sent to CMS. CMS and its contractors compile the various state MSIS data files into a uniform data structure for each calendar year and make these annual state segment files available to researchers as the Medicaid Analytic eXtract (MAX) data files. Additional details regarding the construction of the MAX files are available on the CMS website (see [https://www.cms.gov/MedicaidDataSourcesGenInfo/07\\_MAXGeneralInformation.asp](https://www.cms.gov/MedicaidDataSourcesGenInfo/07_MAXGeneralInformation.asp)).

It is often desirable to be able to determine which particular Medicare beneficiaries are also enrolled in Medicaid. People enrolled in Medicare who have limited income and resources may receive help paying for their out-of-pocket expenses from their state Medicaid program, and some people may be eligible for additional Medicaid benefits ([https://www.cms.gov/MLNProducts/downloads/Medicare\\_Beneficiaries\\_Dual\\_Eligibles\\_At\\_a\\_Glance.pdf](https://www.cms.gov/MLNProducts/downloads/Medicare_Beneficiaries_Dual_Eligibles_At_a_Glance.pdf)). Cost-sharing may include assistance with premium payments and may also include assistance with deductible, coinsurance or copayments. Some investigators may find it helpful to understand detailed information regarding the extent of Medicare and Medicaid benefits a person is entitled to receive: full benefits or only partial benefits, or simply a subsidy to offset a Medicare Part B or Part D premium. Determining who these Medicare-Medicaid enrolled beneficiaries (aka: dually eligible beneficiaries) are, can be easily accomplished using these data files.

Guidance for analyses using MAX data is available on the CCW website. CCW Technical Guidance: Getting Started with Medicaid Analytic eXtract (MAX) Data Files (<http://www.ccwdata.org/web/guest/technical-guidance-documentation>).

The source CCW MAX data files consist of the following:

- **Person Summary (PS)** - Person-level information regarding Medicaid-eligible individuals who have enrolled in a state Medicaid program in the year, whether or not they used any services.
- **Inpatient Hospital (IP)** - Contains complete stay records for enrollees who used inpatient services (e.g., acute hospitalizations). Records include diagnoses, procedures, discharge status, length of stay, and payment amounts.
- **Long Term Care (LT)** - Includes service data from four types of long-term care facilities (e.g., nursing facilities, intermediate care facilities) that serve Medicaid enrollees and Medicare-Medicaid enrollees.
- **Prescription Drug (RX)** - Contains final action records of prescription and over-the-counter drugs paid by Medicaid. Records include a National Drug Code (NDC) to indicate what drug product was used, service date and payment information.
- **Other Services (OT)** - Includes outpatient physician and professional services, hospice, home health, lab/X-ray, durable medical equipment (DME), premium payments etc., and all Medicaid records not reported in any other MAX service files.

Source data file record layouts (i.e., for MAX data files) as well as additional details regarding the construction of the MAX files is available on the CMS website ([https://www.cms.gov/MedicaidDataSourcesGenInfo/07\\_MAXGeneralInformation.asp](https://www.cms.gov/MedicaidDataSourcesGenInfo/07_MAXGeneralInformation.asp)).

MAX file layouts and other helpful information regarding use of MAX files can be referenced on the Research Data Assistance Center (ResDAC) website ([http://www.resdac.org/Medicaid/data\\_available.asp](http://www.resdac.org/Medicaid/data_available.asp)).

Several clinical conditions which are prevalent in Medicaid and Medicare-Medicaid enrollee populations have been identified by CMS. The algorithms for these mental health and tobacco use conditions go beyond the chronic condition categories which have traditionally been available through CCW and often referred to as the CCW conditions. These additional condition categories are available on the CCW website under the “Condition Categories” tab (<http://www.ccwdata.org/web/guest/condition-categories>). Additional clinical condition algorithms are under development and will be made available in the future.

## Chapter 2. Medicare and Medicaid Eligibility Classifications

Many options exist for classifying people in terms of their level of dual Medicare-Medicaid enrollment coverage. CCW has made available a Technical Guidance Document called “Options in Determining Dual Eligibles” (<http://www.ccwdata.org/web/guest/technical-guidance-documentation>) which provides useful background information regarding the potential scope of benefits and types of dual Medicare-Medicaid coverage.

To create variables in the MMLEADS, we used a recommended algorithm from CMS to assign each person in the files an MME<sup>3</sup> classification for the purposes of calculating population statistics. Two levels of MME variables are available; those which have a monthly status and those which have an annual status. A combination of three variables is used for these determinations:

1. The state-reported monthly Medicare-Medicaid Enrollee Eligibility Type variable which is submitted to CMS monthly by states. This variable is available to researchers in the CCW Master Beneficiary Summary File (i.e., CCW variable name is DUAL\_STUS\_CD\_01 - DUAL\_STUS\_CD\_12; also referred to as DUAL\_STUS\_CD\_MM).
2. Monthly Medicare buy-in variables (i.e., BENE\_MDCR\_ENTLMT\_BUYIN\_IND\_01 - BENE\_MDCR\_ENTLMT\_BUYIN\_IND\_12; also referred to as BENE\_MDCR\_ENTLMT\_BUYIN\_MM) are used to identify Medicare-only beneficiaries.
3. The monthly MAX uniform eligibility code variables (i.e., MAX\_ELG\_CD\_MO\_1 - MAX\_ELG\_CD\_MO\_12; also referred to as MAX\_ELG\_CD\_MM) are used to identify Medicaid-only individuals with disability.

For the MMLEADS, a determination is made each month regarding the level of benefits. This variable which captures the type of Medicare and/or Medicaid enrollment (MME) is available in the data files as **E\_MME\_TYPE\_1** – **E\_MME\_TYPE\_12** and uses the following algorithm, which results in five values for this field.

---

<sup>3</sup> In this document, the acronym MME refers generically to the classification of an individual as being enrolled in Medicare and/or Medicaid, and the data element denoting this classification. MME does not refer to the individuals or populations with concomitant or dual enrollment in Medicare and Medicaid. Such persons are referred to as “Medicare-Medicaid enrollees”.

**Table 1. Medicare and Medicaid Eligibility (MME) Classifications**

MME Classifications	Algorithm
1. Medicaid – with Disability <i>non-dual</i>	Medicaid covered and blind or with disability (MAX Uniform Eligibility Code = 12 (blind/disabled, cash), 22 (blind/disabled, medically needy), 32 (blind/disabled, poverty), 42 (other blind/disabled), 3A (breast and cervical cancer prevention act) or 52 (disabled, section 1115 demonstration expansion) with no dual eligibility (i.e., not in categories 3-5)
2. Medicare-only (in Medicare data file) <i>non-dual</i>	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 categories 3-5)
3. QMB-only Dual	DUAL_STUS_CD_MM = '01'
4. Partial Dual	DUAL_STUS_CD_MM = '03','05','06'
5. Full Dual	DUAL_STUS_CD_MM = '02','04','08'
Missing	None of the above

For the monthly MME\_TYPE\_MM variables, null values may appear. This occurs for people who did not have Medicare or Medicaid coverage continuously for the entire year (e.g., those who were either uninsured for some of the months, or who had some other coverage, or who were Medicaid eligible but did not meet the MMLEADS criteria for inclusion as “Medicaid-only with disability”).

From the monthly MME\_TYPE\_MM variables, we assign a single annual MME value. All beneficiaries *with* one or more months of MME\_TYPE\_MM = Full, Partial or QMB-only qualify as Medicare-Medicaid dual enrollment for the year. The type of dual (full, partial, QMB-only) for this annual MME data element is assigned according to the most recent dual month of the year. For those *without* any dual coverage in any given month, the latest valid value for MME\_TYPE\_MM was used. For example, so that if an individual had no dual Medicare-Medicaid enrollment during the year and was “Medicaid only with Disability” in the month of December, then this individual would be assigned this annual MME categorization of “Medicaid only with Disability”. The annual E\_MME\_TYPE variable has the same five values that appear in the table above. There are no missing values; all beneficiaries in the MMLEADS files are assigned a yearly MME\_TYPE. Since MME type is based on the monthly state-reported MMA File information that the CCW obtains with the Medicare enrollment data, an individual (BENE\_ID) will have one annual eligibility type regardless of potentially multiple Medicaid states of residence.

In general, beneficiaries with any level of Medicare-Medicaid dual eligibility (i.e., full, partial, or QMB-only) could have service and payment information in both the Medicare and Medicaid files.

The MME\_TYPE is used throughout the MMLEADS Files. For the annual summaries of utilization and payments, for example, totals are available and they are also stratified using the monthly MME\_TYPE variables. For each month a beneficiary has the particular type of enrollment, all payments are summed and all utilization is counted. Therefore, there are six categories of MME used to stratify the services; however five appear in the Medicare Files and

five appear in the Medicaid files (i.e., the Medicare-only category [variables using MRO] would only appear in the Medicare file and the Medicaid-only category [variables using MDO] would only appear in the Medicaid file). The strata used for the analytic variables include:

<b>MME Categorizations</b>	<b>Variable example</b> (total spending by MME strata)
1. Medicaid –only with disability ( <b>MDO</b> ) <i>non-dual</i>	<b>S_MDO_MEDICAID_PMT</b>
2. Medicare only ( <b>MRO</b> ) <i>non-dual</i>	<b>S_MRO_MEDICARE_PMT</b>
3. QMB-only Dual ( <b>QMB</b> )	<b>S_QMB_MEDICARE_PMT</b>
4. Partial Dual ( <b>PD</b> )	<b>S_PD_MEDICARE_PMT</b>
5. Full Dual ( <b>FD</b> )	<b>S_FD_MEDICARE_PMT</b>
Other – None of the above	<b>S_OTH_MEDICARE_PMT</b>

The level of benefits may change on a monthly basis. Within the data files several variables are available to enable investigators to use a variety of criteria for describing the level of dual benefits received each month. More details regarding variable options are described in Chapter 3.

## Chapter 3. Contents of Linked Data Files

Throughout this Chapter, when a specific variable is introduced and described, the variable name will be in bold and in all capital letters (e.g., **SRVC\_1**). Other uses of variable names, such as a subsequent reference to a variable name to help describe a new derived variable or to suggest uses of variables, are not in bold.

### A. Person-level files

#### 1. Medicare Beneficiary-Level File

Dataset Name= Medicare_beneficiary_2008.sas7bdat Record Count = 46,508,928
---

This file contains beneficiaries with an annual MME\_TYPE of: 5) FD, 4), PD, 3) QMB, and 2) MRO. These MME categories are explained in more detail in Chapter 2. The Medicare Beneficiary-Level File is a person-level file which contains demographic and Medicare coverage information and summary spending and utilization information for the year.

The file contains the unique person identifier called the Beneficiary ID (**BENE\_ID**). It also includes information regarding the latest state (**STATE\_CD**), county (**COUNTY**), and ZIP code (**ZIP**) for the calendar year which the beneficiary used as a mailing address for Medicare correspondence. Components of the Medicare Beneficiary File include:

**a. Demographics.** There are many variables within the file which are useful for describing the demographic characteristics of the beneficiary. Many of these variables appear exactly as they did in the CMS source enrollment database (EDB). All variables in this category (demographics) have a “D\_” prefix for the variable name. Such variables include:

**D\_ALIVE\_MOS** – for the subset of beneficiaries with a date of death, the total number of months alive during the calendar year (up to/including the date of death). If the person was alive through the end of the year, then the value will be null.

**D\_DIED** – dichotomous indicator that beneficiary died during the year. The presence of a date of death is used to determine this value.

**D\_DOD** – for beneficiaries who died during the year, the date of death from the CMS EDB

**D\_DOB** – date of birth from the CMS EDB

**D\_AGE** – age (in years) at the end of the calendar year from the CMS EDB

**D\_GENDER** – gender from the CMS EDB

**D\_MEDICARE\_RACE** – Research Triangle Institute (RTI) race code, which uses the race code Medicare receives from the Social Security Administration (SSA), and applies an algorithm using surnames to capture additional Hispanics and Asians

**D\_MEDICARE\_COV\_START** – date of first Medicare coverage from the CMS EDB (historical information; dates may precede the 1999 CCW data files)

**D\_MEDICAID\_COV\_START** – first occurrence of Medicaid eligibility, as far back as 1999 (a derived date value from the MAX uniform eligibility code).

**b. Eligibility.** A series of variables are available to describe Medicare and Medicaid eligibility. All variables within this category (eligibility) have an “E\_” prefix for the variable name. Such variables include:

**E\_DUAL\_1 - E\_DUAL\_12** – monthly variables for the state-reported Medicare-Medicaid Enrollee Eligibility Type indicator from the state MMA files (i.e., monthly; CCW variable name is DUAL\_STUS\_CD\_01 - DUAL\_STUS\_CD\_12). Values include:

- 00 Not Medicare
- 01 QMB only
- 02 QMB + Medicaid + Prescription coverage
- 03 SLMB only
- 04 SLMB + Medicaid + Prescription coverage
- 06 Qualified Individuals - QI
- 08 Other Dual + Medicaid + Prescription coverage
- 09 Other - Not Medicaid
- 99 Unknown
- NA Not Medicaid
- XX = Enrolled in Medicare A and/or B, but no dual eligibility data available

**E\_MME\_TYPE\_1 - E\_MME\_TYPE\_12** – monthly variable derived from monthly Medicare-Medicaid enrollee and MAX Uniform eligibility codes. The algorithm is based on a person’s most recent monthly MME status (described in Chapter 2), is used to create one of five values MME for each month. Values are:

- 5 FD
- 4 PD
- 3 QMB
- 2 MRO
- 1 MDO
- Other – not any of the above categories for the month

**E\_MME\_TYPE** – annual variable which assigns each person to a single MME status, based on the 12 monthly MME\_TYPE variables. The algorithm described earlier, in Chapter 2, is used to create one of four MME values for the year.

- 5 FD
- 4 PD
- 3 QMB
- 2 MRO

- Annual summaries of enrollment are stratified by MME classification:
  - E\_FD\_MOS** – number of months during the year with FD eligibility
  - E\_PD\_MOS** – number of months during the year with PD eligibility
  - E\_QMB\_MOS** – number of months during the year with QMB dual eligibility
  - E\_MEDICAREONLY\_MOS** – number of months during the year with MRO, and no dual eligibility
  - E\_MEDICAIDONLY\_MOS** – number of months during the year with MDO, and no dual eligibility
  - E\_OTHER\_MOS** – number of months during the year for those who were either uninsured for some of the months, or who had some other coverage, or who were Medicaid eligible but not under the Medicaid classifications that are included in the Linked Files; sum of the months with missing values from the MME type monthly variable).
- Additional eligibility variables capture information regarding participation in managed care (e.g., MA, or a Medicaid managed care plan) or FFS coverage. If a beneficiary is Medicare-Medicaid enrolled and had more than one state where s/he was Medicaid enrolled, the Medicaid records were collapsed across states and summarized for each BENE\_ID. These variables are:

**E\_MEDICAIDFFS1 - E\_MEDICAIDFFS12** – monthly variables used to show whether the person was enrolled in FFS Medicaid or whether some aspect of coverage was provided through managed care plans. The FFS claims will be in the source data files and considered in the examination of services for these files. In addition, some of the managed care encounter data may be included for some states. This variable allows for identification of long-term care, comprehensive managed care, PCCM, PACE, dental, behavioral, or prenatal care coverage. The monthly MAX prepaid plan identifier variables are used. In the MAX files there are up to four types of plans (i.e., prepaid health plans [PHPs]) allowed for each month (e.g., EL\_PHP\_ID\_1\_MM for the first plan type). Since there can be more than one PHP value per month (i.e., four such variables), a hierarchy of values is used. The algorithm and resulting values for this variable are:

- 1 FFS: if all of the four monthly MAX PHP indicators are not 01 – 07; that is, if none of the categories below apply for the month.
- 2 Long term care: if any of the four concurrent MAX PHP variables has a monthly value of 05 (LTC).
- 3 Comprehensive: if any of the four MAX PHP variables has a monthly value of 01 (comprehensive managed care); also if the value is 08 (enrolled in another managed care plan) and the state is AL, CA, FL or WI.
- 4 Primary care case management (PCCM): if any of the four MAX PHP variables has a monthly value of 07.
- 5 PACE: if any of the four PHP variables has a monthly value of 06.
- 6 Dental: if any of the four PHP variables has a monthly value of 02.
- 7 Behavioral: if any of the four PHP variables has a monthly value of 03.
- 8 Prenatal: if any of the four PHP variables has a monthly value of 04.

Null/Missing – Other (e.g., Medicaid coverage for the month or coverage is unknown)

*Note:*

Multiple plans are possible for each month, and these monthly hierarchical summary variables are designed to be used to determine the highest level or most comprehensive type of plan for the person each month. This variable should not be used to infer the number of people with a behavioral health managed care plan, for example – since any other more intensive plan during the month will cause this information to be masked for the purposes of this variable.

**E\_MEDICAREFFS1 - E\_MEDICAREFFS12** – monthly variables used to show whether the beneficiary was enrolled in FFS Medicare or managed care (i.e., MA). This information is helpful for understanding whether claims data would be observable for the person for each month of enrollment (i.e., Medicare claims files do not contain any information regarding services provided through MA plans). The monthly Medicare buy-in variables and the monthly HMO variables (i.e., managed care variables; MA) from the source data are used (e.g., BENE\_MDCR\_ENTLMT\_BUYIN\_IND\_MM and BENE\_HMO\_IND\_MM). The algorithm and resulting values for this variable are:

- 1 FFS: if the BUYIN indicator = 3 (Medicare Part A and B) or C (Medicare Parts A and B with state buy-in) and the HMO indicator = 0 (not a member of HMO) or 4 (FFS participant in care management demo);
- 2 MA cost-based: if the HMO indicator = 1 (non lock-in, CMS to process claims) or 2 (non lock-in, GHO to process claims);
- 3 MA risk-based: if the HMO indicator = A (lock-in, CMS to process claims), B (lock-in, GHO to process in-plan claims), or C (lock-in, GHO to process claims)

Null/Missing – Other (e.g., no Medicare coverage for the month, Part A only, or Part B only)

**E\_PTDFFS1 - E\_PTDFFS12** – monthly variables used to show whether the beneficiary was enrolled in Medicare Part D for the month, and whether such coverage was for a stand-alone PDP, for an employer-sponsored drug plan, or for managed care coverage with a wrap-around prescription drug plan (which is referred to as MA-PD). The beneficiary's monthly Part D plan benefit package and contract identifiers (e.g., CCW PTD\_PBP\_ID\_MM and PTD\_CNTRCT\_ID\_MM) were linked to the CCW Plan File variable called organization type (ORG\_TYPE) to derive the type of Part D plan for each month. The algorithm and resulting values for this variable are:

- 1 PDP: if the plan and contract are for the ORG\_TYPE = 10 (PDP)
- 2 Employer Direct: if the plan and contract are for ORG\_TYPE = 13 (Employer or Union only-PDP) or 14 (Employer or Union only-PFFS)
- 3 MA-PD: if the plan and contract are for ORG\_TYPE = 01 (local CCP), 04 (PFFS), or 11 (regional CCP)
- 4 Other: if the plan and contract are for the ORG\_TYPE = 05, 06, 08 or 15

Null/Missing – No coverage

**E\_MEDICAREFFS** – yearly summary of Medicare FFS coverage. From the monthly E\_MEDICAREFFS variables, we assign a yearly Medicare FFS value. Values are assigned in a hierarchical fashion; these are:

- 1 Had Medicare FFS coverage all months alive during the year
  - 0 Had Medicare managed care (MA) coverage one or more month during the year
- Null/Missing – No months of Medicare managed care coverage, but some Medicare FFS (e.g., beneficiary has 0 months of MA coverage but 2 months of Medicare FFS, this variable is null)

**E\_MEDICAREMA** – yearly summary of Medicare MA coverage. From the monthly E\_MEDICAREFFS variables, we assign a yearly Medicare MA value. Values are assigned in a hierarchical fashion; these are:

- 1 Had Medicare MA one or more month during the year
  - 0 No MA during the year; had FFS Medicare coverage for the entire year (or all months alive)
- Null/Missing – No months of Medicare managed care coverage, at least one month Medicare FFS – but less than all months of the year

**E\_MEDICAIDFFS** – yearly summary of Medicaid FFS coverage. From the monthly E\_MEDICAIDFFS values for the person, based on all values across all states (if the person was enrolled in Medicaid in more than one state during the year). The annual determination is made by finding the lowest value that occurs in the monthly variables. Values are assigned in a hierarchical fashion; these are:

- 1 Had Medicaid FFS coverage all months alive during the year
  - 0 Had Medicaid managed care coverage during one or more months of the year
- Null/Missing – No months of Medicaid managed care coverage, but some Medicaid FFS (e.g., enrollee has 0 months of Medicaid managed care coverage but 4 months of Medicaid FFS, this variable is null)

**E\_MEDICAIDMA** – yearly summary of the type of Medicaid managed care coverage. If the E\_MEDICAIDFFS yearly flag is one, then E\_MEDICAIDMA is zero. Otherwise, if there person was enrolled in Medicaid in more than one state during the year, we take the maximum E\_MEDICAIDMA value across the states. The values are presented in hierarchical order.

- 4 For some eligible months, the person had LT Medicaid managed care coverage.
- 3 No LT managed care coverage, but some eligible months of Medicaid comprehensive managed care
- 2 No LT or comprehensive Medicaid managed care, but some eligible months of PCCM
- 1 No LT, Comprehensive, or PCCM managed care, but some eligible months of Limited Managed Care (LMC)

0 FFS Medicaid. No LT, Comprehensive, PCCM or Limited managed care.  
Null/Missing – coverage status unknown

- A final set of eligibility variables describe the reason for Medicare enrollment, and also supply the monthly Medicare buy-in codes.

**E\_CREC** – Medicare current reason for entitlement, obtained from the CMS EDB. Values include:

- 0 Old age and Survivor’s insurance
- 1 Disability insurance benefits
- 2 ESRD
- 3 Disability insurance and ESRD

**E\_OREC** – Medicare original reason for entitlement, obtained from the CMS EDB. This code comes from the time the person was initially entitled to benefits and may be different than the current reason for entitlement (i.e., if a person who was entitled to Medicare benefits due to a disability becomes eligible due to aging into Medicare, the current reason for entitlement would become “aged” or 0; whereas the original reason would remain “disability insurance benefits” or 1). Values include:

- 0 Old age and Survivor’s insurance
- 1 Disability insurance benefits
- 2 ESRD
- 3 Disability insurance and ESRD

**E\_MS\_CD** – Medicare status code, as it appears in the CCW source data (CCW variable BENE\_MDCR\_STATUS\_CD). This variable is a bit more granular than the E\_CREC and E\_OREC variables since it uses E\_CREC in combination with age. Values for the E\_MS\_CD are:

- 10 Aged without ESRD
- 11 Aged with ESRD
- 20 Disability without ESRD
- 21 Disability with ESRD
- 31 ESRD only

**E\_BUYIN01 - E\_BUYIN12** – Medicare monthly entitlement or buy-in code. This variable comes directly from the CCW files (CCW variable name BENE\_MDCR\_ENTLMT\_BUYIN\_IND\_01 - BENE\_MDCR\_ENTLMT\_BUYIN\_IND\_12).

**c. Spending.** Total Medicare FFS spending, as well as detailed information regarding aggregate payments is summarized using many variables, at the person-level. All variables within this category (spending) have an “S\_” prefix for the variable name.

**S\_MEDICARE\_PMT\_1 - S\_MEDICARE\_PMT\_12** -- the total Medicare payments for the month, including the Medicare-paid amount for all Part A and B services, and the low-income subsidy amounts (i.e., the CCW variable LICS\_AMT) and Part D plan-covered amounts (CVRD\_D\_PLAN\_PD\_AMT) for Part D drugs.

*Note:* For beneficiaries with MA rather than FFS Medicare, the payments for Part D drugs may be the only values observed in these variables (i.e., for Part D all PDEs are present whether the person is enrolled in a stand-alone prescription drug plan or a MA-PD plan). These monthly variables are identical to the S\_MEDICARE\_PMT\_1 - S\_MEDICARE\_PMT\_12 variables in the Medicare Beneficiary File.

**S\_MEDICARE\_BENE\_PMT\_1 - S\_MEDICARE\_BENE\_PMT\_12** – includes the beneficiary responsibility for all services received in the month, including the deductible and coinsurance amounts. Totals for all Medicare Part A, B and Part D are included. For Medicare Part D patient amounts, four fields are considered: the PTNT\_AMT + OTHR\_TROOP\_AMT + LICS\_AMT + PLRO\_AMT.

- Annual summaries of FFS Medicare spending were created. Monthly spending for each person was compared to their monthly MME classification. Then, the payments for each of the MME classifications were summed for the year. For example, if a person had three months as a partial dual and nine months as a full dual, the corresponding payments for the PD months would appear in the PD annual summary variables (e.g., S\_PD\_MEDICARE\_PMT), and the payments for FD months would appear in the FD annual summary variables (e.g., S\_FD\_MEDICARE\_PMT). Two perspectives on spending are present – the Medicare portion of the payment and the beneficiary portion of the payment.

**S\_FD\_MEDICARE\_PMT** – total Medicare payments during the year for months when beneficiaries had FD eligibility

**S\_FD\_MEDICARE\_BENE\_PMT** – total beneficiary payments during the year, including the deductible and coinsurance amounts, for months when beneficiaries had FD eligibility

**S\_PD\_MEDICARE\_PMT** – total Medicare payments during the year for months when beneficiaries had PD eligibility

**S\_PD\_MEDICARE\_BENE\_PMT** – total beneficiary payments during the year, including the deductible and coinsurance amounts, for months when beneficiaries had PD eligibility

**S\_QMB\_MEDICARE\_PMT** – total Medicare payments during the year for months when beneficiaries had QMB eligibility

**S\_QMB\_MEDICARE\_BENE\_PMT** – total beneficiary payments during the year, including the deductible and coinsurance amounts, for months when beneficiaries had QMB eligibility

**S\_MRO\_MEDICARE\_PMT** – total Medicare payments during the year for months beneficiaries had MRO; not dual eligibility

**S\_MRO\_MEDICARE\_BENE\_PMT** – total beneficiary payments during the year, including the deductible and coinsurance amounts, for months when beneficiaries had MRO eligibility

**S\_OTH\_MEDICARE\_PMT** – total Medicare payments during the year for months beneficiaries had “Other” only (not MRO; not dual) (OTH) eligibility

**S\_OTH\_MEDICARE\_BENE\_PMT** – total beneficiary payments during the year, including the deductible & coinsurance amounts, for months beneficiaries had “Other” (not MRO; not dual) (OTH) eligibility

**d. Utilization.** Total Medicare utilization, as well as detailed information regarding the settings of care which were used, is summarized using many person-level variables. All variables within this category (utilization) have a “U\_” prefix for the variable name.

**U\_ADMITS** – a count of all acute hospital stays during the year for the beneficiary. Only inpatient prospective payment hospitals (IPPS) and critical access hospitals (CAH) are considered acute care hospitals for this purpose. This count includes acute hospital stays for all purposes, including readmissions. An acute hospitalization may consist of more than one inpatient claim. Furthermore, the stay may consist of treatment at more than one acute facility. All claims for the acute hospitalization are included as a single stay, and stays are counted to determine total number of hospital admissions. Consecutive acute hospitalization claims are considered part of the same stay if: 1) the first IP claim did not result in a discharge (i.e., the discharge status code did not show patient was discharged); or, 2) two IP claims have overlapping service dates. All stays where the last CCW Medicare CLM\_THRU\_DT for the last claim for the stay was within the calendar year of the file are included.

**U\_READMITS** – count of all acute hospital readmissions during the year for the beneficiary which occurred within 30 days of hospital discharge. For this variable, we look for the onset of an acute hospitalization (i.e., the CCW CLM\_FROM\_DT for the acute hospital stay), and look a full 30 days after the discharge date for all hospitalizations which are counted in the U\_ADMITS variable. This count does not include cases where the patient was transferred directly from one acute care hospital to another (i.e., if there was no gap in acute hospitalization days where the person was in a different level of care or in the community; those are considered transfers and not readmissions).

Utilization is stratified using 11 types of service categorizations, each with monthly variables to allow for calculation of per-member-per-month (PMPM) statistics.

The first four types of utilization variables below count “days” at a particular level of care. To calculate days, we use the ending date for the final claim for the stay to decide which of the monthly files will hold the data for the stay (e.g., if a beneficiary has a SNF stay that begins in January and ends in February, all of these days will be counted and appear only in the February SNF\_DAYS variable [i.e., U\_SNF\_DAY\_CNT\_2 variable]). Because days apply to the stay, and are not parceled out based on when the particular days occurred, the count of days may be greater than the number of calendar days in the month; in fact, it is common to have SNF day counts that are greater than 31 days.

**U\_IP\_ACUTE\_DAY\_CNT\_1 - U\_IP\_ACUTE\_DAY\_CNT\_12** – monthly variables to indicate the number of Medicare covered days in acute hospitals (both critical access [CAH] and inpatient prospective payment [IPPS] reimbursed hospitals).

**U\_SNF\_DAY\_CNT\_1 - U\_SNF\_DAY\_CNT\_12** – monthly variables to indicate the number of Medicare covered skilled nursing facility (SNF) days

**U\_PAC\_OTH\_DAY\_CNT\_1 - U\_PAC\_OTH\_DAY\_CNT\_12** – monthly variables to indicate the number of Medicare covered post-acute care (PAC) days

**U\_HOSPICE\_DAY\_CNT\_1 - U\_HOSPICE\_DAY\_CNT\_12** – monthly variables to indicate the number of Medicare covered hospice days

**U\_MEDICARE\_HH\_VST\_CNT\_1 - U\_MEDICARE\_HH\_VST\_CNT\_12** –monthly variables to indicate home health (HH) visits using the claim HH total visit count

**U\_MEDICARE\_IER\_CNT\_1 - U\_MEDICARE\_IER\_CNT\_12** – monthly variables to indicate the number of Medicare covered institutional facility emergency room (IER) visits. Inpatient revenue center codes related to the claims used to identify Emergency Room care include 0450, 0451, 0452, 0456, 0459.

**U\_MEDICARE\_OER\_CNT\_1 - U\_MEDICARE\_OER\_CNT\_12** – monthly variables to indicate the number of Medicare covered outpatient facility emergency room (OER) visits. Hospital Outpatient revenue center codes related to the claims used to identify Emergency Room care include 0450, 0451, 0452, 0456, 0459.

**U\_HOP\_VST\_1 - U\_HOP\_VST\_12** – for the HOP setting, different billable services appear on distinct revenue center lines of the claim. The revenue centers may occur on different days, indicating the person received services at more than one time. This variable identifies all revenue center dates for the person, and counts these for each month (i.e., number of days within the month with an HOP visit).

**U\_PHYS\_VST\_1 - U\_PHYS\_VST\_12** – count of unique claims for the Physician evaluation and management (E&M) service category. Please refer to Table 3 for more description regarding the definition of Medicare physician E&M services.

**U\_DME\_VST\_1 - U\_DME\_VST\_12** - count of unique claims for the DME service category. Please refer to Table 3 for more description regarding the definition of DME services.

**U\_DRUG\_PTD\_1 - U\_DRUG\_PTD\_12** – unique count of the number of prescription drug fills for each month, regardless of whether they were Medicare covered drugs or not.

A series of variables break down the total annual Medicare utilization into strata based on whether the person was full, partial, QMB, Medicare only, or other for each month (i.e., only months with FD coverage are allowed to accumulate for the FD utilization variables). These five variables for each of the 11 care settings with monthly variables result in a total of 55 additional ways to look at use. Each of these 55 variables is an annual summary of use (e.g., day or visit counts).

Full Benefit Dual (FD)	Partial Benefit Dual (PD)	QMB-only Dual	Medicare Only (MRO)	Other (OTH)
U_FD_IP_ACUTE_DAY	U_PD_IP_ACUTE_DAY	U_QMB_IP_ACUTE_DAY	U_MRO_IP_ACUTE_DAY	U_OTH_IP_ACUTE_DAY
U_FD_SNF_DAY	U_PD_SNF_DAY	U_QMB_SNF_DAY	U_MRO_SNF_DAY	U_OTH_SNF_DAY
U_FD_PAC_OTH_DAY	U_PD_PAC_OTH_DAY	U_QMB_PAC_OTH_DAY	U_MRO_PAC_OTH_DAY	U_OTH_PAC_OTH_DAY
U_FD_HOSPICE_DAY	U_PD_HOSPICE_DAY	U_QMB_HOSPICE_DAY	U_MRO_HOSPICE_DAY	U_OTH_HOSPICE_DAY
U_FD_HH_VST_CNT	U_PD_HH_VST_CNT	U_QMB_HH_VST_CNT	U_MRO_HH_VST_CNT	U_OTH_HH_VST_CNT
U_FD_IER_CNT	U_PD_IER_CNT	U_QMB_IER_CNT	U_MRO_IER_CNT	U_OTH_IER_CNT
U_FD_OER_CNT	U_PD_OER_CNT	U_QMB_OER_CNT	U_MRO_OER_CNT	U_OTH_OER_CNT
U_FD_HOP_VST	U_PD_HOP_VST	U_QMB_HOP_VST	U_MRO_HOP_VST	U_OTH_HOP_VST
U_FD_PHYS_VST	U_PD_PHYS_VST	U_QMB_PHYS_VST	U_MRO_PHYS_VST	U_OTH_PHYS_VST
U_FD_DME_VST	U_PD_DME_VST	U_QMB_DME_VST	U_MRO_DME_VST	U_OTH_DME_VST
U_FD_DRUG_PTD	U_PD_DRUG_PTD	U_QMB_DRUG_PTD	U_MRO_DRUG_PTD	U_OTH_DRUG_PTD

## 2. Medicaid Beneficiary-Level File

Dataset Name = Medicaid_beneficiary_2008.sas7bdat
Record Count = 14,662,641

This file contains beneficiaries with an annual MME\_TYPE of: 5) FD, 4), PD, 3) QMB, and 1) MDO. The Medicaid Beneficiary-Level File is a person-level file by state (i.e., a person who moves might be enrolled in Medicaid in two different states during the year; this file is at the person-state level). This file contains demographic Medicaid and Medicare coverage information and summary spending and utilization information for the year. The contents of this file closely mirror the contents of the Medicare Beneficiary-Level File.

The file contains the unique person identifier called the Beneficiary ID (**BENE\_ID**). This must be used in combination with the state (**STATE\_CD**) since more than one row of data might exist for a single **BENE\_ID**. A very small number of Medicaid enrollees in the MMLEADS files may not have a **BENE\_ID** (n=217,197 for 2008). This might occur if CCW was unable to uniquely identify an individual based on the completeness of the demographic information provided in **MAX** (e.g., the Social Security number [SSN],

DOB, Medicare Health Insurance Claim number [HIC], gender). Individuals with a missing BENE\_ID are limited to the MDO population. If this occurs, investigators should use the Medicaid enrollment number called the Medical Statistical Information System identification number (**MSIS\_ID**) and **STATE\_CD** variables as a unique key to identify a person during a single calendar year. The MSIS\_ID and STATE\_CD combination can be used to partition a person's Medicaid enrollment across states and over time, since a person may be enrolled in the program in more than one state during a year. A person may also be enrolled in Medicaid at different points in time, and a new MSIS\_ID might be assigned. The BENE\_ID will uniquely define a person, but not necessarily a unique row of data in this Medicaid Beneficiary file. A coding example demonstrating how to identify and count unique people in these files appears in Chapter 4 (see Code Example 1).

The state code corresponding to the state where the person was enrolled in Medicaid (i.e., the MAX data variable STATE\_CD) is used for state (**STATE\_CD**). The MAX variable for the latest county and ZIP code during the year (i.e., EL\_RSDNC\_CNTY\_CD\_LTST and EL\_RSDNC\_ZIP\_CD\_LTST) are used for county (**COUNTY**) and ZIP code (**ZIP**), respectively.

**a. Demographics.** There are many variables within the file which are useful for describing the demographic characteristics of the Medicaid enrollee. All variables within this category (demographics) have a "D\_" prefix for the variable name. Such variables include:

**D\_ALIVE\_MOS** – for the subset of Medicaid enrollees with a date of death, the total number of months alive during the calendar year (up to/including the date of death). If the person was alive through the end of the year, then the value will be null.

**D\_DIED** – dichotomous indicator that beneficiary died during the year. The presence of a date of death is used to determine this value.

**D\_DOD** – for enrollees who died during the year, the date of death. Decedents who were enrolled in Medicare used the Medicare CCW variable called "BENE\_DEATH\_DT" and those who were only in Medicaid used the date of death obtained from the Social Security Administration (i.e., MAX file variable called SSA\_DOD for 2007 forward; in 2006 this is from the MSIS\_date of death variable, called "EL\_DOD" in the MAX files).

**D\_DOB** – date of birth

**D\_AGE** – calculated age (in years) at the end of the calendar year

**D\_GENDER** – gender, using the MAX variable "EL\_SEX\_CD"

**D\_MEDICARE\_RACE** – RTI race code, which uses the race code Medicare receives from the SSA, and applies an algorithm using surnames to capture additional Hispanics and Asians. This will be populated beneficiaries with some Medicare coverage during the year.

**D\_MEDICAID\_RACE** – the race/ethnicity code from MSIS (MAX variable EL\_RACE\_ETHNCY\_CD). This will be populated for beneficiaries with some Medicaid coverage during the year.

**D\_MEDICARE\_COV\_START** – date of first Medicare coverage from the CMS EDB (historical information; dates may precede the 1999 CCW data files)

**D\_MEDICAID\_COV\_START** – first occurrence of Medicaid eligibility, as far back as 1999 (derived date value using the MAX uniform eligibility code).

**b. Eligibility.** A series of variables are available to describe Medicare and Medicaid eligibility. All variables within this category (eligibility) have an “E\_” prefix for the variable name. Such variables include:

**E\_DUAL\_1 - E\_DUAL\_12** – monthly variables from the state-reported Medicare-Medicaid Enrollee Eligibility Type indicator from the state MMA files (i.e., monthly; CCW Medicare variable name is DUAL\_STUS\_CD\_01 - DUAL\_STUS\_CD\_12). Values include:

- 00 Not Medicare
- 01 QMB only
- 02 QMB + Medicaid + Prescription coverage
- 03 SLMB only
- 04 SLMB + Medicaid + Prescription coverage
- 06 Qualified Individuals - QI
- 08 Other Dual + Medicaid + Prescription coverage
- 09 Other - Not Medicaid
- 99 Unknown
- NA Not Medicaid
- XX = Enrolled in Medicare A and/or B, but no dual eligibility data available

**E\_MME\_TYPE\_1 - E\_MME\_TYPE\_12** – monthly variable derived from monthly Dual and MAX Uniform eligibility codes. The algorithm described in Chapter 2 is used to create one of five values MME for each month. Values are:

- 5 FD
- 4 PD
- 3 QMB
- 2 MRO
- 1 MDO
- Other – not any of the above categories for the month

**E\_MAX\_DUAL\_1 - E\_MAX\_DUAL\_12** – monthly variables are available in the MAX files to describe in detail the level of benefits for which the enrollee is eligible. The MAX variable traditionally known as the Medicare Crossover code (e.g., monthly variables EL\_MDCR\_XOVR\_MO\_#), is currently available in the MAX source data as the monthly Medicare dual code (i.e., variables EL\_MDCR\_DUAL\_MO\_1 - EL\_MDCR\_DUAL\_MO\_12). Values are:

- 00 in MSIS, eligible is not a Medicare beneficiary
- 01 in MSIS, eligible is entitled to Medicare-QMB only
- 02 in MSIS, eligible is entitled to Medicare-QMB and full Medicaid coverage
- 03 in MSIS, eligible is entitled to Medicare-SLBM only
- 04 in MSIS, eligible is entitled to Medicare-SLBM and full Medicaid coverage
- 05 in MSIS, eligible is entitled to Medicare-QDWI
- 06 in MSIS, eligible is entitled to Medicare-qualifying individuals (1)

07 in MSIS, eligible is entitled to Medicare-qualifying individuals (2)  
 08 in MSIS, eligible is entitled to Medicare-other DEs  
 09 in MSIS, eligible is entitled to Medicare-dual eligibility category unknown  
 50 a record was found in the Medicare EDB for the eligible and codes 01-09 do  
 not apply  
 51 a record was found in the Medicare EDB for the eligible and code 01 applies  
 52 a record was found in the Medicare EDB for the eligible and code 02 applies  
 53 a record was found in the Medicare EDB for the eligible and code 03 applies  
 54 a record was found in the Medicare EDB for the eligible and code 04 applies  
 55 a record was found in the Medicare EDB for the eligible and code 05 applies  
 56 a record was found in the Medicare EDB for the eligible and code 06 applies  
 57 a record was found in the Medicare EDB for the eligible and code 07 applies  
 58 a record was found in the Medicare EDB for the eligible and code 08 applies  
 59 a record was found in the Medicare EDB for the eligible and code 09 applies  
 98 a record was found in the Medicare EDB for the eligible and code 99 applies  
 99 in MSIS, eligible's Medicare status is unknown

*Note:*

While this variable is being made available in the MMLEADS files, the recommended method for identifying Medicare-Medicaid enrollees is MME\_TYPE.

Often, a person is considered eligible for full dual Medicare-Medicaid benefits if the value of this field is 02, 04, 08, 52, 54, or 58. A restricted level of dual benefits is indicated for values 01, 03, 05, 06, 51, 53, 55, and 56. Additional details regarding how an analyst might wish to employ this information are located in the CCW Technical Guidance Paper called "Options in Determining Dual Eligibles" located on the CCW website (<http://www.ccwdata.org/analytic-guidance/index.htm>). This document also provides a comparison of the use of the MAX dual indicator compared to the Medicare-Medicaid Enrollee Eligibility Type indicator code from Medicare.

**E\_MME\_TYPE** – annual variable which assigns each person to an MME status, based on the 12 monthly MME\_TYPE variables. The algorithm described in Chapter 2 is used to create one of four MME values for the year. Values are:

- 5 FD
- 4 PD
- 3 QMB
- 1 MDO – Medicaid only with disability

➤ Annual summaries of enrollment are stratified by MME classification:

**E\_FD\_MOS** – number of months during the year with FD eligibility

**E\_PD\_MOS** – number of months during the year with PD eligibility

**E\_QMB\_MOS** – number of months during the year with QMB dual (QMB) eligibility

**E\_MEDICAREONLY\_MOS** – number of months during the year with MRO and no dual eligibility

**E\_MEDICAIDONLY\_MOS** – number of months during the year with MDO and no dual eligibility

**E\_OTHER\_MOS** – number of months during the year for those who were either uninsured for some of the months, or who had some other coverage, or who were Medicaid eligible but not under the Medicaid classifications that are included in the MMLEADS Files. This variable is the sum of the months with missing values from the monthly MME\_TYPE\_MM variables.

- Additional eligibility variables capture information regarding participation in managed care (e.g., Medicare Advantage [MA], or a Medicaid managed care plan) or FFS coverage. These variables are:

**E\_MEDICAIDFFS1 - E\_MEDICAIDFFS12** – monthly variables used to show whether the person was enrolled in FFS Medicaid or whether some aspect of coverage was provided through managed care plans. The FFS claims will be in the source data files and considered in the examination of services for these files. In addition, some of the managed care encounter data may be included for some states. This variable allows for identification of long-term care, comprehensive managed care, PCCM, PACE, dental, behavioral, or prenatal care coverage. The monthly MAX prepaid plan identifier variables are used. In the MAX files there are up to four types of plans (i.e., prepaid health plans [PHPs]) allowed for each month (e.g., EL\_PHP\_ID\_1\_MM for the first plan type). Since there can be more than one PHP value per month (i.e., four such variables), a hierarchy of values is used. The algorithm and resulting values for this variable are:

- 1 FFS: if all of the four monthly MAX PHP indicators are not 01 – 07; that is, if none of the categories below apply for the month.
  - 2 Long term care: if any of the four concurrent MAX PHP variables has a monthly value of 05 (LTC).
  - 3 Comprehensive: if any of the four MAX PHP variables has a monthly value of 01 (comprehensive managed care); also if the value is 08 (enrolled in another managed care plan) and the state is AL, CA, FL or WI.
  - 4 Primary care case management (PCCM): if any of the four MAX PHP variables has a monthly value of 07.
  - 5 PACE: if any of the four PHP variables has a monthly value of 06.
  - 6 Dental: if any of the four PHP variables has a monthly value of 02.
  - 7 Behavioral: if any of the four PHP variables has a monthly value of 03.
  - 8 Prenatal: if any of the four PHP variables has a monthly value of 04.
- Null/Missing – Other (e.g., Medicaid coverage for the month or coverage is unknown)

*Note:*

Multiple plans are possible for each month, and these monthly hierarchical summary variables are designed to be used to determine the highest level or most comprehensive type of plan for the person each month. This variable should not be used to infer the number of people with a behavioral health managed care plan,

for example – since any other more intensive plan during the month will cause this information to be masked for the purposes of this variable.

The following seven counter variables may be used to ascertain enrollment in the various types of PHP plans:

- E\_LTC\_MOS** – number of months during the year with a Medicaid LTC PHP
- E\_CMC\_MOS** – number of months during the year with a Medicaid CMC PHP
- E\_PCCM\_MOS** – number of months during the year with a Medicaid PCCM PHP
- E\_PACE\_MOS** – number of months during the year with a Medicaid PACE PHP
- E\_DENTAL\_MOS** – number of months during the year with a Medicaid Dental PHP
- E\_BEHAVIORAL\_MOS** – number of months during the year with a Medicaid Behavioral PHP
- E\_PRENATAL\_MOS** – number of months during the year with a Medicaid Prenatal care PHP

**E\_MEDICAREFFS1 - E\_MEDICAREFFS12** – monthly variables used to show whether the beneficiary was enrolled in FFS Medicare or managed care (i.e., MA). This information is helpful for understanding whether claims data would be observable for the person for each month of enrollment (i.e., Medicare claims files do not contain any information regarding services provided through MA plans). The monthly Medicare buy-in variables and the monthly HMO variables (i.e., managed care variables; MA) from the source data are used (e.g., *BENE\_MDCR\_ENTLMT\_BUYIN\_IND\_MM* and *BENE\_HMO\_IND\_MM*). The algorithm and resulting values for this variable are:

- 1 FFS: if the BUYIN indicator = 3 (Medicare Part A and B) or C (Medicare Parts A and B with state buy-in) and the HMO indicator = 0 (not a member of HMO) or 4 (FFS participant in care management demo);
  - 2 MA cost-based: if the HMO indicator = 1 (non lock-in, CMS to process claims) or 2 (non lock-in, GHO to process claims);
  - 3 MA risk-based: if the HMO indicator = A (lock-in, CMS to process claims), B (lock-in, GHO to process in-plan claims), or C (lock-in, GHO to process claims)
- Null/Missing – Other (e.g., no Medicare coverage for the month, Part A only, or Part B only)

**E\_PTDFFS1 - E\_PTDFFS12** – monthly variables used to show whether the beneficiary was enrolled in Medicare Part D for the month, and whether such coverage was for a stand-alone PDP, for an employer-sponsored drug plan, or for managed care coverage with a wrap-around prescription drug plan (which is referred to as MA-PD). The beneficiary's monthly Part D plan benefit package and contract identifiers (e.g., *CCW\_PTD\_PBP\_ID\_MM* and *PTD\_CNTRCT\_ID\_MM*) were linked to the CCW Plan File variable called

organization type (ORG\_TYPE) to derive the type of Part D plan for each month. The algorithm and resulting values for this variable are:

- 1 PDP: if the plan and contract are for the ORG\_TYPE= 10 (PDP)
  - 2 Employer Direct: if the plan and contract are for ORG\_TYPE= 13 (Employer or Union only-PDP) or 14 (Employer or Union only-PFFS)
  - 3 MA-PD: if the plan and contract are for ORG\_TYPE= 01 (local CCP), 04 (PFFS), or 11 (regional CCP)
  - 4 Other: if the plan and contract are for the ORG\_TYPE= 05, 06, 08 or 15
- Null/Missing – No coverage

**E\_MEDICAREFFS** – Yearly summary of Medicare FFS coverage. From the monthly E\_MEDICAREFFS variables, we assign a yearly Medicare FFS value. Values are assigned in a hierarchical fashion; these are:

- 1 Had Medicare FFS coverage all months alive during the year
  - 0 Had MA coverage one or more month during the year
- Null/Missing – No months of MA coverage, but some Medicare FFS (e.g., beneficiary has 0 months of MA coverage but 3 months of Medicare FFS, this variable is null)

**E\_MEDICAREMA** – Yearly summary of Medicare MA coverage. From the monthly E\_MEDICAREFFS variables, we assign a yearly Medicare MA value. Values are assigned in a hierarchical fashion; these are:

- 1 Had Medicare managed care (MA) one or more months during the year
  - 0 No MA during the year; had FFS Medicare coverage all months alive during the year
- Null/Missing – No months of MA coverage, but at least one month of Medicare FFS

**E\_MEDICAIDFFS** – Yearly summary of Medicaid FFS coverage. From the monthly E\_MEDICAIDFFS values for the person, based on all values across all states (if the person was enrolled in Medicaid in more than one state during the year). The annual determination is made by finding the lowest value that occurs in the monthly variables. Values are assigned in a hierarchical fashion; these are:

- 1 Had Medicaid FFS coverage all months alive during the year
  - 0 Had Medicaid managed care coverage during one or more months of the year
- Null/Missing – No months of Medicaid managed care coverage, but some Medicaid FFS (e.g., enrollee has 0 months of Medicaid managed care coverage but 4 months of Medicaid FFS, this variable is null)

**E\_MEDICAIDMA** – Yearly summary of Medicaid managed care coverage. Values are assigned in a hierarchical fashion; these are:

- 4 Had one or more months of LT Medicaid managed care coverage
- 3 No LT managed care coverage, but one or more months of Medicaid comprehensive managed care
- 2 No LT or comprehensive Medicaid managed care, but one or more months of PCCM

- 1 No LT, Comprehensive, or PCCM managed care, but one or more months of Limited Managed Care (LMC)
  - 0 FFS Medicaid. No LT, Comprehensive, PCCM or LMC.
- Null/Missing –No months of Medicaid managed care coverage, but at least one month of Medicaid FFS

➤ Another set of eligibility variables describe the reason for eligibility for Medicaid, the scope of benefits, and reason for Medicare entitlement.

**E\_CREC** – Medicare current reason for entitlement. Values include:

- 0 Old age and Survivor’s insurance
- 1 Disability insurance benefits
- 2 ESRD
- 3 Disability insurance and ESRD

**E\_OREC** – Medicare original reason for entitlement. This code comes from the time the person was initially entitled to benefits and may be different than the current reason for entitlement (i.e., if a person who was entitled to Medicare benefits due to a disability becomes eligible due to aging into Medicare, the current reason for entitlement would become “aged” or 0; whereas the original reason would remain “disability insurance benefits” or 1). Values include:

- 0 Old age and Survivor’s insurance
- 1 Disability insurance benefits
- 2 ESRD
- 3 Disability insurance and ESRD

**E\_MS\_CD** – Medicare status code, as it appears in the original CCW source data (CCW variable BENE\_MDCR\_STATUS\_CD). This variable is a bit more granular than the E\_CREC and E\_OREC variables, since it uses E\_CREC in combination with age. Values for the E\_MS\_CD are:

- 10 Aged without ESRD
- 11 Aged with ESRD
- 20 Disability without ESRD
- 21 Disability with ESRD
- 31 ESRD only

**E\_MAS1 - E\_MAS12** – monthly value for the Medicaid Maintenance Assistance Status (MAS), derived from the first digit of the monthly MAX uniform eligibility code variables (i.e., MAX\_ELG\_CD\_MO\_1 – MAX\_ELG\_CD\_MO\_12). Values include:

- 0 Not eligible for Medicaid
- 1 Cash
- 2 Medically Needy
- 3 Poverty
- 4 Other

- 5 Section 1115 waiver
- 9 Unknown

**E\_BOE1 - E\_BOE12** – monthly value for the Medicaid Basis of Eligibility (BOE), derived from the 2nd digit of the monthly MAX uniform eligibility code variables. Values include:

- 0 Not eligible for Medicaid
- 1 Aged
- 2 Blind/disabled
- 4 Child
- 5 Adult
- 6 Child of unemployed adult
- 7 Unemployed Adult
- 8 Foster care child
- A Covered under Breast and Cervical Cancer Prevention Act
- 9 Unknown

**E\_MAS** – most recent monthly value for the Medicaid Maintenance Assistance Status (MAS; from E\_MAS\_1 - E\_MAS\_12)

**E\_BOE** – most recent monthly value for the Medicaid Basis of Eligibility (BOE); from E\_BOE\_1 - E\_BOE\_12).

**E\_RESTRICTED\_1 - E\_RESTRICTED\_12** – scope of benefits to which a Medicaid enrolled beneficiary is entitled. Monthly variable which uses the MAX source variables EL\_RSTRCTCT\_BNFT\_FLG\_1 - EL\_RSTRCTCT\_BNFT\_FLG\_12. Values are:

- 0 Not Medicaid eligible
- 1 Full Medicaid
- 2 Restricted Medicaid – alien status
- 3 Restricted Dual (QMB/SLMB only)
- 4 Restricted – pregnancy-related only
- 5 Restricted – other
- 6 Medicaid – Family Planning only
- 9 Medicaid – unknown restrictions
- X Medicaid– Prescription (RX) drug only
- Y Dual – RX only (QMB/SLMB only)
- Z Dual – RX only

- A final set of eligibility variables describe how the Medicaid benefit is offered. For example, states can apply for waivers from CMS to operate managed care plans or other demonstration projects within the Medicaid program. The various waivers are designed to meet particular objectives: section 1915(b) waivers allow for use of managed care delivery programs for a particular Medicaid subpopulation, 1915(c) waivers are for home and community-based services for long-term care recipients, and Section 1115

waivers allow for states to conduct demonstrations or pilot test innovative delivery systems (see CMS Medicaid website at: <http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Waivers/Waivers.html>). There can be more than one waiver in force in a state which affects the enrollee any particular month. In the linked file a researcher is able to identify up to 3 waiver programs for a given month.

**E\_WAIVER1\_01 - E\_WAIVER1\_12** – monthly Medicaid waiver status, using the first of 3 allowed waiver type variables in the source MAX data files (i.e., from monthly MAX variables “MAX\_WAIVER\_TYPE\_1\_MO\_1 - MAX\_WAIVER\_TYPE\_1\_MO\_12”). Values are:

- 0 individual was not eligible for Medicaid this month
- 1 enrolled in Section 1115 waiver this month
- 2 enrolled in section 1915(B) waiver this month
- 4 enrolled in combined section 1915(B) and (C) waiver this month
- 5 enrolled in section 1115 Health Insurance and Flexibility and Accountability (HIFA) waiver this month
- 6 section 1115 pharmacy waiver coverage this month
- 7 enrolled in other type of waiver this month
- 8 not applicable (not enrolled in a waiver)
- 9 enrolled in unknown type of waiver this month
- A enrolled in section 1115 disaster-related waiver
- F enrolled in section 1115 family planning-only waiver
- G Enrolled in section 1915(C) waiver for aged and disabled
- H Enrolled in section 1915(C) waiver for aged this month
- I enrolled in section 1915(C) waiver for physically disabled this month
- J enrolled in section 1915(C) waiver for people with brain injuries this month
- K enrolled in section 1915(C) waiver for people with human immunodeficiency virus / acquired immunodeficiency syndrome (HIV/AIDS)
- L enrolled in section 1915(C) waiver for intellectual and developmental disability
- M enrolled in section 1915(C) waiver for people with mental illness / serious emotional disturbance
- N enrolled in section 1915(C) waiver for technology dependent / medically fragile
- O enrolled in section 1915(C) waiver for unspecified or unknown populations

**E\_WAIVER2\_01 - E\_WAIVER2\_12** – monthly Medicaid waiver status, using the second of three allowed waiver type variables in the source MAX data files (i.e., from monthly MAX variables “MAX\_WAIVER\_TYPE\_2\_MO\_1 - MAX\_WAIVER\_TYPE\_2\_MO\_12”).

**E\_WAIVER3\_01 - E\_WAIVER3\_12** – monthly Medicaid waiver status, using the third of three allowed waiver type variables in the source MAX data files (i.e., from monthly MAX variables “MAX\_WAIVER\_TYPE\_3\_MO\_1 - MAX\_WAIVER\_TYPE\_3\_MO\_12”).

- Some Medicaid enrollees used long-term care services, either in an institutional nursing facility or in a community-based setting. This series of variables describes long term care supports and services (LTSS).

**LTSS\_DTL1 - LTSS\_DTL12** – detailed variable regarding monthly use of long-term care nursing facility (NF) services. To create this variable, a combination of two MAX variables was used: the MAX type of service (MAX\_TOS) and the MSIS type of program (MSIS\_TOP). All four MAX claims files (i.e., IP, LT, OT, and RX) are queried to identify all claims of interest with the claim payment amount >0. There are four possible values for each month for the LTSS variables, and if more than one category is found for the month, a hierarchy is used – going from the highest intensity of services to the lowest, as represented by the ordering of the values below (I1 is most intensive). The values are:

- I1 Institutional Nursing Facility (NF) Services (where MAX\_TOS = 07 [Nursing Facility Services])
- I2 Other Institutional NF Services (where MAX\_TOS = 2 [mental hospital services for the aged], 4 [inpatient psychiatric facility for individuals under age 21], or 5 [Indian health services])
- C1 Waiver for Community-based LTSS (where MSIS\_TOP = 6 [home and community based waiver under section 1915-d] or 7 [home and community based waiver under section 1915-c])
- C2 HH or Personal Care Service (PCS) Community-based LTSS (where MAX\_TOS = 13 [home health] or 30 [personal care services])
- A Non-LTSS. Person has Medicaid coverage but is not in any of the previous categories
- Null/Missing – Not Medicaid covered for a given month

**LTSS\_STAY** – annual summary variable describing whether each person in the file had any Medicaid-covered short or long stays in the long-term care Institutional NF setting (i.e., the “I1” values from the monthly LTSS detailed values above [LTSS\_DTL1 - LTSS\_DTL12], were there 90 or more consecutive days during the calendar year in this setting. Variable has the following values:

- L Long stay (90 or more consecutive days)
- S Short stay (less than 90 consecutive days)
- Null/Missing – no LTSS institutional days

*Note:* This variable only counts Medicaid days (i.e., those appearing in the claims files); if there were other non-Medicaid days, these are not counted.

**c. Spending.** Total Medicaid spending, as well as detailed information regarding aggregate payments is summarized using many variables, all at the person-level. The source data for these variables are the MAX claims files (i.e., IP, LT, OT and RX). All variables within this category (spending) have an “S\_” prefix for the variable name.

The Medicaid program is jointly funded by the federal government and states. The federal government pays states for a specified percentage of program expenditures, called the Federal Medical Assistance Percentage (FMAP). This percentage varies by state, and is 57% of expenditures on average – but ranges from 50 – 75%. The federal percentage is adjusted every three years. More information regarding Medicaid financing can be found on the Medicaid.gov website (<http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Financing-and-Reimbursement/Financing-and-Reimbursement.html>).

**S\_FED\_PMT\_1 - S\_FED\_PMT\_12** – the Federal share of total Medicaid payments for the month. This field is calculated by examining the Medicaid payment amounts on each claim (i.e., the MAX variable MDCD\_PYMT\_AMT) and multiplying by the FMAP for the State. All claims are included in these calculations, including premiums).

**S\_ST\_PMT\_1 - S\_ST\_PMT\_12** – the state share of total Medicaid payments for the month. This field is calculated by examining the Medicaid payment amounts on each claim (i.e., the MAX variable MDCD\_PYMT\_AMT) and subtracting the federal share of the payment from each payment (i.e., removing the S\_FED\_PMT amounts from the previous variable).

**S\_MEDICAID\_PMT\_1 - S\_MEDICAID\_PMT\_12** – the total Medicaid payments for the month. This field sums the Medicaid payment amounts on each claim (i.e., the MAX variable MDCD\_PYMT\_AMT) for the month. The source data field includes the Medicaid portion of payments for all services, including premiums to third parties for capitated care. The payment amounts are divided into monthly variables, using the ending date of services on the claim (e.g., the SRVC\_END\_DT from the MAX IP file).

*Note:* A breakdown of these payments for the year by service type appears in the Medicaid-service level file.

**S\_MEDICAID\_FFS\_PMT\_1 - S\_MEDICAID\_FFS\_PMT\_12** – the total Medicaid FFS payments for the month. This field is calculated by subsetting the service types so that payments for all types except managed care are included (i.e., SRVC\_1 where the value is not MDCD\_MC). Refer to Table 4 for more information regarding the algorithms for the service type variables.

**S\_MEDICAID\_BENE\_PMT\_1 - S\_MEDICAID\_BENE\_PMT\_12** – the non-Medicaid liability for payments for the month. This field is calculated using the Medicare deductible and coinsurance amounts for each claim (i.e., the MDCR\_DED\_PYMT\_AMT and MDCR\_COINSUR\_PYMT\_AMT).

*Note:* A breakdown of these payments for the year by service type appears in the Medicaid-service level file.

**S\_MEDICAID\_BENE\_FFS\_PMT\_1 - S\_MEDICAID\_BENE\_FFS\_PMT\_12** – the non-Medicaid liability for FFS payments for the month. This field is calculated using the Medicare deductible and coinsurance amounts for each claim (i.e., the MDCR\_DED\_PYMT\_AMT and MDCR\_COINSUR\_PYMT\_AMT) where the person is not covered by Medicaid managed care (i.e., where the SRVC\_1 value is not MDCD\_MC).

- Annual summaries of Medicaid spending were created by summing all of the monthly variables above. A series of variable breaks down the total payments into five strata based on whether the person was full, partial, QMB-only, Medicaid-only, or other. Six variables appear for each of these strata, including the Federal and state responsibility for payment, the total Medicaid payment, the FFS Medicaid payment, and the beneficiary portion of the payment. Each of these 30 variables is an annual summary.

Full Benefit Dual (FD)	Partial Benefit Dual (PD)	QMB-only Dual (QMB)
S_FD_MEDICAID_PMT_FED	S_PD_MEDICAID_PMT_FED	S_QMB_MEDICAID_PMT_FED
S_FD_MEDICAID_PMT_ST	S_PD_MEDICAID_PMT_ST	S_QMB_MEDICAID_PMT_ST
S_FD_MEDICAID_PMT	S_PD_MEDICAID_PMT	S_QMB_MEDICAID_PMT
S_FD_MEDICAID_FFS_PMT	S_PD_MEDICAID_FFS_PMT	S_QMB_MEDICAID_FFS_PMT
S_FD_MEDICAID_BENE_PMT	S_PD_MEDICAID_BENE_PMT	S_QMB_MEDICAID_BENE_PMT
S_FD_MEDICAID_BENE_FFS_PMT	S_PD_MEDICAID_BENE_FFS_PMT	S_QMB_MEDICAID_BENE_FFS_PMT

Medicaid-only (MDO)	Other (OTH)
S_MDO_MEDICAID_PMT_FED	S_OTH_MEDICAID_PMT_FED
S_MDO_MEDICAID_PMT_ST	S_OTH_MEDICAID_PMT_ST
S_MDO_MEDICAID_PMT	S_OTH_MEDICAID_PMT
S_MDO_MEDICAID_FFS_PMT	S_OTH_MEDICAID_FFS_PMT
S_MDO_MEDICAID_BENE_PMT	S_OTH_MEDICAID_BENE_PMT
S_MDO_MEDICAID_BENE_FFS_PMT	S_OTH_MEDICAID_BENE_FFS_PMT

**d. Utilization.** Total Medicaid utilization, as well as detailed information regarding the settings of care which were used, is summarized using many variables at the person-level. The source data for these variables are the MAX claims files (i.e., IP, LT, OT and RX). All variables within this category (utilization) have a “U\_” prefix for the variable name.

Utilization is stratified primarily using seven types of service categorizations; refer to Table 4 for more information regarding the Medicaid service type variables. Each of the utilization variables below has monthly variables to allow for calculation of setting-specific per-member-per-month (PMPM) statistics:

**U\_MEDICAID\_IP\_DAYS\_FFS1 - U\_MEDICAID\_IP\_DAYS\_FFS12** – monthly variables to indicate the number of Medicaid covered days in an acute inpatient hospital setting during the month (i.e., using the MAX IP variable MDCD\_CVRD\_IP\_DAYS). To calculate days, we use the ending date for the final claim for the stay to decide which of the monthly files will hold the data for the stay (e.g., if a beneficiary has a hospital stay that begins in March and ends in April, all of these days will be counted and appear only in the April variable [i.e., U\_MEDICAID\_IP\_DAYS\_FFS4 variable]). Because days apply to the stay, and are

not parceled out based on when the particular days occurred, the count of days may be greater than the number of calendar days in the month.

**U\_MEDICAID\_NURS\_FAC\_FFS1 - U\_MEDICAID\_NURS\_FAC\_FFS12** – monthly variables to indicate the number of claims for institutional nursing facility services (i.e., where SRVC\_3 = “MDCD\_FFS\_LTI\_NFS”) during the month.

**U\_MEDICAID\_HH\_VST\_FFS1 - U\_MEDICAID\_HH\_VST\_FFS12** – monthly variables to indicate the number of lines of data (e.g., generally but not always a claim) for home health services (i.e., where SRVC\_3 = “MDCD\_FFS\_LTI\_HH\_W” or “MDCD\_FFS\_LTI\_HH\_NW”) during the month.

*Note:* There may be many visits per claim; it is not possible to accurately count the number of visits for all Medicaid HH claims; therefore this variable is at the MAX OT file line-level (i.e., does not represent visits).

**U\_MEDICAID\_PCS\_VST\_FFS1 - U\_MEDICAID\_PCS\_VST\_FFS12** – monthly variables to indicate the number of lines of data (e.g., generally but not always a claim) for personal care services (PCS) (i.e., where SRVC\_3 = “MDCD\_FFS\_LTI\_PCS\_W” or “MDCD\_FFS\_LTI\_PCS\_NW”) during the month.

*Note:* There may be many visits per claim; it is not possible to accurately count the number of visits for all Medicaid PCS claims; therefore this variable is at the MAX OT file line-level (i.e., does not represent visits).

**U\_MEDICAID\_IER\_VST\_1 - U\_MEDICAID\_IER\_VST\_12** – monthly variables to indicate the number of visits to an institutional emergency room (i.e., where SRVC\_3 = “MDCD\_FFS\_ACUTE\_IP”) during the month. Inpatient revenue center codes related to the claims used to identify Emergency Room care include 0450, 0451, 0452, 0456, 0459.

*Note:* Some states (e.g., NY) do not use revenue center codes on their Medicaid claims. This variable will not capture ER visits for those states.

**U\_MEDICAID\_OER\_VST\_1 - U\_MEDICAID\_OER\_VST\_12** – monthly variables to indicate the number of visits to the hospital outpatient emergency department (i.e., SRVC\_3 = “MDCD\_FFS\_ACUTE\_HOP”) during the month. Outpatient revenue center codes related to the claims used to identify Emergency Room care include 0450, 0451, 0452, 0456, 0459.

*Note:* Some states (e.g., NY) do not use revenue center codes on their Medicaid claims. This variable will not capture ER visits for those states.

**U\_MEDICAID\_DRUG\_RX\_FFS1 - U\_MEDICAID\_DRUG\_RX\_FFS12** – monthly variables to indicate the number of filled prescriptions during the month (i.e., where SRVC\_2 = “MDCD\_FFS\_DRUG”).

A series of variables breaks down the total Medicaid utilization into strata based on whether the person was full benefit, partial benefit, QMB-only, Medicaid-only, or other. These five variables for each of the seven care settings result in a total of 35 additional ways to look at use. Each of these 35 variables is an annual summary of use (e.g., day or visit counts).

Full Benefit Dual (FD)	Partial Benefit Dual (PD)	QMB-only Dual (QMB)
U_FD_MEDICAID_IP_DAYS	U_PD_MEDICAID_IP_DAYS	U_QMB_MEDICAID_IP_DAYS
U_FD_MEDICAID_NURS_FAC	U_PD_MEDICAID_NURS_FAC	U_QMB_MEDICAID_NURS_FAC
U_FD_MEDICAID_HH_VST_CNT	U_PD_MEDICAID_HH_VST_CNT	U_QMB_MEDICAID_HH_VST_CNT
U_FD_MEDICAID_PCS_VST	U_PD_MEDICAID_PCS_VST	U_QMB_MEDICAID_PCS_VST
U_FD_MEDICAID_IER_VST	U_PD_MEDICAID_IER_VST	U_QMB_MEDICAID_IER_VST
U_FD_MEDICAID_OER_VST	U_PD_MEDICAID_OER_VST	U_QMB_MEDICAID_OER_VST
U_FD_MEDICAID_DRUG_RX	U_PD_MEDICAID_DRUG_RX	U_QMB_MEDICAID_DRUG_RX

Medicaid-only (MDO)	Other (OTH)
U_MDO_MEDICAID_IP_DAYS	U_OTH_MEDICAID_IP_DAYS
U_MDO_MEDICAID_NURS_FAC	U_OTH_MEDICAID_NURS_FAC
U_MDO_MEDICAID_HH_VST_CNT	U_OTH_MEDICAID_HH_VST_CNT
U_MDO_MEDICAID_PCS_VST	U_OTH_MEDICAID_PCS_VST
U_MDO_MEDICAID_IER_VST	U_OTH_MEDICAID_IER_VST
U_MDO_MEDICAID_OER_VST	U_OTH_MEDICAID_OER_VST
U_MDO_MEDICAID_DRUG_RX	U_OTH_MEDICAID_DRUG_RX

### 3. Chronic / Clinical Condition File

Dataset Name= Linked\_contition\_summary\_2008.sas7bdat  
Record Count = 53,378,722

The MMLEADS Linked Condition Summary File is a person-level file which contains variables used to indicate the presence of treatment for common or chronic conditions using claims-based algorithms (as a proxy for evidence of the presence of a condition). This information is present for all people in MMLEADS, regardless of whether the person has any of the conditions.

This data file contains the unique person identifier called the beneficiary ID (**BENE\_ID**). For people without a BENE\_ID, the **MSIS\_ID** and state code (**STATE\_CD**) for the state where the person was enrolled in Medicaid (i.e., the MAX data variable STATE\_CD) are available to identify a unique person within each state for the year. It is important to note that this level of aggregation is the same as what is used in the Medicare Beneficiary MMLEADS file, however it is a rolled-up person-level version of the Medicaid Beneficiary MMLEADS file (which is at the “enrollee” level where a person could have a record for each state where Medicaid benefits were received during the year). Individuals are flagged as having a condition regardless of the state of residence during the year. An individual may have an outpatient claim indicating diabetes while living in CA the first 3 months of the year and a second outpatient claim for diabetes while living in AZ. The individual would be identified as having diabetes regardless of the state of residence since the claim criteria for the condition was met.

The MMLEADS Condition Summary File includes the 27 CCW Medicare common and chronic conditions which were developed by CMS using a multi-stage process. Initially, ResDAC used CMS and other national data sources to identify candidate conditions

which could be coded using claims-based algorithms. Next, extensive literature reviews were conducted to gather code sets for each candidate condition. Finally, CMS engaged other Federal agencies in a series of conversations to vet the proposed category definitions.

The MMLEADS Condition Summary File also contains nine mental health and tobacco use clinical conditions developed specifically to enhance research of the Medicare-Medicaid population (listed in Table 2 below).

The chronic condition variables consider administrative claims criteria, FFS versus managed care coverage criteria, and specified look-back time periods from which to observe a pattern of care. The claims criteria consider variations of the following:

- ICD-9, Current Procedural Terminology (CPT) 4, or Healthcare Common Procedure Coding System (HCPCS) codes
- Claim type(s) and count(s)
- Date(s) of service (e.g., claim thru dates [CLM\_THRU\_DT] at least one day apart)

The coverage criteria consider variations of Medicare Parts A, B, and HMO coverage; similarly, they consider variations in Medicaid FFS and Managed care coverage. The specified time periods, or *reference time periods*, consider the length of time during which the clinical and coverage criteria are considered. The condition algorithms use calendar years as the basis for the reference years (e.g., 2008 data files with a variable for a condition algorithm with one-year reference period includes services between 01/01/08-12/31/08). To be classified as meeting the coverage criteria, the person had to be covered for all 12 months of the reference year – or if the person died during this time frame, the person needed to have coverage all months alive (i.e., if the condition had a reference time period of 2 years, then the person had to have 24 months of FFS coverage), and have FFS coverage which would allow for observation of the claims of interest. For example, for the Medicare variables for a condition using a one-year reference time period, the value “coverage met” means that the person had Medicare FFS for all 12 months of the year (or all months alive during the year). If the value indicates coverage is not met, then the person had 11 or fewer months of FFS coverage, or no FFS coverage at all during the year. If the data file user wishes to use the “COMBINED” variables, which consider both Medicare and Medicaid, it is important to note that “coverage met” means all 12 months of BOTH Medicare and Medicaid FFS.

The values for each of the variables indicate whether the person received services during the time frame to designate treatment for the condition (i.e., based on the FFS administrative claims pattern, the person likely is being treated for the condition – or not). The reference time period is the look-back period during which the other criteria must be met. It is possible for a person to meet the claims criteria for a given year and not the next year.

The following are valid values for each of the condition variables:

- 0 Neither claims nor coverage met
- 1 Claims met, coverage not met
- 2 Claims not met, coverage met
- 3 Claims and coverage met

Three variables are present for each of the conditions to represent different payer perspectives:

- using only Medicare claims
- using only Medicaid claims
- using a combination of Medicare and Medicaid claims

The denominator for each variable in this file is the same. If a person is not eligible for Medicare, then all values for the Medicare versions of the conditions will =0; similarly, for people not enrolled in Medicaid, all values for the Medicaid versions of the conditions will =0.

There are three variables for each of the 36 conditions created using Medicare claims, Medicaid claims, or both type of claims. These three payer perspectives for identifying the condition sum to 108 condition variables in the file.

**Table 2. Condition Variables**

27 CCW conditions	Combined claims	Medicaid-only claims	Medicare-only claims
Acquired Hypothyroidism	<b>HYPHY_COMBINED</b>	<b>HYPHY_MEDICAID</b>	<b>HYPHY_MEDICARE</b>
Acute Myocardial Infarction	<b>AMI_COMBINED</b>	<b>AMI_MEDICAID</b>	<b>AMI_MEDICARE</b>
Alzheimer's Disease	<b>ALZ_COMBINED</b>	<b>ALZ_MEDICAID</b>	<b>ALZ_MEDICARE</b>
Alzheimer's or Related Dementia	<b>ALZRDSD_COMBINED</b>	<b>ALZRDSD_MEDICAID</b>	<b>ALZRDSD_MEDICARE</b>
Anemia	<b>ANEMIA_COMBINED</b>	<b>ANEMIA_MEDICAID</b>	<b>ANEMIA_MEDICARE</b>
Asthma	<b>ASTHMA_COMBINED</b>	<b>ASTHMA_MEDICAID</b>	<b>ASTHMA_MEDICARE</b>
Atrial Fibrillation	<b>AFIB_COMBINED</b>	<b>AFIB_MEDICAID</b>	<b>AFIB_MEDICARE</b>
Benign Prostatic Hyperplasia	<b>HYPPLA_COMBINED</b>	<b>HYPPLA_MEDICAID</b>	<b>HYPPLA_MEDICARE</b>
Cataract	<b>CAT_COMBINED</b>	<b>CAT_MEDICAID</b>	<b>CAT_MEDICARE</b>
Chronic Kidney Disease (CKD)	<b>CKD_COMBINED</b>	<b>CKD_MEDICAID</b>	<b>CKD_MEDICARE</b>
Chronic Obstructive Pulmonary Disease (COPD)	<b>COPD_COMBINED</b>	<b>COPD_MEDICAID</b>	<b>COPD_MEDICARE</b>
Heart Failure	<b>CHF_COMBINED</b>	<b>CHF_MEDICAID</b>	<b>CHF_MEDICARE</b>
Depression	<b>DEPR_COMBINED</b>	<b>DEPR_MEDICAID</b>	<b>DEPR_MEDICARE</b>
Diabetes	<b>DIAB_COMBINED</b>	<b>DIAB_MEDICAID</b>	<b>DIAB_MEDICARE</b>
Glaucoma	<b>GLCM_COMBINED</b>	<b>GLCM_MEDICAID</b>	<b>GLCM_MEDICARE</b>
Hip/Pelvic Fracture	<b>HFRAC_COMBINED</b>	<b>HFRAC_MEDICAID</b>	<b>HIRAC_MEDICARE</b>
Hyperlipidemia	<b>HYPLIP_COMBINED</b>	<b>HYPLIP_MEDICAID</b>	<b>HYPLIP_MEDICARE</b>
Hypertension	<b>HYPTEN_COMBINED</b>	<b>HYPTEN_MEDICAID</b>	<b>HYPTEN_MEDICARE</b>
Ischemic Heart Disease	<b>IHD_COMBINED</b>	<b>IHD_MEDICAID</b>	<b>IHD_MEDICARE</b>
Osteoporosis	<b>OST_COMBINED</b>	<b>OST_MEDICAID</b>	<b>OST_MEDICARE</b>
Rheumatoid/Osteoarthritis	<b>RAOA_COMBINED</b>	<b>RAOA_MEDICAID</b>	<b>RAOA_MEDICARE</b>
Stroke	<b>STRK_COMBINED</b>	<b>STRK_MEDICAID</b>	<b>STRK_MEDICARE</b>
Breast Cancer	<b>BRC_COMBINED</b>	<b>BRC_MEDICAID</b>	<b>BRC_MEDICARE</b>
Colorectal Cancer	<b>CRC_COMBINED</b>	<b>CRC_MEDICAID</b>	<b>CRC_MEDICARE</b>
Lung Cancer	<b>LNGC_COMBINED</b>	<b>LNGC_MEDICAID</b>	<b>LNGC_MEDICARE</b>
Prostate Cancer	<b>PRC_COMBINED</b>	<b>PRC_MEDICAID</b>	<b>PRC_MEDICARE</b>
Endometrial Cancer	<b>ENDC_COMBINED</b>	<b>ENDC_MEDICAID</b>	<b>ENDC_MEDICARE</b>

Mental Health, Tobacco, Physical and Mental Disability Conditions	Combined claims	Medicaid-only claims	Medicare-only claims
Conduct Disorders and Hyperkinetic Syndrome	<b>ACP_COMBINED</b>	<b>ACP_MEDICAID</b>	<b>ACP_MEDICARE</b>
Anxiety Disorders	<b>ANXI_COMBINED</b>	<b>ANXI_MEDICAID</b>	<b>ANXI_MEDICARE</b>
Bipolar Disorder	<b>BIPL_COMBINED</b>	<b>BIPL_MEDICAID</b>	<b>BIPL_MEDICARE</b>
Depressive Disorders	<b>DEPSN_COMBINED</b>	<b>DEPSN_MEDICAID</b>	<b>DEPSN_MEDICARE</b>
Personality Disorders	<b>PSDS_COMBINED</b>	<b>PSDS_MEDICAID</b>	<b>PSDS_MEDICARE</b>
Post-traumatic Stress Disorder (PTSD)	<b>PTRA_COMBINED</b>	<b>PTRA_MEDICAID</b>	<b>PTRA_MEDICARE</b>
Schizophrenia	<b>SCHI_COMBINED</b>	<b>SCHI_MEDICAID</b>	<b>SCHI_MEDICARE</b>
Schizophrenia and Other Psychotic Disorders	<b>SCHIOT_COMBINED</b>	<b>SCHIOT_MEDICAID</b>	<b>SCHIOT_MEDICARE</b>
Tobacco Use Disorders	<b>TOBA_COMBINED</b>	<b>TOBA_MEDICAID</b>	<b>TOBA_MEDICARE</b>
Autism Spectrum Disorder	<b>AUTISM_COMBINED</b>	<b>AUTISM_MEDICAID</b>	<b>AUTISM_MEDICARE</b>
Cerebral Palsy	<b>CERPAL_COMBINED</b>	<b>CERPAL_MEDICAID</b>	<b>CERPAL_MEDICARE</b>
Cystic Fibrosis and Other Metabolic Developmental Disorders	<b>CYSFIB_COMBINED</b>	<b>CYSFIB_MEDICAID</b>	<b>CYSFIB_MEDICARE</b>
Epilepsy	<b>EPILEP_COMBINED</b>	<b>EPILEP_MEDICAID</b>	<b>EPILEP_MEDICARE</b>
Intellectual Disabilities and Related Conditions	<b>INTDIS_COMBINED</b>	<b>INTDIS_MEDICAID</b>	<b>INTDIS_MEDICARE</b>
Learning Disabilities and Other Developmental Delays	<b>LEADIS_COMBINED</b>	<b>LEADIS_MEDICAID</b>	<b>LEADIS_MEDICARE</b>
Mobility Impairments	<b>MOBIMP_COMBINED</b>	<b>MOBIMP_MEDICAID</b>	<b>MOBIMP_MEDICARE</b>
Multiple Sclerosis and Transverse Myelitis	<b>MULSCL_COMBINED</b>	<b>MULSCL_MEDICAID</b>	<b>MULSCL_MEDICARE</b>
Muscular Dystrophy	<b>MUSDYS_COMBINED</b>	<b>MUSDYS_MEDICAID</b>	<b>MUSDYS_MEDICARE</b>
Sensory-Deafness and Hearing Impairment	<b>HEARIMP_COMBINED</b>	<b>HEARIMP_MEDICAID</b>	<b>HEARIMP_MEDICARE</b>
Sensory – Blindness and Visual Impairment	<b>VISUAL_COMBINED</b>	<b>VISUAL_MEDICAID</b>	<b>VISUAL_MEDICARE</b>
Spina Bifida and Other Congenital Anomalies of the Nervous System	<b>SPIBIF_COMBINED</b>	<b>SPIBIF_MEDICAID</b>	<b>SPIBIF_MEDICARE</b>
Spinal Cord Injury	<b>SPIINJ_COMBINED</b>	<b>SPIINJ_MEDICAID</b>	<b>SPIINJ_MEDICARE</b>
Traumatic Brain Injury and Nonpsychotic Mental Disorders due to Brain Damage	<b>BRAINJ_COMBINED</b>	<b>BRAINJ_MEDICAID</b>	<b>BRAINJ_MEDICARE</b>
Other Developmental Delays	<b>OTHDEL_COMBINED</b>	<b>OTHDEL_MEDICAID</b>	<b>OTHDEL_MEDICARE</b>

*Note:* Data file users should consider carefully which payer perspective variables to use for analyses, particularly if examining conditions for people who may have some Medicare-Medicaid enrollment (i.e., where MME\_TYPE = 5, 4, or 3). For example, if a beneficiary meets the criteria for a Medicare condition as a “3 = Claims and coverage met” using the “\*\_MEDICARE” variables, but the person does not have Medicaid coverage during the reference time period, this same person will be classified as a “1 = Claims met, coverage not met” for the same

condition using the “\*\_COMBINED” variables. This difference in values is due to the person’s coverage criteria in the COMBINED files indicating that the person did not have BOTH Medicare and Medicaid coverage for all months in the reference period. Chapter 4 of this document demonstrates two examples for how to use the Chronic/Conditions File to achieve different study objectives (see Code Examples 2 and 4).

Data file users are cautioned that claims data are generally not available if the person is enrolled in managed care; this is always true for Medicare, and often true for Medicaid, with some state-by-state variation. Since the conditions use diagnoses on claims-based algorithms, there is not an opportunity to determine whether the managed care enrollees have been treated for the condition(s) of interest. The condition variables are designed to examine patterns of services – which serve as a proxy for indicating the person likely is receiving treatment for the condition.

Investigators are encouraged to determine whether restrictions to the study population may be appropriate (e.g., limiting the analysis of conditions to beneficiaries with FFS coverage), which can be accomplished by using the enrollment criteria variables within the Medicare Beneficiary and/or Medicaid Beneficiary files within MMLEADS. A CCW Technical Guidance paper which describes some important considerations when using the CCW conditions for calculating Medicare population statistics is available on the CCW website, under the “Analytic Guidance” tab (<http://www.ccwdata.org/analytic-guidance/index.htm>).

## B. Service-level files

The claims data, which are summarized into service-level files, indicate treatment for Medicare or Medicaid patients. To be able to describe the nature of the services received we have used the various Medicare claim types, revenue centers, and HCPCS codes to create type of service categories. For Medicaid claims, we used the MAX type of service (**MAX\_TOS**) and MSIS type of program (**MSIS\_TOP**) variables to develop service categories for describing and classifying the care.

The service types are hierarchical groupings. Service type 1 (variable called **SRVC\_1**) is a fairly broad grouping of services, service type 2 (**SRVC\_2**) is a more granular breakdown of services, and service type 3 (**SRVC\_3**), which only appears in the Medicaid files, is an even more granular breakdown of service type 2 categories. Thus, Medicare service files have two levels of service type and Medicaid files have three levels.

The source Medicare data include the following types of claims which are mapped to the service 1 (**SRVC\_1**) and service 2 (**SRVC\_2**) classifications. For Medicare, there are four **SRVC\_1** categories describing the claim type, and 22 **SRVC\_2** categories describing the care setting. These categories are listed below.

**Table 3. Medicare Service Types**

Medicare Claim Type	Service Type 1	Service Type 2	SRVC_2 Values
Inpatient	Medicare Part A	Inpatient Hospital	MDCR_IP
		Other Inpatient (Psych, other hospital)	MDCR_IP_OTH
		Other post-acute care (Inpatient Rehab, long-term hospital)	MDCR_PAC_OTH
SNF	Medicare Part A	SNF	MDCR_SNF
Hospice	Medicare Part A	Hospice	MDCR_HOSPICE
HH	Medicare Part A	Medicare HH	MDCR_HH
HOP	Medicare HOP	Outpatient Prospective Payment-paid services	MDCR_OPSP
		End Stage Renal Disease Facility	MDCR_ESRD
		Other Skilled Nursing Facility	MDCR_OSNF
		Outpatient Clinic	MDCR_CLINIC
		Outpatient Therapy (outpatient rehab and community outpatient rehab)	MDCR_THRPHY
		Community Mental Health Center (CMHC)	MDCR_CMHC
		Other – HOP	MDCR_OTH40
Carrier	Medicare Part B	Ambulatory Surgical Center (ASC)	MDCR_ASC
		Part B Drugs	MDCR_PTBDRUG
		Physician Evaluation and Management	MDCR_EM
		Procedures	MDCR_PROC
		Imaging	MDCR_IMG
		Laboratory and Testing	MDCR_LABTST
		Other Part B	MDCR_OTH
DME	Medicare Part B	DME	MDCR_DME
PDE	Medicare Part D	Medicare Part D	MDCR_PTD

The drugs obtained in a community-based setting (i.e., those not covered as part of the all-inclusive care at institutional facilities) appear as a separate service type called “Medicare Part D”. Note that some drugs are also included in the Medicare Part B benefit (i.e., SRVC\_2 = MDCR\_PTBDRUG, meaning Part B Drugs). These consist largely of injectables such as immunizations and physician-supervised infusions such as chemotherapy.

Medicaid has three service levels. The first level, service 1 (SRVC\_1) has four categories:

- 1) Medicaid nonwaiver (MDCD\_NONWAIVER)
- 2) Medicaid waiver (MDCD\_WAIVER)
- 3) Medicaid managed care (MDCD\_MC)
- 4) Other (MDCD\_OTHER) – if the service does not have a description

The service 2 variable (**SRVC\_2**) for Medicaid describes the acuity or circumstances of care using six broad categories:

- 1) Acute hospitalization, outpatient hospital, physician or other practitioner treatment, laboratory tests or imaging (MDCD\_FFS\_ACUTE)
- 2) Long term care – institutional or facility-based (MDCD\_FFS\_LTI)
- 3) Long-term care – non-institution-based, including personal care services and durable medical equipment (MDCD\_FFS\_LTN)
- 4) Drugs, which are not included in the per diem payments for facility care (MDCD\_FFS\_DRUG)
- 5) Managed care (MDCD\_MC)
- 6) Other (MDCD\_OTHER)

The service 3 (**SRVC\_3**) variable describes the type of service using a combination of the Medicaid type of service variable (MAX variable MAX\_TOS) and the type of program variable (MAX variable MSIS\_TOP). The setting primary comes from the MAX\_TOS variable; however the determination regarding whether the service is provided through a waiver or not is derived from the MSIS\_TOP variable. Service 3 categories for Medicaid are displayed in Table 4 below.

**Table 4. Medicaid Service Types**

<b>Medicaid Service Levels</b>			
<b>SRVC_3 TOS and Description</b>	<b>SRVC_3 Values</b>	<b>SRVC_2</b>	<b>SRVC_1</b>
01 INPATIENT HOSPITAL	MDCD_FFS_ACUTE_IP	MDCD_FFS_ACUTE	MDCD_NON WAIVER
11 OUTPATIENT HOSPITAL	MDCD_FFS_ACUTE_HOP		
08 PHYSICIAN	MDCD_FFS_ACUTE_PHYS		
12 CLINIC	MDCD_FFS_ACUTE_OTH_CLINIC		
37 NURSE PRACTITIONER SERVICES	MDCD_FFS_ACUTE_OTH_NP		
36 NURSE MIDWIFE SERVICES	MDCD_FFS_ACUTE_OTH_NMW		
10 OTHER PRACTITIONERS	MDCD_FFS_ACUTE_OTH_OTHPRC		
53 PSYCHIATRIC SERVICES	MDCD_FFS_ACUTE_OTH_PSYC		
09 DENTAL	MDCD_FFS_ACUTE_OTH_DENTAL		
15 LAB X-RAY	MDCD_FFS_ACUTE_OTH_LABX		
34 PT, OT, SPEECH, HEARING SERVICES	MDCD_FFS_ACUTE_OTH_THERAPY		
24 STERILIZATIONS	MDCD_FFS_ACUTE_OTH_STERL		
19 OTHER SERVICES	MDCD_FFS_ACUTE_OTH_MISC		
25 ABORTIONS	MDCD_FFS_ACUTE_OTH_ABORT		
39 RELIGIOUS NON-MEDICAL HEALTH CARE INSTITUTIONS	MDCD_FFS_ACUTE_OTH_RELIG		
99 UNKNOWN	MDCD_FFS_ACUTE_OTH_UNKW		
02 MENTAL HOSPITAL SERVICES FOR THE AGED	MDCD_FFS_LTI_IMD	MDCD_FFS_LTI	MDCD_NON WAIVER
04 INPATIENT PSYCHIATRIC FACILITY FOR INDIVIDUALS UNDER THE AGE OF 21	MDCD_FFS_LTI_IPF		
07 NURSING FACILITY SERVICES (NFS) - ALL OTHER	MDCD_FFS_LTI_NFS		
05 INTERMEDIATE CARE FACILITY (ICF) FOR INDIVIDUALS WITH INTELLECTUAL DISABILITIES	MDCD_FFS_LTI_ICF		
13 HOME HEALTH, nonwaiver	MDCD_FFS_LTI_HH_NW	MDCD_FFS_LTN	MDCD_NON WAIVER
13 HOME HEALTH, waiver	MDCD_FFS_LTI_HH_W		MDCD_WAIVER
35 HOSPICE BENEFITS, nonwaiver	MDCD_FFS_LTI_HOS_NW		MDCD_NON WAIVER
35 HOSPICE BENEFITS, waiver	MDCD_FFS_LTI_HOS_W		MDCD_WAIVER

Medicaid Service Levels (Table 4 continued)			
SRVC_3 TOS and Description	SRVC_3 Values	SRVC_2	SRVC_1
52 RESIDENTIAL CARE, nonwaiver	MDCD_FFS_LTI_RC_NW	MDCD_FFS_LTN	MDCD_NON WAIVER
52 RESIDENTIAL CARE, waiver	MDCD_FFS_LTI_RC_W		MDCD_WAIVER
33 REHABILITATIVE SERVICES, nonwaiver	MDCD_FFS_LTI_REHAB_NW		MDCD_NON WAIVER
33 REHABILITATIVE SERVICES, waiver	MDCD_FFS_LTI_REHAB_W		MDCD_WAIVER
38 PRIVATE DUTY NURSING, nonwaiver	MDCD_FFS_LTI_PDN_NW	MDCD_FFS_LTN	MDCD_NON WAIVER
38 PRIVATE DUTY NURSING, waiver	MDCD_FFS_LTI_PDN_W		MDCD_WAIVER
30 PERSONAL CARE SERVICES, nonwaiver	MDCD_FFS_LTI_PCS_NW		MDCD_NON WAIVER
30 PERSONAL CARE SERVICES, waiver	MDCD_FFS_LTI_PCS_W		MDCD_WAIVER
54 ADULT DAY CARE, nonwaiver	MDCD_FFS_LTI_ADC_NW	MDCD_FFS_LTN	MDCD_NON WAIVER
54 ADULT DAY CARE, waiver	MDCD_FFS_LTI_ADC_W		MDCD_WAIVER
31 TARGETED CASE MANAGEMENT, nonwaiver	MDCD_FFS_LTI_TCM_NW		MDCD_NON WAIVER
31 TARGETED CASE MANAGEMENT, waiver	MDCD_FFS_LTI_TCM_W		MDCD_WAIVER
26 TRANSPORTATION SERVICES, nonwaiver	MDCD_FFS_LTI_TS_NW	MDCD_FFS_LTN	MDCD_NON WAIVER
26 TRANSPORTATION SERVICES, waiver	MDCD_FFS_LTI_TS_W		MDCD_WAIVER
51 DURABLE MEDICAL EQUIPMENT AND SUPPLIES , nonwaiver	MDCD_FFS_LTI_DME_NW	MDCD_FFS_LTN	MDCD_NON WAIVER
51 DURABLE MEDICAL EQUIPMENT AND SUPPLIES , waiver	MDCD_FFS_LTI_DME_W		MDCD_WAIVER
16 Prescribed Drugs	MDCD_FFS_DRUG	MDCD_FFS_DRUG	MDCD_NON WAIVER
.	MDCD_OTHER	MDCD_OTHER	MDCD_OTHER
20 CAPITATED PAYMENTS TO HMO OR HIO PLAN	MDCD_MC_HMO	MDCD_MC	MDCD_MC
22 CAPITATED PAYMENTS FOR PRIMARY CARE CASE MANAGEMENT - PCCM	MDCD_MC_PCCM		
21 CAPITATED PAYMENTS TO PREPAID HEALTH PLANS - PHPs	MDCD_MC_PHP		

The scope of benefits potentially available through Medicaid is much broader than what is offered in Medicare; therefore data users should be cautious when comparing volume and costs of services between the two payers since the scope of services is not comparable.

Chapter 4 of this document demonstrates two examples for how to use the service variables to describe the nature of services received (see Code Example 4) or how to explore utilization for a specific service setting (see Code Example 5).

## 1. Medicare Service-Level File

Dataset Name= medicare_service_2008.sas7bdat Record Count = 220,383,942
--

A claim may consist of multiple services, which we have indicated using the service type variables described in Table 3, above. The Medicare Service-Level File splits up claims into distinct types of services (i.e., using the most granular service type – SRVC\_2), then aggregates these in various ways. There is one record per person per type of service 2 used during the year. Data for each row are aggregated across services so that each row of data could be describing multiple medical encounters. The source data for this file are all Medicare A, B, and D claims.

There are many variables within the file which are useful for describing Medicare cost and use by setting or service type, as well as summarizing total per person (per capita) or per member per month (PMPM) spending and utilization.

The file contains the unique person identifier called the beneficiary ID (**BENE\_ID**). There will be at least one row of data for each person in the Medicare MMLEADS Files, even if there was no utilization during the year (i.e., this file allows for calculation of both per capita statistics and per user statistics).

**SRVC\_1** – Service level 1 category; Medicare claim type for the service. Refer to Table 3 above.

**SRVC\_2** – Service level 2 category; setting of care. Refer to Table 3 above.

**a. Counter variables.** A series of counter variables appear in the data file to allow for construction of numerators and denominators for population-level or per user statistics. Investigators are reminded that all people in the Medicare Beneficiary File have at least one record in this Medicare Service File, even if the person did not have any service utilization. In addition to the variable descriptions which appear below, there is an illustrative example of the relationship between these particular service and count variables below, as well as a SAS® coding example in Chapter 4.

**BENE\_CNT** – beneficiary count. Variable to use for obtaining a beneficiary count to calculate per capita statistics. This value is a proportion indicating the relative value of each row of data in comprising the total number of service lines of data at the beneficiary level. If there are  $x$  rows of data, the BENE\_CNT for each row of data is  $1/x$ , so that sum of all rows = 1.0 for each person in the Medicare Service-level File. Note that this variable is most valuable when the file contains the entire study population of interest (i.e., it indicates the population denominator). If select service types are used rather than the entire population in the service file, the BENE\_CNT variable will lead to inaccurate results. Refer to Coding Example 5 in Chapter 4.

**USER1\_CNT** – user 1 count. Variable to use for obtaining a count of all the different SRVC\_1 settings used by the beneficiary during the year. This value is a proportion indicating the relative weight of each row of data in comprising the total number of SRVC\_1 lines; if an individual has services for  $y$  subcategories of SRVC\_1 (indicated by SRVC\_2) the relative weight for each row is  $1/y$ . The sum of all rows for USER\_1 is equal to 1.0 for each person\*SRVC\_1 combination in the Medicare Service-level File.

**USER2\_CNT** – user 2 count. Variable to use for obtaining a count of all the different SRVC\_2 settings used by the beneficiary during the year. Since the lowest level of detail contained in the Medicare Service file is SRVC\_2, individuals who have utilization will have a value of 1.0 for SRVC\_2.

An example of how data appear in the service file is below. There may be multiple service1 types (i.e., SRVC\_1) across rows of data since each row is a person\*service2 (BENE\_ID by SRVC\_2) combination. Several “count”, variables, each of which is a proportion, are helpful when counting the number of Medicare beneficiaries who used each service type 1 or 2. For example, if there are six rows of data for a person in this file, it means there are six different service 2 classifications used by the person during the year. In order to summarize the service 1 types used during the year, this USER1\_CNT variable is used. To calculate statistics at a user-level (e.g., per capita), the BENE\_CNT is used.

Beneficiary	SRVC_2	USER2_CNT	SRVC_1	USER1_CNT	BENE_CNT
LMNOP	MDCR_OPPS	1.0	MDCR_HOP	.5	.166
LMNOP	MDCR_OTH40	1.0	MDCR_HOP	.5	.166
LMNOP	MDCR_LABTST	1.0	MDCR_PTB	.33	.166
LMNOP	MDCR_IMG	1.0	MDCR_PTB	.33	.166
LMNOP	MDCR_EM	1.0	MDCR_PTB	.33	.166
LMNOP	MDCR_PTD	1.0	MDCR_PTD	1.0	.166
Sum		6.0		3.0	1.0

An example illustrating use of these variables for calculating population statistics, along with sample SAS<sup>®</sup> analytic code, is presented later in this document (see Chapter 4, Coding Example 3).

**b. Medicare Payments.** These variables are parallel to the payment variables found in the Medicare Beneficiary File. Within this file we can stratify monthly variables by service type to look at detailed payment and use information (e.g., monthly payments for hospitalizations or Part D drugs). Monthly variables allow for calculation of PMPM payments. There are three components of payments – each of which appears in a separate variable.

**MEDICARE\_PMT\_1 - MEDICARE\_PMT\_12** -- the total Medicare payments for the month, including the Medicare-paid amount for all Part A and B services, and the low-income subsidy amounts (i.e., the CCW variable LICS\_AMT) and Part D plan-covered amounts (CVRD\_D\_PLAN\_PD\_AMT) for Part D drugs.

*Note:* For beneficiaries with MA rather than FFS Medicare, the payments for Part D drugs may be the only values observed in these variables (i.e., for Part D all PDEs are present whether the person is enrolled in a stand-alone prescription drug plan or a MA-PD plan). These monthly variables are identical to the S\_MEDICARE\_PMT\_1 - S\_MEDICARE\_PMT\_12 variables in the Medicare Beneficiary File.

**MEDICARE\_BENE\_PMT\_1 - MEDICARE\_BENE\_PMT\_12** – includes the beneficiary responsibility for all services received in the month, including the deductible and coinsurance amounts. Totals for all Medicare Part A, B and Part D are included. For Medicare Part D patient amounts, four fields are considered: the PTNT\_AMT + OTHR\_TROOP\_AMT + LICS\_AMT + PLRO\_AMT.

**MEDICARE\_COIN\_PMT\_1 - MEDICARE\_COIN\_PMT\_12** – the beneficiary coinsurance for the all claims for services during the month.

**MEDICARE\_DED\_PMT\_1 - MEDICARE\_DED\_PMT\_12** – the beneficiary deductible for all claims for services during the month.

*Note:* The Medicare Beneficiary File contains variables called S\_MEDICARE\_BENE\_PMT\_1 - S\_MEDICARE\_BENE\_PMT\_12, which are calculated as the sum of the coinsurance and deductible variables in this file (i.e., the  $S\_MEDICARE\_BENE\_PMT_1 = MEDICARE\_COIN\_PMT_1 + MEDICARE\_DED\_PMT_1$ ).

Medicare Payments (Spending). The file contains two perspectives on payment: 1) Medicare paid, and 2) beneficiary paid (includes coinsurance and deductibles). Monthly spending for each person was compared to their monthly MME classification. Then, the payments for each of the MME classifications were summed for the year. For example, if a person had 3 months as a partial dual and 9 months as a full dual, the corresponding payments for the PD months would appear in the PD annual summary variables (e.g., S\_PD\_MEDICARE\_PMT), and the payments for FD months would appear in the FD annual summary variables (e.g., S\_FD\_MEDICARE\_PMT). Two perspectives on spending are present – the Medicare portion of the payment and the beneficiary portion of the payment. The five MME types are used to break down the total Medicare payments into strata. These five variables for the two types of payments results in 10 additional ways to examine payments.

MME Categorization	Medicare payments	Beneficiary payments
Full Benefit Dual (FD)	<b>FD_MEDICARE_PMT</b>	<b>FD_MEDICARE_BENE_PMT</b>
Partial Benefit Dual (PD)	<b>PD_MEDICARE_PMT</b>	<b>PD_MEDICARE_BENE_PMT</b>
QMB-only Dual (QMB)	<b>QMB_MEDICARE_PMT</b>	<b>QMB_MEDICARE_BENE_PMT</b>
Medicare-only (MRO)	<b>MRO_MEDICARE_PMT</b>	<b>MRO_MEDICARE_BENE_PMT</b>
Other (OTH)	<b>OTH_MEDICARE_PMT</b>	<b>OTH_MEDICARE_BENE_PMT</b>

Chapter 4 of this document demonstrates the payment variables which have been stratified by MME categorization (see Code Example 3).

**c. Medicare Utilization.** Summarized using monthly variables to allow for PMPM utilization statistics. Two types of monthly variables count “days” of coverage. To calculate days, we use the ending date for the final claim for the stay to decide which of the monthly files will hold the data for the stay (e.g., if a beneficiary has a hospital stay that begins in June and ends in July, all of these days will be counted and appear only in the July days count variable [i.e., MEDICARE\_DAY\_CNT\_7 variable]). Because days apply to the stay, and are not parceled out based on when the particular days occurred, the count of days may be greater than the number of calendar days in the month. Variables include:

**MEDICARE\_CLM\_CNT\_1 - MEDICARE\_CLM\_CNT\_12** – count of all FFS claims for the month, includes all settings, and all claim types (Medicare A, B, and D)

**MEDICARE\_DAY\_CNT\_1 - MEDICARE\_CLM\_CNT\_12** – count of Medicare covered and non-covered inpatient hospital days (i.e., where SRVC\_2=“MDCR\_IP”)

**MEDICARE\_COV\_DAY\_CNT\_1 - MEDICARE\_COV\_DAY\_CNT\_12** – Medicare covered inpatient hospital days (i.e., where SRVC\_2=“MDCR\_IP”)

Medicare utilization employs the same five dual categories. Use is stratified by: 1) claim count, 2) covered days count, 3) total covered and noncovered days, and 4) visit counts for HH services.

MME Category	Claim Counts	Covered Days
FD	FD_MEDICARE_CLM_CNT	FD_MEDICARE_COV_DAY_CNT
PD	PD_MEDICARE_CLM_CNT	PD_MEDICARE_COV_DAY_CNT
QMB	QMB_MEDICARE_CLM_CNT	QMB_MEDICARE_COV_DAY_CNT
MRO	MRO_MEDICARE_CLM_CNT	MRO_MEDICARE_COV_DAY_CNT
OTH	OTH_MEDICARE_CLM_CNT	OTH_MEDICARE_COV_DAY_CNT

MME Category	All days	Visit Counts
FD	FD_MEDICARE_DAY_CNT	FD_MEDICARE_VST_CNT
PD	PD_MEDICARE_DAY_CNT	PD_MEDICARE_VST_CNT
QMB	QMB_MEDICARE_DAY_CNT	QMB_MEDICARE_VST_CNT
MRO	MRO_MEDICARE_DAY_CNT	MRO_MEDICARE_VST_CNT
OTH	OTH_MEDICARE_DAY_CNT	OTH_MEDICARE_VST_CNT

## 2. Medicaid Service-Level File

Dataset Name = Medicaid_service_2008.sas7bdat
Record Count = 68,473,680

A claim may consist of multiple services, which we have indicated using the service type variables described at the beginning of Chapter 3, B (refer to Table 4). The Medicaid Service-Level File summarizes claims into distinct types of services (i.e., using the most granular service type – SRVC\_3), then aggregates these in various ways. There is one record per person per type of service used during the year. The source data for this file are all claims in the MAX files.

There are many variables within the file which are useful for describing Medicaid cost and use by setting or service type, as well as summarizing total per person (per capita) or per member per month (PMPM) spending and utilization. There will be at least one row of data for each person in the Medicaid MMLEADS Files, even if there was no utilization during the year (i.e., this file allows for calculation of both per capita statistics and per user statistics).

The file contains the unique person identifier called the beneficiary ID (**BENE\_ID**). If a person does not have a **BENE\_ID**, the **MSIS\_ID** and **STATE\_CD** can be used in combination to uniquely identify the experiences of a person within a state Medicaid program.

**SRVC\_1** – Service level 1 category; high-level categorization of services – largely whether the claim is for managed care, or FFS, or is part of a waiver. Refer to Table 4.

**SRVC\_2** – Service level 2 category; describes a general setting/type of care. Refer to Table 4.

**SRVC\_3** - Service level 3 category; describes the type of service; the most granular setting of care. Refer to Table 4.

**a. Counter variables.** A series of counter variables appear in the data file to allow for construction of numerators and denominators for population-level statistics (e.g., per capita or per user counts). In addition to the variable descriptions which appear below, there is an illustrative example of the relationship between these particular service and count variables, and coding examples in Chapter 4.

**BENE\_CNT** – beneficiary count. Variable to use to obtain a beneficiary count for calculating per capita statistics. This value is a proportion indicating the relative value of each row of data in comprising the total number of service lines of data. If there are  $x$  rows of data, the **BENE\_CNT** for each row of data is  $1/x$ , so that sum of all rows = 1.0 for each person in the Medicaid Service-level File. Note that this variable is most valuable when the file contains the entire study population of interest (i.e., it indicates the population denominator). If select service types are used rather than the entire population in the service file, the **BENE\_CNT** variable will lead to inaccurate results. Refer to Coding Example 5 in Chapter 4.

**USER1\_CNT** – user 1 count. Variable to use for obtaining a count of all the different types of SRVC\_1 settings used by the beneficiary during the year. This value is a proportion indicating the relative value of each row of data in comprising the total number of SRVC\_1 lines of data for each value of the variable. If there are y rows of data for a particular value of SRVC\_1, then each row of data is 1/y, so that the sum of all rows for USER\_1 = 1.0 for each person by SRVC\_1 combination in the Medicaid Service-level File.

**USER2\_CNT** – user 2 count. Variable to use for obtaining a count of all the different types of SRVC\_2 settings used by the beneficiary during the year. This value is a proportion indicating the relative value of each row of data in comprising the total number of SRVC\_2 lines of data for each value of the variable. If there are z rows of data for a particular value of SRVC\_2, then each row of data is 1/z, so that the sum of all rows for USER\_2 = 1.0 for each person\*SRVC\_2 combination in the Medicaid Service-level File.

**USER3\_CNT** – user 3 count. Variable to use for obtaining a count of all the different types of SRVC\_3 settings used by the beneficiary during the year. Since the lowest level of detail contained in the Medicaid Service file is SRVC\_3, individuals who have utilization will have a value of 1.0 for SRVC\_3.

There may be multiple service 1 types (i.e., SRVC\_1) and service 2 types (i.e., SRVC\_2) across rows of data since each row is a person\*service3 (BENE\_ID by SRVC\_3) combination. Several “count”, variables, each of which is a proportion, are helpful when counting the number of Medicare beneficiaries who used each service type 1, 2, or 3. For example, if there are five rows of data for a person in this file, it means there are five different service 3 classifications used by the person during the year. In order to summarize the service 2 types used during the year, this USER2\_CNT variable is used. Similarly, to summarize the service 1 types during the year, the USER1\_CNT variable is used. To calculate statistics at a user-level (e.g., per capita), the BENE\_CNT is used.

BENE_ID	SRVC_3	USER3_CNT	SRVC_2	USER2_CNT	SRVC_1	USER1_CNT	BENE_CNT
ABCD	MDCD_FFS_ACUTE_OTH_PHYC	1.0	MDCD_FFS_ACUTE	.33	MDCD_NONNW AIVER	.25	.2
ABCD	MDCD_FFS_ACUTE_OTH_LABX	1.0	MDCD_FFS_ACUTE	.33	MDCD_NONNW AIVER	.25	.2
ABCD	MDCD_FFS_ACUTE_OTH_CLINIC	1.0	MDCD_FFS_ACUTE	.33	MDCD_NONNW AIVER	.25	.2
ABCD	MDCD_FFS_DRUG	1.0	MDCD_FFS_DRUG	1.0	MDCD_NONNW AIVER	.25	.2
ABCD	MDCD_MC_PHP	1.0	MDCD_MC	1.0	MDCD_MC	1.0	.2
	Sum	5.0		3.0		2.0	1.0

In this example, in 2008 Beneficiary ABCD used five different types of services, three types of care (managed care, FFS, and Drugs), and two types of USER\_1 services (nonwaiver and managed care).

An example illustrating use of these variables for calculating population statistics, along with sample SAS<sup>®</sup> analytic code, is presented later in this document (Chapter 4, Code Example 3).

**b. Medicaid Payments.** The federal government pays states for a specified percentage of program expenditures, called the Federal Medical Assistance Percentage (FMAP). This percentage varies by state, and is 57% of expenditures on average. The federal rate (FR), which is synonymous with FMAP for the purposes of this data file, is used to calculate several of the payment variables.

**FR\_08** – Federal Rate for federal fiscal year 2008 (FFY 2008; for claims 10/1/2007 – 9/30/2008). This rate is equal to the FMAP for the state. The data in this field are provided largely for reference. These proportions come into play when determining the federal and state share of Medicaid payments.

**FR\_09** – Federal Rate for federal fiscal year 2009 (FFY 2009; for claims 10/1/2008 – 9/30/2009). This rate is equal to the FMAP for the state. The data in this field are provided largely for reference. These proportions come into play when determining the federal and state share of Medicaid payments.

*Note:* For data files from different calendar years, different FR variables will appear (e.g., for the 2007 data file, the FR\_07 and FR\_08 will be present).

There is a series of monthly variables which are parallel to the payment variables found in the Medicaid Beneficiary File. Within this Service File we can stratify monthly variables by service type to look at detailed payment and use information (e.g., monthly payments for hospitalizations or Part D drugs). Monthly variables allow for calculation of PMPM payments. There are five components of payments – each of which appears in a separate variable.

**FED\_PMT\_1 - FED\_PMT\_12** – the Federal share of total Medicaid payments for the month. This field is calculated by examining the Medicaid payment amounts on each claim (i.e., the MAX variable MDCD\_PYMT\_AMT) and multiplying by the FMAP for the state. All claims are included in these calculations, including premiums). These monthly variables are identical to the S\_FED\_PMT\_1 - S\_FED\_PMT\_12 in the Medicaid Beneficiary File.

**ST\_PMT\_1 - ST\_PMT\_12** – the state share of total Medicaid payments for the month. This field is calculated by examining the Medicaid payment amounts on each claim (i.e., the MAX variable MDCD\_PYMT\_AMT) and subtracting the federal share of the payment from each payment (i.e., removing the S\_FED\_PMT amounts from the previous variable). These monthly variables are identical to the S\_ST\_PMT\_1 - S\_ST\_PMT\_12 in the Medicaid Beneficiary File.

**MEDICAID\_PMT\_1 - MEDICAID\_PMT\_12** – the total Medicaid payments for the month. This field sums the Medicaid payment amounts on each claim (i.e., the MAX variable MDCD\_PYMT\_AMT) for the month. The source data

field includes the Medicaid portion of payments for all services, including premiums to third parties for capitated care. The payment amounts are divided into monthly variables, using the ending date of services on the claim (e.g., the SRVC\_END\_DT from the IP file). These monthly variables are identical to the **S\_MEDICAID\_PMT\_1 - S\_MEDICAID\_PMT\_12** in the Medicaid Beneficiary File.

**MEDICAID\_COIN\_PMT\_1 - MEDICAID\_COIN\_PMT\_12** – the amount on the claim which consisted of the Medicare coinsurance (e.g., MAX variable MDCR\_COINSUR\_PYMT\_AMT); summed for all claims for the month.

**MEDICAID\_DED\_PMT\_1 - MEDICAID\_DED\_PMT\_12** – the amount on the claim which consisted of the Medicare deductible (e.g., the MAX variable MDCR\_DED\_PYMT\_AMT); summed for all claims for the month.

**c. Medicaid utilization.** Summarized using monthly variables to allow for PMPM utilization statistics. Two types of monthly variables count “days” of coverage. To calculate days, we use the ending date for the final claim for the stay to decide which of the monthly files will hold the data for the stay (e.g., if a beneficiary has a hospital stay that begins in November and ends in December, all of these days will be counted and appear only in the December days count variable [i.e., MEDICAID\_DAY\_CNT\_12 variable]). Because days apply to the stay, and are not parceled out based on when the particular days occurred, the count of days may be greater than the number of calendar days in the month. Variables include:

**MEDICAID\_CLM\_CNT\_1 - MEDICAID\_CLM\_CNT\_12** – count of all FFS claims for the month, includes all settings, and all claim types.

**MEDICAID\_DAY\_CNT\_1 - MEDICAID\_DAY\_CNT\_12** – count of Medicaid covered and non-covered inpatient hospital days (i.e., where SRVC\_3=“MDCD\_FFS\_ACUTE\_IP”)

**MEDICAID\_COV\_DAY\_CNT\_1 - MEDICAID\_COV\_DAY\_CNT\_12** – count of Medicaid covered inpatient hospital days (i.e., where SRVC\_3=“MDCD\_FFS\_ACUTE\_IP”)

Medicaid Payments (Spending). Variables in the Medicaid Service–Level File allow for examination of six perspectives on payment: 1) Medicaid payment – the Federal portion, 2) Medicaid payment – the state portion, 3) total Medicaid paid, 4) total Medicaid FFS paid, 5) Beneficiary/Medicaid paid (includes coinsurance and deductibles), and 6) Beneficiary/Medicaid FFS paid. This series of variables is stratified by five MME categories: 1) full benefit, 2) partial benefit, 3) QMB-only, 4) Medicaid-only, and 5) other. Each of these 30 variables is an annual summary of spending.

MME Category	Medicaid Payment – Federal Share	Medicaid Payment – State Share	Medicaid – Total Payment	Medicaid – Total FFS Payment	Medicaid – Total Beneficiary Payment	Medicaid – Total Beneficiary FFS Payment
FD	FD_MEDICAID_PMT_FED	FD_MEDICAID_PMT_ST	FD_MEDICAID_PMT	FD_MEDICAID_FFS_PMT	FD_MEDICAID_BENE_PMT	FD_MEDICAID_BENE_FFS_PMT
PD	PD_MEDICAID_PMT_FED	PD_MEDICAID_PMT_ST	PD_MEDICAID_PMT	PD_MEDICAID_FFS_PMT	PD_MEDICAID_BENE_PMT	PD_MEDICAID_BENE_FFS_PMT
QMB	QMB_MEDICAID_PMT_FED	QMB_MEDICAID_PMT_ST	QMB_MEDICAID_PMT	QMB_MEDICAID_FFS_PMT	QMB_MEDICAID_BENE_PMT	QMB_MEDICAID_BENE_FFS_PMT
MDO	MDO_MEDICAID_PMT_FED	MDO_MEDICAID_PMT_ST	MDO_MEDICAID_PMT	MDO_MEDICAID_FFS_PMT	MDO_MEDICAID_BENE_PMT	MDO_MEDICAID_BENE_FFS_PMT
OTH	OTH_MEDICAID_PMT_FED	OTH_MEDICAID_PMT_ST	OTH_MEDICAID_PMT	OTH_MEDICAID_FFS_PMT	OTH_MEDICAID_BENE_PMT	OTH_MEDICAID_BENE_FFS_PMT

Chapter 4 of this document demonstrates how to use these payment variables which have been stratified by MME type and payment perspective (see Code Example 3).

Medicaid Utilization. This series of variables employs the same five MME categories used previously. Use is stratified by: 1) claim count, 2) total covered and noncovered days, and 3) total covered days. Each of these 15 variables is an annual summary of spending.

MME Category	FFS Claim Counts	All days	Medicaid Covered Days
FD	FD_MEDICAID_CLM_FFS	FD_MEDICAID_COV_DAYS	FD_MEDICAID_DAYS
PD	PD_MEDICAID_CLM_FFS	PD_MEDICAID_COV_DAYS	PD_MEDICAID_DAYS
QMB	QMB_MEDICAID_CLM_FFS	QMB_MEDICAID_COV_DAYS	QMB_MEDICAID_DAYS
MDO	MDO_MEDICAID_CLM_FFS	MDO_MEDICAID_COV_DAYS	MDO_MEDICAID_DAYS
OTH	OTH_MEDICAID_CLM_FFS	OTH_MEDICAID_COV_DAYS	OTH_MEDICAID_DAYS

## Chapter 4. Methods and Tips for Working with the MMLEADS Data Files

### A. Identifying the Universe of Dually Enrolled

A major objective of the MMLEADS data files is to enable investigators to easily identify people who are dually enrolled. All of the Medicare-Medicaid enrollees (i.e., all who have even a single month of dual enrollment) are included in the Medicare Beneficiary File. Since there is a single row of data for each unique person in the Medicare Beneficiary File, we recommend starting with this file to obtain population counts for the Medicare-Medicaid enrollees as well most applicable descriptive information (e.g., demographic and coverage variables). Then, for the people who only have Medicaid coverage and are not dually enrolled, the Medicaid Beneficiary File must be used.

Sample analytic code using SAS<sup>®</sup> programming language for generating counts of the universe of Medicare only, dually enrolled, and Medicaid only is below. Researchers may adapt this code to use with whatever software they prefer.

#### Code Example 1: Count the Medicare Only, Dually Enrolled and Medicaid Only

Partition the MMLEADS files into populations consisting of those enrolled only in Medicare, those dually enrolled, and those enrolled in only Medicaid. The MMLEADS files already contain variables which summarize both Medicare and Medicaid enrollment on an annual basis (e.g., E\_MME\_TYPE). The two input data sources are the Medicare Beneficiary File and the Medicaid Beneficiary File from 2008.

*Note:* The variables and variable names are the same for all years of the MMLEADS Files.

The following SAS<sup>®</sup> code uses PROC MEANS to count the number of beneficiaries who meet the three mutually-exclusive coverage groupings. In order to properly count the number of people in the Medicaid Beneficiary File, we change the missing values for BENE\_ID to a “-1” so that these records are counted in the PROC MEANS; any non-null value would suffice.

```
*Obtain the Dual and National Total Bene Counts*;

*Get Dual Counts;
proc means data=FCHC2008.medicare_beneficiary_2008 noprint;
  where e_mme_type in (5,4,3);
  output out=mdcr_dual_bene(drop=_) n(bene_id)=dual_cnt;
run;

data mdcd_only_bene mdcd_only_nobene;
  set FCHC2008.medicare_beneficiary_2008(keep=bene_id msis_id
  state_cd e_mme_type rename=(state_cd=state));
  where e_mme_type=1;
  if bene_id=. then do; bene_id=-1; output mdcd_only_nobene;end;
  else output mdcd_only_bene;
run;
```

```

proc sort data=mdcd_only_bene(keep=bene_id e_mme_type) nodupkey;
  by bene_id;
run;

data a.all_bene;
  set FCHC2008.medicare_beneficiary_2008(keep=bene_id e_mme_type)
      mdcd_only_bene mdcd_only_nobene;
run;

*National Total Bene Count;
proc means data=a.all_bene noprint;
  output out=a.all_bene_count(drop=_) n(bene_id)=total_bene_cnt;
run;

```

This code produces the following person counts:

Population	Unique Person Count
Medicare-Medicaid Eligible	8,961,506
Medicare Only	38,888,163
Medicaid Only	5,529,059
Total	53,378,728

## B. Subsetting Data to Identify a Population of Interest

From the universe of Medicare beneficiaries and Medicaid enrollees included in the MMLEADS files, you may wish to reduce the population to those who are “at risk” for the events or services of interest (i.e., those for whom we can expect to observe utilization). Not all Medicare beneficiaries are enrolled in FFS Medicare; however, these are the only types of claims that appear in the Medicare data files (note that in a few exceptions, claims for managed care enrollees will appear, for example with hospice claims). Similarly, claims data are not available if the person is enrolled in Medicaid managed care; however, there is some state-by-state variation with regard to which “encounters” appear in the data files in place of actual claims. More information about Medicare claims data for managed care enrollees is available in a ResDAC technical publication at [http://www.resdac.org/Tools/tech\\_pubs.asp](http://www.resdac.org/Tools/tech_pubs.asp). Variables within the MMLEADS files make it easy for data users to determine in which months Medicare utilization might be observed and/or in which months Medicaid utilization might be observed. It is simple to select a Medicare-Medicaid enrolled subsample using some of the value-added data fields within this data product.

Users should be cautious when requiring a certain length of Medicare or Medicaid coverage, because coverage is terminated after death. For example, if you were studying acute myocardial infarction (AMI) and wanted to examine cases for 2008, your denominator (beneficiary sample) should be restricted to those who had at least some Medicare Part A coverage (for FFS payment of the inpatient stay), but if you require a full 12 months of coverage you will lose your subjects who did not survive the AMI. The MMLEADS files have annual summary coverage variables

which consider coverage for each month of the year until death. For more information about applying coverage restrictions, please refer to a previous Technical Guidance paper available on the CCW website (<http://www.ccwdata.org/analytic-guidance/index.htm>).

Sample analytic code using SAS® for selecting a sample based on Medicare and Medicaid dual coverage is below. Throughout these examples, we retain as few rows of data and as few variables as possible to allow the programs to run as efficiently as possible.

### Code Example 2: Define a Sample of People Dually Enrolled and with FFS Coverage

Define a sample of Medicare-Medicaid enrollees who have a specified duration of Medicare A and B FFS coverage, or coverage until the month of death. These people must also have Medicaid FFS coverage. The MMLEADS files already contain variables which summarize both Medicare and Medicaid coverage on an annual basis (e.g., E\_MedicareFFS is the annual Medicare FFS summary variable). The sample code leverages these data fields to identify a study population. **In general, when the objective is to examine national level results for Medicare-Medicaid enrollees (i.e., using the annual MME\_TYPE variable), we recommend starting with the Medicare data files, as these are more straight forward with only a single row of data for each beneficiary.** The first portion of the code uses the annual coverage variables, which require a full 12 months of FFS coverage (or coverage until time of death); the second portion of code demonstrates how to create a finder file of people with the coverage of interest and then determine their condition status using the MMLEADS Conditions File. The two input data sources are the Medicare Beneficiary File and the MMLEADS Conditions File from 2008.

The following SAS® code assumes that you are developing a new data file (called *bene\_finder*) by using Medicare coverage specifications from the 2008 Medicare Beneficiary File. Then a list of the people in this file is used to extract information from the MMLEADS Conditions File.

```
*Define Population: Medicare-Medicaid Eligible and Medicare FFS
Keep only the variables necessary for this analysis*;
data bene_finder;
    set FCHC2008.medicare_beneficiary_2008(keep=bene_id e_MME_TYPE:
    e_MedicareFFS e_FD_MOS e_PD_MOS e_QMB_MOS e_MedicareOnly_MOS
    e_MedicaidOnly_MOS e_Other_MOS s_FD_: s_PD_: s_QMB_:);
    where e_MME_TYPE in (5,4,3) and e_MedicareFFS=1;
run;

*Merge with condition file to further limit population with Diabetes
combined claims met;
proc sort data= FCHC2008.linked_condition_summary_2008(keep=bene_id
DIAB_COMBINED) out=cond;
    by bene_id;
run;

data a.bene_cond;
    merge bene_finder(in=x) cond (in=y);
```

```

by bene_id;

if x and Diab_COMBINED in (1,3);
run;

```

The resulting Medicare-Medicaid enrollee subpopulation with Diabetes can be described different ways. Some results follow:

DIAB_COMBINED	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1-Claims met, coverage not met	1,095,001	48.94	1,095,001	48.94
3-Claims and coverage met	1,142,438	51.06	2,237,439	100

DIAB_MEDICARE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-Neither claims nor coverage met	4,821	0.22	4,821	0.22
1-Claims met, coverage not met	184,280	8.24	189,101	8.45
2-Claims not met, coverage met	11,599	0.52	200,700	8.97
3-Claims and coverage met	2,036,739	91.03	2,237,439	100

DIAB_MEDICAID	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0-Neither claims nor coverage met	661,890	29.58	661,890	29.58
1-Claims met, coverage not met	377,015	16.85	1,038,905	46.43
2-Claims not met, coverage met	571,574	25.55	1,610,479	71.98
3-Claims and coverage met	626,960	28.02	2,237,439	100

There are a few important things to note regarding the results of this example:

1. The population counts are the same for all 3 variables. Note that this will be the case even if one selects a Medicare only or Medicaid only population (refer to Chapter 3 A.3. for more information).
2. Individuals with values of 0 and 2 for DIAB\_MEDICARE and DIAB\_MEDICAID are dual eligible beneficiaries who would not be flagged as having the condition using claims from one payment system. 16,420 individuals would not be identified as having the condition using Medicare alone and 1,233,464 individuals would not be identified using Medicaid alone.
3. Investigators using the MMLEADS Conditions File must be cautious regarding which version of the condition variable is used – as very different information is obtained if using the “\*\_COMBINED” rather than the “\*\_MEDICARE” or “\*\_MEDICAID” versions of the same variable.
4. We have some values of ‘1’, even though we limited our population to those with Medicare FFS in 2008. This is because coding for the diabetes algorithm required a 2-year look back period. The 1s are the instances where the person had the pattern of claims – but we did not have a full 2 years of FFS. This is the reason there are so many more 1s in the DIAB\_COMBINED variable than in either of the other 2 DIAB variables.

An additional example for use of the MMLEADS Conditions File is presented in “D”, with Code Example 4 below.

### C. Merging and Aggregating Data for Medicare-Medicaid Enrollees

When examining data for Medicare-Medicaid enrollees, an understanding of all the utilization and payments can be gained by combining data from the Medicare and Medicaid data files.

There are two main options for approaching linkage of Medicare and Medicaid data. The first approach begins with Medicare beneficiaries, and then merges information regarding Medicaid service use for all who are both Medicare and Medicaid enrolled. The Medicaid information should be summarized to the BENE\_ID prior to merging with the Medicare beneficiary data. This approach is well suited for calculating national statistics, and is illustrated in Code Example 3.

An alternative approach should be used if state-level statistics regarding Medicaid are desired. This approach begins with summarizing Medicare statistics to a state level from the Medicare beneficiary file and Medicaid statistics are also summarized to a state level from the Medicaid beneficiary file. The summarized state level statistics are merged to provide state-level reports where Medicare payments are not duplicated across states when a beneficiary resides in more than one state in the year. One limitation of this analysis is that the Medicare information for a beneficiary is attributed to the state of residence at the end of the year. This approach is illustrated in Code example 5.

In the MMLEADS Beneficiary files, many of the useful payment and service use information has already been aggregated for ease of use.

#### Code Example 3: Identify All Utilization and Payment Information for Medicare-Medicaid Enrollees by Merging Files

First portion of code begins with the sample of Medicare-Medicaid enrollees who had Diabetes (from Example B above) and appends the necessary Medicaid coverage variables. The second portion of code calculates aggregate annual payments for each of the spending variables retained in the data file. The third portion of the code similarly obtains and summarizes the Medicare payment information. Finally, a variety of PMPM statistics are calculated (e.g., for FD, PD, etc.), looking at the Medicare and Medicaid payments as well as the beneficiary payments. It is important to make sure the enrollment variables and payment variables align for the PMPM calculations. For example – if we are interested in payments for FD, we will make sure the enrollment months are also for FD. The formula becomes:  $s\_FD\_TOT\_PMT/e\_FD\_MOS =$  PMPM payments for FD. This can be broken into Medicare and Medicaid PMPM payments using total payments from each system rather than the combined payment.

The following SAS® code assumes that you make use of the data file created in the previous example (called *bene\_cond*). A PROC MEANS is used to calculate population totals, which are saved as an output data file (called *a.mdc\_d\_pmt*). This file is merged with the Medicare payment information (from *bene\_cond*) and the merged file is used to calculate a variety of PMPM statistics.

\*Use **bene\_cond** file to get Medicaid payment information (caution - this is a one-to-many merge, since there may be more than one record per unique person in the Medicaid Beneficiary MMLEADS File; this is one-to-many even when using the BENE\_ID for the Medicaid Beneficiary File);

```
data mdcd_bene;
  merge a.bene_cond(in=x keep=bene_id)
        FCHC2008.medicaid_beneficiary_2008(keep=bene_id e_MME_TYPE:
        e_FD_MOS e_PD_MOS
        e_QMB_MOS e_MedicareOnly_MOS e_MedicaidOnly_MOS
        e_Other_MOS s_FD_Medicaid_FFS_PMT
        s_FD_Medicaid_BENE_FFS_PMT
        s_PD_Medicaid_FFS_PMT s_PD_Medicaid_BENE_FFS_PMT
        s_QMB_Medicaid_FFS_PMT s_QMB_Medicaid_BENE_FFS_PMT)
  ;
  by bene_id;
```

```
  if x;
```

```
run;
```

\*Aggregate Medicaid payment information to bene\_id level;

```
proc means data=mdcd_bene noprint;
  by bene_id;
  var s_;;
  output out=a.mdcd_pmt(drop=_freq_ _type_) sum(=);
run;
```

\*Merge in Medicare payment information and calculate PMPM;

```
data comb;
  merge a.bene_cond(in=x) a.mdcd_pmt;
  by bene_id;
  s_FD_tot_PMT=sum(s_FD_Medicaid_FFS_PMT,s_FD_Medicare_PMT);
  s_PD_tot_PMT=sum(s_PD_Medicaid_FFS_PMT,s_PD_Medicare_PMT);
  s_QMB_tot_PMT=sum(s_QMB_Medicaid_FFS_PMT,s_QMB_Medicare_PMT);
  s_FD_tot_BENE_PMT=sum(s_FD_Medicaid_BENE_FFS_PMT,s_FD_Medicare_BE
  NE_PMT);
  s_PD_tot_BENE_PMT=sum(s_PD_Medicaid_BENE_FFS_PMT,s_PD_Medicare_BE
  NE_PMT);
  s_QMB_tot_BENE_PMT=sum(s_QMB_Medicaid_BENE_FFS_PMT,s_QMB_Medicare
  _BENE_PMT);
```

```
run;
```

```
proc means data=comb noprint;
  var s_: e_FD_MOS e_PD_MOS e_QMB_MOS;
  output out=a.pmpm(drop=_freq_ _type_) sum(=);
```

```
run;
```

```
data a.pmpm;
  set a.pmpm;
  format FD_mdcr_pmt_pmpm PD_mdcr_pmt_pmpm QMB_mdcr_pmt_pmpm
```

```

FD_mdcr_bene_pmt_pmpm PD_mdcr_bene_pmt_pmpm
QMB_mdcr_bene_pmt_pmpm
FD_mdcd_pmt_pmpm PD_mdcd_pmt_pmpm QMB_mdcd_pmt_pmpm
FD_mdcd_bene_pmt_pmpm PD_mdcd_bene_pmt_pmpm
QMB_mdcd_bene_pmt_pmpm
s_FD_tot_PMT s_PD_tot_PMT s_QMB_tot_PMT s_FD_tot_BENE_PMT
s_PD_tot_BENE_PMT s_QMB_tot_BENE_PMT
FD_tot_pmt_pmpm PD_tot_pmt_pmpm QMB_tot_pmt_pmpm
FD_tot_bene_pmt_pmpm PD_tot_bene_pmt_pmpm
QMB_tot_bene_pmt_pmpm dollar15.2
e_FD_MOS e_PD_MOS e_QMB_MOS 8.;

```

```

FD_mdcr_pmt_pmpm=s_FD_Medicare_PMT/e_FD_MOS;
PD_mdcr_pmt_pmpm=s_PD_Medicare_PMT/e_PD_MOS;
QMB_mdcr_pmt_pmpm=s_QMB_Medicare_PMT/e_QMB_MOS;
FD_mdcr_bene_pmt_pmpm=s_FD_Medicare_bene_PMT/e_FD_MOS;
PD_mdcr_bene_pmt_pmpm=s_PD_Medicare_bene_PMT/e_PD_MOS;
QMB_mdcr_bene_pmt_pmpm=s_QMB_Medicare_bene_PMT/e_QMB_MOS;
FD_mdcd_pmt_pmpm=s_FD_Medicaid_FFS_PMT/e_FD_MOS;
PD_mdcd_pmt_pmpm=s_PD_Medicaid_FFS_PMT/e_PD_MOS;
QMB_mdcd_pmt_pmpm=s_QMB_Medicaid_FFS_PMT/e_QMB_MOS;
FD_mdcd_bene_pmt_pmpm=s_FD_Medicaid_bene_FFS_PMT/e_FD_MOS;
PD_mdcd_bene_pmt_pmpm=s_PD_Medicaid_bene_FFS_PMT/e_PD_MOS;
QMB_mdcd_bene_pmt_pmpm=s_QMB_Medicaid_bene_FFS_PMT/e_QMB_MOS;
FD_tot_pmt_pmpm=s_FD_tot_PMT/e_FD_MOS;
PD_tot_pmt_pmpm=s_PD_tot_PMT/e_PD_MOS;
QMB_tot_pmt_pmpm=s_QMB_tot_PMT/e_QMB_MOS;
FD_tot_bene_pmt_pmpm=s_FD_tot_bene_PMT/e_FD_MOS;
PD_tot_bene_pmt_pmpm=s_PD_tot_bene_PMT/e_PD_MOS;
QMB_tot_bene_pmt_pmpm=s_QMB_tot_bene_PMT/e_QMB_MOS;

```

run;

Results of running the code are contained in an output file called PMPM. The results are as follows:

	<b>PMPM</b>	<b>Medicare</b>	<b>Medicaid</b>	<b>Total</b>
<b>Full Benefit Dual</b>	<b>Claim Payment</b>	<b>\$2,385.21</b>	<b>\$1,440.00</b>	<b>\$3,825.20</b>
	<b>Bene Payment</b>	<b>\$515.67</b>	<b>\$139.66</b>	<b>\$655.33</b>
<b>QMB-only</b>	<b>Claim Payment</b>	<b>\$1,836.71</b>	<b>\$152.57</b>	<b>\$1,989.28</b>
	<b>Bene Payment</b>	<b>\$400.74</b>	<b>\$115.30</b>	<b>\$516.03</b>
<b>Partial Benefit Dual</b>	<b>Claim Payment</b>	<b>\$1,699.63</b>	<b>\$28.44</b>	<b>\$1,728.07</b>
	<b>Bene Payment</b>	<b>\$376.08</b>	<b>\$6.35</b>	<b>\$382.43</b>

This example illustrates why it is so important to combine data from both Medicare and Medicaid when describing service use or payments for Medicare-Medicaid enrollees. Using either payer perspective alone would lead to inaccurate results. This difference is true for all Medicare-Medicaid enrollees: full benefit, partial benefit, and QMB-only.

## D. Examining Services Used for Specific Populations

The following SAS® code examples illustrate how to identify the service records for the care settings of interest. Care settings are represented by the service type variables, which are found in the Medicare or Medicaid Service Level Files. Since we are using a detailed data file, we must perform some aggregations to calculate per user (i.e., for all who used a specific type of service) statistics. For this example, we have chosen a Medicare-Medicaid enrolled population, which means we are able to simply use the BENE\_ID to represent a unique person. There are instances where a single BENE\_ID may appear more than once in the Medicaid Service File (i.e., more than one BENE\_ID and STATE\_CD combination represented in the file, which means the person had Medicaid enrollment in more than one state during the year). For this type of aggregation the assumption is that there would be enrollment in only one state at a time which means no un-duplication of records is necessary for the purposes of this analysis.

We address the question of whether there are differences in specific types of service use for a population with and without the condition of interest. For example, we seek to describe the difference in inpatient payments, clinic, physician and drug spending for people with and without schizophrenia.

### Code Example 4: Demonstrate Calculation of Per User Statistics for Specific Types of Care Settings

We begin by identifying a subpopulation with a history of treatment for schizophrenia. For this example, we identify the population a bit differently than we did in Code Example 2. Here we want to know if there is an indication of the condition using either Medicare or Medicaid versions of the condition variables from the MMLEADS Condition Summary File (i.e., where the variables SCHI\_MEDICARE or SCHI\_MEDICAID=2 [met coverage criteria but did not have claims for the condition] or 3 [met coverage criteria and had claims for the condition]). Then we merge in data from the MMLEADS Medicare Beneficiary File to obtain MME type, which allows us to easily identify Medicare-Medicaid enrollees. Finally, we must use the MMLEADS Medicaid and Medicare Service Files to examine service use for those with and without schizophrenia. The sample code illustrates how to calculate per user statistics. Since the level of detail we are examining for services is SRVC\_3 for the Medicaid data, we employ the USER3\_CNT variable to tabulate usage in the settings (service 3 types) of interest; however, for the Medicare files the level of aggregation is SRVC\_2 and the corresponding USER2\_CNT variable. The final portion of the code compares use and payments between the population with and without treatment for schizophrenia.

The following SAS® code uses data elements from four of the MMLEADS Files. The first Data step uses the Linked\_condition\_Summary\_2008 file to identify people with and without schizophrenia. Next, the MEDICARE\_BENEFICIARY\_2008 file is used to identify the dual eligible population. Then the medicaid\_service\_2008 file is used to bring in information regarding spending and use of Medicaid services. We perform Proc Means to calculate Medicaid service-specific use and payments.

Similarly, we obtain spending and use information from the medicare\_service\_2008. We use Proc Means to calculate Medicare-specific use and payments. Finally, once all the necessary data have been assembled, the final Data step combined Medicare and Medicaid summary statistics for output.

**\*Define Population: Medicare-Medicaid Enrollees with Schizophrenia  
Medicare/Medicaid Condition Flag in (2,3);**

```
data temp(keep=bene_id mdcr_condition mdcd_condition);
  set FCHC2008.linked_condition_summary_2008(keep=bene_id
  schi_medicare schi_medicaid);
  where (schi_medicare in (2,3) or schi_medicaid in (2,3)) and
  bene_id>0;
```

```
  if schi_medicare=3 then
    mdcr_condition=1;
  else if schi_medicare=2 then
    mdcr_condition=0;
```

```
  if schi_medicaid=3 then
    mdcd_condition=1;
  else if schi_medicaid=2 then
    mdcd_condition=0;
```

```
run;
```

**\*Limit dual eligible population;**

```
data bene_finder(keep=bene_id mdcr_condition mdcd_condition);
  merge FCHC2008.medicare_beneficiary_2008(in=x keep=bene_id
  e_mme_type) temp(in=y);
  by bene_id;
```

```
  if x and y and e_mme_type in (5,4,3);
```

```
run;
```

**\*Merge the benes to Medicaid Service File and accumulate monthly  
payment variables;**

**\* If this analytic code is modified to include people who may have  
less than 12 months of coverage it may be prudent to accumulate only  
the payment months which correspond with the enrollment months;**

```
data mdcd_srvc(keep=bene_id srvc_3 user3_cnt medicaid_pmt
mdcr_condition mdcd_condition);
  merge FCHC2008.medicaid_service_2008(in=x keep=bene_id srvc_3
  user3_cnt Medicaid_PMT_1 - Medicaid_PMT_12) bene_finder(in=y);
  by bene_id;
```

```
  if x and y and srvc_3 in
  ('MDCD_FFS_ACUTE_IP', 'MDCD_FFS_LTI_IMD', 'MDCD_FFS_LTI_IPF', 'MDCD_
  FFS_ACUTE_PHYS', 'MDCD_FFS_ACUTE_HOP', 'MDCD_FFS_DRUG');
  array mdcd_pmt(*) Medicaid_PMT_1 - Medicaid_PMT_12;
  medicaid_pmt=sum(of mdcd_pmt(*));
```

```
run;
```

```
proc sort data=mdcd_srvc;
```

```

    by srv3_3 mdc_d_condition;
run;

*Aggregate total medicaid payment by service 3 level and compare the
population with and without the condition;
proc means data=mdcd_srvc(where=(mdcd_condition in (1,0))) noprint;
    by srv3_3 mdc_d_condition;
    var user3_cnt medicaid_pmt;
    output out=a.mdc_d_srvc_exc(drop=_) sum()=;
run;

*Calculate medicaid payment per user - and output results by service
setting;
data a.mdc_d_srvc_exc;
    set a.mdc_d_srvc_exc;
    format user3_cnt 8.;
    mdc_d_pmt_per_user3=medicaid_pmt/user3_cnt;
run;

*Merge the benes to Medicare Service File and accumulate monthly
payment variables;
data mdc_r_srvc(keep=bene_id srv3_2 user2_cnt medicare_pmt
mdc_r_condition mdc_d_condition);
    merge FCHC2008.medicare_service_2008(in=x keep=bene_id srv3_2
user2_cnt Medicare_PMT_1 - Medicare_PMT_12) bene_finder(in=y);
    by bene_id;

    if x and y and srv3_2 in
    ('MDCR_IP', 'MDCR_OPSP', 'MDCR_EM', 'MDCR_PTD');
    array mdc_r_pmt(*) Medicare_PMT_1 - Medicare_PMT_12;
    medicare_pmt=sum(of mdc_r_pmt(*));
run;

proc sort data=mdc_r_srvc;
    by srv3_2 mdc_r_condition;
run;

*Aggregate total medicare payment by service 2 level and compare the
population with and without the conditon;
proc means data=mdc_r_srvc(where=(mdc_r_condition in (1,0))) noprint;
    by srv3_2 mdc_r_condition;
    var user2_cnt medicare_pmt;
    output out=a.mdc_r_srvc_exc(drop=_) sum()=;
run;

*Calculate medicare payment per user- and output results by service
setting;
data a.mdc_r_srvc_exc;
    set a.mdc_r_srvc_exc;
    format user2_cnt 8.;
    mdc_r_pmt_per_user2=medicare_pmt/user2_cnt;
run;

```

The last Data step outputs a five-variable data file which includes: SRVC\_2, MDCR\_CONDITION, USER2\_CNT MEDICARE\_PMT, MDCR\_PMT\_PER \_USER2. There is a row of data for each of the four service type by 'MEET CONDITION' categories.

MMLEADS V 1.0

The following data table illustrates the output of the final Data step as well as the corresponding Medicaid Data step (which appears earlier in the code example). When “MEET CONDITION”=1 the person had indications of schizophrenia on their claims.

Medicaid					Medicare				
SRVC_3	MEET CONDITION	USER3_CNT	MEDICAID_PMT	MDCD_PMT_PER_USER3	SRVC_2	MEET CONDITION	USER2_CNT	MEDICARE_PMT	MDCR_PMT_PER_USER2
<b>Hospitalizations</b>					<b>Hospitalizations</b>				
MDCD_FFS_ACUTE_IP	1	50,715	\$ 160,975,852.00	\$ 3,174.13	MDCR_IP	1	117,866	\$ 1,977,974,372.91	\$ 16,781.55
MDCD_FFS_ACUTE_IP	0	553,451	\$ 1,174,065,905.00	\$ 2,121.35	MDCR_IP	0	1,518,782	\$ 26,415,093,676.38	\$ 17,392.29
MDCD_FFS_LTI_IMD	1	3,970	\$ 130,829,542.00	\$ 32,954.54					
MDCD_FFS_LTI_IMD	0	4,210	\$ 52,502,348.00	\$ 12,470.87					
MDCD_FFS_LTI_IPF	1	1,735	\$ 7,797,749.00	\$ 4,494.38					
MDCD_FFS_LTI_IPF	0	1,656	\$ 5,249,994.00	\$ 3,170.29					
<b>Ambulatory Care</b>					<b>Ambulatory Care</b>				
MDCD_FFS_ACUTE_HOP	1	96,562	\$ 51,603,026.00	\$ 534.40	MDCR_OPPTS	1	312,519	\$ 516,629,339.54	\$ 1,653.11
MDCD_FFS_ACUTE_HOP	0	1,187,759	\$ 554,505,836.00	\$ 466.85	MDCR_OPPTS	0	3,724,026	\$ 5,473,952,587.90	\$ 1,469.90
MDCD_FFS_ACUTE_PHYS	1	155,937	\$ 39,993,170.00	\$ 256.47	MDCR_EM	1	415,041	\$ 681,456,773.14	\$ 1,641.90
MDCD_FFS_ACUTE_PHYS	0	2,138,892	\$ 577,204,302.00	\$ 269.86	MDCR_EM	0	4,990,173	\$ 5,904,820,927.10	\$ 1,183.29
MDCD_FFS_DRUG	1	118,225	\$ 36,384,364.00	\$ 307.76	MDCR_PTD	1	416,388	\$ 3,421,020,090.70	\$ 8,215.94
MDCD_FFS_DRUG	0	1,459,219	\$ 335,667,178.00	\$ 230.03	MDCR_PTD	0	4,985,962	\$ 20,581,145,496.27	\$ 4,127.82

The per user resource use is higher among those identified as having been treated for schizophrenia for almost every service setting; the exception is for Medicaid physician care (MDCD\_FFS\_ACUTE\_PHYS) and Medicare IP setting (MDCR\_IP).

## E. Calculating Utilization and Payment Statistics

You have many options for exploring and describing utilization. Numerous variables in the MMLEADS make it possible to classify the types of services received (i.e., service types), and the corresponding payments. There are also many options for the unit of analysis (e.g., per capita spending, PMPM spending, or per user spending). Some common methods for counting and summarizing spending and utilization are presented below. Code Example 5 demonstrates how to calculate population statistics using key features of the Beneficiary Files. Code Example 6 demonstrates use of the Service Files in obtaining detailed data to calculate payment and use statistics (i.e., an alternative method to achieve the same end result as for Code Example 5).

### Code Example 5: Use the Medicare Beneficiary and Medicaid Beneficiary MMLEADS Files to Calculate State-level Population Statistics

We begin by identifying people who were fully dual eligible with Emergency Department (ED) visits (i.e., the Medicare variables `u_FD_IER_CNT` for institutional ER care and `u_FD_OER_CNT` for outpatient ER care), and sort this information into state-specific strata, and also calculate a national total. The same analysis is then performed with the Medicaid data. ED visits are calculated per thousand Medicare, Medicaid, and then the combined, unduplicated count of enrollees. Users are reminded that some states (e.g., NY) do not use revenue center codes on their Medicaid claims, therefore information regarding ED use is not available.

The following SAS<sup>®</sup> code uses the summary ED count variables available in the Medicare and Medicaid Beneficiary MMLEADS files, and retains very few other variables in the data files. The ED visit counts are obtained from the `medicare_beneficiary_2008` file. Two `proc means` are used: 1) to sum all of the visit counts nationally, then 2) for each state. The same processing is performed using the `medicaid_beneficiary_2008` file. The last portion of the code is used to combine Medicare and Medicaid data; then the final `Data` step in the code is used to combine the information from Medicare and Medicaid and calculate the per 1,000 enrollee statistics.

```
*Medicaid/Medicare Bene File: Full Dual Institutional ER &Outpatient
ER counts per 1000 Full Duals by national and by state;
data mdcr_bene;
    set FCHC2008.medicare_beneficiary_2008(keep=bene_id e_mme_type
state_cd u_FD_IER_CNT u_FD_OER_CNT rename=(state_cd=state));
    where e_mme_type=5;
run;
*Medicare National Total Counts;
proc means data=mdcr_bene noprint;
    output out=mdcr_tot(drop=:) sum(u_FD_IER_CNT
u_FD_OER_CNT)=mdcr_fd_ier mdcr_fd_oer n(bene_id)=mdcr_cnt;
run;

*Medicare Counts by State;
proc sort data=mdcr_bene;
    by state;

run;
```

```

proc means data=mdcr_bene noprint;
  by state;
  output out=mdcr_state(drop=_) sum(u_FD_IER_CNT
u_FD_OER_CNT)=mdcr_fd_ier mdcr_fd_oer n(bene_id)=mdcr_cnt;
run;

data a.mdcr_bene_exd;
  set mdcr_tot mdcr_state;
  format state $8. mdcr_cnt mdcr_fd_er 8. mdcr_fd_er_capita 5.;

  if state='' then
    state='A-National';
  mdcr_fd_er=sum(mdcr_fd_ier,mdcr_fd_oer);
  mdcr_fd_er_capita=mdcr_fd_er/mdcr_cnt*1000;
run;

****Medicaid****;
data mdcd_bene;
  set FCHC2008.medicaid_beneficiary_2008(keep=bene_id state_cd
e_mme_type u_FD_Medicaid_IER_VST u_FD_Medicaid_OER_VST
rename=(state_cd=state));
  where e_mme_type=5;
run;

*Medicaid National Total Counts;
proc means data=mdcd_bene noprint;
  output out=mdcd_er_tot(drop=_) sum(u_FD_Medicaid_IER_VST
u_FD_Medicaid_OER_VST)=mdcd_fd_ier mdcd_fd_oer;
run;

proc sort data=mdcd_bene out=mdcd_unique_bene nodupkey;
  by bene_id;
run;

proc means data=mdcd_unique_bene noprint;
  output out=mdcd_bene_tot(drop=_) n(bene_id)=mdcd_cnt;
run;

data mdcd_tot;
  merge mdcd_er_tot mdcd_bene_tot;
run;

*Medicaid Counts by State;
proc sort data=mdcd_bene;
  by state;
run;

proc means data=mdcd_bene noprint;
  by state;
  output out=mdcd_state(drop=_) sum(u_FD_Medicaid_IER_VST
u_FD_Medicaid_OER_VST)=mdcd_fd_ier mdcd_fd_oer
n(bene_id)=mdcd_cnt;

```

```

run;

data a.mdc_d_bene_exd;
  set mdc_d_tot mdc_d_state;
  format state $8. mdc_d_cnt mdc_d_fd_er 8. mdc_d_fd_er_capita 5.;

  if state='' then
    state='A-National';
  mdc_d_fd_er=sum(mdc_d_fd_ier,mdc_d_fd_oer);
  mdc_d_fd_er_capita=mdc_d_fd_er/mdc_d_cnt*1000;
run;

*Total Unique Bene Counts by Combining Medicaid and Medicare Benes;
proc sort data=mdcr_bene;
  by bene_id state;
run;

proc sort data=mdc_d_bene;
  by bene_id state;
run;

data all_bene;
  set mdc_r_bene(keep=bene_id state) mdc_d_bene(keep=bene_id state);
  by state bene_id;
run;

proc means data=all_bene noprint;
  by state;
  output out=tot_cnt_state(drop=_) n(bene_id)=total_cnt;
run;

data all_bene_cnt;
  set tot_cnt tot_cnt_state;
  if state='' then state='A-National';
run;

data a.exd(keep=state mdc_d_fd_er mdc_d_cnt mdc_d_fd_er_capita mdc_r_fd_er
mdc_r_cnt mdc_r_fd_er_capita total_fd_er total_cnt total_fd_er_capita);
  merge a.mdc_d_bene_exd a.mdc_r_bene_exd all_bene_cnt;
  by state;
  format total_fd_er 8. total_fd_er_capita 5.;
  total_fd_er=sum(mdc_r_fd_er,mdc_d_fd_er);
  total_fd_er_capita=total_fd_er/total_cnt*1000;
run;

```

MMLEADS V 1.0

The final Data step outputs the “a.exd” data file, which is a summary data set with the following variables and values.

	Medicaid			Medicare			Medicare/Medicaid Combined		
	Medicaid FD person count	FD Medicaid Count of ER visits	Medicaid ER visits per 1,000 FD	Medicare FD person count	FD Medicare Count of ER visits	Medicare ER visits per 1,000 FD	Medicare or Medicaid FD person count	FD Combined Count of ER visits	ER visits per 1,000 FD
STATE	MDCD_CNT	MDCD_FD_ER	MDCD_FD_ER _CAPITA	MDCR_CNT	MDCR_FD_ER	MDCR_FD_ER _CAPITA	TOTAL_CNT	TOTAL_FD_ER	TOTAL_FD_ER _CAPITA
<b>National</b>	6,852,706	1,411,122	206	6,879,572	6,242,986	907	6,879,572	7,654,108	1,113
<b>AK</b>	13,692	2,630	192	13,556	13,579	1,002	27,248	16,209	595
<b>AL</b>	97,368	18,287	188	96,503	99,311	1,029	193,871	117,598	607
<b>AR</b>	74,919	60,196	803	73,277	79,206	1,081	148,196	139,402	941
<b>AZ</b>	119,309	74,106	621	118,378	61,803	522	237,687	135,909	572
<b>CA</b>	1,168,804	29,315	25	1,154,783	722,745	626	2,323,587	752,060	324
<b>CO</b>	60,010	25,815	430	59,286	49,225	830	119,296	75,040	629
<b>CT</b>	78,845	33,919	430	78,112	84,680	1,084	156,957	118,599	756
<b>DC</b>	18,703	4,144	222	17,809	20,036	1,125	36,512	24,180	662

It is apparent that there is much ED utilization paid both by Medicare and Medicaid for this Medicare-Medicaid enrolled population. An accurate quantification of utilization can be obtained by combining the pre-summarized utilization information from the Medicare Beneficiary Level File and the Medicaid Beneficiary Level File.

Users are cautioned that the sum of all of the state-level beneficiary counts for Medicaid (and, as a result, the Medicare/Medicaid combined) would be larger than the “National” count indicates in the table above. This is because for Medicaid data, we first count all people within a state (i.e., all BENE\_IDs, and if these are not available, all MSIS\_IDs within a state). However, when we roll up state-level data to obtain a national total, we unduplicate by person (i.e., we collapse and combine the information for people enrolled in Medicaid in more than one state; the person is counted only once).

## Code Example 6: Use the Medicare and Medicaid Service Files to Calculate Per Capita Spending

Code Example 4 demonstrated use of the Medicare and Medicaid Services Files to obtain setting-specific spending and use statistics. These Service Files may also be used to calculate aggregate population statistics. The BENE\_CNT variable, when used for the entire population or sample of interest and not subsetted to specific service settings, is equal to the population denominator. Code Example 6 illustrates use the BENE\_CNT variable for calculating per capita spending. Note that if the same study population were used, these methods produce the same results as the methods in Code Example 5.

For this example, we begin by using the Medicaid Service-Level File and calculating total payments and total people, then doing the same for the Medicare Service-Level File.

The following SAS® code requires use of an array to accumulate all of the monthly MEDICAID\_PMT\_MM and MEDICARE\_PMT\_MM variables. Proc Means statements are used to create small summary data sets which contain only the summarized results needed for per capita spending.

```
*Medicaid/Medicare Service File: Medicare/Medicaid Claim Payment per
Capita;
```

```
*Medicaid National Total FFS Payment and Bene Counts;
```

```
data mdcd_pmt;
  set FCHC2008.medicaid_service_2008(keep=bene_id bene_cnt srvc_1
  Medicaid_PMT_1 - Medicaid_PMT_12);
  array mdcd_pmt(*) Medicaid_PMT_1 - Medicaid_PMT_12;
  medicaid_pmt=sum(of mdcd_pmt(*));
run;
```

```
proc means data=mdcd_pmt noprint;
  output out=mdcd_pmt_tot(drop=_) sum(medicaid_pmt
  bene_cnt)=medicaid_pmt mdcd_bene_cnt;
run;
```

```
*Medicare National Total FFS Payment and Bene Counts;
```

```
data mdcr_pmt;
  set FCHC2008.medicare_service_2008(keep=bene_id bene_cnt
  Medicare_PMT_1 - Medicare_PMT_12);
  array mdcr_pmt(*) Medicare_PMT_1 - Medicare_PMT_12;
  medicare_pmt=sum(of mdcr_pmt(*));
run;
```

```
proc means data=mdcr_pmt noprint;
  output out=mdcr_pmt_tot(drop=_) sum(medicare_pmt
  bene_cnt)=medicare_pmt mdcr_bene_cnt;
run;
```

```
data bene.example_E_1;
  merge mdcd_pmt_tot mdcr_pmt_tot;
```

```
format mdc_d_bene_cnt mdc_r_bene_cnt 8. medicaid_pmt medicare_pmt
dollar15.2;
run;
```

The final Data step assembles the two small output files which resulted from the Proc Means. The resulting data are:

	Payment	Bene Count
<b>Medicaid</b>	\$191,437,940,175.00	14,662,641
<b>Medicare</b>	\$354,819,256,330.95	47,849,669

*Note:* We wish to caution investigators that these Service-Level Files do not contain information regarding which beneficiaries have FFS coverage, yet those are the only payments which are available in the Medicare data files. As a result, it may be challenging to accurately calculate per capita statistics without also accessing information from the Beneficiary Files. In the next example, we attempt this same exercise using the Beneficiary Files, which allows us to subset the population so that we count only FFS beneficiaries – and their corresponding spending.

Users are cautioned that when the BENE\_CNT variable in the Medicaid MMLEADS files is used for calculating population statistics, the count actually represents unique BENE\_ID and STATE combinations (alternatively MSIS\_ID \* STATE, if there is no BENE\_ID). That means that if a person is enrolled in Medicaid in more than one state during the year, the person is counted more than once in the Bene Count field. If one were to un-duplicate unique people in the MMLEADS files, an accurate count of people would be obtained (i.e., the value in the Bene Count [BENE\_CNT] variable would be smaller). Please refer to the next example to see a modified version of the Medicaid beneficiary counts.

### **Code Example 7: Use the Medicare and Medicaid Beneficiary-Level Files to Calculate Per Capita Spending**

Code Example 6 demonstrated the use of the Medicare and Medicaid Services Files to obtain overall per capita statistics. For this coding example, since we do not have a predefined BENE\_CNT variable in the Beneficiary Level files, we must count the number of BENE\_IDs in order to obtain the population counts (refer to Code Example 1 for more details). This example shows how to compile per capita spending overall (which matches the results from Code Example 6), then to more precisely consider per capita spending for the FFS population.

The following SAS® code begins with data from Code Example 6, and calculates overall per capita spending (output as a small SAS file (called *example\_E\_2A*). Next, we show how to be more precise about capturing FFS enrollees (using separate Data steps for the medicare\_beneficiary\_2008 and the medicaid\_beneficiary\_2008) and the corresponding FFS spending. This last part is output as a SAS file (called *example\_E\_2B*).

\*Medicaid/Medicare Service File: Medicare/Medicaid Claim Payment per Capita;

```

data a.example_E_2A;
    merge a.example_E_1 a.all_bene_count ;

    *Use the result from Example D for national unique bene counts;
    format mdcd_bene_cnt mdcr_bene_cnt total_bene_cnt 8. medicaid_pmt
    medicare_pmt total_pmt
    medicaid_pmt_capita medicare_pmt_capita total_pmt_capita
    dollar15.2;

    total_pmt=sum(medicaid_pmt,medicare_pmt);
    medicaid_pmt_capita=medicaid_pmt/mdcd_bene_cnt;
    medicare_pmt_capita=medicare_pmt/mdcr_bene_cnt;
    total_pmt_capita=total_pmt/total_bene_cnt;

run;

***Limit the population to FFS;
***Medicare***;
data mdcr_pmt_ffs;
    set FCHC2008.medicare_beneficiary_2008(keep=bene_id state_cd
    e_MedicareFFS s_Medicare_PMT_1 - s_Medicare_PMT_12
    rename=(state_cd=state)) ;
    where e_MedicareFFS=1;
    array mdcr_pmt(*) s_Medicare_PMT_1 - s_Medicare_PMT_12;
    medicare_pmt=sum(of mdcr_pmt(*));

run;

proc means data=mdcr_pmt_ffs noprint;
    output out=mdcr_pmt_ffs_tot(drop=_) sum(medicare_pmt)=
    n(bene_id)=mdcr_bene_cnt;

run;

***Medicaid***;
*In this example, we are counting the unique BENE_ID(or
MSIS_ID/STATE), different from example E part one;

data mdcd_pmt_ffs;
    set FCHC2008.medicaid_beneficiary_2008(keep=bene_id e_mme_type
    e_MedicaidFFS state_cd s_Medicaid_FFS_PMT_1 -
    s_Medicaid_FFS_PMT_12 rename=(state_cd=state)) ;
    where e_MedicaidFFS=1;
    array mdcd_pmt(*) s_Medicaid_FFS_PMT_1 - s_Medicaid_FFS_PMT_12;
    medicaid_pmt=sum(of mdcd_pmt(*));
    if bene_id=. then bene_id=-1;

run;

proc means data=mdcd_pmt_ffs noprint;
    output out=mdcd_pmt_ffs_tot(drop=_) sum(medicaid_pmt)=;

run;

```

```

***Enumerating Medicaid unique people
Distinguishing between those with (WB) and without (NB) the
BENE_ID***;

data mdc_d_wb_ffs(keep=bene_id) mdc_d_nb_ffs(keep=bene_id);
    set mdc_d_pmt_ffs(keep=bene_id e_mme_type);

    if bene_id~=-1 then
        output mdc_d_wb_ffs;
    else output mdc_d_nb_ffs;
run;

proc sort data=mdc_d_wb_ffs nodupkey;
    by bene_id;
run;

data mdc_d_bene_ffs;
    set mdc_d_wb_ffs mdc_d_nb_ffs;
run;

proc means data=mdc_d_bene_ffs noprint;
    output out=mdc_d_bene_cnt_ffs(drop=_) n(bene_id)=mdc_d_bene_cnt;
run;

data mdc_d_pmt_ffs_tot;
    merge mdc_d_pmt_ffs_tot mdc_d_bene_cnt_ffs;
run;

*National Unique FFS Bene Counts;
data wb_ffs nb_ffs;
    set mdc_r_pmt_ffs(keep=bene_id) mdc_d_bene_ffs;
    if bene_id~=-1 then output wb_ffs;
    if bene_id=-1 then output nb_ffs;
run;

proc sort data=wb_ffs nodupkey;
    by bene_id;
run;

data all_unique_bene_ffs;
    set wb_ffs nb_ffs;
run;

proc means data=all_unique_bene_ffs noprint;
    output out=ffs_tot_cnt(drop=_) n(bene_id)=total_bene_cnt;
run;

***Output per capita FFS;

data a.example_E_2B;
    merge mdc_r_pmt_ffs_tot mdc_d_pmt_ffs_tot ffs_tot_cnt;

```

```
format mdc_d_bene_cnt mdc_r_bene_cnt total_bene_cnt 8. medicaid_pmt
medicare_pmt total_pmt
medicaid_pmt_capita medicare_pmt_capita total_pmt_capita
dollar15.2;
total_pmt=sum(medicaid_pmt,medicare_pmt);
medicaid_pmt_capita=medicaid_pmt/mdcd_bene_cnt;
medicare_pmt_capita=medicare_pmt/mdcr_bene_cnt;
total_pmt_capita=total_pmt/total_bene_cnt;
run;
```

The following data table is the output from the final Data step (i.e., a.example\_E\_2B data file).

	All Benes			FFS Benes		
	Payment	Bene Count	Per Capita	Payment	Bene Count	Per Capita
<b>Medicaid</b>	\$191,437,940,175.00	14,662,641	\$13,056.17	\$96,706,192,842.00	6,044,686	\$15,998.55
<b>Medicare</b>	\$354,819,256,330.95	47,849,669	\$7,415.29	\$319,496,358,570.83	30,923,846	\$10,331.71
<b>Total</b>	\$546,257,196,505.95	53,378,728	\$10,233.61	\$416,202,551,412.83	33,041,029	\$12,596.54

It is important to note the very large change in the per capita payments for Medicare once we limited the denominator (i.e., the beneficiary count) to only those with FFS coverage. This population restriction also had an impact on the Medicaid per capita spending, but to a lesser extent – largely because of the availability of managed care premiums in the Medicaid data.

The Bene Counts for Medicaid and Total are slightly different than the Bene Counts obtained using Code Example 6. That is because a different method of aggregating the BENE\_IDs (or MSIS\_IDs if there was not a BENE\_ID) was used. The counts in this example count unique people, rather than people\*state combinations (which occurs in the Medicaid files when people live in more than one state in a given year).

## Chapter 5. Request Access / Technical Support

Potential data users must contact ResDAC for assistance in obtaining data files. These files are considered “identifiable” in that they contain information regarding treatment rendered to individual patients. A data use agreement (DUA) from CMS is required to gain access to the files.

ResDAC offers free assistance to researchers using Medicare or Medicaid data for research. Please note that ResDAC assistants are very knowledgeable about the source data from the CCW; however, they do not have insight into the nuances of this data resource. The ResDAC website provides links to descriptions of the CMS data available, request procedures, supporting documentation, such as record layouts and SAS<sup>®</sup> input statements, workshops on how to use Medicare data, and other helpful resources. Visit the ResDAC website at <http://www.resdac.org> for additional information.

The CCW website also provides data dictionaries for the data files which serve as inputs for the MMLEADS Files. There are a variety of resources available, depending on the topic of interest. Appendix B of this document identifies resources.

**Attachment A – Acronyms**

ACA	Affordable Care Act
AMI	Acute Myocardial Infarction
ASC	Ambulatory Surgical Center
BOE	Basis of Eligibility
CAH	Critical Access Hospital
CCW	Chronic Condition Data Warehouse
CHIP	Children’s Health Insurance Program
CKD	Chronic Kidney Disease
CMHC	Community Mental Health Center
CMS	Centers for Medicare & Medicaid Services
COPD	Chronic Obstructive Pulmonary Disease
CPT	Current Procedural Terminology
DE	Dually Eligible
DME	Durable Medical Equipment
DUA	Data Use Agreement
E&M	Evaluation and Management
ESRD	End-Stage Renal Disease
FFS	Fee-For-Service
FFY	Federal Fiscal Year
FMAP	Federal Medical Assistance Percentage
FR	Federal Rate
HCPCS	Healthcare Common Procedure Coding System
HH	Home Health
HIC	Health Insurance Claim
HIFA	Health Insurance and Flexibility and Accountability
HIV / AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome
HMO	Health Maintenance Organizations
HOP	Hospital Outpatient
IER	Institutional Emergency Room
IP	Inpatient
IPPS	Inpatient Prospective Payment Hospitals
LMC	Limited Managed Care
LT	Long-term Care
LTSS	Long Term Care Supports and Services
MA	Medicare Part C (Medicare Advantage)
MA-PD	Medicare Advantage-Prescription Drug
MAS	Maintenance Assistance Status
MAX	Medicaid Analytic eXtract
MMA	Medicare Modernization Act
MMCO	Medicare Medicaid Coordination Office
MME	Classification of Medicare and/or Medicaid Enrollment
MDO	Medicaid-only

MRO	Medicare-only
MSIS	Medical Statistical Information System
NF	Nursing Facility
OER	Outpatient Facility Emergency Room
OT	Other Therapy
PAC	Post-acute Care
PACE	Program of All-inclusive Care for the Elderly
PCCM	Primary Care Case Management
PCS	Personal Care Service
PDE	Part D Events
PDP	Prescription Drug Plan
PHP	Prepaid Health Plan
PMPM	Per Member Per Month
PS	Person Summary
PTSD	Post-traumatic Stress Disorder
QMB	Qualified Medicare Beneficiary
ResDAC	Research Data Assistance Center
RTI	Research Triangle Institute
RX	Drug
SLMB	Specified Low-Income Medicare Beneficiary
SNF	Skilled Nursing Facility
SSA	Social Security Administration
SSN	Social Security Number

**Attachment B – Resources List**

<b>CCW Website</b>	
Home page	<a href="http://www.ccwdata.org">http://www.ccwdata.org</a>
Data Dictionaries	<a href="http://www.ccwdata.org/web/guest/data-dictionaries">http://www.ccwdata.org/web/guest/data-dictionaries</a>
Chronic Conditions	<a href="http://www.ccwdata.org/web/guest/condition-categories">http://www.ccwdata.org/web/guest/condition-categories</a> <ul style="list-style-type: none"> <li>• 27 Chronic Conditions</li> <li>• 9 Mental Health and Tobacco Use Conditions</li> </ul>
Analytic Guidance	<a href="http://www.ccwdata.org/web/guest/technical-guidance-documentation">http://www.ccwdata.org/web/guest/technical-guidance-documentation</a> <ul style="list-style-type: none"> <li>• CCW Technical Guidance for Researchers: Calculating Population Statistics</li> <li>• CCW Technical Guidance: Getting started with MAX data</li> <li>• CCW Technical Guidance: Getting Started with CMS Administrative Research Files</li> </ul>

<b>CMS Website / Medicare.gov / Medicaid.gov</b>	
CMS home page	<a href="http://www.cms.gov">http://www.cms.gov</a>
Duals	<a href="https://www.cms.gov/MLNProducts/downloads/Medicare_Beneficiaries_Dual_Eligibles_At_a_Glance.pdf">https://www.cms.gov/MLNProducts/downloads/Medicare_Beneficiaries_Dual_Eligibles_At_a_Glance.pdf</a>
Medicaid source data file record layouts	<a href="https://www.cms.gov/MedicaidDataSourcesGenInfo/07_MAXGeneralInformation.asp">https://www.cms.gov/MedicaidDataSourcesGenInfo/07_MAXGeneralInformation.asp</a>
Medicaid.gov home page	<a href="http://www.medicaid.gov/">http://www.medicaid.gov/</a>
Waivers	<a href="http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Waivers/Waivers.html">http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Waivers/Waivers.html</a>
FMAP	<a href="http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Financing-and-Reimbursement/Financing-and-Reimbursement.html">http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Financing-and-Reimbursement/Financing-and-Reimbursement.html</a>
Medicare.gov home page	<a href="http://www.medicare.gov/default.aspx">http://www.medicare.gov/default.aspx</a>

<b>ResDAC Website</b>	
Home page	<a href="http://www.resdac.org">http://www.resdac.org</a>
Technical publication	<a href="http://www.resdac.org/Tools/tech_pubs.asp">http://www.resdac.org/Tools/tech_pubs.asp</a>
MAX files	<a href="http://www.resdac.org/Medicaid/data_available.asp">http://www.resdac.org/Medicaid/data_available.asp</a>