# APPENDIX A: GOALS, RESEARCH QUESTIONS, AND ANALYTIC APPROACHES FOR EVALUATING SECTION 1115 SERIOUS MENTAL ILLNESS/SERIOUS EMOTIONAL DISTURBANCE DEMONSTRATIONS

This appendix provides detailed recommendations for evaluations of Section 1115 demonstrations for adults with serious mental illness (SMI) and children with serious emotional disturbance (SED). This document contains the demonstration goals and hypotheses; an example logic model for expected outcomes; and a table of suggested research questions, comparative strategies, outcome measures, and analytic approaches. States should work with their evaluators to determine which research questions are most appropriate and feasible to address for individual demonstration goals.

## 1. Section 1115 demonstrations for SMI/SED

On November 13, 2018, the Centers for Medicare & Medicaid Services (CMS) published a State Medicaid Director (SMD) letter that provided guidance on Section 1115 demonstrations for improving access to and quality of treatment for Medicaid beneficiaries with SMI/SED. This SMI/SED demonstration opportunity will allow states, upon CMS approval of their demonstrations, to receive federal financial participation for services furnished to Medicaid beneficiaries during short-term stays for acute care in psychiatric hospitals or residential treatment settings that qualify as Institutions for Mental Disease (IMD), if those states are also taking action through these demonstrations to ensure quality care in IMDs and to improve access to community-based services. This SMI/SED demonstration opportunity is similar to the recent Section 1115 demonstration opportunity to improve treatment for substance use disorders (SUDs), including opioid use disorder.

To improve care for beneficiaries with SMI/SED, CMS provided detailed guidance in the SMD letter on innovative service delivery reforms that states are encouraged to consider implementing with existing state plan authority. As part of their SMI/SED 1115 demonstrations, states are expected to undertake actions identified as important milestones for making progress toward specific goals identified in the SMD letter. States are also encouraged to build on the opportunities for innovative service delivery reforms described in the letter to achieve the goals and milestones for their SMI/SED 1115 demonstrations.

## 2. Goals of the SMI/SED demonstrations

The five goals of SMI/SED demonstrations specified in the SMD letter are as follows:

a. Reduced utilization and length of stay in emergency departments (EDs) among Medicaid beneficiaries with SMI/SED while awaiting mental health treatment in specialized settings
b. Reduced preventable readmissions to acute care hospitals and residential settings
c. Improved availability of crisis stabilization services, including services made available through call centers and mobile crisis units, intensive outpatient services, as well as services provided during acute short-term stays in residential crisis stabilization programs, psychiatric hospitals, and residential treatment settings throughout the state

d. Improved access to community-based services to address the chronic mental health care needs of beneficiaries with SMI/SED, including through increased integration of primary and behavioral health care
e. Improved care coordination, especially continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities

States should also articulate any additional state-specific policy goals for their changes in service delivery systems for SMI/SED populations.

### 3. Sample logic model for SMI/SED demonstrations

Figure A.1 presents a sample logic model for the demonstration goal of improving care coordination, especially continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities. The logic model includes five sections:

**a. Key actions.** The key action section lists activities the state will implement that are a substantial change from the pre-demonstration period and that are expected to produce impacts that will contribute to achieving the goal. The sample logic model provides generic examples. CMS encourages states to identify specific programs, processes, or policies they are implementing.

**b. Short-term outcomes.** The short-term outcomes are the expected direct effects of the key actions.

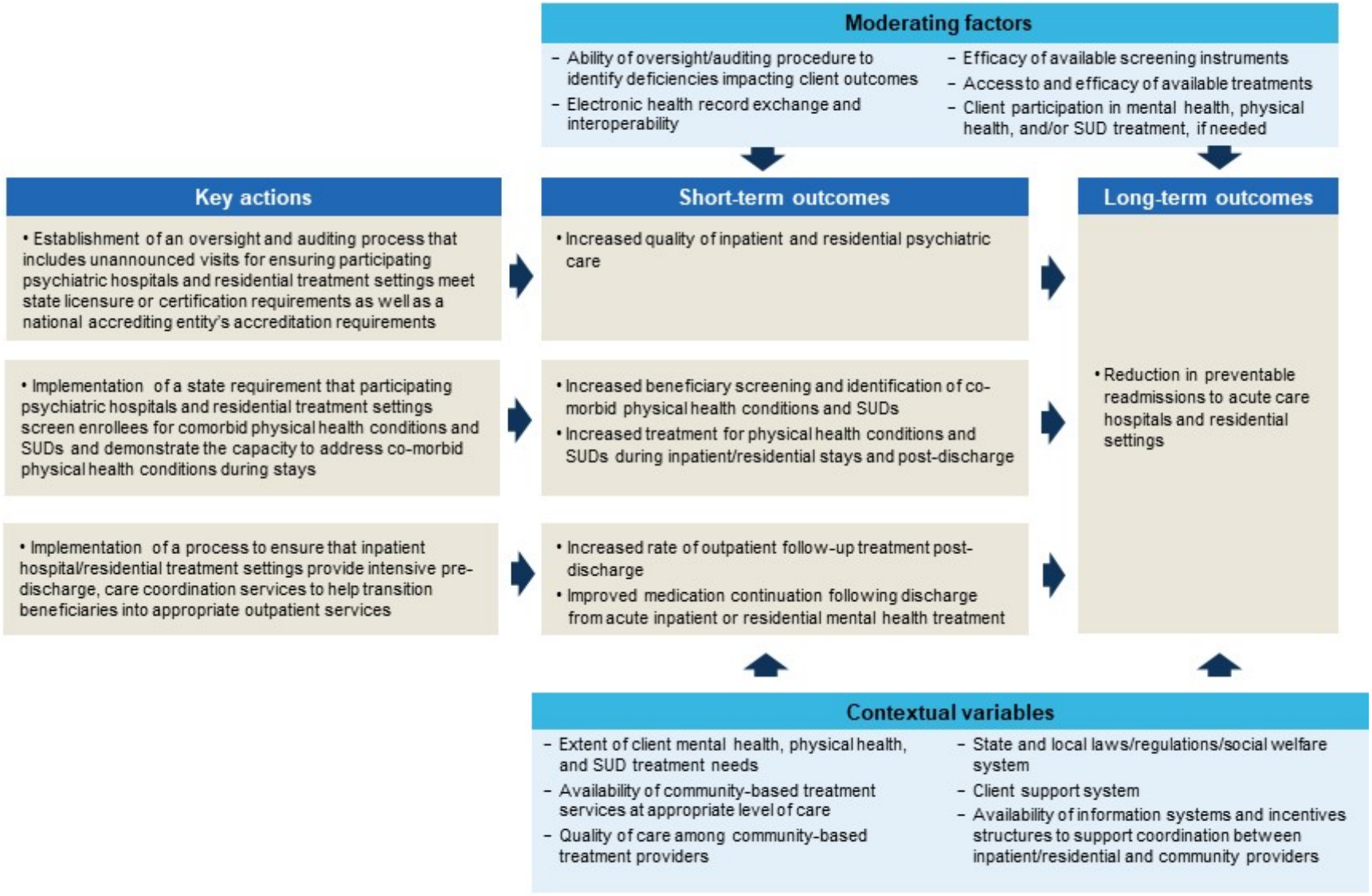
**c. Long-term outcomes.** The long-term outcomes are secondary effects of the key actions and indicators that the state has achieved the intended goals.

**d. Moderating factors.** The moderating factors are important preliminary outcomes that states should consider because they affect the relationship between the demonstration activities and one or more hypothesized outcomes; however, they are not themselves the demonstration goals.

**e. Contextual variables.** Confounding or contextual variables may influence policy implementation or outcomes and can bias evaluation results if the evaluation approach does not control for them.

States are expected to evaluate their success at achieving each of the five demonstration goals; therefore, they will have to create one or more logic models that together cover all five of the demonstration goals. When multiple goals and the activities intended to achieve them are related, states may choose to include them in one logic model; however, separate logic models are likely to provide a more precise road map when goals and associated activities are unrelated. States may also choose to develop separate logic models for targeted subpopulations (for example, children and adolescents versus adults) if different activities target each subpopulation.

**Figure A.1. Sample logic model for Goal 2: Reduction in preventable readmissions to acute care hospitals and residential settings**



## 4. Hypotheses and research questions for SMI/SED

States must include hypotheses and research questions in their evaluations that address each of the five demonstration goals described in the SMD letter. The recommended hypotheses and primary research questions listed below align with the demonstration goals; states should consider including them in their evaluations. States may, however, modify the recommended hypotheses and research questions to more directly align with their demonstration activities. States may also add hypotheses and research questions designed to evaluate (1) unique or state-specific aspects of their demonstrations or (2) demonstration processes and implementation that draw on monitoring or qualitative data that are not already included here. States and evaluators should work together to determine which subsidiary research questions are appropriate for capturing the specific aims of their demonstrations.

***Hypothesis 1:*** The SMI/SED demonstrations will result in reductions in utilization and length of stay in EDs among Medicaid beneficiaries with SMI/SED while awaiting mental health treatment. (Goal 1)

*Primary Research Question 1:* Does the SMI/SED demonstration result in reductions in utilization and length of stay in EDs among Medicaid beneficiaries with SMI/SED while awaiting mental health treatment?

*Subsidiary Research Question 1.1:* How do the SMI/SED demonstration effects on reducing utilization and length of stay in EDs among Medicaid beneficiaries with SMI/SED vary by geographic area or beneficiary characteristics?

*Subsidiary Research Question 1.2:* How do SMI/SED demonstration activities contribute to reductions in utilization and length of stay in EDs among Medicaid beneficiaries with SMI/SED while awaiting mental health treatment in specialized settings?

***Hypothesis 2:*** The SMI/SED demonstration will result in reductions in preventable readmissions to acute care hospitals and residential settings. (Goal 2)

*Primary Research Question 2:* Does the SMI/SED demonstration result in reductions in preventable readmissions to acute care hospitals and residential settings (including, short-term inpatient and residential admissions to both IMDs and non-IMD acute care hospitals, critical access hospitals, and residential settings)?

*Subsidiary Research Question 2.1:* How do the SMI/SED demonstration effects on reducing preventable readmissions to acute care hospitals and residential settings vary by geographic area or beneficiary characteristics?

*Subsidiary Research Question 2.2:* How do demonstration activities contribute to reductions in preventable readmissions to acute care hospitals and residential settings?

*Subsidiary Research Question 2.3:* Does the SMI/SED demonstration result in increased screening and intervention for comorbid SUD and physical health conditions during acute care psychiatric hospital and residential setting stays and increased treatment for such conditions after discharge?

***Hypothesis 3:*** The SMI/SED demonstration will result in improved availability of crisis stabilization services[1] throughout the state. (Goal 3)

*Primary Research Question 3.1:* To what extent does the SMI/SED demonstration result in improved availability of crisis outreach and response services (including, crisis call centers, mobile crisis units, crisis observation/assessment centers, and coordinated community crisis response teams) throughout the state?

*Primary Research Question 3.2:* To what extent does the SMI/SED demonstration result in improved availability of intensive outpatient services and partial hospitalization?

*Primary Research Question 3.3:* To what extent does the SMI/SED demonstration improve the availability of crisis stabilization services provided during acute short-term stays in each of the following: public and private psychiatric hospitals; residential treatment facilities; general hospital psychiatric units; and community-based settings (such as residential crisis stabilization programs, small inpatient units in community mental health centers, peer-run crisis respite programs, and so on)?

***Hypothesis 4:*** Access of beneficiaries with SMI/SED to community-based services to address their chronic mental health care needs will improve under the demonstration, including through increased integration of primary and behavioral health care. (Goal 4)

*Primary Research Question 4.1:* Does the demonstration result in improved access of beneficiaries with SMI/SED to community-based services to address their chronic mental health care needs?

*Subsidiary Research Question 4.1a:* To what extent does the demonstration result in improved availability of specific types[2] of community-based services needed to comprehensively address the chronic needs of beneficiaries with SMI/SED?

*Subsidiary Research Question 4.1b:* To what extent does the demonstration result in improved access of SMI/SED beneficiaries to the specific types of community-based services that they need?

*Subsidiary Research Question 4.1c:* How do the SMI/SED demonstration effects on access to community-based services vary by geographic area or beneficiary characteristics?

[1] Under Goal 3, the SMD letter describes crisis stabilization services as "including services made available through call centers and mobile crisis units, intensive outpatient services, as well as services provided during acute short-term stays in residential crisis stabilization programs, psychiatric hospitals, and residential treatment settings."

[2] Types of community-based services to address the chronic mental health care needs of beneficiaries with SMI/SED may include certified community behavioral health clinics, supportive housing, illness self-management, evidence-based psychotherapy, peer-support and consumer-operated services, psychosocial habilitation or rehabilitation, outreach to and engagement of those who are homeless, systematic medication management, integrated treatment for co-occurring substance use disorders and other disabilities, supported employment, education and family supports, school-based services, and trauma-informed care, among others.

*Primary Research Question 4.2:* Does the integration of primary and behavioral health care to address the chronic mental health care needs of beneficiaries with SMI/SED increase under the demonstration?

***Hypothesis 5:*** The SMI/SED demonstrations will result in improved care coordination, especially continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities. (Goal 5)

*Primary Research Question 5.1:* Does the SMI/SED demonstration result in improved care coordination for beneficiaries with SMI/SED?

*Primary Research Question 5.2:* Does the SMI/SED demonstration result in improved continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities?

*Subsidiary Research Question 5.2a:* Does the SMI/SED demonstration result in improved discharge planning and outcomes regarding housing for beneficiaries who are transitioning out of acute psychiatric care in hospitals and residential treatment facilities?

*Subsidiary Research Question 5.2b:* How do demonstration activities contribute to improved continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities?

## 5. Recommended outcome measures and analytic approaches

Recommended outcome measures,[3] comparison strategies (where applicable), potential data sources, and suggested analytic approaches are listed in Table A.1 for Hypotheses 1 through 5 and the corresponding research questions.

States are expected to select outcome measures tailored to the activities they implement under the demonstration to achieve each goal. The measures listed in Table A.1 under the primary research questions are aligned with the goals that all states are required to target. Thus, states should give substantial consideration to including these outcome measures in their evaluation, if feasible. States may, however, propose alternative measures for each goal if they are better tailored to their target population and data sources. For subsidiary research questions, states should select the measures that best align with the activities they are undertaking as part of their demonstration. In addition, states may supplement the suggested measures with additional measures tailored to their demonstrations. In an effort to minimize state burden, some of the recommended measures presented in Table A.1 align with the metrics used for monitoring reports. States should review the SMI/SED metrics list and technical specifications for more details.

[3] States should review the measure specifications for details on the specifics of the recommended outcome measures. Measure specifications for many of the recommended measures can be found in the manual, "Section 1115 Serious Mental Illness and Serious Emotional Disturbance Demonstrations Monitoring Metrics Technical Specifications" (known as, the technical specifications).

CMS expects that states will work with their evaluators to choose the most robust evaluation approaches possible based on comparison group opportunities and data availability. Suggested approaches to answering primary research questions emphasize quasi-experimental approaches, such as difference-in-differences regression models, regression discontinuity designs, and interrupted time series designs. When a valid comparison strategy is available, states should consider using propensity scores to balance the groups and improve causal inference. States should make their best efforts to develop evaluation designs that incorporate comparison populations. When no valid comparison group is available, interrupted time series designs are preferable to pre-post analyses. Subsidiary questions are more exploratory in nature; in some cases, descriptive analyses may be the only feasible way to address them. States should also consider the availability and reliability of suggested data sources when designing their evaluations. If suggested data sources are not available, states should consider alternative data sources, measures, and approaches.

## Table A.1. Sample measures, data sources, and analytic approaches for hypotheses and research questions to evaluate SMI/SED demonstrations

Note: The approaches suggested here are the strongest potentially feasible approaches that are likely to be broadly applicable across participating states. CMS expects that states will work with their evaluators to (1) identify outcome measures that will best provide evidence regarding the specific hypotheses that the state is testing under section 1115 authority and (2) for identified outcome measures, choose among and adapt suggested evaluation approaches based on comparison group opportunities and data availability.

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| ***Hypothesis 1:*** *The SMI/SED demonstrations will result in reductions in utilization and lengths of stays in EDs among Medicaid beneficiaries with SMI or SED while awaiting mental health treatment.* | | | | |
| **Primary Research Question 1:** Does the SMI/SED demonstration result in reductions in utilization and lengths of stays in EDs among Medicaid beneficiaries with SMI or SED while awaiting mental health treatment in specialized settings? | | | | |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Number of all-cause ED visits per 1,000 beneficiary-months among adult Medicaid beneficiaries age 18 and older who met the eligibility criteria of beneficiaries with SMI | Milestone 2 monitoring metric (and could adapt for beneficiaries younger than age 18 with SED) | Claims | Difference-in-differences model |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Number of beneficiaries with SMI/SED who use ED services for mental health during the measurement period | Milestone 3 monitoring metric | Claims | Difference-in-differences model |
| Similar non-Medicaid beneficiaries | Time from ED arrival to ED departure for Medicaid beneficiaries with an SMI or SED diagnosis who are admitted or transferred from an ED to inpatient psychiatric treatment | CMS, NQF #0496 (adapted) | Electronic/paper medical records or ED/inpatient facility administrative records | Differences-in-differences model |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| **Subsidiary Research Question 1.1:** How do the SMI/SED demonstration effects on reducing utilization and lengths of stays in EDs among Medicaid beneficiaries with SMI/SED vary by geographic area or beneficiary characteristics? | | | | |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Number of all-cause ED visits per 1,000 beneficiary-months among adult Medicaid beneficiaries age 18 and older who met the eligibility criteria of beneficiaries with SMI<br><br>Subgroups could be based on zip code of beneficiary residence or beneficiary characteristics (for example, primary and secondary diagnoses, age group, ethnicity, race, receipt of community-based treatment services in the 7 or 30 days prior to the ED visit) | Milestone 2 monitoring metric (and could adapt for beneficiaries under age 18 with SED) | Claims | Subgroup analyses, using difference-in-differences models |
| Similar non-Medicaid beneficiaries | Subgroup of analyses of time from ED arrival to ED departure for Medicaid beneficiaries with SMI/SED diagnoses who are admitted or transferred from an ED to inpatient psychiatric treatment<br><br>Subgroups could be based on zip code of ED or beneficiary characteristics (for example, primary and secondary diagnoses, age group, ethnicity, race) | CMS, NQF #0496 (adapted) | Electronic/paper medical records or ED/inpatient facility administrative records | Subgroup analyses, using difference-in-differences models |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| **Subsidiary Research Question 1.2:** How do demonstration activities contribute to reductions in utilization and lengths of stays in EDs among Medicaid beneficiaries with SMI/SED while awaiting mental health treatment in specialized settings? | | | | |
| n.a. | Demonstration activities or their components or characteristics that stakeholders identify as most effective in reducing utilization and lengths of stays in EDs among Medicaid beneficiaries with SMI or SED<br><br>Obstacles that stakeholders identify as hindering the effectiveness of the demonstration in reducing utilization and lengths of stays in EDs | None | Interviews or focus groups with ED and state demonstration staff<br><br>Interviews or focus groups with affected beneficiaries and/or their family members/caregivers | Qualitative analysis to identify themes associated with the effectiveness of demonstration activities for reducing utilization and lengths of stays in EDs among Medicaid beneficiaries with SMI/SED |
| n.a. | Changes made through the demonstration to systems, processes, or policies related to tracking inpatient psychiatric bed availability in real time<br><br>Demonstration activities that ED and/or state demonstration staff identify as most effective for improving the ability to track inpatient psychiatric bed availability in real time<br><br>Obstacles that ED and/or state demonstration staff identify as hindering the effectiveness of demonstration activities aimed at improving systems or processes for tracking inpatient psychiatric bed availability in real time | None | Interviews with ED and/or state demonstration staff | Qualitative analysis to identify themes associated with the effectiveness of demonstration activities to improve systems or processes for tracking inpatient psychiatric bed availability in real time |
| ***Hypothesis 2:*** *The SMI/SED demonstration will result in reductions in preventable readmissions to acute care hospitals and residential settings.* | | | | |
| **Primary Research Question 2:** Does the SMI/SED demonstration result in reductions in preventable readmissions to acute care hospitals and residential settings (including, short-term inpatient and residential admissions to both IMDs and non-IMD acute care hospitals, critical access hospitals, and residential settings)? | | | | |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Thirty-day, all-cause unplanned readmissions following psychiatric hospitalization | Milestone 2 monitoring metric, CMS, NQF #2860 (adapted) | Claims | Difference-in-differences model |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| **Subsidiary Research Question 2.1:** How do the SMI/SED demonstration effects on reducing preventable readmissions to acute care hospitals and residential settings vary by geographic area or beneficiary characteristics? | | | | |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Thirty-day, all-cause unplanned readmissions following psychiatric hospitalization<br><br>Subgroups could be based on zip code of beneficiary residence or beneficiary characteristics (for example, primary and secondary diagnoses, age group, ethnicity, race, receipt of community-based treatment services in the 7 and 30 days prior to the readmission) | Milestone 2 monitoring metric, CMS, NQF #2860 (adapted) | Claims | Subgroup analyses, using difference-in-differences models |
| **Subsidiary Research Question 2.2:** How do demonstration activities contribute to reductions in preventable readmissions to acute care hospitals and residential settings? | | | | |
| n.a. | Demonstration activities or their components or characteristics that stakeholders identify as most effective in reducing preventable readmissions to acute care hospitals and residential settings<br><br>Obstacles that stakeholders identify as hindering the effectiveness of the demonstration in reducing preventable readmissions to acute care hospitals and residential settings | None | Interviews or focus groups with hospital/residential staff and community-based service providers<br><br>Interviews or focus groups with affected beneficiaries and/or their family members/caregivers | Qualitative analysis to identify themes associated with the effectiveness of demonstration activities for reducing preventable readmissions to acute care hospitals and residential settings |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Percentage of Medicaid beneficiaries with 30-day, all-cause unplanned readmissions following psychiatric hospitalization who receive community-based treatment services in the 7 and 30 days prior to readmission | None | Claims | Difference-in-differences regression model |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| **Subsidiary Research Question 2.3:** Does the SMI/SED demonstration result in increased screening and intervention for comorbid SUD and physical health conditions during acute care psychiatric inpatient and residential stays and increased treatment for such conditions after discharge? | | | | |
| Trend over time during the pre-demonstration period | Beneficiaries admitted to psychiatric inpatient or residential treatment facilities who are screened for SUDs and, if indicated, offered an intervention for the SUD during the hospital stay | Milestone 1 monitoring metric, The Joint Commission, NQF #1663 (adapted) | Electronic/ paper medical records<br>IPFQR program[b]<br>State-specific beneficiary survey | Descriptive quantitative analysis of trends over time before and during the demonstration |
| Baseline assessment for the period just prior to the start of the demonstration | Beneficiaries admitted to psychiatric inpatient or residential treatment facilities who are screened for comorbid physical health conditions and, if indicated, offered an intervention for the condition during the hospital stay | None | Electronic/paper medical records<br>State-specific beneficiary survey | Descriptive quantitative analysis comparing baseline and demonstration midpoint and end date |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Proportion of beneficiaries who receive outpatient treatment for SUDs and physical health conditions within 30 days after discharge from a psychiatric inpatient or residential treatment facility | None | Claims | Difference-in-differences regression model |
| ***Hypothesis 3:*** *The SMI/SED demonstration will result in improved availability of crisis stabilization services throughout the state.* | | | | |
| **Primary Research Question 3.1:** To what extent does the SMI/SED demonstration result in improved availability of crisis outreach and response services (including, crisis call centers, mobile crisis units, crisis observation/assessment centers, and coordinated community crisis response teams) throughout the state? | | | | |
| Baseline assessment at the start of the demonstration | Number of crisis call centers<br>Number of mobile crisis units<br>Number of crisis observation/assessment centers<br>Number of coordinated community crisis response teams | CMS 1115 SMI/SED demonstration team | Annual assessments of availability of mental health services | Descriptive quantitative analysis of trends over time during the demonstration |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| Baseline map that shows the geographic distribution at the start of the demonstration | For each geographic region, the ratio of Medicaid beneficiaries with SMI/SED to the number of:<br>• Crisis call centers<br>• Mobile crisis units<br>• Crisis observation/assessment centers<br>• Coordinated community crisis response teams | CMS 1115 SMI/SED demonstration team | Annual assessments of availability of mental health services | State maps that show the ratio of Medicaid beneficiaries with SMI/SED to crisis stabilization services across the state at baseline and for each year of the demonstration |
| States without SMI/SED 1115 waivers[a] | Number of mental health facilities that accept Medicaid and offer a crisis intervention team that handles acute mental health issues | None | NMHSS, Questions A15 and A24 in 2018 survey[c] | Descriptive quantitative analysis of trends over time before and during the demonstration for demonstration state and comparison states |
| **Primary Research Question 3.2:** To what extent does the SMI/SED demonstration result in improved availability of intensive outpatient services and partial hospitalization? | | | | |
| Baseline assessment at the start of the demonstration | Number of Medicaid-enrolled intensive outpatient and partial hospitalization providers | CMS 1115 SMI/SED demonstration team | Annual assessments of availability of mental health services | Descriptive quantitative analysis of trends over time during the demonstration |
| Baseline map that shows the geographic distribution at the start of the demonstration | Ratio of Medicaid beneficiaries with SMI/SED to Medicaid-enrolled intensive outpatient/partial hospitalization providers, by geographic region | CMS 1115 SMI/SED demonstration team | Annual assessments of availability of mental health services | State maps that show the ratio of Medicaid beneficiaries with SMI/SED to intensive outpatient and partial hospitalization providers across the state at baseline and for each year of the demonstration |
| States without SMI/SED 1115 waivers[a] | Number of mental health facilities that accept Medicaid and offer partial hospitalization/day treatment<br><br>Number of hospitals with psychiatric partial hospitalization programs | None | NMHSS, Questions A3, A12, and A24 in 2018 survey[c]<br><br>AHRF | Descriptive quantitative analysis of trends over time before and during the demonstration for demonstration state and comparison states |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| **Primary Research Question 3.3:** To what extent does the SMI/SED demonstration improve the availability of crisis stabilization services provided during acute short-term stays in each of the following: public and private psychiatric hospitals; residential treatment facilities; general hospital psychiatric units; and community-based settings (such as residential crisis stabilization programs, small inpatient units in community mental health centers, peer-run crisis respite programs, and so on)? | | | | |
| Baseline assessment at the start of the demonstration | Number of psychiatric hospitals<br><br>Total number of residential mental health treatment facilities and beds (adult)<br><br>Number of Medicaid-enrolled psychiatric residential treatment facilities and beds (child)<br><br>Number of Medicaid-enrolled psychiatric units in acute care and critical access hospitals<br><br>Number of licensed psychiatric hospital and psychiatric unit beds<br><br>Number of crisis stabilization units | CMS 1115 SMI/SED demonstration team | Annual assessments of availability of mental health services | Descriptive quantitative analysis of trends over time during the demonstration |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| Baseline map that shows the geographic distribution at the start of the demonstration | For each geographic region, the ratio of the number of Medicaid beneficiaries with SMI/SED to the number of:<br>• Psychiatric hospitals<br>• Medicaid-enrolled psychiatric units in acute care and critical access hospitals<br>• Licensed psychiatric hospital and psychiatric unit beds<br>• Crisis stabilization units<br><br>For each geographic region:<br>• The ratio of Medicaid beneficiaries with SMI to the total number of residential mental health treatment facilities and beds (adult)<br>• The ratio of Medicaid beneficiaries with SED to the number of Medicaid-enrolled psychiatric residential mental health treatment facilities and beds (child) | CMS 1115 SMI/SED demonstration team | Annual assessments of availability of mental health services | State maps that show the ratio of Medicaid beneficiaries with SMI/SED to inpatient and residential treatment across the state at baseline and for each year of the demonstration |
| States without SMI/SED 1115 waivers[a] | Number of mental health facilities offering 24-hour hospital inpatient or residential treatment—total and broken out by facility type (public psychiatric hospital, private psychiatric hospital, residential treatment facility, general hospital psychiatric unit, community-based inpatient setting) | None | NMHSS, Questions A3, A4, A9 in 2018 survey[c]<br><br>AHRF data on psychiatric short-term hospitals, hospitals with psychiatric care, hospitals with psychiatric residential treatment | Descriptive quantitative analysis of trends over time before and during the demonstration for demonstration state and comparison states |
| Trend over time during the pre-demonstration period | Number of inpatient beds—total and broken out by facility type (public psychiatric hospital, private psychiatric hospital, residential treatment facility (adult), psychiatric residential treatment facility (child), general hospital psychiatric unit, crisis stabilization units or other community-based inpatient setting) | None | State administrative data or state-specific provider survey<br><br>AHRF data on psychiatric care beds set up in short-term general hospitals | Descriptive quantitative analysis of trends over time before and during the demonstration |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| States without SMI/SED 1115[a] | Number of mental health facilities offering 24-hour hospital inpatient or residential treatment, broken out by age groups accepted for treatment (children, adolescents, young adults, adults, seniors), or that provide mental health services in languages other than English | None | NMHSS, Questions A3, A13, A16, A17 in 2018 survey[c]<br><br>AHRF data on number of hospitals with psychiatric child/adolescent services or geriatric services | Descriptive quantitative analysis of trends over time before and during the demonstration for demonstration state and comparison states |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| ***Hypothesis 4:*** *Access of beneficiaries with SMI/SED to community-based services to address their chronic mental health care needs[d] will improve under the demonstration, including through increased integration of primary and behavioral health care.* | | | | |
| **Primary research question 4.1:** Does the demonstration result in improved access of beneficiaries with SMI/SED to community-based services to address their chronic mental health care needs? | | | | |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Proportion of beneficiaries with SMI/SED who use mental health–related (1) outpatient, rehabilitation, and targeted case management services; (2) home and community-based services; and (3) long-term services and supports | Milestone 3 monitoring metric for outpatient mental health services utilization divided by Milestone 4 monitoring metric for count of beneficiaries with SMI/SED | Claims | Difference-in-differences regression model |
| | Amount of mental health–related (1) outpatient, rehabilitation, and targeted case management services; (2) home and community-based services; and (3) long-term services and supports used by beneficiaries with SMI/SED | None | | |
| | Ratio of non-inpatient/nonresidential costs associated with mental health services for beneficiaries with SMI/SED to inpatient or residential costs for the same | "Other SMI/SED" monitoring metrics for total costs and per capita costs associated with mental health services for beneficiaries with SMI/SED—not inpatient or residential<br><br>"Other SMI/SED" monitoring metrics for total costs and per capita costs associated with mental health services for beneficiaries with SMI/SED—inpatient or residential | | |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| **Subsidiary Research Question 4.1a:** To what extent does the demonstration result in improved availability of community-based services needed to comprehensively address the chronic mental health needs of beneficiaries with SMI/SED? | | | | |
| Baseline assessment at the start of the demonstration | Number of Medicaid-enrolled:<br>• Community mental health centers<br>• Psychiatrists and other mental health practitioners authorized to prescribe<br>• Mental health practitioners (other than psychiatrists) who are certified and licensed by the state to independently treat mental illness | CMS 1115 SMI/SED demonstration team | Annual assessments of availability of mental health services | Descriptive quantitative analysis of trends over time during the demonstration |
| States without SMI/SED 1115 waivers[a] | Number of mental health facilities that offer outpatient mental health treatment and accept Medicaid | None | NMHSS, Questions A3 and A24 in 2018 survey[c] | Descriptive quantitative analysis of trends over time before and during the demonstration for demonstration state and comparison states |
| States without SMI/SED 1115 waivers[a] | Number of community mental health centers, outpatient mental health facilities, and multi-setting mental health facilities that accept Medicaid and offer specific types of mental health treatment approaches, services, and practices | None | NMHSS, Questions A4, A11, A12, and A24 in 2018 survey[c] | Descriptive quantitative analysis of trends over time before and during the demonstration for demonstration state and comparison states |
| States without SMI/SED 1115 waivers[a] | Per capita availability of outpatient mental health professionals, by type (for example, psychologists, social workers, psychiatrists, counselors) | None | AHRF | Chi-squared analysis comparing baseline and each demonstration year for demonstration state and comparison states |
| Baseline assessment at the start of the demonstration | Number and capacity of certified community behavioral health clinics[d] | None | State administrative data | Descriptive quantitative analysis comparing baseline and demonstration midpoint and end date |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| **Subsidiary Research Question 4.1b:** To what extent does the demonstration result in improved access of SMI/SED beneficiaries to specific types of community-based services?[e] | | | | |
| States without SMI/SED 1115 waivers[a] | Percentage of individuals with SMI/SED served by the state mental health authority who receive specific types of evidence-based community mental health practices | None | URS[f] | Descriptive quantitative analysis of trends over time before and during the demonstration for demonstration state and comparison states |
| Similar children and adolescents in states without SMI/SED 1115 waivers[a] | The percentage of children and adolescents ages 1 to 17 who had a new prescription for an antipsychotic medication and had documentation of psychosocial care as first-line treatment | NCQA, NQF #2801 | Claims<br><br>Child Core Set[g] | Difference-in-differences model |
| Similar prescriptions in states without SMI/SED 1115 waivers[a] | Percentage of new antipsychotic prescriptions for Medicaid beneficiaries age 18 and older who have completed a follow-up visit with a provider with prescribing authority within four weeks (28 days) of prescription of an antipsychotic medication | Milestone 4 monitoring metric, CMS, NQF #3313 | Claims | Difference-in-differences model |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| **Subsidiary Research Question 4.1c:** How do the SMI/SED demonstration effects on access to community-based services vary by geographic area or beneficiary characteristics? | | | | |
| Baseline map that shows the geographic distribution at the start of the demonstration | For each geographic region, the ratio of Medicaid beneficiaries with SMI/SED to Medicaid-enrolled:<br>• Community mental health centers<br>• Psychiatrists and other mental health practitioners authorized to prescribe<br>• Mental health practitioners (other than psychiatrists) who are certified and licensed by the state to independently treat mental illness | CMS 1115 SMI/SED demonstration team | Annual assessments of the availability of mental health services | State maps that show the ratio of Medicaid beneficiaries with SMI/SED to mental health providers across the state at baseline and for each year of the demonstration |
| | Per capita availability of outpatient mental health professionals, by type (for example, psychologists, social workers, psychiatrists, counselors) | | AHRF county data | |
| States without SMI/SED 1115 waivers[a] | Number of mental health facilities that provide outpatient mental health treatment, accept Medicaid, and (1) serve children, adolescents, or geriatric populations or (2) provide mental health services in languages other than English | None | NMHSS, Questions A3, A4, A13, A16, A17, and A24 in 2018 survey[c] | Descriptive quantitative analysis of trends over time before and during the demonstration for demonstration state and comparison states |
| **Primary Research Question 4.2:** Does the integration of primary and behavioral health care to address the chronic mental health care needs of beneficiaries with SMI/SED improve under the demonstration? | | | | |
| Baseline assessment at the start of the demonstration | Number of FQHCs that offer behavioral health services | CMS 1115 SMI/SED demonstration team | Annual assessments of availability of mental health services | Descriptive quantitative analysis of trends over time during the demonstration |
| Baseline map that shows the geographic distribution at the start of the demonstration | For each geographic region of the state, the ratio of Medicaid beneficiaries with SMI/SED to FQHCs that offer behavioral health services | | | State maps that show the ratios of Medicaid beneficiaries with SMI/SED to FQHCs that offer behavioral health services across the state at baseline and for each year of the demonstration |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| States without SMI/SED 1115 waivers[a] | Number and percentage of Medicare FFS or Medicaid providers providing behavioral health integration services[h] | Medicare G-codes G0502, G0503, G0504, and G0507 (from January 1, 2017, to December 31, 2017); Medicare CPT codes 99492, 99493, 99494, 99484 (after January 1, 2018); state-specific Medicaid billing codes for behavioral health integration services | Medicare claims for dual Medicare-Medicaid beneficiaries; Medicaid claims for states with specific billing codes for behavioral health integration services | Difference-in-differences model |
| States without SMI/SED 1115 waivers[a] | Percentage of beneficiaries screened for clinical depression on the date of the encounter using an age-appropriate standardized depression screening tool AND, if positive, a follow-up plan is documented on the date of the positive screen (age 18 and older and age 12 to 17) | Milestone 4 monitoring metric, CMS, NQF #0418/0418e | Hybrid claims and medical records or electronic medical records<br>Child and Adult Core Set[g] | Difference-in-differences |
| ***Hypothesis 5:*** *The SMI/SED demonstration will result in improved care coordination, especially continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities.* | | | | |
| **Primary Research Question 5.1:** Does the SMI/SED demonstration result in improved care coordination for beneficiaries with SMI/SED? | | | | |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Percentage of patients age 18 and older with an SMI who were screened for unhealthy alcohol use with a systematic screening method at least once within the last 24 months AND who received brief counseling if identified as an unhealthy alcohol user | Milestone 4 monitoring metrics, PCPI, NQF #2152 (adapted) | Claims | Difference-in-differences model |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Percentage of discharges for patients age 18 and older who had a visit to the ED with a primary diagnosis of mental health or alcohol or other drug dependence during the measurement year AND who had a follow-up visit with any provider with a corresponding primary diagnosis of mental health or alcohol or other drug dependence within 7 and 30 days of discharge | Milestone 2 monitoring metrics, NCQA, NQF #2605 | Claims<br>Adult Core Set[g] | Difference-in-differences model |
| Baseline assessment for the period just prior to the start of the demonstration | Percentage of patients for whom a designated PTA medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization | CMS, NQF #3317 | Electronic/paper medical records | Descriptive quantitative analysis comparing baseline and demonstration midpoint and end date |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Percentage of discharges of patients (regardless of age) from an inpatient facility to home or any other site of care for whom a transition record was transmitted within 24 hours of discharge to the facility or primary physician or other health care professional designated for follow-up care | PCPI, NQF #0648 | Electronic/ paper medical records<br>IPFQR program[b] | Difference-in-differences model |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Percentage of patients, regardless of age, discharged from an inpatient facility to home or any other site of care, or their caregivers, who received a transition record (and with whom a review of all included information was documented) at the time of discharge including, at a minimum, all of the specified elements | PCPI, NQF #0649 | Electronic/ paper medical records<br>IPFQR program[b] | Difference-in-differences model |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| n.a. | Changes made through the demonstration to data sharing systems, processes, or policies<br><br>Demonstration activities regarding data sharing systems, processes, or policies that staff identify as most effective for improving care coordination<br><br>Obstacles that staff identify as hindering the effectiveness of demonstration activities regarding data sharing systems, processes, or policies aimed at improving care coordination | None | Interviews with state demonstration and/or inpatient/residential and outpatient provider staff | Qualitative analysis to identify themes associated with the effectiveness of demonstration activities to improve data sharing systems, processes, and policies to support care coordination |
| **Primary Research Question 5.2:** Does the SMI/SED demonstration result in improved continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities? | | | | |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Medication continuation following inpatient psychiatric discharge | Milestone 2 monitoring metric, CMS, NQF #3205 | Claims | Difference-in-differences model |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | The percentage of discharges for patients age 6 to 17 who were hospitalized for treatment of selected mental illness diagnoses and who had a follow-up visit with a mental health practitioner | Milestone 2 monitoring metric, NCQA, NQF #0576 (adapted) | Claims<br>Child Core Set[g]<br>IPFQR program[b] | Difference-in-differences model |
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | The percentage of discharges for patients age 18 and older who were hospitalized for treatment of selected mental illness diagnoses and who had a follow-up visit with a mental health practitioner | Milestone 2 monitoring metric, NCQA, NQF #0576 (adapted) | Claims<br>Adult Core Set[g]<br>IPFQR program[b] | Difference-in-differences model |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| Similar beneficiaries in states without SMI/SED 1115 waivers[a] | Amount of mental health–related (1) outpatient, rehabilitation, and targeted case management services; (2) home and community-based services; and (3) long-term services and supports used by beneficiaries within 30 days after discharge from a psychiatric inpatient or residential treatment facility | None | Claims | Difference-in-differences regression model |
| | Subgroups could be based on zip code of beneficiary residence, primary diagnosis, age group, ethnicity, race | | | Subgroup analyses to examine population variance in outcomes |
| **Subsidiary Research Question 5.2a:** Does the SMI/SED demonstration result in improved discharge planning and outcomes regarding housing for beneficiaries transitioning out of acute psychiatric care in hospitals and residential treatment facilities? | | | | |
| Baseline assessment for the period just prior to the start of the demonstration | Among beneficiaries transitioning out of acute psychiatric care in hospitals and residential treatment facilities, percentage screened for housing needs | None | Facility records | Descriptive quantitative analysis comparing baseline and demonstration midpoint and end date |
| Baseline assessment for the period just prior to the start of the demonstration | Among beneficiaries provided acute psychiatric care in hospitals or residential treatment facilities who lack housing, percentage who meet with housing services agencies/providers before discharge | None | Facility records | Descriptive quantitative analysis comparing baseline and demonstration midpoint and end date |
| Baseline assessment for the period just prior to the start of the demonstration | Percentage of beneficiaries released from acute psychiatric care in a hospital or residential treatment facility to a homeless shelter or no fixed address | None | Facility discharge records | Descriptive quantitative analysis comparing baseline and demonstration midpoint and end date |

| Comparison strategy | Outcome measure | Measure steward, endorsement | Data source | Analytic approach |
|---|---|---|---|---|
| Baseline assessment for the period just prior to the start of the demonstration | Of beneficiaries released from acute psychiatric care in a hospital or residential treatment facility to a homeless shelter or no fixed address, the percentage who before discharge had an appointment scheduled with a housing services agency or provider for within 7 or 30 days after discharge | None | Facility discharge records | Descriptive quantitative analysis comparing baseline and demonstration midpoint and end date |
| **Subsidiary Research Question 5.2b:** How do demonstration activities contribute to improved continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities? | | | | |
| n.a. | Demonstration activities or their components or characteristics that stakeholders identify as most effective in improving continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities<br><br>Obstacles that stakeholders identify as hindering the effectiveness of the demonstration in improving continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities | None | Interviews or focus groups with state demonstration and/or inpatient/residential and outpatient provider staff<br><br>Interviews or focus groups with affected beneficiaries or their families/caregivers | Qualitative analysis to identify themes associated with the effectiveness of demonstration activities for improving continuity of care in the community following episodes of acute care in hospitals and residential treatment facilities |

[a]States selected for other-state comparisons should have similar beneficiary population characteristics and pre-demonstration outcome trends and should not be implementing similar service delivery changes concurrent with the demonstration. We have included the strongest potentially feasible approach for each row in this table. Note that claims analyses involving comparisons to states without 1115 SMI/SED waivers require the state to get claims from another state directly or through the CMS Chronic Conditions Data Warehouse or Research Data Assistance Center. If this is not feasible, states should consider conducting interrupted time series analyses within their own state.

[b]The IPFQR program is a public reporting system that provides consumers with data about quality of care in inpatient psychiatric facilities via CMS's Hospital Compare website. Through this pay-for-reporting program, CMS encourages Medicare-participating inpatient psychiatric facilities to submit data on a defined set of quality metrics. Facility-level data are available for public use at https://data.medicare.gov/.

[c]States should use caution when using NMHSS data for other-state comparisons. Although NMHSS attempts to provide a complete count of facilities in the state, the annual response is not perfect and the data are not corrected for nonresponse. Therefore, some increases or decreases over time might result from variance in nonresponse from year to year rather than strictly from actual changes in service availability. States that use NMHSS data for comparisons should consult the publicly available NMHSS reports for information about response rates for each measure and year for states included in the SMI/SED 1115 demonstration analyses. States should also be aware that public use files are made available about two years after data collection, so data may not be available for the full demonstration period in time for inclusion in the evaluation.

[d]See page 8 of the SMD letter for a description of the CCBHC demonstration. Not all community mental health centers are certified. Although the CCBHC demonstration was limited to select states, the SMD letter states that "States may be able to adapt the CCBHC model of care using different authorities … [and] may also elect to use incentive payments (as is being done in the CCBHC demonstration) to encourage providers to implement the comprehensive model of care delineated for the CCBHC demonstration." See the SMD letter for more information about funding CCBHCs under the state plan.

[e]Types of community-based services to address the chronic mental health care needs of beneficiaries with SMI/SED may include certified community behavioral health clinics, assertive community treatment, intensive case management, supportive housing, illness self-management, evidence-based psychotherapy, peer-support and consumer-operated services, psychosocial habilitation or rehabilitation, legal advocacy, suicide prevention services, outreach to and engagement of those who are homeless, systematic medication management, integrated treatment for co-occurring substance use disorders and other disabilities, supported employment, education and family supports, school-based services, and trauma-informed care, among others.

[f]States should be cautious when using URS data for other-state comparisons. Although states follow general guidelines in reporting URS data, they may vary in the exact methodology used. States that use URS data for comparisons should consult URS resources and footnotes to individual state reports for additional context about the data reported by the state for each measure.

[g]States should be cautious when using Adult and Child Core Set data for other-state comparisons. Core Set reporting is currently voluntary, and the reporting methods and included populations can vary by state. States that use Core Set data for comparisons should consult CMS resources for additional context about the data reported by state for each measure, including information about the data source, populations reflected in the data, measurement period, and any deviations from the Core Set specifications that were reported by the state.

[h]Medicare G-codes G0502, G0503, G0504 (used from January 1, 2017, to December 31, 2017) and CPT codes 99492, 99493, and 99494 (in use since January 1, 2018) focus specifically on the psychiatric Collaborative Care Model. Medicare G-code G0507 and CPT code 99484 are used to bill for behavioral health care integration based on other models. See pages 5 and 6 of the SMD letter for descriptions of the Collaborative Care Model and Child Psychiatry Access Model and approaches to funding them. See the Medicare fact sheet on the Collaborative Care Model for more information about the Medicare CPT codes that can be used for billing and evaluating the use of behavioral health integration services with dual Medicare-Medicaid beneficiaries: https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/BehavioralHealthIntegration.pdf. See the *Federal Register,* vol. 81, no. 220, 80230–80243, from Tuesday, November 15, 2016, for more information about the Medicare G-codes that were used to bill for behavioral health integration services from January 1, 2017, to December 31, 2017.

AHRF = Area Health Resources File (maintained by the federal Health Resources & Services Administration); CCBHC = Certified Community Behavioral Health Clinic; CMS = Centers for Medicare & Medicaid Services; ED = emergency department; FFS = fee-for-service; FQHC = Federally Qualified Health Center; IPFQR = Inpatient Psychiatric Facility Quality Reporting; n.a. = not applicable; NCQA = National Committee for Quality Assurance; NMHSS = National Mental Health Services Survey; NQF = National Quality Forum; PCPI = Physician Consortium for Performance Improvement (a clinical quality measure developer and steward); PTA = prior to admission; SAMHSA = Substance Abuse and Mental Health Services Administration; SMI/SED = serious mental illness/serious emotional disturbance; SUD = substance use disorder; URS = Uniform Reporting System (for SAMHSA Community Mental Health Services Block Grants).