



P.O. Box 60
Jefferson City, MO 65102

573/893-3700
www.mhanet.com



POLICY BRIEF

Rates of Suicidality Following Psychiatric Hospitalizations for Children in Missouri

Mat Reidhead, MA
Vice President of Research
and Analytics
Hospital Industry Data Institute

Alan Greimann
Executive Vice President
Compass Health
President and CEO
Royal Oaks Hospital
Windsor, Mo.

**Alyson Wysong-Harder, LCSW,
LCSW, ACHE**
CEO
Heartland Behavioral Health Services
Nevada, Mo.

Kathy Harms, Ph.D.
Senior Director of Therapy Services
Crittenton Hospital
Kansas City, Mo.

Background

A June 2016 report from the Hospital Industry Data Institute highlighted some of the devastating effects of the increasing demand for mental health services amid an increasingly constrained supply of such services in Missouri. Among those effects, the report found that hospital utilization for **suicide ideation among children and adolescents in Missouri had grown nearly 900 percent** during the previous decade.ⁱ Suicide among children and adolescents continues to be an escalating public health crisis in the U.S.ⁱⁱ A wide array of factors are considered by experts to be contributing to this trend, including social media, cyberbullying, increased use of antidepressants and lack of access to specialized mental health care.ⁱⁱⁱ The incidence of suicidality — defined as suicide ideation or attempt — is far more prevalent than the rate of completed suicide among children and adolescents. Research shows that for every adolescent suicide, there are between 50 and 100 additional children who have attempted suicide.^{iv}

The problem of child and adolescent suicide is acutely pervasive in Missouri. **It is the second-leading cause of death in the state among children ages 5 to 19.**^v At 6.4 suicide deaths per 100,000 children in this age group, Missouri had the 11th-highest rate of child and adolescent suicide in the country during 2017.^{vi} In addition, the rate of child and adolescent suicide is growing more rapidly in Missouri compared to the country as a whole. Between 2003 and 2017, the rate of suicide for children and adolescents increased from 2.8 to 6.4 in Missouri, a relative increase of 129 percent (Figure 1).

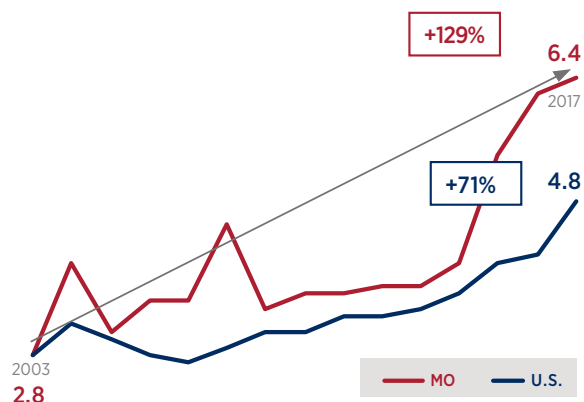
Nationally, the rate of child and adolescent suicide increased from 2.8 to 4.8 per 100,000 during the same period, an increase of 71 percent — this was 57 percentage points less than the rate of growth in Missouri.

One potential driver of the disparities in child and adolescent suicide observed in Missouri is the shortage of mental health providers specializing in behavioral care for children.

According to the Health Resources and Services Administration, 96.5 percent of Missouri counties (111 out of 115) are designated as geographic Mental Health Professional Shortage Areas. With the exception of Clay County north of Kansas City, every county in the state has either a geographic area or medical facility with a shortage of mental health professionals.^{vii} Taken as a whole, there are 22 percent fewer psychiatrists and 14 percent fewer psychologists practicing in Missouri compared to the national average, and a geographically contiguous swath of counties without any practicing psychiatrists or psychologists stretches from the state's northern-to-southern and eastern-to-western borders.^{viii}

Compounding issues related to shortages of mental health professionals in the state are reports of Medicaid managed care organizations imposing aggressive utilization reviews when certifying inpatient psychiatric hospital admissions and continued stays that result in payment of care that is far below national averages and commercial payers. As a result, psychiatric hospitals in Missouri feel pressure to prematurely discharge patients that may not be completely stable, or risk treating these patients with no reimbursement for that care.

Figure 1: 15-Year Trend in Suicides per 100,000 Children Ages 5 to 19



Source: Author's Analysis of CDC WONDER data

A network of eight Missouri hospitals and health systems formed in 2016 to evaluate disparities in authorized services for behavioral care that they provide to children and adolescents with Medicaid managed care compared to fee-for-service.^{ix} The network compiled a variety of data on observed differences in care authorized for children with Medicaid fee-for-service and individual Medicaid managed care organizations. The network's most recent data found that MCOs account for the majority of child and adolescent psychiatric admissions, and they deny

Key Findings

A network of Missouri hospitals that provide inpatient psychiatric services for children and adolescents presented data raising serious concerns over **Medicaid managed care organizations refusing authorization and denying payment** for levels of care required to treat and stabilize patients before discharge.

The average length of stay at psychiatric hospitals for children and adolescents with **Medicaid managed care coverage is 7.3 days**. For patients covered by **Medicaid fee-for-service, the average duration is 12.5 days** — a difference of 5.2 days, or 71 percent — which can be critical time needed to stabilize the child or adolescent before discharge back into the community.

The 60-day suicidality rate following a psychiatric hospitalization nearly doubled for children and adolescents with insurance coverage that shifted from Medicaid FFS to Medicaid MCO following statewide expansion of managed care in May 2017.

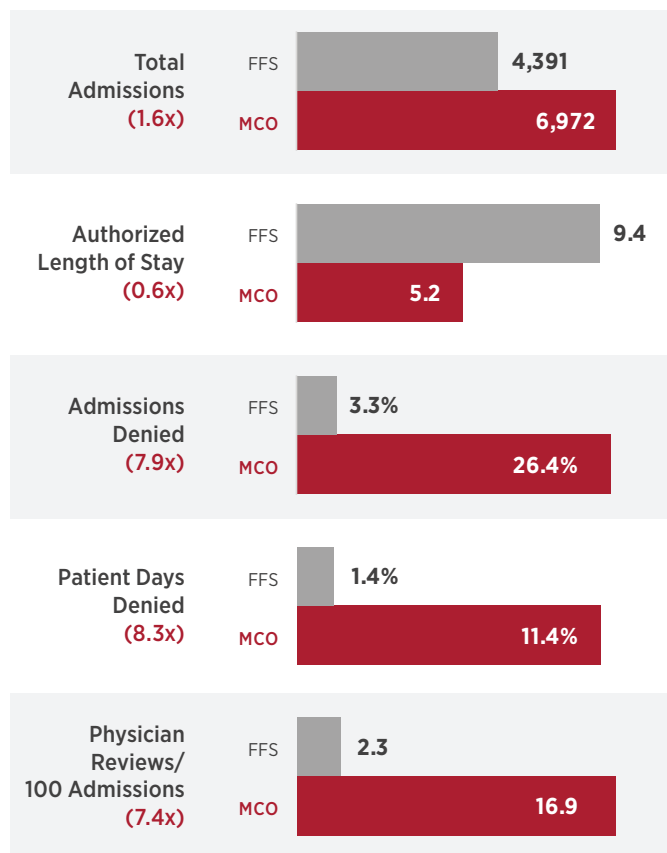
After adjusting for differences in psychiatric complexity and other risk factors, it is estimated that **the switch from Medicaid FFS to Medicaid MCO in May 2017 induced nearly 200 additional hospital visits** by Missouri children and adolescents for suicide attempt or ideation within 90 days of discharge from a psychiatric hospital.

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claims for more than one out of four admissions following discharge — **this is 7.9 times the denial rate of Medicaid FFS**. In addition, Medicaid MCOs refuse reimbursement for 11.4 percent of the total patient days during approved hospitalizations, and they require psychiatrists to spend significantly more time with added administrative burden justifying prescribed levels of care to physicians employed by the health plans (Figure 2).

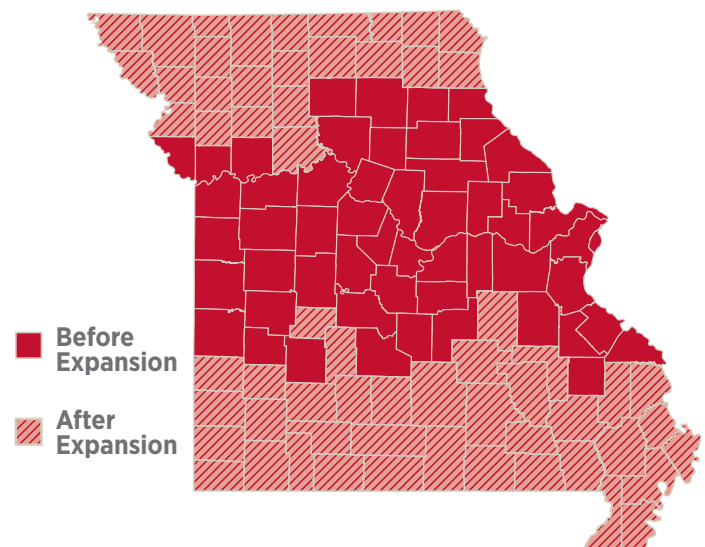
The profound differences in the levels of care authorized by Medicaid MCOs raise serious concerns on the financial sustainability of treatment for their beneficiaries, and more importantly, on the potential for adverse health outcomes for children with Medicaid managed care coverage.

Figure 2: Disparities in Authorized Services for Child and Adolescent Psychiatric Patients with Medicaid Fee-For-Service and Managed Care



Source: Children's Medicaid Managed Care Parity Network, January 2017 - August 2018

Figure 3: Expansion of Medicaid Managed Care in Missouri



In May 2017, the Missouri General Assembly expanded the Medicaid MCO service area from 54 counties encompassing the Interstate 70 corridor to statewide coverage (Figure 3). This resulted in 240,000 individuals, primarily women and children in the expansion counties, who shifted from traditional Medicaid to managed care from one of three for-profit corporations.^x

The expansion of Medicaid managed care in 2017 presented a unique opportunity to close the evidence gap^{xi} using a robust, controlled quasi-experimental research design.

Quasi-experimental studies are commonly used to evaluate pre-post impacts of interventions or policy shifts on treatment groups large enough to be prohibitive to randomized controlled designs.^{xii} In this case, hospital utilization data are becoming available to evaluate differences in health outcomes for children who were switched from Medicaid FFS to MCO coverage in May 2017. Children and adolescents under age 20 constitute approximately two-thirds of the population eligible for Medicaid managed care in Missouri.^{xiii} This implies that more than 160,000 children were shifted to Medicaid MCO coverage following statewide expansion. Among them were 2,152 children ages 5 to 19 who experienced an inpatient psychiatric hospitalization with Medicaid FFS coverage before, and Medicaid MCO coverage after, May 1, 2017.

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| Opportunities for States to Address Child and Adolescent Suicidality

❶ Innovating on Child-Centered Care Coordination

On Feb. 8, 2019, the Center for Medicare & Medicaid Innovation announced a new component of the larger national effort to reduce the effect of opioid use disorder. The Integrated Care for Kids Model provides \$128 million in funding for upstream approaches designed to improve access, early identification and treatment, and care coordination for the behavioral and physical health needs of children with Medicaid or CHIP. The InCK Model requires the involvement of the state Medicaid agency; however, other HIPAA-covered entities can serve as the lead organization for the funding opportunity. The InCK Model will provide as much as \$16 million in funding during a seven-year performance period to eight successful applicants. Applications are due on June 10, 2019.^{xvii}

❷ 21st Century Approach to Tackling Barriers to Care in IMDs

In a Nov. 13, 2018, letter to state Medicaid directors, the Centers for Medicare & Medicaid Services announced a new demonstration opportunity under Section 12003 of the 21st Century Cures Act aimed at improving outcomes for children with behavioral health needs. The initiative allows for enhanced federal financial participation for pilot projects designed to reduce barriers to accessing mental health services, among other efforts. This includes matching federal funds for care delivered to Medicaid beneficiaries in Institutions for Mental Diseases. IMD services to treat nonelderly adults and children in noninpatient, short-term residential psychiatric treatment programs currently are excluded from reimbursement from Medicaid, which largely is seen as a significant barrier in accessing behavioral health care. By focusing on the coordination of transitional care from IMDs to community-based

providers, the demonstration is designed to prevent ED use and boarding, hospital readmissions, discharge prior to stabilization, and increasing rates of suicide. States are encouraged to submit applications through the Section 1115(a) demonstration proposal process.^{xviii}

❸ A New Look at Old Authorizations

In the same SMD letter, CMS described several options for states to improve outcomes for children with behavioral health needs under existing Medicaid authorities. Strategies include advanced detection and treatment, care coordination, and school-based access to mental health services. Many of these services are reimbursable under home health state plans, and the Early and Periodic Screening, Diagnostic and Treatment benefit. In addition, developing mental health referral networks to digitally connect providers with schools, hospitals and others could be billed as an administrative expense, and additional funding for referral networks could be available through the Medicaid Information Technology Architecture 3.0. States also can use existing authorities under MTA 3.0 to receive enhanced matching funds for telehealth networks to expand access to care.^{xviii}

❹ Legislating Access to Care

Senate Bill 10 currently is making its way to the Texas Senate floor. The bill came out of committee with unanimous approval on Feb. 12, 2019. The legislation would provide \$100 million in funding during a two-year period to improve access to coordinated mental health care for children and adolescents by creating regional mental health hubs across the state, including a Child Psychiatry Access Network, investing in telehealth and underwriting medical residencies in psychiatry.^{xix}

❺ Incentivizing Early Screening and Treatment

According to the Medicaid and CHIP Payment and Access Commission, nearly half of all Medicaid spending is for beneficiaries with behavioral health comorbidities.^{xx} This provides a powerful incentive for states to diagnose and treat children with behavioral health needs as early as possible before they result in complex physical health needs. In 2014, Minnesota began publicly posting the rates of provider screening for child and adolescent depression. During the inaugural year, 45 percent of pediatric patients were screened using one of 11 standardized measures. During the second year, the rate increased to 70 percent. The Oregon Medicaid program uses a similar quality reporting approach and incentive funding to reward top performing provider organizations for early screening and treatment of child and adolescent depression. Since implementation, statewide screening rates increased 34 percent.^{xxi}

The aim of this policy brief is to explore the relationship between insurance status and suicidality rates for children and adolescents in Missouri following an inpatient psychiatric hospitalization. Emphasis is given to differences for children and adolescents with Medicaid FFS compared to MCO coverage, particularly to those who were switched from Medicaid FFS to MCO coverage in May 2017.

Data and Methods

Observed and risk-adjusted suicidality rates for children and adolescents within 30, 60 and 90 days of discharge from a Missouri psychiatric hospital were evaluated using hospital claims data between Oct. 1, 2015, and June 30, 2018. The study cohort was defined as Missouri residents between ages 5 and 19 with an inpatient admission at a psychiatric hospital during the study period. This criteria resulted in 21,362 index admissions for 13,213 individual children and adolescents.

Instances of suicidality during the defined intervals following discharge from an index admission were detected using all inpatient and emergency department records for children and adolescents included in the study cohort using master patient identification code linkages. During the study period, the cohort accounted for 75,486 hospitalizations and ED visits for any reason at all acute and specialty hospitals in Missouri. The inpatient and ED claims data for the study cohort were flagged for instances of suicide attempt or ideation based on the presence of related diagnosis codes at any position on the discharge record.^{xiv}

Index admissions were categorized by insurance status — Medicaid FFS, Medicaid MCO or other payer — using the expected primary payer codes included on the claims. Patients who churned from Medicaid FFS coverage to Medicaid MCO coverage were identified as having FFS coverage before, and MCO coverage following, statewide expansion of Medicaid managed care in May 2017. This “MCO Expansion” cohort was used in pre-post analyses of suicidality rates before and after expansion to estimate the effect of the policy change for child and adolescent behavioral health patients affected by a shift in Medicaid coverage.

Summary statistics were tabulated to evaluate differences across payer and principal diagnosis categories associated with individual patients during the study period. Factors evaluated included demographic characteristics, social and behavioral risk factors, and clinical and psychological comorbidities (Table 1). Principal diagnosis categories were grouped using three-digit ICD-10 codes to observe differences in suicidality rates and average length of stay by payer and primary reason for hospitalization for each of the 21,362 index admissions identified during the study period.

Risk-adjusted suicidality rates were estimated using hierarchical generalized logistic regression. The models were specified to account for risk at both the patient and payer levels. At the patient level, individual predictors included the reason for the index hospitalization in addition to demographic, clinical, behavioral and social characteristics of the child or adolescent. The patient-level risk factors (model fixed effects) were used to derive predicted rates,

Names and other distinguishing characteristics, including the specific details of each case, have been altered to prevent patient identification. ▼

Sarah was a teen in crisis. Last year, she was admitted to a network hospital from the local juvenile detention center. She had a history of threatening her coworkers with violence and had recently been found with a weapon on the job. Upon admission, she was evaluated by a board-certified psychiatrist with specialization in child and adolescent psychiatry. The evaluation found that she was suffering from delusions and paranoia, which resulted in a formal diagnosis of psychosis. A psychotropic medication regimen was initiated, and Sarah responded well.

Sarah’s Medicaid managed care plan notified the hospital of two authorized days of inpatient care, and following that, referred her case to a peer-to-peer review with the attending psychiatrist. The MCO physician refused to authorize any additional days, questioned Sarah’s diagnosis as well as the results of standardized tests and risk assessments conducted by the hospital’s care team, and concluded she should be treated in an outpatient setting.

Based on their direct observation of Sarah and her test results, the treatment team felt that early discharge posed an extreme risk to her safety and potentially that of others. Despite no source of payment, Sarah remained at the hospital for an additional seven days of stabilization, at which point it was both safe and clinically appropriate to discharge her home with outpatient care.

or risk-adjusted suicidality rates holding the child’s insurance coverage constant. Payer-level risk was estimated using model random effects for index admissions with Medicaid FFS, Medicaid MCO or other expected primary payer, in addition to MCO expansion beneficiaries both before and after May 1, 2017, to provide risk-adjusted rates of suicidality pre- and post-expansion. The payer-level risk factors were used to derive expected rates, or risk-adjusted suicidality rates by insurance coverage holding patient-level risk factors constant.

Risk-adjusted excess suicidality ratios were calculated as the predicted over the expected rates for each payer category. A ratio below one indicates lower-than-expected suicidality. Conversely, a ratio over one indicates higher-than-expected suicidality after controlling for the child’s risk factors and insurance coverage. The number of excess or prevented events (instances of suicide attempt or ideation during the defined interval following discharge) was estimated by scaling the difference between the risk-adjusted suicidality ratio and one by the observed number with suicide ideation or attempt during the study period.

Table 1: Characteristics of Pediatric and Adolescent Psychiatric Patients by Payer:
Missouri Residents Ages 5 to 19 with an Inpatient Hospitalization at a Psychiatric Facility Between October 2015 and June 2018

		MCO EXPANSION*	MEDICAID FFS	MEDICAID MCO	OTHER PAYER	TOTAL
Demographic Factors	Unique Patients	2,152	2,261	4,714	4,802	13,213
	Average Age	13.5	13.3	13.3	14.8	13.9
	Race: White	86.2%	79.8%	79.0%	85.6%	81.3%
	Race: Black	15.5%	18.3%	17.4%	9.4%	14.3%
	Race: Other	17.6%	18.7%	17.3%	12.5%	15.4%
	Male	46.9%	53.4%	48.8%	41.4%	46.7%
Behavioral Risk Factors	Tobacco Use	30.1%	22.8%	18.2%	19.9%	18.9%
	Obese	28.2%	26.3%	17.1%	14.9%	16.7%
	Alcohol Use	7.5%	7.6%	5.5%	8.2%	6.8%
	Substance Use	4.2%	2.8%	2.4%	3.0%	2.6%
	Opioid Use	3.5%	2.5%	2.0%	3.3%	2.5%
Social Risk Factors	Social Determinant of Health Diagnosis	69.2%	69.6%	54.1%	45.2%	51.7%
	SDOH – Family-Related	56.9%	59.3%	43.3%	32.8%	40.4%
	SDOH – Psychosocial-Related	33.5%	26.8%	20.2%	17.0%	18.9%
	SDOH – Noncompliance-Related	10.2%	7.1%	6.8%	5.8%	6.0%
	SDOH – Socioeconomic-Related	3.1%	2.0%	1.4%	1.3%	1.4%
	SDOH – Housing-Related	3.3%	2.3%	1.3%	1.0%	1.3%
Clinical Comorbidities	Asthma	30.6%	22.1%	21.2%	15.8%	18.6%
	Heart Disease	19.0%	11.8%	12.1%	10.0%	10.7%
	Diabetes	5.9%	4.0%	3.2%	2.6%	2.9%
	Hypertension	4.7%	3.8%	2.6%	2.3%	2.5%
	Liver Disease	2.9%	1.8%	1.5%	1.2%	1.4%
	Kidney Disease	2.3%	1.6%	1.3%	1.3%	1.3%
Psychological Comorbidities	ADHD & Conduct Disorders	69.6%	70.8%	55.6%	39.2%	50.3%
	Suicidality (Attempt or Ideation)	56.1%	44.4%	46.9%	56.2%	48.8%
	Major Depression (Chronic)	47.2%	42.7%	38.6%	51.7%	43.6%
	Major Depression (Acute)	55.8%	41.1%	41.0%	40.6%	39.7%
	Stress Disorders	59.8%	57.4%	42.4%	30.4%	38.8%
	OCD, Anxiety and Phobia	44.9%	35.8%	33.0%	40.8%	35.7%
	Mood Disorders	49.8%	47.6%	39.0%	25.1%	33.5%
	Bipolar-Manic	42.4%	36.5%	29.1%	25.7%	26.8%
	Other Psychiatric Disorders	41.6%	38.5%	27.0%	18.2%	23.9%
	Other Child Psychiatric Disorders	16.7%	16.3%	7.3%	5.8%	7.7%
	Personality Disorders	11.4%	8.8%	7.3%	8.9%	7.6%
	Delusions and Psychoses	5.6%	4.7%	4.5%	3.0%	3.7%
	Schizophrenia	6.5%	4.6%	3.9%	3.0%	3.4%

* Indicates patients that were covered by Medicaid FFS before, and Medicaid MCO after, May 1, 2017, when statewide expansion of the Medicaid managed care program took place in Missouri.

Results

Suicidality rates within 30, 60 and 90 days of discharge for children and adolescents hospitalized at a psychiatric facility varied widely by the primary reason for hospitalization. Figure 4 shows that 21 percent of children and adolescents hospitalized for schizophrenia experience a rehospitalization or ED visit for suicide ideation or attempt within 90 days of discharge. The least prevalent rates of suicidality were found among child and adolescent patients hospitalized for stress disorders.

Average length of stay similarly varied widely depending on the reason for the hospitalization, as well as the child's insurance coverage. Index admissions for affective disorders are associated with the longest duration; however at 18 days, children and adolescents with Medicaid FFS were hospitalized twice as long on average compared to children with Medicaid MCO coverage (Figure 5). Children and adolescents hospitalized for acute episode of major depression had the shortest duration psychiatric hospital stays. Validating the data generated by the Children's Medicaid Managed Care Parity Network (see Figure 2), patients with Medicaid MCO coverage had significantly shorter hospital stays compared to children and adolescents with Medicaid FFS, regardless of the reason for hospitalization (Figure 5).

Across all payers, the most common cause of psychiatric hospitalization for child and adolescent patients in Missouri were episodes of chronic major depression, which accounted for 29 percent of all index admissions during the study period. Hospitalization for chronic major depression was particularly prevalent for non-Medicaid patients, while mood disorders were the leading cause of hospitalization for both the Medicaid MCO expansion and FFS cohorts. At 1 percent of all index admissions, schizophrenia was the least prevalent reason for hospitalization for Missouri children and adolescents during the study period (Table 2).

Figure 4: Suicidality Rates Following Pediatric and Adolescent Psychiatric Hospitalizations by Principal Diagnosis Category: October 2015 – June 2018

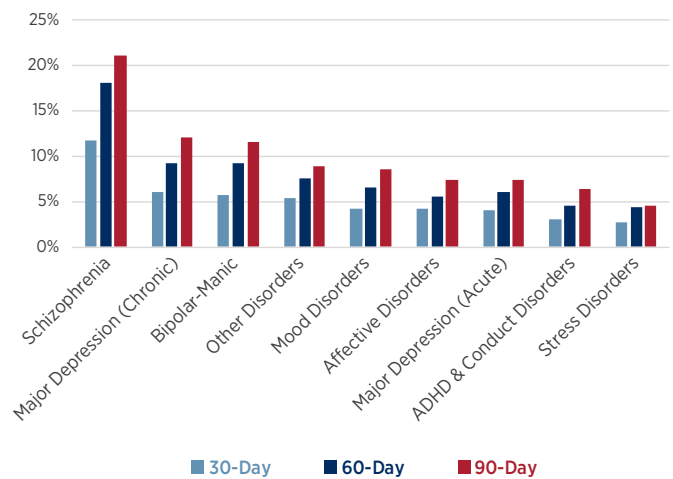
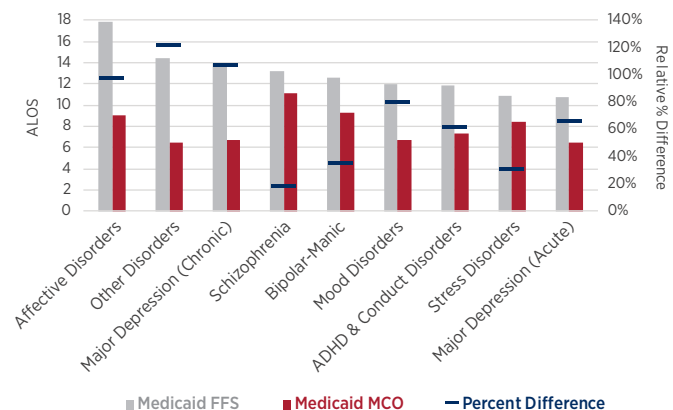


Figure 5: Average Length of Stay for Medicaid Pediatric and Adolescent Psychiatric Hospitalizations by Principal Diagnosis Category: October 2015 – June 2018



Names and other distinguishing characteristics, including the specific details of each case, have been altered to prevent patient identification. ▼

John was admitted to a network hospital through a community crisis assessment referral. He had recently lost his father in an auto accident and was being bullied at school for wearing worn clothes and shoes. The community intervention was triggered when John confided to a friend that he intended to hang himself in his closet.

John's initial evaluation at the hospital indicated extremely high risk of suicide or self-harm. He wasn't on any medications for depression, struggled with impulse control and did not have access to outpatient care. In addition, his community recently experienced several suicides. The hospital immediately started John on psychotropic medications in addition to individual, group and family therapy.

John's Medicaid MCO notified the hospital that he was authorized for two days of inpatient care, and the peer-to-peer review process with the MCO physician upheld this decision. Because of John's risk, lack of outpatient care and the amount of time needed to monitor his response to new medications, the hospital care team kept John for an additional three days without reimbursement from his health plan.

Table 2: Distribution of Pediatric and Adolescent Psychiatric Hospitalizations by Principal Diagnosis Category, Payer, Length of Stay and Suicidality Rates: October 2015 - June 2018

	MCO EXPANSION*	MEDICAID FFS	MEDICAID MCO	OTHER PAYER	TOTAL
Major Depression (Chronic)	23.1%	21.8%	25.9%	40.8%	29.0%
Mood Disorders	23.8%	26.4%	24.0%	16.0%	22.0%
Bipolar-Manic	19.5%	12.2%	13.8%	15.0%	15.3%
Major Depression (Acute)	8.9%	8.8%	10.8%	12.0%	10.4%
Affective Disorders	10.2%	10.1%	10.3%	4.9%	8.6%
ADHD & Conduct Disorders	7.1%	10.4%	6.4%	2.9%	6.2%
Other Disorders	3.4%	3.9%	3.9%	4.0%	3.8%
Stress Disorders	2.9%	5.8%	3.9%	3.2%	3.7%
Schizophrenia	1.0%	0.7%	0.9%	1.1%	1.0%
Total Hospitalizations	5,091	3,331	6,566	6,374	21,362
Average Length of Stay	13.0	12.5	7.3	10.6	10.5
30-Day Suicidality Rate	7.0%	4.0%	4.7%	4.1%	5.0%
60-Day Suicidality Rate	10.4%	6.2%	7.4%	6.2%	7.6%
90-Day Suicidality Rate	13.3%	7.8%	9.5%	7.8%	9.6%

* Indicates patients that were covered by Medicaid FFS before, and Medicaid MCO after, May 1, 2017, when statewide expansion of the Medicaid managed care program took place in Missouri.

Overall, observed suicidality rates in 30, 60 and 90 days following discharge from a psychiatric hospital were 5.0, 7.6 and 9.6 percent, respectively. The Medicaid MCO expansion cohort had the highest observed rates during the study period; however, this included periods of coverage by both Medicaid FFS and MCOs. Among the mutually exclusive insurance categories, children with Medicaid MCO coverage had both the highest observed rates of suicidality and shortest average length of stay at 7.3 days compared to 10.5 days for all index admissions (Table 2).

With Medicaid FFS coverage, during the six quarters leading up to the statewide expansion of Medicaid managed care in May 2017, the MCO expansion cohort experienced suicidality rates similar to the larger population. Following expansion, with Medicaid MCO coverage, the same group of patients experienced significantly higher rates of suicidality across each of the defined intervals (Figure 6). This also coincided with a sharp decline in the average length of stay for these patients. Table 3 shows a 16 percent decrease in the average duration of hospitalization for these children and adolescents, in tandem with increased suicidality rates in order of magnitude ranging from 81.7 to 93.2 percent following statewide Medicaid managed care expansion.

Figure 6: Quarterly Suicidality Rates Following Pediatric and Adolescent Psychiatric Hospitalizations for MCO Expansion Patients Before and After May 1, 2017

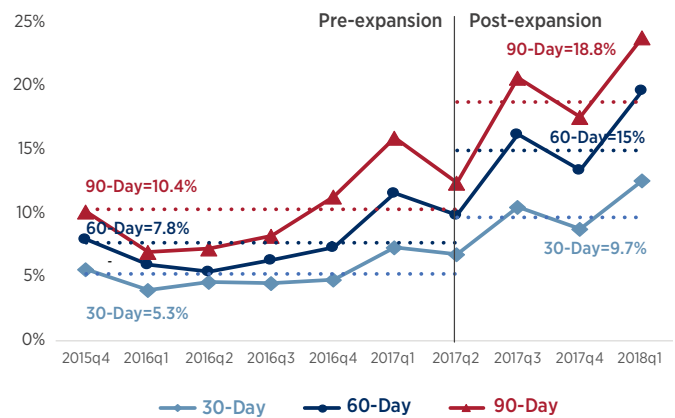


Table 3: Difference in Average Length of Stay and Suicidality Rates Following Pediatric and Adolescent Psychiatric Hospitalizations for MCO Expansion Patients Pre- and Post-May 1, 2017

	BEFORE EXPANSION OF MCO COVERAGE	AFTER EXPANSION OF MCO COVERAGE	RELATIVE PERCENT DIFFERENCE
Average Length of Stay	13.91	11.68	-16.0%
30-Day Suicidality Rate	5.3%	9.7%	83.5%
60-Day Suicidality Rate	7.8%	15.0%	93.2%
90-Day Suicidality Rate	10.4%	18.8%	81.7%
Total Hospitalizations	3,070	2,021	*

* For discharges between Oct. 1, 2015, and June 30, 2018. Because the data cover 19 months before the statewide expansion of the Medicaid managed care program and 14 months after, the relative percent difference for total psychiatric hospitalizations is not reported.

While the observed differences in length of stay and suicidality for children and adolescents with Medicaid FFS and MCO coverage are significant, they do not fully account for potential variation in the risk characteristics of the patients, which might explain all or part of the observed differences between the two groups. For example, children and adolescents with higher suicidality rates might have higher levels of psychological complexity, which would explain the higher rates.

To account for these and other differences for patients across insurance coverage groups, a multilevel risk-adjusted model was fit to the data to estimate the defined interval suicidality rates to assist in drawing inferential comparisons on performance by payer, holding patient risk and insurance type constant. The model was designed to account for multiple dimensions of risk, including patient's demographics, reason for hospitalization, and whether the child or adolescent experienced a diagnosis for clinical, behavioral or social risk factors during the study period. Table 4 includes the model results for each defined interval. The number of observations, or index admissions, decreases with each interval due to the last 30, 60 or 90 days of the study period being omitted to fully account for suicidality events for each interval following discharge from a psychiatric hospitalization.

In general, the reason for hospitalization was not significantly associated with increased risk of suicidality with the exception of two disorders in the 60- and 90-day models. All else equal, schizophrenia was found to significantly increase the risk of suicidality (OR = 1.92-1.93, P = 0.005-0.008), while hospitalization for stress disorders significantly decreased the risk (OR = 0.53-0.58, P = 0.004-0.019). Heart disease, hypertension, asthma and obesity were found to be significantly associated with higher risk of suicidality across each of the defined interval models. Longer length of stay also was associated with a reduced risk of suicidality across all three models, with at least 95 percent confidence. Perhaps unsurprisingly, the strongest predictors of suicidality within 30, 60 and 90 days of discharge for children and adolescents with an inpatient psychiatric hospitalization were social determinants of health. The SDOH flags were assigned using arrays of ICD-10 codes that have demonstrated significant predictive ability in previous health outcomes modeling.^{xv, xvi}



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Max was a third grader admitted to a network hospital for stabbing himself and his siblings with a small screwdriver. He had a history of physical and sexual abuse, and he had been hospitalized several times during the previous year for increasing aggression and self-harm.

In the hospital, Max was stabilized throughout the course of eight days with individual, group and milieu therapy, in addition to medications to control his impulsivity. The hospital care team also worked with his father and outpatient care team to build Max's coping skills.

After Max was discharged, the hospital learned that his Medicaid MCO would only cover the first three days of his stay. Further inpatient authorization required a peer-to-peer review with a plan physician; however, none were available because the third day of Max's stay happened to fall on a weekend.

Table 4: Model Results for Suicidality Following Pediatric and Adolescent Psychiatric Hospitalizations

		30-DAY		60-DAY		90-DAY	
		ODDS RATIO	P-VALUE	ODDS RATIO	P-VALUE	ODDS RATIO	P-VALUE
Demographic Factors	Length of Stay	0.996	0.050	0.996	0.015	0.996	0.008
	Age	0.983	0.215	0.987	0.281	0.982	0.097
	Male	1.016	0.826	0.924	0.200	0.877	0.019
	Race: White	1.023	0.850	1.197	0.093	1.182	0.085
	Race: Black	1.115	0.455	1.244	0.084	1.199	0.115
Reason for Hospitalization (Pri. Diagnosis Category)	Major Depression (Acute)	0.892	0.565	0.881	0.459	0.895	0.493
	ADHD & Conduct Disorders	0.605	0.033	0.626	0.019	0.749	0.112
	Affective Disorder	0.825	0.349	0.788	0.182	0.893	0.490
	Bipolar-Manic	0.791	0.200	0.917	0.584	0.995	0.971
	Major Depression (Chronic)	1.057	0.752	1.111	0.488	1.257	0.108
	Mood Disorders	0.756	0.124	0.851	0.304	0.945	0.700
	Schizophrenia	1.587	0.107	1.917	0.008	1.925	0.005
	Stress Disorders	0.534	0.024	0.581	0.019	0.527	0.004
History of Clinical Comorbidities	Diabetes	1.122	0.393	1.244	0.055	1.370	0.003
	Heart Disease	1.401	<.0001	1.320	0.000	1.336	<.0001
	Hypertension	1.865	<.0001	1.502	0.001	1.345	0.008
	Asthma	1.225	0.006	1.280	<.0001	1.235	0.000
	Liver Disease	0.987	0.944	1.001	0.995	1.283	0.088
	Kidney Disease	0.612	0.017	0.662	0.017	0.768	0.088
History of Behavioral Risk Factors	Substance Use	0.984	0.926	0.966	0.818	0.937	0.639
	Alcohol Use	0.996	0.972	1.079	0.436	1.162	0.094
	Tobacco Use	1.109	0.215	1.116	0.119	1.119	0.083
	Obese	1.428	<.0001	1.374	<.0001	1.371	<.0001
History of Social Risk Factors	SDOH – Family-Related	1.748	<.0001	1.833	<.0001	1.798	<.0001
	SDOH – Housing-Related	1.775	0.000	1.695	0.000	1.683	<.0001
	SDOH – Psychosocial-Related	2.744	<.0001	2.626	<.0001	2.649	<.0001
	SDOH – Socioeconomic-Related	1.401	0.028	1.572	0.001	1.573	0.000
	SDOH – Noncompliance-Related	1.538	<.0001	1.516	<.0001	1.550	<.0001
Number of Observations		20,848		20,193		19,500	
C-Statistic		0.735		0.733		0.734	

Table 5 presents the risk-adjusted comparisons of 30-, 60- and 90-day suicidality rates by insurance coverage following discharge from a psychiatric hospitalization for Missouri children and adolescents. Holding included risk factors and payer constant, patients with Medicaid FFS and other insurance coverage had lower-than-expected risk-adjusted rates of suicidality during each of the defined intervals following hospitalization. The opposite held true for children and adolescents with Medicaid MCO coverage. The rates of suicidality for patients with Medicaid MCOs were estimated to be between 6.8 and 11 percent higher than expected after accounting for patient- and payer-level risk.

The difference was more pronounced for children and adolescents who were shifted from Medicaid FFS to Medicaid MCO coverage following statewide expansion in May 2017. Before the policy change, under Medicaid FFS coverage, these children and adolescents had 24 to 27 percent lower-than-expected rates of suicidality. Following expansion, under Medicaid MCO coverage, the same patients experienced 40 to 42 percent higher-than-expected rates of suicidality following discharge from a psychiatric hospital (Table 5).

Table 5: Risk-Adjusted Suicidality Rates and Excess or Prevented Number of Occurrences by Payer

		MCO EXPANSION PATIENTS*		MEDICAID FFS PATIENTS	MEDICAID MCO PATIENTS	OTHER PAYER PATIENTS
		BEFORE EXPANSION	AFTER EXPANSION			
30-Day Suicidality	Number with Suicide Ideation or Attempt	163	185	128	300	257
	Total Hospitalizations	3,070	2,021	3,331	6,566	6,374
	Observed Suicidality Rate	5.3%	9.7%	4.0%	4.7%	4.1%
	Predicted Suicidality Rate	5.4%	9.4%	4.0%	4.6%	4.1%
	Expected Suicidality Rate	7.2%	6.7%	4.6%	4.3%	4.2%
	Excess Suicidality Ratio	0.758	1.402	0.879	1.068	0.992
	Risk-Adjusted Suicidality Rate	3.8%	6.9%	4.4%	5.3%	4.9%
	Estimated Excess (Prevented) Events	(40)	74	(15)	21	(2)
60-Day Suicidality	Number with Suicide Ideation or Attempt	238	263	193	460	372
	Total Hospitalizations	3,070	2,021	3,331	6,566	6,374
	Observed Suicidality Rate	7.8%	15.0%	6.2%	7.4%	6.2%
	Predicted Suicidality Rate	7.9%	14.6%	6.2%	7.4%	6.2%
	Expected Suicidality Rate	10.8%	10.2%	7.0%	6.6%	6.5%
	Excess Suicidality Ratio	0.732	1.424	0.893	1.110	0.952
	Risk-Adjusted Suicidality Rate	5.5%	10.8%	6.7%	8.4%	7.2%
	Estimated Excess (Prevented) Events	(64)	111	(21)	51	(18)
90-Day Suicidality	Number with Suicide Ideation or Attempt	318	301	237	568	456
	Total Hospitalizations	3,070	2,021	3,331	6,566	6,374
	Observed Suicidality Rate	10.4%	18.8%	7.8%	9.5%	7.8%
	Predicted Suicidality Rate	10.5%	18.2%	7.9%	9.4%	7.9%
	Expected Suicidality Rate	13.7%	13.0%	8.9%	8.5%	8.4%
	Excess Suicidality Ratio	0.764	1.399	0.889	1.096	0.940
	Risk-Adjusted Suicidality Rate	7.4%	13.5%	8.6%	10.6%	9.1%
	Estimated Excess (Prevented) Events	(75)	120	(26)	55	(27)

* Indicates patients that were covered by Medicaid FFS before, and Medicaid MCO after, May 1, 2017, when statewide expansion of the Medicaid managed care program took place in Missouri.

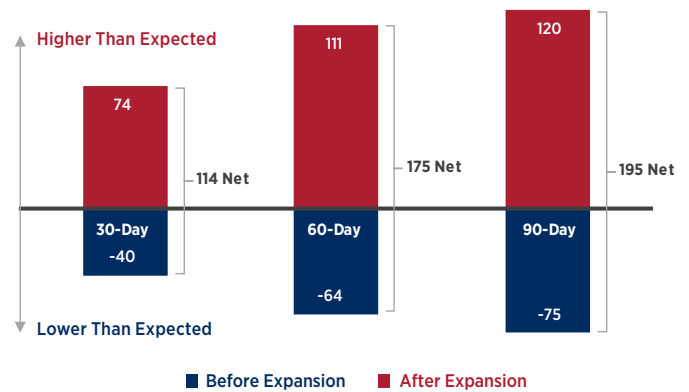
Taking these differences into account, it is estimated that the shift to Medicaid MCO coverage induced 114 additional hospitalizations or ED visits for suicide ideation or attempt within 30 days, 175 additional events within 60 days, and 195 additional events within 90 days of discharge from a psychiatric hospitalization (Figure 6).

Conclusion

The findings presented in this policy brief pose difficult questions for elected and appointed policymakers in Missouri. At the same time, the findings validate concerns long raised by the Missouri Children’s Medicaid Managed Care Parity Network of hospitals that for years raised concerns on the potential consequences of denied care before stabilization for children and adolescents.

The paucity of specialized mental health care in Missouri makes it particularly difficult for these children and their families to obtain needed services. After navigating an already difficult system to secure the care needed, they should not be subjected to discharge before achieving stabilization and health. **The data and findings presented in this policy brief suggest an association between insurance coverage and suicidality rates for children and adolescents in Missouri following psychiatric hospitalizations.** Additional research and careful examination is needed to identify the causal pathways that result in these disparities.

Figure 6: Estimated Excess Suicidality Events Following Pediatric and Adolescent Psychiatric Hospitalizations for MCO Expansion Patients Before and After May 1, 2017



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