

Children's Health Services in a "System of Care": Patterns of Mental Health, Primary and Specialty Use

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SYNOPSIS

Objectives. This study was designed to investigate demonstrable impacts of the Mental Health Services Program for Youth (MHSPY), a highly coordinated, intentionally integrated "system of care," on patterns of health service utilization for youth with multiple needs.

Methods. The MHSPY intervention is available to a target population of urban youth who face barriers to health care and are at risk for out-of-home placement. These youth are enrolled in a non-profit managed care organization (MCO). Patterns of medical, pharmacy, and mental health and substance abuse service use were compared for children aged 3 to 19 across insurance categories.

Results. Despite risks for access and engagement barriers to care, and for greater medical expense due to greater morbidity, MHSPY enrollees received significantly more ambulatory care per person-year than either the privately insured population or the Medicaid Standard population, and medical expense for MHSPY members was significantly lower than expected. During the four years studied, individuals in the privately insured and Medicaid Standard populations were less likely than MHSPY enrollees to have had an ambulatory pediatric visit (odds ratio [OR] 0.833, 95% confidence interval [CI] 0.765, 0.908 and OR 0.823, 95% CI 0.775, 0.897, respectively). Medical expenses per member per month for MHSPY enrollees were significantly less than that for the similarly impaired Medicaid Disabled population with any medical claim ($p < 0.001$) or with any outpatient mental health claim ($p < 0.01$).

Conclusions. Patterns of health care for subpopulations with known risk are important to identify to evaluate system-of-care effectiveness. The service utilization patterns for youth enrolled in the MHSYP system of care vs. those for similar MCO youth suggest health care access for individuals can be affected by delivery system design variables.

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Health policy researchers have decried the sorry state of children's mental health in the United States for more than 20 years.¹⁻³ Epidemiologic statistics cited by the Surgeon General's Report in 2000 indicate that 20% of the nation's children have diagnosable psychiatric disorders and 9% to 13% have serious emotional disturbance. Meanwhile, the same report adds, only one in five children with serious emotional disturbance receives treatment.⁴

Mental health service system changes, from "deinstitutionalization" to managed care, and more recently, "behavioral health carve-outs," have overlapped the same two decades but brought us no closer to, and may have moved us farther from, adequate care delivery for children. In response to the urgent need articulated by consumers and providers alike, the President's New Freedom Commission on Mental Health was convened in 2002. The Commission's final report eloquently calls for a "transformation" of the children's mental health system.⁵ Saying that the time for reform has long past, the Commission instead urges transformation of the overall system (including schools, courts, and primary and specialty care) within which children develop: "If the system does not appropriately screen and treat them early, these childhood disorders may persist and lead to a downward spiral of school failure, poor employment opportunities, and poverty in adulthood. No other illnesses damage so many children so seriously."⁵

The burgeoning family movement in children's mental health has helped create recognition of the difficulties families face attempting to access appropriate mental health services for their children.⁶ The Department of Health and Human Services' (HHS') *Healthy People 2010* report states that families of children with special health care needs "continuously face the challenge of obtaining and coordinating the primary and specialty services their children require. Differing eligibility criteria, duplication and gaps in services, inflexible funding sources, and poor coordination among service sectors are some of the barriers consistently reported."⁷

If it is difficult for average families to access child mental health services, it is presumably even more difficult for those with additional language, cultural, and/or economic challenges. Some of the urgency found in the tone of the Commission report is fueled by increasingly recognized health care disparities experienced by the most vulnerable populations.^{8,9} Many family members serving as caregivers for children with mental health needs face medical or mental health needs of their own. Additionally, families of color often confront disparities in health status that compound

the risk of negative health outcomes for their children.^{10,11} The Commission notes "significant barriers still remain in access, quality, and outcomes of care for minorities. As a result [racial and ethnic minorities] bear a disproportionately high burden of disability from mental disorders. This higher burden does not arise from a greater prevalence or severity of illnesses in these populations. Rather it stems from receiving less care and poorer quality of care."⁵

The *Healthy People 2010* guidelines recommend a "system of services" informed by family member and health care professional participation: "These service systems should ensure access to a source of insurance for primary and specialty care and enabling services, an identified medical home, and care coordination." They suggest that a "collaborative partnership" between families and professionals "will strengthen the ability of families to care for their children with special needs and will enable children with complex conditions to live at home with their families."⁷

As congruent as the New Freedom Commission and *Healthy People 2010* recommendations sound, they have been produced out of the parallel universes of children's mental health and children's physical health, respectively. Although the mind and the body reside in the same person, we still, maybe even increasingly, face a great divide between primary care and mental health care delivery. This gap has made it difficult to receive, provide, and pay for integrated care, but it has also made it difficult to study the impact of innovations that aim to improve overall health care delivery. Additional research challenges can be found in multiple disconnects between epidemiological data and claims data, between clinical encounter documentation and outcomes documentation, and between disease-specific results and the overall health status of a population. Given these caveats, and the further recognition that clinical quality measurement differs widely from standardized managed care cost analyses, one way to begin to examine impacts on overall care delivery is to attempt to track simultaneous records of mental health/substance abuse (MH/SA) service and medical utilization for the same populations and analyze patterns of care.

This study uses the Mental Health Services Program for Youth (MHSPY) as the lens to examine these patterns of care. The MHSPY is a new, intentionally integrated care delivery system based on earlier work done between 1985 and 1995, and financed by the Robert Wood Johnson Foundation (RWJ). RWJ funded several such systems-of-care efforts that relied on blended funding and interagency agreements, in conjunction with the Child and Adolescent Service Sys-

tem Program (CASSP) principles articulated by Stroul in 1986.¹² Stroul outlined 12 principles, foremost among them that systems of care were expected to be "child-centered, family-focused, need-driven, community-based, and culturally competent."¹² The original RWJ MHSPY pilots were aimed at recruiting "communities rather than institutions" to care for high-risk children and were originally directed at system change, not clinical change.¹³ Past efforts to demonstrate the effectiveness of these specialized systems of care for children with serious emotional disturbance have been fraught with difficulties. Problems have included inconsistencies in defining the "intervention," lack of standardization in both outcome measures and financial methodologies between different systems of care,^{14,15} and insufficient study scope to address questions of "cost shifting" or "add-on" costs.^{16,17} The recent trend toward greater accountability for cost and service delivery, in both public and private settings, is somewhat beneficial in that more utilization information is available for study.¹⁸⁻²⁰ Still, even crisper definitions of service types and easier access to outcomes information from public spending would be desirable to establish baselines for quality improvement initiatives such as MHSPY.^{21,22}

Building on the CASSP principles of strength-based, family-driven care and learning from examples of strategic use of the "wraparound" approach to individualized service planning,²³ systems of care have sought to incorporate nontraditional approaches to reaching high-risk families. An additional challenge for evaluations, however, lies in demonstrating associations between such non-mental health interventions and improvements in mental health outcomes. Purchasers, too, ask about the degree to which, for example, a "wraparound" approach prevents unnecessary hospitalizations, or how a "partnership with child welfare" supports a child remaining in his home. While further study at the level of the individual is necessary to answer these questions, demonstrable impacts on patterns of care for subpopulations with known risk would be valuable to identify in the investigation of an overall systems-of-care effect.

BACKGROUND

The Massachusetts Mental Health Services Program for Youth is a system of care for Medicaid youth determined to be seriously emotionally disturbed.²⁴ The intervention combines primary care, mental health, substance abuse, education, juvenile justice, and social service resources for each child, as needed. Due to the inclusion of medical care in the model, MHSPY is

unique among systems of care in that it also offers the opportunity to assess overall health care delivery patterns. Measurement of utilization of services not only in mental health and substance abuse, but also across the entirety of the medical care service delivery system, provides a larger picture of patterns of use by selected populations. In this descriptive study, the patterns of overall medical, mental health/substance abuse, and pharmacy use of the MHSPY population of Medicaid children are compared to patterns of use among same-aged youth with at least one service claim from (1) privately insured youth, (2) those with standard Medicaid coverage and (3) those who have Medicaid coverage based on a disability (mental or physical). Examination of variations in these patterns is seen as a beginning, not the conclusion, of the type of analysis needed to better understand the impact of intentionally organized clinically integrated systems of care on overall access and service utilization for high-risk youth.

MHSPY system intervention

MHSPY is an integrated delivery system aimed at providing individualized, biopsychosocial treatment for seriously emotionally disturbed youth in order to improve their level of functioning and help maintain them in their homes and communities. The MHSPY system of care is funded collaboratively via a blended case rate drawn from the categorically separate Massachusetts juvenile justice, social services, education, Medicaid, and mental health agency budgets. This case rate purchases all medical services, including hospital and pharmacy, and all mental health and substance abuse care (inpatient and outpatient). MHSPY is unique among organized systems of care in its inclusion of medical care within its service array. The MHSPY case rate also includes flexible funds to support individualized, strength-based service planning building on the "wraparound" philosophy.²³ The program is managed by the broadly based, interagency MHSPY Steering Committee, a diverse group of stakeholders that also includes consumers, clinicians, and community representatives. Over a two-year planning process, the Steering Committee developed a consensus model of shared governance, and defined the MHSPY "benefit," with a focus on intensity of service need rather than diagnosis. In this manner, the support of an expanded Medicaid benefit is combined with other child-serving state agency resources to provide a continuum of care from least (home-based) to most restrictive (hospital and residential) settings. Referrals for inclusion in the program are made via an independent community-based selection committee that triages and

prioritizes MHSPY referrals on the basis of severity, using agreed-upon eligibility criteria (Figure 1), with the most clinically urgent cases matched to the earliest available opening. A key element of the systemic intervention is collaborative decision-making at the community level regarding referrals, risk factors, and resources.

MHSPY clinical intervention

MHSPY relies on an intensively coordinated disease management process that is strengths-based and goal-directed, with families in the lead. Once enrolled, a youth and family are assigned a MHSPY Care Manager, a licensed, masters-level mental health clinician who provides individualized support in the form of direct clinical intervention with the child and his/her family, care coordination of all needed services and interventions, and case administration, including identification of resources, authorizations for care, and quality management. MHSPY Care Managers use their clinical experience to help assess the strengths and needs of each child, and to facilitate the creation of a dedicated team of individuals (teachers, friends, relatives, state agency staff, pediatricians, and other clinicians) identified by the family to participate as their Care Planning Team (CPT). This team meets monthly to create, implement, and monitor an individualized plan to meet the family's mission for the child. This process allows all services and care delivery, whether for medical, mental health, substance abuse, social, educational, or other needs, to be integrated into one care plan and administered by one team. The Individual Care Plan created by the CPT has specific goals

and utilizes strength-based interventions; responsible parties are assigned for each intervention, and measurable outcomes are determined to track progress toward the goals defined by the team. The MHSPY care planning processes combined to create the impact of the overall intervention at the case level include (1) family-driven care, based in the Care Planning Team, using natural supports; (2) an integrated Individual Care Plan, including measurable goals and results monitoring; and (3) collaboration and shared accountability among all MHSPY participants, including system partners such as teachers and probation officers. The mission-driven group culture and clinical care management process is reinforced via multiple layers of training, continuous quality improvement activities, and concurrent supervision.

MHSPY outcome domains

A key element in the MHSPY shared governance model is the identification of agreed-upon outcome domains of interest to the stakeholder/purchasers prior to beginning the initiative. These domains were selected for their relevance to the individual stakeholders in terms of ongoing performance monitoring and quality improvement, and also for the purposes of research. As a result, data are collected in four selected areas and reported to the stakeholders every six months: functional status, service utilization, cost, and satisfaction. Standardized child level-of-functioning measures are administered at baseline, every six months, and at discharge. Cost and service utilization information is obtained quarterly based on MCO claims data. Satisfaction surveys are collected at the time of disenrollment. To date, MHSPY functional assessments have demonstrated improvement across all areas, particularly in clinical areas of self-harm and substance abuse. These findings are consistent with service utilization data demonstrating diminished need for out-of-home placements and hospitalization, with resulting decreased costs. Finally, parents, youths, and state agency representatives all report high levels of satisfaction with their experience with MHSPY.²⁴ Cost and utilization data form the basis of the secondary analysis reported in this study.

Figure 1. MHSPY eligibility criteria

- Age: 3 to 17.5^a
- Residency: Massachusetts communities of Malden, Everett, Medford, Somerville, or Cambridge
- Eligibility for services: MassHealth (Medicaid) and at least one other state agency and/or special education
- Demonstrable impairment for greater than six months and risk of out-of-home placement
- Child and Adolescent Functional Assessment Scale (CAFAS)^b score indicating need for intensive services
- IQ: 70 or above
- Parental consent

^aReferral eligibility limit is 17.5 years of age; however, data analyses include claims for youth up to age 19, as program enrollees may receive services until age 19.

^bHodges K. Use of the Child and Adolescent Functional Assessment Scale (CAFAS) as an outcome measure in clinical settings. *J Behav Health Serv Res* 1998;25:325-36.

MHSPY=Mental Health Services Program for Youth

METHODS

Study population: MHSPY enrollees

From program inception in March 1998 through 2004, 177 children were enrolled in MHSPY. Based on an internal report from 2004,²⁵ approximately 70% of those enrollees were male, though the proportion of female enrollees steadily increased over the six years.

Greater than 50% of enrollees were children of color, disproportionate to community demographics indicating families of color representing 20% of the overall population. Child welfare is the major source of MHSPY referrals, with 79% of enrollees receiving services from two or more agencies in addition to Medicaid and 84% receiving special education. MHSPY enrollees share significant family risk factors, with 77% of enrollees in the past year having a parent/caregiver with mental illness, and 49% with parental/caregiver substance abuse. The majority of enrollees have serious mental health co-morbidities; the three most frequent diagnostic categories are post traumatic stress disorder, mood disorders, and Attention-Deficit/Hyperactivity Disorder (ADHD). In addition, MHSPY enrollees are likely to have had at least one out-of-home placement prior to program enrollment; 64% of new enrollees in the fiscal year 2003 had a prior placement in a hospital, foster care, shelter/respite care, or detention facility.

MCO-based comparison groups

MHSPY is housed within a small, non-profit managed care organization (MCO) in the eastern United States, 70% of whose members are Medicaid recipients. Since all MHSPY members are insured by Medicaid, they represent a distinct subset of the total MCO membership insured by Medicaid. An MHSPY program identifier allows differentiation of all services for MHSPY members from those for other MCO members. Comparison populations were drawn from the approximately 60,000 MCO members not enrolled in MHSPY, selecting for those 3 to 19 years of age, in order to match the MHSPY enrollees. Recognizing that MHSPY youth were by definition at greater risk for service use than the overall MCO population, and because the MHSPY enrollees all have claims, only MCO members with claims were included in the comparison data.

Data sets

Claims data for non-MHSPY youth in the comparison age-range of 3 to 19 years were grouped according to their exclusive rating category identifiers: commercial insurance (privately insured), Medicaid Standard (income based), and Medicaid Disabled (severity based). The Medicaid Disabled rating category is for those insured by Medicaid who also receive Supplemental Security Income (SSI). The Centers for Medicare & Medicaid Services (CMS) considers the MHSPY population, selected for their degree of established morbidity, to be similar in their degree of impairment to the Medicaid Disabled group.

Comparison claims groups were created by extracting claims for non-MHSPY members (in Commercial, Medicaid Standard, and Medicaid Disabled rating categories) that met the following member criteria during the study period: (1) the member had any type of claim (medical, mental health, outpatient or inpatient, lab, pharmacy, etc.); (2) the member had one or more outpatient mental health/substance abuse (MH/SA) claims and no inpatient MH/SA claims; and (3) the member had one or more inpatient MH/SA claims. These three categories were designed to capture differing levels of service intensity, from any medical claim at all through outpatient mental health and inpatient psychiatric hospitalization. The "any claim" extraction includes all claims in the subsequent extractions. Total claims (including all medical, inpatient, and outpatient mental health, etc.) for MHSPY members represents a constant that is analyzed in contrast to all three comparison categories. Within each comparison group, claims were further broken down by rating category (Commercial, Medicaid Standard, and Medicaid Disabled). Claims data for MHSPY enrollees were not subcategorized by MH/SA service utilization, but include claims for the entire group at every grouping level, permitting comparison of the study population against populations with increasing mental health service use.

Data sources

MCO data are derived from standard UB92 (hospital), CMS-1500 (outpatient), and pharmacy claims forms. Information is captured in three separate databases, one each for medical, mental health/substance abuse, and pharmacy services. A unique person identifier in each of the datasets allows the retrieval of all medical, mental health, substance abuse, and pharmacy services claimed for a single person, regardless of setting. These claims data include diagnosis, service type, and cost information. Claims that met all of the following criteria were included for analysis:

1. The claim was for an MCO member age 3 to 19 on the date of service.
2. The claim was associated with a service date within the time period defined as January 1, 2001, through December 31, 2004.
3. The claim was paid within the time period defined as January 1, 2001, through January 31, 2005.
4. The claim was coded to an eligible rating category (Commercial, Medicaid Standard, Medicaid Disabled, or MHSPY).

Data analysis categories

Separate analyses were performed for (1) service type and total service utilization, including MH/SA intensity, and (2) primary and specialty outpatient medical care utilization. To allow for differences in MCO enrollment periods, utilization rates were reported in visits per 1,000 member-years, and utilization costs were described in dollars per member, per month. The member-year denominator is based on calculated “member-months;” this is the sum of months of MCO enrollment for each member (or person) in a given category and is similar in concept to person-years. The dollars per member per month (PMPM) unit of analysis is an insurance industry standard.

Service type and total service utilization. For the utilization analyses, claims were identified by rating category and service type. Service type was determined by procedure code and assigned to the following groups: medical, pharmacy, outpatient MH/SA, and inpatient MH/SA services. Claims for “wraparound” (i.e., social support services) are funded outside of standard insurance or Medicaid coverage; they are available only to MHSPY program members and were therefore excluded. Medical services include all non-mental health-related inpatient and outpatient pediatric care; emergency room, laboratory, and radiology services; and claims for durable medical equipment. Outpatient MH/SA services include psychiatric partial hospitalization services as well as all outpatient MH/SA visit types. Inpatient MH/SA includes all inpatient psychiatric or substance abuse hospitalizations.

Total service utilization was described in dollars PMPM, and broken down by type of care (medical, pharmacy, outpatient MH/SA, and inpatient MH/SA). Claims were extracted according to intensity of MH/SA service utilization as described above. Total utilization by MHSPY enrollees was constant across analyses but contrasted separately to total utilization for members with claims in the Commercial, Medicaid Standard, and Medicaid Disabled MCO rating categories at each MH/SA service intensity level (“any type of claim,” “one or more outpatient MH/SA claim,” and “one or more inpatient MH/SA claim”).

Primary and specialty care medical utilization. Primary and specialty care medical claims were identified by extracting claims with a medical outpatient procedure code only; for this analysis, medical care was the focus so all claims with mental health-related procedure codes were excluded. Utilization was reported in number of visits per 1,000 member-years. Rates for total ambulatory care use were captured for each rating category and for each year over a four-year period

(calendar years 2001–2004). The member-years denominator is based on enrollment duration of all MCO members with any type of claim whose service date falls within the individual year.

STATISTICAL ANALYSES

For the total service utilization and service distribution sub-analyses, medical utilization in dollars PMPM was compared for the Commercial, Medicaid Standard, and Medicaid Disabled categories using the analysis of variance (ANOVA). Separate analyses were performed comparing MHSPY member utilization to MCO member utilization by “any medical or MH/SA claim,” “one or more outpatient MH/SA visits but no inpatient claims,” and “one or more inpatient MH/SA claim” categories within the three comparison populations. For the primary and specialty medical care utilization sub-analysis, the odds of having a primary and/or specialty care visit were compared, using four years of data, between MHSPY and the other three MCO member comparison populations with any type of claim. Odds ratios were calculated using logistic regression, controlling for year and rating category. All statistical analyses were performed using SAS 9.1.²⁶ *P*-values greater than 0.05 were considered statistically significant.

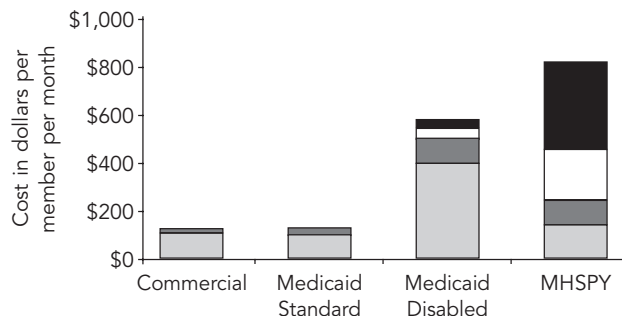
RESULTS

Children’s health services utilization PMPM for MHSPY vs. MCO

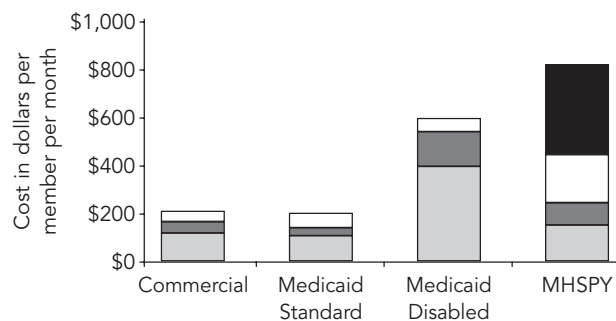
Overall utilization, represented by the height of the stacked bar, and service distribution patterns, identified as distinct layers, were compared for all MHSPY enrollees and MCO members selected with any type of claim during calendar year 2004 (Figure 2a). Utilization and service distribution were similar for the Commercial and Medicaid Standard members, and higher for both the Medicaid Disabled and the total MHSPY populations, consistent with the greater morbidity of these two populations. As expected, due to the mental health severity selection criteria, both inpatient and outpatient MH/SA service utilization were highest for the MHSPY population in this initial comparison. However, despite expected co-morbidities, medical utilization for MHSPY enrollees, while higher, appeared to be more similar to Commercial and Medicaid Standard populations than to Medicaid Disabled members, with the differences between MHSPY and the two Medicaid categories each statistically significant (Table 1). When the same total MHSPY enrollee utilization was compared to that of MCO members who

Figure 2. Total children's health services utilization PMPM for MHSPY^a vs. three selected MCO populations: 2004

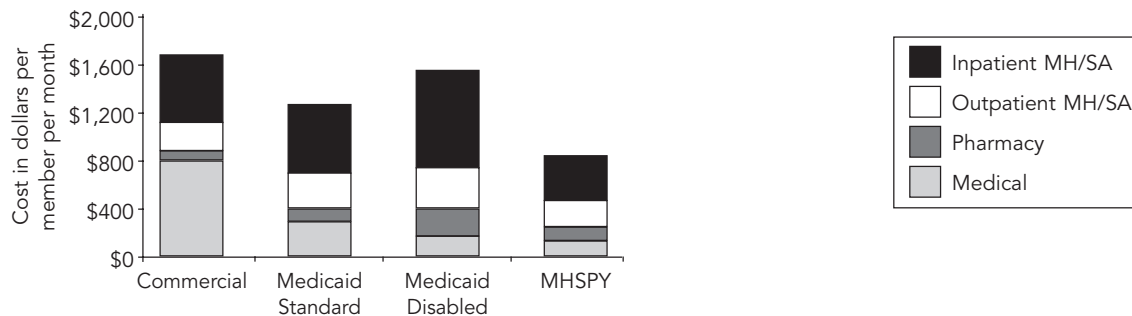
a) Total MHSPY utilization vs. MCO members with any claim



b) Total MHSPY utilization vs. MCO members with one or more outpatient MH/SA claims and no inpatient MH/SA claims



c) Total MHSPY utilization vs. MCO members with one or more inpatient MH/SA claims



^aOverall utilization and service distribution varies for MCO populations according to level of mental health service intensity in 2a, 2b, and 2c, but utilization data for MHSPY enrollees is the same across all three figures and analyses.

^bChildren's health services utilization is reported in dollars per member per month for MHSPY enrollees vs. non-MHSPY enrolled MCO members. Cost data for claims with 2004 service dates are represented. Medical services include all non-mental health-related inpatient and outpatient pediatric care; emergency room, laboratory, and radiology services; and durable medical equipment. Pharmacy claims include both mental health and non-mental health related medications. Inpatient MH/SA includes all inpatient psychiatric utilization. Outpatient MH/SA includes outpatient psychiatry, psychotherapy, group therapy, and partial hospital treatment.

PMPM = per member per month

MHSPY = Mental Health Services Program for Youth

MCO = managed care organization

received outpatient MH/SA only, the differences between MHSPY and Commercial and Medicaid Standard were further reduced, while MHSPY medical utilization remained well below that of Medicaid Disabled (Figure 2b), with the differences between MHSPY and each Medicaid category again statistically significant (Table 1).

When compared to the third category, MCO members with any inpatient MH/SA use, the total MHSPY service utilization was demonstrably lower than for all MCO populations (Figure 2c). The subcategory of medical utilization of MHSPY enrollees was much lower than for the Commercial MCO population, slightly

lower than for the Medicaid Standard MCO population, and similar to that of the Medicaid Disabled population. Only the difference between Commercial and MHSPY medical utilization was statistically significant (Table 1). Meanwhile, for those members across the populations who had at least one inpatient MH/SA day, inpatient costs PMPM were higher than for the total MHSPY membership.

In summary, overall service utilization in 2004 for MHSPY enrollees was higher when compared to that of MCO members with "any type of claim" or exclusively "outpatient MH/SA" claims; this is consistent with expected patterns of higher MH/SA service need

Table 1. Children's medical services utilization PMPM for MHSPY vs. MCO populations: 2004^a

Population	Number of individuals ^b	Total member- months ^c	Medical utilization \$PMPM
MHSPY	98	755	\$147
Any claim ^d			
Commercial	6,871	68,261	\$83
Medicaid Standard	51,281	48,0991	\$84 ^e
Medicaid Disabled	653	3,373	\$406 ^e
One or more outpatient MH/SA claims ^f			
Commercial	597	6,128	\$120
Medicaid Standard	6,640	62,809	\$111 ^e
Medicaid Disabled	287	1,530	\$411 ^g
One or more inpatient MH/SA claims ^h			
Commercial	25	285	\$800 ^e
Medicaid Standard	186	1,693	\$281
Medicaid Disabled	31	140	\$157

^aData are derived from medical claims for MHSPY and non-MHSPY MCO members for 2004. Medical utilization is reported in dollars PMPM. Separate analyses were performed for MHSPY enrollees compared to non-MHSPY enrolled MCO members in the Commercial, Medicaid Standard, and Medicaid Disabled categories.

^bNumber of unique individuals with claims in these categories; a single individual may have multiple claims.

^cMedical utilization costs PMPM are based on a denominator of "member months," which is the sum of months of enrollment time per member for that category.

^dMCO members with any type of medical, mental health, or substance abuse (MH/SA) claim.

^e $p < 0.001$; p -values test significance of difference between outcome for that population and MHSPY.

^fMCO members with one or more outpatient MH/SA claims and no inpatient MH/SA claims.

^g $p < 0.01$; p -values test significance of difference between outcome for that population and MHSPY.

^hMCO members with one or more inpatient MH/SA claims.

PMPM = per member per month

MHSPY = Mental Health Services Program for Youth

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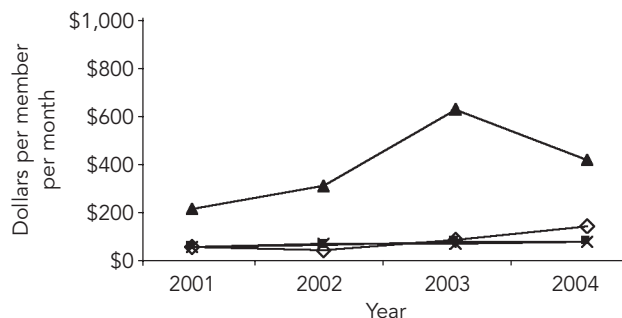
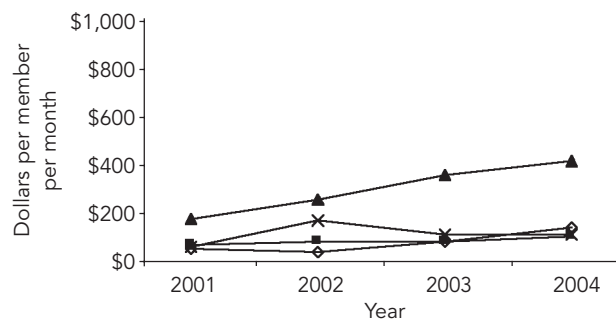
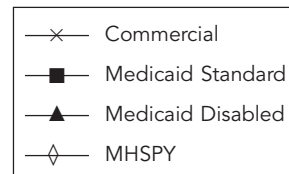
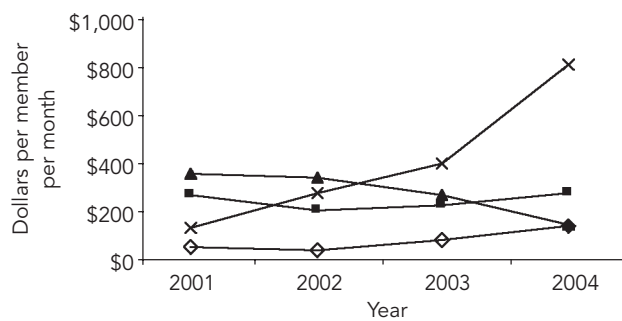
MH/SA = mental health/substance abuse

(Figure 2). Medical utilization by MHSPY enrollees was greater than that of the Medicaid Standard population with "any claim" and only slightly greater than that of the Medicaid Standard population with "outpatient only MH/SA" claims. Medical utilization by MHSPY enrollees was much lower than that of the Medicaid Disabled population for MCO members with "any claim" or "outpatient only MH/SA" claims (Table 1). To better understand the reliability of this profile, the same analysis was completed on the three previous years of data. The pattern of lower-than-expected medical service use by the MHSPY population (lower than that of the more clinically equivalent Medicaid Disabled population, and more similar to lower-risk rating categories) was consistent over time from 2001–2004 (Figure 3).

Primary and specialty ambulatory pediatric utilization

In the second sub-analysis, we compared rates of primary and specialty care pediatric utilization of MHSPY enrollees to that of MCO members with any claim

during the study period (Figure 4). In 2001, the rate of total ambulatory care visits (primary plus specialty medical care visits) was higher for MHSPY enrollees than for the other three rating categories. Between 2002 and 2004, rates of total ambulatory care visits for MHSPY enrollees overall were much lower than those of the Medicaid Disabled MCO population, although they trend up between 2002 and 2004, and are more similar to those of the Commercial and Medicaid Standard MCO populations. These relative relationships were also observed when primary and specialty utilization rates were reviewed separately. Controlling for year, for the entire four-year study period, members in the Medicaid Disabled population were somewhat more likely to have a primary or specialty care visit than the MHSPY members (OR=1.501, 95% CI 1.367, 1.639) (Table 2). Members in the Commercial and Medicaid Standard populations were statistically slightly less likely than MHSPY enrollees to have a primary or specialty care visit (OR=0.833, 95% CI 0.765, 0.908 and OR=0.823, 95% CI 0.775, 0.897, respectively).

Figure 3. Total medical utilization PMPM for MHSPY^a vs. three selected MCO populations: 2001–2004^b**a) Total MHSPY utilization vs. MCO members with any claim****b) Total MHSPY utilization vs. MCO members with one or more outpatient MH/SA claims and no inpatient MH/SA claims****c) Total MHSPY utilization vs. MCO members with one or more inpatient MH/SA claims**

^aTotal MHSPY Medical utilization is the same for all analyses represented in Figures 3a, 3b, and 3c. Medical services include all non-mental health-related inpatient and outpatient pediatric care; emergency room, laboratory, and radiology services; and durable medical equipment.

^bChildren's medical utilization is reported in dollars per member per month for MHSPY enrollees vs. non-MHSPY enrolled MCO members. Figure 3a compares the medical utilization of MHSPY children against the medical utilization of MCO children who have any type of medical, mental health, or substance abuse (MH/SA) claim. Figure 3b compares the medical utilization of MHSPY children with that of MCO children who have outpatient MH/SA claims but no inpatient MH/SA claims. Finally, Figure 3c compares the medical utilization of MHSPY children with the medical utilization of MCO children who have one or more inpatient MH/SA claims.

PMPM = per member per month

MHSPY = Mental Health Services Program for Youth

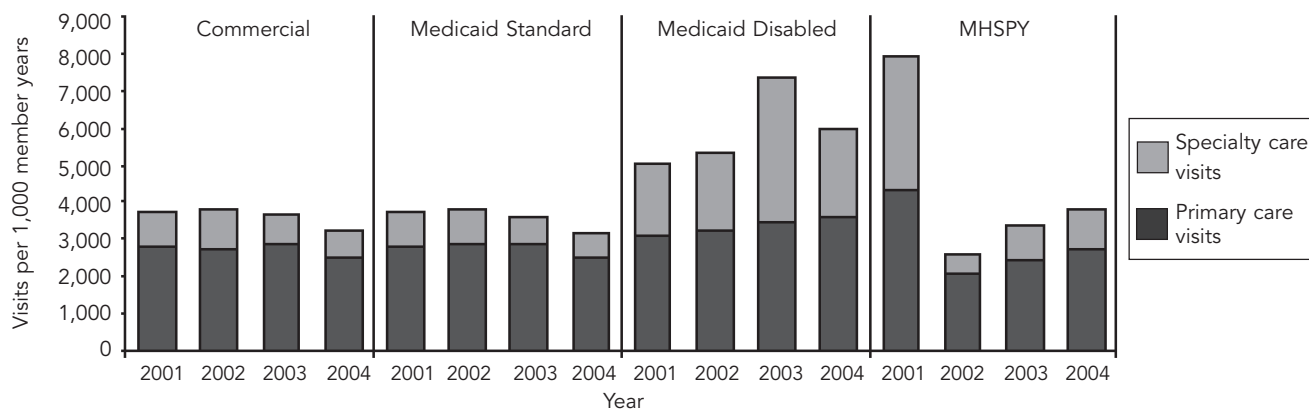
MCO = managed care organization

DISCUSSION

Utilization

Total service utilization. MHSPY enrollees are identified and prioritized by independent community-based selection committees, based on the perceived severity of MH/SA need, failure of standard treatments or interventions, and likelihood for the child or adolescent to have to be placed outside of their community for more intensive services. Therefore, it is not surprising to see higher MH/SA service utilization, both inpatient and outpatient, than the two average mental health risk populations (Commercial and Medicaid Standard). This is the population of need MHSPY is intended to serve.

Since all MHSPY enrollees have MH/SA claims, but many have not had a psychiatric hospitalization during their MHSPY enrollment, it is reasonable to assume that they would approximate some midpoint between the "outpatient only MH/SA" and "inpatient MH/SA" populations in service use. This appears to be the case. Yet in other ways, since their inpatient risk, based on history of reported out-of-home placements and hospitalizations experienced prior to referral, is so much higher than their actual MHSPY inpatient experience during enrollment,²⁵ we might expect them to be more similar than they are in use patterns to the comparison member subpopulations with any inpatient MH/SA day. Claims data do not yield causality, so we cannot attribute the discrepancy to the

Figure 4. Children's primary and specialty medical care utilization rates for MHSPY vs. MCO: 2001–2004

NOTE: Data were derived from claims from MHSPY members or MCO members with any claim in an individual year from 2001–2004. Utilization is reported in number of visits per 1,000 member-years to allow for differences in MCO enrollment periods for individual members.

MHSPY intervention, but it is noteworthy that a group identified as at-risk for out-of-home placement and intensive psychiatric care is being maintained using so little inpatient care, as evidenced by lower overall cost and lower outpatient and inpatient mental health expense than all the other groups whose members have had at least one hospital day (Figure 2). As previously described, in order to maximally approach comparability with the MHSPY membership, the MCO comparison groups were drawn from the 76% of the total MCO population of members with some type of claim. Had the total MCO membership, including those without claims, been used as a fourth MCO comparison group, MHSPY member utilization would have been greater on average than the average utilization for the overall MCO population. This is consistent with the fact that MHSPY members are pre-selected for risk.

Regarding non-mental health utilization patterns, most of these youth have already been identified as needing special education services and most of the families have multiple child-serving agency involvements. All MHSPY members are on Medicaid, and some may have had applications accepted for disability under Medicaid (SSI) based on the severity of an emotional or behavioral disorder. Many others are eligible but have no one to submit such an application, or face other barriers, such as language or citizenship of caregivers, that impact access to this level of support. Actuarial studies by Massachusetts Medicaid performed during the initial rate-setting process indicate that MHSPY enrollees are equivalent to the Medicaid Disabled population in level of impairment and medical expense. Given all of this, similar patterns of overall utilization would be expected. Instead, there

are consistently lower medical (including emergency room) and pharmacy costs for the MHSPY enrollees than for the Medicaid Disabled group across all three analyses (Figure 2). The fact that the MHSPY model includes such services as intensive home-based outreach or 24/7 on-call access makes it conceivable that at least some of these differences are attributable to the system of care intervention. Some differences may be due to case mix, as the Medicaid Disabled group may have a higher proportion of serious or chronic medical diagnoses, but there is also evidence that having a mental health diagnosis alone increases one's likelihood for medical utilization.^{27–29} The lower-than-expected medical utilization for Medicaid Disabled MCO members with any inpatient claim may be related to the small number of observations in this subgroup ($n=31$ individuals). Though Commercial MCO members with any inpatient claim were also relatively few in number ($n=25$), the magnitude of difference in medical utilization between this group and the MHSPY population was great enough to result in a statistically significant difference. A significant difference between MHSPY and Commercial populations was not seen for MCO members with “any claim” or any “outpatient only MH/SA” claim. This is likely explained by the greater variance in medical utilization between individuals in the Commercial population. The Medicaid Standard group's medical utilization was significantly lower than that for MHSPY for “any claim” and “outpatient only” (though similar in absolute value to Commercial utilization); this is likely explained by the much larger number of observations and lower variance in the data for this rating category.

The fact that the pattern of medical utilization by

the MHSPY group has remained consistently below that of the other MCO populations over a four-year period suggests that this is a stable trend. Further analysis controlling for diagnosis or with some consideration of co-morbidities would be helpful in further understanding these findings.

Primary and specialty pediatric ambulatory utilization.

The most striking aspect of this analysis is the variation within the MHSPY data reported for the years 2001–2004 (Figure 4). Reported combined primary and specialty utilization for 2001 for total MHSPY enrollees is

more than twice that in each of the ensuing years and is even greater than that for the Medicaid Disabled group in any year. The proportion of specialty vs. primary care for MHSPY is close to 1:1 in 2001, comparable to Medicaid Disabled in 2003. Subsequent years show a proportion of 1:3 for specialty vs. primary care. This last ratio indicates a reduction in specialty care to a level that is more consistent with the Medicaid Standard and Commercial experience. Several possible factors may be contributing to this variation: (1) In 2001, the overall MHSPY membership was only 30 members, as opposed to 80 in the subsequent years, so

Table 2. Children's primary and specialty medical care utilization for MHSPY vs. MCO populations: 2001–2004^a

Population ^b	Number of individuals ^c	Total member-months ^d	Specialty medical visit rate	Primary medical visit rate	Total ambulatory visit rate	Odds of any ambulatory visit (vs. MHSPY)	95% confidence intervals
MHSPY							
2001	40	351	3,625	4,343	7,968	—	—
2002	76	490	539	2,107	2,646	—	—
2003	88	748	930	2,501	3,431	—	—
2004	98	755	1,049	2,797	3,846	—	—
Commercial							
2001	4,873	48,845	981	2,835	3,816	0.237 ^e	(0.190, 0.296)
2002	5,821	58,481	1,078	2,798	3,876	1.685 ^f	(1.360, 2.088)
2003	6,978	67,909	786	2,896	3,682	1.106 ^e	(0.934, 1.297)
2004	6,871	68,261	667	2,584	3,251	0.788 ^e	(0.675, 0.919)
Overall odds ratio ^g						0.833 ^g	(0.765, 0.908)
Medicaid Standard							
2001	46,433	454,626	945	2,839	3,784	0.234 ^e	(0.188, 0.292)
2002	51,736	492,232	934	2,923	3,857	1.673 ^f	(1.352, 2.072)
2003	51,835	492,725	734	2,918	3,652	1.092 ^e	(0.932, 1.280)
2004	51,281	480,991	606	2,597	3,203	0.772 ^e	(0.662, 0.899)
Overall odds ratio ^g						0.823 ^g	(0.775, 0.897)
Medicaid Disabled							
2001	1,985	18,659	1,878	3,163	5,041	0.368 ^f	(0.294, 0.460)
2002	2,137	19,279	2,101	3,257	5,358	2.849 ^e	(2.297, 3.534)
2003	718	3,637	3,916	3,478	7,394	4.009 ^e	(3.375, 4.761)
2004	653	3,373	2,408	3,632	6,040	2.146 ^e	(1.816, 2.536)
Overall odds ratio ^g						1.501 ^g	(1.367, 1.639)

^aData are derived from medical claims with an outpatient procedure code for MHSPY and non-MHSPY MCO members for 2001 through 2004; claims with a mental-health related procedural code were excluded. Rates are reported in visits per 1,000 member-years. The odds of having had any primary or specialty care visit, vs. MHSPY, was determined for each population. Odds ratios were calculated using logistic regression, by year, controlling for population (Commercial, Medicaid Standard, and Medicaid Disabled).

^bClaims for MHSPY enrollees are compared to non-MHSPY enrolled MCO members in the Commercial, Medicaid Standard, and Medicaid Disabled categories with any claim during 2001–2004.

^cNumber of unique individuals with claims in these categories; note a single individual may have multiple claims.

^dVisit rates are based on a denominator of "member-months." Member-months are equal to the sum of months of enrollment time per member.

^e $p < 0.0001$. The probability of the chi-square of the estimate.

^f $p > 0.1$ (not significant). The probability of the chi-square of the estimate.

^gThe odds of having had any primary or specialty care visit, vs. MHSPY, was determined for each population. Odds ratios were calculated using logistic regression, controlling for population (Commercial, Medicaid Standard, and Medicaid Disabled) and year. The probability of the chi-square of the estimate is $p < 0.0001$ for all populations.

MHSPY = Mental Health Services Program for Youth

MCO = managed care organization

sample size might be an issue; (2) In 2001, all MHSPY members were receiving medical care via a co-located pediatric practice with a strong culture valuing integrated care; and (3) In 2002, and from that point forward, the MHSPY expanded to two sites, rather than one, and most primary and specialty medical care began to be delivered via the standard pediatric network in the community rather than through the co-located mental health and medical setting. Curiously, the change in 2002 was accompanied by a shift to fee-for-service as opposed to capitated payments to primary care providers, an incentive structure working in the opposite direction to the observed trend, so reimbursement does not appear to be a factor. Further analyses are required to fully understand the observed differences.

However, putting aside the 2001 discrepancy, it is interesting to note that the years 2002–2004 show downward primary and specialty utilization trends for both the Commercial MCO population and the Medicaid Standard members. The Medicaid Disabled population, conversely, trends up overall, and the MHSPY population trends consistently up in total and for specialty use.

Again, further analyses are needed, but one hypothesis is that the expanded MHSPY program needed to both hire and train new staff in the model in 2002 and needed to establish relationships with a new group of primary care providers (providers reflected in the 2001 data had been in place since 1998). Whether the trend levels off in the range of the Commercial MCO and Medicaid Standard populations, or continues upward toward the Medicaid Disabled level, will be worth revisiting. Also, the question of what is the “right” amount of primary, specialty, or combined ambulatory utilization based on need remains to be answered.

Limitations

No currently available cohort exists among the standard insurance classifications as an exact comparison group to study the impact of an integrated system of care on patterns of clinical service use. Given this, two approximate comparison populations were determined using the presence of MH/SA utilization as a criterion. Within the MCO membership, one or more outpatient MH/SA visits and no inpatient visits constituted the lower end of the clinical severity continuum. The presence of any inpatient stay in the overall MCO membership was chosen as an indicator of greater clinical severity and therefore represents the higher boundary. Data from these two MH/SA utilization groups were hypothesized to fall on either side of the

MHSPY enrollee group, the population of interest, whose members included both outpatient only and inpatient MH/SA utilization. Short of a randomized controlled trial, our inferences about what observed trends might be for the MHSPY population, without the MHSPY intervention, must at this stage be based on conjecture. Additionally, while claims-based data are objective and useful for standardized reporting, they cannot by themselves address the issue of clinical appropriateness, or even appropriate amounts, of care.

CONCLUSIONS

Our comparison of the MHSPY system of care with other MCO populations suggests that patterns of service use in individuals can be affected by delivery system variables, such as the degree of integration, coordination, and home-based availability of care. To understand how to optimally impact these patterns and address the mental health needs of the vulnerable population of children who might get neither identified nor treated in “usual care” systems, we need to repeat these comparisons using a statistically defined reference population. Another useful area for future study would be variations in assigned diagnoses and matched interventions across the MCO subpopulations of children with mental health needs to model explanatory variables that may predict differences in clinical appropriateness of care received between the groups.

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