



FEI Systems



Medicare-Medicaid Data Integration (MMDI) Use Case: Profiling Potential Opioid Misuse among Dual Eligibles

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1 Program Overview

The Medicare-Medicaid Data Integration (MMDI) program is an initiative jointly sponsored by the Centers for Medicare & Medicaid Services (CMS) Medicare-Medicaid Coordination Office (MMCO) and the Center for Medicaid and CHIP Services (CMCS). The focus of the MMDI program is to provide technical support to selected states and assist them with integrating Medicare and Medicaid data in order to enhance care coordination and reduce costs for the dual eligible population. In each contract year, the MMDI team collaborates with a certain number of participating Financial Alignment Initiative (FAI) and Medicaid Innovation Accelerator Program (IAP) states to gain in-depth understanding of the data integration challenges faced, provide technical support and assistance in addressing those challenges, and document common issues and best practices. One of the services offered by the MMDI team is to provide states with use cases that demonstrate how states can leverage integrated Medicare and Medicaid data to potentially inform policy and program design, educate stakeholders, and benefit dual eligibles.

2 Objective

The goal of this use case is to identify ways in which states can leverage integrated Medicare-Medicaid data to generate a profile of prescription opioid use among their dual eligible populations.

3 Analysis Overview

3.1 Background

Opioid use disorders and prescription opioid misuse* are prevalent and costly public health problems in the United States. Nearly two million Americans were identified as having a diagnosed opioid use disorder in 2015.¹ Additionally, of the 97.5 million individuals ages 12 and older who received a prescription pain reliever in 2015, 12.5 million reported misusing their prescriptions.² In an attempt to prevent opioid-related mortality, morbidity, and cost, many states are implementing efforts to improve safer prescribing of opioids.³

Dual eligibles may have increased risk for opioid misuse due to higher rates of co-occurring substance use disorder (SUD) and chronic pain compared to both the Medicare-only and Medicaid-only populations.⁴ To address prescription opioid misuse among dual eligibles, states must understand prescription filling patterns and factors associated with opioid misuse within this population. This use case shows states how to

* In the 2015 National Survey on Drug Use and Health, the definition of misuse referred to the use of prescription drugs in any way a doctor did not direct respondents to use them and focused specifically on behaviors that constituted misuse. Examples of behaviors that were presented to respondents for misuse included (a) use without a prescription of the respondent's own; (b) use in greater amounts, more often, or longer than told to take a drug; or (c) use in any other way a doctor did not tell respondents to take a drug." See endnote 1 for the source.

use Part D Prescription Drug Event (PDE) data, with other Medicare and Medicaid data sources, to examine opioid prescription fills among dual eligible beneficiaries.

3.2 Potential Application of Findings

- **Care Coordination**
 - States can utilize the use case analytics to detect the frequency of opioid prescribing and of potentially dangerous prescribing practices, such as prescribing high dosages, prescribing opioids for extended amounts of time, and prescribing multiple substances. In turn, states can use these methods to identify dual eligibles who are engaging in these prescription filling practices and who could benefit from care coordination or other interventions to address potential opioid misuse.
- **Program Planning and Evaluation**
 - States can use the analytics demonstrated herein, combined with other data, to predict the need for and cost of behavioral health care services for dual eligibles who may be at risk of opioid SUD.
 - States can use the analytics to evaluate the efficacy of programs and interventions aimed at opioid misuse.

3.3 Approach

The MMDI team used calendar year (CY) 2014 historic Medicare data and Medicaid Analytic eXtract (MAX) data for a sample state, hereafter referred to as “State B,” to conduct this analysis. All analyses were performed in CMS’ Virtual Research Data Center (VRDC).

The Medicare files used include:

- Historic Medicare Part D PDE data from the Integrated Data Repository (IDR)
- Master Beneficiary Summary File (MBSF) Base segment from the Chronic Conditions Data Warehouse (CCW)
- Chronic Conditions, and Other Chronic or Potentially Disabling Conditions segments from the CCW

As a proxy for the state’s Medicaid data, we used MAX files. The MAX files are summarized Medicaid data designed for research and analytic purposes.

The analytic sample included full-benefit dual eligibles who had Medicare Parts A/B or Part C (Medicare Advantage) and Medicare Part D for 11 or more months of the year or, for those who died, for all months they were alive during the year. This “full/nearly full” coverage approach yields more precise annual estimates of opioid fills. However, it may exclude beneficiaries who were newly enrolled or had coverage lapses during the observation year.

For chronic conditions analyses, we further limited the sample to beneficiaries with 11 or more months of Medicare fee-for-service (FFS) Parts A/B coverage. This cohort is referred to as “full/nearly full Medicare FFS.” This limitation provides the most robust

chronic conditions prevalence estimates possible because it assures a complete claims history for the identification of diagnosis and procedure codes associated with chronic conditions. Beneficiaries enrolled in Medicare Advantage are excluded since their encounter records are not yet available through CMS for states' use.*

We utilized the Prescription Drug Monitoring Program Training and Technical Assistance Center (PDMP TTAC) Guide on Calculating Daily Morphine Milligram Equivalents (MMEs)⁵ to identify opioid analgesics and to determine the generic drug name, master form (tablet, solution, patch), and strength per unit.

States may want to use additional data sources for their profiles depending on the desired elements or measures. For more detail on data sources, methodologies, and variables, states may refer to Appendix A – Technical Supplement.

4 Analytic Findings

In this section, the MMDI team presents findings for State B and describes the analytic approach. All analyses were conducted at the state level. To protect the confidentiality of State B, we do not report identifiable information such as the number of dual eligible beneficiaries or opioid fills.

4.1 Opioid Prescription Fills among Dual Eligibles

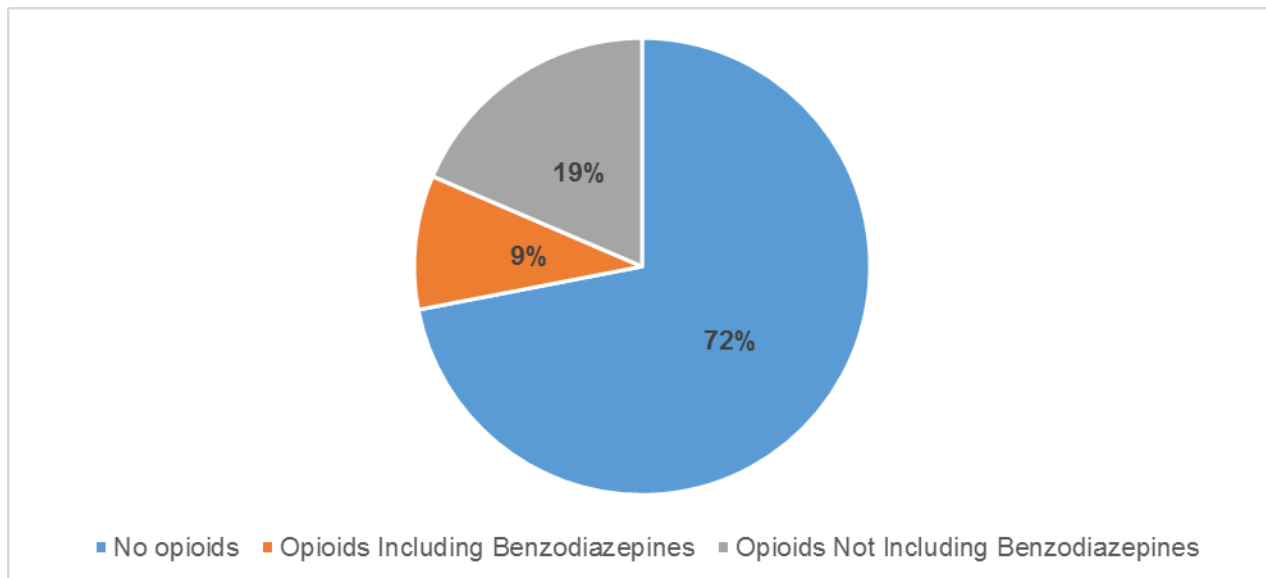
4.1.1 Opioid and Benzodiazepine Prescription Fills among Dual Eligibles

Using PDE data, we identified beneficiaries as having an opioid fill if they had a PDE at any time during the year with a national drug code (NDC) that matched the opioid drug class in the PDMP TTAC guide. Given the increased risk of overdose among individuals who co-use opioids and benzodiazepines,⁶ those who had opioid fills were further subdivided based on whether they had a benzodiazepine fill in addition to an opioid fill.

As shown in Figure 1, 28% of dual eligibles in State B had at least one opioid fill in 2014. A little less than one-third of beneficiaries who had an opioid fill also had a fill for benzodiazepines within the same year.

* States participating in the Financial Alignment Initiative may have access to Medicare-Medicaid Plan (MMP) encounters for their demonstrations.

Figure 1: Percentage of Dual Eligibles with Opioid Fills, with and without Benzodiazepines, in State B, 2014



4.1.2 Most Commonly Filled Generic Opioids among Dual Eligibles

To provide greater insight into the specific opioid drugs filled by State B’s dual eligible population, we identified the most commonly filled opioids by generic drug name* based on the percentage of beneficiaries who filled a prescription (Table 1). Acetaminophen/Oxycodone Hydrochloride was the most commonly filled opioid for this population.

Table 1: Rankings of Most Commonly Filled Opioids among Dual Eligibles with at Least One Opioid Fill in State B, 2014

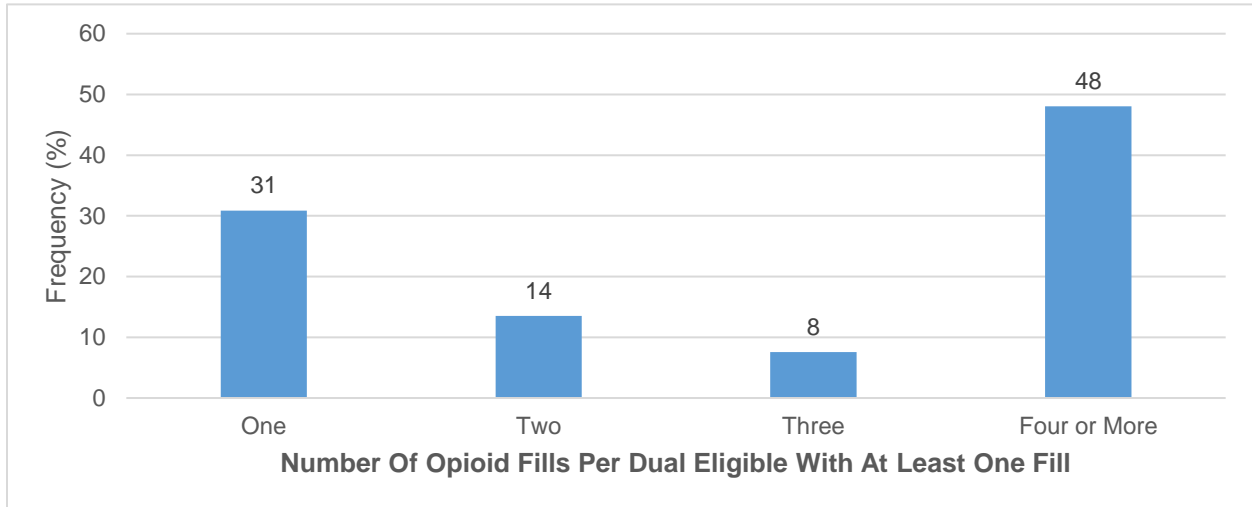
Ranking	Generic Drug Name	Percentage Of Dual Eligibles With a Prescription Fill
1	Acetaminophen/Oxycodone Hydrochloride	40.9%
2	Tramadol Hydrochloride	34.4%
3	Acetaminophen/Hydrocodone Bitartrate	17.5%
4	Acetaminophen/Codeine Phosphate	16.2%
5	Oxycodone Hydrochloride	15.3%
6	Fentanyl	6.3%
7	Acetaminophen/Tramadol Hydrochloride	6.2%
8	Morphine Sulfate	5.8%
9	Hydromorphone Hydrochloride	3.4%
10	Hydrocodone Bitartrate/Ibuprofen	1.3%

* The methodology used to identify opioid NDCs and associated generic drug names is described in Appendix A – Technical Supplement.

4.1.3 Number of Fills, Strength of Dosage per Fill, and Number of Days Supplied per Fill among Dual Eligibles with at Least One Opioid Prescription Fill

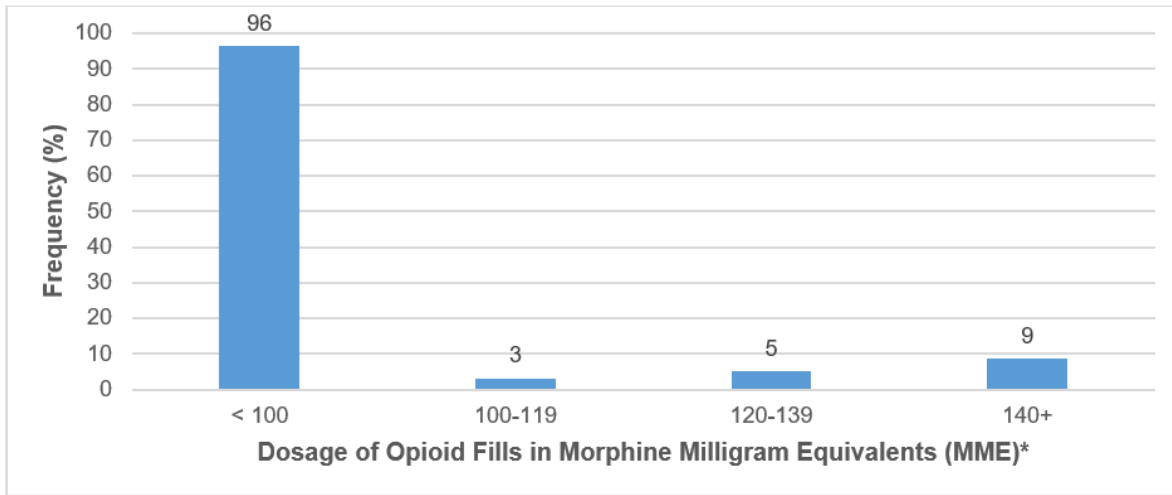
Figure 2 shows the number of opioid fills per dual eligible with at least one opioid fill in State B in 2014. Nearly half (48%) had four or more opioid fills during the year.

Figure 2: Percentage of Dual Eligibles with at Least One Opioid Fill by Number of Annual Opioid Fills in State B, 2014



In Figure 3, we examined the individual fill dosages among dual eligibles who had opioid fills. Note that a beneficiary could fall into multiple opioid dosage strength categories due to having multiple opioid fills throughout the course of the year. Use of high-dosage opioids is a risk factor for opioid abuse, overdose, and subsequent death.⁷ To standardize calculations of dosage across different opioids, we report on morphine milligram equivalents (MME) for each opioid fill based on calculations guided by the PDMP TTAC resource. As shown, nearly all (96%) dual eligibles with at least one opioid fill in State B received a fill with a dosage of less than 100 mg MME. However, opioid fills of greater than 100 mg MME were also observed.

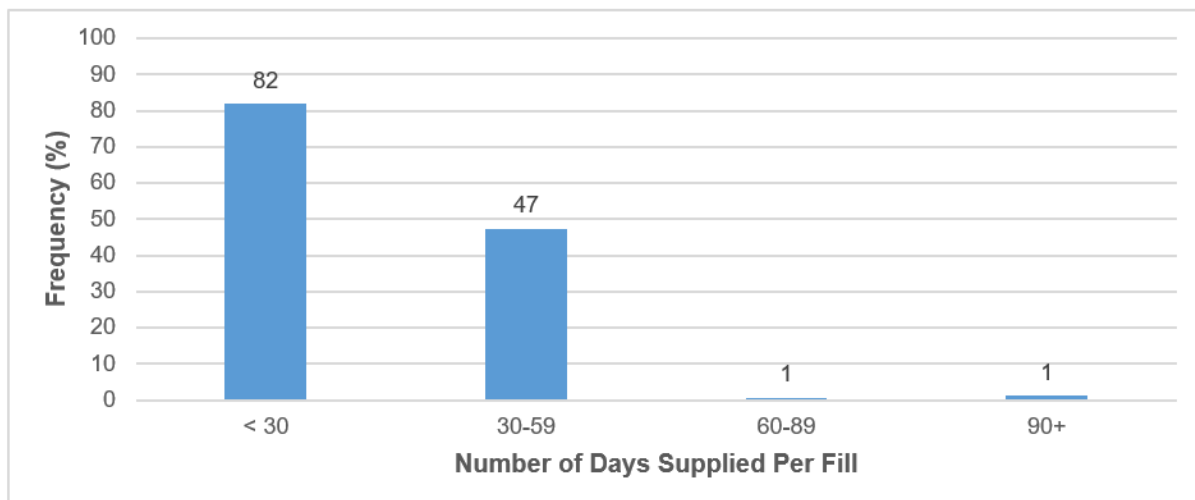
Figure 3: Percentage of Dual Eligibles with at Least One Opioid Fill by Dosage of Opioid Fills in State B, 2014



Note: Percentages do not sum up to 100% because beneficiaries could have multiple opioid fills with different dosages throughout the year.

In Figure 4, we examined the number of days supplied per fill. Similar to the previous analysis on dosage, a beneficiary could fall into multiple opioid days supplied categories due to having multiple opioid fills during the year. As shown, most beneficiaries (82%) filled an opioid prescription with days supplied of less than 30 days. However, opioid fills of more than 30 days were still common, with nearly all of these fills being less than 60 days.

Figure 4: Percentage of Dual Eligibles with at Least One Opioid Fill by Length of Consecutive Days Supplied per Fill in State B, 2014



Note: Percentages do not sum up to 100% because beneficiaries could have multiple opioid fills with different consecutive days supplied per fill throughout the year.

4.1.4 Number of Pharmacies and Number of Prescribers Used Among Dual Eligibles with at Least One Opioid Prescription Fill

As shown in Figure 5 and Figure 6, respectively, over half (58%) of dual eligibles who received an opioid fill during the year used only one prescriber, and over three-quarters used only one pharmacy throughout the year for their opioid fills. Dual eligibles who had an opioid fill were more likely to use four or more prescribers (10%) than they were to use four or more pharmacies (3%).

Figure 5: Percentage of Dual Eligibles with at Least One Opioid Fill by Number of Prescribers in State B, 2014

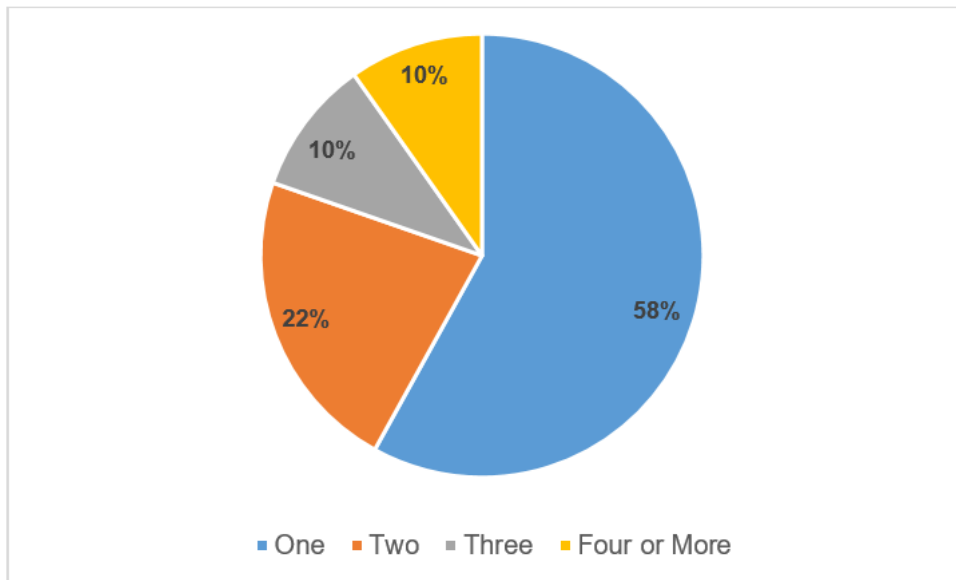
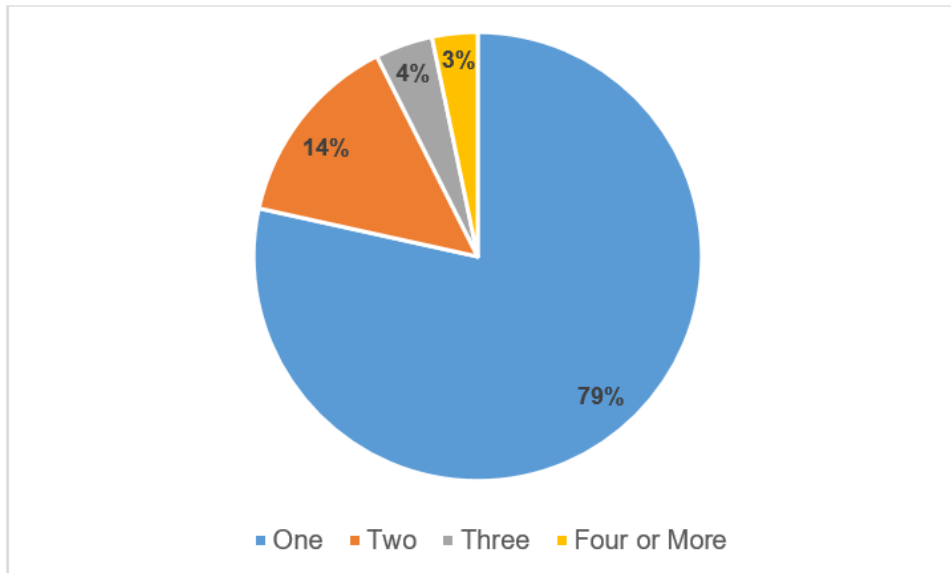


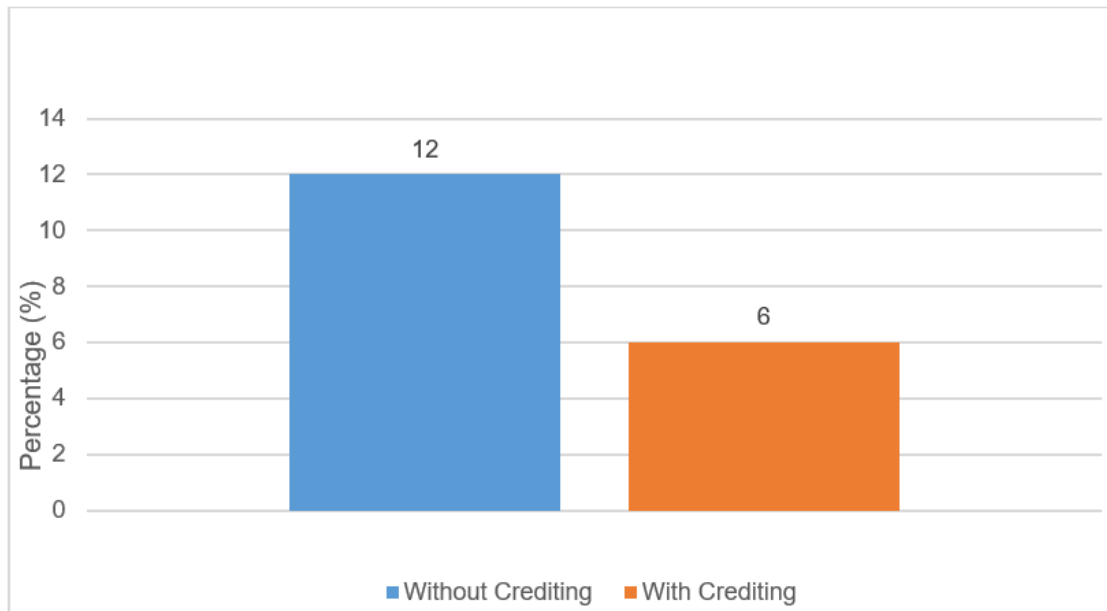
Figure 6: Percentage of Dual Eligibles with at Least One Opioid Fill by Number of Pharmacies in State B, 2014



4.1.5 Prevalence of Concurrent Opioid Fills among Dual Eligibles with at Least One Opioid Prescription Fill

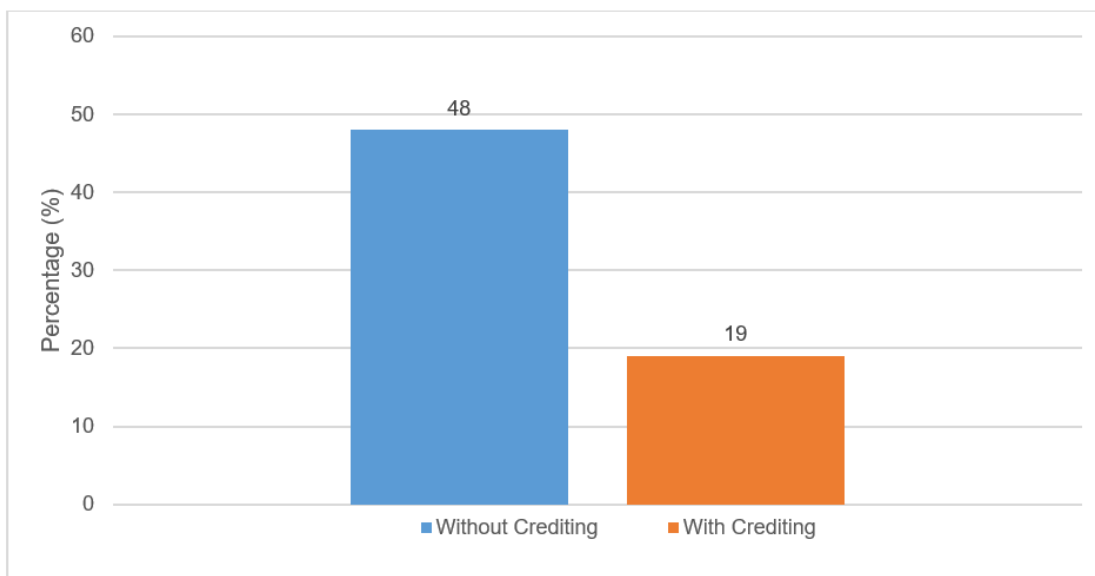
In Figure 7, we show the prevalence of concurrent fills of opioids among dual eligibles who received at least one opioid prescription fill during the year. Concurrency refers to fills that appear to overlap in the days supplied. Results are presented in credited and non-credited form. Crediting is a method to identify “probable refills” by detecting prescriptions that are filled prior to the end of the initial prescription’s days supplied for the same drug, prescriber, and pharmacy. In such cases, the fill date is changed to the end of the last prescription, thus eliminating the overlap. As shown, crediting reduced the overlap of opioid fills for dual eligibles in State B substantially.

Figure 7: Percentage of Dual Eligibles with Concurrent Opioid Fills, by Crediting, in State B, 2014



In Figure 8, we show the prevalence of concurrent fills of opioids and benzodiazepines among beneficiaries who received both an opioid fill and a benzodiazepine fill during the year. Crediting opioid and benzodiazepine fills among beneficiaries who had both an opioid and a benzodiazepine prescription throughout the year also reduced the overlap of opioid and benzodiazepine fills.

Figure 8: Percentage of Dual Eligibles with Concurrent Opioid and Benzodiazepine Fills by Crediting, in State B, 2014

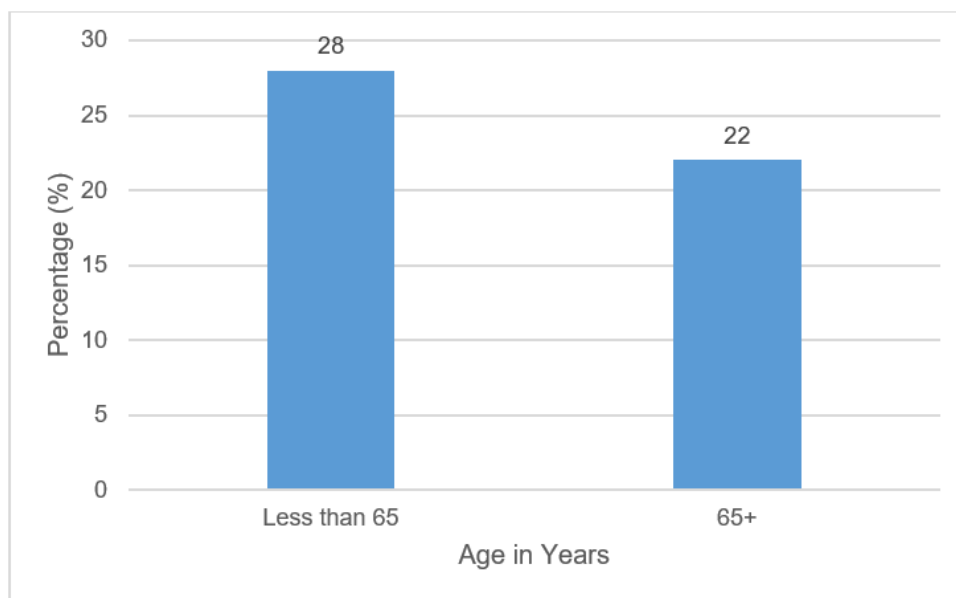


4.2 Opioid Prescription Fills among Dual Eligibles Based on Demographics and Treatment Setting

The next set of analyses provides examples of how states can stratify opioid prescription fills by demographic variables, the presence of behavioral health conditions, and treatment settings.

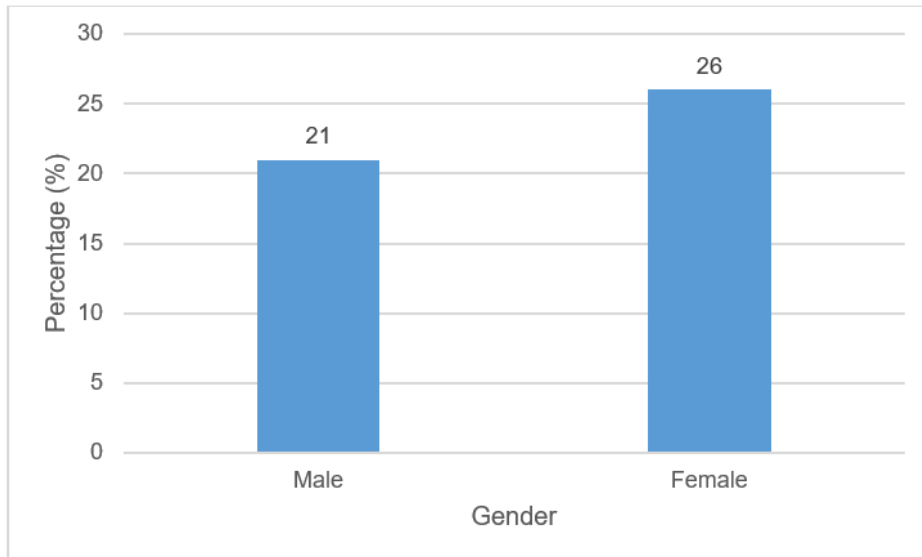
In Figure 9, we show the percentage of dual eligibles in each age group that had at least one opioid fill in State B. A slightly larger percentage of beneficiaries under the age of 65 had an opioid fill compared to beneficiaries ages 65 and older.

Figure 9: Percentage of Dual Eligibles with at Least One Opioid Prescription Fill by Age Group in State B, 2014



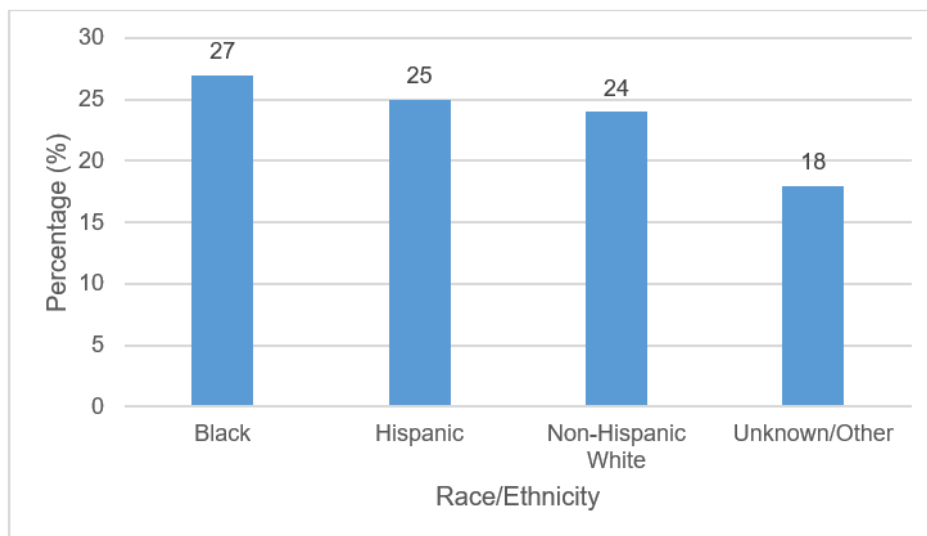
The findings by gender in Figure 10 show that female beneficiaries were more likely to have had at least one opioid fill during the year compared to males.

Figure 10: Percentage of Dual Eligibles with at Least One Opioid Prescription Fill by Gender in State B, 2014



In Figure 11, we examine the percentage of beneficiaries of different races and ethnicities that had an opioid prescription fill. Blacks were most likely to have had an opioid fill, followed by Hispanics and Non-Hispanic Whites. Beneficiaries of Unknown/Other races had the lowest percentage of opioid fills.

Figure 11: Percentage of Dual Eligibles with at Least One Opioid Prescription Fill by Race and Ethnicity in State B, 2014

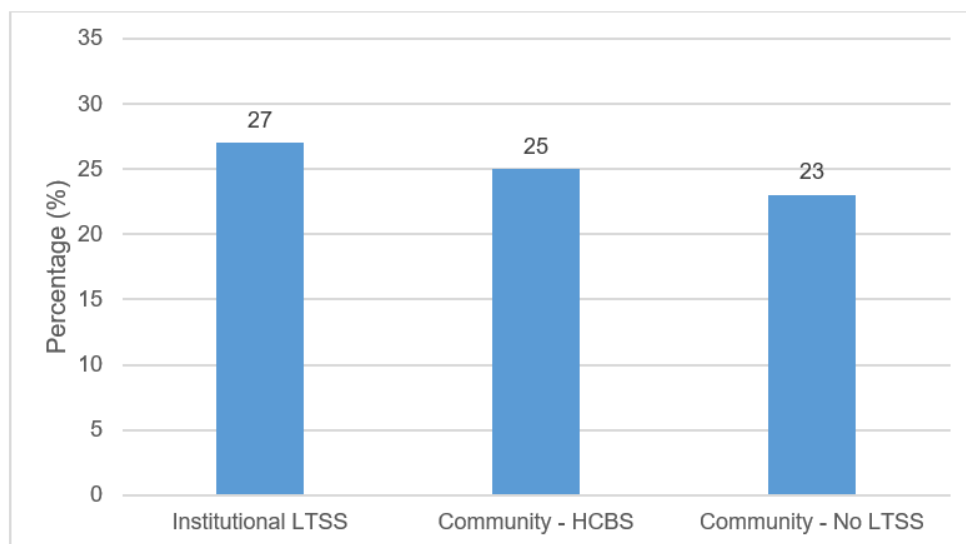


Unknown/Other includes beneficiaries under the following racial/ethnic classifications: Unknown Race, Other, Asian/Pacific Islander, American Indian/Alaska Native

One of the ways states engage with dual eligibles is through the delivery of long-term services and supports (LTSS), thus it is important for states to know how opioid use

differs by use of LTSS vs. non-use and by type of LTSS used. The three groups examined include: those living in institutions (such as nursing homes); those living in the community and receiving home and community-based services (HCBS)* and those living in the community who do not receive LTSS. As shown in Figure 12, opioid prescription fills were somewhat more common among beneficiaries who received LTSS compared to those who did not, and was highest among those living in institutions.

Figure 12: Percentage of Dual Eligibles with at Least One Opioid Prescription Fill by Medicaid LTSS Status in State B, 2014



While opioids are not generally prescribed directly as treatment for a behavioral health condition, having a behavioral health condition is associated with an increased likelihood of prescription opioid use.⁸ Thus, we examined the percentage of dual eligibles with a behavioral health condition that had an opioid fill during the year. Behavioral health conditions include: anxiety disorders, bipolar disorder, major depressive affective disorder, personality disorders, or schizophrenia and other psychotic disorders (see Appendix A – Technical Supplement for the methodology to identify chronic conditions).

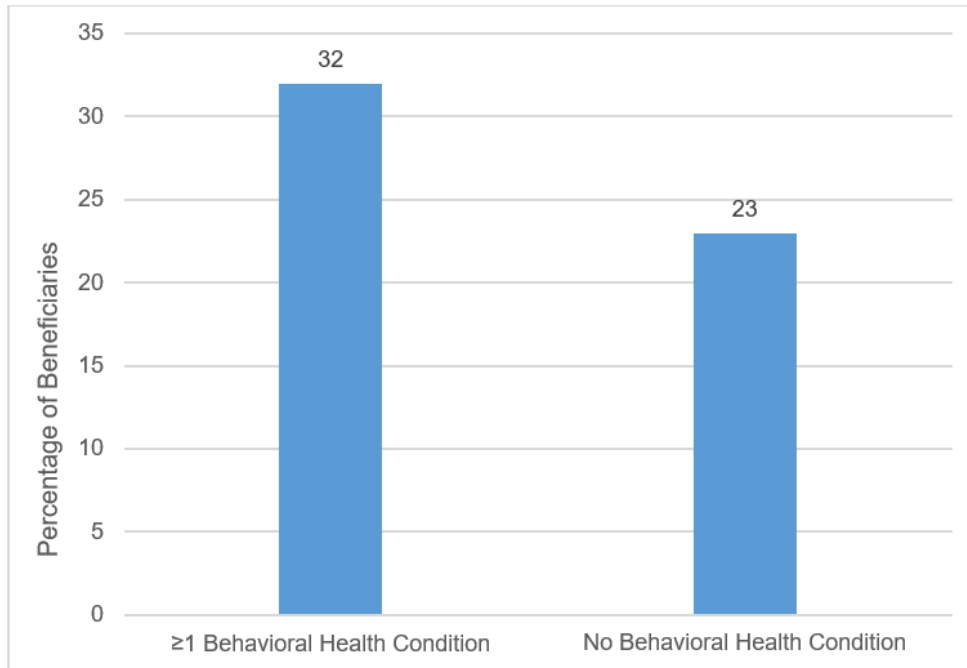
The population for this analysis was limited in two ways. First, we limited it to those who had full/nearly full Medicare FFS (as described in the Approach section). Second, we excluded the 7% of beneficiaries who had cancer[†] since opioids are used commonly as a treatment for pain in patients with cancer.⁹

As shown in Figure 13, non-cancer dual eligibles with one or more behavioral health conditions were more likely to receive an opioid (32%) compared to beneficiaries without a behavioral health condition (23%).

* HCBS includes waiver and state plan services (any community-based LTSS that the state provides through its Medicaid program).

† Specific details regarding the cancers considered can be found in Appendix A – Technical Supplement

Figure 13: Percentage of Full/Nearly Full Non-Cancer Dual Eligibles with at Least One Opioid Prescription Fill by Presence of a Behavioral Health Condition in State B, 2014



4.3 Profile of Prescription Opioid Use and Prescribing Behaviors Based on Pharmacy Quality Alliance (PQA) Performance Measures

The analysis below shows how full-benefit dual eligible beneficiaries performed according to Pharmacy Quality Alliance (PQA) performance measures.¹⁰ States may choose to use other guidelines for evaluating opioid filling patterns.

We applied the PQA measure specifications to the previously specified full/nearly full FFS dual eligible population, excluding beneficiaries under 18 and those who had cancer based on end-of-year Medicare chronic condition flags. We examined two PQA measures: high dosage prescriptions over a 90-day period and opioid fills from multiple prescribers and multiple pharmacies.* The proportion receiving opioid fills with a daily dose of 120 mg MME or greater for 90 days was very low among non-cancer beneficiaries (Table 2). A slightly higher proportion of non-cancer beneficiaries received opioid prescriptions from four or more prescribers and pharmacies, yet this proportion still amounted to less than 1% of all non-cancer beneficiaries.

* We were unable to examine a third PQA measure, Multi-Provider, High Dosage, due to low beneficiary counts.

Table 2: Pharmacy Quality Alliance (PQA) Performance Measure: Completion Use of Opioids from Multiple Providers or at High Dosage among Dual Eligibles without Cancer for State B, 2014

Pharmacy Quality Alliance (PQA) Performance Measure	Measure Description	Measure Result: Count per 1,000 beneficiaries
Opioid High Dosage	Proportion of non-cancer beneficiaries receiving opioid fills with daily dosage \geq 120 mg MME for 90+ days	0.4
Opioid Multiple (4+) Prescribers and Multiple (4+) Pharmacies	Proportion of non-cancer beneficiaries receiving prescriptions for opioids from four or more prescribers and four or more pharmacies.	5.2

4.4 Limitations

- The PDMP TTAC list was created in 2013 and, over time, new opioid and benzodiazepine NDCs have become available. As a result, the number of identified opioid and benzodiazepine PDEs in our sample may be incomplete.
- Our findings reflect opioid fills specific to one state that were submitted for Medicare Part D reimbursement. It is possible that the individuals analyzed may have had additional opioid fills submitted in other states or covered by other payers for which we cannot account. We did not include Medicaid data in the identification of opioid fills because there were very few unique (not duplicative with PDE) opioid fill for dual eligibles in State B’s MAX prescription drug file. However, states may want to explore the extent to which there are unique opioid records for dual eligibles in their Medicaid prescription drug data before determining whether to include their Medicaid data in the analysis.
- We were unable to examine drugs dispensed during hospital and skilled nursing facility stays as these are not included in the PDE data.
- Our analyses examined recorded Part D opioid fills which may not necessarily be representative of drug usage or adherence to prescribed opioids.
- We relied on Medicare claims’ end-of-year chronic condition indicators from the MBSF to determine if a beneficiary had a behavioral health condition or cancer. Use of Medicare data alone may underestimate the true prevalence of chronic conditions among dual eligibles. Ideally, integrated Medicare and Medicaid claims data should be used to identify chronic conditions among the dual eligible population. Further, at the time we conducted the analysis, there were no chronic condition indicators for SUDs. Alcohol use disorder and drug use disorder indicators became available in 2016 in the Other Chronic or Potentially Disabling Conditions segments.
- Using a full/nearly full coverage approach to define the population excludes people who may be newly enrolled or otherwise have more than a one month gap in coverage. Further, there may be differences between the included and excluded groups on factors that could affect opioid fill behaviors.
- Similarly, limiting the population to those with full/nearly full Medicare FFS enrollment could bias results to the extent that there are differences between

groups by type of Medicare enrollment on factors that could affect opioid fill behaviors.

4.5 Other Considerations

The analyses presented in this use case provide a basis for states to better understand and address the needs of dual eligibles who use prescription opioids. States could further expand these analyses to add other data sources or to investigate subgroups, such as those receiving medication assisted therapy (MAT). Further, states may want to stratify results by local geographic areas, including rural/urban classifications.

5 Summary

In this use case, we provide examples of analyses states can conduct using Medicare PDE data, Medicare person-level summary data, and Medicaid data (related to LTSS status), to develop a better understanding of dual eligibles' opioid prescription fill patterns. We also examine demographic, chronic condition, geographic, and treatment setting variances among dual eligibles with an opioid prescription fill. The integration of these data sources expands and informs the types of analyses states can perform related to opioid prescribing patterns for beneficiaries. In turn, states can use this information to inform care coordination and other efforts designed to improve the health, functioning, and care of this particularly vulnerable population.

6 Contact Information

Any state that is currently integrating or plans to integrate Medicare and Medicaid data in order to enhance care coordination and reduce costs for the dual eligible population and is interested in technical support related to this particular topic may contact:

- The MMDI Team: MMDIFEiTeam@feisystems.com

Appendix A – Technical Supplement

The analysis presented in this use case demonstrates how Medicare Part D Prescription Drug Event (PDE) data can be used to describe opioid analgesic fills among dual eligibles. States could replicate these analyses using the appropriate data sources to obtain current estimates of metrics calculated. See Appendix B for information on Medicare data available to states. The MMDI team used the following data sources to conduct the use case analyses:

- Integrated Data Repository
 - Monthly Medicare Part D PDE
- CCW Medicare enrollment data
 - Master Beneficiary Summary File (MBSF) – Base A/B/D
 - MBSF – Other Chronic or Potentially Disabling Conditions
 - MBSF – Chronic Conditions
- CCW MAX
 - Person Summary (PS)

Definitions used in the analysis are described below.

- **Dual Eligibility Status:** We defined the dual eligible population as those who had dual eligible status for at least one month in CY 2014 based on the monthly dual status code in the MBSF. We then assigned each individual an annual Medicaid benefit status based on the last month of dual eligible coverage within the year, according to Medicare-Medicaid Coordination Office (MMCO) criteria.¹¹ Using this approach, we defined all individuals with their last month of dual eligible coverage equal to 02, 04, or 08 as full-benefit.
- **Medicare Coverage:** We further limited our sample to those who had Parts A/B and Part D coverage for 11 or more months of the year or for those who died, for all months alive. These restrictions enabled us to provide robust estimates of fills by capturing those who have complete months of coverage.
When reporting chronic conditions, we further limited the sample to those with full/nearly full FFS Medicare Parts A/B. Although PDE data includes any Medicare beneficiary with Part D (whether in FFS or Medicare Advantage), the chronic condition flags were available only for those with Medicare FFS.
- **Part D PDE:** For all analyses presented in this use case, the unit of analysis was the PDE or fill. In Part D data, a beneficiary can have multiple PDEs. Each PDE has an associated patient identifier, service date, NDC, prescriber and pharmacy identifier, and other information. To obtain beneficiary-level indicators, we transposed the PDE data to the beneficiary level, accounting for the fact that a single beneficiary could have multiple opioid PDEs within the year. This was done to examine opioid fills on a per-person basis instead of at the PDE level. Additional details regarding specific Part D data elements available to states can be obtained from the State Data Resource Center (SDRC).¹²

- **Opioids and Benzodiazepine PDEs:** We identified beneficiaries who filled prescriptions in the opioid and benzodiazepine drug classes during the course of the year by matching NDCs present in each PDE with one found in the PDMP TTAC guide using the variable ‘class’. The PDMP TTAC guide provides guidance on how to calculate morphine milligram dosage for all listed NDCs in their conversion table and additional information on each NDC’s class, generic drug name, strength per unit, MME, and master form (e.g., tablet, capsule, solution). Note that benzodiazepines were excluded from Medicare Part D coverage until 2013, when the Patient Protection and Affordable Care Act (Section 2502) prohibited this exclusion. Thus, states should only use PDE data from years 2013 and forward for any analysis on benzodiazepines.
- **Drug:** For the purpose of this analysis and to account for multiple NDCs per generic drug, we defined a drug by generic drug name, master form, and strength per unit as defined in the PDMP TTAC guide.
- **Dosage:** To enable standard comparison of dosage across different opioids, we calculated MME for all opioid fills using the guidance and data table included in the PDMP TTAC. Morphine is used to standardize dosages because it is considered the “gold standard” for the treatment of pain.
- **Number of Days Supplied:** Each PDE includes a record of the number of days supplied of medication dispensed by the pharmacy. We excluded all PDEs with days supplied equal to zero (<1%) prior to calculating MME and concurrency. Such PDEs consisted of less than 1% of all PDEs in our sample. These values may arise when less than a full day’s quantity of drugs are supplied or when there is a data entry error.
- **Concurrent Opioid-Opioid and Opioid-Benzodiazepine Fills:** Assessing concurrency of medication therapy involved managing a dataset with multiple PDEs and associated NDCs, prescribers, service dates, and days filled per dual eligible. To determine the occurrence of concurrent opioid-opioid and opioid-benzodiazepine fills, we examined PDE fill coverage for all the days of the year and reported on beneficiaries who had any concurrent days. We determined which days of the year each individual had drug coverage using the service date and the number of days filled for each PDE. On any given day, an individual was considered to have concurrent opioid-opioid fills if they had more than one opioid, and have concurrent opioid-benzodiazepine fills if they had both an opioid and benzodiazepine on that day.

To avoid over-counting of concurrency, we used a crediting method to identify “probable” refills when a fill occurred before the end of the supply of a preceding fill. As PDEs do not have a reliable variable to identify refills, we credited probable refills, defined as chronological fills with the same drug, prescriber, and pharmacy. To credit a fill as a probable refill, we shifted the subsequent fill date so that the fill days would not overlap with the preceding fill. Our findings are reported with and without crediting. Further guidance for the use of crediting to calculate overlapping drug utilization is available from the SAS® guideline for calculating medication utilization.¹³

- **Demographics:** We reported opioid fills by standard demographic variables including age, gender, and race/ ethnicity from the MBSF Base segment.
- **Chronic Conditions:** We reported chronic conditions for beneficiaries with full/nearly full FFS only (11+ months of FFS or FFS for all months alive for those who died during the year). We determined cancer diagnosis (yes/no) for exclusion when reporting by opioid use by the presence of behavioral health conditions (yes/no). All chronic condition diagnoses were based on Medicare end-of-year indicators found in the MBSF Chronic Conditions, and Other Chronic or Potentially Disabling Conditions segments. An individual was flagged as having cancer if any of the indicators for Leukemia/Lymphomas, Breast, Lung, Colorectal, Prostate, or Endometrial Cancer had a value of 1 or 3. Likewise, an individual was flagged as having a behavioral health condition if any of the indicators for Anxiety Disorders, Bipolar Disorder, Major Depressive Affective Disorder, Personality Disorders, or Schizophrenia and Other Psychotic Disorders had a value of 1 or 3.

Long-Term Services and Supports (LTSS) Reporting Categories

We defined three LTSS subpopulations: Institutionalized; Community HCBS (includes waiver and state plan services); and Community non-HCBS (no use of LTSS). These were determined based on annual Medicaid type of program and community-based long-term care (CLTC) flags in MAX Person Summary (PS) data. Specifically, we used the following hierarchy to define these groups:

- **Institutionalized:** Resided in an institution (nursing facility, intermediate care for individuals with intellectual disabilities, mental hospital services for the aged, or inpatient psychiatric facilities for individuals under the age of 21) for 90 days or longer.
- **Community HCBS:** Excludes LTSS institutionalized and those enrolled in the Program of All-Inclusive Care for the Elderly (PACE). Had a Medicaid claim with a payment greater than \$0 for HCBS waiver services or State Plan HCBS.
- **Community Non-HCBS:** Excludes LTSS institutionalized and those enrolled in PACE. Had no Medicaid claims or encounters with payments greater than \$0 for HCBS waiver services or for State Plan HCBS.
- See Table 3 below for specifications. Note that a small number of beneficiaries were not assigned to a LTSS reporting category because they did not have records in the MAX Personal Summary (PS) file.

Table 3: LTSS Reporting Categories Based on MAX Person Summary File

LTSS Category	Specifications
Institutionalized	TOT_LTC_CVR_DAY_CNT >= 90 AND EL_PPH_PLN_MO_CNT_AICE = 0

LTSS Category	Specifications
Community HCBS	TOT_LTC_CVR_DAY_CNT <90 AND EL_PPH_PLN_MO_CNT_AICE = 0 AND (OT_PYMT_AMT_HCBCA > 0 OR OT_PYMT_AMT_HCBCS > 0) OR (FFS_PYMT_AMT_13 > 0 OR FFS_PYMT_AMT_30 > 0 OR FFS_PYMT_AMT_31 > 0 OR FFS_PYMT_AMT_33 > 0 OR FFS_PYMT_AMT_38 > 0 OR FFS_PYMT_AMT_54 > 0)
Community Non-HCBS	TOT_LTC_CVR_DAY_CNT <90 AND EL_PPH_PLN_MO_CNT_AICE = 0 AND MAX_1915C_WAIVER_TYPE_LTST =0 AND FFS_PYMT_AMT_13 = 0 AND FFS_PYMT_AMT_30 =0 AND FFS_PYMT_AMT_31 = 0 AND FFS_PYMT_AMT_33 = 0 AND FFS_PYMT_AMT_38 =0 AND FFS_PYMT_AMT_54= 0 AND OT_PYMT_AMT_HCBCA = 0 AND OT_PYMT_AMT_HCBCS = 0

Appendix B – Medicare Data Available to States

Table 4: Medicare Data Sources Available To States

Data Files	Time Period Available	Source
MBSF Base Segment (A/B/C/D)	2007 through 2015	CCW
MBSF Cost and Use Segment	2007 through 2015	CCW
MBSF Chronic Condition Segment	2007 through 2015	CCW
MBSF Chronic or Other Potentially Disabling Conditions Segment	2007 through 2015	CCW
Historic Annual Medicare Parts A/B Claims	2007 through 2015	CCW
Historic Monthly Medicare Parts A/B Claims	Up to a four month lag from date of service to allow for three months of maturity plus up to one month of processing	CCW
Medicare Assessment Data: Minimum Data Set (MDS), Inpatient Rehabilitation Facility-Patient Assessment Instrument (IRF-PAI), Outcome and Assessment Information Set (OASIS), Swing-Bed	2007 through 2015	CCW
Identifier Crosswalks	2007 through 2017	CCW
Current Medicare Parts A/B Claims, Enhanced Coordination of Benefits Agreement (COBA)	Two weeks post-adjudication	Benefits Coordination Recovery Center (BCRC)
Historic Medicare Part D PDE	2007 through 2017	IDR
Monthly Medicare Part D PDE	One month processing lag	IDR

End Notes

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¹⁰ “Performance Measure: Completion Use of Opioids from Multiple Providers or at High Dosage in Persons without Cancer,” Pharmacy Quality Alliance (PQA). 06/2015, Page 4 of 5. <http://pqaalliance.org/images/uploads/files/PQA%20measuresJuly2015.pdf>, accessed 7/14/2016.

¹¹ “Medicare-Medicaid Dual Enrollment from 2006 through 2011”. MMCO. Page 24 of 24. February 2013. https://www.cms.gov/medicare-medicare-coordination/medicare-and-medicare-coordination/medicare-medicare-coordination-office/downloads/dual_enrollment_2006-2011_final_document.pdf, accessed 2/14/2017.

¹² “Part D Data Elements Available to States for Care Coordination and Program Integrity Data Requests,” the State Data Resource Center (SDRC). 12/14/2016. http://www.statedataresourcecenter.com/assets/files/Part_D_File_Record_Layout.pdf, accessed 3/1/2017

¹³ “Using Arrays to Calculate Medication Utilization,” SAS® guideline for calculating medication utilization. 2007. <http://www2.sas.com/proceedings/forum2007/043-2007.pdf>, accessed 12/19/2016.