Mental Health Conditions and Health Care Payments for Children with Chronic Medical Conditions

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Abstract

Objective: To estimate additional payments associated with co-existing mental health or substance use disorders (MH/SUDs) among commercially insured children and youth with chronic medical conditions (CMCs) and to determine whether children's MH/SUDs have similar associations with parental health care payments.

Methods: Cross-sectional analysis of a national database of paid commercial insurance claims for 2012−2013. Participants were children and youth ages 0 to 26 years covered as dependents on parents' health insurance and categorized by the presence or absence of any of 11 chronic medical conditions and MH/SUDs. We determined the numbers of children and youth with CMCs and paid health care claims categorized as hospital, professional, and pharmacy services and as medical or behavioral. We compared paid claims for children and youth with CMCs with and without co-occurring MH/SUDs and for their parents.

Results: The sample included almost 6.6 million children and youth and 5.8 million parents. Compared to children without CMCs, children with CMCs had higher costs, even higher for children with CMCs who also had MH/SUDs. Children with CMCs and co-occurring MH/SUDs had 2.4 times the annual payments of those with chronic conditions alone, especially for medical expenses. Estimated additional annual payments associated with MH/SUDs in children with CMCs were $8.8 billion. Parents of children with CMCs and associated MH/SUDs had payments 59% higher than those for parents of children with CMCs alone.

Conclusions: MH/SUDs in children and youth with CMCs are associated with higher total health care payments for both patients and their parents, suggesting potential benefits from preventing or reducing the impact of MH/SUDs among children and youth with CMCs.

Keywords: parent health care payments; pediatric medical and mental health care payments

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What's New

Data from a large commercially insured population demonstrate more mental health or substance use disorders (MH/SUDs) among children with chronic medical conditions. Children and adolescents with co-existing chronic medical conditions and MH/SUDs had 2.4 times higher health care payments than those who had chronic conditions alone, and their parents had higher payments for health care. Estimated additional yearly payments associated with co-existing MH/SUDs are $8.8 billion.

Adults with chronic health conditions and co-occurring mental health and substance use disorders (MH/SUDs) experience much higher costs for health care than those without MH/SUDs.[1−4] Children and youth with chronic conditions similarly have higher health care costs, some related to behavioral health services.[5,6] Rates of chronic health conditions, including mental health conditions, among children and adolescents have increased over the past few decades.[7,8] Children and youth with chronic medical conditions also have high rates of comorbid MH/SUDs,[9] and those with comorbidities generally also have higher total health care costs, particularly for medical care,[5,10] although the level and sources (medical or behavioral) of these additional costs have had less study. Few studies have focused on commercially insured populations. Mental health conditions themselves account for substantial costs.[11,12] The additional costs of MH/SUDs in pediatric populations with chronic conditions may indicate opportunities for improved care models to prevent or ameliorate MH/SUDs in this population.

No studies have directly assessed whether MH/SUDs among children and youth with chronic childhood

conditions are associated with increased health care utilization and costs for the parents of affected children, although studies have shown high correlations of adult and child health costs in the same household. Parents of children with chronic pediatric illnesses face significant stressors that result in increased rates of parental depression, anxiety, post-traumatic stress disorder, and decreased functioning.[13,14] Parental stress associated with children's chronic conditions affects both mothers and fathers and can be enduring.[15–17] Many chronic medical and mental conditions have a familial basis; thus, parents may experience the same condition as their child, raising costs in that way, as well. Given these associations, we questioned whether parenting a child with a chronic condition would be associated with increased parental health care costs.

To address these questions, we analyzed a large commercial claims database to estimate increased paid medical and behavioral health care claims among children with chronic conditions and MH/SUDs, disaggregated by type of health care expense (ie, medical or behavioral services). We carried out similar analyses to estimate increased payments for parents associated with MH/SUDs among their children. Previous studies have used general samples or focused on Medicaid-insured children, given the high burden of chronic conditions in low-income children. Our use of commercial claims allowed us to focus on a relatively well-insured population.

We hypothesized that 1) children with chronic conditions have high rates of co-existing MH/SUDs, and 2) children with chronic conditions and co-existing MH/SUDs have higher total paid claims, as well as higher payments for medical care, than children with chronic conditions but no MH/SUDs. We hypothesized that parents' health care payments would increase in similar ways.

METHODS

DATABASE

We obtained data on pharmacy and medical claims from the Truven Health MarketScan Research Database,[18] a national claims database of private sector health data from approximately 350 payers. These data describe paid claims and encounter data for inpatient (and residential, if covered by the policy) and outpatient health care service use. The data describe the medical care of insured employees and their dependents, including dependent children, for active employees. The database does not include Medicaid claims. This study used the 2012 and 2013 data, covering more than 400 million member months.

SAMPLE DEFINITION

The study sample included all children and youth ages 0 to 26 years covered as dependents on a parent's health insurance, as well as their parents. We used the MarketScan family ID variable to identify adult family members and dependents. The upper age limit of 26 years was used to include young adults for consistency with the Affordable Care Act, which supports health insurance for dependent young adults to age 26. Inclusion criteria included at least 3 months of enrollment in 2012 and 12 months in 2013 and eligibility for pharmacy and mental health benefits in both years. We restricted the sample to members who were eligible in both years and had full prescription histories for 2013. The 2012 data were used to identify patients having the selected conditions, and then we followed their health care utilization and paid claims patterns in 2013. We also stratified the sample by dependent age: 0 to 18 years and 19 to 26 years.

CHRONIC MEDICAL CONDITIONS

We developed a list of chronic conditions and MH/SUDs based on previous studies using condition lists.[19] For this study, we chose a limited series of common and less common chronic medical conditions relevant to the pediatric population and defined their presence based on inpatient, outpatient, and pharmacy claims. The 11 conditions selected include all of the high-prevalence conditions and represent a spectrum of child and young adult chronic illnesses. Diagnoses included were arthritis, asthma, chronic renal disease, congenital heart disease, diabetes, developmental disabilities (cerebral palsy, autism spectrum disorder, and intellectual disability), epilepsy, cancer, obesity, Crohn's disease, and Lyme disease. Similarly, we determined the presence of MH/SUDs common to the pediatric population, including adjustment reactions, eating disorders, anxiety disorders, depression, learning disorders, attention disorders, Tourette's and other tic disorders, bipolar disorders, somatoform disorders, schizophrenia and other psychoses, post-traumatic stress disorder, oppositional defiant and conduct disorders, suicide and self-injurious behavior, elimination disorders, and any substance use disorder (including alcohol). For the purpose of this study, developmental disabilities (eg, autism spectrum, intellectual disability, cerebral palsy) were considered to be chronic medical conditions, as opposed to MH/SUDs, because they receive most medical care in pediatric settings. Although attention disorders also receive much care in pediatric settings, we included them in mental health disorders as a common co-occurring condition. A child with a developmental disability and co-existing psychiatric diagnosis was included in the chronic medical condition (CMC) with co-existing MH/SUD group. (Specifics of diagnostic coding and inclusion criteria are available on request.) Patients could have more than one medical condition. Claims for patients with the medical conditions were further analyzed to determine the presence or absence of a comorbid MH/SUD. Here, too, they could have more than one. Although we did not determine the number or any combination of behavioral conditions, we did separate mental health conditions and substance use disorders. Children who had both mental health and substance use disorders were included in both analyses, so percentages do not always add up to 100.

HEALTH CARE PAYMENTS

We used the claims data to determine payments for children and their parents. All data reflect claims paid by

insurance, including hospital, professional (physician), and pharmacy claims, along with patient information. We aggregated payments by type: medical, behavioral, medical pharmacy, or behavioral pharmacy, distinguishing between medical or behavioral health payments.

DATA ANALYSIS

We first determined prevalence rates of chronic medical conditions in the child and youth population and then determined rates of co-existing MH/SUDs by chronic medical condition status. We then determined health care payments for children and adolescents in 3 cohorts—those with neither a chronic medical nor behavioral condition, those with a chronic medical condition alone, and those with a chronic medical condition and MH/SUD—and determined the main categories of health care payments. Health care payments were summarized for each cohort and by major health care service category on an annual basis. We also determined health care payments for the parents of children and adolescents, separating the parents into the same cohorts depending on whether their children or adolescents had no chronic medical condition, CMC alone, or CMC with MH/SUD. Finally, we determined the aggregate payments for the population with chronic conditions and then calculated the additional payments associated with having co-existing MH/SUD. These payments were calculated as the difference in annual payments between those with a chronic medical condition who had a treated MH/SUD condition and those with the same medical condition but no treated MH/SUD, multiplied by the enrolled members for each group. Annual population and claim payment trends from the US Census were applied to the 2013 study enrollment and claim payment levels to determine projections for 2015. We extrapolated the data to estimate values for the entire commercially insured market, with extrapolation factors based on the ratio of total commercially insured persons in the 2013 US Census and those identified in this study, by cohort.[20]

RESULTS

SAMPLE

The child and youth sample includes 4.7 million ages 0 to 18 years and 1.9 million ages 19 to 26 years (Table 1). Of the total 6.6 million, 535,000 (8.2%) had one of the study chronic conditions, with asthma, diabetes, and developmental disabilities being the most common reported conditions; 94,000 children and youth had chronic physical conditions with co-occurring MH/SUDs. Young adults (ages 19 to 26 years) were less likely to have claims for any chronic medical condition than younger youth (ages 0 to 18 years) (6.1% vs 8.97%; $P < .0001$). The rate of co-occurring chronic medical conditions and MH/SUDs was 32% higher among young adults compared with youth under age 18.

The Figure indicates the rates of MH/SUDs among children and youth with and without chronic medical conditions, here extrapolated to the US population in 2015. Over 16% of children and youth with a medical condition had a MH/SUD, compared with less than 8% of children and youth with no medical condition.

Table 1. Sample Demographic and Clinical Characteristics

	Ages 0–18 Y	%	Ages 19–26 Y	%	Total	%
Males	2,396,747	51.09	952,855	50.75	3,349,602	50.99
Females	2,294,469	48.91	924,808	49.25	3,219,277	49.01
Total	4,691,216		1,877,663		6,568,879	
Chronic medical conditions						
Arthritis	2209	0.05	1256	0.07	3465	0.05
Chronic renal disease	827	0.02	893	0.05	1720	0.03
Congenital heart disease	11,238	0.24	1,784	0.10	13,022	0.20
Diabetes	15,845	0.34	16,524	0.88	32,369	0.49
Asthma	348,644	7.43	74,073	3.94	422,717	6.44
Cancer	2341	0.05	1,074	0.06	3415	0.05
Obesity	10,103	0.22	8,214	0.44	18,317	0.28
Epilepsy	13,412	0.29	6,571	0.35	19,983	0.30
Developmental disabilities	27,495	0.59	5,946	0.32	33,441	0.51
Crohn's disease	2209	0.05	3,227	0.17	5436	0.08
Lyme disease	961	0.02	519	0.03	1480	0.02
Any chronic medical condition	421,005	8.97	114,453	6.10	535,458	8.15
No chronic medical condition	4,270,211	91.03	1,763,210	93.90	6,033,421	91.85
Mental health and substance use disorders						
Mental health	342,433	7.30	237,386	12.64	579,819	8.83
Substance use disorder	9207	0.20	50,176	2.67	59,383	0.90
Any MH/SUD	346,339	7.38	265,304	14.13	611,643	9.31
No MH/SUD	4,344,877	92.62	1,612,359	85.87	5,957,236	90.69
Co-occurring CMC and MH/SUD	61,378	1.31	32,485	1.73	93,863	1.43
No CMC or MH/SUD	3,985,250	84.95	1,530,391	81.51	5,515,641	83.97

MH/SUD indicates mental health/substance use disorder; CMC, chronic medical condition.
P values for all comparisons by age < .001.

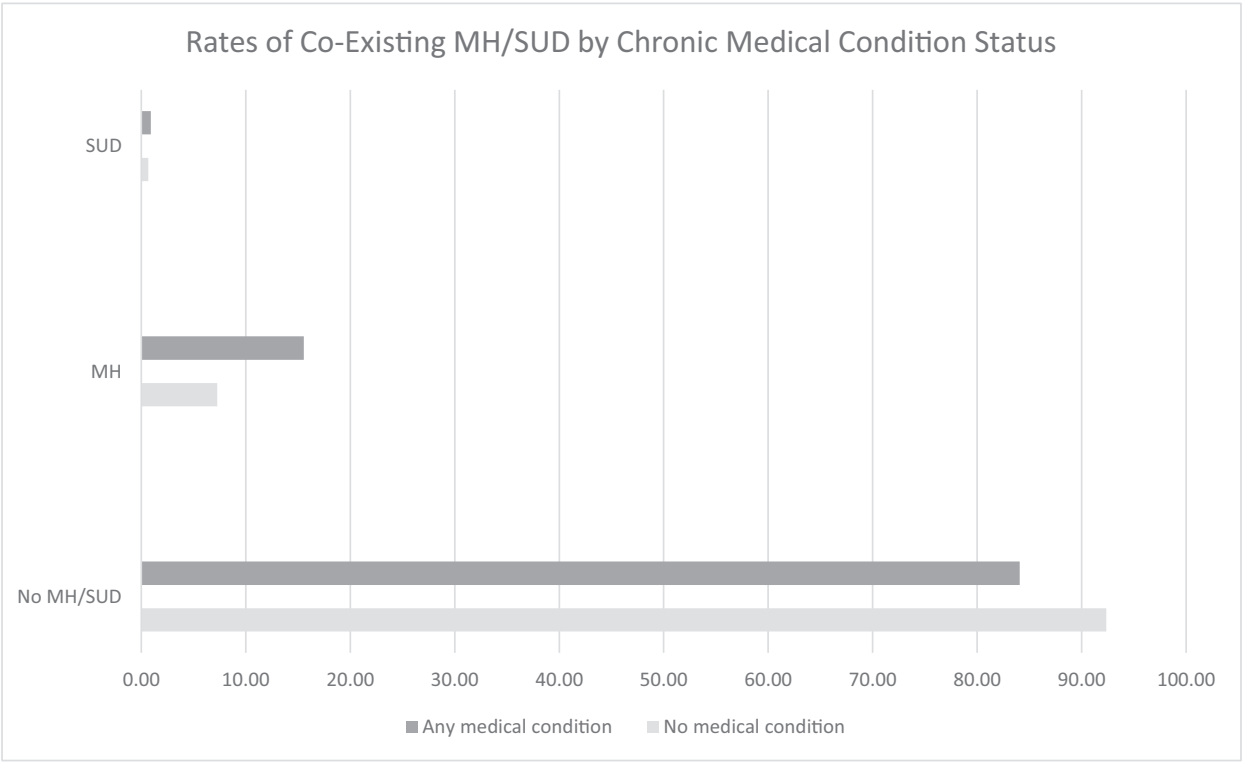

Figure. *Rates of co-existing mental health/substance use disorders (MH/SUDs) by chronic medical condition status.*

Overall Paid Claims Among Children and Young Adults

We compared health care payments, extrapolated to national estimates, for the 3 primary groups of children and youth (no condition, medical condition alone, or comorbid medical and MH/SUD condition) (Table 2). This national estimate represents approximately 55 million children and youth, with almost 50 million (91% of the total) not having any chronic condition. The sample included 4.1 million (7.6%) with a medical condition but no MH/SUD disorder and 780,000 (1.4%) with both a CMC and MH/SUD. Individuals with a medical condition and no comorbid MH/SUD had annual payments 3.5 times higher than children with no medical condition or MH/SUD. Those with comorbid medical and MH/SUD conditions had average payments 8.4 times that of children without any chronic condition, or about 2.4 times the average payments for children with chronic medical conditions alone. Increased overall payments reflected substantially higher payment for medical services in all groups, as well as increased behavioral payments. Even though these children and youth with comorbid conditions received more behavioral services and medications than children with no or only a medical condition, the larger increase was in much higher medical care and prescription paid claims.

The final column of Table 2 calculates total national commercial payments (in 2015) based on the annual payments multiplied by the number of member years, thus accounting for differences in prevalence of the chronic medical and MH/SUD conditions. The 7.6% of children and youth with any chronic medical condition alone accounted for 19.0% of total payments; whereas, the 1.4% with comorbid medical and MH/SUD conditions accounted for 9.9% of total payments.

Table 2. Children and Adolescents' Annual Payments (and Total Commercial Health Care Payments) by Diagnostic Category

Diagnosis	Age Group	Member Years	Medical	MBH	Med Rx	MBH Rx	Total Annual	Total Payments*
No condition	Child 0–18 y	39,974,470	$1572.86	$29.58	$200.63	$31.86	$1834.94	$73,351
	Youth 19–26 y	9,721,877	$1817.15	$63.02	$278.35	$49.23	$2207.74	$21,463
Medical only	Child 0–18 y	3,605,649	$4531.25	$51.89	$1160.61	$107.04	$5850.80	$21,096
	Youth 19–26 y	520,705	$5942.43	$83.82	$1837.94	$245.65	$8109.84	$4223
Comorbid	Child 0–18 y	575,731	$12,153.94	$1005.46	$1846.23	$1613.92	$16,619.55	$9568
	Youth 19–26 y	206,362	$12,174.90	$1398.60	$2092.59	$1632.30	$17,298.39	$3570
Total		54,604,794	$1958.99	$47.70	$310.06	$58.52	$2440.65	$133,271

MBH indicates mental behavioral health; Med, medical; Rx, prescriptions.
Payments adjusted to 2015. All comparisons are by age and diagnosis categories ($P < .0001$).
*In millions; calculated as total × member years.

Table 3. Parents' Annual Costs (and Total Commercial Health Care Costs) by Child's Diagnostic Category

Dependent's Diagnosis	Member Years	Medical	MBH	Med Rx	MBH Rx	Total Annual	Total Costs*
No condition	38,238,333	$4502.04	$67.20	$879.60	$160.20	$5609.04	$214,482
Medical only	5,557,847	$4910.88	$76.08	$1061.76	$191.40	$6240.12	$34,682
Comorbid	1,366,644	$6658.68	$220.68	$1542.00	$487.80	$8909.16	$12,176
Total	45,162,824	$4617.61	$72.94	$922.06	$173.95	$5786.57	$261,340

MBH indicates mental behavioral health; Med, medical; Rx, prescriptions.
Payments adjusted to 2015. $P < .0001$ for all differences among diagnosis categories.
*In millions; calculated as total × member years.

Health Care Paid Claims for Parents

Children's health conditions were also associated with their parents' health care paid claims. Parents of children with a CMC alone had total annual parent health care payments that were 11.3% higher than for parents of children without any condition. Parents of children with both a CMC and MH/SUD had 58.8% higher health care payments compared with parents of children with no CMC and 43% higher payments compared to parents of children with a CMC alone (Table 3). Here, too, increased payments mainly reflect additional medical care for parents, not behavioral services.

Annual Expenditures with Chronic Medical Conditions and Comorbid MH/SUD

Children with either MH or SUD conditions co-occurring with their chronic medical condition had substantially higher annual rates (Table 2). To determine estimated total additional national payments associated with co-occurring MH/SUD in the commercially insured population, we multiplied the annual payments by number of member years (Table 4) and determined what these payments would be if these children and youth had the same annual payments as those with chronic medical conditions but no MH/SUD. Results indicate a total annual additional expenditure of $8.8 billion per year in the commercial market for youth who have chronic medical conditions with co-occurring MH/SUD.

Discussion

This study shows that commercially insured children with chronic medical conditions who have co-existing mental health and substance use disorders have much higher health care paid claims than those with chronic medical conditions alone. Per-child payments are approximately 3 times higher than payments for children who have a chronic medical condition but no MH/SUD. Where behavioral health service payments did increase in the context of MH/SUD, medical service payments increased even more. The rate of co-occurring chronic medical conditions and MH/SUDs was 32% higher among young adults compared with younger children. These results support the importance of further attention to the health care needs of the young adult population. We found similar patterns among the parents of children with chronic medical conditions and MH/SUDs, where per-member, per-month payments for their health care were 1.5 times higher than those for parents of children with chronic medical conditions but no MH/SUDs. This is one of the first studies to focus on a relatively well-insured population, as well as to develop clear estimates of these additional payments in the commercial sector.

As with previous studies, our findings indicate much higher rates of comorbid MH/SUD among children and youth with chronic medical disorders, approximately twice the rates found among children without chronic medical conditions. In an early study in Ontario, Cadman et al.[9] found 3 times higher rates of psychiatric disorders if children had both a chronic medical condition and a disability and 2 times the rate for a chronic medical condition alone. Other smaller studies have also shown increased mental health conditions among children with chronic medical conditions.[21–24] Two studies based on the Medical Expenditures Panel Survey have shown increased costs for children with chronic medical conditions and co-existing mental disorders. Children with chronic conditions had 62% more mental health disorders, and the

Table 4. Annual Member and Total Payments With and Without Co-Existing MH/SUD with Chronic Medical Condition

	No MH/SUD	Mental Health Disorder	Substance Use Disorder
Any medical condition			
Annual	$6132	$16,896	$20,856
Member years	4,126,354	763,216	44,659
Total payments*	$25,303	$12,895	$931
Costs if same as no MH/SUD			
Annual	. . .	$6132	$6132
Member years	. . .	763,216	44,659
Total payments*	. . .	$4680	$274
Additional payments from co-existing MH/SUD†	. . .	$8215	$657

MH/SUD indicates mental health/substance use disorder.
*In millions; calculated as total × member years.
†In millions; calculated as current payments minus payments if at same rate as no MH/SUD.

adjusted incremental costs due to mental disorders was $2631 per child per year.[5] Another Medical Expenditures Panel Survey study aiming to predict high-cost pediatric patients did not find that mental health status was associated with increased costs, although this study did not examine any interaction between special health care needs and mental disorders.[25]

Accounting for both the increased medical payments and the relative prevalence of co-existing MH/SUDs among children and youth with chronic medical conditions, we estimate that care for commercially insured children with medical conditions and comorbid MH/SUD conditions leads to an additional $8.8 billion in yearly expenses. Including different conditions might have altered this figure, although the magnitude of these payments suggests that prevention or amelioration of these MH/SUD comorbidities could decrease expenditures.

We believe these results are conservative. The data do not include children insured by Medicaid, who typically have higher rates of chronic health conditions, including mental health and substance use disorders, than the general population. Including children and youth insured by Medicaid would likely increase the payment differentials and reveal even higher total payments. Furthermore, our data cover only children and young adults with treated MH/SUDs and cannot account for undiagnosed MH/SUDs.

Further work is needed to identify optimal strategies for preventing and treating comorbid MH/SUDs that escalate costs. Higher costs in children with both CMCs and MH/SUDs may reflect a greater likelihood of identification and appropriate treatment of MH/SUDs due to more frequent health care contacts. On the other hand, the main increases in medical rather than behavioral services suggest otherwise. This study does not address whether the children had any coordination of medical and behavioral services. Integrated care might allow for better efforts at prevention and early identification and treatment, potentially reducing overall per capita expenditures.[26,27] Research with adults and a recent study of adolescent depression have supported the cost effectiveness of collaborative care models for addressing MH/SUD needs.[28–30] Most of these studies involved delivery of evidence-based mental health services by embedded mental health professionals in primary care with offsite mental health consultation as needed.[30]

This study has several limitations, including the cross-sectional data used. Furthermore, its focus on commercially insured children and youth limits its generalizability to the over 40% of US children insured by Medicaid or the Children's Health Insurance Program, although it provides new information on a population less studied. Our choice to consider autism and developmental disabilities as chronic medical conditions could be challenged, insofar as many children and youth with these conditions receive much care in the mental health sector. Nonetheless, they relatively infrequently accompany other chronic medical conditions. Similarly, we included attention-deficit/hyperactivity disorder as a mental health condition, even though care of these patients often takes place in general medical settings. Alternative choices would change the differences in rates of expenditures. Given the high prevalence of these conditions, these choices may have increased or decreased the relative expenditures of medical-only versus comorbid conditions. Nonetheless, the choices we made reflect the typical care arrangements for these conditions.

Claims paid do not reflect true costs or include expenditures from other sources, especially out of pocket (eg, deductibles, co-pays). Coding practices among physicians may have skewed the data, insofar as primary care clinicians and many neurologists may avoid mental health diagnoses to improve the likelihood of payment, and other conditions (eg, obesity, asthma) may be missed in claims data. Our data do not allow determination of causality in co-existing MH/SUDs. Children with chronic medical conditions often experience stresses that could lead to MH/SUDs, and similarly MH/SUDs can make chronic medical conditions manifest or more severe. The data do not include information on medical condition severity. Those with comorbid medical and behavioral disorders may have more severe cases of their chronic medical conditions than those without the behavioral comorbidity. Additional costs could reflect that children with diagnosed conditions are more in touch with health care providers and thus more likely to have a comorbid condition identified. Similarly, although parents of children with chronic medical or behavioral conditions have higher health care payments than parents of healthier children, our analysis cannot address any causal link. Future research should clarify the degree to which higher payments observed for parents of children with MH/SUDS stem from parent or child characteristics and conditions, or their interactions; for example, evaluation of whether health care costs for parents increase after a diagnosis of MH/SUD in their children, relative to prior to diagnosis, would help. Finally, the data do not include information on details of treatment or outcomes.

In conclusion, the present results underscore the high additional payments associated with MH/SUDs among commercially insured children and young adults with chronic medical illness and indicate the need to study efforts to prevent or reduce the severity of MH/SUDs in the context of chronic medical conditions. Moreover, higher medical payments among parents of children with chronic conditions and co-occurring MH/SUDs suggest the potential of family-based approaches. These data support current trends toward addressing behavioral health care in the comprehensive management of children and youth with chronic medical conditions and underscore the importance of policies that aim to increase access to effective treatments for MH/SUDs through primary care and specialty medical services.

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