Medicaid Section 1115 Serious Mental Illness/Serious Emotional Disturbance (SMI/SED) Demonstrations: Use of Mental Health Services in Seven Early Implementing States

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RTI International

Introduction

An estimated 58 million adults in the United States (23 percent of the adult population) have a mental health condition, and 5.5 percent have a serious mental illness.[1] Within Medicaid the percentage is higher; almost 30 percent of adults in Medicaid have reported a mental health condition, including 8 percent that have reported a serious mental illness (SMI).[2] Medicaid enrollees have difficulty accessing treatment for needed mental health services, with an estimated 50 percent of Medicaid beneficiaries with SMI reporting that they needed treatment but did not receive it.[2] Access to and engagement in treatment can be challenging for many reasons, and the Centers for Medicare & Medicaid Services (CMS) has prioritized improving care for Medicaid-enrolled adults with SMI or youth with serious emotional disturbance (SED). Section 12003 of the 21st Century Cures Act mandated CMS to develop section 1115 demonstrations for Medicaid enrollees with SMI/SED. Through the section 1115 SMI/SED demonstrations, CMS partners with states to support innovative service delivery and access to the full continuum of care for this population.

This report is part of a series of rapid cycle reports intended to share early findings and insights about section 1115 SMI/SED demonstrations as part of a meta-evaluation of the section 1115 SMI/SED demonstrations. The analysis presented here uses Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF) to

1. Describe trends in use of select mental health-related services before and immediately after the Medicaid section 1115 SMI/SED demonstrations started for states whose demonstration began in 2020 or 2021. Understanding these trends will help inform strategies for future analyses designed to determine impacts of the demonstrations on health care service use for beneficiaries with SMI/SED.
2. Identify how the COVID-19 pandemic and the subsequent public health emergency shifted patterns of service use for beneficiaries with SMI/SED. Future analyses that assess the impact of the demonstrations on health service use will need to account for any notable shifts that happened during the pandemic period.

This analysis also tested the feasibility of using TAF data to identify Medicaid beneficiaries with SMI/SED and to calculate mental health-related service use outcomes in demonstration states. Seven states that began demonstration activities in 2020 or 2021 were included in this analysis; the states include the District of Columbia, Idaho, Indiana, Oklahoma, Utah, Vermont, and Washington.[3]

About Section 1115 SMI Demonstrations

States with approved section 1115 SMI/SED demonstrations can receive federal financial participation (i.e., federal Medicaid matching dollars) for care delivered during short-term stays in institutions for mental diseases (IMDs) as long as the state is taking action to ensure quality of care in IMDs and to improve access to mental health care at all levels of intensity as well as recovery support services for Medicaid enrollees with SMI or SED. States must also commit to maintaining funding levels for outpatient community-based mental health services and monitor and evaluate demonstration performance.

The goals of section 1115 SMI/SED demonstrations include: reduce utilization and length of stay in emergency departments (EDs); reduce readmissions to acute care hospitals and residential settings; improve availability of crisis stabilization, intensive outpatient, psychiatric hospital, and residential treatment setting services; improve access to community-based services and integrated primary and behavioral health care; and improve care coordination and continuity of care after a hospitalization or residential treatment stay.

[1] Substance Abuse and Mental Health Services Administration. (2022). Key substance use and mental health indicators in the United States: Results from the 2021 National Survey on Drug Use and Health (HHS Publication PEP22-07-01-005). Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. https://www.samhsa.gov/data/report/2021-nsduh-annual-national-report

[2] MACPAC. (2022). Chapter 2. Access to mental health services for adults covered by Medicaid. In *Report to Congress on Medicaid and CHIP*. https://www.macpac.gov/wp-content/uploads/2021/06/Chapter-2-Access-to-Mental-Health-Services-for-Adults-Covered-by-Medicaid.pdf

[3] Maryland's demonstration was approved in 2021 but excluded from the analyses due to significant TAF data quality issues. Alabama and New Hampshire were excluded from analyses because their demonstrations were approved in 2022. For purposes of this report, we refer to the District of Columbia as a state.

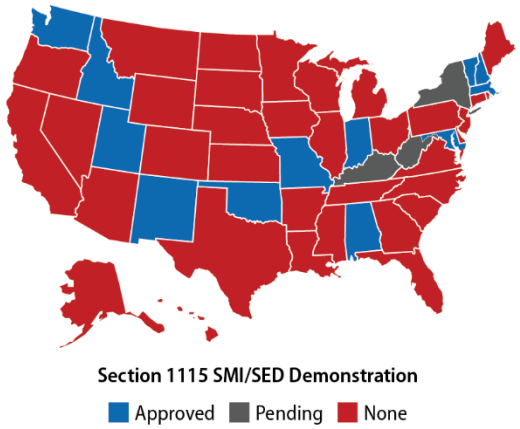
These demonstrations require the state to submit and carry out implementation plans that set forth how the state will meet four key milestones on its path to achieving demonstration goals:

1. Ensure quality care in psychiatric hospitals and residential settings
2. Improve care coordination and transitions to community care
3. Increase access to a continuum of care and crisis care
4. Support early identification and engagement in treatment

Achieving these milestones is expected to lead to successful performance on demonstration goals.

As of February 2024, 12 states and the District of Columbia had received approval for section 1115 SMI/SED demonstrations; 3 states have a pending application (**Exhibit 1**).

Exhibit 1. Section 1115 SMI/SED demonstration status as of February 2024



Overview of Findings

Medicaid claims data from 2017 through 2021 were used to calculate four mental health-related service use measures for seven section 1115 SMI/SED demonstration states. The District of Columbia, Idaho, Indiana, and Vermont received section 1115 SMI/SED demonstration approval in early to mid-2020, so the analysis for these states includes three years of pre-implementation claims data and two years of post-implementation data. Oklahoma, Utah, and Washington received approval in December 2020 or early 2021, so the analysis for these states includes four years of pre-implementation claims data and one year of post-implementation data.

The COVID-19 pandemic began in 2020, so we also assessed how patterns of health care use shifted in 2020 relative to prior years. It is important to note that demonstration roll-out for the District of Columbia, Idaho, Indiana, and Vermont coincided with the start the COVID-19 pandemic, and we cannot yet determine if shifts in utilization in 2020 are due to the pandemic, demonstration activities, or a combination of the two.

We observed the following trends, as shown in **Exhibit 2**:

- Mental health-related ED visits declined among beneficiaries with SMI/SED in the District of Columbia, Idaho, Utah, and Washington in the year(s) after their section 1115 SMI/SED demonstration began. The COVID-19 pandemic may have contributed to the observed declines in 2020.
- Mental health-related inpatient admissions also declined in the District of Columbia, Vermont, Indiana, Idaho, and Utah in the year(s) after implementation, possibly in part as a result of the COVID-19 pandemic. Mental health-related admissions increased in 2021 in Oklahoma, possibly due in part to the state's Medicaid expansion that coincided with the start of the demonstration.
- Follow-up within 30 days after a hospitalization for mental illness increased in Indiana in the two years after their demonstration began.
- Trends in 30-day readmissions after a psychiatric discharge were less consistent across states, with some states experiencing small increases in rates over time and others experiencing small decreases.

These exploratory analyses demonstrated the feasibility of using TAF data to identify beneficiaries with SMI/SED and to measure demonstration outcomes. These analyses also highlight that the COVID-19 pandemic impacted use of at least some types of mental health-related services. Future impact analyses will need to control for pandemic impacts to differentiate changes in utilization trends related to section 1115 SMI/SED demonstration implementation from changes due to the COVID-19 pandemic.

Exhibit 2. Changes in outcomes from pre-demonstration to post-demonstration based on descriptive trends

Outcome	Demonstration started in 2020				Demonstration started in late 2020 or 2021		
	DC	VT	IN	ID	OK	UT	WA
1115 SMI/SED demonstration start date	1/2020	1/2020	1/2020	4/2020	12/2020	1/2021	12/2020
Mental health-related ED visits per 1,000 beneficiaries	↓	⊖	⊖	↓	⊖	↓	↓
Mental health-related inpatient admissions per 1,000 beneficiaries	↓	↓	↓	↓	↑	↓	⊖
Follow-up within 30 days after hospitalization for mental illness	⊖	⊖	↑	NR	NR	NR	NR
30-day readmissions per 1,000 psychiatric discharges	⊖	↓	↑	↑	⊖	↓	⊖

NR = not reported due to data limitations; ⊖ = small or inconsistent change over time; ↑ = increase over time; ↓ = decrease over time

Approach

This report summarizes descriptive trends from 2017 to 2021 in four key outcomes for the first seven states to implement their section 1115 SMI/SED demonstration: District of Columbia, Idaho, Indiana, Oklahoma, Utah, Vermont, and Washington. The data, outcomes, study sample, and data limitations are described in detail in **Appendix A**.

Data Source

We used Medicaid enrollment and claims data from 2017 to 2021 in TAF in the Chronic Conditions Warehouse (CCW) to identify individuals with SMI/SED and to measure mental health-related utilization.

Study Sample, Outcome Measures, and Analysis

Study Sample. Analyses included adult and youth Medicaid beneficiaries who were diagnosed with SMI or SED, eligible for full Medicaid benefits, not dually enrolled in Medicare, and enrolled for any length of time during the analysis period. To identify individuals with SMI or SED, we applied the Healthcare Effectiveness Data and Information Set (HEDIS) definition of SMI.

Outcome Measures. This report includes four claims-based mental health-related service use measures: mental health-related ED visits, mental health-related inpatient admissions, follow-up with a mental health practitioner within 30 days after hospitalization for mental illness, and all-cause 30-day readmission following a psychiatric discharge among adults with SMI.[4] These measures are all monitoring metrics[5] that the section 1115 SMI/SED demonstration states must report to CMS. These four claims-based measures were chosen because they aligned with demonstration goals of reducing ED visits, reducing readmissions, improving availability of psychiatric hospital services, and improving care coordination. These measures will also be used in future analyses to assess demonstration impacts.

Analyses. We plotted the average value of each measure by year for each state to observe trends over time. This report is descriptive only; we did not conduct statistical testing to assess whether yearly averages were significantly different from each other.

Analysis Period

We included data from 2017 to 2021 for each state. Because states implemented their section 1115 SMI/SED demonstration at different times, this period includes two implementation years for four states (District of Columbia, Vermont, Indiana, and Idaho) and one implementation year for three states (Oklahoma, Utah, and Washington). The analysis periods by state are summarized in **Exhibit 3**.

Exhibit 3. Analysis period by state

State	Implementation date	Baseline years	Demonstration year(s)
District of Columbia	January 2020	2017-2019	2020; 2021
Indiana	January 2020	2017-2019	2020; 2021
Vermont	January 2020	2017-2019	2020; 2021
Idaho	April 2020	2017-2019	2020; 2021
Oklahoma	December 2020	2017-2020	2021
Utah	January 2021	2017-2020	2021
Washington	January 2021	2017-2020	2021

[4] Throughout this report, we refer to the measure using the name given by the measure steward.

[5] There are 35 monitoring metrics representing five measurement domains (the four SMI/SED demonstration milestones and one domain representing "other" metrics of interest). The metrics are designed to monitor state demonstration performance while also minimizing state burden to report these metrics.

Results

Characteristics of the Study Sample

Exhibit 4 summarizes the characteristics of the SMI/SED population for 2019 in each state included in this report. Population characteristics in other years are similar for most states and one year is shown for simplicity. Due to differences in Medicaid expansion status, states varied in the percentage of the study sample that was under 19 years of age.[6] Children are a smaller percentage of the study sample in the states that expanded Medicaid: District of Columbia, Vermont, Indiana, and Washington. Oklahoma did not expand Medicaid until 2021; as such, 21 percent of their sample was below the age of 19. Likewise, a larger portion of the study samples in Idaho and Utah were children because these states did not expand Medicaid until 2020. Similarly, Oklahoma (36 years) and Idaho (33 years) had the lowest average age, and District of Columbia (42 years), Washington (38 years), and Vermont (37 years) had the highest average age. Because of the differing age distributions, utilization patterns may vary by state because children are less likely than adults to use intensive services like inpatient care. Among states that had fully expanded Medicaid in 2019,[7] the percentage of beneficiaries with SMI/SED eligible through Medicaid expansion varied from 35 percent (District of Columbia) to 62 percent (Washington).

Exhibit 4. Study sample characteristics in 2019, by state

Characteristic	DC	VT	IN	ID[2]	OK[3]	UT	WA
Number of SMI/SED beneficiaries[1]	9,491	4,109	35,313	6,421	17,878	8,380	38,968
Average age (years)	42	37	36	33	36	36	38
Child (age less than 19), %	4	7	12	23	21	11	6
Enrolled in Medicaid through Medicaid expansion, %	35	59	50	0	0	28	62
Average months enrolled in Medicaid	11	11	10	11	11	10	11
Co-occurring substance use disorder, %	38	55	41	43	33	52	48
Non-White, %	84	4	16	2	35	13	28
Missing race, %	13	6	20	0	2	27	3
Disabled, %	42	22	27	48	49	37	29
Enrolled in Medicaid managed care, %	53	0	85	0	0	66	96
Resides in rural county, %	0	81	24	30	44	13	13

[1]We compared the number of SMI/SED beneficiaries identified using the HEDIS definition of SMI to states' reports of individuals with SMI or SED at the time of states' section 1115 SMI/SED demonstration applications. States reported their estimates of the number of individuals with SMI or SED in the mental health availability assessment that accompanied the demonstration application. In every state, the state-reported count of individuals with SMI/SED is higher than the count identified using the HEDIS definition.
[2]Idaho expanded Medicaid in 2020. In 2020, Idaho had 13,109 beneficiaries, 42% of whom were enrolled through Medicaid expansion and 13% of whom were children.
[3]Oklahoma expanded Medicaid in 2021. In 2021, Oklahoma had 22,420 beneficiaries, 10% of whom were enrolled through Medicaid expansion and 19% of whom were children.

The average number of months enrolled in Medicaid during the year was 10 to 11 months. The percentage of beneficiaries with a co-occurring substance use disorder diagnosis varied from 33 percent (Oklahoma) to 55 percent (Vermont). A much larger portion of the sample in the District of Columbia was non-White compared to other states. The percentage of missing race values also varied by state and was highest in Utah (27 percent). A high percentage of missing race may limit our ability to conduct subpopulation analyses in future reports. The percentage of the study sample that was eligible for Medicaid due to a disability varied across states, ranging from 22 percent (Vermont) to 49 percent (Oklahoma). Four study states have Medicaid managed care (District of Columbia, Indiana, Utah, and Washington) and all enrolled a high percentage of the study sample in managed care. The percentage of beneficiaries living in rural counties varied substantially by state, ranging from 0 percent in District of Columbia to 81 percent in Vermont.[8]

Trends in Service Use

Exhibits 5 through 8 show the descriptive trends from 2017 to 2021 for the outcome measures in the seven study states. The averages for each outcome are shown by year and state in **Appendix B**.

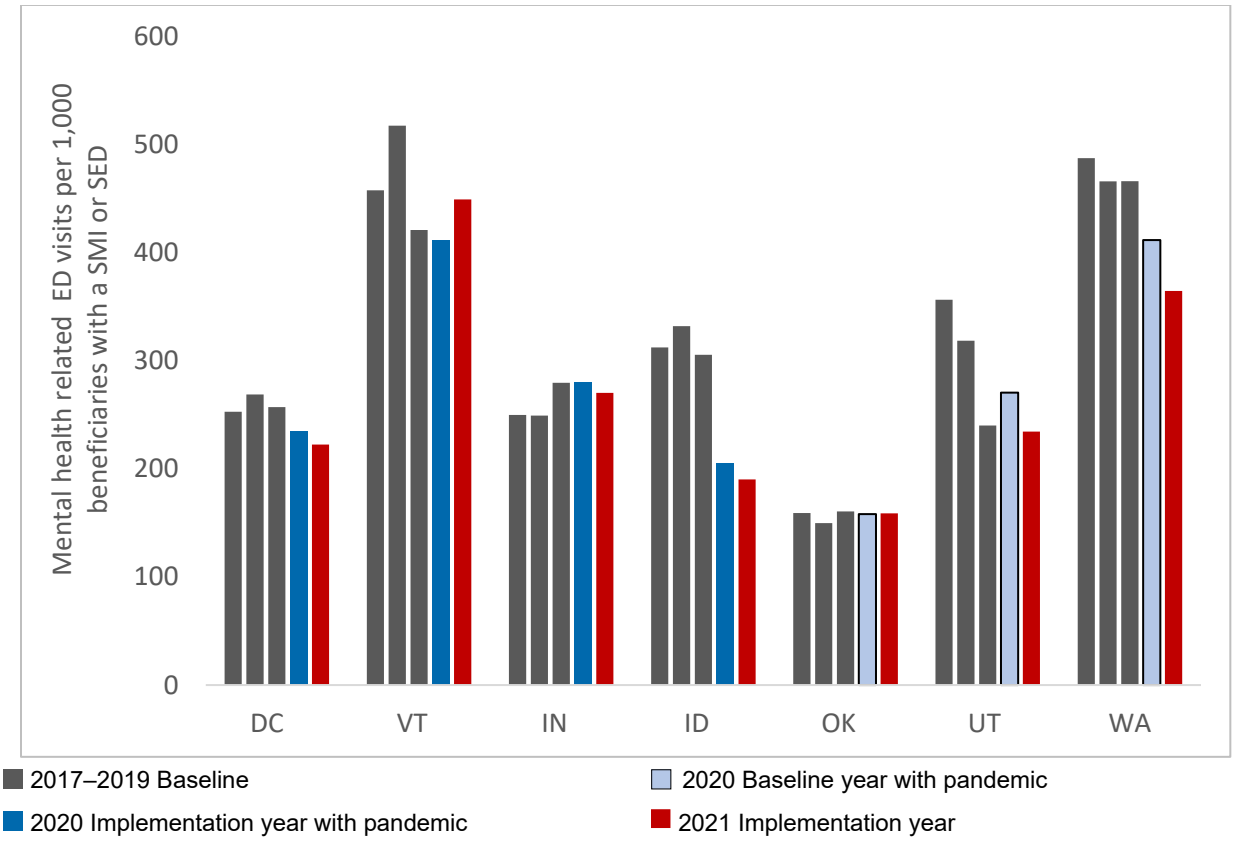
[6] Most state Medicaid programs define a child as less than 19 years of age, so that criterion is used in this analysis.
[7] Utah had a smaller-scale expansion that began in April 2019 but did not fully expand Medicaid until 2020.
[8] Vermont had a large amount of missingness in zip code information used to determine rurality. We filled in missingness with imputation that may overestimate the percentage of population that lives in a rural area.

MENTAL HEALTH-RELATED EMEGENCY DEPARTMENT VISITS

Descriptive trends showed little change or declines in mental health-related ED visits in all states in 2020-2021.

Exhibit 5. Mental health-related ED visit trends across all states, 2017 to 2021

Mental health-related ED visits declined or held steady in 2020-2021 in most states.



States Implementing the Demonstration in 2020. Mental health-related ED visits per 1,000 beneficiaries diagnosed with SMI or SED fluctuated slightly before demonstration implementation in the District of Columbia, Vermont, Indiana, and Idaho (**Exhibit 5**). In 2020, mental health-related ED visits declined slightly or held steady in all states except for Idaho. Because demonstration roll-out coincided with the start the COVID-19 pandemic, we cannot yet determine if the decrease in visits was due to the pandemic or due to demonstration activities. The sharp decline in 2020 in Idaho coincides with the expansion of Medicaid and is likely due in part to the increase in the number of beneficiaries used to calculate this measure. ED visit rates continued to decline in 2021 in the District of Columbia, Indiana, and Idaho; however, the ED visit rate increased in Vermont in 2021. Overall, from the baseline period (2017 to 2019) to the implementation period (2020–2021), the mental health ED visit rate declined by 12 percent, 8 percent, and 38 percent in the District of Columbia, Vermont, and Idaho, respectively. In Indiana, the ED visit rate increased by 6 percent from the baseline period to the implementation period.

States Implementing the Demonstration in Late 2020/Early 2021. Mental health-related ED visits stayed steady in Oklahoma and declined in Utah and Washington prior to the demonstration (**Exhibit 5**). Similar to the states implementing in 2020, mental health-related ED visits also held steady or declined in 2020 in Oklahoma and Washington, but visits increased in Utah. In 2021, the first year after implementation, the ED visit rate declined in Utah and Washington and held steady in Oklahoma. Overall, from the baseline period (2017-2020) to the implementation period (2021), the ED visit rate declined by about 20 percent in Utah and Washington and increased by 1 percent in Oklahoma. Utah's outpatient Medicaid TAF files have a high rate of missingness in the procedure code fields, however, which likely impacts the accuracy of the ED visit rate.

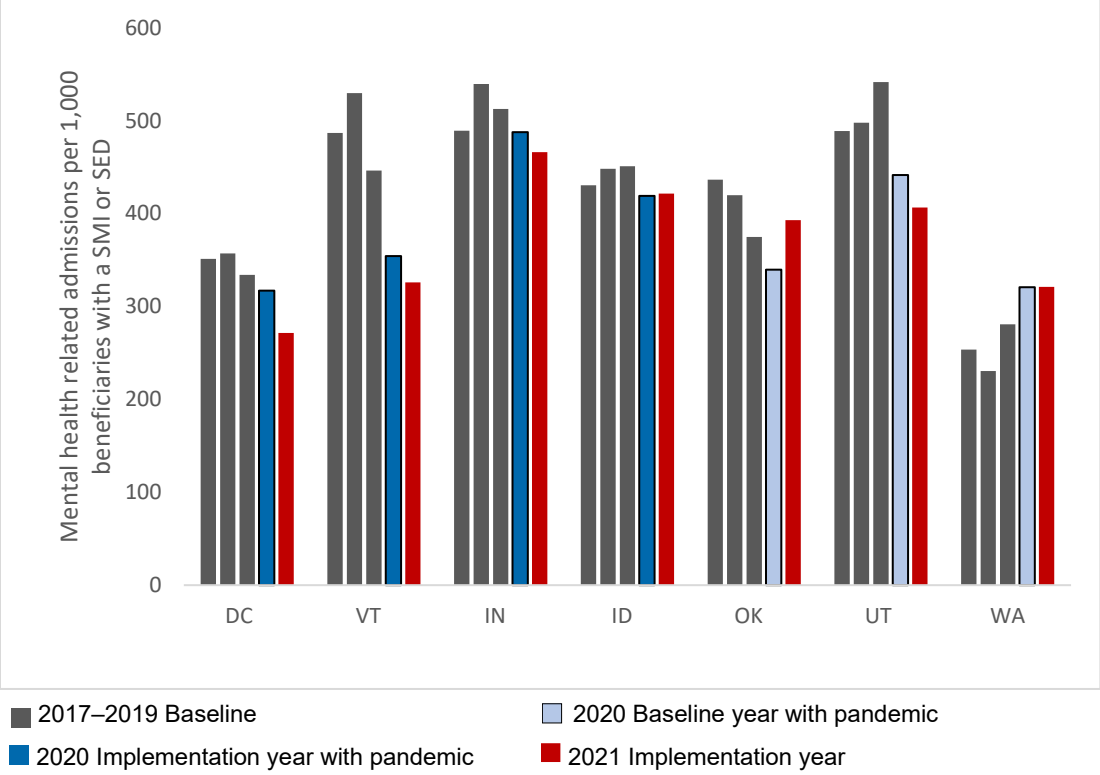
Impact of COVID-19. Almost all states experienced a decrease in mental health-related ED visits in 2020, likely due to less care-seeking as the COVID-19 pandemic spread across the country.

MENTAL HEALTH-RELATED INPATIENT ADMISSIONS

Descriptive trends showed declines or small changes in mental health-related inpatient admissions in all states in 2020-2021.

Exhibit 6. Mental health-related admissions trends across all states, 2017 to 2021

Mental health-related admissions declined or held steady in 2020-2021 in most states.



States Implementing the Demonstration in 2020. Mental health-related inpatient admissions per 1,000 beneficiaries diagnosed with SMI or SED fluctuated before the section 1115 SMI/SED demonstration implementation in the District of Columbia, Vermont, and Indiana (**Exhibit 6**). In Idaho, inpatient admissions increased slightly from 2017 to 2019, before implementation. Mental health-related inpatient admissions declined in the District of Columbia, Vermont, and Indiana in 2020 and 2021. The admission rate declined 15 percent in the District of Columbia, 30 percent in Vermont, 7 percent in Indiana, and 5 percent in Idaho from the baseline period to the implementation period.

States Implementing the Demonstration in Late 2020/Early 2021. From 2017 to 2019, mental health-related inpatient admissions per 1,000 beneficiaries declined in Oklahoma and fluctuated in Utah and Washington (**Exhibit 6**). Mental health-related inpatient admissions also declined in 2020 in Oklahoma and Utah. From the baseline period (2017 to 2020) to the implementation period (2021), the inpatient admission rate did not change in Oklahoma, declined by 17 percent in Utah, and increased by 18 percent in Washington.

Impact of COVID-19. Almost all states experienced a decrease in mental health-related inpatient admissions in 2020, following patterns of less inpatient use observed nationwide during the early phase of the COVID-19 pandemic.[9]

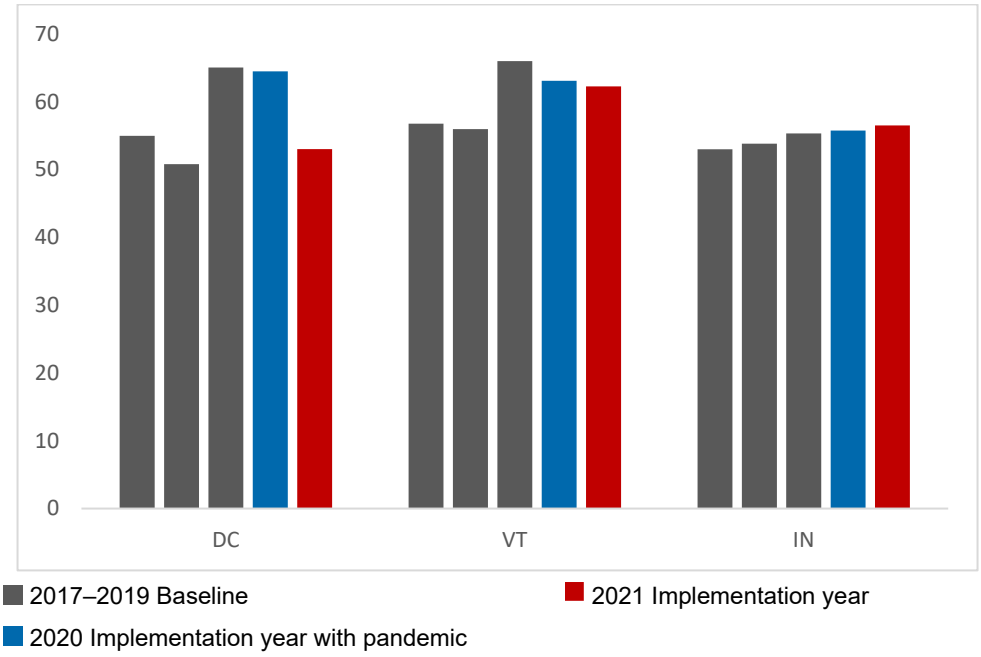
[9] Heist, T., Schwartz, K., & Butler, S. (2021). *Trends in overall and non-COVID-19 hospital admissions*. KFF. https://www.kff.org/health-costs/issue-brief/trends-in-overall-and-non-covid-19-hospital-admissions/

FOLLOW-UP WITH A MENTAL HEALTH PRACTITIONER AFTER HOSPITALIZATION FOR MENTAL ILLNESS

Descriptive trends showed that rates of follow-up within 30 days after a hospitalization for mental illness generally increased from 2017 to 2019 and were largely unchanged in 2020 in the three states with usable mental health provider data (District of Columbia, Vermont, and Indiana); however, the rate declined in the District of Columbia in 2021.

Exhibit 7. Follow-up visit rates after hospitalization for mental illness trends, 2017 to 2021

Follow-up visit rates after hospitalization for mental illness declined slightly or held steady after demonstration implementation.



States Implementing the Demonstration in 2020. This measure was only created for the District of Columbia, Vermont, and Indiana because Medicaid TAF data for the other states did not have usable provider specialty information, which is required to identify visits with a mental health practitioner. In the District of Columbia, the percentage of mental illness discharges with a follow-up visit within 30 days fluctuated over the baseline period from 2017 to 2019 but had an overall increase of 18 percent (from 55 percent to 65 percent) (**Exhibit 7**). Likewise, the 30-day follow-up rate increased from 2017 to 2019 by 15 percent in Vermont (from 57 percent to 66 percent) and by 4 percent in Indiana (from 53 percent to 55 percent). From the baseline period to the implementation period, the 30-day follow-up visit rate increased by 3, 5, and 4 percent in the District of Columbia, Vermont, and Indiana, respectively.

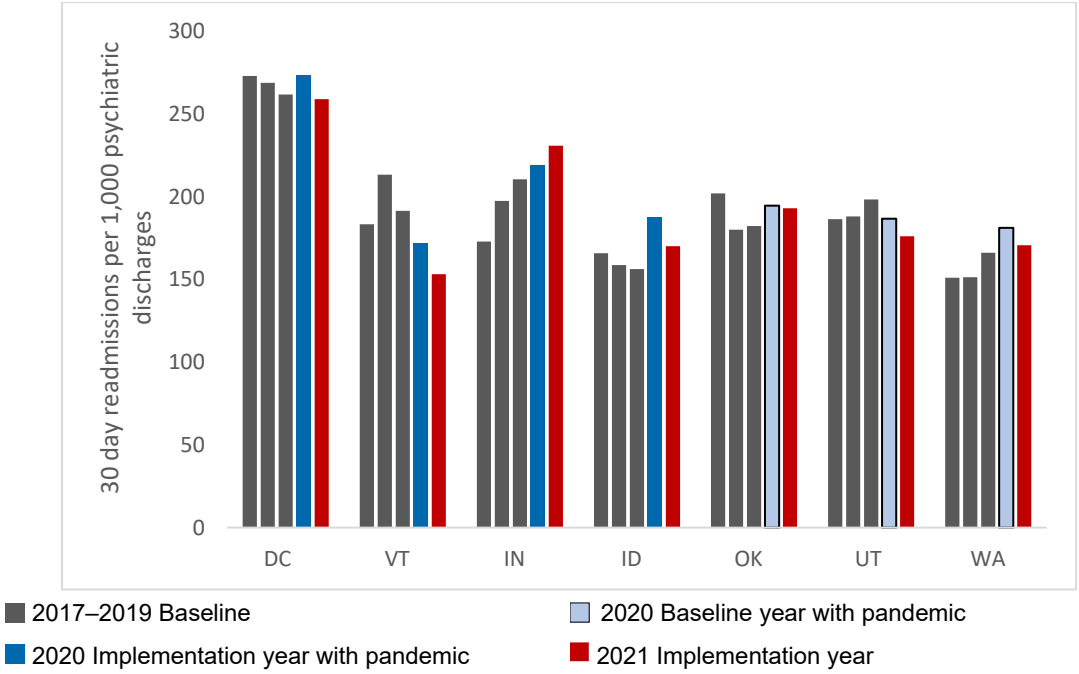
Impact of COVID-19. Across the three states for which this measure could be calculated, there were no large changes in follow-up rates during 2020.

ALL-CAUSE READMISSIONS WITHIN 30 DAYS OF A PSYCHIATRIC DISCHARGE FOR ADULTS WITH SMI

The rate of all-cause readmissions within 30 days of a psychiatric discharge did not change substantially in 2020-2021 across all states. For some states there was a slight increase and for others there was a slight decline.

Exhibit 8. All-cause 30-day readmission rates per 1,000 psychiatric discharges for adults with SMI, 2017 to 2021

All-cause 30-day readmission rates did not substantially change in 2020-2021.



States Implementing the Demonstration in 2020. All-cause 30-day readmissions per 1,000 psychiatric discharges declined slightly during the three years before demonstration implementation in the District of Columbia and Idaho while fluctuating in Vermont (**Exhibit 8**). In Indiana, 30-day readmissions increased 22 percent from 2017 to 2019. Overall, the readmission rate declined by 1 percent from the baseline period to the implementation period in the District of Columbia. The readmission rate had a larger decline in Vermont; where it declined 17 percent from the baseline period to the implementation period. In contrast, the readmission rate increased by 16 percent and 12 percent, respectively in Indiana and Idaho.

States Implementing the Demonstration in 2021. The 30-day readmission rate showed similar small changes in 2020 among the states that implemented their section 1115 SMI/SED demonstration in 2021 (**Exhibit 8**). In Oklahoma, the readmission rate declined from 2017 to 2018 then steadily increased to 2020. From the baseline period to the implementation period overall, the readmission rate increased 2 percent in Oklahoma. In Utah, the 30-day readmission rate increased during the years before the pandemic, then declined 7 percent from the baseline period to 2021. In Washington, the readmission rate increased before the pandemic, then dropped slightly in the demonstration period; however, the net effect was a 5 percent increase between the baseline period and 2021.

Impact of COVID-19. There is no consistent pattern to suggest that readmission rates decreased, increased, or remained unchanged across the states during 2020.

Conclusions

As the start of the COVID-19 pandemic, 2020 was an anomalous year, and there were some noticeable declines in service use, specifically for mental health-related ED visits and inpatient admissions. Future impact analyses will need to disentangle whether these declines were solely due to the health system shock that was the pandemic or, for the states that began in 2020, if the declines also reflect impacts of demonstration activities. For states that received approval in 2021, 2022, and later, COVID-19–related shifts in utilization during the pre-demonstration period will also need to be accounted for when conducting impact analyses. Interestingly, rates of follow-up with a mental health practitioner after a hospitalization for mental illness and 30-day readmissions after a hospitalization for mental illness did not change substantially in 2020; the reasons for this will need to be investigated further, both quantitatively and qualitatively with state officials.

These exploratory analyses provided an opportunity to test the usability of the Medicaid TAF data to analyze health service use among individuals with SMI/SED. These findings demonstrated the feasibility of using TAF data to measure mental health-related service use outcomes and highlighted several issues to address in future impact analyses, including sample composition due to Medicaid expansion and data quality concerns. Utah and Idaho expanded Medicaid in 2020 and Oklahoma expanded in 2021. Medicaid expansion changes the population that comprises the sample and can affect utilization patterns, so analyses in these states will need to account for these changes. We also found that most states did not have usable provider specialty data that would allow us to calculate the follow-up after a hospitalization for the mental illness measure because the measure requires that the follow-up visit be with a mental health provider. As such, it is possible that the actual follow-up visit rates are higher than reported. We will need to continue to assess the quality of provider data to determine if we can calculate this measure for states with future versions of the TAF data. In addition, we have concerns about Utah data that may impact their ED visit rates. We may need to exclude any outpatient measures, including ED visits, for Utah if their data quality does not improve with future iterations of TAF.

Authors and Acknowledgments

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The Federal Meta-Analysis Support Contract

In 2018, the Centers for Medicare & Medicaid Services (CMS) commissioned the Federal Meta-Analysis Support contract (HHSM-500-2014-00037I) to learn from each Medicaid section 1115 demonstration and the groups of such demonstrations with similar features. Under this contract, RTI International is conducting meta-evaluations of selected groups of Medicaid section 1115 demonstrations.

Rapid cycle reporting is central to the Federal Meta-Analysis Support contract, providing CMS with timely, practical findings, and supporting dissemination of findings to key stakeholder audiences. This report is one of several rapid cycle reports prepared by RTI International under the contract.

Appendix A: Data, Methods, and Limitations

This report summarizes descriptive trends from 2017 to 2021 in mental health-related service use measures in early implementing section 1115 serious mental illness/serious emotional disturbance (SMI/SED) demonstration states. The analysis focuses on seven states approved by April 2021: the District of Columbia, Vermont, Indiana, Idaho, Oklahoma, Utah, and Washington. Maryland was excluded due to missing diagnosis code information in the Medicaid claims data.

The analytic methods for the descriptive analyses are covered in this appendix, including: (1) the data sources used; (2) the study sample; (3) detailed measure specifications for each outcome; and (4) data limitations.

Data Source

Medicaid Data. We used Transformed Medicaid Statistical Information System Analytic Files (TAF) from the Chronic Conditions Warehouse (CCW) to derive Medicaid eligibility and enrollment information and mental health-related service use outcomes for Medicaid beneficiaries in the seven study states. For this report, we used Medicaid data from January 2017 through December 2021.

Study Sample

Analyses included youth and adult Medicaid beneficiaries who were diagnosed with SMI or SED, eligible for full Medicaid benefits, not dually enrolled in Medicare, and enrolled for any length of time during the analysis period. Section 1115 SMI/SED demonstration states vary in how they identify populations with SMI or SED. We applied the Healthcare Effectiveness Data and Information Set (HEDIS) definition of SMI/SED to all states to standardize the definition across states. We identified beneficiaries as having SMI or SED if they had at least one acute inpatient visit for schizophrenia, bipolar 1 disorder, or major depression or two outpatient visits for schizophrenia or bipolar 1 disorder during the measurement year. Because there is no standard definition of SED for children, we applied the HEDIS SMI definition for purposes of this report, which likely undercounts the number of children with SED because conditions such as schizophrenia and bipolar 1 disorder are often not diagnosed in younger children. We compared the number of SMI/SED beneficiaries identified using the HEDIS definition of SMI to states' reports of individuals with SMI or SED at the time of states' section 1115 SMI/SED demonstration applications. States reported their estimates of the number of individuals with SMI or SED in the mental health availability assessment that accompanied the demonstration application. In every state, the state-reported count of individuals with SMI/SED is higher than the count identified using the HEDIS definition.

Outcome Measures

The analyses included four outcome measures related to mental health services utilization: (1) emergency department (ED) utilization for mental health; (2) inpatient stays for mental health; (3) follow-up with a mental health practitioner after hospitalization for mental illness; and (4) all-cause 30-day readmissions following a psychiatric discharge. The measure definitions followed the specifications detailed in the *Medicaid Section 1115 Serious Mental Illness Demonstrations: Technical Specifications for Monitoring Metrics v3.0*.

The outcomes were defined as follows:

- **Mental health-related ED visits per 1,000 Medicaid beneficiaries with SMI (Metric #16):** This measure is a count of the number of ED visits a beneficiary had in a year with a primary diagnosis included in the HEDIS 2021 Mental Health Diagnosis Value Set. All ED visits were included in the ED visit count, including ED visits billed by (1) a hospital using revenue codes or procedure code in the HEDIS ED value set; (2) a visit with a procedure code in the Visit Setting Unspecified value set with a corresponding code from ED place of service value set with a mental health provider; and (3) a visit with a procedure code from the Visit Setting Unspecified value set with a corresponding code from the Community Mental Health Center place of service value set. ED visits were identified in the TAF other therapy file and were assigned to a calendar year based on the ending service date.
- **Number of mental health-related hospital admissions per 1,000 Medicaid beneficiaries with SMI (Metric #13):** This measure is a count of the number of inpatient stays a beneficiary had in a year. Inpatient stays are counted if the claim includes any revenue code with a value in the HEDIS 2021 Inpatient Stay Value Set and a primary diagnosis in the HEDIS 2021 Mental Health Diagnosis Value Set. Inpatient stays were identified in the TAF inpatient file and were assigned to a calendar year based on discharge date.
- **Percent of inpatient discharges for mental illness with a follow-up visit to a mental health practitioner within 30 days (Metric #7 and Metric #8):** This measure is a binary indicator for whether eligible discharges had at least one follow-up visit with a mental health provider within 30 days. An inpatient stay is included if it includes a diagnosis in the mental illness or self-harm value sets. The inpatient stay was assigned to a calendar year based on discharge date. Follow-up visits included outpatient visits, intensive outpatient encounters or partial hospitalizations, Community Mental Health Center visits, electroconvulsive therapy, telehealth visits, observation visits, transitional care management services visits, behavioral health care visits, and telephone visits. Outpatient visits, telehealth visits, observation visits, and transitional care visits had to include a mental health provider specialty code (identified through the provider specialty field or taxonomy codes).

- **All-cause 30-day readmissions for adults following a psychiatric discharge (Metric #4):** This measure is based on the Medicare Inpatient Psychiatric Facility Quality Reporting Program (IPFQR) measure. For this report, we made three modifications: (1) we counted all-cause readmissions rather than unplanned readmissions only; (2) we did not employ risk adjustment; and (3) we did not limit the index admissions to those from a psychiatric hospital only due to limitations in identifying psychiatric hospitals in the TAF data. We identified hospitalizations with a primary diagnosis in the list of qualifying diagnosis codes for the IPFQR measure. We then rolled up transfers (stays within one day of discharge) to create a file of unique inpatient psychiatric stays. We identified whether the psychiatric index stay was followed by another hospitalization (with any diagnosis code) within 30 days. We calculated the number of readmissions per 1,000 discharges. We used the TAF inpatient and long-term care files to identify hospital stays. Admissions were assigned to a calendar year based on index stay discharge date. This measure was restricted to adults only as children had very low rates of readmissions.

Data Limitations

The TAF data quality vary by state and year. This section summarizes the major issues that impacted the analyses for this report and may impact future analyses of the section 1115 SMI/SED demonstrations.

- Utah has unusable procedure code data in the other therapy file from 2017 to 2020. This information is used to identify services such as ED visits and outpatient visits, so we may not be able to reliably report outpatient outcomes for Utah.
- Idaho, Oklahoma, Utah, and Washington had high rates of missingness or invalid information across all provider fields that can be used to identify provider specialty. Because of this we could not reliably identify mental health provider visits, which is required to calculate the follow-up visit rate after a mental illness discharge. TAF other therapy file claims have three main provider fields for both servicing and billing providers: provider specialty, provider taxonomy, and National Provider Identifiers (NPIs). We can use the provider specialty field or provider taxonomy to identify the provider specialty, but there is a lot of missingness in these fields. To fill in provider information, we used any available NPI (servicing or billing provider) on the claim to link with the National Plan and Provider Enumeration System (NPPES) to identify provider taxonomy codes. However, there was still a high level of missing provider information in these states because the TAF data were often missing NPIs, provider specialty, and taxonomy information.
- According to the Medicaid DQ (Data Quality) Atlas,[10] Oklahoma claim volume in its inpatient file is lower than expected. The lower-than-expected volume of claims may partly explain why their mental health-related utilization rates were lower than other states (in addition to the large portion of children in their included population).

[10] https://www.medicaid.gov/dq-atlas/welcome

Appendix B. Descriptive Statistics by State

Year	DC	VT	IN	ID	OK	UT	WA
Mental health-related ED visits per 1,000 beneficiaries							
2017	253	457	250	312	159	356	487
2018	269	517	249	332	150	318	466
2019	257	421	280	305	161	240	466
2020	234	411	280	205	158	270	411
2021	222	449	270	190	159	234	364
Mental health-related inpatient admissions per 1,000 beneficiaries							
2017	351	487	489	430	436	489	254
2018	357	530	539	448	420	498	231
2019	334	446	513	451	375	542	281
2020	317	354	488	419	340	442	321
2021	271	326	466	422	393	407	321
% of hospitalizations for mental illness with a follow-up visit within 7 days after discharge							
2017	37	38	34	NR	NR	NR	NR
2018	33	40	35	NR	NR	NR	NR
2019	46	45	36	NR	NR	NR	NR
2020	49	43	36	NR	NR	NR	NR
2021	39	43	36	NR	NR	NR	NR
% of hospitalizations for mental illness with a follow-up visit within 30 days after discharge							
2017	55	57	53	NR	NR	NR	NR
2018	51	56	54	NR	NR	NR	NR
2019	65	66	55	NR	NR	NR	NR
2020	64	63	56	NR	NR	NR	NR
2021	53	62	56	NR	NR	NR	NR
30-day readmissions per 1,000 psychiatric discharges							
2017	273	183	173	166	202	187	151
2018	269	213	198	159	180	188	151
2019	262	192	211	156	182	198	166
2020	273	172	219	188	195	187	181
2021	259	153	231	170	193	176	171

NR = not reported due to data limitations