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EXAMINING CHILDREN'S BEHAVIORAL HEALTH SERVICE UTILIZATION AND EXPENDITURES

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The Center for Health Care Strategies (CHCS) is a nonprofit health policy resource center dedicated to improving health care access and quality for low-income Americans and people with chronic illnesses and disabilities. CHCS works with state and federal agencies, health plans, providers, and consumer groups to develop innovative programs that better serve people with complex and high-cost health care needs. Its work focuses on: enhancing access to coverage and services; advancing quality and efficiency through delivery system reform; integrating care for people with complex needs; and building Medicaid leadership and capacity.

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Preface

Children receiving behavioral health care represented less than 10 percent of the overall Medicaid child population, but they accounted for an estimated 38 percent of all Medicaid child expenditures.

Through its *Faces of Medicaid* series, the Center for Health Care Strategies has documented the complexity of Medicaid's high-need, high-cost adult populations and the challenges inherent in designing cost-effective delivery systems to address their needs. This report, *Faces of Medicaid: Examining Children's Behavioral Health Service Use and Expenditures (Children's Faces)*, focuses on another important complex subset of the Medicaid population – children and adolescents with mental health and substance use disorders. As revealed in this analysis, while children receiving behavioral health care represent less than 10 percent of the overall Medicaid child population, they account for an estimated 38 percent of all Medicaid child expenditures. The following analysis sheds light on the types of services that drive these expenditures and potential opportunities to improve the quality, equitable access to, and cost of care.

In addition to an examination of the utilization and costs related to behavioral health services for all children in Medicaid, the analysis focuses specifically on two distinct high-need child populations: children in foster care and those with developmental disabilities. It also analyzes the use of psychotropic medication among children in Medicaid and the related costs, reinforcing current national concerns regarding quality and cost in this area.

Adult Medicaid beneficiaries with chronic conditions, particularly those with comorbid physical and behavioral health conditions, garner considerable attention from state and federal Medicaid policymakers. Some state reforms geared toward these adults – health home proposals, for example – will include children with serious behavioral health challenges, but often without necessary recognition of the differences between the adult and child populations and appropriately unique care delivery approaches. This analysis documents that while children with behavioral health challenges have higher physical health expenditures than Medicaid children in general, they typically have far lower rates of expensive comorbid physical health conditions than adults.[2] Overall Medicaid costs for these children are driven predominantly by their use of behavioral health care, not physical health care. Additional expenses for children in Medicaid who have behavioral health challenges are often incurred via their involvement in multiple public systems outside health care – child welfare, juvenile justice, and schools, for example. Improved care delivery systems have the potential to impact quality and costs, not only in health care, but also in these other sectors.

State Medicaid re-design initiatives that seek to integrate physical and behavioral health care at a management and financing level will be effective only if they are tailored for the unique needs of these children. A number of states are testing innovative provider-based care management entity (CME) models to manage quality, cost, and outcomes across multiple systems for this population. Such models are typically financed through multi-payer case rate arrangements. Other states are using high quality wraparound teams embedded in supportive organizations such as community mental health centers. The CME model and high-quality wraparound approach offer ways of customizing health homes for children with serious behavioral health challenges, and could be incorporated within a state's health home state plan amendment for individuals with serious and persistent mental illness (SPMI).

In identifying behavioral health service use and expenditures for children in Medicaid, *Children's Faces* confirms the importance of testing new approaches for service delivery and care coordination that are tailored for high-utilizing child populations. In the current context of national health reform, this report offers a timely resource for state policymakers, legislators, health care leaders, and others considering effective reforms for a small, but high-need, subset of children in Medicaid.

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I. Introduction

Medicaid is a significant source of funding for behavioral health services – defined as both mental health and substance use disorder services – for children and youth in the United States. However, there are few national analyses examining behavioral health services and supports being used by children in Medicaid. In particular, there is a dearth of information regarding how expenditures are distributed across service types and how patterns of health care use and expense differ for children across Medicaid aid categories, including Temporary Assistance for Needy Families (TANF) recipients; children who are eligible for Supplemental Security Income (SSI)-based Medicaid coverage due to medical and/or mental health disabilities; and children in foster care.[3]

The *Children's Faces* study, funded by the Annie E. Casey Foundation, with additional support from the Substance Abuse and Mental Health Services Administration (SAMHSA) and the Commonwealth Fund, was designed to fill this data gap. The resulting data exploration illustrates the behavioral health service utilization patterns and costs of children and youth covered by Medicaid and identifies opportunities for improving Medicaid-funded behavioral health care services for this at-risk population. The analysis examines Medicaid utilization and expenditure data from the Medicaid Analytic eXtract (MAX) system that includes roughly 29 million children and youth who received Medicaid-financed services in 2005 (see Exhibit 1).[4]

Recent analyses from SAMHSA and the Centers for Medicare & Medicaid Services (CMS) provide important insights into the overall characteristics of Medicaid beneficiaries using mental health and substance use services; however, they do not focus exclusively on children.[5,6] *Children's Faces* expands on existing analyses by incorporating:

- An exclusive focus on children and youth;
- Stratification of the population by age, including very young children (0-5), grade school children (6-12), and adolescents (13-18), as well as by gender, race/ethnicity, and aid category;
- An analysis of use and expense across the range of behavioral health service types, by age and aid category;
- An analysis of psychotropic medication use and expense, by age, gender, race/ethnicity, aid category, and psychiatric diagnosis;
- An analysis of differences in utilization and expenditures across states based on their management and payment models (i.e., fee-for-service (FFS), mainly FFS, or mainly capitated managed care);
- An analysis of concomitant physical health service use and expense by age and aid category and among the behavioral health service users with the highest behavioral health expense; and
- Targeted analyses for children in foster care and children with developmental disabilities.

Previous reports suggest that, nationwide, public systems tend to invest in institutional, high-cost services, with documented disparities based on race/ethnicity.[7,8,9] This report supports these prior findings, and explores the extent to which Medicaid continues to finance restrictive, expensive services, such as residential treatment, versus home- and community-based care for which there is an emerging evidence base.

The use of psychotropic medications represents another critical area of national concern for children in Medicaid, particularly those in foster care. Administrators of the three federal agencies responsible for providing and/or paying for services for children in foster care – the Administration for Children and Families, the Centers for Medicare & Medicaid Services, and the Substance Abuse and Mental Health Services Administration – are jointly mandating federal and state monitoring activities and focusing

national attention on the need to reduce inappropriate prescribing of psychotropic medications to children in foster care.[10] To better understand the use of these medications among children in Medicaid, *Children's Faces* examines patterns in psychotropic medication use and expense by demographic and aid categories.

National health reform is placing a renewed emphasis on coordination of physical and behavioral health care. Children receiving behavioral health services may have chronic physical health needs as well, yet little is known about the severity or health burden of comorbid conditions among children covered by Medicaid. This study is unique in analyzing use of physical health services among children using behavioral health services, including those with the highest mean expenditures for behavioral health use, and including services and costs associated with serious physical health conditions. Additionally, *Children's Faces* includes analysis of the top 10 percent most expensive children in Medicaid with behavioral health services use in 2005 – a group of 120,000 children that has higher average expenditures than high-cost, high-need adults with comorbid physical and mental health conditions.[11]

Overall, this analysis shows a different pattern among children and youth than for adults. Recent studies of adults with SPMI have shown a significant burden of co-occurring chronic health conditions, with an estimated 68 percent of adults diagnosed with SPMI also diagnosed with comorbid physical health conditions.[12] As this analysis shows, total mean Medicaid expenditures for children with behavioral health needs are driven primarily by behavioral, not physical, health service use. These children are also typically involved with multiple agencies in addition to the health care system (e.g., special education, child welfare, and juvenile justice), which can be costly for states. Coordination across all of these systems, including, but not limited to health care, has long been recognized as integral to improved outcomes for this population.[13]

Opportunities to control overall health costs and improve outcomes for children in Medicaid with behavioral health needs lie primarily in improving the quality of their behavioral health care.[14] These opportunities include, for example, more selective use of psychotropic medications and improved availability of home and community alternatives to residential treatment. Appropriate and timely attention to behavioral health needs can also improve children's physical health outcomes and reduce unnecessary expenditures.[15] The new findings uncovered in *Children's Faces* can be used to guide state reform efforts to customize approaches for organizing and financing care for children with serious behavioral health needs.

Focus Areas

In addition to a broad examination of all children in Medicaid using behavioral health services, this analysis highlights two high-priority child populations: children in foster care and children with developmental disabilities. Past studies analyzing behavioral health service use among Medicaid beneficiaries in foster care examined relatively small samples of children in California, Florida, Pennsylvania, and Washington.[16] These studies found that child Medicaid beneficiaries in foster care use more mental health services and have significantly greater mental health expenditures than children who qualify for Medicaid through TANF. One of the more recent studies found that beneficiaries in foster care used services similarly to children who were covered by Medicaid due to SSI/disability eligibility.[17]

Children's Faces offers updated, nationally-representative data on behavioral health expenditures and service utilization for children in Medicaid who are in foster care. The analysis found that the behavioral health service use and expenses of children in foster care in 2005 actually exceeded those of children who are on SSI/disability. In addition, children in foster care were more likely to be overrepresented in

restrictive services such as residential and group care and more likely to receive concurrent prescriptions for psychotropic medications.

This analysis suggests that children with developmental challenges who had claims for any type of Medicaid service use significant levels of behavioral health care. Challenges persist in determining the prevalence of behavioral health needs in this population for two reasons: (1) the difficulty of teasing out primarily behavioral health needs from the behavioral manifestations of developmental disabilities; and (2) the need for sufficiently sensitive tools to identify mental health needs in a population that may have difficulty communicating. However, this study is focused not on the level of need, but on the utilization and expense associated with services provided to this population. This analysis was unable to determine the penetration rate for use of behavioral health services by children with developmental disabilities because the total population of children with developmental disabilities in the Medicaid population is unknown. However, among all Medicaid children who used behavioral health care, children with developmental disabilities had higher rates of psychotropic medication use and higher mean expenditures for behavioral health service use than Medicaid children in general.

Demographic and Aid Characteristics of the Study Population

Exhibit 1 shows characteristics of the overall Medicaid child population in 2005 examined for this study. Of note, children in the TANF aid category represented by far the largest percentage of the overall Medicaid child population. Young children, 0-5, constituted the largest age cohort of children in Medicaid, and relative to their representation in the U.S. child population, African-American children were overrepresented in Medicaid.

Exhibit 1: **Characteristics of Children in Medicaid, 2005**

Demographic and Aid Characteristics	U.S. Children*	U.S. Children in Medicaid**
Age		
0 - 5 years	30.6%	41.3%
6 - 12 years	36.1%	34.0%
13 - 18 years	33.3%	24.6%
Gender		
Female	49.0%	48.9%
Male	51.0%	51.0%
Race and Ethnicity		
White	58.0%	38.8%
Black or African American	14.0%	25.9%
American Indian or Alaska Native	1.0%	1.5%
Asian	4.0%	2.2%
Hispanic or Latino	20.0%	22.1%
Native Hawaiian or Pacific Islander	0.0%	0.6%
Hispanic or Latino + one or more races	--	2.9%
More than one race	20.0%	0.3%
Unknown	--	5.6%
Aid Category		
TANF	--	92.3%
Foster care	--	3.2%
SSI/disabled* **	--	4.5%
Total Population	**74,748,795**	**29,050,305**

*Source: National KIDS COUNT program, Annie E. Casey Foundation

**Source: Medicaid Analytic eXtract (MAX) data, 2005; "child" refers to an individual aged 0 through 18 (below the age of 19).

*** Includes all children determined to be disabled by SSI or state criteria (all disabilities, including mental health disabilities).

Applying the Findings to Improve the Understanding of Children's Behavioral Health Service Use

This report is intended to increase state and federal policymakers' understanding of Medicaid penetration, service use distribution, and expenditures for children's behavioral health services. The analyses in the report enable federal and state policymakers to:

1) Comprehend the range of utilization and expenditures by type of service in general, across Medicaid aid categories, and by demographic variables such as age, gender, and race/ethnicity;

2) Understand levels of service use and expenditures nationally and across groups of states with similar managed care versus FFS arrangements; and

3) Gain greater insight into the use of psychotropic medications among the Medicaid child population, particularly among the most vulnerable subpopulations, including the very young, children in foster care, and those with developmental disabilities.

Since this analysis was undertaken, the 2008 MAX data have become available. Access to these new data sets will allow CHCS to compare service use and costs over time, as well as refine methodology and explore new focus areas, to better characterize trends and opportunities for quality improvement among children with behavioral health needs.

The U.S. is at a critical health care juncture. Health reform provisions highlight the need for improved access to behavioral health services; better coordination of care; timely screening, assessment, and treatment; incentives for preventive care; and improved care for high-utilizing Medicaid populations. Analysis of Medicaid data over time can help shed light on outcomes relevant to health reform, for example, whether: 1) overall rates of access to behavioral health services improve; 2) rates of access to home- and community-based services increase; 3) rates of use for psychotropic medications, residential, and institutional forms of care decline; and, 4) race/ethnicity disparities are reduced.

Faces of Medicaid: Illustrations of Children with Behavioral Health Needs

The stories below represent composite sketches of Medicaid beneficiaries.* In each of these illustrations, the child and family would likely have benefited from access to an individualized set of behavioral health services and supports; improved care coordination; a more interconnected system of child-serving agencies; and, particularly for children involved in the child welfare system, a trauma-informed approach to care.

Kayla

Five-year-old Kayla visited her pediatrician after her teacher reported that she was disruptive and aggressive. Kayla was diagnosed with attention-deficit hyperactivity disorder (ADHD) and prescribed Ritalin; however, with the medication, Kayla was more irritable, lost her appetite, and was having difficulty sleeping. Her teacher noted that Kayla was calmer in class, but was not keeping up with lessons and continued to be aggressive toward classmates during free time. The pediatrician recommended a child mental health specialist at the university several miles away, but Kayla's mother was unable to get off from work to drive her there. If Kayla and her mother had been provided with a telephonic consultation with a child mental health specialist from her pediatrician's office, relevant diagnostic information could have been identified to provide a more comprehensive assessment of Kayla's learning and social-emotional needs and an individually-tailored follow-up treatment plan for her and for her family, beyond ADHD medications.

Angel

Eleven-year-old Angel, the second of five children, has been in and out of foster care since age six and rarely sees his siblings who are in separate foster homes. His 16-year-old-brother is in juvenile detention, and his father died in Central America when Angel was five. His mother, who has no family in the U.S., struggles with alcohol addiction, and her children have been removed from the home due to abuse and neglect. Angel worries about his family, and wonders whether his mother will come back. It is hard for him to concentrate at school. He feels hopeless and sometimes wants to die, but does not share his feelings with his foster mother for fear of being sent away. When his foster mother gets upset, Angel becomes frightened that something bad will happen again and he starts to shake all over. Access to a system of care that includes a Care Management Entity could provide Angel and his family with a variety of supports and services, including a care coordinator to communicate with his school about his struggles; a peer specialist to provide guidance to his foster mother on how to support Angel; and a trauma-informed approach to care that has shown evidence of better outcomes for children like Angel.

Brian

Brian, age 15, lives with his mother, stepfather, and two half-siblings. He and his stepfather often argue, and Brian sometimes becomes violent. After months of threatening outbursts, followed by running away for several days, Brian's family called the police, who brought him to the emergency room. After sharing homicidal thoughts, he was admitted to a psychiatric hospital, where he was diagnosed with a mood disorder with psychotic features and placed on multiple medications. Though less violent, Brian remained irritable, difficult to engage, and often fought with other patients. Following a fight with his roommate, Brian was discharged after 14 days to an acute residential treatment facility. After 45 days, he was sent home with instructions to pursue outpatient treatment. His parents, who are worried about his emotional stability, have met with a therapist at a local mental health center, but Brian refuses to go. He wants to stop his medications, saying he is unhappy with the acne and weight gain side effects. His parents are at a loss for what to do next. Brian and his family could benefit from better coordination among his primary care practitioner, the psychiatric hospital, the residential facility, and the local mental health center. Transitional support, particularly between the residential setting and home, should include a safety plan, a re-assessment of his medications, a review of his diagnosis and treatment history, and a treatment plan for continued non-medication based therapy, such as Multisystemic Therapy. Brian and his family would particularly benefit from a family-directed, youth-guided wraparound approach that involves him in decision-making and includes peer support services.

** These profiles represent composite sketches of Medicaid beneficiaries drawn from the experiences of clinicians and researchers in the fields of child behavioral health and child welfare. They do not portray real individuals, but rather serve to illustrate the varied experiences of children in Medicaid with behavioral health needs.*

II. Key Findings

Following is an at-a-glance summary of key findings from this analysis of behavioral health service utilization and costs for children in Medicaid in 2005. They offer critical information to improve the quality and cost-effectiveness of programs for vulnerable child populations. Key findings are organized under the following categories: (1) Behavioral Health Care Penetration Rates and Service Use; (2) Total and Overall Mean Behavioral and Physical Health Expenditures; (3) Utilization by Service Type; (4) Expenditures by Service Type; (5) Behavioral Health Utilization and Expenditures by State Medicaid Payment and Delivery Structure; (6) Patterns of Psychotropic Medication Utilization and Expenditures; (7) Physical Health Service Utilization and Expenditures; and (8) Children with Developmental Disabilities.

Behavioral Health Care Penetration Rates and Service Use (pg. 22-27)

Penetration Rates

- Of the 29M children enrolled in Medicaid, 2.8M used some type of behavioral health care, inclusive of behavioral health services and/or psychotropic medications, for a combined 9.6 percent penetration rate.
  - Children who used behavioral health services, with or without use of psychotropic medications = 1.9M for a 6.7 percent penetration rate.
  - Children who used psychotropic medication, with or without use of behavioral health services = 1.7M for a 5.8 percent penetration rate.
  - Children who used only behavioral health services (no psychotropic medication) = 1.1M for a 3.8 percent penetration rate.
  - Children who used only psychotropic medication and no behavioral health services = 0.5M for a 1.7 percent penetration rate.

- The overall penetration rate for behavioral health service use (6.7%) was low, given national prevalence estimates. The rates were especially low for:
  - Females (5.5%);
  - Hispanic/Latino children (3.7%);
  - Asian children (1.8%);
  - Native Hawaiian/Pacific Islander children (3.1%); and
  - TANF children (4.9%).

- Penetration rates for racially/ethnically diverse children (range of 3.1% - 6.6%) were appreciably lower than for white children (9%).

- Of the 29M children enrolled in Medicaid, 243,375 used substance use disorder services for a 0.8 percent penetration rate.

Service Use

- Adolescents, ages 13-18, had the highest rates of behavioral health service use, with 12.2 percent of adolescents enrolled in Medicaid using at least one behavioral health service in 2005.

- Children in foster care represented 3.2 percent of children in Medicaid, but 15 percent of children in Medicaid using behavioral health services.

- Children on SSI/disability represented 4.5 percent of children in Medicaid, but 17.8 percent of children in Medicaid using behavioral health services.

- TANF children represented 92.3 percent of children in Medicaid, but 67.2 percent of children in Medicaid using behavioral health services.

- 39.1 percent of children receiving behavioral health services had no behavioral health diagnosis.

- For children with one or more behavioral health diagnoses, the most frequent diagnosis was ADHD (54.9%). The next most common primary or secondary diagnoses were:
  - Conduct disorder (22.8%);
  - Mood disorder (22.7%);
  - Anxiety disorder (22.7%);
  - Developmental disability (5.8%);
  - Psychosis (4.3%); and
  - Other (1.4%).

Total and Overall Mean Behavioral and Physical Health Expenditures (pg. 27-31)

- The 9.6 percent of children in Medicaid who used behavioral health care were estimated to have expenditures over $19.3B, or 38.4 percent of total spending for all children in Medicaid.

- Children in Medicaid using behavioral health services represent a high-cost population with overall mean Medicaid expenditures (physical and behavioral health care) of $8,520 per year.

- Expenditures for children using behavioral health services were driven more by behavioral health service use than by physical health service use, with an annual mean behavioral health expenditure of $4,868 and an annual mean physical health expenditure of $3,652. Behavioral health expense drove overall expense for all aid categories of children except those who were on SSI/disability, for whom mean physical health expenditures were slightly higher.

- Adolescents, 13-18, had the highest mean and total behavioral health expenditures and accounted for over 60 percent of total expenditure.

- Boys had 14.5 percent higher mean behavioral health expenditures than girls.

- TANF children represented 67.2 percent of children using behavioral health services and accounted for 44 percent of spending; children in foster care represented 15 percent of children using behavioral health services and accounted for 28.6 percent of spending; and children who were on SSI/disability represented 17.8 percent of children using behavioral health services and accounted for 27 percent of spending.

- Children in foster care had the highest mean behavioral health expenditure ($8,094 per year), followed by children who were on SSI/disability ($7,264), then TANF ($3,028). When physical health expenditures were added, children who were on SSI/disability had the highest mean expenditure.

- When examining the relative expense of the medications used, children diagnosed with psychosis had the highest mean behavioral health care (services and medications) expenditures

($14,482) compared to children with other diagnoses. Children diagnosed with ADHD had the lowest mean behavioral health care expenditures ($5,298).

Utilization by Service Type (pg. 32-42)

- The most commonly used services – used by 20 percent or more of children using behavioral health services – were outpatient treatment; psychotropic medication; screening and assessment; and medication management.
- One percent or less of children in Medicaid who received behavioral health services used wraparound; therapeutic foster care; Multisystemic Therapy (MST); peer support; respite; or telehealth services.
- Among children in Medicaid who used some kind of behavioral health service, about 12 percent received substance use disorder services.
- Young children, 0-5, were more likely to use screening, assessment and psychological testing services; and therapeutic foster care.
- Children, ages 6-12, were more likely to use behavioral health management and mental health consultation services.
- Adolescents, ages 13-18, were more likely to use facility-based care such as residential treatment and therapeutic group homes, inpatient psychiatric hospitalization and emergency room services
- TANF children were more likely to use substance use inpatient and MST than children in foster care and those on SSI/disability.
- Children in foster care were more likely to use more restrictive/expensive service types including residential treatment/group care, inpatient psychiatric treatment, emergency room services, and therapeutic foster care than children on TANF and those on SSI/disability.
- Children who were on SSI/disability were more likely to receive: wraparound, respite, home-based and activity therapies, and psychotropic medications than children in foster care and those on TANF.

Expenditures by Service Type (pg. 42-56)

- The top three highest expenditure services are residential treatment/therapeutic group homes, outpatient treatment, and psychotropic medication. Most notably, 3.6 percent of children accessing behavioral health services used residential and/or therapeutic group homes, generating expenses totaling 19.2 percent of all behavioral health service expenditures.
- Even when combined, spending on promising services such as therapeutic foster care; family therapy and education; therapeutic behavioral support; behavioral management consultation; in-home services; MST; respite; peer support; and crisis intervention and stabilization, accounted for less than 10 percent of all behavioral health service expenditures.
- Substance use disorder service costs represented 9.7 percent of all behavioral health service expenditures.

- Children in foster care were only one-fifth the size of the TANF population, but used nearly the same amount of dollars for residential/group care and emergency room visits and 3.5 times more dollars for therapeutic foster care.

- Children who were on SSI/disability were about one quarter the size of the TANF population but used the same amount of dollars for psychotropic medications and wraparound, two times more for therapeutic foster care, eight times more for home-based services, and three times more for respite.

Behavioral Health Utilization and Expenditures by State Medicaid Payment and Delivery Structure (pg. 57-58)

- Child behavioral health penetration rates differed by state payment arrangements, with FFS states having the highest penetration rates, averaging 10.5 percent, and fully capitated managed care states having the lowest penetration rates, averaging 5.1 percent. Partially capitated (primarily FFS) states were in the middle with an average 7.5 percent penetration rate.

- Child behavioral health spending differed by state payment arrangements. At the high end, FFS states had a mean annual expenditure of $5,542 per child; at the low end, capitated states had a mean expenditure of $3,684 per child; and partially capitated (primarily FFS) states were in the middle with a mean expenditure of $4,709 per child.

Patterns of Psychotropic Medication Utilization and Expenditures (pg. 59-68)

- Out of 29M children (0-18) enrolled in Medicaid in 2005, 1.7M children (5.8%) received psychotropic medications, with or without accompanying behavioral health service use.

- Only 51 percent of the 1.7 million children on psychotropic medications received identifiable behavioral health services; another 20 percent received indeterminate services, which may include some behavioral health services.

- The remaining 29 percent of Medicaid children using psychotropic medications received no accompanying behavioral health services; and an even higher percentage, 35.3 percent, of children 0-5 years of age who were prescribed psychotropic medications, received no accompanying behavioral health services.

- 32 percent of children covered by TANF who received psychotropic medications received no identified behavioral health services; that figure is 25 percent for children covered through SSI/disability and 22 percent for those in foster care.

- 33 percent of children received two or more types of psychotropic medications; 19 percent of children who were prescribed psychotropic medications with physical health services only, received two or more types of psychotropic medications.

- Almost a quarter (22.7%) of young children (0-5) on psychotropic medications were given antipsychotics; frequency of antipsychotic use across ages (26.3%) did not correspond to the very low prevalence of diagnoses related to psychosis (4.3%).

- 18.1 percent of children on psychotropic medications covered through TANF were prescribed anti-psychotics, as were 42.4 percent of children on psychotropic medications with SSI/disability eligibility, and 42.1 percent of those on psychotropic medications enrolled through foster care.
- 66.5 percent of children with a diagnosis of developmental disabilities who received psychotropic medications received antipsychotics.
- While 81.6 percent of children with a diagnosis of psychosis were prescribed antipsychotics, 28.5 percent of children with no psychiatric diagnosis were prescribed antipsychotics.
- 43.4 percent of children with a psychosis diagnosis who used psychotropic medications were prescribed ADHD/stimulant medications, despite most guidelines suggesting psychosis is a contraindication for stimulants.
- Total expense for child and adolescent psychotropic medication use in 2005 was: $1.6B.
- Expenditures for antipsychotic medications represented 42 percent of total psychotropic medication expense and the highest mean psychotropic medication expense ($1,516).

Physical Health Service Utilization and Expenditures (p. 68-73)

- 38 percent of a study subset of children and adolescents with mental health and/or substance use claims also had claims for at least one serious medical condition.
- The three serious chronic health areas with the highest utilization in the 2005 study population, per the CDPS methodology, were: pulmonary, skeletal, and central nervous system.
- Physical health expense represented 43 percent of total Medicaid expense for the overall population of children using behavioral health services.
- Mean physical health expenditures were $2,053 for TANF-eligible children, $4,036 for children in foster care, and $7,895 for children on SSI/disability.
- Overall mean physical health expenditure among children's behavioral health users was $3,652, more than twice the combined physical and behavioral health mean expense for children in Medicaid in 2005, per CMS estimates.
- Among Medicaid youth with the top 10 percent highest behavioral health expenditures in 2005, the mean physical health expense was $20,121, and the mean behavioral health expense was $28,669.
- For all aid categories, inpatient pediatric care was the most expensive physical health service. The second most expensive physical health service for children in the SSI/disabled group was non-psychotropic medications; this was also the third highest expense for foster children and children eligible via TANF.
- Together, expenditures for pediatric hospitalization and non-psychotropic medications represented 30 percent of all physical health expense for children with behavioral health service use across aid categories.

Children with Developmental Disabilities (pg. 73-89)

- Roughly 115,000 children, or 0.4 percent of total Medicaid child enrollment in 2005, were identified as having a claim for physical or behavioral health services with a diagnosis of developmental disability.

- Children with developmental disabilities represented 3.6 percent of the 1.9M children in Medicaid who used behavioral health services (with or without psychotropic medications) and 3.3 percent of the 1.7M children in Medicaid who were prescribed psychotropic medications (with or without any other behavioral health service).

- Psychotropic medications were the most frequently used type of behavioral health care among children with developmental disabilities: the rate was a third higher than that for children in Medicaid in general who used behavioral services (57.8% vs. 43.8%).

- Based on available FFS data, total behavioral health expenditures for children with developmental disabilities using behavioral health care was $596M.

- Average mean behavioral health expense for children with developmental disabilities was $7,550, 55.1 percent higher than those of all children using behavioral health services, $4,868.

- Nearly half of children with developmental disabilities who used behavioral health care used psychotropic medications. Of these, 72.1 percent also used a behavioral health service.

- Among all children in Medicaid using behavioral health services and who had diagnoses, children with developmental disabilities had the highest rate of anxiety medication use (8.7%) and a rate of anti-psychotic medication use (66.5%) second only to children with a diagnosis of psychosis.

- Mean psychotropic medication expenditures for children with developmental disabilities using behavioral health services was $2,230, which is 76 percent higher than for Medicaid children in general who used behavioral health services and also used psychotropic medications; the mean expenditure for those children was $1,267.

- Among children with developmental disabilities that used behavioral health services, anti-psychotics accounted for 66 percent of psychotropic medication expenditures (partly attributed to the high cost of anti-psychotics), followed by ADHD/stimulant medication at 18.3 percent.

- Total expenditures for dental services were lower for children with developmental disabilities than for Medicaid children in any of the three Medicaid aid categories (TANF, foster care, SSI/disabled).

- Children with developmental disabilities who used behavioral health care had overall mean health (physical and behavioral) expenditures ($19,257) that were 2.2 times that of Medicaid children in general who used behavioral health care ($8,520).

III. Study Questions, Data, and Methods

This study sought to:

1) Examine overall patterns of behavioral health service use and expense for Medicaid-insured children and youth in the U.S.;
2) Examine psychotropic medication use and expense for Medicaid-insured children;
3) Better understand the associated patterns of physical health service use and expense for these children; and
4) Describe profiles of behavioral health service use for Medicaid-insured children in foster care, as well as for children with developmental disabilities.

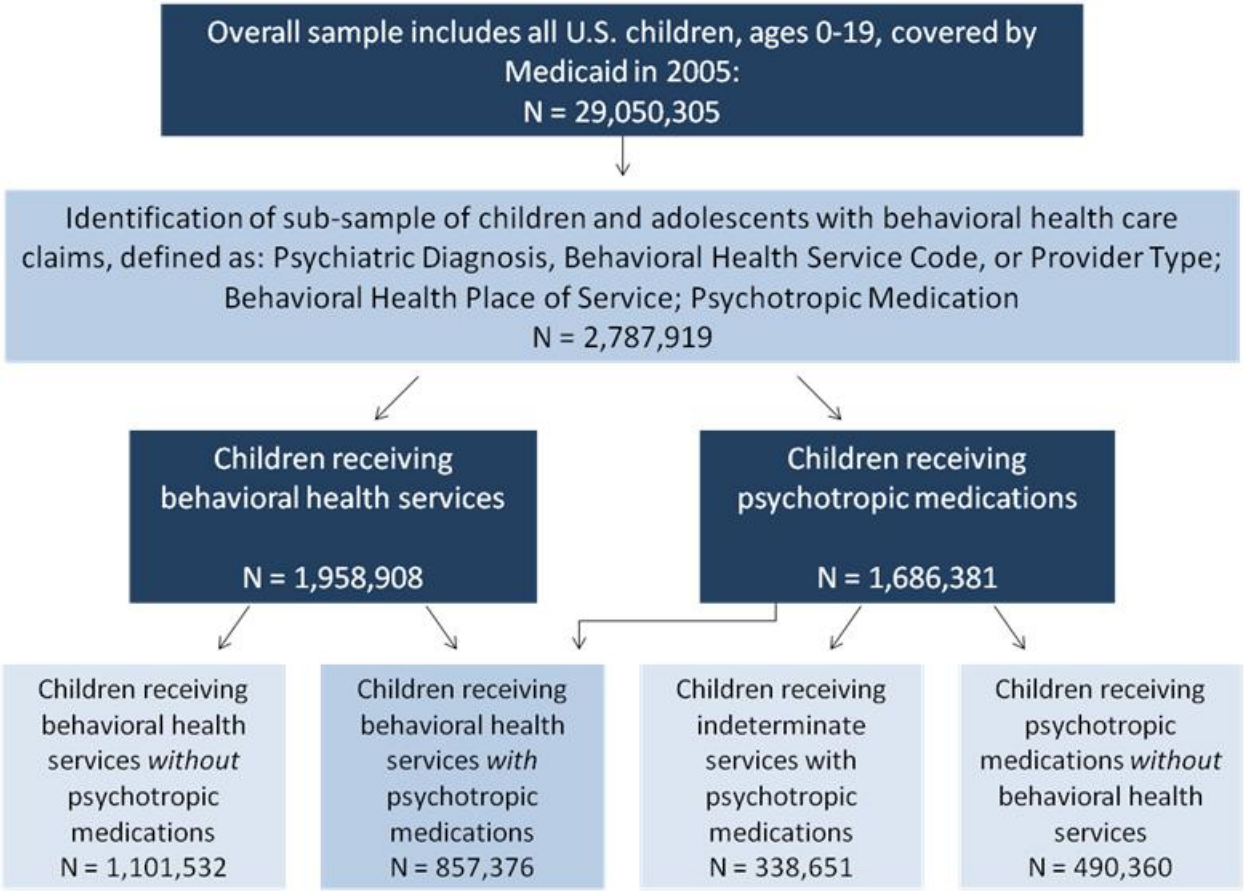
Several analyses were performed to answer the following questions:

1) How do behavioral health service use and expense among Medicaid-insured children vary by age, gender, race/ethnicity, aid category, and diagnosis?
2) How do psychotropic medication use and expense among Medicaid-insured children vary by age, gender, race/ethnicity, aid category, and diagnosis?
3) Does behavioral health utilization differ by state management and payment structure (i.e., FFS versus managed care)?

To answer these questions, analyses were conducted using data for all children under age 19 who were enrolled in Medicaid in the U.S. in 2005. The data were derived from the Medicaid Analytic eXtract (MAX) system,[18] a set of data files containing person-level information on Medicaid eligibility and claims-level information on service utilization and payments. The MAX data were used to:

1) Extract claims for all children in Medicaid who used specialty behavioral health services, non-specialty behavioral health services, or psychotropic medication in 2005, regardless of how long they were enrolled (i.e., continuous Medicaid enrollment not required) (Figure 2);
2) Summarize behavioral health service use and cost, including that associated with psychotropic medication use;
3) Illuminate the variation in behavioral health service use by state payment and financing arrangement (i.e., FFS and managed care); and
4) Profile population disease burden, including psychiatric diagnoses and comorbid physical health conditions.

Exhibit 2: **Children's Faces Study Population Methods**



Additionally, behavioral health services were sorted into 'specialty behavioral health' or 'non-specialty behavioral health' using procedure codes employed in the MAX data, including CPT-4,[19] ICD-9-CM,[20] HCPCS,[21] and state-specific systems. Claims were considered to be for specialty behavioral health services if:

1) They included a behavioral health primary diagnosis; or
2) The MAX type of service was designated as 'psychiatric services;' or
3) The service was delivered in a mental health setting, such as a community mental health center.

Services not specific to behavioral health (e.g., 'office visit') incurred by children who had other claims that included a psychiatric diagnosis were considered to be indeterminate services. Remaining claims, that did not meet either specialty or non-specialty behavioral health, or medication, were classified as relating to physical health services.

Psychiatric diagnoses were clustered into seven major categories and assigned in a hierarchical fashion for this study by a team of clinical sub-specialists to examine the distribution of diagnoses within the population, as well as to analyze service use, in particular, psychotropic medication use, in the context of diagnosis.

Additionally, a detailed taxonomy of behavioral health services was developed for this study (see Appendix A for a glossary of service type definitions). The total number of Medicaid-enrolled children using specialty behavioral health services was identified. Within that group, the number of children using each individual service, within the taxonomy, was determined, along with the mean number of claims per user. In addition, total and mean expenditures for each service type were calculated per user.

Analyses of Medicaid utilization and expenditures often exclude beneficiaries in managed care organizations (MCOs), since plans financed via capitation may not be required to provide encounter data and do not provide expenditure data. This limits many analyses to information that can be retrieved from the FFS claims data only. Some children may be enrolled in an MCO for their medical care but have their specialty behavioral health services provided through non-capitated managed behavioral health care arrangements that often pay providers by FFS and submit FFS Medicaid claims, such as a non-risked administrative services organization. The utilization and expenditure data for children in such arrangements are included in this analysis.

To more accurately analyze the utilization and expense data across states with different management and financing approaches, the study team conducted a formal survey of all 50 states and the District of Columbia – via electronic survey and follow-up telephone calls – to confirm each state's Medicaid management and payment structure in 2005 specifically for the provision of child behavioral and physical health care. This information was used to group states that operated similarly with regard to their state Medicaid financing systems (i.e., FFS, capitated managed care or both).

The analyses in this study include all children, whether they were enrolled in an MCO or managed behavioral health plan, and all claims records, whether they were FFS claims or MCO encounter records. However, mean expenditures could only be calculated for children with paid FFS claims for that service. Data for children without claims (MCO encounter records only) were used to analyze utilization, but not expenditure. Expenses were extrapolated based on FFS data and imputed for capitated or partially capitated states, with caveats noted. FFS expenditure data were available for 60 percent of the study population. While the analysis includes all states, it should be noted that the quality and completeness of data vary, particularly in states utilizing capitated managed care.

Specialty behavioral health service use and expense were summarized overall, and by age, aid category (TANF, foster care, or SSI/disabled), and state Medicaid payment structure (FFS, primarily FFS, or capitated managed care). Additional analyses examined race/ethnicity and gender stratification; psychotropic medication use; children with developmental disabilities; and children in foster care. Total and mean overall physical health expense was also calculated for children who used behavioral health services. Expenditures for physical health services by type of service were summarized overall, and by aid category. Service utilization was further detailed for those children whose behavioral health expenses fell within the top 10 percent of total expenditures for behavioral health. Additionally, the Chronic Disability Payment System (CDPS) method[22] was employed to investigate prevalence of chronic medical conditions among all children in Medicaid who had behavioral health service use and at least six months of FFS enrollment. CDPS, developed at University of California San Diego, is a well-known classification system that clusters Medicaid claims types by illness category and assigns corresponding claim expense.[23] CDPS has been widely used to provide information about which categories of chronic illness are most responsible for high costs in adult populations. Adjustments to the CDPS model were made to allow for differences in diagnoses among children.

The presence of psychotropic medication use within the Medicaid child and adolescent population was identified using pharmacy claims. The Medicaid Rx classification system was then used to map National Drug Codes to six classes of psychotropic medications: antipsychotics, anticonvulsant medications (used

in psychiatry for conditions such as bipolar disorder), lithium, anti-depressants, attention deficit hyperactivity disorder (ADHD) medications, and anxiety medications. Psychotropic medication utilization and expenditures were summarized by medication type, and by age, aid category, and psychiatric diagnosis of the children for whom the medications were prescribed. Variations in patterns of medication use were examined, comparing children with documented use of specialty behavioral health services to children who appeared to be receiving only physical health and/or indeterminate health services.

Separate analyses were conducted for the overall population of children with developmental disabilities, defined either via diagnosis code or if they received services in an Intermediate Care Facility for Persons with Mental Retardation (ICF/MR).[24]

Limitations for this study include:

1) Variations in code usage conventions and processes exist from state to state, including use of state-specific codes, so attempts to combine state claims data may over- or under-estimate specific service category use;
2) Variations in reliability of state data impact the accuracy of both state level and overall utilization and expenditure results;
3) MCO expenditures were imputed, based on FFS expenditures, in order to estimate combined total dollars; and
4) All claims for youth in Medicaid with any day of enrollment in 2005 were included in this study; therefore, results cannot be compared to results of studies where a year of continuous enrollment was required.

IV. Findings

A. Behavioral Health Care Penetration Rates and Service Use

1. Medicaid Child Behavioral Health Penetration Rates

Behavioral health *penetration rate* is defined as the percentage of children within the overall Medicaid child population who received behavioral health care, including mental health and/or substance use disorder (SUD) services and/or psychotropic medications. As Exhibit 3 indicates, of the 29 million children enrolled in Medicaid in 2005, 2.8 million children used behavioral health care, yielding a 9.6 percent penetration rate. This comprehensive rate is comparable to the 9.3 percent penetration rate cited in the 2003 SAMHSA study on Medicaid child beneficiaries with mental health and SUD service use.[25] However, in separating out the number of children who actually received behavioral health services, as opposed to those who were given psychotropic medications only, this analysis identified an appreciably lower penetration rate. The rate for behavioral health service use fell from 9.6 percent to a 6.7 percent penetration rate – or just under two million children. Given estimates that 20 percent of children in the U.S. need behavioral health services,[26] this penetration rate is low, and because poverty is associated with an even higher need for services, it would seem especially low for children in Medicaid.[27]

This analysis found that about 243,000 Medicaid children used SUD services in 2005, for a penetration rate of 0.8 percent. For comparative purposes, the 2003 SAMHSA study found a 0.3 percent penetration rate. The penetration rate for SUD services in both studies may be understated due to coding anomalies, for example, coding of SUD services as mental health services. Even with this data caveat, the SUD penetration rate is very low, given estimates that 3.3 percent of 15-year olds, and 9.8 percent of 17-18 year olds, have a need for SUD treatment.[28]

Of the 29 million children enrolled in Medicaid in 2005, there were nearly 1.7 million unduplicated children receiving psychotropic medications (with or without other services) – for a 5.8 percent penetration rate. While about half of these children used a behavioral health service along with a psychotropic medication (857,376 children, or 3% penetration), roughly half did not. Nearly 500,000 children (1.7% of all children in Medicaid) received psychotropic medications without accompanying behavioral health service use (with only physical health service use), and another roughly 300,000 children (1.2%) used psychotropic medications along with indeterminate service use (i.e., cannot determine whether service was behavioral or physical health service).

Exhibit 3: **Medicaid Child Behavioral Health Penetration Rates, 2005**

	Number of Children (% of Total)	% of Total Medicaid Child Population
Total number of U.S. children enrolled in Medicaid	**29,050,305 (100%)**	**100%**
All children receiving behavioral health services		
▪ Recipients of behavioral health services only (no psychotropic medication use)	1,101,532 (56.2%)	3.8%
▪ Recipients of behavioral health services and psychotropic medications	857,376 (43.8%)	2.9%
Total	**1,958,908 (100%)**	**6.7%**
All children receiving psychotropic medications (includes mutually exclusive groups		
▪ Recipients of psychotropic medications and behavioral health service use	857,376 (50.8%)	2.9%
▪ Recipients of psychotropic medications and physical health service use only (no behavioral health use)	490,360 (29.1%)	1.7%
▪ Recipients of psychotropic medications with indeterminate services only (i.e., cannot determine whether service was behavioral or physical health)	338,651 (20.1%)	1.2%
Total	**1,686,387 (100%)**	**5.8%**
All children receiving behavioral health care (children with behavioral health service use and/or psychotropic medication use)		
▪ Recipients of behavioral health services	1,958,908 (70.3%)	6.7%
▪ Recipients of psychotropic medications and physical health services only (no behavioral health use)	490,360 (17.6%)	1.7%
▪ Recipients of psychotropic medications with indeterminate service use (i.e., cannot determine whether service was behavioral or physical health)	338,651 (12.1%)	1.2%
Total	**2,787,919 (100%)**	**9.6%**

The bulk of this analysis pertains to the 1.9 million children in Medicaid in 2005 (6.7%) who either used a behavioral health service or used a behavioral health service along with a prescribed psychotropic medication. Within this population, 56 percent only used behavioral health services, and 44 percent used behavioral health services in combination with psychotropic medications.

2. Penetration Rates for Use of Behavioral Health Services among Children in Medicaid by Age, Gender, Race/Ethnicity, and Aid Category

The overall penetration rate for the primary study population – that is, children in Medicaid using behavioral health services with or without concomitant psychotropic medication use – was 6.7 percent, which, as noted earlier, is low given national prevalence estimates of 20 percent or higher.[29] Penetration rates were even lower for certain populations of children in Medicaid, as Exhibit 4 shows. For example, penetration rates were lower than the overall child penetration rate for: females; Asian, Hispanic/Latino, and Native Hawaiian/Pacific Islander children; and children covered through TANF. The study also confirmed the very low behavioral health utilization rates of young children (0-5) found in other studies, with only 1.8 percent of young children having used behavioral health services in 2005.[30]

For these particular groups of children – males, white children, children in foster care, and those receiving SSI/disability – penetration rates were *higher* than the overall mean for behavioral health service use among all children, though still low compared to overall prevalence estimates.

Prior studies on the foster care population found that behavioral health service utilization rates were comparable between the foster care and SSI/disabled child populations in Medicaid.[31] This analysis found that foster care-eligible children in Medicaid had higher behavioral health service penetration rates than children in Medicaid on SSI/disability, with 32 percent of the foster care population using behavioral health services compared to 26.4 percent of the SSI/ disabled population. Even this relatively higher penetration rate is still low, in light of studies documenting that nearly half of children entering foster care have significant behavioral health challenges.[32]

Rates of both access to and use of behavioral health services vary by race/ethnicity. Consistent with prior research reporting a lack of access to behavioral health services among Hispanic/Latino children,[33] this study found a disproportionately low penetration rate for this population. Among all Hispanic/Latino children enrolled in Medicaid in 2005, less than four percent used behavioral health services (compared to the average penetration rate across racial/ethnic groups of roughly seven percent). Penetration rates also were disproportionately low for Asian and Native Hawaiian/Pacific Islander children (1.8% and 3.1%, respectively). Although some earlier studies have found disproportionate access to behavioral health services for African-American children,[34] this analysis did not find disproportionate behavioral health utilization by African-American or American Indian/Alaska Native (AI/AN) children relative to children in Medicaid in general. As Exhibit 4 shows, of all African-American children enrolled in Medicaid in 2005, 6.6 percent used behavioral health services, and of all AI/AN children enrolled in Medicaid, 6.4 percent used behavioral health services. However, penetration rates for children in all major racial and ethnic minority groups – which range from 3.1 percent to 6.6 percent – were appreciably lower than the 9 percent rate for white children enrolled in Medicaid (and, again, even 9 percent is low, relative to the estimated prevalence noted above).

Exhibit 4: **Penetration Rates for Use of Behavioral Health Services among Children in Medicaid, by Demographic and Aid Category, 2005***

	Percent (%)**	Number
Children Using Behavioral Health Services	**6.7%**	**1,958,908**
Age		
0 - 5 years	1.8%	217,584
6 - 12 years	8.8%	869,994
13 - 18 years	12.2%	871,330
Gender		
Female	5.5%	776,685
Male	8.0%	1,181,997
Race and Ethnicity		
White	9.0%	1,015,126
Black or African American	6.6%	496,426
American Indian or Alaska Native	6.4%	28,870
Asian	1.8%	11,458
Hispanic or Latino	3.7%	234,398
Native Hawaiian or Pacific Islander	3.1%	5,702
Hispanic or Latino + one or more races	5.1%	43,521
More than one race	7.2%	5,366
Unknown	7.2%	118,041
Aid Category		
TANF	4.9%	1,316,635
Foster care	32.0%	293,885
SSI/disabled* **	26.4%	348,338

*Children were required to have at least one behavioral health service claim (other than for psychotropic medications alone).
**Penetration Rates in the table are based on the total number of children in Medicaid, N = 29,050,305.
*** Includes all children determined to be disabled by SSI or state criteria (all disabilities, including mental health disabilities).

3. Characteristics of Children in Medicaid Using Behavioral Health Services by Age, Gender, Race/Ethnicity, and Aid Category

Exhibit 5 describes the age, gender, race/ethnicity, and Medicaid eligibility characteristics of children in Medicaid who used behavioral health services in 2005. In comparison to their representation in the overall Medicaid child population, certain categories of children were *underrepresented* among children who used behavioral health services, including: females; Asian, Hispanic/Latino, and Native Hawaiian/Pacific Islander children; TANF children; and 0-5 year olds. Other categories of children were *disproportionately represented*, including: 6-12 and 13-18 year olds; males; white children; children in foster care; and children on SSI/disability.

While utilization was low among all children compared to prevalence, the data suggest that, among children using behavioral health services, white children disproportionately utilized behavioral health services compared to all other racial/ethnic groups. As Exhibit 5 shows, white children represented 38.8 percent of children in Medicaid but made up 51.8 percent of children in Medicaid using behavioral health services. This may indicate greater service access availability for white children.

This analysis also confirms earlier findings[35] regarding greater use of behavioral health services by children in foster care and those on SSI/disability relative to TANF children. Children in foster care represented 3.2 percent of the Medicaid child population but 15 percent of children in Medicaid using

behavioral health services. Children on SSI/disability were 4.5 percent of the Medicaid child population but represented 17.8 percent of children in Medicaid using behavioral health services.

Male children were more likely to use behavioral health services than females. Males represented 51 percent of the Medicaid child population and 60.3 percent of children in Medicaid using behavioral health services.

Young children, 0-5, represented 41.3 percent of all children in Medicaid and comprised 11.1 percent of children in Medicaid using behavioral health services.

Exhibit 5: **Characteristics of Children in Medicaid Using Behavioral Health Services, 2005**

Demographic and Aid Category	Total Medicaid Children 100%, N=29,050,305		Medicaid Children Using Behavioral Health Services* 100%, N = 1,958,908	
Age	*%*	*N*	*%*	*N*
0 - 5 years	41.3%	12,001,451	11.1%	217,584
6 - 12 years	34.0%	9,889,507	44.4%	869,994
13 - 18 years	24.6%	7,159,347	44.5%	871,330
Gender				
Female	48.9%	14,202,259	39.6%	776,685
Male	51.0%	14,816,976	60.3%	1,181,997
Race and Ethnicity				
White	38.8%	11,271,574	51.8%	1,015,126
Black or African American	25.9%	7,537,925	25.3%	496,426
American Indian or Alaska Native	1.5%	448,234	1.5%	28,870
Asian	2.2%	644,744	0.6%	11,458
Hispanic or Latino	22.1%	6,413,067	12.0%	234,398
Native Hawaiian or Pacific Islander	0.6%	185,598	0.3%	5,702
Hispanic or Latino + one or more races	2.9%	846,083	2.2%	43,521
More than one race	0.3%	74,093	0.3%	5,366
Unknown	5.6%	1,628,987	6.0%	118,041
Aid Category				
TANF	92.3%	26,812,742	67.2%	1,316,635
Foster care	3.2%	919,590	15.0%	293,885
SSI/disabled**	4.5%	1,317,973	17.8%	348,338

*Children were required to have at least one behavioral health service claim (other than for psychotropic medications alone).
** Includes all children determined to be disabled by SSI or state criteria (all disabilities, including mental health disabilities).

4. Distribution of Diagnoses by Age and Aid Category for Children in Medicaid Using Behavioral Health Services

In the study population, 1,192,538 children, or 61 percent of those using behavioral health services, received at least one psychiatric diagnosis. Thirty-nine percent of children who used behavioral health services received no psychiatric diagnosis. Exhibit 6 shows the distribution of psychiatric diagnoses among children in Medicaid who used behavioral health services in 2005 by age and aid category. The top three diagnoses were: ADHD, mood disorder, and conduct disorder. The top three diagnoses associated with claims for young children, ages 0-5, were: ADHD, conduct disorder, and anxiety; however, over 60 percent received no diagnosis. The top three diagnoses for children ages 6-12 were:

ADHD, anxiety, and conduct disorder; and for adolescents, ages 13-18: ADHD, mood disorder, and anxiety disorders. For TANF children and children in foster care, the top three diagnoses were: ADHD, mood disorder, and anxiety. For children on SSI/disability, the top three diagnoses were: ADHD, mood disorder, and conduct disorder.

Children ages 6-12 were more likely than children in general to have a claim associated with a diagnosis of ADHD. With the exception of ADHD and developmental disability, adolescents, ages 13-18, were more likely to receive all other types of psychiatric diagnoses than other children. Developmental disability was the only diagnostic category in which young children, ages 0-5, were more likely than other children to be represented, though it should be noted that the actual number of young children with a diagnosis of developmental disability is very small.

Children on SSI/disability were more likely to have claims associated with ADHD, developmental disability, and psychosis than other children. Children in foster care were more likely than other children to have claims associated with mood, anxiety and conduct disorders. TANF children were more likely than other children to have claims with no behavioral health diagnosis.

Exhibit 6: **Distribution of Psychiatric Diagnoses among Children in Medicaid Using Behavioral Health Services, by Age and Aid Category, 2005***

Diagnosis**	Children Using Behavioral Health Services	Age 0-5 N = 217,584 (100%)	Age 6-12 N = 869,994 (100%)	Age 13-18 N = 871,330 (100%)	TANF N = 1,316,365 (100%)	Foster Care N = 293,885 (100%)	SSI/ Disabled N = 348,388 (100%)
ADHD	33.4%	19.0%	43.9%	26.6%	30.8%	32.4%	44.2%
Mood	16.0%	3.4%	10.9%	24.2%	14.2%	19.8%	19.3%
Anxiety	13.8%	8.0%	12.8%	16.2%	13.4%	19.3%	10.6%
Conduct Disorder	13.9%	12.6%	12.3%	15.8%	12.4%	18.7%	15.7%
Developmental Disability	3.6%	5.8%	3.8%	2.7%	1.6%	3.3%	11.2%
Psychosis	2.6%	0.8%	1.9%	3.8%	1.9%	3.2%	5.0%
Other Diagnosis	0.8%	0.5%	0.8%	1.0%	0.8%	0.7%	1.2%
No Behavioral Health Diagnosis	39.1%	60.4%	36.3%	36.7%	42.7%	35.3%	28.7%

*The number of children with at least one psychiatric diagnosis is 1,192,538. The percentages in the table refer to the larger denominator of children using behavioral health services (1,958,908).
**Percentages across diagnoses cannot be summed to 100 percent due to overlapping representation (i.e. duplicate counts for children with more than one diagnosis).

B. Total and Overall Mean Behavioral and Physical Health Expenditures

1. Total Medicaid Health Expenditures for Children Using Behavioral Health Services

This study examined total health expenditures for physical health care, behavioral health services and psychotropic medications by children in Medicaid using behavioral health services in 2005. The analysis estimated that, in 2005, the 9.6 percent of children in Medicaid who used behavioral health services and/or psychotropic medications accounted for 38 percent ($19.3 billion) of total physical and behavioral health Medicaid spending in this age group (Exhibit 7). The SAMHSA study of 2003 data found that nine percent of children using behavioral health services accounted for 33 percent of total Medicaid child spending.[36] The estimate of 38 percent in this study may be overstated to an unknown degree because it applies mean FFS expenditure data to children enrolled in capitated managed care

arrangements where expenditure data were not available, and this population may have lower mean expenditures than children in FFS arrangements.

Expenditure data for the primary study sample of children using behavioral health services with or without psychotropic medication use can also be found in Exhibit 7. These children represent 6.7 percent of the total Medicaid child population and account for an estimated 30 percent of total Medicaid child expenditures.

Exhibit 7: **Total Estimated Health Expenditures (Physical and Behavioral) for Children in Medicaid Using Behavioral Health Services and/or Psychotropic Medications, 2005**

	Number of Children (% of Medicaid Child Population)	Physical Health Expenditures	Behavioral Health Expenditures	Combined Expenditures
Total users of behavioral health care (services and/or psychotropic medications)*	2,787,919 (9.6%)	$10.8B**	$8.5B	$19.3B (38.4%)
Users of behavioral health services (including children with at least one behavioral health service with or without concomitant psychotropic medication use)	1,958,908 (6.7%)	$7.2B	$8.0B	$15.2B (30.3%)
Children using behavioral health services with FFS expenditure data* **	1,213,201 (4.2%)	$4.4B	$6.0B	$10.4B (20.7%)
All Children in Medicaid** **	**29,050,305 (100%)**			**$50.2B (100%)**

*Includes children with behavioral health service claim with or without psychotropic medication use and their physical health service use; children with psychotropic medication use and indistinguishable physical and behavioral health service use; and children with psychotropic medication use and physical health care use.
**Overstates physical health service use because estimate includes service use expenditures for children with indistinguishable physical and behavioral health services so some unknown amount of expenditures should be in the behavioral health column.
***Children not enrolled in a comprehensive MCO, i.e., children with FFS expenditure data, 1.2 million children.
**** Centers for Medicare & Medicaid Services, Center for Medicaid and State Operations: Statistical Report on Medical Care: Eligibles, Recipients, Payments, and Services (HCFA 2082), Medicaid Statistical Information System. 2008 Statistical Supplement.

Exhibit 7 displays both actual and imputed behavioral health expenses for children in Medicaid in this study, with a reference column of total Medicaid expenditures for children in 2005 based on CMS data.[37] Row 4 shows total expenditure data for the 1.2 million children in FFS arrangements for whom actual expenditure data were available. These children represent 4.2 percent of the total Medicaid child population and account for 21 percent of total Medicaid child expenditures.

Proportionally, this ratio is higher than the estimate cited above of 9.6 percent of children accounting for 38 percent of total expenditures, which makes sense given that children in FFS generally include the higher-need populations of children in foster care and on SSI/disability. In effect, the fact that this study's ratio for all children using behavioral health care is somewhat lower than the higher ratio for children in FFS lends additional credibility to this study's expenditure estimate for all children using behavioral health care.

2. Mean Overall Health Expenditures for Children in Medicaid Using Behavioral Health Services

Similar to findings from a 2003 SAMHSA study, this analysis confirmed that children with behavioral health service use are a high-cost Medicaid population. Exhibit 8 shows mean expenditures for physical health, behavioral health, and total health service utilization for this population in 2005. As noted earlier, expenditure data were obtained on 61 percent of the overall study population – 1.2 million children using behavioral health services who were not enrolled in a comprehensive MCO. Total mean health expenditures (physical and behavioral health utilization combined) were $8,520 for children with behavioral health service use, nearly five times the mean amount spent on children in Medicaid in general ($1,729), per CMS analysis.[38] Expenditures for these children were driven more by behavioral health service utilization than by physical health care, although their mean physical health care expenditures were more than two times that for children in Medicaid in general.

Also in Exhibit 8, mean expenditures are disaggregated by Medicaid aid category. The total mean expenditure for TANF children using behavioral health services was nearly three times the mean expenditure for children in Medicaid in general and was driven more by use of behavioral health care than by physical health service utilization. The total mean expenditure for children in foster care was seven times the mean expenditure for children in Medicaid in general and was driven twice as much by use of behavioral health care as by physical health service utilization. Children on SSI/disability who used behavioral health services had the highest total mean expenditure, nearly nine times higher than the mean expenditure for children in Medicaid in general. Unlike the TANF and foster care populations, for whom behavioral health care drove total mean expenditures, the mean expenditure for physical health care ran slightly higher than the mean expenditure for behavioral health care for children on SSI/disability (see Section G, Physical Health Service Use and Expense).

Exhibit 8 also shows the total mean expenditure (for use of both physical and behavioral health services) for the 10 percent of children in Medicaid with the highest levels of behavioral health service use in 2005 (121,323 children). The total mean expenditure for children in the top 10 percent – $48,098 – exceeded that cited for adults with SPMI and/or behavioral health comorbidities in a CHCS 2010 report.[39] While mean expenditures are high for both physical and behavioral health service utilization among the top 10 percent most expensive children using behavioral health care, mean expenditures were higher for use of behavioral health care than for physical health service utilization. For adults with SPMI, the opposite is true – overall mean expenditures are driven more by use of physical health care.[40]

Exhibit 8: **Mean Health Expenditures for Children in Medicaid Using Behavioral Health Services, 2005***

	All Children Using Behavioral Health Services	TANF	Foster Care	SSI/ Disabled	Children Representing Top 10% of Expense for Behavioral Health Services**
Behavioral Health Services	$4,868	$3,029	$8,094	$7,264	$27,977
Physical Health Services	$3,652	$2,053	$4,036	$7,895	$20,121
Total Health Services	**$8,520**	**$5,082**	**$12,130**	**$15,159**	**$48,098**

* Includes children using behavioral health services, with or without concomitant psychotropic medication use, who are not enrolled in a comprehensive MCO, N = 1,213,201.
**N = 121,323 children.

3. Behavioral Health Mean and Total Expenditures by Age and Gender

Exhibit 9 shows mean and total expenditures, broken out by age and gender, for children in Medicaid who used behavioral health services in 2005 (with or without psychotropic medication use). Adolescents, ages 13-18, had the highest total and mean expenditures; young children, ages 0-5, had the lowest. Adolescents had total expenditures that were 62 percent higher than for 6-12 year olds, although each represents 44 percent of the population of children using behavioral health services. Males had about a 15 percent higher mean expenditure than females.

Exhibit 9: **Behavioral Health Mean and Total Expenditures for Children in Medicaid Using Behavioral Health Services, by Age and Gender, 2005**

Demographics	Mean Expenditure (% of Children Using Behavioral Health Services)	Total Expenditures (% of Total Expenditures)
Age		
0 - 5 years	$ 1,717 (11.1%)	$ 373.6M (4.7%)
6 - 12 years	$ 3,353 (44.4%)	$ 2.9B (36.3%)
13 - 18 years	$5,409 (44.5%)	$ 4.7B (58.8%)
Gender		
Female	$ 3,769 (39.6%)	$ 2.9B (36.3%)
Male	$ 4,318 (60.3%)	$ 5.1B (63.8%)

4. Behavioral Health Mean and Total Expenditures by Aid Category

Exhibit 10 shows mean and total expenditures broken out by aid category for children using behavioral health services in 2005. Children on SSI/disability represented 18 percent of children using behavioral health services but accounted for 27 percent of total expenditures. Children in foster care, who represented 15 percent of all children using behavioral health services, had the highest mean behavioral health expenditure among all children and, at 29 percent, an even higher proportion of total expenditures than children on SSI/disability.

Exhibit 10: **Behavioral Health Mean and Total Expenditures for Children in Medicaid Using Behavioral Health Services, by Aid Category, 2005**

Aid Category	Percent of Children Using Behavioral Health Services	Mean Expenditure	Total Expenditure (% of Total Expenditures for Children's Behavioral Health Services)
TANF	67.2%	$2,682	$3.5B (43.8%)
Foster care	15.0%	$7,825	$2.3B (28.8%)
SSI/disability	17.8%	$6,234	$2.2B (27.5%)

5. Behavioral Health Mean Expenditures by Behavioral Health Diagnosis

Exhibit 11 shows behavioral health mean expenditures by psychiatric diagnosis. Thirty-nine percent of children in Medicaid who used behavioral health care in 2005 had no behavioral health diagnosis. Those with no diagnosis had the lowest mean expenditure compared to children with diagnoses. It is possible that some expenses for this group of children may represent instances where a diagnosis has not yet been made (e.g., those receiving screening/assessment, psychological testing, and/or crisis services).

Exhibit 11: **Mean and Total Expenditures for Children in Medicaid Using Behavioral Health Services, by Psychiatric Diagnosis, 2005**

Behavioral Health Diagnosis	% Children with Diagnosis*	Mean Expenditure**
ADHD	33.4%	$ 5,298
Mood	16.0%	$ 9,831
Anxiety	13.8%	$ 6,816
COD	13.9%	$ 8,144
DD	3.6%	$ 7,590
Psychosis	2.6%	$ 14,482
Other Diagnosis	0.8%	$ 7,398
No Diagnosis	39.1%	$ 1,830

*Percentages across diagnoses cannot be summed to 100% due to overlapping representation (i.e., duplicate counts for children with more than one diagnosis).
**Expenditures pertain to children who used behavioral health services with or without psychotropic medications.

Among children who used behavioral health services and had diagnoses, claims for children diagnosed with psychosis, while a small percentage of children using behavioral health services, had a mean expenditure ($14,482) that was 47 to 173 percent higher than mean expenditures for children with other types of behavioral health diagnoses. This appears attributable in large part to the high cost of anti-psychotic medications (see Section F, Patterns of Psychotropic Medication Use and Expense). Claims associated with children diagnosed with ADHD had the lowest mean expenditure ($5,298) and represented the largest percentage of children with behavioral health diagnoses (33%).

C. Utilization by Service Type

1. Behavioral Health Service Utilization by Service Type

Exhibit 12 shows behavioral health utilization rates by service type among children in Medicaid who used behavioral health services in 2005.

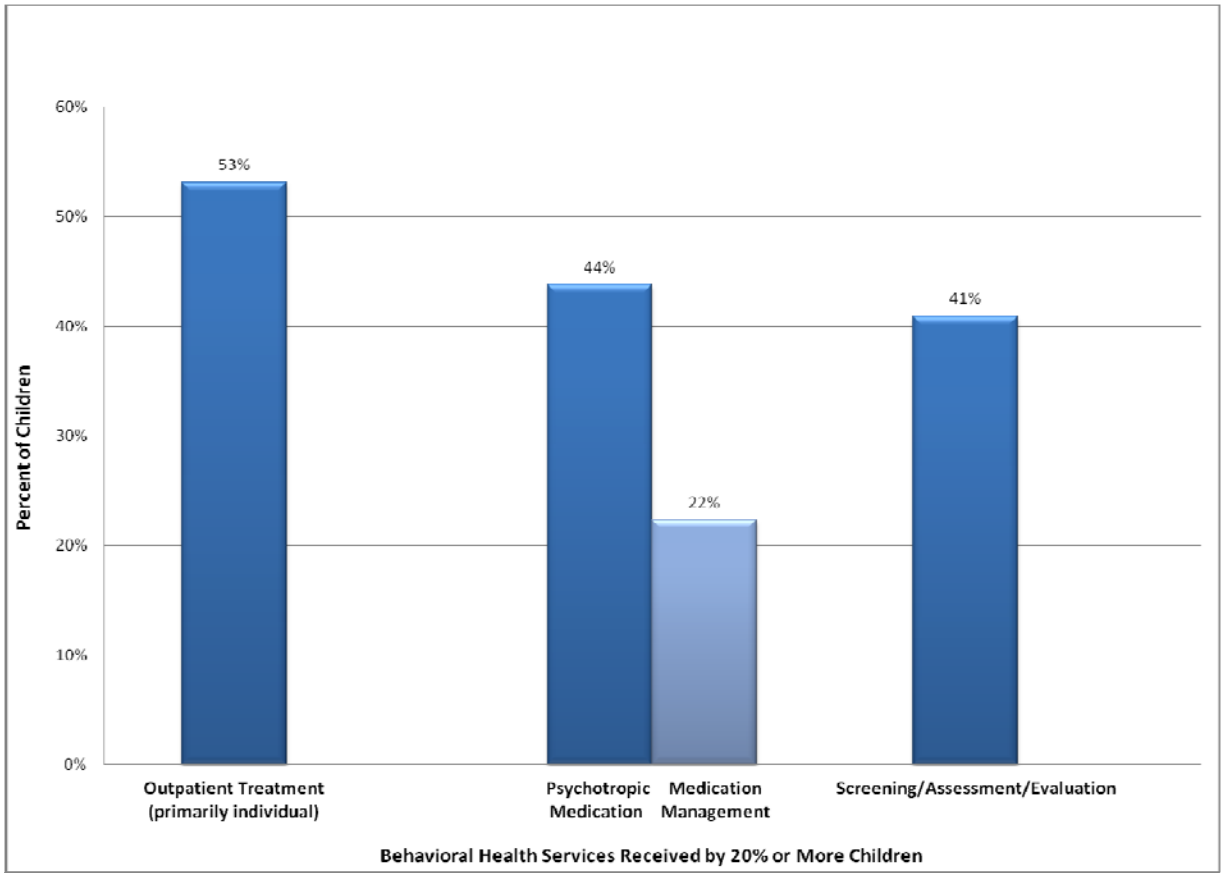
Exhibit 12: **Use of Behavioral Health Services for Children in Medicaid, by Service Type, 2005***

Service Type	% of Children Using Behavioral Health Services	# of Children Using Service Type**
Outpatient treatment (primarily individual)	53.1%	1,039,827
Psychotropic medication	43.8%	857,376
Screening/assessment/evaluation	40.9%	801,449
Medication management	22.3%	436,698
Family therapy/family education and training	19.4%	379,817
Psychosocial rehabilitation	12.4%	242,052
Substance use outpatient	10.5%	206,612
Psychological testing	9.3%	182,546
Initial service planning	8.8%	173,194
Case management	8.7%	170,100
Group therapy	7.6%	138,749
Targeted case management	7.1%	138,666
Behavior management consultation and training	3.9%	76,118
Residential treatment/therapeutic group homes	3.6%	71,003
Crisis intervention and stabilization (non ER)	3.5%	68,148
Inpatient psychiatric treatment	3.3%	65,209
Partial hospitalization/day treatment	3.3%	63,806
Mental health consultation	3.1%	60,570
Substance use screening and assessment	2.9%	57,038
Wraparound	1.1%	22,308
Therapeutic behavioral support	0.8%	15,646
Therapeutic foster care	0.8%	14,758
Substance use inpatient	0.3%	5,887
Respite	0.2%	4,620
Supported housing	0.2%	3,521
Transportation	0.1%	2,465
Emergency room	0.1%	2,233
Peer services	0.1%	1,495
Home-based (e.g., in-home services)	0.1%	1,193
Activity therapies	0.1%	1,116
Telehealth	0.0%***	613
Multisystemic Therapy	0.0%***	102
All Behavioral Health Services	**100%**	**1,958,908**

*Includes 1,958,908 children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.
**Counts of children may be duplicated across service categories.
***Numbers too small to register as percentages.

Exhibit 13 shows utilization rates for the four behavioral health services most frequently used by children in Medicaid in 2005 ("frequently used" is defined as 20 percent or more children used the service). Outpatient treatment (primarily individual), psychotropic medication, screening and assessment, and medication management were the services most likely to be used. The remaining services were used by fewer than 20 percent of children who used behavioral health services. Of particular note: of the 44 percent of children using behavioral health services who were prescribed a psychotropic medication, only half also received medication management consultation.

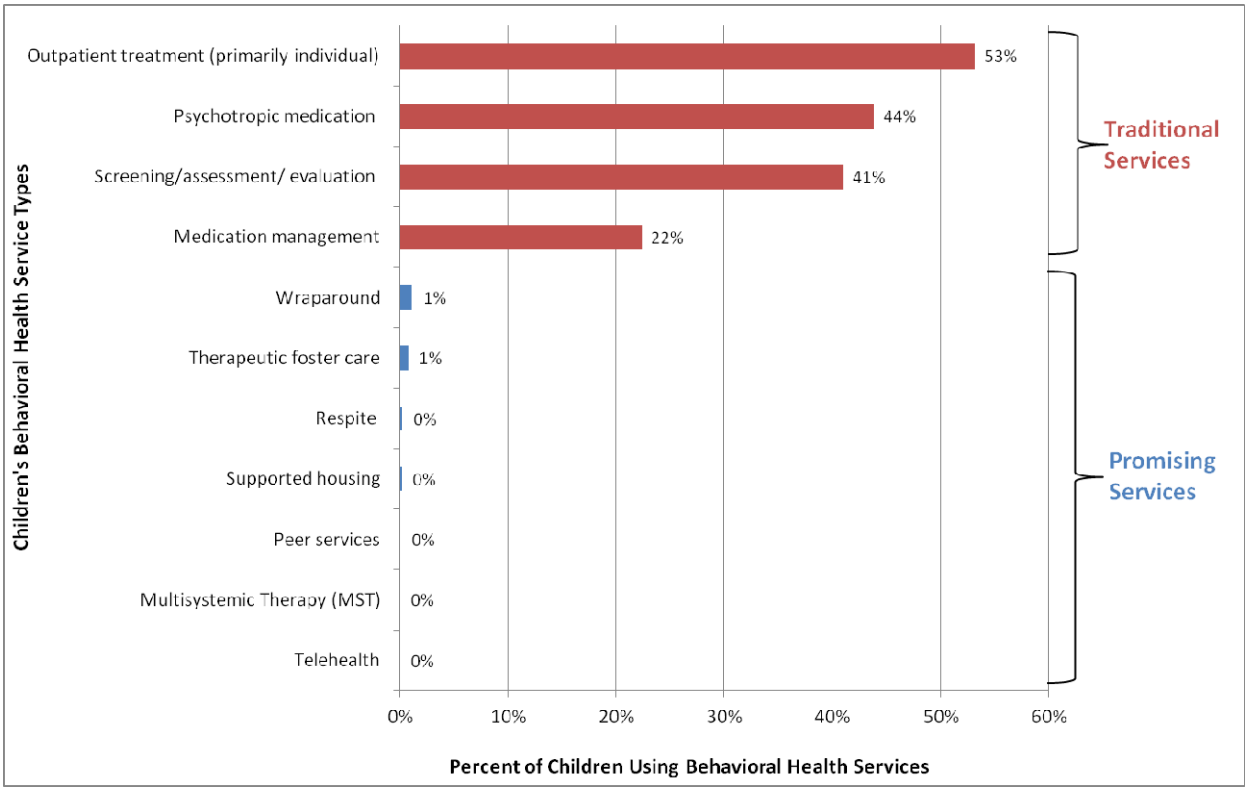
Exhibit 13: **Most Frequently Used Behavioral Health Services among Children in Medicaid, 2005***



* Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.

Exhibit 14 compares behavioral health utilization rates for certain home- and community-based services, some with an emerging evidence base, to rates for the four services most commonly received (in effect, "usual care"). For example, while 44 percent of children had claims for psychotropic medication, one percent or fewer children had claims for wraparound, therapeutic foster care, Multisystemic Therapy (MST), peer support, telehealth, or respite services. The utilization rates for these emerging or documented best practices may be underreported because they may be coded to other service categories, for example, to psychosocial rehabilitation (used by 12% of children); yet even taking coding anomalies into account, utilization of these services is very infrequent. The low utilization may be due both to lack of coverage of these services in Medicaid and lack of availability even when covered.

Exhibit 14: **Behavioral Health Utilization for Traditional vs. Promising Services among Children in Medicaid, 2005***



* Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim. Note: 0% includes numbers of children too small to register as percentages.

An unduplicated count of 243,375 children used some type of substance use disorder service in 2005, about 12 percent of all Medicaid children who used behavioral health services. Among all children using SUD services in 2005, about 77 percent used outpatient treatment, about 21 percent used assessment services, and two percent used substance use inpatient treatment. An estimated 19 percent of the adolescents with behavioral health service utilization (165,552 youth) used SUD services. The estimate for adolescents is overstated because of an unknown amount of duplication of youth across SUD service categories. Exhibit 15 shows substance use disorder service utilization by adolescents, ages 13-18, by SUD service type.

Exhibit 15: **Substance Use Disorder Service Utilization among Adolescents in Medicaid, Ages 13-18, by Service Type, 2005**

Service Type	Number of Adolescents with Behavioral Health Service Use*	Percent of Adolescents with Behavioral Health Service Use**
Substance use disorder screening and assessment	38,559	4.4%
Substance use disorder outpatient	124,482	14.3%
Substance use disorder inpatient	2,869	0.3%

*Adolescents may have received more than one service type, so counts may be duplicated across service types
** Percentages are based on total number of adolescents using behavioral health services (N = 871,330).

2. Representation of Children by Age Across Service Types

Exhibit 16 shows the percentage of children by age using each service type. For example, of all children in Medicaid using behavioral health services in 2005, one million (53%) used outpatient treatment, with almost 8 percent of these children being ages 0-5, 46 percent ages 6-12, and 46 percent ages 13-18.

Young children, ages 0-5, used fewer of most service types compared to children in other age groups. There was little to no use by very young children of services such as residential treatment and group care, substance use disorder services, inpatient psychiatric treatment, and psychotropic medication. Young children, who represent 11 percent of children in Medicaid using behavioral health care, used the following services in proportion to their representation in the behavioral health-using population: family therapy/family education; psychosocial rehabilitation; and targeted case management. They used more of the following services relative to their representation in the population: screening, assessment and evaluation; psychological testing; therapeutic foster care; and telehealth.

Children ages 6-12, who comprised 44 percent of children in Medicaid using behavioral health care, used most service types in roughly the same proportion to their representation in the behavioral health-using population. They used fewer substance use disorder services; targeted case management; residential treatment and group care; crisis and emergency room services; inpatient psychiatric treatment; therapeutic behavioral supports; therapeutic foster care; and MST than older children but had greater use of: behavioral management and mental health consultation services and telehealth.

Unlike younger children (both 0-5 and 6-12), who used most service types either in rough proportion to or *less* than their representation in the population using services, older youth, ages 13-18, used most service types either in proportion to or *more* than their representation in the population using services. Older youth, who comprised 45 percent of children in Medicaid using behavioral health care, were significantly overrepresented in use of: substance use screening and assessment; substance use outpatient; targeted case management; residential treatment and therapeutic group homes; crisis and emergency room services; inpatient psychiatric treatment; therapeutic behavioral support; therapeutic foster care; supported housing; in-home services; and MST services. They were underrepresented in use of: family therapy/family education; psychological testing; and telehealth services.

Exhibit 16: **Distribution of Age among Children in Medicaid Using Behavioral Health Services, by Service Type, 2005***

Service Type	Children Using Behavioral Health Services *N = 1,958,908** (100%)*	Age 0-5 *N = 217,584 (11%)*	Age 6-12 *N = 869,994 (44%)*	Age 13-18 *N = 871,330 (45%)*
Outpatient treatment (primarily individual)	53.1% (1,039,827)	7.6%	46.4%	46.0%
Psychotropic medication	43.8% (857,376)	3.8%	47.7%	48.5%
Screening/assessment/evaluation	40.9% (801,449)	12.6%	45.5%	41.9%
Medication management	22.3% (436,698)	4.0%	47.4%	48.5%
Family therapy/family education and training	19.4% (379,817)	11.3%	49.7%	39.0%
Psychosocial rehabilitation	12.4% (242,052)	11.5%	42.1%	46.5%
Substance use outpatient	10.5% (206,612)	5.6%	34.1%	60.2%
Psychological testing	9.3% (182,546)	14.4%	49.0%	36.5%
Initial service planning	8.8% (173,194)	9.2%	47.1%	43.8%
Case management	8.7% (170,100)	8.0%	46.6%	45.4%
Group therapy	7.6% (148,749)	5.4%	44.4%	50.2%
Targeted case management	7.1% (138,666)	11.2%	39.5%	49.2%
Behavior management consultation and training	3.9% (76,118)	9.6%	50.2%	40.2%
Residential treatment/therapeutic group homes	3.6% (71,003)	1.2%	25.5%	73.3%
Crisis intervention and stabilization (non ER)	3.5% (68,148)	3.0%	31.1%	65.9%
Inpatient psychiatric treatment	3.3% (65,209)	9.7%	25.8%	64.5%
Partial hospitalization/day treatment	3.3% (63,806)	9.2%	41.6%	49.2%
Mental health consultation	3.1% (60,570)	6.7%	50.5%	42.8%
Substance use screening and assessment	2.9% (57,038)	6.4%	26.0%	67.6%
Wraparound	1.1% (22,308)	6.9%	45.0%	48.1%
Therapeutic behavioral support	0.8% (15,646)	9.8%	17.8%	72.4%
Therapeutic foster care	0.8% (14,758)	12.3%	27.7%	60.0%
Substance use inpatient	0.3% (5,887)	8.4%	42.9%	48.7%
Respite	0.2% (4,620)	5.2%	49.0%	45.7%
Supported housing	0.2% (3,521)	1.5%	45.9%	52.6%
Transportation	0.1% (2,465)	3.6%	47.5%	48.9%
Emergency room	0.1% (2,233)	0.4%	16.9%	82.7%
Peer services	0.1% (1,495)	8.0%	43.5%	48.4%
Home-based (e.g., in-home services)	0.1% (1,193)	1.8%	43.6%	54.6%
Activity therapies	0.1% (1,116)	3.9%	47.7%	48.5%
Telehealth	0.0% (613)	16.8%	58.1%	25.1%
Multisystemic Therapy	0.0% (102)	0.0%	5.9%	94.1%

* Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.
**Includes duplicated counts of children across service categories.

3. Distribution within Age Categories of Children Using Behavioral Health Services by Service Type

Exhibit 17 shows the proportion of children within each age bracket who used each service type – for example, 36.5 percent of 0-5 year-olds who used behavioral health services in 2005 used outpatient treatment, compared to 55.4 percent of 6-12 year-olds and 54.9 percent of 13-18 year-olds.

Adolescents, ages 13-18, relative to the other age groups, were more likely to use all of the service types, with the exception of psychotropic medications (used in the same proportion by 6-12 year-olds) and mental health consultation (more likely to be used by 6-12 year-olds). Adolescents used residential treatment and group homes and therapeutic behavioral supports at nearly three times the rate of 6-12 year-olds and nearly six times the rate of 0-5 year-olds. Of adolescents using behavioral health services in 2005, six percent used residential treatment/ group homes, compared to 0.4 percent of 0-5 year-olds who used behavioral health services and 2.1 percent of 6-12 year-olds. Because adolescents are more likely to use virtually all service types relative to the other age groups, and particularly higher-end, higher-cost services, there are opportunities for improving the quality and cost of care through approaches targeted to this older age cohort of youth.

Young children, ages 0-5, represented a relatively small proportion of the population who used behavioral health services in 2005. While the most frequently used service in this age category was screening and assessment, 0-5 year olds were relatively more likely to use inpatient psychiatric treatment, therapeutic behavioral supports, and therapeutic foster care than children ages 6-12. Of young children, ages 0-5, who used behavioral health services in 2005, 2.9 percent used inpatient psychiatric treatment, compared to 1.9 percent of children ages 6-12. The higher relative use of inpatient care by young children may be reflective of the lack of specialized placements staffed to care for children in this age group. Although the early childhood field cites the importance of mental health consultation services for children 0-5, this population used less of this service, proportionally, than the other age groups.[41] The low use of mental health consultation services by young children may be overstated because of coding issues where, for example, consultation is billed as screening and assessment.

Children ages 6-12 were more likely than children in general to use the following service types in 2005: outpatient treatment; family therapy/family education; regular case management; behavioral management consultation; mental health consultation; and respite (Exhibit 18).

Exhibit 17: **Distribution of Service Type within Age Category among Children in Medicaid Using Behavioral Health Services, 2005***

Service Type	Children Using Behavioral Health Services** *N = 1,958,908*	Ages 0-5 *N = 217,584 (100%)*	Ages 6-12 *N = 869,994 (100%)*	Ages 13-18 *N = 871,330 (100%)*
Outpatient treatment, primarily individual	53.1% (1,039,827)	36.5%	55.4%	54.90%
Psychotropic medication	43.8% (857,376)	14.9%	47.0%	47.7%
Screening/assessment/evaluation	40.9% (801,449)	46.4%	41.9%	38.6%
Medication management	22.3% (436,698)	8.1%	23.8%	24.3%
Family therapy/family education and training	19.4% (379,817)	19.7%	21.7%	17.0%
Psychosocial rehabilitation	13.8% (242,052)	12.7%	11.7%	12.9%
Substance use outpatient	12.4% (206,612)	5.3%	8.1%	14.3%
Psychological testing	10.5% (182,546)	12.1%	10.3%	7.7%
Initial service planning	9.3% (173,194)	7.3%	9.4%	8.7%
Case management	8.8% (170,100)	6.3%	9.1%	8.9%
Group therapy	8.7% (148,749)	3.7%	7.6%	8.6%
Targeted case management	7.6% (138,666)	7.2%	6.3%	7.8%
Behavior management consultation and training	7.1% (76,118)	3.4%	4.4%	3.5%
Residential treatment/therapeutic group homes	3.9% (71,003)	0.4%	2.1%	6.0%
Crisis intervention and stabilization (non ER)	3.6% (68,148)	0.9%	2.4%	5.2%
Inpatient psychiatric treatment	3.5% (65,209)	2.9%	1.9%	4.8%
Partial hospitalization/day treatment	3.3% (63,806)	2.7%	3.1%	3.6%
Mental health consultation	3.3% (60,570)	1.9%	3.5%	3.0%
Substance use screening and assessment	3.1% (57,038)	1.7%	1.7%	4.4%
Wraparound	2.9% (22,308)	0.7%	1.2%	1.2%
Therapeutic behavioral support	1.1% (15,646)	0.7%	0.3%	1.3%
Therapeutic foster care	0.8% (14,758)	0.8%	0.5%	1.0%
Substance use inpatient	0.3% (5,887)	0.2%	0.3%	0.3%
Respite	0.2% (4,620)	0.1%	0.3%	0.2%
Supported housing	0.2% (3,521)	0.0%	0.2%	0.2%
Transportation	0.1% (2,465)	0.0%	0.1%	0.1%
Emergency room	0.1% (2,233)	0.0%	0.0%	0.2%
Peer services	0.1% (1,495)	0.1%	0.1%	0.1%
Home-based (e.g., in-home services)	0.1% (1,193)	0.0%	0.1%	0.1%
Activity treatment	0.1% (1,116)	0.0%	0.1%	0.1%
Telehealth	0.0% (613)	0.0%	0.0%	0.0%
Multisystemic Therapy	0.0% (102)	0.0%	0.0%	0.0%

* Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.
**Includes duplicated counts of children across service categories.

4. Representation of Children by Aid Category Across Service Types

Exhibit 18 shows the percentage by aid category of all children in Medicaid using behavioral health services in 2005 for each service type. For example, among the one million children who had outpatient treatment, 67.1 percent were TANF-enrolled, 17.3 percent were children in foster care, and 15.6 percent were children on SSI/disability.

Relative to their proportion in the overall population of children in Medicaid using behavioral health services in 2005, TANF children, who represented 67 percent of all children in Medicaid using behavioral health care in 2005, were significantly overrepresented in only two types of services compared to other aid categories of children: substance use inpatient treatment and MST. They were significantly underrepresented in many other service types compared to other aid categories of children, including: wraparound; therapeutic behavioral supports; therapeutic foster care; home-based services; and activity therapies. This lower relative service use may be appropriate to clinical need, or it may be due to access barriers, including benefit or waiver criteria that make some services available only to certain populations, such as children in foster care or those who meet disability criteria.

Children in foster care, who comprised 15 percent of all children in Medicaid using behavioral health care in 2005, were disproportionately represented in most service types, some significantly, in contrast to the overall population of behavioral health users. These included: residential treatment and therapeutic group homes; psychotropic medication; inpatient psychiatric treatment; therapeutic behavioral supports; therapeutic foster care; and emergency room services. They were significantly underrepresented in use of home-based services and MST.

Children on SSI/disability, who comprised 17.8 percent of children in Medicaid using behavioral health care in 2005, were significantly overrepresented among those using psychotropic medications, as well as non-traditional service types such as: wraparound; respite; home-based; and activity therapy services. This disproportional use of non-traditional services may be attributable to eligibility for waivers more likely to cover these services. They were significantly less likely to use substance use inpatient treatment services and MST.

Exhibit 18: **Distribution of Aid Categories among Children in Medicaid Using Behavioral Health Services, by Service Type, 2005***

Service Type	All Medicaid Children *N = 1,958,908** (100%)*	TANF *N = 1,316,635 (67%)*	Foster Care *N = 293,885 (15%)*	SSI/Disabled *N = 348,338 (18%)*
Outpatient treatment (primarily individual)	53.1% (1,039,827)	67.1%	17.3%	15.6%
Psychotropic medication	43.8% (857,376)	58.3%	16.9%	24.8%
Screening/assessment/evaluation	40.9% (801,449)	69.7%	15.2%	15.1%
Medication management	22.3% (436,698)	56.9%	18.6%	24.4%
Family therapy/family education and training	19.4% (379,817)	68.6%	15.6%	15.8%
Psychosocial rehabilitation	13.8% (242,052)	62.3%	14.0%	23.7%
Substance use outpatient	12.4% (206,612)	66.0%	19.3%	14.6%
Psychological testing	10.5% (182,546)	59.6%	20.5%	19.9%
Initial service planning	9.3% (173,194)	64.0%	14.3%	21.7%
Case management	8.8% (170,100)	62.3%	13.1%	24.6%
Group therapy	8.7% (148,749)	63.3%	18.0%	18.7%
Targeted case management	7.6% (138,666)	55.6%	21.2%	23.2%
Behavior management consultation and training	7.1% (76,118)	59.2%	15.6%	25.2%
Residential treatment/therapeutic group homes	3.9% (71,003)	50.1%	25.3%	24.5%
Crisis intervention and stabilization (non ER)	3.6% (68,148)	60.7%	19.3%	19.9%
Inpatient psychiatric treatment	3.5% (65,209)	56.7%	23.0%	20.2%
Partial hospitalization/day treatment	3.3% (63,806)	55.7%	19.3%	25.0%
Mental health consultation	3.3% (60,570)	61.3%	12.2%	26.5%
Substance use screening and assessment	3.1% (57,038)	70.5%	18.6%	10.9%
Wraparound	2.9% (22,308)	48.1%	14.6%	37.3%
Therapeutic behavioral support	1.1% (15,646)	36.3%	44.4%	19.3%
Therapeutic foster care	0.8% (14,758)	22.4%	60.4%	17.2%
Substance use inpatient	0.8% (5,887)	76.4%	13.9%	9.8%
Respite	0.3% (4,620)	50.5%	16.8%	32.7%
Supported housing	0.2% (3,521)	63.1%	15.1%	21.8%
Transportation	0.1% (2,465)	66.6%	12.3%	21.1%
Emergency room	0.1% (2,233)	46.3%	32.4%	21.4%
Peer services	0.1% (1,495)	63.3%	14.1%	22.5%
Home-based (e.g. in-home services)	0.1% (1,193)	20.2%	6.7%	73.1%
Activity therapies	0.1% (1,116)	37.4%	13.7%	48.9%
Telehealth	0.0% (613)	60.2%	25.3%	14.5%
Multisystemic Therapy	0.0% (102)	93.1%	3.9%	2.9%

* Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.
**Includes unduplicated counts of children within service categories and all-services total counts, and duplicated counts of children across service categories.

5. Distribution *within* Aid Categories of Children Using Behavioral Health Services by Service Type

Exhibit 19 shows the proportion of children within each Medicaid aid category (TANF, foster care, SSI/disabled) who used each service type. For example, 53 percent of TANF children who used behavioral health services in 2005 used outpatient treatment, compared to 61.3 percent of children in foster care and 46.6 percent of children on SSI/disability.

Exhibit 19: **Distribution of Service Type within Aid Category among Children in Medicaid Using Behavioral Health Services, 2005***

Service Type	Children Using Behavioral Health Services** *N = 1,958,908*	TANF *N = 1,316,635 (100%)*	Foster Care *N = 293,885 (100%)*	SSI/ Disabled *N = 348,338 (100%)*
Outpatient treatment (primarily individual)	53.1% (1,039,827)	53.0%	61.3%	46.6%
Psychotropic medication	43.8% (857,376)	37.9%	49.3%	61.2%
Screening/assessment/evaluation	40.9% (801,449)	42.4%	41.4%	34.8%
Medication management	22.3% (436,698)	18.9%	27.7%	30.6%
Family therapy/family education and training	19.4% (379,817)	19.8%	20.2%	17.3%
Psychosocial rehabilitation	13.8% (242,052)	11.5%	11.5%	16.5%
Substance use outpatient	12.4% (206,612)	10.4%	13.6%	8.7%
Psychological testing	10.5% (182,546)	8.3%	12.7%	10.4%
Initial service planning	9.3% (173,194)	8.4%	8.4%	10.8%
Case management	8.8% (170,100)	8.0%	7.6%	12.0%
Group therapy	8.7% (148,749)	7.1%	9.1%	8.0%
Targeted case management	7.6% (138,666)	5.9%	10.0%	9.2%
Behavior management consultation and training	7.1% (76,118)	3.4%	4.1%	5.5%
Residential treatment/therapeutic group homes	3.9% (71,003)	2.7%	6.1%	5.0%
Crisis intervention and stabilization (non ER)	3.6% (68,148)	3.1%	4.5%	3.9%
Inpatient psychiatric treatment	3.5% (65,209)	2.8%	5.1%	3.8%
Partial hospitalization/day treatment	3.3% (63,806)	2.7%	4.2%	4.6%
Mental health consultation	3.3% (60,570)	2.8%	2.5%	4.6%
Substance use screening and assessment	3.1% (57,038)	3.1%	3.6%	1.8%
Wraparound	2.9% (22,308)	0.8%	1.1%	2.4%
Therapeutic behavioral support	1.1% (15,646)	0.4%	2.4%	0.9%
Therapeutic foster care	0.8% (14,758)	0.3%	3.0%	0.7%
Substance use inpatient	0.3% (5,887)	0.3%	0.3%	0.2%
Respite	0.3% (4,620)	0.2%	0.3%	0.4%
Supported housing	0.2% (3,521)	0.2%	0.2%	0.2%
Transportation	0.1% (2,465)	0.0%***	0.1%	0.2%
Emergency room	0.1% (2,233)	0.1%	0.2%	0.1%
Peer services	0.1% (1,495)	0.0%***	0.0%***	0.3%
Home-based (e.g. in-home services)	0.1% (1,193)	0.1%	0.1%	0.1%
Activity therapies	0.1% (1,116)	0.1%	0.1%	0.1%
Telehealth	0.1% (613)	0.0%***	0.0%***	0.0%***
Multisystemic Therapy	0.0%*** (102)	0.0%***	0.1%	0.0%***

* Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.
**Includes unduplicated counts of children within service categories and all-services total counts, and duplicated counts of children across service categories.
***Values were too low to register.

There were key differences in utilization by service type based on aid category. The foster care population, relative to the other aid categories of children, was more likely to use the following service types: outpatient treatment; substance use outpatient treatment; psychological testing; targeted case management; residential treatment/group homes; crisis services; inpatient psychiatric treatment; therapeutic behavioral supports; emergency room use; and psychotropic medication. Among these treatments are some of the most expensive and intensive behavioral health service types. This analysis confirms earlier studies indicating that children in foster care are often overrepresented in restrictive service settings and among recipients of psychotropic medication.[42,43] The only categories of behavioral health services that children in foster care were less likely to use than children in other aid categories were home-based services and mental health consultation.

Children on SSI/disability were more likely than children in other aid categories to use the following services: psychotropic medications; psychosocial rehabilitation; partial hospitalization/day treatment; wraparound; activity therapies; and respite. They were the least likely aid category of children to use: outpatient treatment; substance use outpatient treatment; and substance use inpatient treatment.

The only category of service that TANF-enrolled children were more likely to use compared to children in other aid categories was screening and assessment.

D. Expenditures by Service Type

1. Total Behavioral Health Expenditures by Service Type

Exhibit 20 shows total expenditures by service type, in hierarchical order by expense, for children in Medicaid who used behavioral health services in 2005 and the percent of children who used each service. Consistent with national efforts to create hospital alternatives, inpatient psychiatric hospitalization was not among the major cost drivers for children in Medicaid using behavioral health care in 2005 (5.4 percent of all expenditures for 3.3 percent of children receiving this service). However, residential treatment and therapeutic group homes accounted for the largest percentage of total expenditures – 19.2 percent (for 3.6% of children served). The second highest total expenditure after residential and group care was for outpatient treatment, which accounted for 16.5 percent of all expenditures (for 53.1%of children served). Psychotropic medications accounted for the third highest total expenditures (13.5 percent of total expenditures for 43.8 percent of children served). Psychosocial rehabilitation services accounted for 10.3 percent of total spending (for 12.4% of children served). Together, these four services accounted for nearly 60 percent of total expenditures for children in Medicaid using behavioral health services in 2005, with restrictive service setting use (hospital, residential and group home) representing approximately 25percent of total behavioral health service expense.

Spending on all home- and community-based services combined – including: therapeutic foster care; family therapy and education; therapeutic behavioral support; behavioral management consultation; wraparound; crisis intervention and stabilization; in-home services; respite, MST, and peer support -- accounted for less than 10 percent of total expenditures for children in Medicaid using behavioral health services in 2005 (expenditures may be understated because spending for some of these services may be captured in psychosocial rehabilitation service expense).

When combined, substance use screening and assessment, substance use outpatient and substance use inpatient accounted for less than 10 percent (9.7%) of total expenditures for all children who used behavioral health services and 13 percent of expenditures for adolescents, age 13-18 (see also Exhibit 22).

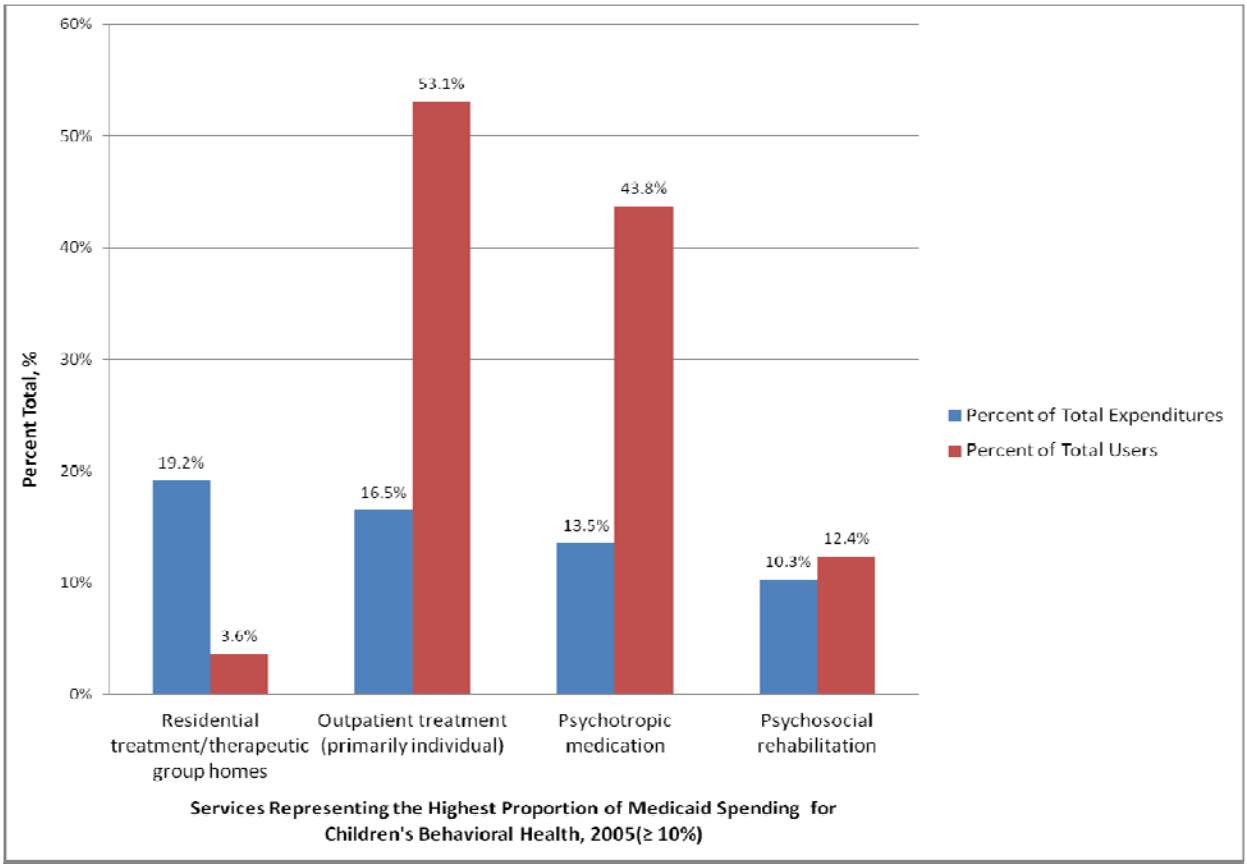
Exhibit 20: **Expenditures and Utilization for Children in Medicaid Using Behavioral Health Services, by Service Type, 2005***

Service Type	Expenditure**	Percent of Total	Percent of Child Behavioral Health Users
Residential treatment/therapeutic group homes	$1.5B	19.2%	3.6%
Outpatient treatment (primarily individual)	$1.3B	16.5%	53.1%
Psychotropic medications	$1.1B	13.5%	43.8%
Psychosocial rehabilitation	$826.9M	10.3%	12.4%
Substance use outpatient	$749M	9.3%	10.5%
Inpatient psychiatric treatment	$433.8M	5.4%	3.3%
Partial hospitalization/day treatment	$366.7M	4.6%	3.3%
Targeted case management	$233.4M	2.9%	7.1%
Case management	$209.8M	2.6%	8.7%
Screening/assessment/evaluation	$175.2M	2.2%	40.9%
Therapeutic foster care	$165.5M	2.1%	0.8%
Family therapy/family education and training	$162.6M	2.0%	19.4%
Medication management	$153.5M	1.9%	22.3%
Therapeutic behavioral support	$122.3M	1.5%	0.8%
Behavior management consultation and training	$116.9M	1.5%	3.9%
Group therapy	$89M	1.1%	7.6%
Wraparound	$77.4M	1.0%	1.1%
Psychological testing	$48.2M	0.6%	9.3%
Crisis intervention and stabilization (non ER)	$45.5M	0.6%	3.5%
Substance use inpatient	$28.1M	0.3%	0.3%
Initial service planning	$26.4M	0.3%	8.8%
Home-based (e.g., in-home services)	$20.5M	0.3%	0.1%
Substance use screening and assessment	$14M	0.2%	2.9%
Supported housing	$8.1M	0.1%	0.2%
Respite	$3M	0.0%***	0.2%
Emergency room	$2.6M	0.0%***	0.1%
Activity therapies	$1.9M	0.0%***	0.1%
Peer services	$0.7M	0.0%***	0.1%
Mental health consultation	$0.4M	0.0%***	3.1%
Telehealth	$0.3M	0.0%***	0.0%***
Multisystemic Therapy	$0.2M	0.0%***	0.0%***
Transportation	$0***	0.0%***	0.1%
Total	**$8.03B**	**100.0%**	

*Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.
**Expenditures are based on 1.2M children in fee-for-service arrangements and extrapolated to children in capitated managed care.
***Values were too low to register.

Exhibit 21 compares total expenditures for the top four highest expenditure services with their utilization rates.

Exhibit 21: **Comparison of Expenditure and Utilization Rates for Services with Highest Total Expenditure, 2005***



*Expenditures are based on 1.2M children in fee-for-service arrangements and extrapolated to children in capitated managed care. Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.

Exhibit 22 shows utilization and expenditures associated with use of substance use disorder services by Medicaid adolescents in 2005. The total amount spent in 2005 on adolescents for SUD services was $595.8M, representing 12.6 percent of all behavioral health Medicaid expenditures for adolescents in 2005.

Exhibit 22: **Utilization and Expenditures for Substance Use Disorder Services for Adolescents in Medicaid, 2005**

Service Type*	Adolescents Using Behavioral Health Services N=871,330**	Mean Expenditure	Total Expenditure
Substance use screening and assessment	38,559 (4.4%)*	$256	$9.9M
Substance use outpatient	124,482 (14.3%)*	$4,584	$570.6M
Substance use inpatient	2,869 (0.3%)*	$5,318	$15.3M
Substance use total	165,910 (19%)*		$595.8M

*Adolescents may have received more than one service type, so counts may be duplicated across service types and total user counts.
** Percentages are based upon total number of adolescents using behavioral health services (N = 871,330).

2. Mean Behavioral Health Expenditures by Service Type

Exhibit 23 shows mean expenditures by service type for behavioral health services used by children in Medicaid in 2005.

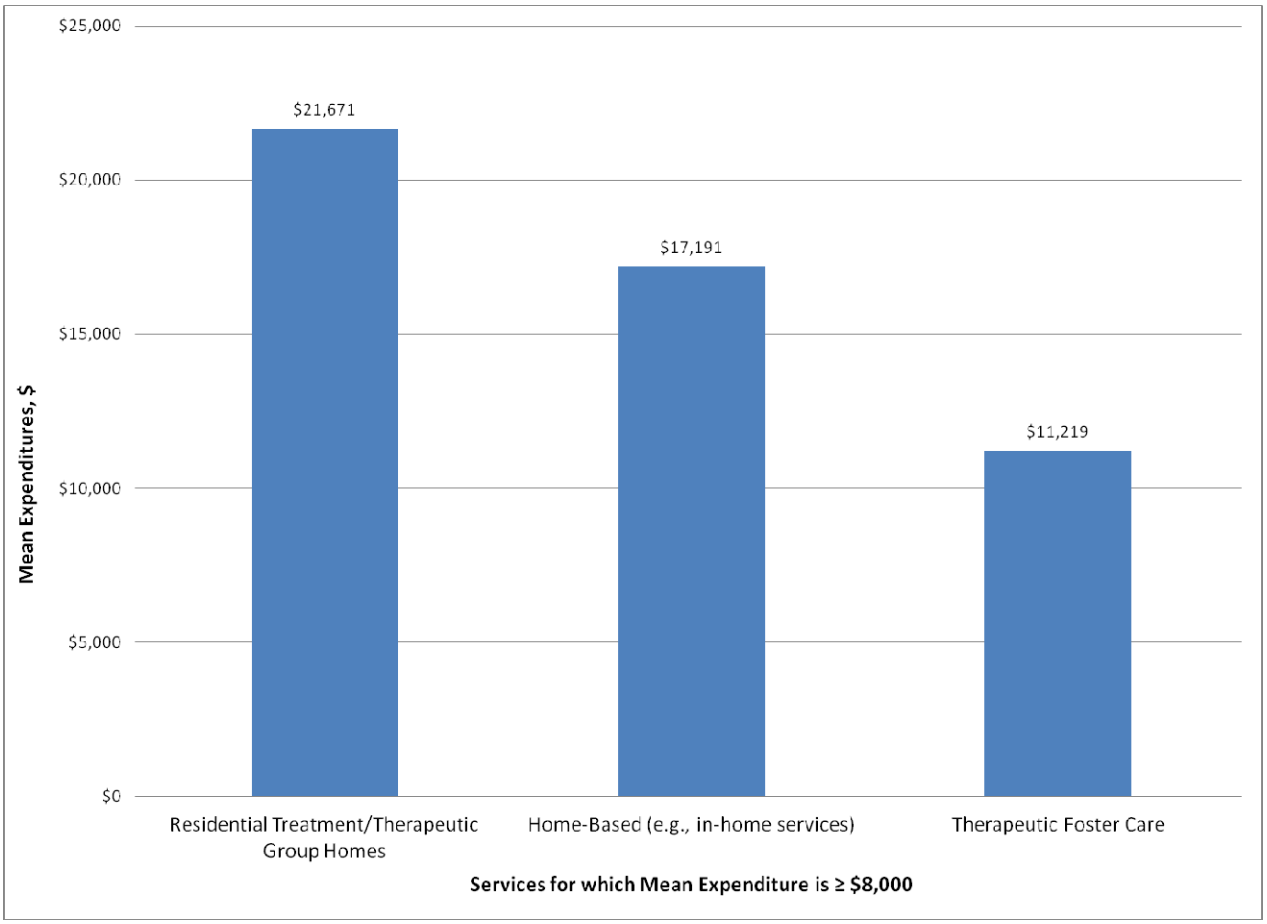
Exhibit 23: **Mean Expenditures for Children in Medicaid Using Behavioral Health Services, by Service Type, 2005***

Service Type	Mean Expenditure
Residential treatment/therapeutic group homes	$21,671
Home-based (e.g., in-home services)	$17,191
Therapeutic foster care	$11,219
Therapeutic behavioral support	$7,821
Inpatient psychiatric treatment	$6,652
Partial hospitalization/day treatment	$5,746
Substance use inpatient	$4,773
Substance use outpatient	$3,625
Wraparound	$3,467
Psychosocial rehabilitation	$3,416
Supported housing	$2,315
Targeted case management	$1,683
Multisystemic Therapy (MST)	$1,662
Activity therapies	$1,658
Behavior management consultation and training	$1,535
Outpatient treatment (primarily individual)	$1,275
Psychotropic medication	$1,267
Case management	$1,233
Emergency room (ER)	$1,162
Crisis intervention and stabilization (non ER)	$667
Respite	$649
Group therapy	$598
Telehealth	$495
Peer services	$492
Family therapy/family education and training	$428
Medication management	$352
Psychological testing	$264
Substance use screening and assessment	$245
Screening/assessment/evaluation	$219
Initial service planning	$153
Mental health consultation	$6
Transportation	$0**

*Expenditures are based on 1.2M children in fee-for-service arrangements and extrapolated to children in capitated managed care. Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.
**Expenditures were too low to register.

Residential treatment/therapeutic group homes had the highest mean expenditure, at $21,671 per child served. Home-based services had the second highest mean expenditure, at $17,191 per child served, followed by therapeutic foster care at $11,219 per child served. Fewer than one percent of children in Medicaid who used behavioral health care in 2005 used home-based and therapeutic foster care services.

Exhibit 24: **Medicaid Children's Behavioral Health Services with Highest Mean Expenditures, 2005***



*Expenditures are based on 1.2M children in fee-for-service arrangements and extrapolated to children in capitated managed care. Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.

3. Total Child Behavioral Health Expenditures by Service Type, by Age

Exhibit 25 shows total expenditures by service type and age, for children in Medicaid using behavioral health services in 2005. Adolescents, ages 13-18, represented 44.5 percent of overall children in Medicaid using behavioral health services in 2005, and accounted for nearly 60 percent of overall expenditures. Children ages 6-12 represented nearly the same proportion of children using behavioral health services as adolescents at roughly 44 percent, but accounted for only 36 percent of expenditures. Young children, ages 0-5, utilized under five percent of total dollars, though they accounted for 11 percent of children using services.

Exhibit 25: **Total Expenditures for Medicaid Children's Behavioral Health Services, by Service Type and Age, 2005***

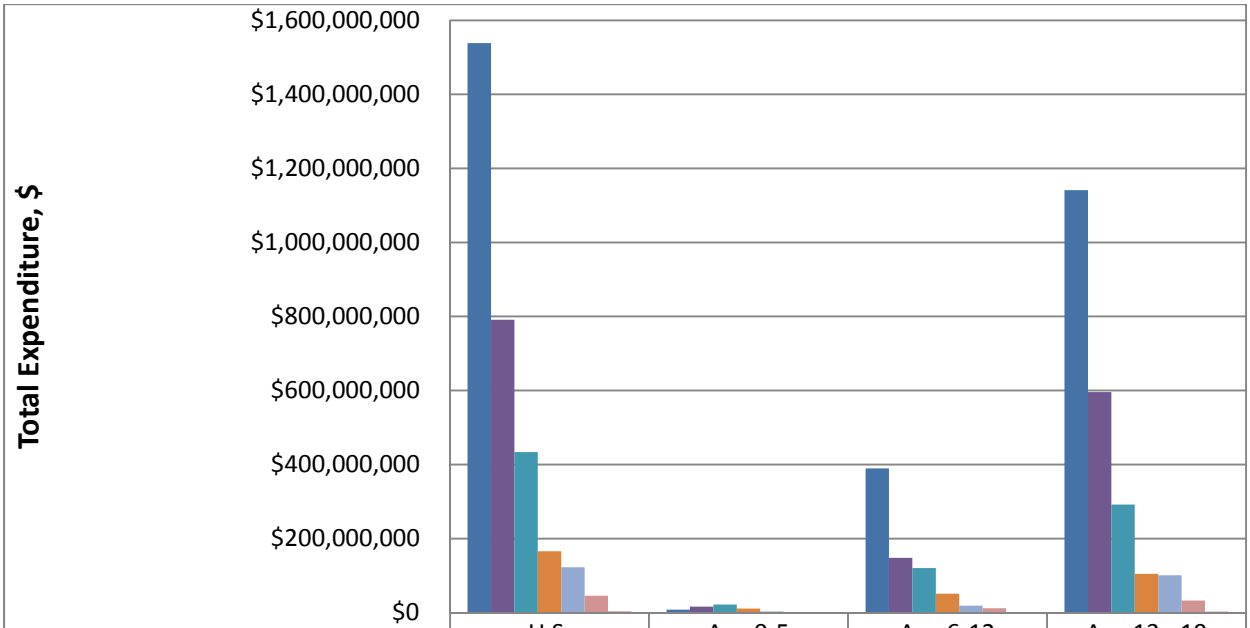
Service Type	Children Using Behavioral Health Services** *N = 1,958,908 (100%)*	Age 0-5 *N = 217,584 (11%)*	Age 6-12 *N = 869,994 (44%)*	Age 13-18 *N = 871,330 (45%)*
Residential treatment/therapeutic group homes	$1.5B	$8.0M	$389.6M	$1.1B
Outpatient treatment (primarily individual)	$1.3B	$78.1M	$602.8M	$645.2M
Psychotropic medication	$1.1B	$21.7M	$490.5M	$574.7M
Psychosocial rehabilitation	$826.9M	$59.5M	$330.9M	$436.6M
Substance use outpatient	$749.0M	$15.2M	$144.7M	$570.6M
Inpatient psychiatric treatment	$433.8M	$21.9M	$120.4M	$291.8M
Partial hospitalization/day treatment	$366.7M	$34.3M	$153.5M	$178.9M
Targeted case management	$233.4M	$27.3M	$84.4M	$121.7M
Case management	$209.8M	$14.6M	$100.4M	$94.8M
Screening/assessment/evaluation	$175.2M	$23.5M	$76.3M	$75.3M
Therapeutic foster care	$165.6M	$11.0M	$51.0M	$104.6M
Family therapy/family education and training	$162.6M	$16.0M	$83.0M	$63.8M
Medication management	$153.5M	$4.1M	$70.7M	$78.6M
Therapeutic behavioral support	$122.4M	$2.9M	$18.7M	$100.7M
Behavior management consultation and training	$116.9M	$14.8M	$60.0M	$42.1M
Group therapy	$89.0M	$6.1M	$41.2M	$41.6M
Wraparound	$77.4M	$3.7M	$31.9M	$41.7M
Psychological testing	$48.2M	$5.6M	$23.6M	$19.0M
Crisis intervention and stabilization (non ER)	$45.5M	$0.9M	$12.0M	$32.5M
Substance use inpatient	$28.1M	$39,146	$0.3M	$15.3M
Initial service planning	$26.4M	$2.9M	$13.5M	$10.1M
Home-based (e.g., in-home services)	$20.5M	$0.1M	$7.3M	$12.9M
Substance use screening and assessment	$14.0M	$0.9M	$3.0M	$9.9M
Supported housing	$8.1M	$0.1M	$3.0M	$5.1M
Respite	$3.0M	$0.1M	$1.9M	$1.1M
Emergency room (ER)	$2.6M	$8,101	$0.4M	$2.1M
Activity therapies	$1.9M	$36,413	$0.8M	$1.0M
Peer services	$0.7M	$0***	$0.7M	$0.2M
Mental health consultation	$0.4M	$0.02M	$0.2M	$0.1M
Telehealth	$0.3M	$0.03M	$0.2M	$0.09M
Multisystemic Therapy (MST)	$0.2M	$0***	$0.02M	$0.1M
Transportation	$0.0M	$0***	$0***	$0***
All Behavioral Health Services	**$8,032,854,496 (100%)**	**$373,574,124 (4.7%)**	**$2,917,080,177 (36.3%)**	**$4,713,419,085 (58.7%)**

*Expenditures are based on 1.2 million children in FFS arrangements and extrapolated to children in capitated managed care.
**Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include expenditures for children with psychotropic medications use and no other behavioral health service claim.
***Expenditures were too low to register.

As Exhibit 26 shows, children 0-5 years old represented the smallest percentage of overall behavioral health service use (11%) and had the lowest utilization rates for all service types, relative to older children. The remaining 89 percent of service use was divided approximately equally between 6-12-year-olds and 13-18-year-olds; however, more was spent in total on adolescents for almost every type of service. For certain services, the differences in spending on adolescents versus children ages 6-12 were especially striking: older youth used three times the amount of dollars for residential treatment/group care; four and a half times the resources for substance use disorder services; more than twice the dollars for inpatient psychiatric treatment and therapeutic foster care; over five times the resources for therapeutic behavioral supports; over two and a half times as much for crisis services and nearly five times as much for emergency room services. As noted earlier, the data illustrate the importance of more customized approaches to managing the quality and cost of care for adolescents.

There were a minority of service types where more was spent on children ages 6-12, which included: regular case management; screening and assessment; family therapy/education; behavior management; psychological testing; respite; peer support; mental health consultation; and telehealth.

Exhibit 26: **Total Expenditures for Medicaid Children's Behavioral Health Services for Selected Service Types, 2005***



	U.S.	Age 0-5	Age 6-12	Age 13 - 19
Residential treatment/therapeutic group homes	$1,538,706,013	$8,027,034.00	$389,615,688	$1,141,122,276
Substance abuse total (all substance abuse services)	$791,104,991	$16,171,958	$148,040,819	$595,771,001
Inpatient psychiatric treatment	$433,770,268	$21,904,074	$120,443,354	$291,846,970
Therapeutic foster care	$165,572,070	$10,952,918	$50,968,996	$104,577,050
Therapeutic behavioral support	$122,367,572	$2,944,168	$18,701,727	$100,742,160
Crisis intervention and stabilization (non ER)	$45,450,877	$943,480	$11,986,608	$32,498,166
Emergency room (ER)	$2,593,888	$8,101	$436,338	$2,149,421

*Expenditures are based on 1.2 million children in fee-for-service arrangements and extrapolated to children in capitated managed care. Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include expenditures for children with psychotropic medications use and no other behavioral health service claim.

4. Total Child Behavioral Health Expenditures by Service Type, by Aid Category

Exhibit 27 shows total expenditures by service type, by aid category, for children in Medicaid using behavioral health services in 2005. While TANF children who used behavioral health services in 2005 accounted for 44 percent of total behavioral health spending, this was driven by their larger overall representation in the Medicaid child population using behavioral health services relative to children in foster care and those on SSI/disability and not by greater service use. TANF children accounted for over 67 percent of children in Medicaid using behavioral health services in 2005, but used only 44 percent of overall behavioral health dollars. In contrast, children on SSI/disability were 17.8 percent of children using behavioral health services and accounted for 27 percent of expenditures. Behavioral health expenditures on children in foster care were actually slightly higher than expenditures on children with disabilities, with children in foster care accounting for 15 percent of all children in Medicaid using behavioral health services in 2005, but using 28.6 percent of overall dollars.

Although the number of children in foster care only represents about a fifth of the number of TANF-enrolled children using behavioral health services, they used virtually the same amount of total dollars for residential treatment/group homes; three and a half times more dollars for therapeutic foster care; and more dollars for both emergency room and therapeutic behavioral support services.

The total number of children on SSI/disability using behavioral health services is approximately a quarter the size of the group using behavioral health services in the TANF population, but their expenses are almost equal for both the psychotropic medication and wraparound service types. Children on SSI/disability coverage also spent over twice as much for therapeutic foster care, over eight times as much for home-based services; and over three times as much for respite services as children in TANF.

TANF children utilized a higher proportion of dollars than their proportion among children using behavioral health services for substance use screening and assessment, and for substance use inpatient services.

Exhibit 27: **Total Expenditures for Medicaid Children's Behavioral Health Services, by Service Type and Aid Category, 2005***

Service Type	Children Using Behavioral Health Services** *N = 1,958,908 (100%)*	TANF *N= 1,316,635 (67%)*	Foster Care *N = 293,885 (15%)*	SSI /Disabled *N = 348,338 (18%)*
Residential treatment/therapeutic group homes	$1.5B	$583.9M	$517.7M	$437.3M
Outpatient treatment (primarily individual)	$1.3B	$712.9M	$357.2M	$244.2M
Psychotropic medication	$1.1B	$423.2M	$266.8M	$396.5M
Psychosocial rehabilitation	$826.9M	$329.1M	$206.8M	$289.5M
Substance use total (all substance use services)	$791.1M	$353.3M	$286.4M	$143.5M
Substance use outpatient	$749.0M	$321.0M	$279.6M	$140.7M
Inpatient psychiatric treatment	$433.8M	$182.8M	$130.6M	$119.3M
Partial hospitalization/day treatment	$366.7M	$163.4M	$101.4M	$101.6M
Targeted case management	$233.4M	$102.7M	$73.3M	$58.1M
Case management	$209.8M	$111.6M	$24.1M	$71.3M
Screening/assessment/evaluation	$175.2M	$115.7M	$32.1M	$26.8M
Therapeutic foster care	$165.6M	$24.9M	$90.4M	$48.8M
Family therapy/family education and training	$162.6M	$102.0M	$32.7M	$27.3M
Medication management	$153.5M	$71.4M	$40.7M	$39.6M
Therapeutic behavioral support	$122.4M	$39.6M	$58.6M	$24.1M
Behavior management consultation and training	$116.9M	$58.1M	$18.0M	$40.6M
Group therapy	$89.0M	$49.8M	$17.4M	$21.7M
Wraparound	$77.4M	$34.9M	$12.2M	$30.2M
Psychological testing	$48.2M	$27.5M	$11.4M	$9.2M
Crisis intervention and stabilization (non ER)	$45.5M	$20.4M	$13.6M	$11.3M
Substance use inpatient	$28.1M	$22.4M	$3.8M	$1.6M
Initial service planning	$26.4M	$13.7M	$3.8M	$8.9M
Home-based (e.g., in-home services)	$20.5M	$1.9M	$1.4M	$16.0M
Substance use screening and assessment	$14.0M	$9.8M	$3.0M	$1.2M
Supported housing	$8.1M	$4.8M	$1.5M	$1.8M
Respite	$3.0M	$0.6M	$0.3M	$1.8M
Emergency room (ER)	$2.6M	$1.0M	$1.0M	$0.6M
Activity therapies	$1.9M	$0.2M	$0.2M	$1.2M
Peer services	$0.7M	$0.3M	$0***	$0.3M
Mental health consultation	$0.4M	$0.2M	$0.04M	$0.1M
Telehealth	$0.3M	$0.09M	$0.02M	$0.09M
Multisystemic Therapy (MST)	$0.2M	$0.08M	$0.008M	$0***
Transportation	$0***	$0***	$0***	$0***
All Behavioral Health Services	**$8,032,854,496 (100%)**	**$3,530,190,072 (44.0%)**	**$2,299,620,450 (29%)**	**$2,171,561,433 (27%)**

*Expenditures are based on 1.2 million children in FFS arrangements and extrapolated to children in capitated managed care.
**Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include expenditures for children with psychotropic medications use and no other behavioral health service claim.
***Expenditures were too low to register.

5. Mean Child Behavioral Health Expenditures by Service Type, by Age

Exhibit 28 displays mean expenditures by service type in rank order, broken down by age among children in Medicaid using behavioral health services in 2005. For most service types, adolescents, ages 13-18, tended to have the highest mean expenditures, including significantly higher mean expenditures for substance use outpatient and substance use inpatient, home-based services, and therapeutic behavioral supports. Children ages 6-12 had the highest mean expenditures for: therapeutic foster care; inpatient psychiatric treatment (though not significantly different from that of adolescents); MST; respite; and peer services. Young children, ages 0-5, had the highest mean expenditures for behavior management consultation.

Exhibit 28: **Mean Expenditures for Medicaid Children's Behavioral Health Services, by Service Type and Age, 2005***

Mean Expenditure by Service Type	Children Using Behavioral Health Services** *N = 1,958,908 (100%)*	Age 0-5 *N = 217,584 (11%)*	Age 6-12 *N = 869,994 (44%)*	Age 13-18 *N = 871,330 (45%)*
Residential treatment/therapeutic group homes	$21,671	$9,813	$21,483	$21,924
Home-based (e.g. in-home services)	$17,191	$4,797	$14,135	$19,856
Therapeutic foster care	$11,219	$6,035	$12,453	$11,817
Therapeutic behavioral support	$7,821	$1,919	$6,710	$8,896
Inpatient psychiatric treatment	$6,652	$3,462	$7,162	$6,938
Partial hospitalization/day treatment	$5,746	$5,860	$5,782	$5,695
Substance use inpatient	$4,773	$79	$128	$5,318
Substance use outpatient	$3,625	$1,312	$2,051	$4,584
Wraparound	$3,467	$2,408	$3,177	$3,892
Psychosocial rehabilitation	$3,416	$2,147	$3,248	$3,882
Supported housing	$2,315	$1,327	$1,879	$2,727
Targeted case management	$1,683	$1,754	$1,540	$1,784
Multisystemic Therapy (MST)	$1,662	-	$2,885	$1,051
Activity therapies	$1,658	$847	$1,506	$1,872
Behavior management consultation and training	$1,535	$2,024	$1,568	$1,377
Outpatient treatment (primarily individual)	$1,275	$984	$1,251	$1,349
Psychotropic medication	$1,267	$670	$1,199	$1,382
Case management	$1,233	$1,070	$1,267	$1,227
Emergency room (ER)	$1,162	$1,013	$1,154	$1,164
Crisis intervention and stabilization (non ER)	$667	$457	$566	$724
Respite	$649	$732	$826	$499
Group therapy	$598	$753	$624	$558
Telehealth	$495	$253	$518	$576
Peer services	$492	-	$1,119	$222
Family therapy/family education and training	$428	$372	$440	$430
Medication management	$352	$234	$341	$371
Psychological testing	$264	$213	$264	$285
Substance use screening and assessment	$245	$253	$204	$256
Screening/assessment/evaluation	$219	$233	$209	$224
Initial service planning	$153	$182	$166	$133
Mental health consultation	$6	$5	$7	$6
Transportation	$0***	$0***	$0***	$0***

*Expenditures are based on 1.2 million children in FFS arrangements and extrapolated to children in capitated managed care.
**Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include expenditures for children with psychotropic medications use and no other behavioral health service claim.
***Expenditures were too low to register.

6. Mean Child Behavioral Health Expenditures by Service Type, by Aid Category

Exhibit 29 displays mean expenditures by service type in rank order, broken down by aid category. Children in foster care had higher mean expenditures compared to children in the other aid categories for half of the service types used, with particularly high mean expenditures for: residential treatment/therapeutic group homes; partial hospitalization/day treatment; substance use outpatient; psychosocial rehabilitation; targeted case management; MST; and crisis intervention and stabilization services.

Both children in foster care and children receiving SSI/ disability had comparably high mean expenditures, compared to TANF children, for: home-based services; therapeutic behavioral support; inpatient psychiatric treatment; outpatient treatment; psychotropic medications; emergency room use; and group therapy. There were only a handful of services for which children on SSI/disability had an appreciably higher mean expenditure than children in foster care, those were: therapeutic foster care; activity therapies; behavioral management consultation; respite; and telehealth.

TANF children tended to have the lowest mean expenditures for all service types compared to children in the other aid categories, with the one exception of substance use inpatient treatment, where TANF children had a slightly higher mean expenditure than children in foster care.

Exhibit 29: **Mean Expenditures for Medicaid Children's Behavioral Health Services, by Service Type and Aid Category, 2005***

Mean Expenditure by Service Type	Children Using Behavioral Health Services** *N = 1,958,908 (100%)*	TANF *N= 1,316,635 (67%)*	Foster Care *N = 293,885 (15%)*	SSI /Disabled *N = 348,338 (18%)*
Residential treatment/therapeutic group homes	$21,671	$16,398	$28,779	$25,118
Home-based (e.g., in-home services)	$17,191	$7,775	$17,440	$18,329
Therapeutic foster care	$11,219	$7,536	$10,140	$19,243
Therapeutic behavioral support	$7,821	$6,977	$8,423	$7,981
Inpatient psychiatric treatment	$6,652	$4,941	$8,694	$9,046
Partial hospitalization/day treatment	$5,746	$4,598	$8,227	$6,366
Substance use inpatient	$4,773	$4,991	$4,714	$2,804
Substance use outpatient	$3,625	$2,353	$7,006	$4,649
Wraparound	$3,467	$3,251	$3,763	$3,630
Psychosocial rehabilitation	$3,416	$2,182	$6,112	$5,040
Supported housing	$2,315	$2,174	$2,844	$2,358
Targeted case management	$1,683	$1,332	$2,492	$1,807
Multisystemic Therapy	$1,662	$838	$2,074	$0
Activity therapies	$1,658	$576	$1,608	$2,259
Behavior management consultation and training	$1,535	$1,290	$1,511	$2,120
Outpatient treatment (primarily individual)	$1,275	$1,022	$1,983	$1,506
Psychotropic medication	$1,267	$847	$1,843	$1,861
Case management	$1,233	$1,053	$1,085	$1,701
Emergency room	$1,162	$987	$1,360	$1,238
Crisis intervention and stabilization (non ER)	$667	$494	$1,032	$832
Respite	$649	$254	$445	$1,196
Group therapy	$598	$529	$648	$779
Telehealth	$495	$251	$147	$1,010
Peer services	$492	$296	$0	$947
Family therapy/family education and training	$428	$392	$551	$454
Medication management	$352	$287	$501	$371
Psychological testing	$264	$253	$306	$253
Substance use screening and assessment	$245	$244	$279	$190
Screening/assessment/evaluation	$219	$207	$264	$220
Initial service planning	$153	$124	$153	$238
Mental health consultation	$6	$6	$6	$7
Transportation***	$0	$0	$0	$0

*Expenditures are based on 1.2 million children in FFS arrangements and extrapolated to children in capitated managed care.
**Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include expenditures for children with psychotropic medications use and no other behavioral health service claim.
***Expenditures were too low to register.

7. Mean Child Behavioral Health Claims by Service Type

The average number of claims for a particular service type can provide additional information about the extent of service use. Exhibit 30 shows mean claims for each of the behavioral health service types used by children in Medicaid in 2005. Services associated with the highest average number of claims were: therapeutic behavioral support; therapeutic foster care; partial hospitalization/day treatment; and home-based services. The relatively low number of mean claims for inpatient psychiatry (9.8) versus the high number of mean claims for partial hospitalization/day treatment (46.1) is consistent with the move to reduce rates of psychiatric hospitalization.

Exhibit 30: **Mean Number of Medicaid Behavioral Health Claims per Child Using the Service, 2005***

Service Type	Mean Claims Per User
Therapeutic behavioral support	73.3
Therapeutic foster care	59.0
Partial hospitalization/day treatment	46.1
Home-based (e.g. in-home services)	40.4
Psychosocial rehabilitation	29.9
Residential treatment/therapeutic group homes	17.9
Behavior management consultation and training	17.8
Substance use outpatient	17.4
Targeted case management	14.8
Wraparound	12.5
Outpatient treatment (primarily individual)	11.7
Case management	11.7
Group therapy	11.0
Multisystemic Therapy (MST)	9.9
Inpatient psychiatric treatment	9.8
Respite	9.7
Activity therapies	9.7
Telehealth	8.2
Transportation	8.0
Mental health consultation	6.1
Peer services	5.8
Supported housing	5.7
Family therapy/family education and training	5.7
Psychotropic medications	5.3
Medication management	4.7
Crisis intervention and stabilization (non ER)	4.3
Substance use screening and assessment	2.7
Substance use inpatient	2.7
Initial service planning	2.5
Screening/assessment/evaluation	1.6
Psychological testing	1.6
Emergency room (ER)	1.4

*Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include claims for children with psychotropic medications use and no other behavioral health service claim.

8. Mean Child Behavioral Health Claims by Service Type, by Age

Exhibit 31 shows mean claims by service type and age group. More claims per service used were associated with adolescents (ages 13-18) for most service types, including: substance use outpatient and substance use inpatient, residential treatment/therapeutic group homes, and therapeutic behavioral supports. Children ages 6-12 had only a few instances of more mean claims per services, these included: therapeutic foster care and home-based services.

Interestingly, children ages 6-12 had a higher average number of claims for home-based services than adolescents (44.8 to 37.5) but a lower mean expenditure for this service ($14,135 to $19,856), suggesting that they may have used less expensive home-based services than adolescents. For young children (ages 0-5), higher mean claims also were associated with only a few service types, in particular, behavioral management consultation, respite, and telehealth.

Exhibit 31: **Mean Number of Medicaid Behavioral Health Service Claims per Child Using the Service, by Age, 2005***

Service Type	Total Mean Claims per User	Age 0-5	Age 6-12	Age 13-18
Therapeutic behavioral support	73.3	17.7	53	85.9
Therapeutic foster care	59	22.6	72.8	60.1
Partial hospitalization/day treatment	46.1	49.5	49.1	42.8
Home-based (e.g., in-home services)	40.4	23.2	44.8	37.5
Psychosocial rehabilitation	29.9	26.1	29.9	30.8
Residential treatment/therapeutic group homes	17.9	4.7	10.7	19
Behavior management consultation and training	17.8	26.5	18	15.5
Substance use outpatient	17.4	8.8	11.7	21.5
Targeted case management	14.8	8.7	15	16
Wraparound	12.5	7.9	12	13.6
Outpatient treatment (primarily individual)	11.7	8.9	11.6	12.2
Case management	11.7	9.2	11.7	12.2
Group therapy	11	11.6	10.4	11.5
Multisystemic Therapy (MST)	9.9	N/A	11.2	9.8
Inpatient psychiatric treatment	9.8	5.1	9.3	10
Respite	9.7	12.6	11.5	7.4
Activity therapies	9.7	8.6	10.4	9.1
Telehealth	8.2	14.1	7.3	6.5
Transportation	8	4.8	9.2	7
Mental health consultation	6.1	5.4	6.8	5.5
Peer services	5.8	3.9	4.9	6.9
Supported housing	5.7	3.8	5.5	5.9
Family therapy/family education and training	5.7	5	5.8	5.6
Psychotropic medication	5.3	1.1	5.7	5.9
Medication management	4.7	3.4	4.7	4.9
Crisis intervention and stabilization (non ER)	4.3	2	3.2	4.9
Substance use screening and assessment	2.7	1.4	1.8	3.2
Substance use inpatient	2.7	1.6	1.5	4
Initial service planning	2.5	2.8	2.6	2.3
Screening/assessment/evaluation	1.6	1.5	1.6	1.7
Psychological testing	1.6	1.4	1.6	1.6
Emergency room (ER)	1.4	1	1.4	1.4

*Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include claims for children with psychotropic medications use and no other behavioral health service claim.

9. Mean Child Behavioral Health Claims by Service Type, by Aid Category

Exhibit 32 shows mean claims per child, by aid category, for children using that unique service type. For about a third of the services, children in foster care using the service had the highest mean claims per service, and for another third, children on SSI/disability using the service had the highest mean claims. Service users among TANF children had the highest mean claims for only two service types: residential treatment/therapeutic group homes and substance use inpatient treatment. Interestingly, while TANF children using residential and group care had higher mean claims (24.1 mean claims) than children in foster care (13.4 mean claims) and children on SSI disability (11.4 mean claims), TANF children had lower mean expenditures for this service type than the other populations, suggesting that TANF children may have been using less expensive residential and group care than children in foster care and those on SSI/disability (see also Exhibit 34).

Exhibit 32: **Mean Number of Medicaid Behavioral Health Service Claims per Child Using the Service Type by Aid Category, 2005***

Service Type	Total Mean Claims per User	TANF	Foster Care	SSI /Disabled
Therapeutic behavioral support	73.3	31.7	111	64.8
Therapeutic foster care	59	43.8	56.1	89.3
Partial hospitalization/day treatment	46.1	38.1	61.3	52.1
Home-based (e.g., in-home services)	40.4	13	6.1	51.2
Psychosocial rehabilitation	29.9	22.3	39.9	43.9
Residential treatment/therapeutic group homes	17.9	24.1	13.4	11.4
Behavior management consultation and training	17.8	16.3	18	21.1
Substance use outpatient	17.4	14.3	25.2	21.6
Targeted case management	14.8	13.2	15.7	17.7
Wraparound	12.5	10.8	14.1	14
Outpatient treatment (primarily individual)	11.7	9.6	18.4	13.1
Case management	11.7	11.7	12.7	11.5
Group therapy	11	9.5	14.6	12.9
Multisystemic Therapy (MST)	9.9	9.7	11.5	15
Inpatient psychiatric treatment	9.8	6.9	14.7	9.7
Respite	9.7	7.8	11.4	11.7
Activity therapies	9.7	5.3	9.5	13.1
Telehealth	8.2	8.3	5.9	11.8
Transportation	8	7.3	9.6	9.1
Mental health consultation	6.1	5.8	5.8	7
Peer services	5.8	5.2	7.2	6.8
Supported housing	5.7	5.2	5.8	7
Family therapy/family education and training	5.7	5.2	7.3	6.1
Psychotropic medication	5.3	3.6	7.8	9.2
Medication management	4.7	3.8	7.2	5.1
Crisis intervention and stabilization (non ER)	4.3	2.5	8.3	6
Substance use screening and assessment	2.7	2.8	2.5	2.9
Substance use inpatient	2.7	2.9	2.1	2.1
Initial service planning	2.5	2.1	2.5	3.6
Screening/assessment/evaluation	1.6	1.5	1.9	1.8
Psychological testing	1.6	1.6	1.6	1.6
Emergency room (ER)	1.4	1.3	1.6	1.6

*Includes children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include claims for children with psychotropic medications use and no other behavioral health service claim.

E. Behavioral Health Utilization and Expenditures by State Medicaid Payment and Delivery Structure

1. Differences in Medicaid Child Behavioral Health Penetration Rates by State Structure

Exhibit 33 shows the differences in penetration rates for Medicaid child behavioral health service utilization in 2005 based on type of Medicaid payment and delivery structure. The study grouped states into three categories based on state organizational structure in 2005 (Exhibit 34): states in which children's behavioral health services were all in a FFS arrangement, including states with no managed behavioral health care and states with non-capitated, largely Administrative Services Organization arrangements; states with fully capitated behavioral health managed care; and states in which some behavioral health services or some child populations, such as children in foster care, remained in a FFS arrangement, with some other behavioral health services and other populations (usually TANF children) in a capitated arrangement. This latter grouping is referred to as "primarily FFS" because child populations with historically high service use (e.g., children in foster care, children on SSI/disability, and children with designations of serious emotional disorders) typically remained in FFS in these hybrid arrangements, as did most behavioral health services under the Rehabilitation Services Option.

Exhibit 33: **Penetration Rates for Medicaid Child Behavioral Health Services Across States, by Medicaid Payment/Delivery Structure, 2005***

Payment/Delivery Structure	Average Penetration Rate	Range
All FFS	10.4%	2.5% - 17.3%
Primarily FFS**	7.5%	0.3% - 10.4%
Primarily capitated**	5.1%	1.6% - 8.9%

*State penetration rates are based on total number of children in Medicaid (1.98 million children) with at least one claim for behavioral health services, with or without psychotropic medication use; does not include children with psychotropic medication use and no other behavioral health service claim.
**May be understated depending on completeness of encounter data submitted to state agencies.

Exhibit 34: **States by Medicaid Program Structure for Children's Behavioral Health Services, 2005**

Fee-For-Service Behavioral Health Care		
Alaska	Kansas	New Jersey
Alabama	Louisiana	Nebraska
Arkansas	Maine	North Dakota
Georgia	Maryland	South Dakota
Idaho	Mississippi	Vermont
Indiana	Montana	West Virginia
Kentucky	New Hampshire	Wyoming
Mainly Fee-For-Service with Some Capitation for Behavioral Health Care		
California	Minnesota	Oklahoma
Connecticut	Missouri	Rhode Island
Delaware	Nevada	South Carolina
District of Columbia	New York	Texas
Florida	North Carolina	Virginia
Illinois	Ohio	Wisconsin
Mainly Capitated Behavioral Health Care		
Arizona	Massachusetts	Pennsylvania
Colorado	Michigan	Tennessee
Hawaii	New Mexico	Utah
Iowa	Oregon	Washington

The state data pertain to the primary study sample of 1,958,908 children in Medicaid who used behavioral health services with or without concomitant psychotropic medications use. The individual state data do not include children who used psychotropic medications and no other identified behavioral health service. States in the "all fee-for-service" category had the highest average child behavioral health penetration rate (10.4%), with a range of 2.5 percent to 17.3 percent. States in which child behavioral health services were fully capitated had the lowest average penetration rate at 5.1 percent, with a range of 1.6 percent to 8.9 percent. States that were primarily FFS were in the middle, with an average penetration rate of 7.5 percent and a range of 0.3 percent to 10.4 percent.

In many cases, states at the very low end of the range appeared to have unique situations or data quality issues. For example, Louisiana was at the lowest end of the states in the FFS category with 2.5 percent utilization, but the time period captured by the 2005 Medicaid data coincided with Hurricane Katrina, which overwhelmed many Louisiana state agency systems and saw an outflow of the state's residents to other states. In the primarily FFS category, Connecticut was at the low end of the range with a utilization rate so low (0.3%) as to strongly suggest data collection issues, rather than true utilization. Similarly, in the primarily capitated states, Colorado was at the low end of the range with a utilization rate (1.6%) suggesting questionable data rather than accurate utilization. In addition to the state-specific challenges, utilization may be understated in states with capitated managed care arrangements depending on the completeness of encounter data provided by managed care organizations to state Medicaid agencies.

2. Differences in Medicaid Child Behavioral Health Mean Expenditures by State Structure

Exhibit 35 displays differences in mean expenditures per child for child behavioral health services associated with FFS, primarily FFS, or fully capitated state structures for behavioral health care. Because expenditure data were not available for fully capitated states and only partially available for the primarily FFS states, the analysis used FFS expenditure data to estimate mean expenditures for these arrangements. This approach may very well overstate mean expenditures in capitated (or partially capitated) arrangements since managed care, by definition, is intended to manage costs more closely than FFS arrangements.

Using FFS expenditure data as a proxy across all three types of state structures, mean expenditures were highest in states with FFS arrangements, with a mean expenditure of $5,542 and a range of$2,099 to $14,803. States with primarily FFS arrangements for behavioral health care had the second highest mean expenditures, with an average mean of $4,709 and a range of $1,862 to $9,172. States with primarily capitated behavioral health care had the lowest average mean expenditures with an average mean of $3,684 and a range of $1,193 to $9,377.

Exhibit 35: **Mean Expenditures* for Medicaid Children's Behavioral Health Services, by Medicaid Program Structure, 2005****

State Finance Model	Mean Expenditure	Range
All FFS	$5,542	$2,099 to $14,803
Primarily FFS***	$4,709	$1,862 to $9,172
Primarily capitated***	$3,684	$1,193 to $9,377
Medicaid Child Behavioral Health Mean Expenditure Across all States	$4,101	

* Includes expenditures for children with at least one claim for behavioral health services, with or without psychotropic medications use; does not include children with psychotropic medications use and no other behavioral health service claim.
** Includes all enrolled members, regardless of length of enrollment, during calendar year 2005.
*** May be understated depending on completeness of encounter data submitted to state agencies.

F. Patterns of Psychotropic Medication Utilization and Expenditures

Introduction

Children and adolescents with mental health and/or substance use disorders often have multiple emotional, physical, intellectual and societal vulnerabilities, making their care complex. In addition, youth are often dependent on others to make decisions regarding their care. This combination of complexity and dependency contributes to an increased risk of disparities in access to appropriate specialty care for children, as well as disparities in the way medications are used.[44] This is the case for children insured by Medicaid, who are at heightened risk of overuse or misuse of psychotropic medications.[45]

Overall psychotropic medication use has increased two- to three-fold in the past 10 years, including among the very young and among privately insured children.[46] Recent research indicates widespread use of "atypical" or second-generation antipsychotics in children of all ages and for conditions that are not linked to psychosis.[47] Such medications, often used off-label for their sedating side effects (mistakenly seen as providing behavioral control for aggressive youth), lead to rapid weight gain and cardio-metabolic effects, which, in turn, increase the risk of diabetes and heart disease.[48]

In addition to quality concerns associated with the likelihood of polypharmacy, drug interactions, and the adverse effects of commonly prescribed psychotropic medications, there are concerns about the impact that increased prescribing has on health care costs. In this study, psychotropic medication prescribing trends within the Medicaid population for 2005 were analyzed by age, gender, race/ethnicity, aid category, expense and diagnosis, as indicated in the tables below, for all children with at least one psychotropic medication claim.

1. Psychotropic Medication Use among Children in Medicaid

The overall rate for psychotropic medication usage among the Medicaid child population in 2005 was nearly six percent, or roughly 1.7 million children. This population differs from, but overlaps with, the main study sample of 1.9 million youth who were receiving some kind of behavioral health treatment, either with or without medication.

As shown in Exhibit 36, psychotropic medication penetration rates varied by demographics, with some categories showing higher than the overall average rate of psychotropic medication use. Those categories include: older children; males; white children; children in foster care and those with Medicaid coverage via SSI/disability. Children on SSI/disability and those in foster care had particularly high use of psychotropic medications: 23 percent of children in foster care and 27 percent of children on SSI/disability used psychotropic medications in 2005 compared to four percent of the TANF population.

Slightly under half (43%) of the main study sample of children who used behavioral health services were receiving psychotropic medication. Twenty-nine percent of children receiving psychotropic medications received no accompanying behavioral health services (see Exhibit 39).

Exhibit 36: **Penetration Rates for Use of Psychotropic Medications among Children in Medicaid, by Demographic and Aid Category, 2005**

Demographic and Aid Category	Percent (%) of Children	Number of Children
Children in Medicaid Prescribed Psychotropic Medications	**5.8%***	**1,686,387**
Age		
0 - 5 years	0.6%	77,812
6 - 12 years	8.6%	850,535
13 - 18 years	10.6%	758,040
Gender		
Female	4.1%	588,393
Male	7.4%	1,097,859
Race and Ethnicity		
White	9.0%	1,025,518
Black or African American	4.6%	348,591
American Indian or Alaska Native	5%	21,636
Asian	1%	6,624
Hispanic or Latino	2%	137,559
Native Hawaiian or Pacific Islander	1.9%	3,156
Hispanic or Latino + one or more races	2.8%	23,151
More than one race	3.9%	3,966
Unknown	7%	116,186
Aid Category		
TANF	4%	1,119,266
Foster Care	23%	212,176
SSI/Disabled**	27%	354,945

*Penetration rates in the table are based on the total number of children in Medicaid, N = 29,050,305.
**Children determined to be disabled based on SSI or state criteria; includes both mental health and physical health disabilities.

In Exhibits 37 and 38, the total Medicaid child population using psychotropic medication is further divided into three groups: 1) those who also used a behavioral health service; 2) those who used a service that was not identifiable as either physical or behavioral health; and 3) those who used psychotropic medication and had only physical health services.

2. Age, Gender, and Aid Category Characteristics of Children in Medicaid Prescribed Psychotropic Medications

Exhibit 37 details use of psychotropic medications among children in Medicaid by age, gender, and aid category. Children, ages 6-12, made up slightly more than half of the population of children using psychotropic medications, although they represented only 34 percent of the Medicaid child population. The next largest age group prescribed psychotropic medication was adolescents, ages 13-18, who represented 45 percent of children using psychotropic medication, although they comprised just under 25 percent of the Medicaid child population. Males were more likely to be prescribed psychotropic medications than females.

Notably, children on SSI/disability made up fewer than five percent of the Medicaid child population, but represented 21 percent of children using psychotropic medications. Children in foster care were almost equally over-represented. Foster children represented just over three percent of the Medicaid

child population but close to 13 percent of children using psychotropic medications. This disproportionate utilization and the factors influencing these prescribing patterns, merit further study.

This analysis also looked at age, gender, and aid-related variation among children using psychotropic medications who were also receiving behavioral health services, as shown in Exhibit 37. Children ages 6-12, while in the majority of those using psychotropic medication, were least likely to be also receiving a clearly defined behavioral health service. While males were in the majority of children receiving psychotropic medications, they were somewhat less likely than females to receive behavioral health services in addition to medication. Lastly, while there were more TANF children getting behavioral health services in absolute numbers, those in foster care or receiving SSI/disability were proportionally more likely to receive behavioral health services in addition to medication.

Exhibit 37: **Age, Gender, and Aid Category Characteristics of Children in Medicaid Prescribed Psychotropic Medications, Overall and by Type of Service Use, 2005**

Demographic and Aid Categories	All Medicaid Children	Medicaid Children Receiving Psychotropic Medication (Overall)	Medicaid Children Receiving Psychotropic Medication, by Type of Service Use (100%)		
			With Behavioral Health Service Use (50.8%)	With Indeterminate (Behavioral or Physical) Service Use Only (20.1%)	With Physical Health Service Use Only (29.1%)
Age					
0-5 years	41.3%	4.6% (77,812)	11.1% (32,358)	5.3% (17,994)	5.6% (27,460)
6-12 years	34.0%	50.4% (850,535)	44.4% (409,128)	61.3% (207,701)	47.7% (233,706)
13-18 years	24.6%	45.0% (758,040)	44.5% (415,890)	33.4% (112,956)	46.7% (229,194)
Gender *					
Female	48.9%	34.9% (588,393)	39.6% (294,071)	31.4% (106,172)	38.4% (188,150)
Male	51.0%	65.1% (1,097,859)	60.3% (563,237)	68.6% (232,449)	61.6% (302,173)
Aid Category					
TANF	92.3%	66.4% (1,119,266)	58.3% (499,595)	77.5% (53,723)	72.9% (357,340)
Foster Care	3.2%	12.6% (212,176)	16.9% (144,745)	6.7% (262,331)	9.1% (44,384)
SSI/Disabled**	4.5%	21.0% (354,945)	24.8% (213,036)	15.9% (22,597)	18.0% (88,186)
Total (N)	**29,050,305**	**1,686,387**	**857,376**	**338,651**	**490,360**

*Gender counts in the stratification may not sum to population total due to exclusion of a small number of individuals for whom gender is reported as "unknown."

**Children determined to be disabled based on SSI or state criteria; includes both mental health and physical health disabilities.

3. Race/Ethnicity Characteristics of Children in Medicaid Prescribed Psychotropic Medications

Exhibit 38 details the distribution of psychotropic medication use by race/ethnicity. The percentage of white children (61%) prescribed psychotropic medications was one and a half times their overall representation of 39.8 percent in the Medicaid child population. Since no such variation has been documented in terms of psychiatric diagnoses or needs, this raises questions about whether white children are being overmedicated or if these differences reflect medication treatment access barriers for children of color.

Differences in psychotropic medication use based on race and ethnicity were somewhat apparent among black or African American children, who comprised 26 percent of the overall 2005 Medicaid child population, but represented 21 percent of those receiving psychotropic medications. A more significant variation was seen, however, in the case of Hispanic/Latino children, who comprised 22 percent of the overall Medicaid population, but whose representation among children receiving psychotropic medications was 8 percent. Such medication use differences warrant further study.

Conversely, with regard to access to behavioral health services, while white children represented the largest absolute number of children receiving psychotropic medications who also used behavioral health services, they represented 62 percent of those receiving psychotropic medication accompanied only by physical health services, as displayed in Exhibit 38.

Exhibit 38: **Race/Ethnicity Characteristics of Children in Medicaid Prescribed Psychotropic Medications, Overall and by Type of Service Use, 2005**

Demographic and Aid Categories	All Medicaid Children	Medicaid Children Receiving Psychotropic Medication	Medicaid Children Receiving Psychotropic Medication, by Type of Service Use (100%)		
			With Behavioral Health Service Use (50.8%)	With Indeterminate (Behavioral or Physical) Service Use Only (20.1%)	With Physical Health Service Use Only (29.1%)
Race and Ethnicity					
White	38.8%	60.8% (1,025,518)	58.1% (498,279)	65.3% (221,225)	62.4% (306,014)
Black or African American	25.9%	20.7% (348,591)	22.1% (189,739)	19.8% (67,002)	18.7% (91,850)
American Indian or Alaska Native	1.5%	1.3% (21,636)	1.3% (11,163)	1.0% (3,465)	1.4% (7,008)
Asian	2.2%	0.4% (6,624)	0.4% (3,033)	0.3% (1,077)	0.5% (2,514)
Hispanic or Latino	22.1%	8.2% (137,559)	8.8% (75,372)	6.1% (20,747)	8.5% (41,440)
Native Hawaiian or Pacific Islander	0.6%	0.2% (3,156)	0.2% (1,632)	0.1% (460)	0.2% (1,064)
Hispanic or Latino + one or more races	2.9%	1.4% (23,151)	1.7% (14,627)	0.8% (2,638)	1.2% (5,886)
More than one Race	0.3%	0.2% (3,966)	0.3% (2,277)	0.2% (676)	0.2% (1,013)
Unknown	5.6%	6.9% (116,186)	7.1% (61,254)	6.3% (2,638)	6.8% (33,571)
Percent of Total(N)	**29,050,305**	**1,686,387**	**857,376**	**338,651**	**490,360**

4. Distribution of Children Receiving Psychotropic Medications with Physical Health Services Only

As shown in Exhibits 37 and 38, there were nearly half a million children in Medicaid, or 29 percent of those prescribed psychotropic medications, who received no other behavioral health treatment. The implications for unmonitored prescription use are of critical concern given the emerging research about the hazards of medication use in children.

Further detail regarding age, aid category, and race/ethnicity distribution for youth who are receiving psychotropic medications without other behavioral health services is shown in Exhibit 39. Of particular concern is the fact that 35 percent of the youngest children who received psychotropic medications, 0-5 year olds, received no other behavioral health services.

Analysis by aid category shows that 32 percent of children covered by TANF who were getting psychotropic medications received no other behavioral health services. The foster care and SSI/disabled child populations receiving psychotropic medication, who had relatively higher use of psychotropic medication, were more likely to also receive a behavioral health service than were TANF children.

Analysis by race/ethnicity indicates that among the three largest groups, 30 percent each of white and Hispanic/Latino children received psychotropic medications without any behavioral health services, while the corresponding percentage of black or African-American children was 26 percent.

Exhibit 39: **Penetration Rates for Prescription of Psychotropic Medications with Physical Health Services Only, among Children in Medicaid Receiving Psychotropic Medications, by Demographic and Aid Category, 2005**

Demographic Category	All Children Receiving Psychotropic Medication	Children Receiving Psychotropic Medications with Physical Health Service Only	
	N	N	%
Age			
0 - 5 years	77,812	27,460	35.3%
6 - 12 years	850,535	233,706	27.5%
13 - 18 years	758,040	229,194	30.2%
Race/Ethnicity			
White	1,025,518	306,014	29.8%
Black or African American	348,591	91,850	26.3%
Hispanic or Latino	137,559	41,440	30.1%
Other	174,719	51,056	29.2%
Aid Category			
TANF	1,119,266	357,340	31.9%
Foster Care	212,176	44,834	21.1%
SSI/Disabled	354,945	88,186	24.8%
Total	**1,686,387**	**490,360**	**29.1%**

5. Concurrent Use of Psychotropic Medications

Concurrent psychotropic medication use, also known as co-prescription, refers to the simultaneous dispensing of different categories of psychotropic medications (i.e., an antipsychotic and an ADHD/stimulant medication).

In the study population, 33 percent of all children taking psychotropic medication received two or more concurrent prescriptions within the same year. Exhibit 40 and Exhibit 41 examine rates of concurrent prescription of psychotropic medication for children in Medicaid by age and aid category. Concurrent psychotropic medication data by race/ethnicity were not available for this study.

Exhibit 40: **Number of Concurrent Psychotropic Medications among Children in Medicaid, by Age, 2005**

Number of Medications	Overall		Age 0-5		Age 6-12		Age 13-18	
	%	N	%	N	%	N	%	N
1	67.0%	1,129,916	80.1%	62,365	71.2%	605,722	60.9%	461,829
2	22.3%	375,996	15.6%	12,157	20.0%	169,763	25.6%	194,076
3	8.5%	142,802	3.6%	2,839	7.1%	60,563	10.5%	79,400
4 or more	2.2%	37,673	0.6%	451	1.7%	14,487	3.0%	22,735
Total	**1,686,387 (100%)**		**77,812 (100%)**		**850,535 (100%)**		**758,040 (100%)**	

Frequency of concurrent prescription of psychotropic medication ranged from 20 percent of prescribing for young children, 0-5 years of age, up to 39 percent for adolescents, ages 13-18.

Exhibit 41: **Number of Concurrent Psychotropic Medications among Children in Medicaid, by Aid Category, 2005**

Number of Medications	Overall		TANF		Foster Care		SSI/Disabled	
	%	N	%	N	%	N	%	N
1	67.0%	1,129,916	74.2%	830,752	51.3%	108,883	53.6%	190,281
2	22.3%	375,996	18.8%	210,210	29.6%	62,790	29.0%	102,996
3	8.5%	142,802	5.7%	64,043	14.7%	31,146	13.4%	47,613
4 or more	2.2%	33,283	1.3%	14,261	4.4%	9,357	4.0%	14,055
Total	**1,686,387 (100%)**		**1,119,266 (100%)**		**212,176 (100%)**		**354,945 (100%)**	

By aid category, among those receiving psychotropic medications, 25.8 percent of TANF children and 46.4 percent of children on SSI/disability received two or more simultaneous prescriptions. Almost half (48.7%) of children in foster care using psychotropic medications received two or more concurrent prescriptions. This finding reinforces the concern being voiced by federal agencies and clinical researchers about concurrent psychotropic medication use, particularly among children in foster care.[49,50,51]

Among the more than 490,000 children with psychotropic medications and physical health services only described earlier, perhaps the most striking finding was that nearly 20 percent were receiving two or more concurrent psychiatric prescriptions with no accompanying behavioral health treatment (Exhibit 42).

Exhibit 42: **Number of Concurrent Psychotropic Medications among Children Receiving Psychotropic Medications with Physical Health Services Only, 2005**

# of Prescriptions	N of Children Receiving Psychotropic Medications With Physical Health Services Only	% of Children Receiving Psychotropic Medication With Physical Health Services Only Among All Children Using Psychotropic Medication
1	394,794 (80.5%)	34.9%
2	71,516 (14.6%)	19.0%
3	19,783 (4%)	13.9%
4 or more	4,267 (0.9%)	11.3%

6. Distribution of Psychotropic Medication Types by Age and Aid Categories

Exhibit 43 shows the distribution of psychotropic medications by medication type, by age, and by aid category. As displayed earlier (Exhibit 39), over 50 percent of all children receiving one or more psychotropic medication (850,535) were 6-12 years old. This is consistent with the results shown here indicating that 84 percent of children ages 6-12 in the overall pharmacy claims sample used ADHD/stimulant medications.

Among the non-ADHD medications, the next most frequently prescribed psychotropic medication category was anti-depressants (35%), followed closely by antipsychotics (26%). Approximately one quarter (22.7%) of children 0-5 years old who were prescribed psychotropic medications were given antipsychotics, along with 22.5 percent of 6-12 year olds and 31 percent of 13-18 year olds. These antipsychotic prescriptions only rarely corresponded to a diagnosis of psychosis. Based on the emerging research mentioned earlier, these usage patterns are likely to bring a high degree of associated risk of metabolic disease, such as diabetes, to the children taking them. In addition to antipsychotics, adolescents were more likely to receive every class of psychotropic medication except ADHD medications.

Across aid categories, 42 percent of children and adolescents on SSI/disability who were prescribed psychotropic medications and 42 percent of those in foster care who were prescribed psychotropic medications were given antipsychotics, as well as 18 percent of children covered through TANF. Across all drug types, the only psychotropic medication that TANF children were slightly more likely to receive than children in other aid categories was ADHD medication.

Children in foster care were more likely than TANF children to receive every class of psychotropic medication, except for ADHD and anti-anxiety medications. Children on SSI/disability also were more likely than TANF children to receive most types of psychotropic medications, except for ADHD medications.

Exhibit 43: **Types of Psychotropic Medications Used by Children in Medicaid, by Age and Aid Category, 2005***

		Age Category			Aid Category		
Medication Type*	**Overall**	**Age 0-5**	**Age 6-12**	**Age 13-18**	**TANF**	**Foster Care**	**SSI/ Disabled**
ADHD Medications	69.3%	64.4%	84.0%	53.4%	70.4%	68.0%	66.6%
Anti-depressants	34.7%	15.1%	22.3%	50.6%	33.1%	43.5%	34.3%
Antipsychotics	26.3%	22.7%	22.5%	30.9%	18.1%	42.1%	42.4%
Anticonvulsants/Mood Stabilizers	8.1%	6.2%	5.8%	10.9%	5.9%	12.1%	12.8%
Anxiety Medications	6.0%	16.0%	3.9%	7.3%	5.5%	3.5%	8.9%
Lithium	1.8%	0.3%	1.0%	2.9%	1.1%	3.5%	3.2%
Any Psychotropic Medication (N of children)	**1,686,317**	**77,812**	**850,535**	**758,040**	**1,119,266**	**212,176**	**354,945**

*Columns do not sum to 100% since children may receive more than one medication type.

Exhibit 44 displays utilization among children prescribed psychotropic medications by medication type and by psychiatric diagnosis. ADHD/stimulant medications were the most frequently prescribed medication category for children with diagnoses of ADHD or COD, and for those with diagnoses of "other." Among children with no psychiatric diagnosis, ADHD and anti-depressant medications were the most frequently prescribed, both at 50 percent.

More surprisingly, ADHD/stimulant medications were the second most frequently prescribed medication for children with an anxiety or developmental disability diagnosis, neither of which would represent an indicated use for such medications; and stimulants were the third most frequently prescribed medication for mood disorders or psychosis, which may be clinically contraindicated.

Of additional concern is the fact that, while 81 percent of youth with a diagnosis of psychosis who used psychotropic medication were, presumably appropriately, receiving antipsychotics, 28 percent of children with no identified diagnosis who were receiving psychotropic medication were being prescribed antipsychotics, representing off-label use. Furthermore, nearly 67 percent of children diagnosed with developmental disabilities who used psychotropic medications received antipsychotics (likely also representing off-label use).

Exhibit 44: **Types of Psychotropic Medications Used by Children in Medicaid, by Psychiatric Diagnosis, 2005**

	Psychiatric Diagnosis							
Medication Type*	**ADHD**	**Mood**	**Anxiety**	**COD**	**DD**	**Psychosis**	**Other**	**None**
ADHD Medications	467,811 (90.5%)	114,116 (48.4%)	72,540 (49.8%)	94,529 (64.2%)	23,287 (58.1%)	17,359 (43.4%)	6,067 (57%)	50,786 (49.4%)
Anti-depressants	161,087 (31.2%)	148,656 (63.1%)	97,278 (66.8%)	65,432 (44.4%)	17,236 (43%)	20,846 (52.2%)	5,717 (53.7%)	50,814 (49.4%)
Antipsychotics	182,846 (35.4%)	145,689 (61.8%)	65,416 (44.9%)	80,450 (54.6%)	26,649 (66.5%)	32,603 (81.6%)	5,932 (55.7%)	29,282 (28.5%)
Anticonvulsants / Mood stabilizers	47,428 (9.2%)	55,397(23.5%)	17,618 (12.1%)	24,574 (15.7%)	5,838 (14.6%)	8,755 (21.9%)	1,509 (14.2%)	8,242 (8.0%)
Anxiety Medications	11,339 (2.2%)	11,877 (5.0%)	10,691 (7.3%)	5,852 (4.0%)	3,484 (8.7%)	2,679 (6.7%)	636 (6.0%)	6,558 (6.4%)
Lithium	11,390 (2.2%)	19,048 (8.1%)	5,348 (3.7%)	6,637 (4.5%)	1,590 (4.0%)	3,492 (8.7%)	606 (5.7%)	1,331 (1.3%)
Any Psychotropic Medication (N of children)	**517,125**	**235,679**	**145,704**	**147,227**	**40,103**	**39,956**	**10,641**	**102,876**

*Columns and rows do not sum to 100% since children may carry more than one diagnosis and/or receive more than one psychotropic medication type.

7. Total Expenditures for Psychotropic Medication Use

A total of $1.6B was spent on psychotropic medications for the 5.8 percent of children in Medicaid who used psychotropic medications in 2005. Analysis of total expenditures for psychotropic medication, as shown in Exhibit 45, indicates that prescriptions for TANF children, who represent 66.4 percent of those receiving psychotropic medication, accounted for 45 percent of the dollars ($713.4M). Meanwhile, children in foster care represented 12.6 percent of children with psychotropic medication use but accounted for 21 percent of the dollars ($342.2M). Those in the SSI/disability category, who equal less than five percent of the Medicaid population but 21 percent of those receiving prescriptions, accounted for 34 percent of total expenditures for psychotropic medications at $547.2M. These differences in expense correlate with the fact that prescriptions for TANF children were mainly for the relatively less expensive medications used to treat ADHD, while prescriptions for children in foster care and SSI/disability groups were more likely to include anti-psychotics, the most expensive of the psychotropic medication categories.

Exhibit 45: **Total Expenditures for Psychotropic Medications for Children in Medicaid, by Aid Category, 2005**

Aid Category	% of Total Medicaid Child Population	% of Population Using Psychotropic Medications	Amount Spent	% of Total Psychotropic Medication Expenditures
TANF	92.3%	66.4%	$713.4M	44.6%
Foster Care	3.2%	12.6%	$342.2M	21.4%
SSI/Disabled	4.5%	21.0%	$547.2M	34.2%
Total Medicaid Children Using Psychotropic Medications	**5.8%**	**100%**	**$1.6B**	**100%**

8. Mean Expenditures for Psychotropic Medications Use by Medication Type and Diagnosis

In addition to quality of care concerns related to inappropriate prescribing, psychotropic medications also represent an increasing source of pediatric health expense. Expenditures for antipsychotic medications alone represented 42 percent of total psychotropic medication expense for Medicaid children ($1.6B), as well as the highest overall mean expense at $1,516 per child. In order to better understand expense patterns, this analysis examined mean expenditures per child by psychotropic medication type and diagnosis.

As Exhibit 46 indicates, children with a diagnosis of psychosis had the highest overall mean psychotropic medication expenditure ($838) across the range of medication types used, followed by children with a diagnosis of developmental disability (mean expenditure of $734), and children with ADHD ($690). Among children with specific diagnoses, those with anxiety had the lowest mean psychotropic medication expenditure ($409).

Exhibit 46: **Mean Expenditures for Psychotropic Medications per Child in Medicaid Using Behavioral Health Services, by Psychiatric Diagnosis and Medication Type, 2005***

	Psychiatric Diagnosis							
Medication Type	**ADHD**	**Mood**	**Anxiety**	**COD**	**DD**	**Psychosis**	**Other**	**None**
Antipsychotics	$1,772	$1,332	$954	$1,025	$1,408	$1,646	$717	$177
Anticonvulsants/ Mood Stabilizers	$837	$522	$429	$451	$873	$627	$341	$131
ADHD Medications	$510	$516	$375	$345	$451	$428	$263	$68
Anti-depressants	$301	$231	$166	$167	$223	$232	$154	$31
Lithium	$170	$108	$79	$79	$115	$105	$46	$17
Anxiety Medications	$55	$39	$21	$30	$44	$47	$24	$8
Mean Pharmacy Expense	**$690**	**$642**	**$409**	**$492**	**$734**	**$838**	**$356**	**$78**

*N = 857,376. Expense data based on children receiving psychotropic medication and behavioral health services; continuous enrollment not required.

9. Mean Expenditures for Psychotropic Medication Use by Medication Type, Age, and Aid Category

Exhibit 47 describes mean expenditures per child by medication type, age, and aid category. When expense was analyzed by age, adolescents (ages 13-18) receiving antipsychotics had the highest overall mean expense ($1,630), while expense for 6-12 year-olds receiving antipsychotics was a close second ($1,437). Adolescents (ages 13-18) received more prescriptions and exceeded the overall mean expenditure for every class of psychotropic medication, while very young children (ages 0-5) received fewer prescriptions and had expenditures that were below the overall mean.

When expense was analyzed by aid category, children in the foster care aid category had higher overall mean expenditures for psychotropic medications ($934) than children on SSI/disability ($916); and higher mean expenditures for the use of antipsychotics, lithium, and anti-depressants. The only medication categories that showed a higher mean expenditure for children on SSI/disability than children in foster care was for anticonvulsants/mood stabilizers and anxiety medications. Psychotropic medication expense for both children in foster care and children on SSI/disability were twice as high as those for children covered through TANF. Antipsychotic use for children in foster care represented the single greatest mean expense, at $1,955.

Exhibit 47: **Mean Expenditures for Psychotropic Medications per Child in Medicaid, by Age, Aid Category, and Medication Type, 2005***

		Age Category			Aid Category		
Medication Type	**Overall**	**Age 0-5**	**Age 6-12**	**Age 13-18**	**TANF**	**Foster Care**	**SSI/Disabled**
Antipsychotics*	$1,516	$867	$1,437	$1,630	$1,045	$1,955	$1,891
Anticonvulsants/Mood Stabilizers	$826	$805	$815	$834	$508	$861	$1,265
ADHD Medications	$568	$332	$571	$594	$499	$762	$683
Anti-depressants	$247	$102	$205	$272	$194	$363	$317
Lithium	$139	$50	$117	$149	$105	$165	$158
Anxiety Medications	$49	$35	$49	$52	$22	$73	$97
Overall Mean	**$650**	**$386**	**$644**	**$678**	**$475**	**$934**	**$916**

*N = 1,686,387. Expense data based on children receiving psychotropic medication; continuous enrollment not required.

G. Physical Health Service Utilization and Expenditures

The interaction between physical and psychiatric diagnoses, including treatment and medication effects, is receiving greater attention from services researchers[52,53] and funders, including Medicaid officials in the context of the Affordable Care Act.[54] As state and federal governments grapple with growing healthcare costs, improvements are being sought for both clinical and financial outcomes.[55] Mental health and substance use needs are often unrecognized in primary care, particularly in childhood, increasing the risk of greater morbidity in adulthood.

Behavioral health challenges impact physical health outcomes and expense in a variety of ways: concurrent mental health needs can directly contribute to poorer physical health, to the extent that they interfere with appropriate management of comorbid medical conditions, such as asthma or diabetes. There are also indirect effects on physical health from conditions like depression or substance use, which can interfere with sleep, for example, or increase the risk of accidents.

Lastly, there can be adverse effects on physical health status secondary to the medications used to treat behavioral health conditions: the most serious of these is the increased risk of diabetes, obesity and heart disease associated with the use of atypical antipsychotics (see Section F, Patterns of Psychotropic Medication Use and Expense).

The opportunity offered by this interaction between physical and behavioral health conditions for children and adolescents is that appropriate diagnosis and treatment of mental health and substance use disorders can often reduce both physical health morbidity and medical expense.[56]

1. Mean Total Health Expenditures

In this study, mean total expenditures were tallied for 1,213,201 children with behavioral health claims and a minimum of six months of FFS Medicaid experience in 2005. Means were displayed as physical and behavioral health sub-totals, and then combined for a grand total mean. When all aid categories are grouped together, the overall total mean for both behavioral health ($4,868) and physical health ($3,652) claims by child was $8,520. The mean expenditure for behavioral health was 35 percent higher than that for physical health among the total population. In addition, many of these children incur still more expense for child welfare, juvenile justice, or special education services.

Exhibit 48 shows overall behavioral health and physical health mean expenditures for children in Medicaid who used behavioral health services, as well as the distribution of expense across aid categories and mean expense for "highest utilizers" – youth whose behavioral health expenses fell within the top 10 percent of behavioral health expenditures in 2005.

Exhibit 48: **Mean Overall Expense per Child for Children in Medicaid Using Behavioral Health Services, by Aid Category and Highest Cost Care Recipients , 2005***

	All Children Using Behavioral Health Services	TANF	Foster Care	SSI/Disabled**	Children representing top 10% of Expense for Behavioral Health Services***
Behavioral Health Services	$4,868	$3,029	$8,094	$7,264	$27,977
Physical Health Services	$3,652	$2,053	$4,036	$7,895	$20,121
Total Health Services	**$8,520**	**$5,082**	**$12,130**	**$15,159**	**$48,098**

* Includes children with at least one claim for a behavioral health service with or without concomitant psychotropic medication use; does not include children with psychotropic medication claims and no other behavioral health service claims.For this analysis, data include only children enrolled in a comprehensive MCO. N = 1,213,201
**Children determined to be disabled based on SSI or state criteria; includes both mental health and physical health disabilities.
***N = 121,323 children.

Mean expense for children on SSI/disability for physical and behavioral health care were almost twice that for the overall group of children, resulting in a combined total mean of $15,159 per SSI/disabled child versus a total mean of $8,520 per child for all children with behavioral health service use.

Overall mean expenditures for children in foster care and children on SSI/disability who used behavioral health services were two and a half to three times higher than for TANF children using behavioral health services; and the TANF children in the analysis had mean expenditures that were two and a half times higher than CMS data for children in Medicaid in general in 2005($5,082 versus $1,729).[57]

For children whose behavioral health expenditures were in the upper 10 percent for all children with behavioral health expense (about 121,000 children), mean expenses were $27,977 for behavioral health and $20,121 for physical health for a combined total expense of $48,098 per child.

2. Mean Physical Health Expenditures by Service Type

In Exhibit 49, physical health service utilization for children and adolescents in Medicaid with behavioral health service use in 2005 is displayed by service type and mean expense. Among the 15 most expensive service types, in this population overall, as shown in the first column, the highest mean service expense was for inpatient pediatric hospitalization ($626) with pharmacy (non-psychotropic) next ($478). The lowest mean pediatric service expense among the top 15 services was for transportation ($48).

Mean physical health expense for the youth representing the top 10 percent of behavioral health service expense (last column) was notably higher in the categories of inpatient pediatric hospitalization ($4,712), pharmacy (non-psychotropic) ($2,035) and non-behavioral health residential care ($1,997), with additional outlier expense for outpatient pediatrics ($1,338), non-behavioral health targeted case management ($1,322), non-behavioral health rehabilitation ($1,101), and home health ($1,002). The types of physical health services used by the top 10 percent of behavioral health-using children in Medicaid, as well as mean expenditures by aid category, suggest that children in the top 10 percent may also have serious physical health conditions.

Notably, mean physical health expenditures for children on SSI/disability, driven mainly by inpatient pediatric hospital expense, were over three and a half times higher than for TANF children, and almost twice as high as mean expenditures for children in foster care.

Physical health expenses by service type were generally higher for the SSI/disabled youth than the other two aid categories, except for non-behavioral health targeted case management, where expense for children in foster care ($704) was considerably higher than that for SSI/disabled youth ($522), and dental expense which was higher for TANF ($159) children than those receiving SSI/disability coverage ($136).

Exhibit 49: **Mean Physical Health Expense per Child for Children in Medicaid Using Behavioral Health Services, Overall and by Aid Category and Highest Cost Care Recipients , 2005***

Service Type	Overall	TANF	Foster Care	SSI/ Disabled**	Top 10%***
Inpatient pediatric hospital	$626	$449	$595	$1,159	$4,712
Pharmacy (non-psychotropic)	$478	$317	$440	$972	$2,035
Outpatient pediatrics	$445	$368	$400	$707	$1,338
Non-BH targeted case management	$352	$182	$704	$522	$1,322
Non-BH residential care	$226	$21	$309	$736	$1,997
Non-BH rehabilitation	$192	$84	$152	$541	$1,101
Dental	$158	$159	$180	$136	$191
Lab / x-ray	$144	$128	$130	$204	$383
Durable medical equipment	$117	$41	$77	$368	$724
Home health	$108	$13	$102	$386	$1,002
Personal care services	$88	$14	$59	$327	$757
Emergency room	$78	$74	$55	$111	$180
Physical, speech therapy	$57	$34	$37	$143	$203
Private duty nursing	$56	$9	$20	$220	$553
Transportation	$48	$34	$52	$85	$233
Other services	$479	$125	$724	$1,279	$3,388
Total physical health services	**$3,652**	**$2,053**	**$4,036**	**$7,895**	**$20,121**

*Includes children with behavioral health service use, not enrolled in a comprehensive MCO; N = 1,213,201.
**Children determined to be disabled based on state criteria; includes both mental health and physical health disabilities.
***Represents children whose behavioral health (BH) service expenditures are in the top 10% of BH expenditures.

3. Service Utilization and Expenditures by Chronic Illness and Disability Payment System

Many states and Medicaid health plans use predictive modeling tools for adult populations to identify the degree of burden represented by serious chronic health conditions, corresponding health expenditures, and potential intervention opportunities to reduce morbidity and associated expense. The Chronic Illness and Disability Payment System (CDPS), a well-known methodology developed at University of California San Diego, is a classification system that clusters Medicaid claims types by illness category and assigns corresponding claim expense.[58] CDPS has been widely used to provide information about which categories of chronic illness are most responsible for high costs in adult populations.

It is more challenging to try to measure "chronic illness" in children. Claims data are not designed to capture what percent of physical health expenditures are routine, what percent goes for acute illness, and what, truly, is for chronic physical health needs. To add to the complexity, the words "chronic illness" and "comorbidity" are frequently interchanged in discussions of health service use. For adults, there is not much difference, in that most comorbid conditions in adults are chronic. But children are mostly healthy, and when they get sick, they typically get better. For those reasons, looking for ways to reduce unnecessary physical health expense in children requires differentiated information that can lead to specifically targeted prevention activities (i.e., immunizations) and other interventions to reduce the likelihood of acute illness becoming chronic and minimize morbidity when chronic illness is truly present.[59]

For this study, the CDPS methodology was applied to a pediatric sub-population within the overall Medicaid data set from 2005, which had at least six months of continuous enrollment in a FFS system. This sample included about 830,000 children, or 42 percent of the total study sample of 1.9 million children using behavioral health services in 2005.

Results in Exhibit 50 below indicate that more than a third (38%) of this sample of children in Medicaid receiving behavioral health services had at least one serious, chronic medical condition, as defined by the presence of one for more CDPS categories. This rate is comparable to the Center for Disease Control and Prevention's estimate of 33 percent based on 2001 data.[60] Per CDPS, the three serious, chronic health areas with the greatest utilization in the 2005 data for children in Medicaid using behavioral health services were pulmonary, skeletal, and central nervous system.

Exhibit 50: **Frequency of Chronic Physical Health Conditions for Children in Medicaid Using Behavioral Health Services, 2005***

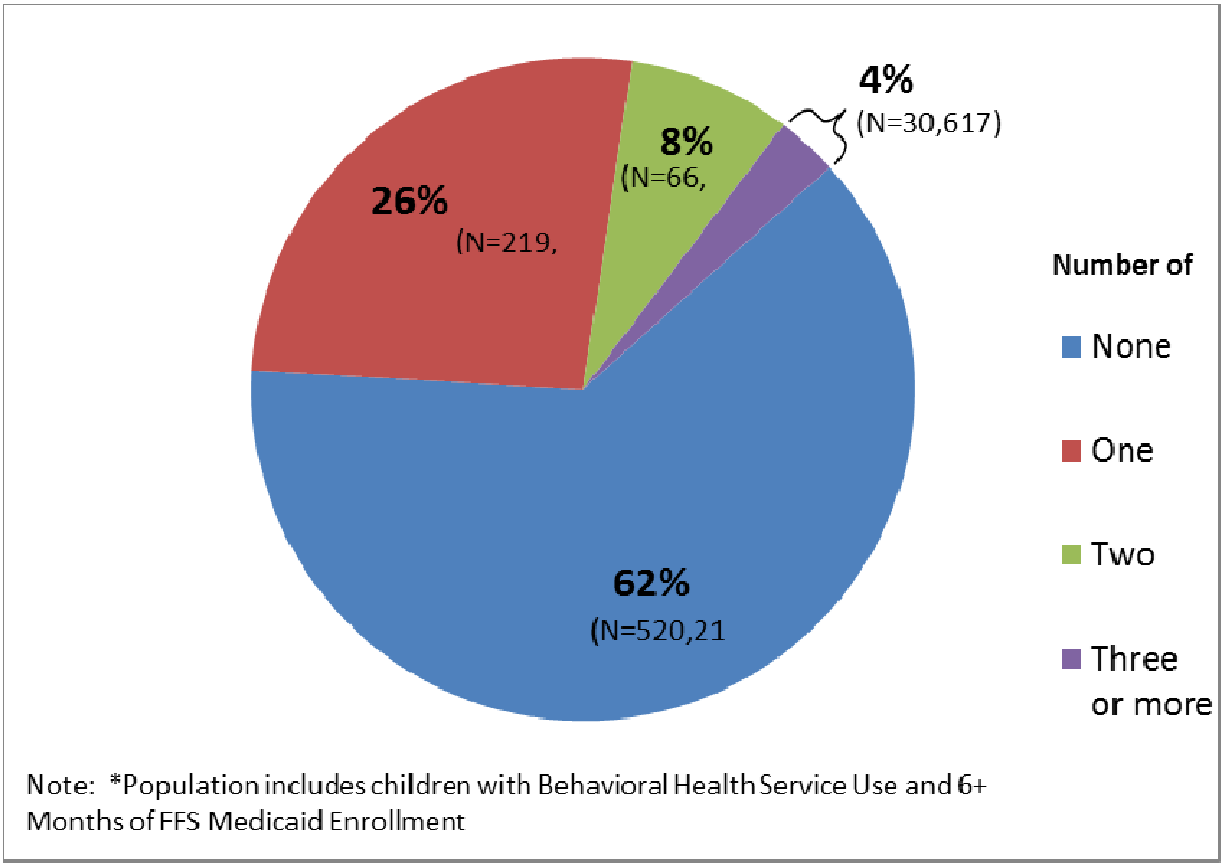


Exhibit 51 displays service use and expense detail for chronic pediatric illness by aid category. Using only the established diagnostic and CPT codes included in the CDPS chronic illness algorithm, and with, therefore, only the expense for those service types represented, children in foster care who used behavioral health services emerge, notably, as having had the most expensive chronic physical health needs among all three aid categories, with a mean expenditure of $12,112.

This amount is contrasted to $10,090 for children on SSI/disability, a group that is generally understood to be the most physically vulnerable, and $4,878 for TANF children, with an overall mean expenditure of $7,320 per child across aid categories for chronic medical conditions.

Exhibit 51: **Physical Health Service Use and Expenditures for Children in Medicaid Using Behavioral Health Services, by CDPS[61] Category, Overall and by Aid Category, 2005***

CDPS Category	Overall		TANF		Foster Care		SSI Disabled**	
	Use	Mean Exp.	Use	Mean Exp.	Use	Mean Exp.	Use	Mean Exp.
Pulmonary	12.6%	$1,091	12.8%	$1,047	10.2%	$2,479	14.2%	$1,054
Skeletal	8.2%	$4,095	7.7%	$2,436	7.7%	$5,989	9.6%	$5,593
Central Nervous System	5.3%	$7,948	3.0%	$5,112	4.0%	$7,017	11.6%	$7,332
Skin	5.3%	$1,833	5.4%	$1,170	4.6%	$4,235	5.7%	$2,256
Metabolic	4.2%	$6,265	2.5%	$4,891	4.3%	$5,611	8.0%	$4,583
Dev. Disability	3.8%	$14,955	1.0%	$9,172	2.6%	$12,255	11.2%	$12,954
Cardiovascular	3.4%	$9,909	2.8%	$6,983	3.4%	$14,004	4.9%	$9,704
Gastrointestinal	3.3%	$6,987	3.1%	$3,869	2.6%	$9,162	4.2%	$11,359
Renal	3.1%	$7,638	2.0%	$2,834	3.4%	$5,614	5.2%	$10,164
Substance use	2.4%	$5,731	2.3%	$6,553	3.6%	$4,508	1.6%	$3,288
Genital	0.9%	$2,059	1.0%	$2,355	1.0%	$3,637	0.8%	$1,390
Diabetes	0.8%	$6,448	0.7%	$4,047	0.6%	$8,960	1.1%	$8,048
Infectious	0.8%	$15,749	0.7%	$9,446	0.8%	$13,478	1.2%	$23,791
Hematological	0.7%	$18,914	0.5%	$10,511	0.7%	$17,097	1.1%	$27,416
Eye	0.5%	$3,824	0.3%	$4,073	0.5%	$3,255	0.7%	$1,558
Cancer	0.4%	$19,065	0.3%	$17,563	0.4%	$15,371	0.7%	$19,321
Cerebrovascular	0.2%	$9,709	0.1%	$8,313	0.2%	$10,362	0.5%	$7,616
Total Expenditure	**$6.13B**		**$2.30B**		**$1.98B**		**$2.05B**	
Number of Children	**837,131**		**470,670**		**163,105**		**203,356**	
Mean Expenditure	**$7,320**		**$4,878**		**$12,112**		**$10,090**	

*Includes children enrolled in FFS for ≥ 6 months in 2005, n = 837,131.

The level of expense by CDPS claim category was roughly inverse to the frequency of service utilization, consistent with the idea that really severe illness in children, while expensive, is rare. For example, pulmonary diseases were the most common chronic condition in children, but had an overall mean expense of $1,091, versus cancer, which was near the bottom in frequency but carried an overall mean expense of $19,065. Perhaps related to their Medicaid aid category, those within the SSI/disabled group incurred cancer-related service claims more than twice as frequently as did TANF youth and 43 percent more frequently than children in foster care.

Many questions reside within the variations displayed; additional study of such variations could reveal important differences in service utilization profiles within CDPS groupings, or, perhaps, differences in adherence, or predisposing population characteristics, between aid categories. Further research is needed to increase understanding of what drives these differences, in order to design interventions that can improve quality of care for children while reducing unnecessary expense.

H. Children with Developmental Disabilities

1. Children with Developmental Disabilities in the Medicaid Child Population

Various studies estimate that between two and four percent of children in the United States have a developmental disability.[62,63] Of particular relevance to this study are the children with developmental disabilities who also have a co-occurring behavioral health need. Results from a 2009 study found that children with developmental disabilities were more likely to be served in public systems, including both the public mental health system, where an estimated 13 percent of children had a co-occurring developmental disability, and special education where, among children placed because they met the

criteria for emotional/behavioral disability, 25 percent also had a co-occurring developmental disability. Further, of those with autism spectrum disorders or intellectual disabilities, approximately one-third were served in more than one public service system.[64]

As shown in Exhibit 52, this study identified 114,969 children with a diagnosis of developmental disabilities in the Medicaid child population in 2005, representing a scant 0.4 percent of Medicaid child enrollment. Children were identified based on a developmental disability diagnosis on a claim for behavioral health, physical health, or Intermediate Care Facility for Persons with Intellectual Disabilities (ICF/MR) services during the study year. Of these, 27.6 percent were TANF-enrolled, 10.2 percent were children in foster care, and not surprisingly, the largest percentage, 62.2 percent, were children deemed eligible for Medicaid based on their SSI/disability status. The analysis may undercount the number of Medicaid children with developmental disabilities who received services in 2005 because developmental disability might not be the primary diagnosis associated with the claim for the physical or behavioral health service they received. Additionally, parents of children with developmental disabilities can have difficulties finding appropriate community-based services for their children, further reinforcing the potential to undercount children with developmental disabilities.[65]

Exhibit 52: **Characteristics of Children in Medicaid with Developmental Disabilities,* 2005**

	Children in Medicaid (N = 29,050,305, 100%)		Children in Medicaid with Developmental Disabilities (N = 114,969, 100%)	
Age				
0-5 years	12,001,451	41.3%	24,827	21.6%
6-12 years	9,889,507	34.0%	55,250	48.1%
13-18 years	7,159,347	24.6%	34,892	30.3%
Gender				
Female	419,428	48.9%	26,735	23.3%
Male	595,558	51.0%	88,218	76.7%
Race and Ethnicity				
White	11,271,574	38.8%	58,357	50.8%
Black or African American	7,537,925	25.9%	23,429	20.4%
American Indian or Alaska Native	448,234	1.5%	960	0.8%
Asian	644,744	2.2%	1,597	1.4%
Hispanic or Latino	6,413,067	22.1%	9,339	8.1%
Native Hawaiian or Pacific Islander	185,598	0.6%	549	0.5%
Hispanic or Latino and one or more races	846,083	2.9%	1,807	1.6%
More than one race	74,093	0.3%	246	0.2%
Unknown	1,628,987	5.6%	18,685	16.3%
Aid Category				
TANF	26,812,742	92.3%	1,777	27.6%
Foster Care	919,590	3.2%	11,692	10.2%
SSI/Disabled**	1,317,973	4.5%	71,500	62.2%

*Includes 114,969 children with a claim having developmental disability as the primary diagnosis.
**Children determined to be disabled based on SSI or state criteria; includes both mental health and physical health disabilities.

In contrast to the general Medicaid child population, where the youngest children represent the largest percentage of enrollees, children in the 6-12-year-old age group represent the largest proportion of children with developmental disabilities – based on claims – and the youngest children, the smallest proportion. This relatively low proportion of young children with developmental disabilities makes sense given that a diagnosis is typically not given to pre-schoolers, in whom developmental delays may not materialize into diagnosable developmental disabilities. It is interesting to note that although developmental disabilities are life-long conditions, the data showed a drop in the number of children with a diagnosis of developmental disabilities in the oldest age group who were captured in the Medicaid

claims data, which should not be interpreted as a decrease in need, but that these children may be receiving services through the developmental disabilities or education systems, rather than Medicaid system.

In the study sample, children with developmental disabilities were more than three times as likely to be male. The under-representation of females among Medicaid children with developmental challenges raises concerns regarding the identification process for developmental disabilities and appropriate access to services for girls.

With regard to race and ethnicity, white children comprised half of all Medicaid children with developmental disabilities in the sample, proportionally more than their representation in the total Medicaid population of 39 percent. Black/African American, American Indian/Alaska Native, and Asian children were slightly under-represented, while Hispanic/Latino children were considerably under-represented among children identified as having a developmental disability. This suggests disparities in diagnosis identification and treatment access based on race and ethnicity.[66] In addition, white children may be overrepresented in Medicaid waivers for persons with developmental disabilities, which create better access to services for those enrolled.

As noted earlier, children with developmental disabilities are most likely to be eligible for Medicaid due to their SSI/disability status, with over 60 percent of children with developmental disabilities in the study sample designated SSI/disabled, just fewer than 30 percent designated TANF, and 10 percent eligible for Medicaid by virtue of their foster care status.

2. Behavioral Health Service Utilization of Children in Medicaid with Developmental Disabilities

Studies conducted over the past decade estimate the rate of serious behavioral health needs among children with developmental disabilities to be anywhere from as low as 14 percent to as high as 70 percent.[67] Because this analysis does not include all children in Medicaid with developmental disabilities – only those with a claim for service and a primary diagnosis of developmental disability – it was not possible to estimate the penetration rate for use of behavioral health services by children with developmental challenges in Medicaid.

As illustrated in Exhibit 53, among the study sample of 114,969 children with developmental disabilities with claims for either behavioral or physical health care, just under 75 percent (86,001) used some type of behavioral health care (behavioral health services and/or psychotropic medications). Of those, over 70,000 (nearly 82% of those with behavioral health care use) actually used behavioral health services and not just psychotropic medications. This is a higher rate of service use than Medicaid children in general who used behavioral health care. By the same token, over 65 percent of children with developmental challenges who used behavioral health care received psychotropic medications, a higher rate of medication use than Medicaid children in general who used behavioral health care. In other words, children with developmental challenges who used behavioral health care were more likely to receive specialty behavioral health services and more likely to receive psychotropic medications than Medicaid children in general. While children with developmental challenges on psychotropic medications were less likely to receive only physical health care, there were still nearly 12 percent receiving psychotropic medications with only physical health services (i.e., no specialty behavioral health services).

Exhibit 53: **Description of Behavioral Health Care Use among Children in Medicaid with Developmental Disabilities,* 2005**

	Children in Medicaid with Developmental Disabilities Who Used Behavioral Health Care**		All Children in Medicaid Who Used Behavioral Health Care	
	Number of children (N)	% of children	Number of children (N)	% of children
Total users of behavioral health care (includes children with behavioral health service use and/or psychotropic medication use)	**86,001**	**100%**	**2,787,919**	**100%**
Users of behavioral health services (includes children with at least one behavioral health service, not psychotropic medications only)	**70,322**	**81.8%**	**1,958,908**	**70.3%**
▪ Users of behavioral health services only (no psychotropic medication use)	29,692	42.2%	1,101,532	56.2%
▪ Users of behavioral health services with psychotropic medications use	40,630	57.8%	857,376	43.8%
Users of psychotropic medications (includes children with behavioral health service use, children with physical health service use, and children with indeterminate service use)	**56,309**	**65.5%**	**1,686,387**	**60.5%**
▪ Users of psychotropic medications with behavioral health services use	40,630	72.1%	857,376	50.8%
▪ Users of psychotropic medications with physical health service use only	6,621	11.8%	490,360	29.1%
▪ Users of psychotropic medication with physical health or indeterminate service use (i.e. cannot determine whether service was behavioral or physical health)	9,058	16.1%	338,651	20.1%

*Includes 114,969 children with a claim for behavioral or physical health care having developmental disability as the primary diagnosis.

**Includes 86,001 children with a claim for behavioral health service and/or psychotropic medication

3. Behavioral Health Service Utilization by Service Type

The analyses that follow are on the 70,322 children with developmental disabilities who used behavioral health services in 2005. As Exhibit 54 shows, out of 32 types of services, children with developmental disabilities were more likely than other children in Medicaid who used behavioral health services to use the following 12 service types: psychotropic medication, medication management, targeted case management, psychosocial rehabilitation, case management, psychological testing, partial hospitalization, crisis intervention, wraparound, respite, home-based, and activity therapies. This higher relative use may be attributable to greater access to these services through Medicaid Developmental Disability Waivers (DD waivers). It should be noted, however, that for many of these services, the absolute number of children using them was very small.

There were eight services received by the overall child behavioral health services-using population that were used less frequently, relatively speaking, by children with developmental disabilities; these include: outpatient treatment, family therapy, group therapy, mental health consultation, substance use screening, substance use inpatient, therapeutic foster care, therapeutic behavioral support, and supported housing.

Similar to the overall Medicaid population of 1.9 million children who used behavioral health services in 2005, fewer than one percent of children with developmental challenges used therapeutic foster care; therapeutic behavioral support; activity therapies; respite; home-based; peer support; or telehealth services.

Exhibit 54: **Use of Behavioral Health Services by Children in Medicaid with Developmental Disabilities, by Service Type, 2005**

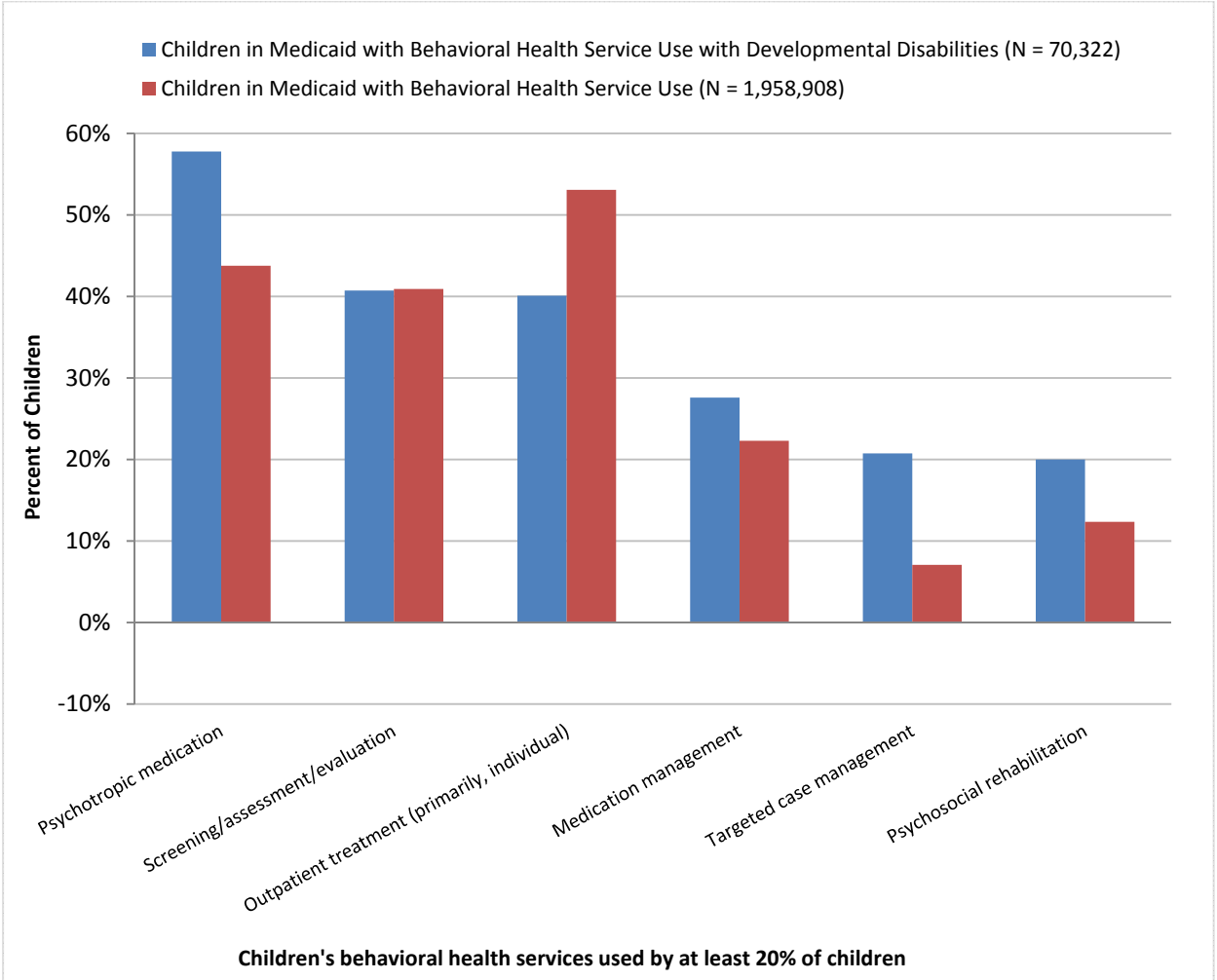
	Medicaid Children Who Used Behavioral Health Services (N = 1,958,908)		Medicaid Children with Developmental Disabilities Who Used Behavioral Health Services* (N= 70,322)	
Service Type	**N**	**%**	**N**	**%**
Psychotropic medication	857,376	43.8%	40,630	57.8%
Screening/assessment/evaluation	801,449	40.9%	28,644	40.7%
Outpatient treatment (primarily individual)	1,039,827	53.1%	28,198	40.1%
Medication management	436,698	22.3%	19,401	27.6%
Targeted case management	138,666	7.1%	14,592	20.8%
Psychosocial rehabilitation	242,052	12.4%	14,063	20.0%
Family therapy/family education and training	379,817	19.4%	12,492	17.8%
Initial service planning	173,194	8.8%	10,323	14.7%
Case management	170,100	8.7%	9,728	13.8%
Psychological testing	182,546	9.3%	9,461	13.5%
Substance use outpatient	206,612	10.5%	7,349	10.5%
Partial hospitalization/day treatment	63,806	3.3%	5,231	7.4%
Group therapy	148,749	7.6%	4,478	6.4%
Crisis intervention and stabilization (non ER)	68,148	3.5%	2,759	3.9%
Behavior management consultation and training	76,118	3.9%	2,678	3.8%
Residential treatment/therapeutic group homes	71,003	3.6%	2,534	3.6%
Wraparound	22,308	1.1%	2,417	3.4%
Inpatient psychiatric treatment	65,209	3.3%	2,392	3.4%
Mental health consultation	60,570	3.1%	1,423	2.0%
Substance use screening and assessment	57,038	2.9%	765	1.1%
Respite	4,620	0.2%	586	0.8%
Therapeutic foster care	14,758	0.8%	397	0.6%
Therapeutic behavioral support	15,646	0.8%	359	0.5%
Home-based (e.g., in-home services)	1,193	0.1%	354	0.5%
Activity therapies	1,116	0.1%	177	0.3%
Substance use inpatient	5,887	0.3%	141	0.2%
Transportation	2,465	0.1%	103	0.1%
Peer services	1,495	0.1%	97	0.1%
Supported housing	3,521	0.2%	79	0.1%
Emergency room	2,233	0.1%	59	0.1%
Telehealth	613	0.0%**	38	0.1%
Multisystemic Therapy	102	0.0%**	--	0.0%

* Includes children with at least one claim for a behavioral health service with or without concomitant psychotropic medication use; does not include children with psychotropic medication claims and no other behavioral health service claims.
**Numbers were too low to register as percentages.

Exhibit 55 shows the most frequently used behavioral health services among Medicaid children with developmental disabilities who had a claim for any behavioral health care in 2005. Psychotropic medications were the most frequently used behavioral health care among this population, used at a rate a third higher than that for children with behavioral health service use overall (57.8% vs. 43.8%). The remaining most frequently used services were screening/assessment and evaluation, outpatient treatment

(primarily individual), targeted case management, and psychosocial rehabilitation services – each of which were used by at least 20 percent of children with developmental challenges receiving behavioral health care.

Exhibit 55: **Most Frequently Used Behavioral Health Services among Children in Medicaid with Developmental Disabilities, 2005**



Four of these services – outpatient treatment, psychotropic medication, screening and assessment, and medication management – were also among the most frequently used services for Medicaid children in general who used behavioral health services in 2005. However, relatively speaking, children with developmental disabilities were more likely to use psychotropic medications and medication management and less likely to use outpatient treatment than children in Medicaid in general who used behavioral health services. Targeted case management and psychosocial rehabilitation were not among the services used by 20 percent or more of all Medicaid children using behavioral health services in 2005, as they were for children with developmental disabilities. Targeted case management stood out at nearly three times the rate of use among children with developmental disabilities, as did psychosocial rehabilitation at nearly twice the rate of use, compared to all children in Medicaid using behavioral health services. Again, this utilization may be related to enrollment of children with developmental disabilities in Medicaid developmental disabilities waivers.

4. Utilization of Psychotropic Medications Among Children with Developmental Disabilities

The analysis in this section pertains to all children with developmental disabilities in Medicaid who received psychotropic medications, regardless of whether they also received a behavioral health service. As Exhibit 53 above shows, in 2005, there were 56,309 children with developmental disabilities who used psychotropic medications (with or without another behavioral health service claim), representing nearly half (48.9%) of all Medicaid children with developmental disabilities in this study and over 65 percent of children with developmental disabilities receiving any type of behavioral health care. Of children with developmental challenges who received psychotropic medications, 40,630 used psychotropic medications as well as specialty behavioral health services; 9,058 used psychotropic medications along with indeterminate mental health or physical health services, and 6,621 used psychotropic medications with physical health services alone.

The 56,309 children with a diagnosis of developmental disability who received psychotropic medications were most likely to receive antipsychotics; 66.5 percent of these children received antipsychotics, a rate of use second only to children with a diagnosis of psychosis and likely representing off-label use. Over half of children with a diagnosis of developmental disability who received psychotropic medications (58.1%) received ADHD/stimulants, and 43 percent received anti-depressants. Just under nine percent of children with a diagnosis of developmental disability who used psychotropic medications received anti-anxiety medications, a higher rate of use than for children with a diagnosis of anxiety (see Exhibit 44).

Exhibit 56: **Use of Psychotropic Medication among Children in Medicaid, by Psychiatric Diagnosis, 2005**

	Psychiatric Diagnosis						
Medication Category	**DD**	**ADHD**	**Mood**	**Anxiety**	**COD**	**Psychosis**	**Other**
Antipsychotics	66.5%	35.4%	61.8%	44.9%	54.6%	81.6%	55.7%
Anticonvulsants/mood stabilizers	14.6%	9.2%	23.5%	12.1%	16.7%	21.9%	14.2%
Lithium	4.0%	2.2%	8.1%	3.7%	4.5%	8.7%	5.7%
Anti-depressants	43.0%	31.2%	63.1%	66.8%	44.4%	52.2%	53.7%
ADHD medications	58.1%	90.5%	48.4%	49.8%	64.2%	43.4%	57.0%
Anxiety medications	8.7%	2.2%	5.0%	7.3%	4.0%	6.7%	6.0%

5. Total Behavioral Health Expenditures for Medicaid Children with Developmental Disabilities in 2005

Based on 2005 FFS data, behavioral health care expenditures for children with developmental disabilities – including those who only used psychotropic medications – totaled $596M. For the subset of children with developmental disabilities who had a claim for behavioral health services (with or without concomitant medications use) total expenditures were just over $530M. This represents about 3.5 percent of all behavioral health expenditures for children in Medicaid using behavioral health services in 2005; children with developmental disabilities also represented roughly 3.5 percent of all children using behavioral health services. Exhibit 57 shows the total expenditures and utilization rates across the range of behavioral health care for children with developmental disabilities who used behavioral health

services. As was the case for the overall Medicaid child population who used behavioral health services, the proportion of dollars spent on certain high-cost services was often disproportionate to the percentage of children who used them. For example, residential treatment services were the third top expense for children with developmental disabilities, representing 13 percent of behavioral health expenditures, yet those services were used by under four percent of children.

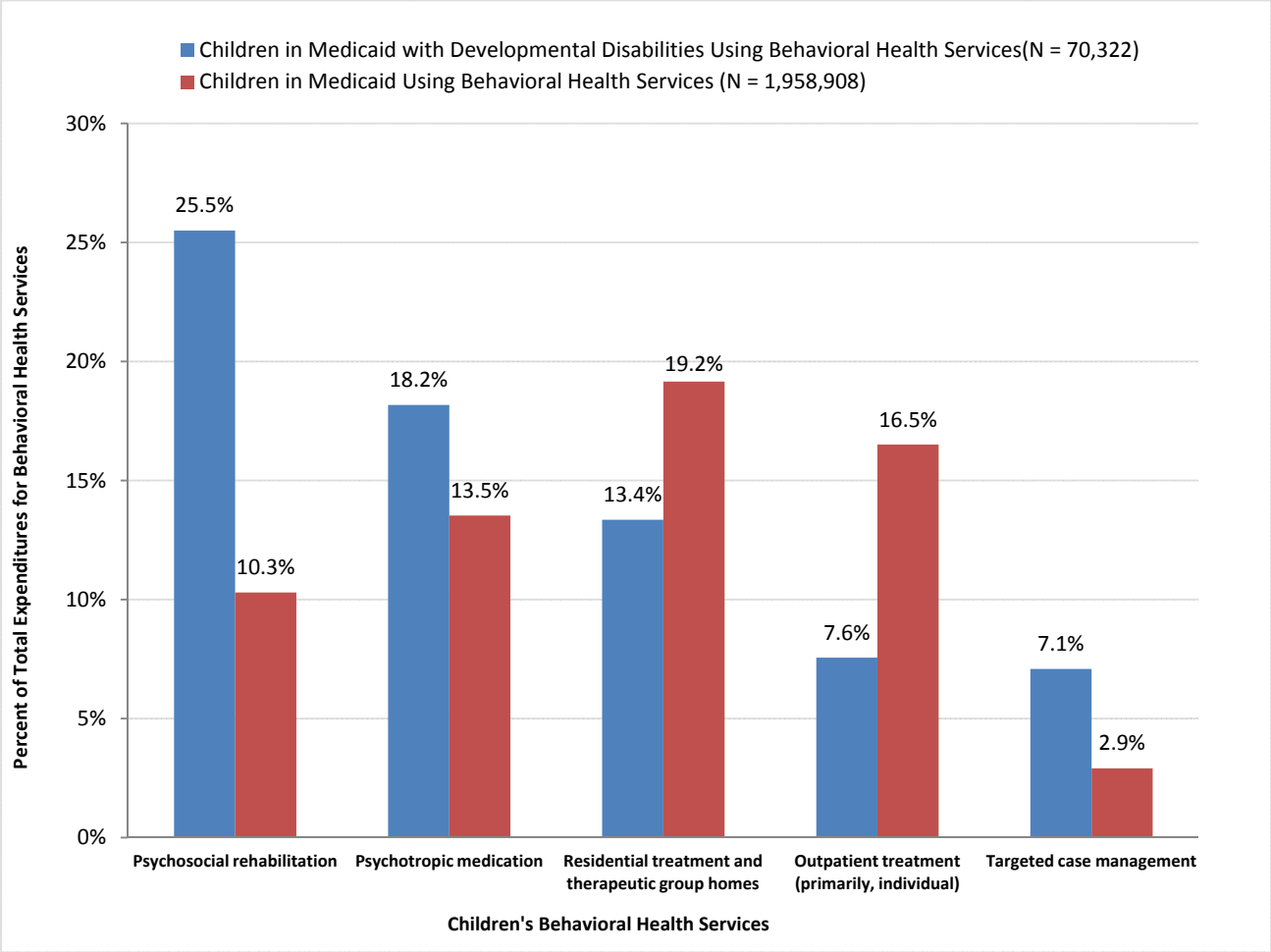
Exhibit 57: **Total Expenditures and Proportion of Behavioral Health Service Use among Children in Medicaid with Developmental Disabilities, by Service Type, 2005**

Service Type	Total Expenditures	% Total Expenditures	% Users*
Psychosocial rehabilitation	$135,385,863	25.5%	20.0%
Psychotropic medication**	$96,474,188	18.2%	57.8%
Residential treatment/therapeutic group homes	$70,881,067	13.4%	3.6%
Outpatient treatment (primarily individual)	$40,141,716	7.6%	40.1%
Targeted case management	$37,599,096	7.1%	20.8%
Inpatient psychiatric treatment	$25,731,851	4.8%	3.4%
Substance use outpatient	$19,927,020	3.8%	10.5%
Case management	$18,383,326	3.5%	13.8%
Partial hospitalization/day treatment	$14,715,066	2.8%	7.4%
Behavior management consultation and training	$14,652,258	2.8%	3.8%
Wraparound	$10,679,784	2.0%	3.4%
Therapeutic foster care	$7,882,551	1.5%	0.6%
Medication management	$6,810,598	1.3%	27.6%
Screening/assessment/evaluation	$5,790,097	1.1%	40.7%
Family therapy/family education and training	$5,626,323	1.1%	17.8%
Home-based (e.g. , in-home services)	$4,462,291	0.8%	0.5%
Initial service planning	$3,841,466	0.7%	14.7%
Therapeutic behavioral support	$2,910,949	0.5%	0.5%
Psychological testing	$2,692,351	0.5%	13.5%
Group therapy	$2,631,722	0.5%	6.4%
Crisis intervention and stabilization (non ER)	$1,403,685	0.3%	3.9%
Respite	$1,135,720	0.2%	0.8%
Activity therapies	$394,280	0.1%	0.3%
Supported housing	$310,750	0.1%	0.1%
Substance use screening and assessment	$281,383	0.1%	1.1%
Emergency room (ER)	$99,074	0.0%***	0.1%
Telehealth	$49,022	0.0%***	0.1%
Substance use inpatient	$25,642	0.0%***	0.2%
Mental health consultation	$11,929	0.0%***	2.0%
Transportation	$0***	0.0%***	0.1%
Peer services	$0***	0.0%***	0.1%
Multisystemic Therapy (MST)	$0***	0.0%***	0.0%
Total	**$530,931,152**	--	--

*N = 70,322. Percentages do not sum to 100% as a child may use multiple service types.
** $96.4M reflects psychotropic medication expenditures for children who used behavioral health services.
***Numbers to small to register.

The top five services – based on total expenditures for children with developmental disabilities who used behavioral health care – were: psychosocial rehabilitation, psychotropic medication, residential treatment/therapeutic group homes, outpatient treatment, and targeted case management (Exhibit 58). Together, expenditures for these five services accounted for 72 percent of the total behavioral health expense among children with developmental disabilities who used behavioral health services.

Exhibit 58: **Behavioral Health Services Accounting for the Largest Proportion of Total Expenditures for Medicaid Children with Developmental Disabilities Using Behavioral Health Services, 2005***



*Includes children with at least one claim for a behavioral health service with or without concomitant psychotropic medication use; does not include children with psychotropic medication claims and no other behavioral health service claims.

6. Total Expenditures for Psychotropic Medication Use among Children with Developmental Disabilities, 2005

As Exhibit 59 shows, among children with developmental disabilities who used psychotropic medication, expenditures for those medications totaled $125.6M, representing just under eight percent of expenditures for all children in Medicaid receiving psychotropic medications in 2005; children with developmental disabilities who received psychotropic medications represented just over three percent of all children receiving psychotropic medications. Children with developmental disabilities had a mean medication expense per child of $2,230, which is three and a half times higher than for children in

Medicaid in general who used psychotropic medications. Among children with developmental disabilities receiving psychotropic medication, those who also received behavioral health services had the highest psychotropic medication mean expense ($2,374); those receiving only physical health care and psychotropic medications had the next highest mean medication expense ($1,922), and those receiving a service that was not readily identifiable as a behavioral health or a physical health service had the lowest psychotropic medication mean expense ($1,808).

Exhibit 59: **Expenditures for Psychotropic Medication among Children in Medicaid with Developmental Disabilities, by Type of Health Care Used, 2005**

Type of Health Care	Children Receiving Psychotropic Medication (N)	Mean Psychotropic Medication Expenditure	Total Psychotropic Medication Expenditure
Behavioral Health Services	40,630	$2,374	$96,474,188
Indeterminate Services *	9,058	$1,808	$16,379,862
Physical Health Services Only	6,621	$1,922	$12,725,125
TOTAL	**56,309**	**$2,230**	**$125,579,175**

*Cannot determine whether service was behavioral or physical health.

7. Psychotropic Medication Expenditures for Children with Developmental Disabilities, By Medication Type

Exhibit 60 shows expenditures among all children in Medicaid who received psychotropic medications and also received behavioral health services in 2005, broken down by diagnosis and medication type. Antipsychotics accounted for 66 percent of psychotropic medication expenditures among those with a diagnosis of developmental disability. While this high percentage is partly attributed to the high cost of antipsychotics, prescribing trends for antipsychotics among children with developmental disabilities are in fact higher than for Medicaid children in general (for whom antipsychotics represented 42 percent of psychotropic medication expense). The next largest psychotropic medication expenditure (18%) for children with developmental disabilities was for ADHD/stimulant medication; expenditures were driven not by the cost of the medication, but by the frequency of prescription. Note that expenditures by medication type as reflected in Exhibit 60 are an underestimate since this analysis did not have access to expenditure data by medication type for children with developmental disabilities who used psychotropic medication *without* concomitant behavioral health service use.

Exhibit 60: **Expenditures for Psychotropic Medication Use among Children in Medicaid, by Psychiatric Diagnosis, 2005**

	Psychiatric Diagnosis							
Medication Category	DD	ADHD	Mood	Anxiety	COD	Psychosis	Other	None
Antipsychotic	$62,236,406	$285,047,522	$253,634,092	$106,002,239	$143,965,560	$68,518,457	$6,252,041	$38,670,755
Anticonvulsant/ Mood Stabilizers	$7,945,193	$34,808,726	$38,065,122	$12,873,287	$19,181,211	$6,962,950	$713,887	$8,048,276
Lithium	$258,351	$1,592,347	$2,702,399	$707,138	$893,733	$462,028	$37,110	$166,344
Anti-depressant	$6,283,006	$45,334,646	$45,423,228	$30,249,988	$19,138,913	$6,207,425	$1,292,057	$11,770,673
ADHD/ stimulant	$17,204,517	$311,658,357	$77,344,900	$47,751,161	$61,213,726	$9,412,724	$2,391,490	$25,858,505
Anxiety	$287,694	$641,370	$630,280	$529,497	$324,937	$167,255	$25,711	$381,667
Total Expenditures	**$94,215,167**	**$679,082,968**	**$417,800,021**	**$198,113,310**	**$244,718,080**	**$91,730,839**	**$10,712,296**	**$84,896,220**

8. Mean Expenditures among Children with Developmental Disabilities

As Exhibit 61 shows, the mean behavioral health services expenditure for Medicaid children with developmental disabilities who used behavioral health services was $7,550 in 2005, which was 55 percent higher than the mean behavioral health expenditure among all Medicaid children using behavioral health services($4,868), and slightly higher than that of all children in the SSI/disability aid category ($7,264).

There were some striking differences in mean expenditures by service type between Medicaid children with developmental disabilities and Medicaid children in general who used behavioral health services. Children with developmental challenges had higher mean expenditures than Medicaid children in general for most service types, with few exceptions. For certain services, mean expenditures were three to three and a half times higher (e.g., behavior management consultation and respite). Mean expenditures for children with developmental disabilities were lower than those of Medicaid children who used behavioral health services overall for only a few services, including partial hospitalization/day treatment; in-home services, substance use disorder services; non-emergency room crisis services; MST; group therapy and peer services.

Exhibit 61: **Mean Behavioral Health Expenditures per User among Children in Medicaid with Developmental Disabilities Who Used Behavioral Health Services, 2005**

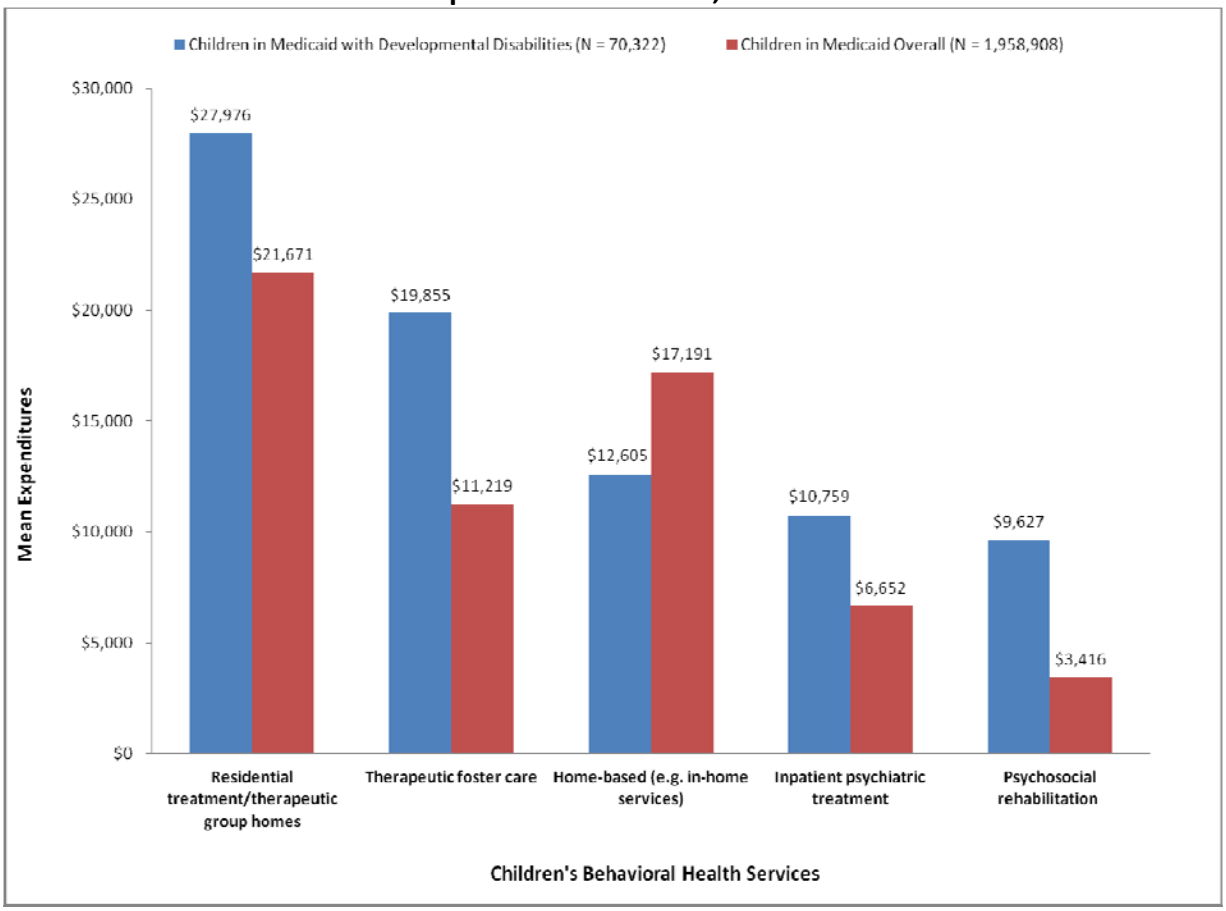
Service Type	Children Using Behavioral Health Services (N = 1,959,908)	Children with Developmental Disabilities (N = 70,322)
Residential treatment/therapeutic group homes	$21,671	**$27,976**
Therapeutic foster care	$11,219	**$19,855**
Home-based (e.g., in-home services)	$17,191	**$12,605**
Inpatient psychiatric treatment	$6,652	**$10,759**
Psychosocial rehabilitation	$3,416	**$9,627**
Therapeutic behavioral support	$7,821	**$8,108**
Behavior management consultation and training	$1,535	**$5,471**
Wraparound	$3,467	**$4,419**
Supported housing	$2,315	**$3,933**
Partial hospitalization/day treatment	$5,746	**$2,813**
Substance use outpatient	$3,625	**$2,712**
Targeted case management	$1,683	**$2,577**
Psychotropic medication	$1,267	**$2,319**
Activity therapies	$1,658	**$2,228**
Respite	$649	**$1,938**
Case management	$1,233	**$1,890**
Emergency room	$1,162	**$1,679**
Outpatient Treatment (primarily individual)	$1,275	**$1,424**
Telehealth	$495	**$1,290**
Group therapy	$598	**$588**
Crisis intervention and stabilization (non ER)	$667	**$509**
Family therapy/family education and training	$428	**$450**
Initial service planning	$153	**$372**
Substance use screening and assessment	$245	**$368**
Medication management	$352	**$351**
Psychological testing	$264	**$285**
Screening/assessment/evaluation	$219	**$202**
Substance use inpatient	$4,773	**$182**
Mental health consultation	$6	**$8**
Multisystemic Therapy	$1,662	**$0***
Transportation	$0*	**$0***
Peer services	$492	**$0***

*Number too small to register.

As Exhibit 62 illustrates, mean expenditures for behavioral health services among children with developmental disabilities were highest for residential treatment and/or therapeutic group homes at $27,976 per child served, followed by therapeutic foster care, home-based services, and inpatient hospitalization – all with a mean expenditure of over $10,000 per child among children with developmental disabilities.

Residential treatment, therapeutic foster care, and home-based services were also the top three services with the highest mean expenditures for Medicaid children in general. Conversely, psychosocial rehabilitation services were not in the top five for Medicaid children in general as they were for children with developmental challenges (see Exhibit 23).

Exhibit 62: **Behavioral Health Services with Highest Mean Expenditures for Children in Medicaid with Developmental Disabilities, 2005***



* Includes children with at least one claim for a behavioral health service with or without concomitant psychotropic medication use; does not include children with psychotropic medication claims and no other behavioral health service claims.

9. Mean Overall Health Expenditures (Behavioral and Physical Health) for Medicaid Children with Developmental Disabilities who Used Behavioral Health Services

Exhibit 63 shows the mean expenditures for both physical and behavioral health services in 2005 for Medicaid children with developmental disabilities who used behavioral health services. Expenditures for physical health services among Medicaid children with developmental disabilities who used behavioral health services were 2.5 times higher than for the overall Medicaid child population using behavioral

health services, and expenditures for behavioral health services were two times higher than for Medicaid children in general. As a result, total health service spending for children with developmental disabilities was 2.2 times higher than for Medicaid children overall who used behavioral health services.

Exhibit 63: **Mean Overall Health Expenditures for Children in Medicaid with Developmental Disabilities Who Used Behavioral Health Services, 2005***

	Children Using Behavioral Health Services** (N=1,213,201)	Children with Developmental Disabilities Using Behavioral Health Services** (N=52,151)
Behavioral Health Care Services	$4,868	$10,085
Physical Health Services	$3,652	$9,172
Total Health Services	$8,520	$19,257

* Includes children with at least one claim for a behavioral health service with or without concomitant psychotropic medication use; does not include children with psychotropic medication claims and no other behavioral health service claims. For this analysis, data include only children not enrolled in a comprehensive MCO.
**Excludes ICF/MR expenditures.

10. Mean Claims by Service Type among Children with Developmental Disabilities

As Exhibit 64 shows, among children with developmental disabilities who used behavioral health services, mean claims were highest for home-based services. Though relatively few children – less than one percent of those receiving behavioral health services – received these services, those who did had a significant number of claims – an average of 113 claims for 354 children receiving the service. The data suggest that while there may be barriers to eligibility for or access to these services, for those who are deemed eligible and/or gain access, the services are used with great frequency. After home-based services, children with developmental disabilities used psychosocial rehabilitation services most frequently, with an average of 94 claims for the 14,063 (20%) children with developmental disabilities receiving that service – a rate that was three times that of Medicaid children using behavioral health services overall. Children with developmental disabilities also had more than three times the number of mean claims for psychotropic medication than Medicaid children in general who used behavioral health services in 2005. Interestingly, mean claims for telehealth among children with developmental disabilities were twice those of overall Medicaid child behavioral health users. Conversely, mean claims for therapeutic behavioral support among the 15,646 Medicaid children overall who used the service were more than three times the average claims for the service among children with developmental disabilities (73.3claims vs. 20.3 claims).

Exhibit 64: **Mean Number of Claims for Children in Medicaid with Developmental Disabilities, by Service Type, 2005**

Service Type	Children Using Behavioral Health Services (N = 1,958,908)			Children with Developmental Disabilities Using Behavioral Health Services (N= 70,322)		
	%	N	Mean Claims	%	N	Mean Claims
Home-based (e.g., in-home services)	0.1%	1,193	40.4	0.5%	354	113.5
Psychosocial rehabilitation	12.4%	242,052	29.9	20.0%	14,063	94.0
Therapeutic foster care	0.8%	14,758	59.0	0.6%	397	66.1
Partial hospitalization/day treatment	3.3%	63,806	46.1	7.4%	5,231	35.1
Behavior management consultation and training	3.9%	76,118	17.8	3.8%	2,678	34.5
Therapeutic behavioral support	0.8%	15,646	73.3	0.5%	359	20.3
Respite	0.2%	4,620	9.7	0.8%	586	18.3
Psychotropic medication	43.8%	857,376	5.3	57.8%	40,630	18.2
Wraparound	1.1%	22,308	12.5	3.4%	2,417	17.0
Telehealth	0.0%	613	8.2	0.1%	38	16.6
Group therapy	7.6%	148,749	11.0	6.4%	4,478	14.6
Substance use outpatient	10.5%	206,612	17.4	10.5%	7,349	14.5
Activity therapies	0.1%	1,116	9.7	0.3%	177	14.1
Supported housing	0.2%	3,521	5.7	0.1%	79	13.9
Outpatient treatment (primarily individual)	53.1%	1,039,827	11.7	40.1%	28,198	12.8
Residential treatment/therapeutic group homes	3.6%	71,003	17.9	3.6%	2,534	12.3
Case management	8.7%	170,100	11.7	13.8%	9,728	12.1
Targeted case management	7.1%	138,666	14.8	20.8%	14,592	11.2
Inpatient psychiatric treatment	3.3%	65,209	9.8	3.4%	2,392	11.0
Mental health consultation	3.1%	60,570	6.1	2.0%	1,423	8.4
Transportation	0.1%	2,465	8.0	0.1%	103	7.8
Peer services	0.1%	1,495	5.8	0.1%	97	6.6
Family therapy/family education and training	19.4%	379,817	5.7	17.8%	12,492	6.0
Initial service planning	8.8%	173,194	2.5	14.7%	10,323	5.4
Medication management	22.3%	436,698	4.7	27.6%	19,401	5.2
Crisis intervention and stabilization (non ER)	3.5%	68,148	4.3	3.9%	2,759	3.6
Emergency room	2.9%	57,038	2.7	0.1%	59	1.9
Substance use screening and assessment	0.1%	2,233	1.4	1.1%	765	1.9
Screening/assessment/evaluation	40.9%	801,449	1.6	40.7%	28,644	1.6
Psychological testing	9.3%	182,546	1.6	13.5%	9,461	1.5
Substance use inpatient	0.3%	5,887	2.7	0.2%	141	1.4

11. Intermediate Care Facilities for People with Mental Retardation

Children with severe developmental disabilities may reside in residential treatment settings called Intermediate Care Facilities for People with Mental Retardation (ICF/MR).[68] These facilities are primarily for the diagnosis, treatment, or rehabilitation of people with intellectual disabilities; they provide, in a protected residential setting, ongoing evaluation, planning, 24-hour supervision, coordination, and integration of health or rehabilitative services to help individuals function at their greatest ability. Most of the individuals who receive care provided by ICF/MR have other disabilities as well as developmental disability. They may also be non-ambulatory, have seizure disorders, behavior problems, mental health needs, visual or hearing-impairments, or have a combination of these conditions.[69]

Of the 114,949 children with developmental disabilities in the study population, regardless of whether they received any behavioral health care, 3.4 percent (3,907 children) had an ICF/MR claim with an average length of stay of 313 days. The mean ICF/MR expenditure for these children was $92,315 and total expenditures were about $360.7M. In the analysis, 1.5 percent of children with developmental disabilities (about 1,000 children) who used behavioral health services also had claims for ICF/MR. About 26 percent of the ICF/MR population used behavioral health services. In 2005, ICF/MR total expenditures for the children with developmental disabilities using behavioral health services was $72.1M, with a mean expenditure per user of $66,200. The average length of stay for these Medicaid children receiving care in an ICF/MR in 2005 was 254 days. In other words, children in ICF/MRs who used behavioral health services, while still a very high cost population, had somewhat lower average expenditures and lengths of stay than children in ICF/MRs who did not use behavioral health services.

12. Physical Health Service Use among Children with Developmental Disabilities

Children with developmental disabilities who use behavioral health services often have other chronic health conditions, such as higher rates of congenital health defects, metabolic disease, and neurologic disorders, including seizure disorders.[70] One of the goals of this report is to capture and estimate the physical health burden among children receiving behavioral health services, including those with developmental disabilities.

13. Total Physical Health Expenditures for Children with Developmental Disabilities by Service Categories

Exhibit 65 shows physical health expenditures for all children in Medicaid who used behavioral health services in 2005, as well as physical health expense for the subset of children with developmental disabilities who used behavioral health services. Physical health expenditure data were limited in this study to the subset of children with behavioral health service use who were enrolled in Medicaid for six months or longer and for whom FFS data were available. Among this subset of Medicaid children, 52,151 children with developmental disabilities had total physical health expenditures of nearly $480M in 2005, as illustrated in Exhibit 65. This represents 11 percent of the total physical health expenditures for Medicaid children using behavioral health services in that year. As children with developmental disabilities represented fewer than four percent of all Medicaid children who received behavioral health services in this study, their percentage of expenditures for physical health services is almost three times higher than would be expected based on their representation among Medicaid children. The physical health services for which these children had the highest total expenditures were non-psychiatric residential care, targeted case management, non-psychiatric medications, rehabilitation, outpatient, and personal care services. Expenditures by children with developmental disabilities for personal care services

represented more than a quarter of the total expenditure among Medicaid children overall using that service. As noted earlier, these expenditures may be related to enrollment in DD waivers. In the overall Medicaid child population receiving behavioral health care, the physical health services on which states spent the largest percentage were inpatient pediatrics, non-psychiatric medication, outpatient pediatrics, non-behavioral health targeted case management and non-psychiatric residential care.

Of particular note, children with developmental disabilities had the lowest total expenditures for dental services at $6.4M, with mean expenditures of $123. Their total expenditures were lower than those of Medicaid children overall and children in any of the three Medicaid aid categories. While children with Medicaid coverage have lower rates of oral health care access than children who are commercially insured,[71] this challenge is compounded for children with developmental disabilities whom dental providers may not be trained to treat, or who may have needs that dental offices and waiting rooms are not set up to manage, such as being wheelchair accessible or having a separate room where families can soothe a child with special needs. According to the National Institute of Dental and Craniofacial Research, data indicate that people with intellectual disabilities have more untreated caries and a higher prevalence of gingivitis and other periodontal diseases than the general population.[72]

Exhibit 65: **Total Expenditures for Physical Health Services among Children in Medicaid with Developmental Disabilities Using Behavioral Health Services, by Service Type, 2005**

Service Type	All Medicaid Children Using Behavioral Health Services* (N = 1,213,201)	Medicaid Children with Developmental Disabilities Using Behavioral Health Services* (N = 52,151)	Percent of Total Expenditures for Physical Health Services Used by Medicaid Children with Developmental Disabilities
Residential care**	$274,183,426	$61,694,633	22.5%
Targeted case management**	$427,046,752	$60,025,801	14.1%
Pharmacy (non-psychotropic)	$579,910,078	$39,478,307	6.8%
Rehabilitation**	$232,934,592	$38,800,344	16.7%
Outpatient	$539,874,445	$34,628,264	6.4%
Personal care services	$106,761,688	$29,361,013	27.5%
Inpatient	$759,463,826	$23,363,648	3.1%
Durable medical equipment	$141,944,517	$19,452,323	13.7%
Home health	$131,025,708	$19,243,719	14.7%
Physical/speech therapy	$69,152,457	$13,037,750	18.9%
Lab/x-ray	$174,700,944	$8,604,915	4.9%
Dental	$191,685,758	$6,414,573	3.3%
Transport	$58,233,648	$5,319,402	9.1%
Emergency room	$94,629,678	$4,537,137	4.8%
Private duty nursing	$67,939,256	$2,764,003	4.1%
Other services	$581,123,279	$111,603,140	19.2%
Total Physical Health Services	$4.43B	$478,328,972	10.8%

*Includes children with at least one claim for a behavioral health service with or without concomitant psychotropic medication use; does not include children with psychotropic medication claims and no other behavioral health service claims. For this analysis, data include only children not enrolled in a comprehensive MCO.
**This is a non-behavioral health service.

14. Mean Expenditures for Physical Health Services among Children with Developmental Disabilities

As Exhibit 66 shows, children with developmental disabilities who used behavioral health services have a mean expenditure for physical health services that is 2.5 times that of the overall Medicaid child population who used behavioral health services. The services with the highest mean expenditures among children with developmental disabilities are non-psychiatric residential care, targeted case management, non-psychiatric medications, rehabilitation, outpatient, and personal care services – all with mean expenditures of more than $500 per child served. The mean expenditures for these services among children with developmental disabilities ranged from 1.5 to 6.5 times the mean expenditures for the same services among the overall Medicaid child population who used behavioral health services.

Exhibit 66: **Mean Expenditures per Service User for Physical Health Services among Children with Developmental Disabilities Using Behavioral Health Services, by Service Type, 2005***

Service Type	Total Medicaid Child Population Using BH Services (N = 1,213,201)	Medicaid Children with Developmental Disabilities Using BH Services (N = 52,151)
Residential care**	$226	$1,183
Targeted case management**	$352	$1,151
Pharmacy (non-psychotropic)	$478	$757
Rehabilitation**	$192	$744
Outpatient	$445	$664
Personal care services	$88	$563
Inpatient	$626	$448
Durable medical equipment	$117	$373
Home health	$108	$369
Physical/speech therapy	$57	$250
Lab/x-ray	$144	$165
Dental	$158	$123
Transport	$48	$102
Emergency room	$78	$87
Private duty nursing	$56	$53
Other services	$479	$2,140
Total Mean for Physical Health Services	$3,652	$9,172

* Includes children with at least one claim for a behavioral health service with or without concomitant psychotropic medication use; does not include children with psychotropic medication claims and no other behavioral health service claims. For this analysis, data include only children not enrolled in a comprehensive MCO.
**This is a non-behavioral health service.

In conclusion, children with developmental disabilities who use behavioral health care are a particularly high-need, high-cost population of Medicaid children. Their utilization of behavioral health, psychotropic medications, and physical health services is significant, as a subset of Medicaid children who use behavioral health care. Consequently, Medicaid expenditures for this population are also disproportionately high. Programs that identify developmental and behavioral health needs early, and ensure appropriate access to physical health and specialty care, are needed to assist in improving clinical care and cost outcomes for children with developmental disabilities.

V. Appendix A

Glossary of Children's Behavioral Health Services

Activity therapy: Adjunctive therapies, such as recreation, music and art therapy, to assist children to develop interpersonal relationships, to socialize effectively, and to develop confidence needed to participate in group activities

Behavior management consultation and training: Includes assessment of a child's behavior, antecedents of behavior and identification of motivators; development of a specific behavior plan; supervision and coordination of behavioral interventions; and training of others, such as family members, to address specific behavior objectives and performance goals

Case management: Assists children and their families to access needed services and supports and includes assessment, care plan development, referral and related activities to needed services, monitoring and follow-up

Crisis intervention and stabilization: Includes 24-hour, seven days a week, toll-free telephone hotline services, mobile crisis services, mobile stabilization services, crisis stabilization units, crisis respite beds, and medically monitored crisis detoxification units to alleviate or prevent a crisis, help the child return to his or her baseline level of functioning, and prevent the need for an inpatient or residential admission

Emergency room: Services provided in a hospital area especially equipped and staffed for emergency care

Family therapy/family education and training: Family therapy is a type of psychotherapy that involves all members of a child's family and, in some cases, members of the extended family (e.g., grandparents) in which a therapist or team of therapists conducts multiple sessions to help families deal with important issues that may interfere with the functioning of the family and the home environment; family education/training are information and supports provided to the family members/caregivers of a child with a behavioral health challenge to better understand the child's disorder, service and support options and intervention strategies

Group therapy: A form of psychosocial treatment where a small group of youth meet regularly to talk, interact, and discuss problems with each other and the group leader (therapist)

Home-based (in-home) services: Interventions provided in the home typically to enable a child to remain in the home, including crisis intervention, individual and family counseling, behavior management and skills training, and case management

Inpatient hospital: Inpatient hospital services provided in a psychiatric hospital or in a psychiatric unit of a general hospital

Medication management: Facilitation of safe and effective use of prescription and over-the-counter medications to help patients achieve the targeted outcomes from medication therapy

Mental health consultation: Any interaction between two or more health care professionals related to a specific issue of mental health or between a professional consultant with mental health expertise and one or more individuals with other areas of expertise, for example, child care center staff, with the purpose of problem-solving or capacity building

Multisystemic Therapy (MST): A time-limited, goal-directed, home-based, team-based and intensive family treatment program that addresses the multiple determinants of serious anti-social behavior in

youth and the factors associated with such behavior across the youth's key settings or systems (e.g., family, peers, school, neighborhood); builds on the strengths of each system to foster positive change

Outpatient counseling: Primarily individual outpatient therapy that is provided in a therapist's office

Partial hospitalization/day treatment: Partial hospitalization is a nonresidential, highly structured day program that may or may not be hospital-based. The program provides diagnostic and treatment services on a level of intensity similar to an inpatient program, but on less than a 24-hour basis. These services typically include therapeutic milieu, nursing, psychiatric evaluation, medication management, group, individual and family therapy. Day treatment is a community-based, nonresidential day program that is intensive but allows a child to remain in his/her home; the program lasts at least four hours per day and typically provides special education, counseling, parent training, vocational training, skill building, crisis intervention, and recreational therapy

Peer services: Include both family peer support and youth peer support; are non clinical, peer-based activities that engage, educate and support families who have children with behavioral health challenges or youth themselves; are provided by trained families or youth who have lived experience of the behavioral health system and are based on principles of respect, shared responsibility, and mutual agreement of what is helpful

Psychological testing: Written, visual, or verbal evaluations administered to assess the cognitive and emotional functioning of children

Psychosocial rehabilitation: Includes an array of services that that are provided in the child's home, in the location where behavioral challenges are most likely to occur such as school, or in community settings; teaches the child and his/her family about, but is not limited to: emotional management, emotional regulation, positive coping mechanisms; interventions include skills training that can include but are not limited to: vocational, social, educational, organizational, or personal care

Psychotropic medication: Chemicals that affect the central nervous system, altering psychological processes (e.g., mood, thoughts, perception, emotions, behavior)

Residential treatment and therapeutic group homes: Residential treatment is mental health and/or substance use treatment in a licensed, highly structured, usually secure out-of-home program providing continuous 24-hour observation and supervision with typically a full complement of in-house programs including education; therapeutic group homes provide 24-hour out-of-home mental health and/or substance use services in a licensed, non-secure facility, with children typically involved in community-based activities such as school, work or recreation

Respite: Provides temporary direct care and supervision for the child/youth in the child's home or a community setting with the primary purpose of providing relief to families/caregivers of a child with a serious emotional disturbance or relief to the child, helping to de-escalate stressful situations and provide a therapeutic outlet for the child; may be either planned or provided on an emergency basis

Screening, assessment, evaluation: Distinct processes with different but related purposes: screening includes activities to identify children who may need further assessment to determine the existence of a behavioral health disorder; assessment is a process of gathering data from multiple sources to create a comprehensive picture of a child's strengths, challenges and needs; evaluation is a more intensive, in-depth study in a particular area to provide additional data and recommendations

Service planning: The process of making decisions about which services and supports are provided to individual children; informed by screening, assessment and evaluation data

Substance use inpatient: Hospital-based detoxification services and substance use rehabilitation counseling

Substance use outpatient: Regularly scheduled individual, group and/or licensed family counseling in a licensed outpatient substance use program; definition also includes intensive outpatient programs that provide a higher intensity of outpatient services over a longer period of time, supporting the daily application of what is learned in therapy, as well as outpatient detoxification services

Substance use screening and assessment: Screening includes activities to identify youth who may need further assessment to determine the existence of a substance use disorder; assessment is a process of gathering data from multiple sources to create a comprehensive picture of a youth's strengths, challenges and needs

Supported housing: The combination of affordable housing with services and supports that help transition-age youth live more stable, productive lives

Targeted case management: Intended for children with serious behavioral health challenges, ensures that service systems and community supports are maximally responsive to the specific, multiple and changing needs of children and their families, with the case manager having limited, small caseloads and a flexible schedule to assist children and their families to access needed services, coordinate care, ensure services are responsive to needs as they change over time, and ensure services match the needs of children and their families

Telehealth: The use of telecommunications and information technology to provide access to behavioral health assessment, diagnosis, interventions, consultation, supervision, education, and information

Therapeutic behavioral support: Structured one-to-one support, coaching and training provided by a therapeutic mentor or behavioral aide in the home, school or other community location to help a child achieve age-appropriate behavior, interpersonal communication, problem-solving, conflict resolution, peer interaction etc.; typically delivered by a paraprofessional supervised by the supervising practitioner and included as part of the child's master treatment plan

Therapeutic foster care: Provides a safe, secure and nurturing environment in a private home with licensed foster parents who have received specialized training in the care of children and adolescents with emotional or substance use disorders; treatment foster parents typically provide care for one child only and perform behavioral interventions and life skills training in addition to ensuring that the child receives needed mental health and substance use services, medical care and education.

Transportation: Transport support for providers to travel to children needing services or for children to access services

Wraparound: A definable, individualized and strengths-based planning process that incorporates a child and family team and results in a unique set of services and supports for a child and family, with the plan closely monitored to achieve a positive set of outcomes

Appendix B

Glossary of Acronyms

ADHD: attention defecit hyperactivity disorder

AI/AN: American Indian/Alaska Native

CDPS: Chronic Disability Payment System

CME: care management entity

CMS: Centers for Medicare & Medicaid Services

COD: conduct oppositional disorder

DD: developmental disability

FFS: fee-for-service

ICF/MR: Intermediate Care Facility for Persons with Mental Retardation

MAX: Medicaid Analytic eXtract

MCO: managed care organization

MST: Multisystemic Therapy

SAMHSA: Substance Abuse and Mental Health Services Administration

SPMI: serious and persistent mental illness

SSI: Supplemental Security Income

SUD: substance use disorder

TANF: Temporary Assistance for Needy Families

Endnotes

[1] For more information on CDPS, see http://cdps.ucsd.edu.
[2] C. Boyd, B. Leff, C. Weiss, J. Wolff, R. Clark, & T. Richards. Clarifying Multimorbidity to Improve Targeting and Delivery of Clinical Services for Medicaid Populations. Center for Health Care Strategies. December 2010. http://www.chcs.org/usr_doc/Clarifying_Multimorbidity_for_Medicaid_report-FINAL.pdf
[3] TANF – Medicaid eligible due to receipt of Temporary Assistance for Needy Families; Foster Care - Medicaid eligible by virtue of their status as a foster child or receipt of adoption assistance payments, and SSI disability - Medicaid eligible by virtue of their status as an individual eligible for Supplemental Security Income or meeting state definitions of disability.
[4] The study examines Medicaid Analytic eXtract (MAX) data for fiscal year 2005, the most recent MAX data available when the project was undertaken.
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The Center for Health Care Strategies (CHCS) is a nonprofit health policy resource center dedicated to improving health care access and quality for low-income Americans and people with chronic illnesses and disabilities. CHCS works with state and federal agencies, health plans, providers, and consumer groups to develop innovative programs that better serve people with complex and high-cost health care needs. Its work focuses on: enhancing access to coverage and services; advancing quality and efficiency through delivery system reform; integrating care for people with complex needs; and building Medicaid leadership and capacity.

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Since 2000, CHCS has shed light on the complex needs of Medicaid's most challenging populations through its *Faces of Medicaid* data analyses. This ongoing series of national analyses provides insights into the prevalence of specific conditions among Medicaid beneficiaries and their patterns of service use. By better understanding the many faces of the Medicaid population, states and health plans can identify new oppoturnieis to improve care, enhance health outcomes, and control program costs. Learn more at www.chcs.org.