Using **Data Analytics** to Better Understand **Medicaid Populations** with **Serious Mental Illness**

Additional Data Sources

IAP | **Medicaid Innovation Accelerator Program**

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Using Data Analytics to Better Understand Medicaid Populations with Serious Mental Illness: Additional Data Sources

A. Background

Many state Medicaid agencies are planning, designing, and implementing person-centered delivery system reforms to improve health outcomes and reduce costs for individuals with serious mental illness (SMI). As part of that process, data analytics is necessary to gain a better understanding of the population with SMI, as well as their needs. This technical resource describes approaches to supplementing and matching Medicaid data with additional data sources that can assist state Medicaid agencies with that analysis. Data analyses related to housing, corrections/justice involvement and food insecurity are highlighted as examples. These health-related social factors, as well as others, are likely to serve as important drivers of preventable/avoidable health care costs and often more acutely affect adult Medicaid beneficiaries with SMI.[1] The Medicaid Innovation Accelerator Program (IAP) created this technical resource to assist state Medicaid agencies in developing approaches for engaging external partners to share data and conduct analytics to better understand these impacts.

> This technical resource may be used as a standalone document; however, it is suggested that states use this resource in conjunction with a previous IAP resource, *Using Data Analytics to Better Understand Medicaid Populations With Serious Mental Illness*, issued by IAP in 2018.[2]

As state Medicaid agencies move beyond reliance on traditional health care services to address beneficiaries' medical issues and seek to broaden service delivery to target social needs that contribute to the medical issues, they may also wish to reference the Centers for Medicare & Medicaid Services (CMS) State Medicaid Director (SMD) letter of November 13, 2018,[3] which emphasizes opportunities to design and implement innovative service delivery models for beneficiaries with SMI, including models that leverage data analytics to identify and address social risk

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[1] Rutgers Biomedical and Health Sciences Working Group on Medicaid High Utilizers. Analysis and Recommendations for Medicaid High Utilizers in New Jersey. January 2016. http://www.cshp.rutgers.edu/Downloads/10890.pdf

[2] Medicaid Innovation Accelerator Program. Using Data Analytics to Better Understand Medicaid Populations With Serious Mental Illness. https://www.medicaid.gov/state-resource-center/innovation-accelerator-program/iap-downloads/program-areas/data-analytics-smi-tech-resource.pdf

[3] Centers for Medicare & Medicaid Services. SMD # 18-011: RE: Opportunities to Design Innovative Service Delivery Systems for Adults with a Serious Mental Illness or Children with a Serious Emotional Disturbance. November 13, 2018. https://www.medicaid.gov/federal-policy-guidance/downloads/smd18011.pdf

factors. The data analytics strategies outlined in this technical resource can also be used to assist states that may be deciding which opportunities in the SMD letter to explore.

About the Medicaid Innovation Accelerator Program

In July 2014, CMS launched a collaboration between the Center for Medicaid and Children's Health Insurance Program (CHIP) Services and the Center for Medicare & Medicaid Innovation called the Medicaid Innovation Accelerator Program (IAP). The goals of the IAP are to improve care for Medicaid beneficiaries and reduce costs by supporting state Medicaid agencies in their ongoing payment and delivery system reforms through targeted technical support, such as this technical resource.

B. Objectives

The goal of this resource is to provide state Medicaid agencies with an approach for supplementing and matching Medicaid data with additional data sources to perform analytics that yield actionable insights on the comprehensive needs of adult Medicaid beneficiaries with SMI. Using this resource, state Medicaid policymakers will be able to identify a more expansive set of data to analyze health-related social factors, identify key questions for analysis, and better understand how to structure their analyses.

- **Objective 1:** To identify pathways for state Medicaid agencies to acquire and conduct analyses with non-Medicaid data related to factors that affect the adult population with SMI, such as housing, justice involvement, and food insecurity.
- **Objective 2:** To provide sample analytic questions that could be answered with expanded analyses leveraging both Medicaid data (including non-claims/encounters data that may be housed within state Medicaid agencies) and data from external data sources.
- **Objective 3:** To assist state Medicaid agencies in capitalizing on data sources available from or through other state/local public health, behavioral health, social services, or corrections agencies.

C. Organization of the Technical Resource

The remainder of this resource is divided into five sections, as shown below.

- **Framework for Approaching Data Analytics (Section D)**
- **Approach for Baseline Analysis (Section E)**
- **Examples of Key Analytics Questions Using Non-Medicaid Data (Section F)**
- **Conclusion (Section G)**
- **Appendix**

First, the resource will lay out a F**ramework** for approaching this kind of data analytics, including approaches used by states working to incorporate non-claims/encounters Medicaid data and non-Medicaid data into their overall analytics strategy.

Next, the resource will outline a suggested B**aseline Analysis** that state Medicaid agencies can conduct using data they already have to gain a better understanding of the potential disparities across beneficiaries with SMI and those who do not have SMI.

The resource will then highlight a sample of **Key Analytic Questions** that incorporate non-Medicaid data in three example areas:

1. **Housing**
2. **Corrections/Justice Involvement**
3. **Food Insecurity**

For each of the areas highlighted, the resource summarizes the data landscape, and provides sample analytic questions and the methodology to perform analyses along with real-life state examples of analyses being conducted. Each section also includes a description of a sample analysis on one of the analysis questions highlighted. **Please note that the tables and charts included in the sample output sections for each area of analysis represent mock data and are presented for illustrative purposes only.** The step-by-step instructions for the sample analyses provide a high-level description of the analytic process. They are written with a level of detail that would inform a data analyst's approach for working with data sets within a state's specific data environment but are not detailed technical specifications.

Finally, the resource will summarize key takeaways for state Medicaid agencies in the **Conclusion** section. The **Appendix** includes a resources section to help states identify data sources and learn more about the examples highlighted in the resource.

D. Framework for Approaching Analysis

As noted above, this technical resource provides a specific framework for analyzing key questions using external data sources to supplement Medicaid claims and administrative data.

For each key analytic question, state Medicaid agencies can follow the steps in Figure D.1 as applicable. This initial framework will be used in the subsequent sections of this technical resource to outline approaches that use non-Medicaid data from external sources to supplement Medicaid data.

FIGURE D.1 – FRAMEWORK FOR APPROACHING ANALYSIS

1. Identify Data Sources

2. Engage Data Partners

3. Develop Analytic Questions

4. Establish Data Sharing Agreements

5. Exchange Data and Check Data Quality

6. Match Data to Medicaid

7. Stratify Data to Identify SMI and Other Sorting Criteria

Abbreviation: SMI, serious mental illness.

1. **Identify Data Sources**

   States may conduct an environmental scan to identify potential external data sources needed to address a key policy question. This includes identification of related external partners with which to collaborate as described in the next step. Depending on the landscape, potential data sources may include data from external sources or Medicaid administrative data that can serve as a proxy for external data sources. States may also want to consider emerging data sources and approaches for collecting information, such as the use of Z-codes[4] on provider claims that indicate social needs.

2. **Engage Data Partners**

   Depending on the area of focus, a state may choose partners that include state mental health authorities, other state agencies, federal, or other county or local-level programs. These external partners will be subject matter experts on data needed for analysis, so it is important to work with them to understand the data availability and any data limitations.

   When engaging partners outside of the Medicaid program, it is important to think about the value proposition to the partner organization for sharing data. For example, organizations that provide supportive services for individuals experiencing homelessness may want to better understand the impact of their services on the health outcomes of the individuals they serve. This helps these types of organizations become invested in the data sharing effort and makes it easier for them to articulate the value of their services to their funders (grant makers, donors, etc.). Engaging partners is discussed further in the Data Considerations section (Section D.1).

3. **Develop Analytic Questions**

   With an understanding of the types of data that are available from data exchange partners, specific data analytic questions can be developed. Developing analytics questions will allow state Medicaid agencies to make specific data requests and describe the proposed use of requested data in data sharing agreements. Example analytic questions are included in this resource (Section F).

4. **Establish Data Sharing Agreements**

   Once the appropriate external data partners are identified, data use or data sharing agreements may be needed. These agreements should include all technical specifications of the files to be exchanged to ensure common understanding of data elements and terminology across all partners. Agencies should consult their legal and information technology departments to ensure that federal and state data sharing and privacy protocols are followed. When collecting data

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[4] Coding available under ICD-10 that adds information to claims to indicate the presence of social factors from education/literacy to family circumstances. (Codes Z55-Z65). American Hospital Association. ICD-10-CM Coding for Social Determinants of Health. http://www.ahacentraloffice.org/PDFS/2018PDFS/value-initiative-icd-10-code-sdoh-0418.pdf

from multiple partners, state Medicaid agencies may find it useful to develop a data sharing agreement template that can be easily modified as necessary. This will reduce the potential for lengthy back and forth with each data exchange partner during this step. For additional information, please reference the IAP Fact Sheet on Data Privacy, Data Use, and Data Use Agreements (DUAs), which includes state data use agreement examples.[5]

5. **Exchange Data and Check Data Quality**

   Upon receipt of these data, time should be built into the process to validate the data received prior to beginning the analysis. During this step, any observed data anomalies or technical specification questions should be addressed with the partner organization(s). For example, if a file is received that contains far fewer records than expected, the data query may need to be revisited. States can use approaches to check the quality of data they receive from external sources that are similar to how they assess the quality of their own Medicaid data. Examples of some of these quality checks that are being applied as part of the Transformed Medicaid Statistical Information System (T-MSIS) are included in CMS Guidance: Overview of Data Quality Top Priority Items.[6]

6. **Match Data to Medicaid**

   Key to matching external data with Medicaid data will be working closely with Medicaid data experts and partner data experts to make sure there is a common understanding of data elements. In particular, be sure to review issues related to individual identifiers that may affect the matching process. For example, individuals may have multiple program identifiers or multiple names/aliases; the latter is particularly common in correctional system data.

7. **Stratify Data to Identify SMI and Other Sorting Criteria**

   After obtaining the Medicaid subset of these data, the last step is to apply the SMI criteria for analysis. This will vary by state based on the state's chosen approach for identifying which Medicaid beneficiaries are living with SMI. When stratifying the data, consider additional filters to analyze the data, such as age cohorts or geographic representation.

D.1 Data Considerations

Non-Medicaid data for these types of analyses can come from partner agencies at the state level, Medicaid Managed Care Organizations (MCOs), county/municipal governments, and community-based organizations.

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[5] Medicaid Innovation Accelerator Program. Data Privacy, Data Use, and Data Use Agreements (DUAs). https://www.medicaid.gov/state-resource-center/innovation-accelerator-program/iap-downloads/program-areas/dua-factsheet.pdf

[6] Medicaid.gov. T-MSIS Coding Blog. CMS Guidance: Overview of Data Quality Top Priority Items. https://www.medicaid.gov/medicaid/data-and-systems/macbis/tmsis/tmsis-blog/?entry=50705

D.1.1 Partnering with Other State Agencies

Many states have implemented comprehensive approaches to provide services to beneficiaries with SMI, such as the Medicaid state plan rehabilitative services benefit, targeted case management, or health homes. Depending on the Medicaid authority used, these services may include psychosocial assessment, treatment planning, referral, and supports that seek to address health-related social factors. These services may be administered by the mental health authority or another agency through a contractual arrangement with the Medicaid agency, and the data may not be captured in Medicaid encounter data or provider claims.

It is important for the Medicaid agency to identify relevant Medicaid-funded services and programs administered by agencies other than the state Medicaid agency to further identify the available data from these programs. It is usually the case that beneficiary-specific service use data related to these programs are reported by the administering agency to the Medicaid agency. In such cases, the data matching that can be conducted to identify which beneficiaries with SMI are using the services is relatively straightforward and can be facilitated between the agencies.

Other state agencies with which Medicaid agencies can collaborate to obtain data include, but are not limited to, the following:

- Agencies charged with administering Supplemental Nutrition Assistance Program (SNAP) and Women, Infants, and Children (WIC) benefits
- State departments of corrections
- State departments of health
- State departments of education
- State housing authorities
- State court systems
- State departments of labor
- State departments of transportation

STATE EXAMPLE

Massachusetts: Medicaid and Mental Health Authority Working Together

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Through a data use agreement with the Department of Mental Health (DMH), Massachusetts' Medicaid agency - MassHealth, was able to identify Medicaid accountable care organization (ACO) enrollees with SMI who also receive Medicaid rehabilitative services through DMH-contracted behavioral health (BH) providers. The ACOs were given demographic and service information that they could use to identify beneficiaries' pre-existing BH, specialty, or primary care relationships, to conduct expedited outreach and assessment activities, and to offer enrollment of the beneficiaries into integrated care coordination services delivered by the BH providers in conjunction with the Medicaid beneficiaries' primary care providers.[7]

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[7] Massachusetts Executive Office of Health & Human Services. Reforms to Strengthen and Improve Behavioral Health Care for Adults. January 2018. https://www.mass.gov/files/documents/2018/01/24/bh-system-restructuring-document_1.pdf

D.1.2 Working with County and Local Governments, and Community-Based Organizations

In some cases, data may be collected by county or local governments (e.g., county-level human services or city jail data) or community-based organizations. In the area of housing, for example, the U.S. Department of Housing and Urban Development (HUD) Continuums of Care infrastructure leverages designated community-based organizations that are tasked with managing data related to homelessness.[8] State Medicaid agencies may also find it useful to collect data from local food banks in analyses related to food insecurity. The landscape of community-based services will vary from state to state. State Medicaid agencies should work with their stakeholders to identify potential partners for initiatives that bring data from community-based programs together with Medicaid data to better understand the needs of Medicaid beneficiaries with SMI.

D.1.3 Working with MCOs

Through Medicaid managed care contracts, states may give MCOs the discretion to provide additional services and supports not covered through the state plan to address social issues through savings or incentives within the capitated payment arrangement. Medicaid MCOs may also have data on health-related social factors collected as part of comprehensive needs assessments within their care management processes. Medicaid agencies can work with their contracted MCOs directly to determine what data may be obtained on the cohort of beneficiaries with SMI who are identified as having health-related social factors. Additionally, state Medicaid agencies should validate whether such services are reflected in encounter submissions, and if they are not, they should establish mechanisms to collect information on these services.

> *STATE EXAMPLE*
> *Michigan: Medicaid Managed Care Contract Requirements*
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> Michigan requires its Medicaid Managed Care Plans to incorporate beneficiary social needs into their population health management approaches. Specifically, MCO contracts require the analysis of data including claims, utilization management data, Health Risk Assessment results and eligibility status to address health disparities, improve community collaboration and enhance care coordination and care management for subpopulations experiencing a disparate level of social needs including transportation, housing food access, unemployment and education.[9]

D.2 What to Expect from External Data

Data sets obtained from the partners identified above will be as diverse as the programs, services, and settings they represent. State Medicaid agencies should be prepared to spend time with their data exchange partners to ensure a full understanding of the program or system objectives and the available

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[8] U.S. Department of Housing and Urban Development. CoC Program Toolkit – CoC Responsibilities and Duties. https://www.hudexchange.info/programs/coc/toolkit/responsibilities-and-duties/#designating-and-operating-the-hmis

[9] State of Michigan. Comprehensive Health Care Program for the Michigan Department of Health and Human Services. https://www.michigan.gov/documents/contract_7696_7.pdf

data that can be used for analyses. Generally, the kind of data that is likely available from these partners includes the following:

1. **Individual Demographic Data:** This is the most straightforward type of data to incorporate into Medicaid data analytics. Using demographic data (i.e., age, race, geographic location) to match beneficiaries who are served in a particular system (e.g., homeless services) enables some of the analyses described later in this resource.

2. **Service/Program Level Data:** These data reflect the service or bundle of services rendered by a particular system or program to an individual, similar to encounter data. The service might simply be "enrolled" or "unenrolled," or the bundle of services unit reported or collected may be a "day" or a "month" (in the case of a program paid on a per member per month enrollment basis). This is typically the case with the bundle of services a state mental health authority provides through a contracted behavioral health provider to an individual with SMI through the rehabilitation services option or through a behavioral health home. State Medicaid agencies should expect data sets to include information on services and dates of service.

3. **Outcomes Data:** These data show outcomes on key metrics important to the partner providing the data. For example, the correctional system may have data on recidivism or a supported housing program may report on the proportion of enrollees that retains housing for a year.

   State Medicaid agencies may want to explore how improvements on outcome metrics important to the health-related social factors correlate to improvements in key Medicaid outcomes (such as hospital readmissions, total cost of care or quality outcomes).

E. Baseline Analysis

An important first step to understanding how non-Medicaid data can be used to identify the full needs of beneficiaries with SMI is to determine the baseline health outcomes and health care utilization among the population with SMI. The results of the baseline analysis can be combined with analyses using additional data sources to gauge the potential benefits of services that address health-related social factors and determine how addressing these factors can contribute to better health outcomes for Medicaid beneficiaries with SMI.

E.1 Baseline Analysis

Before engaging in expanded analysis of beneficiaries with SMI using other Medicaid and external data, state Medicaid agencies should first gather insights from Medicaid claims and encounters that will provide context for subsequent analyses.

The previously released IAP resource, *Using Data Analytics to Better Understand Medicaid Populations with Serious Mental Illness*,[10] provided ways for states to determine their own approach for identifying if a Medicaid beneficiary has SMI. That resource also highlighted analyses using Medicaid claims, encounters, and enrollment data to gather insights on the characteristics of identified Medicaid beneficiaries with SMI, related demographic data, beneficiary health care utilization patterns, comorbid physical health conditions, and Medicaid costs associated with these beneficiaries. As described in that resource, it may be useful to compare metrics and outcomes for beneficiaries with SMI to a group of beneficiaries that does not meet the criteria for having SMI (SMI to non-SMI comparison group). This approach can identify disparities that can be further explored in analyses focused on health-related social factors, including a comparison of beneficiaries with SMI who have a particular social factor with those who do not. State Medicaid agencies can use existing Medicaid data to build upon the analyses described in the previous resource and gather important baseline data that can be used to assess the impact of health-related social factors.

Examples of baseline analysis questions that state Medicaid agencies may want to pursue include the following:

1. How do utilization rates of non-acute outpatient services (primary care, recommended behavioral health outpatient care and medication adherence) compare between Medicaid beneficiaries with SMI versus a comparison group of Medicaid beneficiaries without SMI?

2. What are the rates of preventable health care utilization for emergency department utilization, admissions, and readmissions for Medicaid beneficiaries with SMI?

The baseline analysis will provide foundational data that can be used in comparison analyses that incorporate non-Medicaid data. For example, as states analyze the effect of housing instability on adult Medicaid beneficiaries with SMI, they can compare

> *STATE EXAMPLE*
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> *Texas: Analysis of Medicaid Beneficiaries*
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> According to a 2017 study by the Meadows Mental Health Policy Institute, compared with adult Medicaid beneficiaries without SMI in Texas, those beneficiaries with SMI had a significantly higher likelihood of being hospitalized during the year and having one or more emergency department (ED) visits. Further, adult Medicaid beneficiaries with SMI had significantly higher annual hospital and ED rates than those without SMI. **The primary reason for the visits were more often medical than psychiatric.**[11]

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[10] Medicaid Innovation Accelerator Program. Using Data Analytics to Better Understand Medicaid Populations with Serious Mental Illness. https://www.medicaid.gov/state-resource-center/innovation-accelerator-program/iap-downloads/program-areas/data-analytics-smi-tech-resource.pdf

[11] Rowan PJ, Begley C, Morgan R, Fu, S, and Turibekov B. Healthcare Utilization and Cost of the SMI Population in Texas Medicaid: Year 3 Final Report of the UTSPH Medicaid SMI Study. March 2017. https://sph.uth.edu/research/centers/chsr/assets/RowanEtAlMedicaidSMI2017ReptFinalA.pdf

these baseline metrics for beneficiaries with SMI that have identified housing needs to beneficiaries with SMI that are not experiencing housing challenges.

States can also compare differences among beneficiaries with SMI with housing needs who have access to services to address the housing needs to those beneficiaries with SMI and housing needs who do not have access to those services. Section E.2 provides an example of a baseline analysis focused on primary care utilization among beneficiaries with SMI.

E.2 Baseline Analysis Example: Primary Care Utilization among Beneficiaries with SMI

Data Required for Analysis

- Identified adult Medicaid beneficiaries with SMI and those without SMI
- Medicaid claims and encounters data
  - Beneficiary identifier
  - Procedure code(s), provider type or place of service that indicate primary care

Analysis Approach

To better understand primary care utilization, determine the proportion of Medicaid beneficiaries with SMI that has had at least one primary care encounter in a 12-month period and compare it with the proportion of beneficiaries in the control group (those without a diagnosis of SMI) that has not had at least one primary care encounter in the same time period. To conduct this analysis, perform the following steps:

1. Establish a study period (recommend a 12-month study period allowing six months for claims runout).
2. Query all claims paid for the population with SMI during the study period identified in step 1 for the procedure codes, provider types or places of service identified as indicating primary care.
3. Calculate a unique count of beneficiaries from the query results from step 2.
4. Calculate the percentage of beneficiaries with at least one primary care encounter by dividing the count from step 3 by the total number of beneficiaries with SMI.
5. Repeat steps 2-4 for the Comparison Group.
6. Compare the percentage of beneficiaries in each group that had at least one primary care encounter during the study period.*
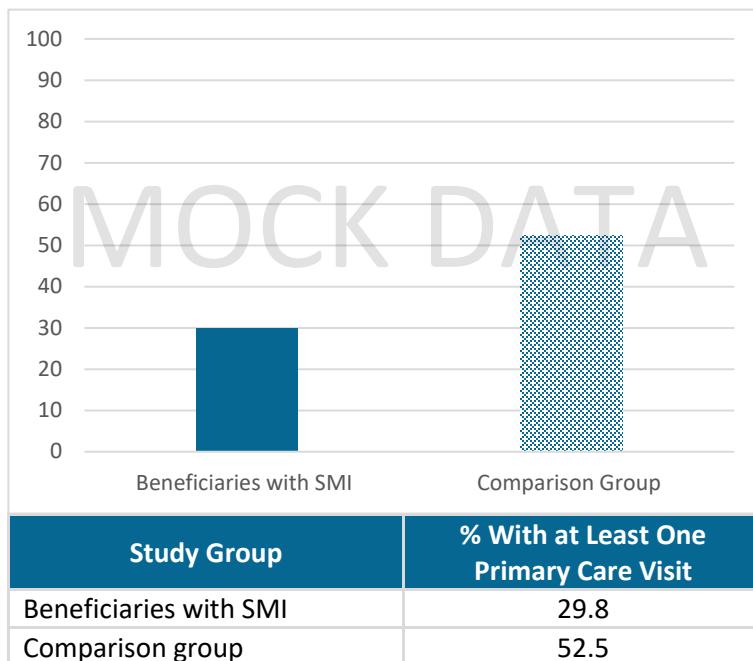
Note: states may want to run this analysis retroactively for several 12-month periods to establish a trend.

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*See sample output on the next page.

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Sample Output

Study Group	% With at Least One Primary Care Visit
Beneficiaries with SMI	29.8
Comparison group	52.5

Abbreviation: SMI, serious mental illness.

Using this type of baseline information will help focus subsequent analysis. For example, recognizing that the Medicaid beneficiaries with SMI have fewer primary care visits, as shown in the example above, a state could explore factors that may be preventing those beneficiaries from being able to access primary care and this may involve analyzing additional, non-Medicaid data.

The analyses included in the remainder of this resource can be combined with a baseline analysis to draw conclusions that drive the design of interventions to improve outcomes.

F. Key Analytic Questions

As noted above, analyses that include non-Medicaid data can provide state Medicaid agencies with a better understanding of beneficiaries with SMI, their service utilization and related cost drivers, and the impact that addressing health-related social factors may have on them. This enhanced understanding can be used to develop partnerships to design or improve services and initiatives to address barriers to improved mental and physical health.

In each of the topic areas highlighted in Section F, available data sources are discussed, along with examples of analytics questions and instructions for a sample analysis based on one question in each topic area. State examples offer potential models of approaches for use by other state Medicaid agencies.

F.1 Housing

Serious mental illness can disrupt an individual's ability to carry out essential aspects of daily life, such as practicing self-care, maintaining a job, and household management. These challenges, coupled with those associated with living with a mental illness, make it much more likely that people with SMI may become homeless or have housing instability compared with the general population.[12]

Data Landscape

State Medicaid agencies may be able to access a number of data sources to support analysis of how homelessness or housing instability can impact Medicaid beneficiaries with SMI:

- **Medicaid and Medicaid-related data:** Using Medicaid and Medicaid-related data, there are a few approaches states can take to identify beneficiaries who are homeless or have experienced housing instability, including the following:
  - Creating proxy criteria for housing instability, such as the individual has had three or more different addresses within the year.
  - Requiring MCOs or Administrative Services Organizations to share data from risk assessments or care management needs assessments, which often include information regarding housing instability.
- **Homeless Management Information Systems:** Most housing programs that receive federal funding report standard information about recipients and their circumstances into locally administered Homeless Management Information Systems (HMIS).[14]

> **STATE EXAMPLE**
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> *Minnesota: Identification of Medicaid Beneficiaries Who Were Homeless Using Administrative Data*
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> The Minnesota Department of Human Services used administrative data to identify beneficiaries with several social risk factors including homelessness.
>
> Beneficiaries were coded as being homeless if they marked a "check if homeless" box on an enrollment application or provided an address that was a known homeless shelter.
>
> Using this methodology, seven percent of adults were coded as being homeless during the study period.
>
> It was recognized that this methodology may underestimate the rate of homelessness because of various drawbacks, including (1) the research team had no knowledge of how individuals interpreted this question and (2) individuals may vary in how they interpret and answer the question. Nonetheless, it provides at least some useful sources for information state Medicaid agencies can use to assess whether homelessness is higher for an individual with SMI than the Medicaid population without SMI.[13]

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[12] Library Index. The Health of the Homeless – The Mental Health of Homeless People. 2009. Source: Library Index, 2009. http://www.libraryindex.com

[13] Minnesota Department of Human Services. Accounting for Social Risk Factors in Minnesota Health Care Program Payments. December 2018. https://edocs.dhs.state.mn.us/lfserver/Public/DHS-7834-ENG

[14] U.S. Department of Housing and Urban Development. HUD Exchange. Homeless Management Information System. https://www.hudexchange.info/programs/hmis/

These data can be matched with Medicaid data to better understand the impact of housing instability on beneficiaries with SMI. Note that individuals are required to provide consent to have their information captured in the HMIS, which may be a limitation. State Medicaid agencies should consider this limitation when assessing analysis results.

Analysis Questions

Table F.1 provides examples of the kinds of analytic questions states can answer by combining Medicaid data with data related to homelessness and housing instability.

TABLE F.1 – HOUSING ANALYSIS QUESTIONS

Analysis Question	Required Data
1. Is homelessness more prevalent among Medicaid beneficiaries with SMI as compared to Medicaid beneficiaries without SMI?	• HMIS data reflecting history of homelessness OR • Administrative data indicating history of homelessness AND • Medicaid beneficiary data (including identification of beneficiaries with SMI)
2. How do the rates of hospital emergency department and inpatient psychiatric admissions compare between beneficiaries with SMI who are homeless and beneficiaries with SMI who are not experiencing homelessness?	• HMIS data reflecting history of homelessness OR • Administrative data indicating history of homelessness AND • Medicaid beneficiary data (including identification of beneficiaries with SMI) • Medicaid claims and encounters data (procedure codes)
3. What proportion of the Medicaid population with SMI is considered to have housing instability? Of those beneficiaries, how many are receiving housing-related services and supports? How do these supports affect their emergency department and psychiatric inpatient service use, compared with the population with SMI that has housing instability and doesn't access these services?	• HMIS data reflecting history of housing instability OR • Proxy for housing instability based on multiple addresses over a defined time period (e.g. three or more addresses in 12 months) AND • Medicaid beneficiary data (including identification of beneficiaries with SMI) • Data from data sharing partners on housing-related services and supports

Example: Homelessness and Inpatient Psychiatric Admissions among Medicaid Beneficiaries with SMI

Data Required for Analysis

- Identified adult beneficiaries that meet the state's criteria for having SMI
- HMIS data reflecting homelessness that can be matched with Medicaid beneficiary data or administrative data that include indicators of homelessness (as described above)
- Medicaid claims and encounters data
    - Beneficiary identifier
    - Procedure code(s) that indicate inpatient admissions with diagnosis codes to identify psychiatric diagnoses

Analysis Approach

To better understand the potential impact of homelessness on the rate of short-term inpatient psychiatric hospitalization for beneficiaries with SMI, perform the following steps:

1. Establish a study period (recommend a 24-month study period allowing six months for claims runout).
2. Identify a cohort of beneficiaries with SMI that experienced homelessness during the study period defined in step 1.
    a. If using HMIS data, match HMIS data with Medicaid beneficiary information using unique identifiers.
    b. If using administrative data, match beneficiaries based on information from enrollment applications or using addresses of known homeless shelters.
3. Identify a comparison group of beneficiaries with SMI that does not have an indication of homelessness during the study period. Note: state Medicaid agencies may want to consider additional demographic factors when selecting the comparison group, such as age

> *STATE EXAMPLE*
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> *Connecticut: Matching Medicaid and HMIS Data*
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> The Connecticut Department of Housing matched Medicaid data with HMIS data as part of an initiative to identify households in need of permanent supportive housing.[15] Of a data set consisting of 8,132 clients received from the HMIS system, 4,193 adults were matched to state Medicaid data. Among the Medicaid beneficiaries in the HMIS data set, 1,340 were identified as homeless. These beneficiaries demonstrated patterns of high utilization and prevalence of chronic conditions:
>
> - 78% had three or more Emergency Department (ED) visits annually
> - 49% had six or more ED visits annually
> - 47% had three or more inpatient admissions
> - 52% had a documented chronic condition.
>
> Using this data, Connecticut targeted over 160 individuals for permanent supportive housing and documented the following outcomes:
>
> - 92% retention rate in supportive housing
> - 90% actively connected to a primary health care provider

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[15] Medicaid Innovation Accelerator Program. Data to Identify Housing Needs and Target Resources. https://www.medicaid.gov/state-resource-center/innovation-accelerator-program/iap-downloads/program-areas/nds-using-data-webinar.pdf

distribution, race, or gender to ensure that it is comparable to the population identified as having experienced homelessness.

4. Query all claims paid for the population with SMI during the study period identified in step 2 for the procedure codes with diagnosis codes indicating inpatient psychiatric hospitalization. Repeat the query for the population identified in step 3.

5. Calculate a unique count of beneficiaries from each study group in the query results from step 4 (i.e., with and without an indication of homelessness) who show the following utilization:
   a. One inpatient psychiatric hospitalization during the study period
   b. Two inpatient psychiatric hospitalizations
   c. Three inpatient psychiatric hospitalizations
   d. Four or more inpatient psychiatric hospitalizations

6. Calculate the percentage of beneficiaries in each group at each utilization level by dividing the number of beneficiaries at each utilization level by the number of beneficiaries in the study group (beneficiaries who were homeless and beneficiaries without an indication of homelessness).

7. Compare the percentage of beneficiaries in each group at each utilization level.

Sample Output

FIGURE F.1 – PERCENTAGE OF MEDICAID BENEFICIARIES WITH SMI WITH INPATIENT PSYCHIATRIC ADMISSIONS BASED ON HOMELESS STATUS
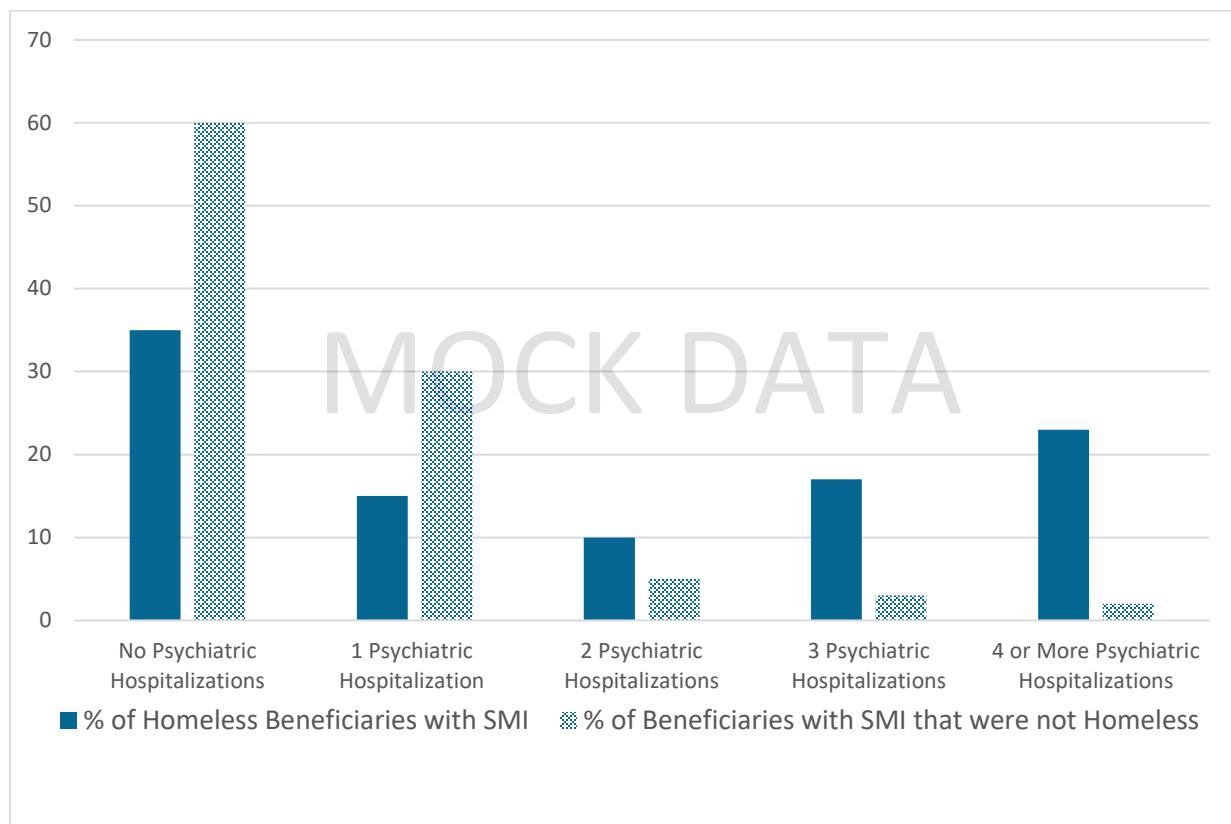
Abbreviation: SMI, serious mental illness.

On the basis of the sample analysis above (which uses mock data for illustrative purposes), Medicaid beneficiaries with SMI who were homeless were more likely to have two or more inpatient psychiatric hospitalizations. This type of finding would suggest that in addition to improving treatment for SMI to address preventable admissions, states may want to consider interventions to address housing challenges that may also be contributing to increased hospitalizations.

STATE EXAMPLE

New Jersey: Study of Homeless Services and Medicaid Spending

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A 2017 Rutgers University study[16] used data to link the 2011-16 data from the Homeless Management Information System (HMIS) to the Medicaid Management Information System (MMIS) to identify opportunities to generate Medicaid savings and improve patient outcomes among Medicaid beneficiaries that use homeless services, and to estimate the impact on Medicaid spending of permanent supportive housing placement. Preliminary findings include the following:

- About 2.5 to 3 percent of Medicaid beneficiaries appear in HMIS annually, including 38,000-68,000 individuals (there was >25 percent increase after expansion)
- The linked population was—
    - More likely to be aged 25-60 years and less likely to be children or over 60 years
    - Much more likely to have substance use or mental health diagnoses, substance use with mental health diagnoses, or SMI
    - More likely to be higher users of inpatient and emergency department care
    - More likely to be in a higher spending group – about 30 percent had higher than average Medicaid spending

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F.2 Corrections/Justice Involvement

Individuals living with SMI are more likely to be incarcerated than those without SMI.[17] Behavioral health care providers and criminal justice professionals across the country are already collaborating in various ways to keep these individuals out of the criminal justice system and advance their recovery. Fortunately, a number of these initiatives and their data can be instructive for state Medicaid agencies wishing to better understand the population of Medicaid beneficiaries with SMI that has been or is engaged in the criminal justice system in their state.

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[16] Cantor JC. Preliminary Findings on Homeless Service Use and Medicaid Spending in New Jersey. 2017 Governor's Conference on Housing and Economic Development. October 2017. http://www.cshp.rutgers.edu/Downloads/11230.pdf

[17] Rosenberg L. And Justice for All: What Works at the Interface of Mental Health and Criminal Justice. National Council for Behavioral Health. October 15, 2018. https://www.thenationalcouncil.org/lindas-corner-office/2018/10/and-justice-for-all-what-works-at-the-interface-of-mental-health-and-criminal-justice/.

Data Landscape

Depending on the correctional system landscape in a state, the most likely sources of data for Medicaid analytics are state correctional agencies and county jail systems. States may find data sharing with state correctional departments to be the easiest to achieve, whereas the practicality of data exchange with county-level jails may be limited on the basis of the number of counties in a state and the potential variance across counties in terms of information technology systems' capabilities. States pursuing data exchange with county jails may consider prioritizing counties with higher populations or concentrations of Medicaid beneficiaries or higher numbers of Medicaid beneficiaries with SMI.

States should consider their eligibility rules around Medicaid beneficiaries who are incarcerated when undertaking data exchanges. Some states terminate Medicaid eligibility when a beneficiary enters the correctional system, and others suspend eligibility or coverage and have processes to allow coverage when a beneficiary is admitted for at least a 24-hour stay in a medical institution or to resume coverage quickly after the beneficiary is released. If a state has opted to suspend eligibility, there may already be data exchange to support Medicaid eligibility updates.

Some data may also be available specific to re-entry and pre-release programs. The quality and availability of data from re-entry programming varies by state and by county/city jail, including general support for release, probation and parole, and population-specific programming, including programming related to SMI. States that have launched initiatives note the need for, and challenges with, the exchange of data and information, including confidentiality concerns.

Additional sources of national data related to the correctional system are included in the Appendix: Resources at the end of this document.

STATE EXAMPLE

Nevada: Jail Data Combined with Medicaid Data Reduces Delays in Both Eligibility and Interventions

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The Nevada Department of Health and Human Services' mental health and public health agencies use combined data analytic resources from the Office of Public Health Informatics and Epidemiology to match jail data with mental health data and Medicaid eligibility data. Nevada uses these data to embed welfare eligibility workers in jails to ensure that individuals being released from incarceration are enrolled in Medicaid and receive mental health services quickly once they've re-entered the community, such as mental health interventions. This data exchange is supported by an inter-agency Memo of Understanding with county detention centers. [18]

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[18] The Pew Charitable Trusts. How States Use Data to Inform Decisions. February 2018. https://www.pewtrusts.org/-/media/assets/2018/02/dasa_how_states_use_data_report_v5.pdf

Analysis Questions

Analysis Question	Required Data
1. How many and what percentage of Medicaid beneficiaries with SMI have been in a corrections facility (jail or prison) in a given period of time?	• Correctional system data including historical data. Note: data should include unique identifiers such as first name, last name, date of birth and release dates. This analysis can be run with state prison data and/or county jail data depending on availability. • Medicaid beneficiary data (including identification of beneficiaries with SMI)
2. What was the average amount of time between release from the correctional system for a beneficiary with SMI to access a Medicaid medical or behavioral health service? Note: in states that terminate Medicaid eligibility upon incarceration, it may be useful to analyze the time period between release and re-enrollment in Medicaid.	• Correctional system data including historical data for the last 2 years. Note: data should include unique identifiers such as first name, last name, date of birth, and release dates. This analysis can be run with state prison data and/or county jail data. • Medicaid beneficiary data (including identification of beneficiaries with SMI) • Medicaid claims and encounters data (date of service)
3. What are the most common initial services accessed by beneficiaries with SMI that become Medicaid-eligible after release from the corrections system (i.e., preventive versus acute services)?	• Correctional system data including historical data for the last 2 years. Note: data should include unique identifiers such as first name, last name, date of birth and release dates. This analysis can be run with state prison data and/or county jail data. • Medicaid beneficiary data (including identification of beneficiaries with SMI) • Medicaid claims and encounters data (procedure codes)

Example: Most Common Initial Medicaid Service Accessed by Medicaid Beneficiaries with SMI Post-release from a Correctional Setting

Data Required for Analysis

- Identified Medicaid beneficiaries that meet the state's criteria for having SMI
- Correctional system data including historical data for the last two years (analysis can be run with state prison data and/or county jail data)

- Medicaid claims and encounters data
  - Beneficiary identifier
  - Procedure code(s) that indicate service type and place of service
  - Diagnosis codes to allow drill down on whether utilization was for physical health or behavioral health concerns

Analysis Approach

To better understand how Medicaid beneficiaries with SMI who are recently released from incarceration re-engage with the health care system, perform the following steps:

1. Establish a study period (recommend a 24-month study period, allowing 6 months for claims runout).
2. Identify the beneficiaries with SMI who were released from a correctional setting during the study period defined in step 1 by matching correctional system data with Medicaid beneficiary data. It is important to be aware of the release dates of beneficiaries identified in this step. Note: beneficiaries identified may have more than one release date during the study period as a result of reincarceration; for the purposes of this analysis, state Medicaid agencies may want to exclude beneficiaries with more than one release date in the study period or proceed with analysis based on the last release date.
3. Query all claims paid for the Medicaid population with SMI identified in step 2 that have a date of service after the release date. Note: this may require programming logic to be created; if conducting the analysis manually, states may want to consider selecting a sample of identified beneficiaries to study.
4. Identify the first post-release claim (based on date of service) for each identified beneficiary.
5. Create a list of identified claims including procedure code and primary diagnosis code.
6. Sort list of identified claims by procedure code.
7. Rank order procedure codes by count (based on the number of times a procedure code appears in the data set).
8. Determine the top 10 procedure codes by count.
9. Categorize primary diagnosis codes into physical health and behavioral health diagnoses.
10. Calculate total encounters in each category.
11. Determine percentages by dividing total encounters with a primary diagnosis code related to behavioral health by the total number of encounters. *

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*See sample output on the next page

Sample Output

Procedure Code	Procedure Description	Total Encounters
99285	EMER DEPT HIGH SEVERITY&THREAT FUNCJ	325
99284	EMER DEPT HI SEVERITY&URGENT EVAL	289
99214	OFFICE OR OTHER OUTPATIENT VISIT FOR ESTABLISHED PATIENT	218
99283	EMER DEPT MODERATE SEVERITY	203
80048	BASIC METABOLIC PANEL CALCIUM TOTAL	185
G0463	HOSPITAL OUTPATIENT CLINIC VISIT	156
90791	PSYCHIATRIC DIAGNOSTIC EVAL W/MEDICAL SERVICES	104
A0427	ALS1-EMERGENCY (ADVANCED LIFE SUPPORT)	31
70450	CT HEAD/BRN C-MATRL	15
85610	PROTHROMBIN TM	4

FIGURE F.2B – PERCENTAGE OF INITIAL MEDICAID SERVICES POST-RELEASE WITH A PRIMARY DIAGNOSIS RELATED TO PHYSICAL HEALTH VERSUS BEHAVIORAL HEALTH (DATA FROM STEPS 9-11)

■ Physical Health   ▓ Behavioral Health
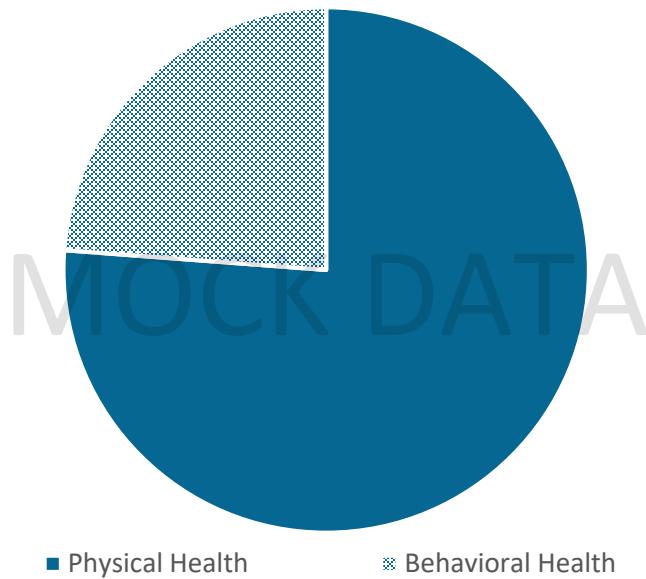
According to this mock data analysis, it would appear that Medicaid beneficiaries with SMI are more likely to seek care for a physical health concern first after being released from a correctional setting even though, given their SMI diagnosis, their behavioral health needs might be of more critical importance. In this example, the mock data also show that the most common procedures involve services in an acute setting (hospital emergency department). States could use these data to inform interventions to connect beneficiaries with SMI who are transitioning from correctional settings to primary care and community-based mental health supports.

F.3 Food Insecurity

Individuals with SMI are particularly vulnerable to food insecurity, defined as the limited or uncertain availability of food. A 2008 study by the University of Kansas found that nearly half (45.8 percent) of individuals with SMI living in the community who were interviewed met the definition of food insecure. The study further found that symptoms associated with SMI were compounding common food insecurity barriers including lack of motivation to shop, cook or eat.[20] Because of the complexity of SMI, individuals with SMI are significantly more likely to be overweight or obese and yet may struggle to access the types of nutritious food and healthy eating programs that may help address their obesity-related health issues.

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[19] Arizona Health Care Cost Containment System. Support for Individuals Transitioning out of the Criminal Justice System. https://www.azahcccs.gov/AHCCCS/Initiatives/CareCoordination/justiceinitiatives.html; Arizona Health Care Cost Containment System. Building a Health Care System: Care Coordination and Integration. https://www.azahcccs.gov/AHCCCS/Initiatives/CareCoordination/

[20] Goetz J. Exploring Food Insecurity Among Individuals With Serious Mental Illness: A Qualitative Study. University of Kansas. May 5, 2008. https://kuscholarworks.ku.edu/handle/1808/3989

Food insecurity has been linked to many diet-related diseases including diabetes, hypertension, and heart disease. In addition, individuals experiencing food insecurity are more likely to engage in cost-related medication underuse or nonadherence.[21]

Data Landscape

The primary sources of data that can provide information about the presence of food insecurity in, and its impact on, Medicaid beneficiaries with SMI include the following:

- Federal programs such as the U.S. Department of Agriculture's SNAP and WIC, which are administered by states
- National data provided by organizations that study geographic patterns related to hunger, food deserts, or food insecurity
- State Medicaid programs, which may have data from health risk assessments pertaining to food insecurity for individual beneficiaries with SMI, or information about covered and utilized nutritionist services, as well as Medicaid MCOs that may include supports from nutritionists as a part of their care management approach

Analysis Questions

TABLE F.3 – FOOD INSECURITY ANALYSIS QUESTIONS

Analysis Question	Required Data
1. Are beneficiaries with SMI who are eligible for SNAP receiving those benefits at rates comparable to beneficiaries without SMI?	• SNAP and Medicaid eligibility criteria • SNAP beneficiary data • Medicaid beneficiary data (including identification of beneficiaries with SMI)
2. Do Medicaid beneficiaries with SMI who are receiving SNAP have better medication adherence than Medicaid Beneficiaries receiving SNAP without SMI?	• SNAP beneficiary data • Medicaid beneficiary data (including identification of beneficiaries with SMI) • Medicaid claims and encounters (pharmacy claims)
3. Do Medicaid beneficiaries with SMI who live in food deserts have higher rates of chronic disease than Medicaid beneficiaries with SMI who do not live in areas with poor access to food?	• U.S. Department of Agriculture Food Access Resource Atlas[22] • Medicaid beneficiary data (including identification of beneficiaries with SMI and county of residence) • Medicaid claims and encounters (with diagnosis codes to identify chronic conditions)

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[21] Hartline-Grafton H. The Impact of Food Insecurity on Health and Well-Being: A Conversation With Heather Hartline-Grafton, Dr.PH., R.D. Food Research & Action Center. http://frac.org/blog/impact-food-insecurity-health-well-conversation-heather-hartline-grafton-dr-ph-r-d

[22] U.S. Department of Agriculture. Food Access Resource Atlas. https://www.ers.usda.gov/data-products/food-access-research-atlas/

Data Required for Analysis

- SNAP and Medicaid eligibility criteria
- SNAP beneficiary data
- Medicaid beneficiary data (including identification of beneficiaries with SMI)

Analysis Approach

To better understand how effectively Medicaid beneficiaries with SMI that are likely to be eligible for SNAP benefits are being connected to those benefits, perform the following steps:

1. Compare SNAP and Medicaid eligibility criteria for Medicaid eligibility categories that include beneficiaries with SMI to validate that Medicaid eligibility is an indicator of likely eligibility for SNAP benefits. SNAP benefits are generally available to individuals with gross household income less than 130 percent of the Federal Poverty Level.
2. If necessary, exclude Medicaid beneficiaries who are not likely to be eligible for SNAP benefits.
3. Match Medicaid enrollment data with SNAP enrollment files on the basis of identifiers such as last name, first name, and date of birth.
4. Calculate the number of Medicaid beneficiaries with SMI who are found in the SNAP enrollment file, and the number who do not appear in the SNAP enrollment file.
5. Calculate the percentage of beneficiaries with SMI who are likely to be eligible for SNAP benefits but are not enrolled.
6. Repeat steps 4 and 5 for a comparison group of beneficiaries who do not have SMI.

Sample Output

FIGURE F.3 – MEDICAID BENEFICIARIES ENROLLED IN SNAP
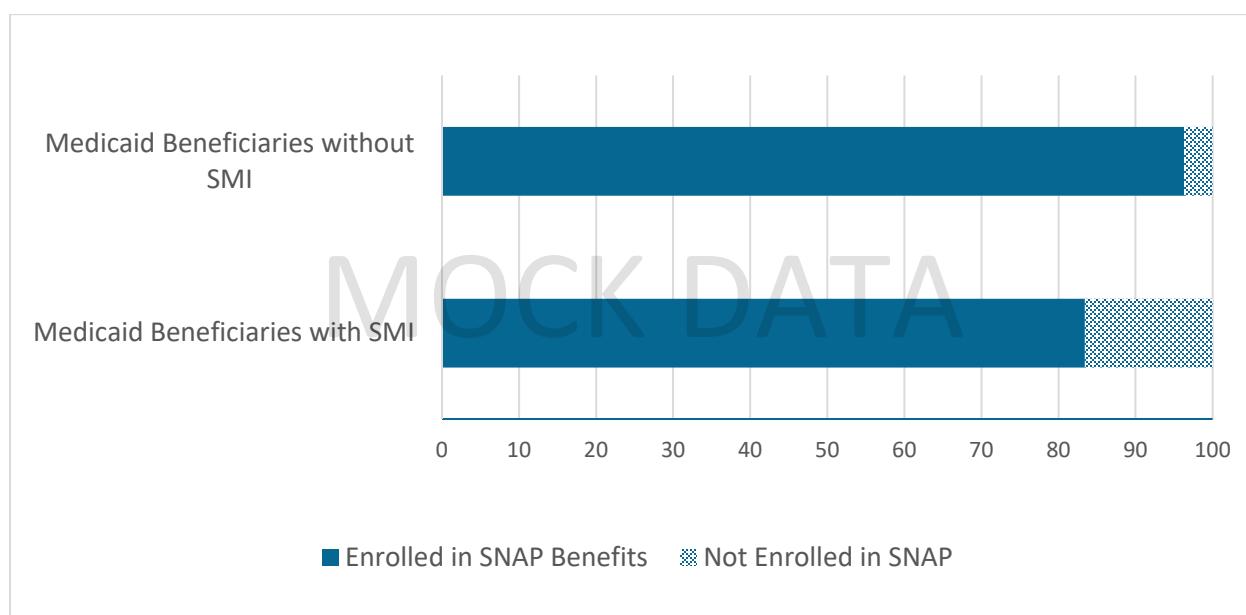
Abbreviations: SNAP, Supplemental Nutrition Assistance Program; SMI, serious mental illness.

The results of this type of analysis can be used to potentially uncover a disparity between beneficiaries with SMI and a comparison group that does not have SMI. In this example, the mock data suggests that Medicaid beneficiaries with SMI may be experiencing challenges in accessing SNAP benefits for which they are eligible. As a result, they may be experiencing food insecurity which may negatively affect their ability to manage their physical and behavioral health conditions. State Medicaid agencies can use this data to connect beneficiaries to the appropriate care coordination resources to facilitate applications for SNAP benefits.

STATE EXAMPLE

Maryland: Study of SNAP Benefits and Dual Eligibles

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In 2017, a study led by Benefits Data Trust examined whether SNAP benefits were associated with reduced hospital and emergency department utilization in duals over the age of 65. The study examined claims data over three years along with SNAP data to identify the rate of hospitalization and associated cost among those beneficiaries over the age of 65 and dually eligible for Medicare and Medicaid who received a SNAP benefit versus dually eligible beneficiaries in the same age group who did not have SNAP but were eligible for it. Hospital utilization was measured relative to the prior year's SNAP participation. Individuals were excluded from the study if they had less than 6 months of claim data for the year or were nursing facility residents, as their institutionalized status makes them ineligible for SNAP.

Medicaid claims and sociodemographic data were merged with Medicare claims and SNAP utilization data. A crosswalk between Medicare and Medicaid beneficiaries' IDs was generated for research purposes, enabling data merging. The variables in the study include annual inpatient hospital day count, annual inpatient hospital cost, and annual ED visit count including visits that resulted in inpatient admission and those resolved in an outpatient basis.

The study found that SNAP participants had, on average, 14% lower odds of hospitalization and 10% lower odds of an ED visit in the subsequent year than non-participants.[23]

G. Conclusion

Data analytics that supplement and match Medicaid data with additional data sets is a useful approach as state Medicaid agencies seek to address the full spectrum of health-related factors affecting their Medicaid population, and beneficiaries with SMI in particular. Data from program partners external to state Medicaid agencies can be matched with Medicaid data (claims and encounters and eligibility data) to identify and understand the specific barriers faced by these beneficiaries and to assess the value of services that address these barriers in terms of improved health outcomes.

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[23] Samuel L. Et al. Does the Supplemental Nutrition Assistance Program Affect Hospital Utilization Among Older Adults? The Case of Maryland. Population Health Management. 2017. https://www.bdtrust.org/wp-content/uploads/2017/07/Pop-Health-Mgmt_Hospitalizations_linked.pdf

Depending on the availability of analytic resources, state Medicaid agencies should consider analyzing the full scope of health-related factors of their beneficiaries using the type of analytic approaches outlined in this technical resource. In addition, in conducting these types of analyses, states should identify opportunities to combine data from other sources (e.g. related to housing, food security, corrections, employment, education, personal safety, transportation etc.) to develop a more comprehensive understanding of beneficiaries with SMI and the opportunities to improve the multidisciplinary services systems that support them. See example from Utah below.

STATE EXAMPLE

Utah: Linking Housing, Medicaid, County Jail and County Behavioral Health Data to Evaluate Services Across Systems

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As highlighted in the U.S. Department of Housing and Urban Development's 2017 H² Final Report: "The Utah Department of Workforce Services (DWS) conducted a match of the data available in the Homeless Management Information System (HMIS) and their Medicaid eligibility system. Utah DWS is using this data match to evaluate current performance, historical trends, and performance expectations at the time of contract renewals. It is also using it to identify individuals receiving housing supports who are not enrolled in Medicaid and target enrollment assistance and to provide estimates of additional individuals who would be covered by a Medicaid waiver being evaluated in their legislature.

Utah also conducted a data match between the County jail and HMIS and between County Behavioral Health providers and HMIS. With County Behavioral Health, the state has identified a significant need for permanent supportive housing linked to substance use services and is working to put together an application for tax credits. This increase in Utah's cross-system integrated data capacity helps the state facilitate a better understanding of system-level operations, effectiveness, and efficiency, and supports its goal to engage in data-driven decision-making around homeless health and housing service provision."[24]

However, even if a comprehensive analytic approach is not immediately possible, pursuing targeted analysis to address specific questions about a particular factor would be valuable.[25] As demonstrated in this technical resource, conducting analyses matching Medicaid claims and encounters data with non-Medicaid data from external sources related to housing, food security or corrections can help in understanding the unique needs of, and challenges for, Medicaid beneficiaries with SMI.

States that want to incorporate data analytic strategies to leverage additional data sources as part of their approach for improving services and outcomes related to beneficiaries with SMI should:

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[24] U.S. Department of Housing and Urban Development. H² Final report. https://www.hudexchange.info/resources/documents/H2-Final-Report.pdf.

[25] Centers for Medicare & Medicaid Services. The Accountable Health Communities Health-Related Social Needs Screening Tool. https://innovation.cms.gov/Files/worksheets/ahcm-screeningtool.pdf

- If efforts are already underway to incorporate additional data sources into the state's Medicaid data analytic strategy, look for ways that such analysis could also be targeted to better understand the specific needs of beneficiaries with SMI.
- Engage data sharing partners to mutually capitalize on data exchanges, establishing the reciprocal benefits of data sharing, and understanding the meaning and potential limitations of data being shared.
- Establish analysis questions that will best inform program approaches, considering the potential output of the analysis and determine how the results can be actionable.

For links to other resources which may be helpful to state Medicaid agencies seeking to analyze a broader range of data to better understand the population with SMI, see the following appendix. The appendix also includes links to state data matching examples which may be useful in undertaking these types of analyses.

Appendix: Resources

The following is a compiled list of the information sources included in this resource that can help state Medicaid agencies better understand aspects of including data on health-related social factors in their analyses to better understand the needs of Medicaid beneficiaries with SMI.

- *Using Data Analytics to Better Understand Medicaid Populations with Serious Mental Illness*, issued by the IAP in 2018 **(Link)**
- **Accountable Health Communities:** Health-Related Social Needs Screening Tool **(Link)**.
- **Strategies to Connect Beneficiaries with SMI to Services that Address Social Risk Factors**: State Medicaid Director Letter RE: Opportunities to Design Innovative Service Delivery Systems for Adults with a Serious Mental Illness or Children with Serious Emotional Disturbance **(Link)**
- **Data Sharing**: IAP Fact Sheet on Data Privacy, Data Use, and Data Use Agreements (DUA) including DUA examples **(Link)**
- **Housing:** U.S. Department of Housing and Urban Development. HUD Exchange Homeless Management Information System **(Link)**
- **Corrections/Justice Involvement:** Medicaid and CHIP Learning Collaborative presentation on Medicaid and Justice-Involved Populations **(Link)**
  - Nationally the following organizations collect data and publish information on justice involved individuals:
    - Centers for Medicare & Medicaid Services **(Link)**
    - The Department of Justice **(Link)**
    - Substance Abuse and Mental Health Services Administration **(Link)**
    - The Urban Institute **(Link)**
- **Food Insecurity:** United States Department of Agriculture Food Access Resource Atlas **(Link)**

The links below will provide more information on the state examples referenced in this technical resource:

- **Massachusetts:** Medicaid and Mental Health Authority Working Together **(Link)**
- **Michigan:** Medicaid Managed Care Contract Requirements **(Link)**
- **Texas:** Analysis of Medicaid Beneficiaries **(Link)**
- **Minnesota** Identification of Medicaid Beneficiaries who were Homeless Using Administrative Data **(Link)**
- **Connecticut:** Matching Medicaid and HMIS data **(Link)**
- **New Jersey**: Study of Homeless Services and Medicaid Spending **(Link)**
- **Nevada:** Jail Data Combined with Medicaid Data Reduces Delays in Both Eligibility and Interventions **(Link)**
- **Arizona:** Coordination Between Medicaid and Corrections: **(Link)**, **(Link)**
- **Maryland:** Study of SNAP Benefits and Dual Eligibles **(Link)**
- **Utah:** Linking Housing, Medicaid, County Jail, and County Behavioral Health Data to Evaluate Services Across Systems **(Link)**