Medicaid Emergency Psychiatric Demonstration: Response to 21st Century Cures Act Requirements

Report to Congress (Appendices)

U.S. Department of Health and Human Services

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APPENDIX A:

CURES ACT REQUIREMENTS

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Table A.1. Cures Act requirements

Summary	Cures Act language	Relevant report chapter(s)
1. Number of IMDs and beds that participated in MEPD as a share of all IMDs and beds in participating states	*The number of institutions for mental diseases (as defined in section 1905(i) of the Social Security Act (42 U.S.C. 1396d(i)) and beds in such institutions that received payment for the provision of services to individuals who receive medical assistance under a State plan under the Medicaid program under title XIX of the Social Security Act (42 U.S.C. 1396 et seq.) (or under a waiver of such plan) through the demonstration project in each such State as compared to the total number of institutions for mental diseases and beds in the State.*	II
2. Effect of MEPD on Medicaid and other costs	*The extent to which there is a reduction in expenditures under the Medicaid program under title XIX of the Social Security Act (42 U.S.C. 1396 et seq.) or other spending on the full continuum of physical or mental health care for individuals who receive treatment in an institution for mental diseases under the demonstration project, including outpatient, inpatient, emergency, and ambulatory care, that is attributable to such individuals receiving treatment in institutions for mental diseases under the demonstration project.*	III
3. Number of forensic hospitals and beds	*The number of forensic psychiatric hospitals, the number of beds in such hospitals, and the number of forensic psychiatric beds in other hospitals in such State, based on the most recent data available, to the extent practical, as determined by such Administrator.*	IV
4. Effect of MEPD on disproportionate share hospital DSH payments	*The amount of any disproportionate share hospital payments under section 1923 of the Social Security Act (42 U.S.C. 1396r–4) that institutions for mental diseases in the State received during the period beginning on July 1, 2012, and ending on June 30, 2015, and the extent to which the demonstration project reduced the amount of such payments.*	V
5. Lengths of stays and payment rates for IMDs, general hospital psychiatric units, and hospital emergency departments	*The most recent data regarding all facilities or sites in the State in which any adults with a serious mental illness who are receiving medical assistance under a State plan under the Medicaid program under title XIX of the Social Security Act (42 U.S.C. 1396 et seq.) (or under a waiver of such plan) are treated during the period referred to in paragraph (4), to the extent practical, as determined by the Administrator, including—* *(A) the types of such facilities or sites (such as an institution for mental diseases, a hospital emergency department, or other inpatient hospital)* *(B) the average length of stay in such a facility or site by such an individual, disaggregated by facility type; and* *(C) the payment rate under the State plan (or a waivers of such plan) for services furnished to such an individual for that treatment, disaggregated by facility type, during the period in which the demonstration project is in operation.*	VI – VIII

Summary	Cures Act language	Relevant report chapter(s)
6. Effect of MEPD on use of hospital emergency departments	*The extent to which the utilization of hospital emergency departments during the period in which the demonstration project was is in operation differed, with respect to individuals who are receiving medical assistance under a State plan under the Medicaid program under title XIX of the Social Security Act (42 U.S.C.1396 et seq.) (or under a waiver of such plan), between—* *(A) those individuals who received treatment in an institution for mental diseases under the demonstration project;* *(B) those individuals who met the eligibility requirements for the demonstration project but who did not receive treatment in an institution for mental diseases under the demonstration project; and* *C) those adults with a serious mental illness who did not meet such eligibility requirements and did not receive treatment for such illness in an institution for mental diseases.*	IX

DSH = disproportionate share hospital; IMD = institution for mental disease; MEPD = Medicaid Emergency Psychiatric Demonstration.

APPENDIX B:

DETAILED METHODS FOR THE ESTIMATED EFFECT OF MEPD ON COSTS

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This appendix provides more detail on the data sources and methods for our analyses of the effects of MEPD on Medicaid and Medicare costs.

A. Data sources

We used the Medicaid Analytic eXtract (MAX) as our primary source of cost data. We abstracted data from the MAX inpatient hospital, long-term care, other services, and person summary files. In general, the MAX data include claims for all fee-for-service Medicaid-funded services that qualify for federal matching funds. To capture the Medicare-funded costs for individuals dually enrolled in Medicaid and Medicare, we used the research identifiable files, including inpatient, outpatient, carrier, and home health agency claims files. In general, Medicare is the primary payer for acute care services (including inpatient stays, outpatient visits, and professional service fees) provided to dual Medicare-Medicaid enrollees; Medicaid covers any patient cost sharing that the beneficiary is responsible for, as well as some additional services not covered by Medicare.[1]

Because of the IMD exclusion, IMD admissions for adult Medicaid beneficiaries do not appear in the Medicaid claims files. However, for the purposes of the evaluation, we operationally defined the MEPD target population—adult Medicaid beneficiaries with psychiatric EMCs—as beneficiaries who receive psychiatric emergency or inpatient services from either a general hospital psychiatric unit or IMD. In order to identify the full population of adult Medicaid beneficiaries with psychiatric EMCs, we used data collected directly from states and IMDs that participated in MEPD to identify beneficiaries who received services in an IMD. These data supplemented the Medicaid and Medicare claims data as a source for identifying psychiatric EMCs.

We excluded several MEPD states from our analysis because of deficiencies in the data available to support this analysis. All MEPD states have Medicare claims data for before and during MEPD. However, in several states, MAX data were not available for the MEPD period at the time the analysis file was created,[2] so we excluded these states (District of Columbia,[3] Illinois, North Carolina, and Rhode Island) from the analysis. We excluded Connecticut because the data submitted by the IMD did not include identifiers to link to the Medicaid data. We excluded Maine because data on IMD admissions before MEPD are not available. We excluded Washington because almost all Medicaid beneficiaries with serious mental illness (who are at

[1] Additional services covered by Medicaid vary by state, depending upon options the state includes in its state plan and the services it covers under CMS-approved waivers.

[2] In 2014, CMS changed the format that states submit Medicaid claims data in, to better capture managed care encounter data. We use only MAX files that were created from files in the original format, known as the MSIS format (MSIS stands for Medicaid Statistical Information System). Although some additional years of data submitted in the new format (known as T-MSIS, which stands for Transformed MSIS) are available, the files available at the time our analysis files were created had not been prepared for research purposes. Fully testing and validating their accuracy and completeness was not feasible within the project timeline.

[3] For the District of Columbia, both Medicaid data and IMD data are now available. However, the District of Columbia was not included in the original MEPD evaluation because Medicaid data for the MEPD period were not available at that time. Because only six months of Medicaid data for the MEPD period were newly available at the time analytic decisions were made for this report, we felt that this limited additional information was not worth the substantial resources required to begin new work with IMD data not previously used.

particular risk for psychiatric EMCs) were enrolled in behavioral health managed care plans, whose cost data were not available.

B. Methods

This section provides more detail on the methods of our analysis. First, we discuss how we identified individuals with psychiatric EMCs, then we discuss how we developed the analysis file. Finally, we discuss how we calculated cost per beneficiary, per month and describe the regression models.

1. Identifying individuals with psychiatric EMCs

Our cost analysis includes beneficiaries with psychiatric EMCs. Below, we detail how we identify beneficiaries with psychiatric EMCs in the data used for this analysis.

Individuals were eligible for participation in MEPD if they were judged to have a psychiatric EMC, which was defined as being suicidal, homicidal, or dangerous to oneself or others. However, Medicaid and Medicare data include no consistently applied indicators for suicidality, homicidality, or dangerousness. In addition, few of the participating IMDs had such indicators available in their electronic data systems. As a result, we define proxies for psychiatric EMCs to identify the study population. Given the available data, our approach to identifying psychiatric EMCs relies upon three broad categories of ICD-9 diagnosis codes: (1) mental health codes, (2) injury codes indicative of self-harm, and (3) substance use disorder codes (see Table B.1).

Table B.1. Diagnosis codes used to define a psychiatric EMC

Category	Clinical Classification Software (CCS) principal diagnosis category[a]	ICD-9 codes
Mental health diagnoses		
Mood disorders	657	
Schizophrenia and other psychotic disorders	659	
Suicide and intentional self-injury	662	
Homicidal ideation		V62.85*
Any other mental health code	650, 651, 652, 653, 654, 655, 656, 658, 670	V62.85*
Injuries indicating self-harm		
Open wound to elbow, forearm, or wrist		881
Poisoning		960–977, 980–989
Asphyxiation		994.7
Substance abuse		
Alcohol-related disorders	660	
Substance-related disorders	661	
Screening and history of mental health and substance abuse codes	663	

[a]The Agency for Healthcare Research and Quality's Clinical Classification Sortware (CCS) groups diagnostic codes into a manageable number of clinically meaningful categories. In this table, we list the 2015 CCS categories that correspond to relevant ICD-9 diagnoses. More information about the CCS is available from https://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp.

Our psychiatric EMC definition differs slightly for hospital emergency department visits and inpatient admissions. We designed our definition for hospital emergency departments to exclude people with serious mental illness who are treated in a hospital emergency department for physical health concerns that are unrelated to mental illness or suicidality (such as broken limbs or heart attacks). In contrast, we include physical health diagnoses as secondary diagnoses in inpatient settings because people with serious mental illness very often have co-occurring physical health problems that must also be recorded and monitored or treated during admission. Tables B.2 and B.3 show the criteria we use for the two types of settings.

Table B.2. Psychiatric EMC definition for inpatient care in general hospital psychiatric units and IMDs

Eligibility criterion	Primary Dx code	Other Dx code
1	MUST BE mood disorder, schizophrenia or other psychotic disorder, suicide or intentional self-injury, or homicidal ideation	MAY BE any (no restriction on secondary diagnoses)
2	OR MAY BE open wound to elbow, forearm, or wrist; poisoning; or asphyxiation	IF ACCOMPANIED BY at least one mental health diagnosis

Table B.3. Psychiatric EMC definition for hospital emergency departments

Eligibility criterion	Primary Dx code	Secondary Dx code
1	MUST BE mood disorder, schizophrenia or other psychotic disorder, suicide or intentional self-injury, or homicidal ideation	MAY BE any mental health diagnosis, alcohol-related disorder, or substance-related disorder; CANNOT BE a physical health diagnosis
2	OR MAY BE an open wound to the elbow, forearm, or wrist; poisoning; or asphyxiation	IF ACCOMPANIED BY any mental health diagnosis
3	OR MAY BE any mental health	IF ACCOMPANIED BY open wound to the elbow, forearm, or wrist; poisoning; or asphyxiation

2. Comparison group creation

The California comparison group comprises beneficiaries who lived in counties that did not participate in MEPD. For the current analysis, we use the same counties for the comparison group that we used for the original MEPD evaluation.

In California, Medicaid beneficiaries were eligible for MEPD if they lived in one of two counties: Contra Costa and Sacramento. Because California has many counties outside of the geographical area served by MEPD, we conducted a matching process to select the subset of the non-MEPD counties most similar to the two MEPD counties. We used MAX and IMD data and the Area Health Resources File (AHRF) to match counties on a series of county-level characteristics, including the number of psychiatric EMCs, the availability of outpatient psychiatrists, and the availability of a hospital with an ED. Next, we selected the subset of non-MEPD counties that matched the two MEPD counties exactly on a set of high-priority characteristics. Because Contra Costa and Sacramento counties differ from each other in these characteristics, we matched each of them to their own set of non-MEPD counties. Of the 56 non-MEPD counties in California, 5 matched to Contra Costa (Kern, Riverside, San Bernardino, Stanislaus, and Tulare) and 6 matched to Sacramento (Alameda, Fresno, Los Angeles, San

Diego, San Francisco, and Santa Clara). We dropped Tulare, because it appears to be an outlier on several matching variables. Finally, we conducted balance tests between the two MEPD counties and the 10 matched non-MEPD counties to see whether they were similar, on average, in terms of the high-priority variables. We found that the MEPD and comparison counties were well-matched on two-thirds of the high priority variables, and the additional matching greatly improved the similarity of the comparison group relative to using all non-MEPD counties. We provide the complete list of matching variables and the balance test results in an appendix to the original MEPD evaluation report.[4]

3. Development of analysis file

Once we identified all the beneficiaries with psychiatric EMCs in the analysis period, we excluded individuals who did not meet the following eligibility criteria at the time of the psychiatric EMC:

- Were age 21 to 64
- Lived in the catchment area of a participating IMD or lived in a county selected as a comparison county in California

We included beneficiaries living in MEPD states who had a psychiatric EMC at any point in the evaluation time period. Mental health costs include total payments for any claim on which the primary diagnosis was a mental health condition, as defined by the Agency for Healthcare Research and Quality's 2015 CCS. We included all diagnoses in the CCS Level 5 (mental illness), except for developmental disorders (intellectual disabilities or learning disorders); disorders usually diagnosed in infancy, childhood, or adolescence (elimination disorders or pervasive developmental disorders); and alcohol- and substance-related disorders. Instead, we include costs associated with these diagnoses in the physical health costs. Total costs include all costs paid by Medicare or Medicaid. We present unadjusted sample characteristics for each state in Table B.4.

[4] See https://innovation.cms.gov/Files/reports/mepd-finalrpt-app.pdf for the appendix to the original MEPD evaluation report.

Table B.4. Sample characteristics for total cost analyses

	California					
	Intervention (n=2,962)	Comparison (n=18,097)	Alabama (n=9,117)	Maryland (n=6,337)	Missouri (n=34,317)	West Virginia (n=11,702)
Age in years at beginning of demonstration (average)	41.4	40.0	40.0	41.2	41.0	40.6
Female	41.5	47.9	63.7	49.1	52.2	52.0
Race and ethnicity						
White	49.7	55.9	64.3	52.6	78.8	95.6
Non-Hispanic black	21.5	24.2	34.3	43.6	19.1	4.1
Hispanic	21.9	10.8	0.7	2.1	1.4	0.1
Non-Hispanic Asian or other Pacific Islander	5.8	6.8	0.3	1.4	0.3	0.1
Non-Hispanic other	1.2	2.3	0.4	0.2	0.4	0.1
Dual Medicare enrollment	48.3	40.5	32.4	52.5	31.7	21.8

Source: Analysis of Medicaid and Medicare data obtained from CMS for five participating states (2010 to 2014).

Note: N is the number of unique beneficiaries. Numbers in all rows except age are percentages.

4. Calculation of total health costs per beneficiary per month

To estimate MEPD's effects on costs for the full continuum of health services, we summarized the total cost paid by Medicaid and Medicare for each eligible beneficiary for each quarter relative to the beneficiary's reference EMC.[5] We organized the analysis file as one record per Medicaid beneficiary per quarter. We also summarized the number of months during the quarter that the individual was eligible for inclusion in the analysis. Our analyses include only fee-for-service Medicaid and Medicare claims because managed care payments do not appear in claims data. Therefore, we exclude from the cost analysis any months in which a beneficiary was enrolled in either a Medicaid or Medicare managed care plan that potentially included behavioral health services. For Medicaid beneficiaries, the exclusion applies to any months they were enrolled in a comprehensive managed care plan or a managed behavioral health plan. For Medicaid beneficiaries dually enrolled in Medicare, the exclusion applies to any months they were enrolled in a Medicare Advantage plan. Because the data and analyses include only fee-for-service costs, we were not able to assess effects of MEPD on managed care costs. In California and Maryland, which included managed care beneficiaries in MEPD, MEPD may have had an effect on managed care costs, but we were not able to measure it due to data limitations.

[5] See Chapter III for an explanation of how the reference EMC was determined.

For each quarterly observation, to calculate each beneficiary's average total, mental, and physical health cost per month, we divide the sum of the beneficiary's costs for the quarter by the number of months in the quarter that the beneficiary is eligible for inclusion in the analysis, as displayed in the equations below:

$$Average\ total\ health\ costs\ per\ month = \frac{All\ Medicaid\ and\ Medicare\ health\ claims\ costs\ for\ the\ quarter}{Number\ of\ months\ during\ which\ Medicaid\ data\ were\ available\ in\ the\ quarter}$$

$$Average\ mental\ health\ costs\ per\ month = \frac{All\ Medicaid\ and\ Medicare\ mental\ health\ claims\ costs\ for\ the\ quarter}{Number\ of\ months\ during\ which\ Medicaid\ data\ were\ available\ in\ the\ quarter}$$

$$Average\ physical\ health\ costs\ per\ month = \frac{All\ Medicaid\ and\ Medicare\ physical\ health\ claims\ costs\ for\ the\ quarter}{Number\ of\ months\ during\ which\ Medicaid\ data\ were\ available\ in\ the\ quarter}$$

We also calculate a weight for each quarter representing the proportion of the quarter during which the beneficiary was eligible for the analysis. We apply these weights to the observations in all cost regressions.

5. Regression model

We assess the average marginal effects of MEPD on total, mental, and physical health care costs per beneficiary per month (PBPM) with a two-part model.[6] We use a two-part model because the distribution of costs is not normal due to the large share of observations indicating zero costs. The first part of the model addresses the large share of observations indicating zero costs; it is a logistic regression that predicts the likelihood of any costs in that person-quarter. The second part of the model addresses the skewed distribution of observations with non-zero costs; it is a generalized linear model. Within the generalized linear model, the conditional distribution of the non-zero costs is specified with the gamma family and the expected value of the cost distribution is transformed into a linear predictor using a log link function.

For California, we use the following difference-in-differences equation with each of the three cost outcomes:

$$\begin{aligned} Cost\ PBPM = {} & \beta_0 + \beta_1 * Intervention + \beta_2 * Post + \beta_3 * Quarter + \beta_4 * Time + \beta_5(Intervention * Post) \\ & + \beta_6(Intervention * Quarter) + \beta_7(Intervention * Time) + \beta_8(Post * Quarter) + \beta_9(Post * Time) + \\ & \beta_{10}(Quarter * Time) + \beta_{11}(Intervention * Post * Quarter) + \beta_{12}(Intervention * Post * Time) + \beta_{13}(Intervention \\ & * Quarter * Time) + \beta_{14}(Post * Quarter * Time) + \beta_{15}(Intervention * Post * Quarter * Time) + \beta_i * Controls + \varepsilon \end{aligned}$$

Intervention is an indicator variable that equals 1 if the psychiatric EMC was experienced by a beneficiary in the intervention group (that is, living in an MEPD county).

[6] Buntin and Zaslavsky, 2004.

Post is an indicator variable that equals 1 if the reference EMC took place on or after the state-specific MEPD start date.

Quarter is 1 when the observation represents the quarter in which the reference EMC occurred. Quarter is 2 when the observation represents the quarter following the reference EMC quarter, and so on.

Time is a continuous measure of the number of quarters since the start of the analysis period.

*Intervention*Post* is the difference in average costs from pre- to post-demonstration for the intervention versus comparison group.

*Intervention*Quarter* is the difference in average costs for the designated post-EMC quarter between the intervention and comparison groups.

*Intervention*Time* is the difference in the secular trend between the intervention and comparison groups (over the entire analysis period).

*Post*Quarter* is the difference in average costs for the designated post-EMC quarter between the pre- and post-demonstration periods.

*Post*Time* is the change in the secular trend from the pre- to post-demonstration period (including both intervention and comparison group).

*Quarter*Time* is the secular trend for the designated post-EMC quarter.

*Intervention*Post*Quarter* is the difference in average costs for the designated post-EMC quarter from pre- to post-demonstration for the intervention versus comparison group.

*Intervention*Post*Time* is the difference in the secular trend from the pre- to post-demonstration period for the intervention versus comparison group.

*Intervention*Quarter*Time* is the difference in the secular trend for the designated post-EMC quarter for the intervention versus comparison group.

*Post*Quarter*Time* is the difference in the secular trend for the designated post-EMC quarter between the pre- and post-demonstration periods.

*Intervention*Post*Quarter*Time* is the difference in the secular trend for the designated post-EMC quarter between the pre- and post-demonstration periods for the intervention group compared to the comparison group.

Controls are covariates including beneficiary characteristics (age, gender, race, ethnicity); dual Medicare-Medicaid enrollment status; whether the individual is eligible for the analysis in all months of the quarter; enrollment in fee-for-service Medicaid in the six months prior to the reference EMC;[7] and, if enrolled, Medicaid and Medicare total, mental, or physical

[7] In March 2013, CMS announced to the MEPD states that individuals with psychiatric EMCs who receive care in IMDs participating in MEPD need not be enrolled in Medicaid at the time of admission in order for MEPD to pay for the IMD services. CMS explained that MEPD would also pay for inpatient care for individuals who at the time

health costs (aligning with the outcome variable) in the six months prior to the reference EMC.

For the difference-in-differences analysis, we use the margins command in Stata to calculate the average impact of MEPD on all post-demonstration period intervention group observations by combining the influence of all of Intervention*Post-demonstration period interaction terms. We also calculate the effects for each post-reference EMC quarter using the interaction terms with quarter.

For each of the remaining states (Alabama, Maryland, Missouri, and West Virginia), we conduct interrupted time series analyses for each of the three cost outcomes:

$$Cost\ PBPM = \beta_0 + \beta_1 * Post + \beta_2 * Quarter + \beta_3 * Time + \beta_4(Post * Quarter) + \beta_5(Post * Time) + \beta_6(Quarter * Time)$$
$$+\beta_7(Post * Quarter * Time) + \beta_i * Controls + \varepsilon$$

Post is the indicator variable that equals 1 if the psychiatric EMC took place on or after the state-specific MEPD start date.

Quarter is 1 when the observation represents the quarter in which the reference EMC occurred. Quarter is 2 when the observation represents the quarter following the reference EMC quarter, and so on.

Time is a continuous measure of the number of quarters since the start of the analysis period.

*Post*Quarter* is the difference in average costs for the designated post-reference EMC quarter between the pre- and post-demonstration periods.

*Post*Time* is the change in the secular trend from the pre- to post-demonstration period.

*Quarter*Time* is the secular trend for the designated post-reference EMC quarter.

*Post*Quarter*Time* is the change in the secular trend for the designated post-reference EMC quarter between the pre- and post-demonstration periods.

Controls are covariates including beneficiary characteristics (age, gender, race, ethnicity); dual Medicare-Medicaid enrollment status; whether the individual is eligible for the analysis in all months of the quarter; enrollment in fee-for-service Medicaid in the six months prior to the

of IMD admission were presumed to be eligible for Medicaid, even if they were not yet enrolled. Payment for IMD care provided to these individuals under MEPD would be made to the state retrospectively after the person was enrolled in Medicaid and had a Medicaid identification number. This payment provision was applicable to IMD admissions under MEPD that occurred in January 2013 or later. Individuals newly enrolled in Medicaid as a result of MEPD, however, may differ from other Medicaid beneficiaries in ways that might affect the type and amount of services they use—thereby affecting costs. Therefore, we include whether the individual was enrolled in fee-for-service Medicaid during the six months prior to the reference EMC in the model to control for the effects of such differences on costs.

reference EMC; and, if enrolled, Medicaid and Medicare total, mental, or physical health costs (aligning with the outcome variable) in the six months prior to the reference

For the interrupted time series models, we use the margins command in Stata to calculate the average marginal effect of MEPD on all post-period intervention group observations by combining the influence of all terms specific to the post-period. We also calculate the separate effects for each quarter post-EMC to assess whether the average marginal effect varies substantially by quarter. The following terms contribute to these effects:

- Post
- Post*Quarter
- Post*Time
- Post*Quarter*Time

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APPENDIX C:

FORENSIC HOSPITALS IN MEPD STATES AND SOURCES OF INFORMATION REPORTED

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Alabama

The Department of Mental Health (DMH) manages the forensic component of Alabama's mental health care system. Taylor Hardin Secure Medical Facility is the only maximum security forensic facility that DMH operates. The facility, which has 140 beds, provides treatment to patients who are criminally committed through Alabama's courts.

Sources:

Alabama Department of Mental Health. "State-Operated Mental Health Facilities." Accessed at http://www.mh.alabama.gov/MI/Facilities.aspx?sm=b_c, July 16, 2018. Similar information is now available through the "Facility Operations" page at https://mh.alabama.gov/facility-operations/. Accessed October 17, 2019.

Substance Abuse and Mental Health Services Administration. "Alabama 2016 Mental Health National Outcome Measures (NOMS): SAMHSA Uniform Reporting System." Available at https://www.samhsa.gov/data/sites/default/files/Alabama-2016.pdf. Accessed July 16, 2018.

California

The Department of State Hospitals (CADSH) manages the forensic component of California's mental health care system. There are five state hospitals: (1) Atascadero, (2) Coalinga, (3) Metropolitan, (4) Napa, and (5) Patton. On November 7, 2016, the most recent information available at the time this report was written, 90 percent of patients in the CADSH hospitals were forensic. CADSH also formerly treated inmates at Salinas Valley, Stockton, and Vacaville prisons through an interagency agreement with the California Department of Corrections and Rehabilitation (CDCR) to provide oversight of three psychiatric programs. However, oversight transferred to CDCR and another agency in mid-2017. Information on inmates treated in the prisons is not included here. CADSH is the largest inpatient mental health hospital system in the country. Its hospitals provide mental health services to individuals referred by county courts, prisons, or parole boards. As of late 2018, increasing numbers of patients are being referred to the system because they are declared incompetent to stand trial. In addition, CADSH is expanding state hospital bed capacity and a competency treatment program in county jails.

Table C.1. Hospitals operated by California's Department of State Hospitals that serve forensic patients, November 2016

Facility name	Total inpatient hospital beds	Forensic patients in hospital
Total	***6,078***	***5,441***
Atascadero	1,184	1,188
Coalinga	1,286	1,287
Metropolitan	826	462
Napa	1,255	1,051
Patton	1,527	1,453

Note: Data reported as of November 7, 2016.

Sources:

California Department of State Hospitals. "2017 Annual Report." Available at http://www.dsh.ca.gov/Publications/docs/ADA2017AnnualRept.pdf. Accessed July 16, 2018.

California Department of State Hospitals. "State Hospitals." Available at https://www.dsh.ca.gov/Hospitals/index.html. Accessed July 16, 2018.

Connecticut

The Department of Mental Health and Addiction Services manages the forensic component of Connecticut's mental health care system. Whiting Forensic Hospital is the only hospital in the system that serves forensic patients. All of its 232 beds are designated for forensic patients. It was formerly a part of Connecticut Valley Hospital, another state-managed psychiatric hospital. The hospitals were separated in May 2018. Connecticut's forensic bed count has slightly increased in the past two decades, from 213 beds in 1997 to 232 beds in 2016, a 9 percent increase.

Sources:

James Siemianowski. "CT Mental Health and Forensic Inpatient Bed Capacity." Email correspondence with Department of Mental Health and Addiction Services, June 28, 2018.

Department of Mental Health and Addiction Services. "Psychiatric Services Study Report." 2016. Available at http://www.ct.gov/dmhas/lib/dmhas/publications/dmhas-dcf_psychiatric_services_report.pdf. Accessed July 13, 2018.

District of Columbia

The Department of Behavioral Health manages the forensic component of the District of Columbia's mental health care system. St. Elizabeth's Hospital is the sole forensic hospital. The federal and local courts provide forensic psychiatry referrals for treatment services (prisoners and individuals who are awaiting trial or needing post-trial or post-sentence psychiatric evaluation). St. Elizabeth's Hospital has 285 inpatient beds, all of which are designated for forensic patients.[8]

Source:

Kress, June, Benjamin Moser, Emily Tatro, and Tracy Velázquez. "Beyond Second Chances: Returning Citizens' Re-Entry Struggles and Successes in the District of Columbia." Washington, DC: Council for Court Excellence, December 2016. Available at http://www.courtexcellence.org/uploads/File/BSC-FINAL-web.pdf. Accessed July 16, 2018.

[8] The hospital also has six restraint beds (devices that restrict a patient's mobility when receiving medical care). They were not included in the bed count because they may not be permanently filled. Although all inpatient admissions to St. Elizabeth's Hospital are forensic, the facility also offers outpatient services to non-forensic clients.

Illinois

Operating under the Department of Human Services, the Division of Mental Health Services (DMS) manages the forensic component of Illinois' mental health care system. DMS manages four mental health centers that have a substantial number of inpatient beds designated for forensic patients and a detention facility for men who have completed sentences for sexually violent crimes but were deemed too dangerous to return to the community. Chester Mental Health Center is the sole male-only maximum security facility. It also serves individuals with developmental and intellectual disabilities. The Department of Corrections has taken over two units at Elgin Mental Health Center for acute psychiatric care for inmates (numbers not included below). In keeping with the national trend, forensic admissions to Illinois state hospitals increased 15 percent from 2005 to 2015.

Table C.2. Facilities operated by Illinois' Department of Human Services, Division of Mental Health

Facility name	Total inpatient hospital beds	Forensic hospital beds
Total	***1,563***	***1,333***
Alton Mental Health Center	125	110
Chester Mental Health Center	284	217
Elgin Mental Health Center	383	327
McFarland Mental Health Center	142	50
Treatment and Detention Facility	629	629

Note: Data current as of July 2018.

Sources:

Diana Knaebe "MEPD Forensic Psychiatric Hospitals inquiry." Email correspondence with Department of Human Services, Division of Mental Health, June 28, 2018.

Illinois Sentencing Policy Advisory Council. "Treatment Capacity in Illinois: Commission on Criminal Justice and Sentencing Reform." June 3, 2015. Available at http://www.icjia.state.il.us/spac/pdf/Presentations/Treatment_Capacity_Revamp_EO_commission.pdf. Accessed July 13, 2018.

Maine

The Department of Health and Human Services manages the forensic component of Maine's mental health care system. Riverview Psychiatric Center is the only state-operated forensic hospital. Riverview serves those committed under the state's criminal statutes for observation and evaluation and those deemed incompetent to stand trial or not criminally responsible. It has 92 beds.

Source:

Maine Department of Health and Human Services. "An Introduction to Riverview Psychiatric Center and Dorothea Dix Psychiatric Center." January 2017. Available at https://www.maine.gov/legis/opla/RPC_DDPCOrientationPresentationJanuary2017.pdf. Accessed July 16, 2018.

Maryland

The Department of Health and Mental Hygiene manages the forensic component of Maryland's mental health care system. There are five state-owned psychiatric hospitals (Table C.3) that serve patients with mental illness who have limited community placement options, forensically involved individuals, and the state's most complex cases. The department does not designate or license psychiatric beds as forensic or non-forensic. Patients admitted to state psychiatric hospital beds may or may not have forensic involvement with the legal system. In 2018, 97 percent of patients across the state hospital system were forensic patients. With the exception of Clifton T. Perkins Hospital Center, these hospitals were not originally designed to serve a forensic-majority population. Clifton T. Perkins is a maximum security psychiatric hospital that treats patients deemed incompetent to stand trial or not criminally responsible. It also accepts felony inmates who meet the criteria for involuntary commitment.

Table C.3. Psychiatric hospitals operated by Maryland's Department of Health and Mental Hygiene

Hospital name	Total inpatient hospital beds
Total	***1,001***
Clifton T. Perkins Hospital Center	288
Spring Grove Hospital Center	347
Springfield Hospital Center	220
Thomas B. Finan Hospital Center	66
Eastern Shore Hospital Center	80

Sources:

John Robison. "MEPD inquiry." Email correspondence with Department of Health and Mental Hygiene, July 27, 2018.

State of Maryland Department of Health and Mental Hygiene. "Independent Study on Future Demand for State-Operated Psychiatric Hospital Capacity." July 17, 2012. Available at http://dlslibrary.state.md.us/publications/JCR/2011/2011_72.pdf. Accessed July 20, 2018

Missouri

The Department of Mental Health (DMH) manages the forensic component of Missouri's mental health care system. DMH operates various types of facilities, six in all. Forensic services comprise evaluation, treatment, and monitoring in the community as prescribed by circuit courts for people with mental illness and developmental disabilities. Each facility provides varying levels of security (maximum, intermediate, minimum, and campus), with movement between levels based on clinical condition and risk assessment.

Table C.4. Facilities operated by Missouri's Department of Mental Health

Facility name	Total inpatient hospital beds	Forensic hospital beds
Total	***1,127***	***1,127***
Fulton State Hospital	376	376
Center for Behavioral Medicine	65	65
Metropolitan St. Louis Psychiatric Center	50	50
St. Louis Psychiatric Center	180	180
Northwest Missouri Psychiatric Rehabilitation Center	108	108
Southeast Missouri Mental Health Center	348	348

Sources:

Jason Jones. "MEPD Forensic Psychiatric Hospitals inquiry." Email correspondence with Department of Mental Health, July 1, 2018.

Missouri Department of Mental Health. "Forensic Services." Accessed at https://dmh.mo.gov/mentalillness/forensics.html, July 20, 2018. Information about the Missouri Department of Mental Health's forensic services is now available at https://dmh.mo.gov/mental-illness/forensic-services. Accessed October 17, 2019. A list of the "State Operated Psychiatric Hospitals and Facilities" listed above and links to information about them is now available at https://dmh.mo.gov/mental-illness/facilities. Accessed October 17, 2019.

Missouri Hospital Association. "Elimination of State-Operated Acute Psychiatric Inpatient and Emergency Services in Missouri." April 2012. Available at https://web.mhanet.com/MHA%20Behavioral%20Health%20Report%20April%202012.pdf. Accessed July 20, 2018.

North Carolina

Operating under the Department of Health and Human Services, the Division of State Operated Healthcare Facilities manages the forensic component of North Carolina's mental health care system. Central Regional Hospital is the sole facility with designated forensic beds. Central Regional Hospital's Forensic Services Unit has 84 of 398 total inpatient beds dedicated to forensic patients who are involuntarily committed or who are deemed not guilty by reason of insanity or incompetent to proceed.

Sources:

Laura White. "MEPD Forensic Psychiatric Hospitals inquiry." Email correspondence with Department of Health and Human Services, Division of State Operated Healthcare Facilities, July 10, 2018.

North Carolina Department of Health and Human Services. "Exploring the Costs and Feasibility of a New Psychiatric Facility." April 1, 2013. Available at https://www.ncleg.net/documentsites/committees/JLOCHHS/Handouts%20and%20Minutes%20by%20Interim/2013-14%20Interim%20JLOC-HHS%20Handouts/October%208,%202013/Reports/DHHS%20Report%20re%20CostFeasibilityNewPsychHospital-04-01-2013.pdf. Accessed July 16, 2018.

Rhode Island

The Department of Behavioral Healthcare, Developmental Disabilities, and Hospitals manages the forensic component of Rhode Island's mental health care system. The state has one psychiatric hospital with two designated forensic units that total 34 beds out of 284 inpatient beds in the hospital. The hospital as a whole provides long-term and post-acute care to patients with complex needs.

Sources:

Thomas Martin. "MEPD Forensic Psychiatric Hospitals inquiry." Email correspondence with Department of Behavioral Healthcare, Developmental Disabilities, and Hospitals, June 27, 2018.

Rhode Island Department of Behavioral Healthcare, Developmental Disabilities, and Hospitals. "Rhode Island Behavioral Health Project: Final Report." September 15, 2015. Available at http://www.bhddh.ri.gov/mh/pdf/Truven%20Rhode%20Island%20Behavioral%20Health%20Final%20Report%209%2015%202015.pdf. Accessed July 16, 2018.

Washington

Operating under the Department of Social and Health Services (DSHS), the Office of Mental Health Services (OMHS) manages the forensic component of Washington's mental health care system. OHMS operates two psychiatric hospitals for adults, two residential treatment facilities, and a youth facility (see Table C.5 for bed counts). Eastern and Western State Hospitals both provide evaluation and inpatient treatment for people with severe mental illness who are referred through behavioral health organizations, court orders for involuntary treatment, or the criminal justice system. The two residential treatment facilities provide inpatient competency restoration services for adults. People are most commonly referred to forensic mental health treatment through evaluations of competency to stand trial. DSHS must provide forensic evaluation and treatment services when individuals receive a court order. The hospitals work with the criminal justice system to provide forensic evaluations and with behavioral health organizations to coordinate outpatient treatments, if additional care is required upon discharge. The behavioral health organizations purchase services through a managed care structure.

Table C.5. Facilities operated by Washington's Department of Social and Health Services

Facility name	Total inpatient hospital beds	Forensic hospital beds
Total	***1,213***	***464***
Eastern State Hospital	317	125
Western State Hospital	842	285
Maple Lane Competency Restoration Program	30	30
Yakima Competency Restoration Program	24	24

Note: Bed counts are based on funded bed capacity in state fiscal year 2017 at each facility.

Sources:

Alice Huber. "MEPD Forensic Psychiatric Hospitals inquiry." Email exchange with Department of Social and Health Services, July 11, 2018.

Washington State Department of Social and Health Services, Office of Forensic Mental Health Services. "Washington State Legal Guide to Forensic Mental Health Services." December 2016. Accessed at https://www.dshs.wa.gov/sites/default/files/WA-State-Legal-System-Guide-to-Forensic-Mental-Health.pdf, July 20, 2018. Although the December 2016 document is no longer available at this web address, an August 2019 revised version is now available at https://www.dshs.wa.gov/sites/default/files/BHSIA/FMHS/WAStateLegalSystemGuidetoForensicMentalHealth.pdf. Accessed October 17, 2019.

West Virginia

Operating under the Department of Health and Human Resources, the Bureau for Behavioral Health and Health Facilities (BBHHF) manages the forensic component of West Virginia's mental health care system. State code outlines the details of forensic services for people with mental illness involved in the criminal justice system. BBHHF liaises with jail staff, inpatient staff, community providers, and families to manage forensic policies for those deemed incompetent to stand trial or not guilty by reason of mental illness. Both state-operated hospitals, William R. Sharpe Jr. Hospital and Mildred Mitchell-Bateman Hospital, serve both civil and forensic patients.

Table C.6. Facilities operated by West Virginia's Bureau for Behavioral Health and Health Facilities

Facility name	Total inpatient hospital beds	Forensic hospital beds
Total	***235***	***117***
William R. Sharpe Jr. Hospital	125	110
Mildred Mitchell-Bateman Hospital	110	7[a]

[a]This number reflects the number of forensic patients on July 11, 2018.

Sources:

Georgette Bradstreet. "MEPD Forensic Psychiatric Hospitals inquiry." Email correspondence with Department of Health and Human Resources, July 11, 2018.

West Virginia Department of Health and Human Resources, Bureau for Behavioral Health and Health Facilities. "Forensic Services—Mental Health and Criminal Justice." Available at https://dhhr.wv.gov/bhhf/Sections/operations/StatewideForensic/Pages/default.aspx. Accessed July 16, 2018.

APPENDIX D:

OVERVIEW OF DISPROPORTIONATE SHARE HOSPITAL PROVISIONS

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As specified in Section 1923 of the Social Security Act,[9] a hospital must meet the following requirements to receive disproportionate share hospital (DSH) payments:

- Have a Medicaid inpatient utilization rate of at least 1 percent[10]
- Have at least two obstetricians with staff privileges at the hospital who have agreed to provide obstetric services to Medicaid-eligible individuals (children's hospitals and facilities that do not offer non-emergency obstetric services as of December 22, 1987, are exempt from this requirement)

Hospitals that meet the requirements above and also meet one of the following requirements must receive DSH payments:

- Have a proportion of Medicaid inpatient days that is one standard deviation above the state average
- Have a share of gross revenue from Medicaid or charity care that is greater than 25 percent

Other hospitals may also receive DSH payments as long as hospitals of the same type are treated equally. Provisions for identifying qualifying hospitals and determining DSH payment amounts must be specified in each state's Medicaid state plan.

State formulas for allocating funds across qualifying hospitals must be based on the proportion of low-income[11] and Medicaid patients served but may otherwise vary across states. Payment amounts are subject to the following limits:

- Payments to a given hospital may not exceed the hospital's overall uncompensated care costs for low-income patients.
- The sum of payments for IMDs or other mental health facilities may not exceed the state's annual IMD allotment and the sum of payments for other hospitals may not exceed the state's annual DSH allotment.[12]

The annual IMD allotments for each state are reported in Table D.1.

[9] See https://www.ssa.gov/OP_Home/ssact/title19/1923.htm.

[10] The Medicaid inpatient utilization rate is defined as the share of total inpatient days attributable to Medicaid patients.

[11] The low-income utilization rate is defined as the sum of the Medicaid portion and the charity portion. The Medicaid portion is total revenue for Medicaid patients plus the amount of any cash subsidies from state and local government divided by total hospital revenue. The charity fraction is the total charges for charity care minus cash from any local and state subsidies divided by total hospital revenues.

[12] Section 4721(b) of the Balanced Budget Act of 1997 added Section 1923(h) to the act to provide that federal financial participation is not available for DSH payments to IMD and other mental health facilities that are in excess of a state-specific aggregate limit.

Table D.1. Federal IMD allotments, 2011–2014

State	FY 2011[a]	FY 2012[b]	FY 2013[c]	FY 2014[d]
Alabama	4,451,770	4,451,770	4,451,770	4,451,770
California	1,555,919	1,555,919	1,555,919	1,555,919
Connecticut	103,275,938	105,573,725	105,573,725	105,573,725
District of Columbia	6,545,136	6,545,136	6,545,136	6,545,136
Illinois	89,408,276	89,408,276	89,408,276	89,408,276
Maine	54,314,781	56,193,779	58,186,183	60,096,845
Maryland	50,329,110	51,637,667	52,876,971	53,723,003
Missouri	207,234,618	207,234,618	207,234,618	207,234,618
North Carolina	150,452,714	153,016,633	156,138,910	157,985,992
Rhode Island	2,397,833	2,397,833	2,397,833	2,397,833
Washington	122,109,973	125,284,832	128,291,668	130,344,335
West Virginia	18,887,045	18,887,045	18,887,045	18,887,045

Note: All amounts include both the state and federal IMD DSH payments.

[a]CMS. "Medicaid Program; Disproportionate Share Hospital Institutions for Mental Diseases Allotments and Disproportionate Share Hospital Limits for FYs 2010, 2011, and Preliminary FY 2012 Disproportionate Share Hospital Allotments and Limits." *Federal Register,* vol. 77, no. 142, July 24, 2012.

[b]CMS. "Medicaid Program; Disproportionate Share Hospital Allotments and Institutions for Mental Diseases Disproportionate Share Hospital Limits for FY 2012, and Preliminary FY 2013 Disproportionate Share Hospital Allotments and Limits." *Federal Register,* vol. 78, no. 144, July 26, 2013.

[c]CMS. "Medicaid Program; Final FY 2013 and Preliminary 2015 Disproportionate Share Hospital Allotments, and Final FY 2013 and Preliminary FY 2015 Institutions for Mental Diseases Disproportionate Share Hospital Limits." *Federal Register,* vol. 81, no. 21, February 2, 2016.

[d]CMS. "Medicaid Program; Final FY 2014 and Preliminary FY 2016 Disproportionate Share Hospital Allotments, and Final FY 2014 and Preliminary FY 2016 Institutions for Mental Diseases Disproportionate Share Hospital Limits." *Federal Register,* vol. 81, no. 207, October 26, 2016.

STATE-SPECIFIC DSH PROVISIONS

Alabama

Concept	Description
Are there eligibility criteria targeted to IMDs?	There are no eligibility criteria specific to IMDs.
Is the payment approach targeted to IMDs?	The formula for DSH payments varies by hospital type. The state designates two hospital-type categories for psychiatric hospitals: (1) psychiatric hospitals owned and operated by the state and (2) psychiatric hospitals, other than those owned or operated by the state, that provide services to individuals under age 21.
Payment calculations affecting IMDs	Alabama annually allocates DSH funds from the federal allotments to each hospital-type category. The hospitals in each category will receive a portion of the allocation for its hospital type based on the hospital's share of Medicaid inpatient days across all hospitals of the given type. The DSH amount for any hospital cannot exceed its uncompensated cost of care.
Key variables affecting facility DSH payment amounts	Medicaid inpatient days at a given hospital relative to other psychiatric hospitals of the same type, state DSH allocation for the hospital's category, and the hospital's uncompensated care costs

Source: Mathematica review of the Medicaid State Plan Under Title XIX of the Social Security Act, State of Alabama: Method for Payment of Reasonable Costs Inpatient Hospital Services, Attachment 4.19-A.

California

Concept	Description
Are there eligibility criteria targeted to IMDs?	There are no eligibility criteria specific to IMDs.
Is the payment approach targeted to IMDs?	Yes, there is a payment formula specifically for psychiatric hospitals or alcohol-drug rehabilitation hospitals.
Payment calculations affecting IMDs	Each qualifying DSH hospital for each Medi-Cal day of acute inpatient hospital service shall be paid the sum of all following amounts, except as limited by other applicable provisions: 1. A minimum payment adjustment of $50 2. The sum of the following amounts, minus $50: a. A $10 payment adjustment for each percentage point, from 25% to 29%, inclusive, of the hospital's low-income number (HLN)[a] b. A $7 payment adjustment for each percentage point, from 30% to 34%, inclusive, of the HLN c. A $5 payment adjustment for each percentage point, from 35% to 44%, inclusive, of the HLN d. A $2 payment adjustment for each percentage point, from 45% to 64%, inclusive, of the HLN e. A $1 payment adjustment for each percentage point, from 65% to 80%, inclusive, of the HLN 3. If the sum calculated above is less than zero, it shall be disregarded for payment purposes.
Key variables affecting facility DSH payment amounts	Medi-Cal revenue for patient services, total revenue for patient services, and Medi-Cal inpatient days

Source: Mathematica's synthesis of California Codes, Welfare and Institutions Code, Section 14105.98.

Note: Medi-Cal is California's Medicaid program.

[a]The hospital's low-income number is a fraction whose (1) numerator is equal to the hospital's total revenue for Medi-Cal patient services plus any subsidies received from state and local governments and (2) denominator is equal to the total hospital revenue for patient services including cash subsidies.

Connecticut

Concept	Description
Are there eligibility criteria targeted to IMDs?	Yes, in addition to hospitals for which federal law mandates eligibility for DSH payments, lawfully operated psychiatric hospitals in Connecticut that provide a disproportionate share of services to low-income populations (as demonstrated by revenues generated from billings that are less than 40 percent of charges) are eligible for DSH payments.
Is the payment approach targeted to IMDs?	Yes, funds allocated for psychiatric hospital DSH payment will be allocated across qualifying facilities based on each hospital's share of the cost of services provided at qualifying hospitals for low-income[a] populations.
Payment calculations affecting IMDs	Payments are made to each qualifying psychiatric hospital on a pro rata basis as follows: 1. For each qualifying psychiatric hospital, the state will calculate the ratio of the cost of low-income services that the hospital provides relative to the cost of all low-income services provided by all qualifying psychiatric hospitals. This percentage is called the low-income ratio. 2. The state will multiply the amount of funds allocated for psychiatric DSH payments by the low-income ratio for each qualifying hospital. The amount of allocated funds for psychiatric hospital DSH payments is subject to state appropriations but will not exceed federal limits. If a psychiatric hospital also qualifies for DSH payments under the standards for all hospitals, then the psychiatric hospital will receive the larger of the payments for which it qualifies.
Key variables affecting facility DSH payment amounts	Cost of services provided by the hospital to low-income individuals, cost of services provided by all qualifying psychiatric hospitals to low-income individuals, and funds allocated by the state for psychiatric DSH payments

Source: Mathematica synthesis of State Plan Under Title XIX of the Social Security Act: State of Connecticut.

[a]Low-income populations are patients at or below 200 percent of the federal poverty level who are not eligible for Medicare and Medicaid coverage of psychiatric hospital services.

District of Columbia

Concept	Description
Are there eligibility criteria targeted to IMDs?	Yes, the payment approach includes a special category for public psychiatric hospitals. The public psychiatric hospital category was added January 1, 2012.
Is the payment approach targeted to IMDs?	Yes, public psychiatric hospitals have a different payment formula than other qualifying hospitals (including private IMDs).
Payment calculations affecting IMDs	1. Each qualifying public psychiatric hospital shall be paid an amount equal to its total uncompensated care costs. 2. For any District Medicaid-participating hospital that is reimbursed on a cost settlement basis, the uncompensated care amount is zero and, thus, the hospital is not eligible for DSH payments. 3. For other qualifying hospitals (including private IMDs) calculate: a. Uncompensated inpatient costs times the percent of inpatient days attributable to individuals served by those costs b. Uncompensated outpatient costs times the share of outpatient visits attributable to individuals who were provided services included in those costs c. Add the output from (a) and (b) for each hospital and divide this sum by the sum across all hospitals d. Multiply the percent from (c) by the District's annual DSH limit to get the hospital's DSH payment amount
Key variables affecting facility DSH payment amounts	Inpatient and outpatient uncompensated care costs, inpatient days associated with inpatient uncompensated care costs, and outpatient visits associated with outpatient uncompensated care costs

Source: Mathematica synthesis of State Plan Under Title XIX of the Social Security Act Methods and Standards for Establishing Payment Rates: Hospital Care, Part III: Qualifications for a Disproportionate Share Hospitals.

Maine

Concept	Description
Are there eligibility criteria targeted to IMDs?	There are no eligibility criteria specific to IMDs.
Is the payment approach targeted to IMDs?	Yes, IMDs have a different payment approach relative to other provider types. State versus private psychiatric hospitals have different reimbursement methods.
Payment calculations affecting IMDs	Subject to the CMS IMD DSH payment cap and to the extent allowed by CMS, the DSH adjustment for IMDs will be 100 percent of actual uncompensated[a] costs. If the total uncompensated care cost for all eligible IMDs is greater than the CMS IMD DSH payment cap, state-owned facilities will be paid their actual uncompensated costs first. The remaining IMD DSH funding will be allocated among the remaining DSH-eligible hospitals based on their relative share of applicable DSH payments absent the federal or state cap. For each non-state-owned IMD, the relative share is calculated as follows: 100% of the IMD's actual uncompensated cost is divided by the sum of 100% of actual uncompensated cost for all non-state-owned IMDs. That fraction is then multiplied by the remaining available IMD DSH funding, as described above, to give the relative share to be paid to the non-state-owned IMD.
Key variables affecting facility DSH payment amounts	Uncompensated care costs, relative share, and ownership type

Source: Mathematica synthesis of MaineCare Benefits Manual, Chapter III: Principles of Reimbursement, Section 45: Hospital Services.

[a]Uncompensated care includes services furnished to MaineCare members and charity care as reported on the hospital's audited financial statement for the relevant payment year. Uncompensated care excludes payments made by the state for services furnished to MaineCare members. MaineCare is Maine's Medicaid program.

Maryland

Concept	Description
Are there eligibility criteria targeted to IMDs?	There are no eligibility criteria specific to IMDs.
Is the payment approach targeted to IMDs?	Yes, state regulations provide differential guidelines for psychiatric hospitals with charity care inpatient costs.
Payment calculations affecting IMDs	The DSH payment rate for freestanding psychiatric hospitals with charity care differs across the following categories: 1. If the hospital has inpatient charity care costs exceeding 40 percent of total inpatient hospital costs, the DSH payment rate is the greater of the hospital's annual costs for low-income patients divided by its annual inpatient medical costs, minus 1, all multiplied by 2, and then multiplied by its inpatient Medicaid payment or minimum payment required by federal law. 2. If the hospital has inpatient charity care less than or equal to 40 percent of the total inpatient hospital costs, then the DSH payment rate equals the minimum payment required by federal law. A freestanding hospital licensed exclusively as psychiatric or rehabilitation for at least two years that has not been a Maryland Medicaid provider for at least two years shall receive a disproportionate share payment, for any year, not greater than the hospital's costs for low-income patients in the complete state fiscal year occurring two years before the fiscal year during which payments are made.
Key variables affecting facility DSH payment amounts	Hospital costs for low-income patients and annual inpatient Medicaid costs

Source: Mathematica synthesis of Title 10 Maryland Department of Health, Subtitle 09 Medical Care Programs, Chapter 47: Disproportionate Share Hospitals.

Missouri

Concept	Description
Are there eligibility criteria targeted to IMDs?	There are no eligibility criteria specific to IMDs.
Is the payment approach targeted to IMDs?	Yes, the only difference from other eligible facilities is that guidelines specify that if the IMD DSH allotment is not fully expended, the remaining federal IMD allotment may be paid to hospitals that are under their hospital-specific DSH limit.
Payment calculations affecting IMDs	Up to 100 percent of the available federal DSH allotment will be allocated to each hospital with a positive estimated uncompensated care cost (UCC) net of out-of-state (OOS) DSH payments. The allocation shall result in each hospital receiving the same percentage of its estimated UCC net of OOS DSH payments. The allocation percentage will be calculated at the beginning of the state fiscal year by dividing the available federal DSH allotment to be distributed by the total hospital industry's positive estimated UCC net of OOS DSH payments. If the Medicaid program's original DSH payments did not fully expend the federal IMD DSH allotment for any plan year, the remaining IMD DSH allotment may be paid to hospitals that are under their projected hospital-specific DSH limit.
Key variables affecting facility DSH payment amounts	Statewide DSH allotment, UCC, OOS, and the federal government cap on IMD DSH allotment

Source: Mathematica synthesis of Rules of Department of Social Services, Division 70: Missouri HealthNet Division, Chapter 15 Hospital Program.

North Carolina

Concept	Description
Are there eligibility criteria targeted to IMDs?	Yes, to be eligible for supplemental DSH payments a hospital must meet at least one of several criteria. One of these criteria is that the hospital is a psychiatric hospital operated by the North Carolina Department of Health and Human Services, Division of Mental Health, Developmental Disabilities, Substance Abuse Services or a hospital owned or controlled by the University of North Carolina Health Care System, as defined in N.C. Gen. Stat. § 116-37.
Is the payment approach targeted to IMDs?	Yes, there is a specific DSH payment method for IMDs.
Payment calculations affecting IMDs	For state-owned IMDs, payment shall equal the facility-specific average per diem cost from its most recent cost report available at the time of data collection multiplied by bed days of service to low-income persons. Bed days of service to low-income persons is defined as the number of bed days provided to individuals that have been determined by the hospital as patients who do not possess the financial resources to pay portions of or all charges associated with care provided and who do not possess health insurance, which would apply to the service for which the individual sought treatment, or who have insurance but are not covered for the particular service rendered or for the procedure or treatment. Payments to IMDs shall not exceed the state's DSH limit for IMDs. The upper payment limit for psychiatric and rehabilitation distinct part units will be calculated by taking each distinct part unit's Medicaid cost per discharge multiplied by the Medicaid distinct part unit discharges.
Key variables affecting facility DSH payment amounts	Bed days of service to low-income persons and per diem costs

Source: Mathematica synthesis of State Plan Under Title XIX of the Social Security Act Medical Assistance Program.

Rhode Island

Concept	Description
Are there eligibility criteria targeted to IMDs?	No, the state does not have specific eligibility criteria for IMDs for DSH.
Is the payment approach targeted to IMDs?	No.
Payment calculations affecting IMDs	Depending upon medical assistance inpatient utilization and state operation, psychiatric hospitals will fall into one of the following categories: **Pool A.** For all licensed hospitals within Rhode Island that meet or exceed the criteria set forth in Section 1923(b) of the Social Security Act: $1,000 plus the proportional share of $232,379. That sum shall be distributed among (1) the qualifying facilities in the direct proportion that the low-income utilization rate in each facility exceeds 25 percent and/or (2) the psychiatric hospitals that have a medical assistance inpatient utilization rate of not less than 1 percent. **Pool B.** For state-operated hospitals that exceed the medical assistance inpatient utilization rate by more than one standard deviation, there shall be an additional payment of $10,000 plus the proportional share of $1,396,940. That sum shall be distributed among the qualifying facilities in the direct proportion of the weighted average yielded by the multiplication of the percentage points that the medical assistance utilization rate exceeds one standard deviation unit above the mean times the total dollars expended for medical assistance care.
Key variables affecting facility DSH payment amounts	State-operation status and medical assistance inpatient utilization rate

Source: Mathematica synthesis of State Plan Under Title XIX of the Social Security Act: Rhode Island, Attachment 4.19-A, and State of Rhode Island Executive Office of Health and Human Services: Public Notice of Proposed Amendment to DSH State Plan.

Washington

Concept	Description
Are there eligibility criteria targeted to IMDs?	Yes, there are specific regulations for state psychiatric hospitals.
Is the payment approach targeted to IMDs?	Yes, there is a specific payment approach for state psychiatric hospitals.
Payment calculations affecting IMDs	State psychiatric hospitals are eligible to receive the value of their uncompensated care costs in DSH payments. Statistical methods are used to estimate these costs. If the total value of uncompensated care costs across eligible facilities exceeds the federal IMD allotment, the eligible facilities receive a share of the allotted amount. Each facility's share is calculated based on its share of uncompensated care costs at eligible state psychiatric hospitals in the prior state fiscal year.
Key variables affecting facility DSH payment amounts	Federal IMD allotment and uncompensated care costs

Source: Mathematica synthesis of State Plan under Title XIX of the Social Security Act: Washington, Attachment 4.11-A.

West Virginia

Concept	Description
Are there eligibility criteria targeted to IMDs?	Yes, there is a special eligibility pool and allocation of funds for state-owned or state-operated hospitals including psychiatric hospitals. There are no special provisions for IMDs that are privately owned.
Is the payment approach targeted to IMDs?	No, except that the state plan acknowledges that total payments to IMDs are limited to the federal IMD allotment.
Payment calculations affecting IMDs	There are three payment pools: 1. State-owned or state-operated hospitals (funds allocated to these hospitals will be equal to the sum of their cost limits)[a] 2. Non-state-owned or -operated hospitals 3. Minimum DSH and critical care access hospital payment pool The allotment of funds to each payment pool and hospital is determined by the Commissioner of the Single State Agency, subject to federal minimum and maximum requirements. These allotments may be established so that the total allotments across hospitals are equal to the federally allowed maximums. In addition, the state plan indicates that if payments to some hospitals exceed their federal cost limits these payments should be redistributed to other eligible hospitals that are below their federal cost limit.
Key variables affecting facility DSH payment amounts	State ownership, hospital size, DSH allotment, and annual cost limit

Source: Mathematica synthesis of State Plan under Title XIX of the Social Security Act: West Virginia, Attachment 4.19.

[a]A hospital's cost limit is equal to the cost of services to Medicaid patients minus Medicaid payments for those patients plus the cost of services to uninsured patients minus payments made for them. IMDs are subject to additional restrictions of Section 4721(b) of the Balanced Budget Act of 1997, which provides for the federal IMD allotments.

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APPENDIX E:

DETAILED METHODS AND SAMPLE CHARACTERISTICS FOR LENGTHS OF STAY ANALYSIS

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To examine the average length of stay in participating IMDs and general hospital psychiatric units, we combine Medicaid and Medicare data with data from MEPD states and IMDs on IMD admissions to create an episode-level file. We include in the analysis file all Medicaid beneficiaries who lived within the area covered by MEPD and received services for a psychiatric EMC from either a participating IMD or general hospital psychiatric unit. See Tables E.1 and E.2 for beneficiary characteristics for IMD admissions we include in the analysis.

Table E.1. Beneficiary characteristics for IMD admissions included in the length of stay analysis

	Alabama (n=1,545)	California (n=2,749)	Connecticut (n=566)	Maryland (n=4,019)	Missouri (n=1,885)	West Virginia (n=2,362)
Age (in years)	40.8	39.2	39.8	37.6	39.9	39.9
Female	48.8	53.8	48.8	53.8	60.1	49.4
Dual eligible	41.9	24.2	48.6	9.3	60.4	46.8
Diagnosis[a]						
Schizophrenia	66.2	43.1	25.4	30.8	21.7	34.6
Mood disorder	33.7	56.9	74.6	69.2	78.1	65.4
Suicide	0.1	0.0	0.0	0.0	0.2	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0
Race/Ethnicity						
White	46.5	56.1	76.9	53.4	83.0	92.7
Black	51.6	25.5	8.1	40.2	14.3	6.4
Hispanic	0.6	11.5	14.1	3.4	1.9	0.7
Asian	0.6	5.5	0.5	2.1	0.5	0.1
Other	0.8	1.6	0.4	0.3	0.4	0.1
Additional psychiatric EMC in previous 12 months	35.8	52.6	39.4	57.9	42.5	43.9
Rural	3.5	0.4	11.5	3.2	28.0	38.3

Source: Mathematica analysis of participating IMD data, covering July 2010 to December 2012 for six states (Alabama, California, Connecticut, Maryland, Missouri, and West Virginia).

Note: N is the number of admissions included in the analysis. Numbers in all rows except age are percentages. The IMD group includes MEPD-eligible beneficiaries who lived inside the IMDs' catchment areas and were admitted to an IMD. Some patients are missing demographic information; calculations are based on available data.

[a]See Appendix B for a list of diagnosis codes included in these groupings.

[b] Percentage of beneficiaries with residential zip codes within rural metropolitan statistical areas.

Table E.2. Beneficiary characteristics for general hospital psychiatric unit admissions included in the length of stay analysis

	Alabama (n=9,621)	California (n=4,148)	Connecticut (n=3,574)	Maryland (n=34,222)	Missouri (n=60,312)	West Virginia (n=11,843)
Age (in years)	41.0	41.4	39.1	40.5	40.7	42.1
Female	56.2	49.7	45.7	48.9	47.7	49.3
Dual eligible	61.9	87.1	7.4	32.0	44.2	35.4
Diagnosis[a]						
Mood disorder	49.0	47.5	83.4	60.8	58.1	68.4
Schizophrenia	44.8	52.0	15.3	38.2	37.6	29.9
Suicide	6.2	0.5	1.1	1.0	4.4	2.5
Other	0.0	0.0	0.1	0.0	0.0	0.0
Race/Ethnicity						
White	62.7	59.7	80.8	47.9	75.0	95.6
Black	36.0	22.7	10.2	49.1	23.1	4.1
Hispanic	0.6	10.1	7.8	1.6	1.3	0.1
Asian	0.3	6.1	0.6	1.2	0.3	0.1
Other	0.4	1.5	0.6	0.3	0.4	0.1
Additional psychiatric EMC in previous 12 months	42.2	52.6	46.9	60.5	53.5	52.5
Rural[b]	33.7	0.0	17.5	5.5	35.1	70.8

Source: Mathematica analysis of Medicaid, Medicare, and participating IMD data, covering July 2010 to December 2012 for six states (Alabama, California, Connecticut, Maryland, Missouri, and West Virginia).

Note: N is the number of admissions included in the analysis. Numbers in all rows except age are percentages. The general hospital psychiatric unit group includes MEPD-eligible beneficiaries who lived inside the IMDs' catchment areas and were admitted to a psychiatric unit. Some patients are missing demographic information; calculations are based on available data.

[a]See Appendix B for a list of diagnosis codes included in these groupings.

[b]Percentage of beneficiaries with residential zip codes within rural metropolitan statistical areas.

We have sufficient data to include six of the 12 MEPD states in this analysis (Alabama, California, Connecticut, Maryland, Missouri, and West Virginia).[13] For three of the states in the analysis, we have data only through the first six months of MEPD, so we restrict the analyses to the two years of pre-demonstration data and six months of demonstration data in all states.[14]

For the analysis of length of stays in hospital emergency departments, we use data we obtained directly from hospital emergency departments under the original MEPD evaluation. To identify potential hospital emergency departments from which to solicit data, the original MEPD evaluation team asked state MEPD project directors and, in some cases, administrators of participating IMDs to suggest hospital emergency departments that made a large number of

[13] We do not have Medicaid data for the MEPD period for five of the MEPD states. For a sixth (Washington), we do not have IMD data.

[14] There are no significant differences between the analyses run on the limited evaluation period versus analyses run on the entire evaluation period.

referrals to a participating IMD and had established a strong relationship with it. One hospital emergency department was selected for each participating IMD on the basis of (1) number of referrals to the IMD, (2) relationship with IMD staff, (3) proximity to the IMD, (4) availability of needed administrative data, and (5) willingness to participate.

The original MEPD evaluation team obtained data from 16 hospital emergency departments in nine of the twelve states and included 30,278 psychiatric EMC visits. After excluding outliers[15] as well as data from hospital emergency departments with fewer than five visits before or during MEPD, our final sample for the length of stay analysis ranges from 409 to 4,081 visits across 12 hospital emergency departments in 7 of the 12 states (Table E.3).

Table E.3. Beneficiary characteristics for hospital emergency department visits included in the length of stay analysis

	Alabama (n=467)	California (n=1,529)	Connecticut (n=646)	Maryland (n=4,081)	Missouri (n=409)	Washington (n=433)	West Virginia (n=2,233)
Age (in years)	35.9	37.5	38.7	37.8	40.0	38.1	40.0
Female	44.3	35.8	46.8	47.9	45.2	52.0	53.3
Dual Medicare Beneficiary	24.6	27.5	0.0	25.2	7.0	18.7	28.5
Race/Ethnicity							
White	50.1	24.4	70.3	58.6	35.8	81.8	88.8
Black	46.7	20.1	9.0	29.4	57.9	6.7	10.9
Native America/Pacific Islander	0.4	4.7	0.0	2.2	0.5	3.9	0.0
Hispanic	0.9	2.6	18.9	4.0	0.0	6.7	0.0
Other/Mixed	1.5	7.9	1.8	2.6	0.1	0.0	0.3
Unknown/Missing	0.4	40.4	0.0	3.4	5.6	0.9	0.0

Source: Mathematica analysis of data obtained from select hospital emergency departments, 2010-2014. Length of stay data includes visits to 12 hospital emergency departments across the 7 states.

Note: The analysis is limited to MEPD-eligible beneficiaries. N is the number of admissions included in the analysis. Numbers in all rows except age are percentages.

[15] Outliers include visits with length of stay of fewer than 0 hours or more than 480 hours.

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APPENDIX F:

DETAILED METHODS AND SOURCES FOR PAYMENT RATE ANALYSIS

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A. Calculating payment rates for diagnosis related groups

Five MEPD states (California, District of Columbia, North Carolina, Rhode Island, and West Virginia) use diagnosis related groups (DRGs) to determine Medicaid payment rates for inpatient stays in general hospital psychiatric units. There are more than 20 psychiatric diagnosis-related groups. We calculated rates using DRGs for only the three most common mental health diagnoses associated with IMD admissions under MEPD—schizophrenia, major depressive disorder and other/unspecified psychoses, and bipolar disorder. The DRG pricing calculators require the user to input information on each specific case to produce the estimated payment. The set of conditions required to calculate the payment rate varies from state to state, and the values entered into the required data entry fields varies from case to case (Table F.1). For example, Rhode Island includes a policy adjustment for an outlier payment for mental health diagnoses when the length of stay is greater than 20 days, whereas California and the District of Columbia do not have a specific mental health outlier payment for adults.

Table F.1. User-specified conditions entered into the DRG calculator

State	Inputs in the DRG calculator
District of Columbia	Total charges: $30,000
	Cost-to-charge (CCR) ratio (Hospital-specific): 21.83%
	Length of stay (covered days): 8
	Discharge status = 02, 05, 63, 65, 66, 82, 85, 91, 93, 94: No
	Patient age (in years): 30
	Other health coverage: $0
	Patient share of cost: $0
	Is discharge status equal to 30?: No
	DRG base rate (Hospital-specific including IME): $11,756.00
	Capital add-on payment (Hospital-specific): $1,053.81 (applies to in-District hospitals)
	DME add-on payment (Hospital-specific): $1,388.56 (applies to in-District Hospitals)
California	Total charges: $30,000
	Hospital-specific cost-to-charge ratio: 33.00%
	Length of stay: 8
	Patient discharge status = transfer?: No
	Patient age (in years): 30
	Other health coverage: $0
	Patient share of cost: $0
	Is discharge status equal to 30?: No
	Designated NICU facility: No

State	Inputs in the DRG calculator
Rhode Island	Covered Charges: $30,000
	Hospital-specific ratio of cost-to-charges: 47.00% (state average)
	Length of stay: 8
	Medicaid covered days: 8
	Patient discharge status = 02, 05, 07: N
	Age < 18: N
	Is it an interim claim - Frequency (third digit of bill type) = 2 or 3?: N
	Is an adjustment for partial eligibility made? - Is occurrence code A2 or A3 on claim: N
	DRG Add-on: $0
	Third party liability: $0
	Cost-sharing: $0
	Spend-down: $0

We focus on moderate (99284) and high (99285) complexity hospital emergency department visits because psychiatric hospital emergency department visits are likely to be classified as such. Moderate severity visits require urgent evaluation but do not pose an immediate significant threat to life, whereas high severity visits pose an immediate significant threat to life. Psychiatric diagnostic interview codes with medical services (90792) and without medical services (90791) can be used for psychiatric consultations in the hospital emergency department. Descriptions of each procedure code we used in the analysis of hospital emergency department payments are provided below:

- **90791** - Psychiatric diagnostic interview without medical services
- **90792** - Psychiatric diagnostic interview (for prescribers / medical services)
- **99284** - Hospital emergency department visit for the evaluation and management of a patient, which requires three key components: a detailed history, a detailed examination and Medical decision making of moderate complexity. Counseling and/or coordination of care with other providers or agencies are provided consistent with the nature of the problem(s) and the patient's and/or family's needs. Usually, the presenting problem(s) are of high severity, and require urgent evaluation by the physician but do not pose an immediate significant threat to life or physiologic function.
- **99285** - Hospital emergency department visit for the evaluation and management of a patient, which requires three key components within the constraints imposed by the urgency of the patient's clinical condition and/or mental status: a comprehensive history; a comprehensive examination; and Medical decision making of high complexity. Counseling and/or coordination of care with other providers or agencies are provided consistent with the nature of the problem(s) and the patient's and/or family's needs. Usually, the presenting problem(s) are of high severity and pose an immediate significant threat to life or physiologic function.

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APPENDIX G:

DETAILED METHODS AND SAMPLE CHARACTERISTICS FOR CALCULATIONS OF EXPENDITURES AS A PROXY FOR PAYMENT RATES

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IMDs. To estimate expenditures for IMD stays funded under MEPD, we use MEPD payment and monitoring data CMS provided us. Table G.1 shows the beneficiary characteristics associated with IMD admissions under MEPD.

Table G.1. Beneficiary characteristics for IMD admissions under MEPD

Characteristic	Number	Average/percent
Age at admission[a]	16,728	38 years
Emergency medical condition (admitted before Oct 1, 2012)[b]	719	
Suicidal thoughts or gestures	526	73
Homicidal thoughts or gestures	125	17
Both suicidal and homicidal thoughts or gestures	54	8
Determined to be a danger to self or others by means other than suicidal or homicidal[c]	14	2
Emergency medical condition (admitted after Oct 1, 2012)[b]	16,012	
Suicidal thoughts or gestures	11,078	69
Homicidal thoughts or gestures	701	4
Both suicidal and homicidal thoughts or gestures	897	6
Determined to be a danger to self or others by means other than suicidal or homicidal	3,336	21
Admitting diagnosis for IMD stay	16,731	
Depressive disorders	4,618	28
Bipolar disorders	4,085	24
Schizophrenia spectrum disorders	4,051	24
Other mood disorders	1,500	9
Other psychotic disorders	1,302	8
Substance-related disorders	370	2
Anxiety disorders	327	2
Other mental health diagnoses	436	3
Other non-mental health diagnoses	42	0
Primary discharge diagnosis differs from admitting diagnosis	4,133	25

Source: Mathematica analysis of data the 12 MEPD states submitted to CMS for payment and monitoring purposes during the MEPD implementation (July 2012 through June 2015).

[a]Three records have invalid dates of birth and are excluded from analysis of age.

[b]The categories of eligibility changed on October 1, 2012 to include "determined to be a danger to self or others by means other than suicidal or homicidal."

[c]All beneficiaries who were admitted before October 1, 2012 and had an EMC of "determined to be a danger to self or others by means other than suicidal or homicidal" were discharged after October 1, 2012.

General hospital psychiatric units and hospital emergency departments. To estimate the Medicaid payment rates for psychiatric stays in general hospital psychiatric units and hospital emergency departments, we summarized the unadjusted average Medicaid expenditures for psychiatric stays in these settings. We organized the analytic file as one record per Medicaid beneficiary per quarter; each record summarizes average monthly expenditures that quarter for

mental health services in general hospital psychiatric units and hospital emergency departments covered by Medicaid. The primary source of data on comprehensive mental health expenditures among beneficiaries is the MAX files; we abstracted data abstracted from the inpatient hospital, other services, and person summary files. In general, the MAX data include claims for all Medicaid-funded services that qualify for federal matching funds.

In several states, Medicaid data were not available for the demonstration period at the time the analytic file was created; we exclude these states (the District of Columbia, Illinois, Maine, North Carolina, and Rhode Island) from the analysis. We exclude Washington because almost all individuals with serious mental illness were enrolled in behavioral managed care plans, for which payment data were not available. We exclude Connecticut because data submitted by the IMD did not include identifiers, so we cannot link the data to the Medicaid data as is necessary to determine the full population of Medicaid beneficiaries with psychiatric EMCs. Five states are included in these analyses: Alabama, California, Maryland, Missouri, and West Virginia. The amount of data available for the MEPD period varies by state, ranging from 6 months for Alabama and Maryland to 29 months for West Virginia.

Beneficiaries living in MEPD states who had a psychiatric EMC at any point in the evaluation time period are included in the analyses. Expenditures include total payments for any claim on which the primary diagnosis is a mental health condition, as defined by the Agency for Healthcare Research and Quality's 2015 Clinical Classifications Software (CCS). We include all diagnoses in the CCS level 5 (mental illness), except for developmental disorders (intellectual disabilities or learning disorders); disorders usually diagnosed in infancy, childhood, or adolescence (elimination disorders or pervasive developmental disorders); and alcohol and substance-related disorders. We use revenue, place of service, and procedure codes to determine whether the services were provided in the psychiatric unit and/or hospital emergency department.

Our analyses include only fee-for-service Medicaid facility and professional services claims because managed care payments do not appear in claims data. Therefore, we exclude from the expenditure analysis any months in which a beneficiary is enrolled in a Medicaid managed care plan that potentially includes behavioral health services. The exclusion applies to any months they are enrolled in a comprehensive managed care plan or a managed behavioral health plan. We also exclude Medicaid beneficiaries dually enrolled in Medicare at any time during the quarter. Because the data and analyses include only fee-for-service expenditures, we are not able to assess expenditures as a proxy for managed care payment rates. Per stay expenditures and payment rates likely differ for stays funded through managed care.

Tables G.2-G.4 display beneficiary characteristics associated with psychiatric stays in general hospital psychiatric units and hospital emergency departments. Separate tables present information for (1) general hospital psychiatric unit inpatient stays with a hospital emergency department visit prior to admission, (2) general hospital psychiatric unit inpatient stays without a hospital emergency department visit prior to admission, and (3) hospital emergency department visits without a subsequent inpatient stay.

Table G.2. Beneficiary characteristics associated with psychiatric stays in general hospital psychiatric units with a hospital emergency department visit prior to admission

	California (n=1,984)	Alabama (n=2,391)	Maryland (n=2,355)	Missouri (n=21,779)	West Virginia (n=5,719)
Average age in years at beginning of MEPD	41.6	37.8	39.5	39.4	41.6
Average length of stay	8.4	6.1	4.7	8.2	10.0
Female	41.9	61.6	45.1	47.4	50.5
Race/ethnicity					
White	42.3	60.2	50.2	74.7	96.4
Non-Hispanic Black	28.0	38.2	46.3	23.6	3.6
Non-Hispanic Asian or Other Pacific Islander	6.2	0.3	1.2	0.3	0.1
Non-Hispanic Other	1.0	0.6	0.2	0.3	0.0
Hispanic	22.5	0.7	2.2	1.2	0.0

Source: Analysis of Medicaid data we obtained from CMS for 2012-2014. The amount of data available varies by state, ranging from 6 months for Alabama and Maryland to 29 months for West Virginia.

Note: N = number of admissions. Numbers for all rows except age and length of stay are percentages.

Table G.3. Beneficiary characteristics associated with psychiatric stays in general hospital psychiatric units without a hospital emergency department visit prior to admission

	California (n=1,513)	Alabama (n=861)	Maryland (n=1,620)	Missouri (n=12,102)	West Virginia (n=2,965)
Average age in years at beginning of MEPD	41.8	38.1	41.3	39.5	42.0
Average length of stay	7.8	7.5	5.3	7.5	10.1
Female	44.1	62.3	47.1	47.6	53.5
Race/ethnicity					
White	43.4	65.2	52.4	74.4	96.8
Non-Hispanic Black	26.8	34.3	44.1	24.0	3.1
Non-Hispanic Asian or Other Pacific Islander	5.8	0.0	1.4	0.3	0.0
Non-Hispanic Other	0.7	0.1	0.1	0.2	0.0
Hispanic	23.3	0.5	2.0	1.1	0.0

Source: Analysis of Medicaid data we obtained from CMS for 2012-2014. The amount of data available varies by state, ranging from 6 months for Alabama and Maryland to 29 months for West Virginia.

Note: N = number of admissions. Numbers for all rows except age and length of stay are percentages.

Table G.4. Beneficiary characteristics associated with hospital emergency department visits without an inpatient stay

	California (n=7,666)	Alabama (n=8,362)	Maryland (n=2,550)	Missouri (n=24,465)	West Virginia (n=10,664)
Average age in years at beginning of MEPD	41.5	38.5	40.1	39.0	40.8
Average length of stay	0.0	0.0	0.0	0.0	0.0
Female	46.5	67.8	48.6	46.2	52.5
Race/ethnicity					
White	46.0	65.6	50.5	73.7	96.5
Non-Hispanic Black	27.4	33.3	46.1	24.5	3.4
Non-Hispanic Asian or Other Pacific Islander	5.0	0.2	1.0	0.2	0.0
Non-Hispanic Other	1.5	0.4	0.5	0.3	0.0
Hispanic	20.2	0.5	1.9	1.4	0.1

Source: Analysis of Medicaid data we obtained from CMS for 2012-2014. The amount of data available varies by state, ranging from 6 months for Alabama and Maryland to 29 months for West Virginia.

Note: N = number of admissions. Numbers for all rows except age and length of stay are percentages.

APPENDIX H:

IDENTIFICATION OF TARGET POPULATIONS AND DETAILED RESULTS FOR ANALYSIS OF MEPD EFFECTS ON HOSPITAL EMERGENCY DEPARTMENT USE

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Defining the populations of interest

The Cures Act specifically requests analyses differentiating hospital emergency department use between three groups:

1. Medicaid beneficiaries who were treated in an IMD under MEPD (MEPD participants);
2. Medicaid beneficiaries who met the MEPD eligibility requirements but who were not treated in an IMD under MEPD (MEPD eligible, non-IMD); and
3. Adult Medicaid beneficiaries with serious mental illness who did not meet MEPD eligibility requirements and were not treated in an IMD (MEPD ineligible, non-IMD).

We were able to identify Group 1 and use a proxy definition to identify Group 2. However, we were not able to distinguish Group 2 and Group 3 using available data.

Proxy definition for identifying beneficiaries who meet MEPD eligibility requirements

In order to identify beneficiaries in Groups 2 and 3, we must determine whether each beneficiary meets the MEPD eligibility criteria listed below:

- Age 21 to 64,
- Living within a geographic area covered by MEPD,
- Meeting state-specific requirements regarding enrollment in Medicaid managed care and Medicare, and
- In need of inpatient care to stabilize a psychiatric EMC, defined as being suicidal, homicidal, or dangerous to oneself or others.

Although the first three criteria can be easily identified in the Medicaid administrative data, the fourth cannot because these data do not include reliable indicators of suicidality, homicidality, or dangerousness. Nor do they include indicators of the need for inpatient care. Instead, we approximate the existence of a psychiatric EMC by identifying whether the beneficiary was hospitalized or received care in a hospital emergency department for a serious mental illness, homicidal ideation, or injury suggesting self-harm (such as poisoning associated with a mental health diagnosis). Appendix B provides details about the diagnosis codes we used for this proxy definition.

Comparing hospital emergency department use between Groups 1 and 2

To fairly compare hospital emergency department use between Groups 1 and 2, the same MEPD eligibility criteria should be applied to both groups. Actual MEPD participants included in the MEPD payment and monitoring data might differ in unknown ways from Group 2 beneficiaries identified using our proxy definition. Such differences might affect hospital emergency department use, thereby biasing the results in unknown ways. Therefore, we use Medicaid and Medicare administrative data to identify Group 1, using the same proxy definition we apply to Group 2.

The challenge in differentiating Groups 1 and 2 using Medicaid and Medicare data, however, is that the proxy definition does not enable us to distinguish beneficiaries who actually

were or were not treated in an IMD under MEPD. Instead, we can only distinguish groups of beneficiaries who were more or less likely to have been treated in IMDs under MEPD.

- The only beneficiaries meeting the proxy definition of MEPD eligibility who could have actually been treated in an IMD under MEPD (Group 1) were those living in the geographic area covered by MEPD during the MEPD period.
- Beneficiaries who either lived outside of the geographic area covered by MEPD or who experienced their psychiatric EMCs before MEPD began could not have be treated in an IMD under MEPD (Group 2). In four of the five states with sufficient data for this analysis, MEPD covered the entire state. For the one state (California) for which it did not, we compare MEPD-eligible beneficiaries living within MEPD areas with those living outside of MEPD areas. For the four remaining states (Alabama, California, Maryland, Missouri, and West Virginia), we compare use of hospital emergency department services among MEPD-eligible beneficiaries living in MEPD areas before and during MEPD.

Impossibility of identifying Group 3

Beneficiaries in Group 3 differ from beneficiaries in Group 2 in that they do not meet the MEPD eligibility criteria. Below we consider each eligibility criterion and how, together, they contribute to the impossibility of identifying Group 3 in a way that differentiates it from Group 2.

- Only adults are include in Group 3. To fairly compare Group 3 to Groups 1 and 2, beneficiaries in the three groups should be comparable in age. Therefore, adult beneficiaries in Group 3 should be limited to those who meet the MEPD age criterion (age 21 to 64).
- If a beneficiary in Group 3 meets all of the MEPD eligibility criteria except having a psychiatric EMC, that means he or she was never hospitalized or treated for a serious mental illness by a hospital emergency department. Beneficiaries never treated by a hospital emergency department have no hospital emergency department use data to include in the analysis.
- If a beneficiary in Group 3 meets all of the MEPD eligibility criteria except for state-specific criteria, that means he or she is enrolled in a Medicaid managed care plan. If they are in managed care, however, we cannot include them in the analysis because available Medicaid data do not include managed care service encounters.
- Therefore, the only beneficiaries that could be in Group 3 are those who met all of the MEPD eligibility criteria except living in a geographic area covered by MEPD. Such beneficiaries, however, are the same beneficiaries included in Group 2.

Sample characteristics

For the hospital emergency department visit analysis, we use Medicaid, Medicare, and IMD data to examine how the probability of being admitted to a hospital emergency department for psychiatric EMCs changes for MEPD-eligible beneficiaries who lived in the geographic area covered by MEPD relative to that of MEPD-eligible beneficiaries who lived elsewhere during the evaluation period. We have limited data for the MEPD period, so we limit the analyses to five states; four of these states have only had six months of data for the MEPD period.

The sample includes 41,486 episodes of care[16] (not unique beneficiaries) in the one state (California) for which we were able to examine MEPD's effects on hospital emergency department visits relative to a comparison group. We used the same comparison group that we used in the original MEPD evaluation. We selected the comparison group for the original MEPD evaluation by matching counties that did and did not participate in MEPD on a series of county-level characteristics that are most relevant to MEPD. These included, for example, the number of psychiatric EMCs, the proportion of Medicaid beneficiaries, and the availability of a hospital with an ED.[17]

We had data but no comparison group for four states: Alabama, Maryland, Missouri, and West Virginia. For these states, we used a pre-post logistic regression model to examine how the probability of a hospital emergency department visit for a psychiatric EMC changed for MEPD-eligible beneficiaries before and during the demonstration. The sample included 147,463 episodes of care across the four states. Control variables in this analysis included all the control variables used for California, as well as an additional psychiatric EMC category (suicidal behavior) and an indicator of whether the beneficiary resided in a rural area.

We display the beneficiary characteristics of the study sample in Table H.1. Although beneficiary characteristics differ between the intervention and comparison groups in California, we proceeded with the analysis because (1) these are the best-matched counties we can find in terms of the high-priority selection variables; (2) the difference-in-differences analysis accounts for pre-existing group differences, and (3) we include the beneficiary characteristics that differed between groups at baseline as covariates in the analysis.

[16] An episode of care is the total of all treatment a patient receives in a hospital emergency department, general hospital, and/or IMD for a single occasion on which they experience a psychiatric EMC.

[17] See Appendix B for more details on our selection of the comparison group.

Table H.1. Beneficiary characteristics for hospital emergency department visits analyses

	California					
	Intervention (n=36,134)	Comparison (n=7,284)	Alabama (n=18,452)	Maryland (n=52,331)	Missouri (n=60,741)	West Virginia (n=22,867)
Age (in years)	39.1	41.0	39.9	39.6	40.3	41.2
Female	50.4	41.4	60.6	49.4	47.5	49.7
Dual eligible	31.5	45.8	40.0	19.7	36.8	27.8
Diagnosis						
Mood disorder	43.2	33.4	43.3	61.1	55.4	58.7
Schizophrenia	43.3	51.4	36.3	31.7	33.5	23.1
Suicide	-	-	9.1	4.3	8.0	13.4
Other	13.5	15.2	1.9	2.1	2.6	2.3
Race						
White	54.7	45.7	64.7	47.8	74.9	95.6
Black	25.7	26.0	33.9	49.3	23.0	4.1
Asian	6.5	5.7	0.3	1.1	0.3	0.1
Other	1.6	1.1	0.4	0.3	0.4	0.0
Hispanic	11.6	21.4	0.7	1.6	1.4	0.2
Additional psychiatric EMC in previous 12 months	53.3	59.2	36.3	58.1	50.6	47.4
Rural	-	-	32.4	6.3	34.4	61.3

Source: Mathematica analysis of Medicaid and Medicare data we obtained from CMS and IMD data we obtained from five states. The analyses include 1.5 years of data during MEPD for West Virginia and six months of data during MEPD for the remaining states.

Note: Numbers for all rows except age are percentages. Some patients are missing demographic information; calculations are based on available data. For California, the intervention group is MEPD-eligible beneficiaries living within counties that participated in MEPD; the comparison group is MEPD-eligible beneficiaries living in non-MEPD counties. All differences between the intervention and comparison group are statistically significant at the $p \leq 0.05$ level.