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ABSTRACT

This collection of papers presented at a 1996 conference on children's mental health focuses on financing strategies of systems of care. Individual papers have the following titles and authors: (1) "Arizona's Implementation of Managed Care in the Public System: A State's Perspective" (Stephen Perkins and Valinda Mores); (2) "The Effect of Intermediate Services on the Cost of Treating Children & Adolescents with Emotional and Behavioral Problems: A Preliminary Inquiry" (Robert C. Saunders); (3) "Do Intermediate Services Save Money? A System-Level Perspective" (E. Michael Foster and others); (4) "The Impact of Managed Mental Health Care on Child and Adolescent Dispositions in a Regional Emergency Mental Health Service" (Stephen C. Young and others); (5) "The Cost of Residential Schools for Children with Severe Emotional Disturbance" (Christine S. Spenser and Richard G. Frank); and (6) "A Comparison of Children and Adolescents Funded by Medicaid and Commercial Insurance in an Inpatient Psychiatric Facility" (Carol Valera Jacobson and others). (Individual papers contain references.) (DB)

8th Annual Children's Mental Health Research Conference Proceedings. Chapter 2. Financing Strategies of Systems of Care.

8th Annual Research & Training Center Conference Proceedings, Dept of Child and Family Studies, Florida Mental Health Institute, University of South Florida,1996

Arizona's Implementation of Managed Care in the Public System: A State's Perspective

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Introduction/Purpose

This report provides a historical review of changes in Arizona's behavioral health system which occurred during the past four years. These changes were designed to develop public sector Managed Behavioral Healthcare Organizations for children and adolescents. Using managed care principles, the use of costly inpatient/institutional care was decreased, while community-based outpatient care increased. A review of service utilization data is included which supports the transition from a fragmented fee-for-services system of care to the current level of system development.
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Method/Procedures

This project involved the review of historical documents, including state and federal legislation, state plans and waivers, intergovernmental policies and agreements, reports, memos, and contracts which tracked the multi-year system changes within the state's behavioral health system. As these changes were implemented over a four year period, client and service data were collected which described utilization under the previous fee-for-service system. These data were compared to client and service data reported since the development of the current managed care system.

Subjects/Sites

Client and service data from the four year transition period were reviewed for all Arizona children presenting with behavioral health needs, regardless of income and level of need. Data for this review period were selected from the state's management information system, selecting those children receiving at least one state-funded behavioral health service through contracted community-based regional behavioral health authorities or their subcontracted providers.

Intervention/Program

Six Regional Behavioral Health Authorities (RBHAs) serving children and families in Arizona are located throughout the state. These are private non-profit corporations which receive funds through contracts with the state to administer behavioral health programs. These RBHAs subcontract with local service providers, providing community-based delivery systems within their designated geographical boundaries, creating provider networks. The RBHAs also provide a case management system designed to provide authorization and conduct utilization review.

Arizona state statute 36-264 requires a Medicaid financial eligibility screening prior to the utilization of publicly funded behavioral health services by children and adolescents. Once this screening completed, the child behavioral health assessment. As a result of the assessment, a behavioral health treatment plan may be developed.

Approval for services is based on medical necessity. Medical Necessity stipulates (1) A child requires a particular type of service; and (2) the child will benefit from that service based upon diagnosis, presenting problems, intensity of service need, and expected response (outcome). For admission to inpatient or residential treatment centers and partial care programs, level of care criteria are imposed which also facilitate overall requirements of medical necessity and impose RBHA case management designed for control of utilization. The required RBHA Prior Authorization is determined by a clinical team of psychiatrist, case manager, and masters-level supervisor, and it applies for any child entering out-of-home care.

Referral into the RBHA managed care system results in two distinct avenues, one for children entitled to behavioral health services under Medicaid, the other for those not meeting Medicaid entitlement, but meeting medical necessity eligibility. In addition to level-of-care evaluation to control utilization, intensive case management services are assigned to children with a diagnosis and presenting with a functional score indicating critical severity of need. The Children and Adolescent Functional Assessment Scale (CAFAS; Hodges, 1990) is used as the functional assessment instrument. Intensive case management acts as gatekeeper for restrictive services. RBHA intensive case management personnel work under the direction of board-certified psychiatrists, and develop an Individual Service Plan, addressing medical necessity, appropriateness of services, prior authorization, and service utilization issues.

After a child is placed in inpatient or institutional care, ongoing utilization reviews are conducted by the RBHA to determine appropriateness of placement. At this point, the case manager, via the clinical team, may request continued placement based on medical necessity. If denied by the RBHA clinical review team, the child is then transferred to a less restrictive treatment environment, such as community-based therapeutic group home, behavioral health group home, group home, therapeutic or non-therapeutic foster care, or return to home. Each of these placements may be supported by optional outpatient services, ranging from partial care programs to home-based counseling.

Measurement/Instruments
Client and service data were reviewed for utilization patterns under the previous fee-for-service system. These data were then compared to client and service data to determine utilization trends under the current managed care system. During the four year period of review, initial data reflected utilization patterns for a mixed capitation fee-for-service system. RBHAs were paid a monthly capitation amount for case management, transportation and assessment services, while their subcontracted providers were paid on a fee-for-services basis at pre-set maximum capped rates. These rates were projected, using past utilization and market rates. Later, under a fully imple-mented managed care system in which RBHAs were paid a monthly capitation amount based on prior enrollment, assuming risk for all services in the continuum of care, data were also tracked for utilization patterns. In this scenario, RBHAs authorized services through the state's manage-ment information system, and their subcontracted providers presented claims for reimbursement by the state's third party payor.
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Results

In Figure 1, service utilization data depict the average days of all admissions to out-of-home services over the past four years. Figure 2 reports the number of children (unduplicated count) receiving out-of-home services. As seen in these Figures, the average number of days in an inpatient/RTC setting decreased while the overall number of children receiving this service increased. The increase in utilization seen in 1992 is thought to be reflective of the state's policy to bring children from other state agencies into the Medicaid program, many of which enter the behavioral health system from an inpatient setting.

The data for children in other out-of-home programs such as therapeutic group homes has shown a decrease during the review period as has the average days in these programs. It should be noted that these out-of-home services are provided in an "unbundled" fashion: a basic room-and-board service fee is billed separately, along with any required therapeutic services, and each component may be paid,

provided, and recorded separately. For example, the room-and-board cost may be paid by other funding sources such as a child welfare agency and may not be accounted for in the behavioral health management information system. Because of this, it may not be possible to capture the exact number of children receiving behavioral health services in a less restrictive out-of-home program. Therefore, some under-reporting of the number of children in these out-of-home services may be evident. Moreover, the standard deviations on average stay were unavailable, thus caution should be used in interpreting these results.

Figure 3 reveals that the average number of days of non-residential services remained the same throughout the four year period. This is remarkable when one considers the number of children (unduplicated count) receiving these services (see Figure 4). The number of children receiving in-home services increased five-fold over the four year period, while those children receiving services through a partial care program doubled during the same period.
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Implications

Preliminary data suggest that Arizona's attempt to provide behavioral health care in a publicly administered environment has yielded positive results. Managed care principles in the public sector can be effective in reducing the utilization of inpatient/residential care for children and adolescents. Additionally, the increase in utilization of non-residential services may indicate that community-based services are a contributing factor in the management of behavioral health services for children and adolescents.
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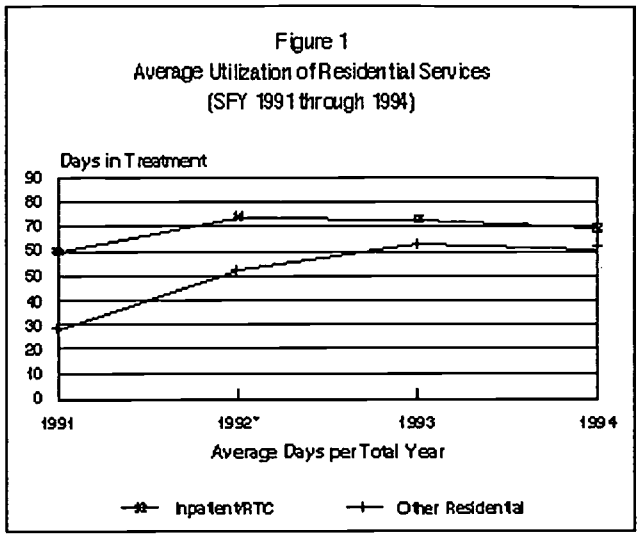

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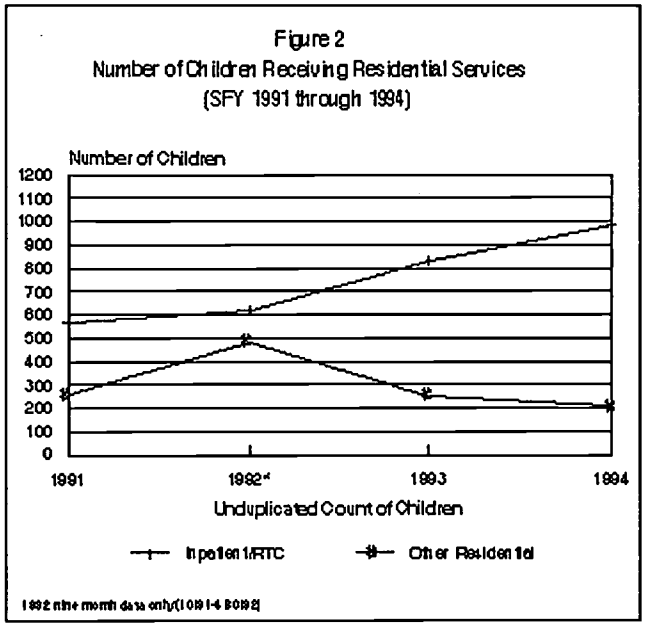

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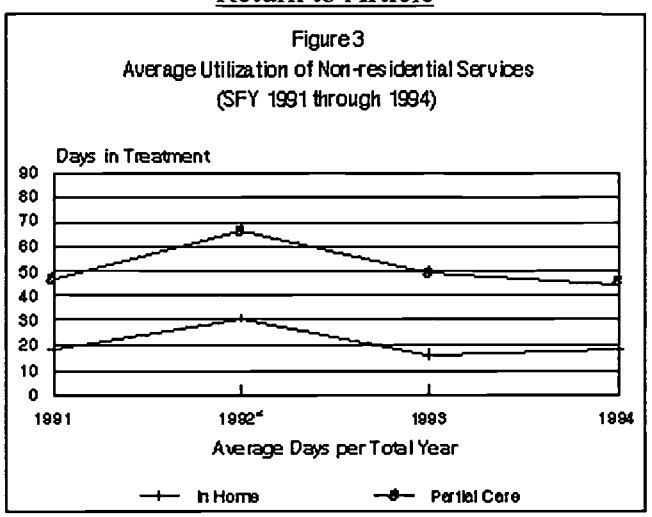

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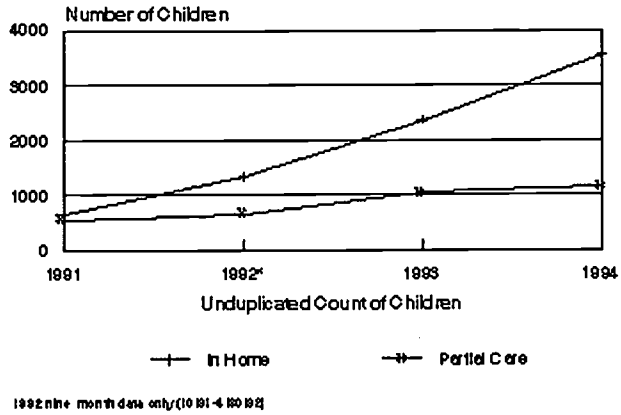
Average Utilization of Residential Services
(SFY 1991 through 1994)



1992 nine month data only (10/91-6/92)

8th Annual Research & Training Center Conference Proceedings, Dept of Child and Family Studies, Florida Mental Health Institute, University of South Florida,1996

The Effect of Intermediate Services on the Cost of Treating Children & Adolescents with Emotional and Behavioral Problems: A Preliminary Inquiry

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Introduction

Proponents of the continuum of care treatment philosophy have argued that by expanding the array of treatment options for which insurance will pay and allowing mental health providers to use their best professional judgment to assign children to treatment cost per treated child will decline. The argument is premised on the observation that the intermediate services of the continuum of care cost less per unit than more restrictive settings (e.g., hospitals and residential treatment facilities); allowing providers to rely upon their expertise (via insurance coverage) will permit providers to substitute less expensive care that is equally, if not more, effective at ameliorating children's emotional and behavioral problems.
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Method

Data Source and Definition of Variables

The data for this paper come from the Evaluation Sample of the Fort Bragg Evaluation Project (FBEP). The results are estimated from a sample of 982 children and adolescents for whom the first six months of treatment cost was calculated.

The service utilization of children was grouped into four categories according to the restrictiveness of services received: outpatient (OP) only, in which children received none of the new intermediate services or hospitalization/RTC treatment; intermediate non-residential (INR) care, in which the client received at least one INR service, perhaps in combination with OP therapy, but never any service in a residential setting; intermediate residential (IR) care, in which a child received at least one day of treatment in an IR facility (e.g. a therapeutic group home), perhaps in combination with hospitalization, RTC, INR, or OP therapy, but not necessarily; and, hospitalization/RTC (H/RTC) care, in which the client received at least one day of treatment in a hospital or RTC, perhaps in combination with OP therapy, but never in combination with any of the intermediate services. This serves as the dependent variable for the multinomial logit model. The other controls for the mutinomial logit and quantile regressions are listed in Table 1.
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Results

Factors Predicting Use of Intermediate Services

One might expect that any relationship between costs and the service use categories to be a function of the severity of children's conditions. If intermediate services cost more, it may be because they are used

for the children most in need of service. To account for this possibility, a multinomial logit model is estimated using the controls listed in Table 1. Indeed, based on the results of the multinomial logit model, severity is predictive across equations at both the Demonstration and Comparison sites, particularly for the IR care group. However, as may be seen in Table 2, many other factors predict use in the IR category, and very few predict for the other categories. Before one can conclude that differences in the costs at different quantiles are attributable to these severity differences, we explore the results of the quantile regressions.

Quantile Regression Estimates

Quantile regression is used to analyze cost effects because its estimates are robust to violations of the normal distribution in the dependent variable (as is frequently the case in health and mental health expenditures). The coefficients are directly interpretable as in dollars (one cannot exponentiate the marginal effects of an OLS that uses logged expenditures and get the effects in terms of dollars; see Duan, Manning, Morris & Newhouse, 1982, for why this is so), and it seems plausible that the effect of intermediate services on a child's costs will differ depending on where in the distribution that child falls.

Table 3 presents the quantile estimates for the 25th, 50th, and 75th percentiles. Quantile regression was used to estimate the effects of intermediate services for children at the 25th, 50th (median), and 75th percentiles of the cost distribution.

Important things to observe include:

- the effect of IR services increases as one moves up the cost distribution;
- at each quartile, moving a child from OP to IR would increase costs by three times what a move from OP to H/RTC would produce;
- the effect of INR approaches that of H/RTC as one moves up the distribution (i.e., INR is cheaper, but not that much cheaper);
- INR costs substantially more than OP; and
- introduction of IR and INR did lower H/RTC relative to what was experienced at the Comparison site.

Interestingly, service type rendered nearly all other controls&shyp;including previous utilization&shyp;irrelevant in explaining effects at each quantile for the Demonstration, whereas at the Comparison various diagnostic and family demographic characteristics were significant predictors of cost of the first six months of treatment.

The null finding for severity at the Demonstration in the quantile regression, coupled with the significance of severity in the multinomial logit suggest that severity influences cost through the process of sorting children into levels of care, but has no direct effect on cost otherwise.

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Conclusion

The quantile regression estimates showed that introducing intermediate services produces different effects depending upon where in the cost distribution one lies. The increase in costs due to intermediate services are much greater than those of traditional inpatient and outpatient services.

The major limitation of these results is the ability to attribute the effects observed exclusively to the new services at the Demonstration. These results are potentially confounded with changes in cost sharing for services that were provided free of charge to families at the Demonstration. For traditional services this amounted to a price reduction of 20%; for the new intermediate services, the reduction was 100%. Thus far the Evaluation has not been able to satisfactorily separate the price effects from the service-type effects; disentangling these effects will be a major research agenda item over the next few years.

Saunders (1996) applies a three-part model similar to the model employed by Duan, et al. (1982) for the

Rand Health Insurance Experiment. However, the quantile regression results are still important because they support the conclusion that relying exclusively upon clinical wisdom as to what is appropriate treatment will not produce cost savings in addition to not producing superior mental health outcomes (Bickman, et al., 1995).
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Table 1
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Variables for the Multinomial Logit and Quantile Regression Estimates

Variable Name	Definition
Individual Characteristics	
child	age < 10 yrs
preteen (omitted category)	10<= age =<13
teen	age >= 13
white (omitted category)	race is Caucasian
black	race is African-American
mixed/other	person is of mixed race, Asian descent, or other
female (male is the omitted category)	
Family & Parent Characteristics	
abuse/neglect	wave one summary of abuse/neglect experienced by child
parent justice system	wave one summary of parent's involvement with the justice system
child justice system	wave one summary of the child's involvement with the justice system
parent's hospitalization	wave one summary of parent's hospitalization experience
Education < HS	parent's education is less than H.S. degree
Education > HS (HS graduate is the omitted category)	parent's education is at least some college
Income < $20k	family income <=$20,000
Income > $30k (family income between 20k and 30k is the omitted category)	family income >$30,000

Variable Name	Definition
Severity	
Severity	composite of child psychopathology, functioning, and family's burden in dealing with the child -- standardized to mean=50, std.dev =10
Diagnosis	
Diagnosis	composite diagnostic categories based on clinician identified disorders
Missing	diagnosis is not available for the child (these cases were turned up in records review at the comparison site)
Anxiety	
ADHD	
behavioral	
mood (omitted category)	
adjustment	
substance use	
physiological	
other	
Previous Use & Timing of Use	
FY 93	enter the evaluation in FY93
FY 92 (FY91 is omitted category)	enter the evaluation in FY92
prev. use of CMH svc	
prev. use of hosp/ RTC svc	
prev. multiple use of hosp/RTC	

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Table 2
Factors Predicting Service Use and Direction of Effects *

Demonstration				
INR	Mixed race	++	Severity	+
IR	Child's involvement with the justice system	++	Prior use of hospital/RTC	+++
	Household income below $20,000	+	multiple hospital/RTC visits	+++
	Severity	+++	Entering the evaluation in FY93	++
	Prior use of outpatient services	++	Entering the evaluation in FY92	+++
	Prior use of hospital/RTC	+++	Entering the evaluation in FY93	++
	multiple hospital/RTC visits	+++	Entering the evaluation in FY92	+++
H/RTC	Severity	+	Multiple prior hospital/RTC visits	+++
	Prior use of hospital/RTC	+++		
Comparison				
H/RTC	Severity	+++	Adjustment disorder	---
	Anxiety disorder	--	Entering the evaluation in FY93	---
	ADHD	--	Entering in FY92	---

* results for outpatient only

Note: +(-) = positive (negative) significance at .05
++(--) = positive (negative) significance at .01
+++(---) = positive (negative) significance at .001

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Table 3
Quantile Regression Estimates

	25%-ile		50%-ile (Median) Regression		75%-ile Regression	
	Demonstration	Comparison	Demonstration	Comparison	Demonstration	Comparison
N=	487	360	487	360	487	360
Model fit (Pseudo R^2)	0.3478	0.2164	0.5270	0.3968	0.7108	0.5647
Quantile value	1043.65	325.00	1737.39	1472.9	8358.05	6221.5
Mean	12,398	7,393	12,398	7,393	12,398	7,393
	Coeff. (Std. Err)	Coeff. (Std. Err)	Coeff. (Std. Err)	Coeff. (Std. Err)	Coeff. (Std. Err)	Coeff. (Std. Err)
Service Type						
INR	3281.787** 335.612	--	8744.574** 330.746	--	16286.240** 471.421	--
IR	24213.910** 266.911	--	41526.110** 250.912	--	54021.340** 364.968	--
H/RTC	7639.294** 363.304	9549.495** 104.342	11951.620** 303.460	17618.020** 173.323	16906.630** 534.480	24727.040** 202.368
Severity	10.127 8.815	20.700** 4.947	13.328 8.790	33.787** 7.272	23.592 12.804	38.082** 8.710
Diagnosis						
No diag. reported	--	307.301** 131.385	--	1164.900** 215.504	--	-21.878 279.049
Anxiety	-120.222 327.299	336.970 230.446	325.360 337.641	612.324 423.777	168.878 500.296	-426.864 506.562
ADHD	96.438 252.432	223.158 151.308	-16.005 242.300	838.358* 261.022	-134.881 373.671	-666.031 340.423
Behavioral	-14.127 230.184	135.374 144.753	12.517 224.590	656.478* 249.286	-201.980 325.234	-1058.753** 317.295
Adjustment	18.990 248.682	83.187 149.235	-91.214 229.897	507.576* 249.146	18.052 388.296	-785.719* 325.101
Subst. Use	628.622 322.603	1219.549** 294.145	2707.075** 322.141	1254.626* 578.335	9790.387** 472.580	23379.79** 510.290
Physiologic	-487.268 278.752	--	-341.721 295.447	--	-585.519 454.101	--
other	1036.761 516.127	-306.577* 163.047	885.909 513.300	527.331 272.637	-11.202 749.519	-945.675 330.727

8th Annual Research & Training Center Conference Proceedings, Dept of Child and Family Studies, Florida Mental Health Institute, University of South Florida,1996

Do Intermediate Services Save Money? A System-Level Perspective

Authors

Introduction

Recent changes in the delivery of mental health services to children and adolescents have been driven by the evolving notion of the continuum of care.(Stroul & Friedman, 1986). A cornerstone of such a system of care is the provision of a diverse range of mental health services. A full range of services are needed to accommodate the diversity of needs among children with emotional and behavioral disorders and their families. An added principle of the continuum of care is that when individuals are placed in services along the continuum they are placed in the least restrictive setting.
Intermediate services&shyp;both residential and non-residential&shyp;are a key component of the continuum of care. They represent services more restrictive than outpatient therapy, yet less restrictive than inpatient hospitalization or care in residential treatment centers.

An added benefit of introducing these services is that they are generally less expensive than more restrictive services. The introduction of intermediate services may improve mental health outcomes while reducing costs.

This summary examines one aspect of the introduction of intermediate services; in particular, it considers the effect on costs at the system level. The analyses are based on the experiences of the Fort Bragg Demonstration. Under this demonstration, services previously unavailable under the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) were made available to military dependent children and adolescents. Known as The Fort Bragg Evaluation, the full results of this study, are reported elsewhere (Bickman, et al., 1994).

Under the Demonstration, a wide range of intermediate services were made available: in-home counseling, after-school group treatment services, day treatment services, therapeutic homes, specialized group homes and 24-hour crisis management teams. As described in Bickman, et al. (1994), the introduction of intermediate services was accompanied by other changes in the service system. Care was coordinated by treatment teams and by case managers. Perhaps most important for the study here, however, is that the Demonstration required no financial outlay for families; usual co-payments and deductibles were waived. The Demonstration was funded under a cost-reimbursement contract; therefore, (theoretically) no limits were placed on the types of services to be offered as long as they were therapeutically appropriate. The philosophy of the Demonstration called for controlling costs by providing a continuum of services designed to be appropriate for each child, rather than placing a limit (or cap) on services or cost per child. All results from the Demonstration should be interpreted in light of this fact, and we discuss the implications below.
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Methods

The Fort Bragg Evaluation focused on a systematic comparison of care at the Demonstration site with

care as usual. The latter was represented by two comparison sites, Fort Campbell and Fort Stewart. Taken together, these sites were of comparable size and had demographics similar to that for Fort Bragg. Care as usual refers to care under CHAMPUS, and coverage for mental health services under CHAMPUS is fairly generous. CHAMPUS has recently incorporated some elements of managed care. Hospital use now requires prior approval by Health Management Systems, the CHAMPUS utilization review manager. The analyses presented here focus on the utilization and cost data.

For the comparison, these data were taken from the claims from the CHAMPUS system. The claims data include information on the type of services received and on expenditures for those services. Included were any claims filed between October 1, 1990 and September 30, 1993. (Fort Campbell provided some services outside the CHAMPUS system. Service utilization records were maintained in a management information system and from there were incorporated into utilization calculations.)

Information on services received under the Demonstration was contained in a management information system. It described all services provided, including the date of service delivery, the specific service and number of units of that service received. Per-unit costs of services were calculated on the basis of budgetary information provided to the evaluation [Interested readers are referred to Bickman et al. (1994) for more details of this process].
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Analysis

Why might one think that intermediate services would save money? Under the Demonstration, the cost of a day in intermediate residential care is 36% that of a day in an inpatient facility, while intermediate non-residential care is 50% (see Table 1). While the gap between care in a residential treatment center and intermediate services is smaller, the latter are clearly less expensive on a daily basis. This information alone, however, is not enough to guarantee that costs savings were realized. In particular, the intermediate services had to be used by significant proportions of children treated and they had to replace other, more expensive services.

If intermediate services were used by only a small percentage of all children treated, it seems unlikely that the resulting changes would be evident at the system level. The first question, therefore, involves the extent to which intermediate services were used.

Of all children treated at the Demonstration, 10.53% used intermediate services of some sort. Specifically, 5.7% of all children and adolescents treated during the Demonstration period received intermediate residential services; 8.2% received intermediate non-residential services (There was some overlap between the two; 59% of those receiving intermediate residential services received intermediate non-residential services as well). When combined, these numbers exceed the proportion of children who were hospitalized or were treated in a residential treatment center.
When used, these services involved large expenditures. The average child treated in a non-residential intermediate setting received over $17,000 worth of services in that setting during the Demonstration period. The corresponding figure for residential services is $26,835&shyp;this exceeds the figure for inpatient hospitalization.

Because significant numbers of children used intermediate services and because the expenditures involved were large, intermediate services represent a significant proportion of total expenditures at the Demonstration. Nearly 40% of total spending was on intermediate residential (19.50%) and non-residential (18.01%) services (see Table 2).

The average child treated at the Demonstration received nearly $3,000 worth of intermediate services during the Demonstration period ($1,517 and $1,401 on residential and non-residential care, respectively). When combined, these figures exceed those for residential treatment centers and inpatient facilities.

Six types of intermediate services were available: in-home services, after-school, latency partial

hospitalization, day treatment, therapeutic home, and out-patient therapy. Table 3 describes the use of each type. In-home services were used most frequently&shyp;nearly half (46%) of the 638 children who received intermediate services used these services. Nearly a third of the individuals treated used day treatment. Latency partial hospitalization was the least used form of intermediate services.

The sum of the figures in Table 3 exceeds one (1.67), which implies that children who used intermediate services used more than one type. This finding was not surprising; our earlier results indicated substantial overlap between the residential and non-residential categories. In sum, significant numbers of children treated at the Demonstration used intermediate services. A large portion of expenditures at the Demonstration went to these services, and if introducing them did not reduce costs, it was not because the services were unavailable.

Whether this utilization lowered total costs, however, depended on the extent to which these services replaced other, more expensive services. As noted, a day of hospitalization was three times as expensive as a day of intermediate residential care. If, however, each day of hospitalization was replaced with 10 days of intermediate residential care, the availability of less expensive services will not reduce costs.

We examined the effect of the availability of intermediate services on total spending per client, including expenditures for hospitalization and care in residential treatment centers. Overall spending on hospitalization and on residential treatment centers was roughly 20% higher at the Demonstration site ($13,436,300) than at the Comparison sites ($11,128,290; see Table 2). To some extent, this difference reflected differences in access. A different picture emerged, therefore, when we focused on expenditures per treated child. Here, we see that expenditures on hospitalization and on residential treatment centers was actually lower at the Demonstration ($2,227 vs. $4,003).

Which perspective is valid, total expend-itures or expenditure per treated child? To the extent the availability of intermediate services lured children into the system, the added costs associated with new clients represent the costs of adding intermediate services to a system of care. On the other hand, if those costs are due solely to changes in cost-sharing requirements for parents, the reduction in the costs of hospitalization and of care in a residential treatment center per treated child may represent real savings.

Even if we suppose that the reduction in expenditures on hospitalization and on residential treatment centers is real, the reduction is not large enough to offset the spending on intermediate services. The savings on those services ($1,776) is smaller than expenditures on intermediate services ($2,917).
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Discussion

Clearly, a day's use of intermediate services is less expensive than a day spent in a residential treatment center or in an inpatient facility. Any actual cost savings, however, depend on the way in which those services are used. This is more than a matter of sequencing (e.g., whether intermediate services are used before or after hospitalization). Rather, it is a matter of whether these services are substitutes or complements.

To see this, one should think of Rumbaugh clinic as a factory that combines different inputs into the production of good mental health. In this case, the inputs include but are not limited to mental health services (e.g., family resources can be thought of as an added input). Economists think of inputs as being either substitutes or complements. Substitutes are used to replace each other&shyp;complements improve the productivity of each other and in doing so increase the demand for each. The key is whether the use of one input increases or reduces the demand for the other.

Clearly, discussions of cost savings seem to presume that the intermediate services and hospitalization (or care in a residential treatment center) involve inputs that may be substituted one for the other. Further, it is assumed that they will be substituted at a rate less than their relative prices. If hospitalization is three times as expensive as intermediate services, then each day of hospitalization is replaced with three or fewer days of intermediate services.

It may be the case, however, that hospital-ization can be replaced only with several days of intermediate services. Indeed, intermediate services may be used as a substitute not for hospitalization but for outpatient therapy. Making intermediate services available may move individuals away from the most restrictive end of the continuum; however, it may move them away from the least restrictive end as well. The latter outcome actually may increase costs.

Another alternative is that intermediate services may not be substitutes for hospitalization at all. Rather, they may be complements&shyp;they may change the use of hospitalization and in doing so may make it more effective. Some evidence exists that this is the case. The use of hospitalization was dramatically different at the Demonstration. As discussed in Bickman et al. (1994), children hospitalized at the Demonstration left sooner but were more likely to return in the future. This change in the use of hospitalization may have been beneficial, and intermediate services may have made this possible.

What is striking about this discussion, however, is that adding more of one input (intermediate services) and improving the productivity of the other (hospitalization) implies increased production&shyp;i.e., better mental health. As discussed in Bickman et al. (1994), there is little evidence that children at the Demonstration showed greater improvement.

Several caveats are in order, however. The impetus to substitute may have been stunted by the absence of any costs savings. The very substitution assumed may depend on the presence of incentives to do so. The absence of cost-sharing not only lowers the costs of services to decisionmakers&shyp;it makes them equal and so eliminates the cost advantages associated with intermediate services.

Obversely, no reason exists to believe that incorporating cost-sharing by parents or scrutinizing spending at the Demonstration more carefully would reduce all spending proportionately &shyp;in other words, there is no reason, for example, to believe that the price elasticity of demand is equal across services. The reduction in the use of hospitalization, therefore, may have been more dramatic had parents and program administrators been faced with hard choices about how to allocate limited resources.

A second caveat involves the limited experience of mental health professionals with intermediate services. Because of this inexperience, they may have been used inefficiently. At this point, we know only that the services were used. It may be that too many people used them or too few. It may be that the wrong people used them; assigning different individuals to intermediate services may have lead to greater effectiveness. The fact that the Fort Bragg experiment was ground-breaking makes it interesting&shyp;this same fact, however, may limit the conclusions that may be drawn from it.

Savings on reduced use of hospitalization, therefore, may have been greater in a system with different financing and in a system where professionals had more experience with intermediate services. Nonetheless, intermediate services were not inexpensive. In fact, the costs savings needed to pay for those services may be greater than stated here. The Demonstration was clearly more expensive per treated child, due partially to a large increase in the use of outpatient therapy. While this difference no doubt reflects reduced cost sharing, it also may reflect the introduction of intermediate services. In particular, children treated in less restrictive environments may require more supervision in the community. Additional outpatient visits may be a requirement of increased reliance on intermediate services.

In sum, while substituting intermediate services for hospitalization offers a hope of costs savings, it is not clear that such savings were realized at Fort Bragg. It is not clear whether these savings would have been realized had different financial incentives have been in place: the lack of any cost sharing by parents may have dulled incentives to substitute intermediate services for hospitalization.
The discussion here raises clear conceptual issues. It is unclear whether hospitalization and intermediate services are substitutes or complements. It is not clear, in other words, whether intermediate services are a replacement for hospitalization or a means of making it more effective. The answer to this question&shyp;and to questions about potential costs savings&shyp;await further research on the components of care.
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Table 1

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Table 1
Type, Cost and Use of Services

Service	Cost per Day of Service		% of Treated Clients Receiving Service	
	Demonstration	Comparison	Demonstration	Comparison
Inpatient hospitalization	¢584	¢488	8.3%	14.2%
Residential treatment center	¢463	¢570	1.2%	3.3%
Intermediate residential	¢210	NA	5.7%	NA
Intermediate non-residential	¢291		8.2%	

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Table 2

Distribution of Costs per Treated Child for Service Types Provided

	Demonstration				Comparison			
	Total	% of Total	Per child receiving the service	Per treated child	Total	% of Total	Per child receiving the service	Per treated child
Hospital	$11,075,309	23.61	$22,107	$1,836	$6,924,853	47.12	$16,224	$2,311
RTC	$2,360,791	5.03	$33,726	$391	$4,703,437	34.50	$51,686	$1,692
Intermediate Residential	$9,150,773	19.50	$24,859	$1,517	Services not available at the Comparison sites			
Intermediate non-residential	$5,921,128	18.81	$17,073	$1,901				
Out-patient	$12,972,106	27.65	$2,471	$2,150	$1,765,325	12.95	$731	$635
Total for demonstration period*	$46,918,811	100.00		$7,777	$13,633,749	100.00		$4,904

*Total also includes case management, treatment teams, and assessments.

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Table 3
Types of Intermediate Services Used

Service	Percent Receiving
In-home services	4558%
After-school	2098%
Latency partial hospitalization	442%
Day treatment	3186%
Therapeutic home	3233%
Therapeutic group home	3170%

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The Impact of Managed Mental Health Care on Child and Adolescent Dispositions in a Regional Emergency Mental Health Service

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Introduction

One of the primary influences in the past decade on children and adolescent mental health services has been the Child and Adolescent Service System Program (CASSP). CASSP has advocated a comprehensive system of services, organized into a coordinated network of care, that is child-centered and family-focused, with the needs of the individual dictating the services provided (Stroul & Friedman, 1986).

At the same time the clinically-oriented CASSP principles have gained widespread recognition and acceptance, the economic underpinnings of mental health services have undergone profound change. Managed care, in its various forms, is rapidly becoming the dominant mode by which mental health services are funded and coordinated.

Hypothetically, it is not difficult to imagine possibilities for both agreement and conflict between the goals of CASSP and the goals of managed care. On one hand, CASSP shares with managed care the importance that is placed on integrated and coordinated services. On the other hand, the CASSP emphasis on individual needs and flexible funds could be perceived as being in conflict with cost containment&shyp;the primary goal of managed care initiatives. Given the impact that both CASSP and managed care have had, and will continue to have, on child and adolescent mental health services, it is surprising that the relationship between these two influential movements has not been given closer empirical examination.

In this summary, we examine the relationship between some of the clinically-oriented concerns of CASSP and the economically-oriented concerns of managed care by focusing on decision-making in emergency mental health services. Because emergency mental health often occupies a central position in mental health services, it is an ideal focus for investigating systemic patterns. Referrals come from and dispositions are made to almost every other mental health service through emergency mental health. While issues of clinical decision-making for children and adolescents in acute crises have been discussed in the literature (e.g., Costello, Dulcan & Kalas, 1991; Hillard, Slomowitz & Deddens, 1988; Slagg, 1993; Way, Evans & Banks, 1992), the role of fiscal and larger systems changes in decision-making has not yet been addressed.

The Emergency Mental Health Services (EMHS) program of the University of Massachusetts Medical Center serves the entire central Massachusetts area, from New Hampshire to the Connecticut border, and includes the metropolitan Worcester area, as well as some rather rural areas of the state. EMHS is located directly adjacent to the medical emergency room. Its clients include individual adults and children who are either self-referred, referred directly from an outside agency, or who are transferred from the medical emergency room. Presenting problems range from suicidality to psychotic symptoms

and other disruptions in behavior. Occasionally, clients will present with violent or self-destructive behaviors and require either chemical or physical restraint.

Clients are assessed by an EMHS clinician and an attending psychiatric resident. In some situations, a client will stabilize while at EMHS; after stabilizing, he or she is then sent home. In other cases, further intervention and treatment will be necessary and the client will be referred to outpatient services, a community-based crisis stabilization program or will be admitted to an inpatient psychiatric setting.

Data were obtained on EMHS dispositions for children and adolescents over a 2-1/2 year interval covering the period before and after the implementation of privately managed mental health benefits for Medicaid recipients. These data allow for clarification of the contributions of clinical, economic and systems factors on decision-making and dispositional outcomes for children and adolescents in crisis.
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Method

Data were drawn from EMHS log sheets that are completed daily and contain clinical and demographic information for all clients who receive services. Data for clients under 18 years of age were obtained for a 2-1/2 year period and divided into three different periods: the pre-managed care period (10/1/91-9/30/92); the transition period immediately following the implementation of private management of Medicaid mental health benefits (10/1/92-3/31/93); and the post-managed care period (4/1/93-3/31/94).

During these 2-1/2 years, there were 877 episodes when children were seen at EMHS. This number denotes the number of contacts or encounters and not the number of different individuals seen at EMHS. While 78% of the individuals seen at EMHS used the service only once during this period, 22% did use the service more than once, with 3% using it more than 4 times. Since repeat usage is a typical part of emergency mental health services, we believe that focusing on episodes as our unit of analysis leads to the best representation of EMHS service provision.

Encounters were pretty evenly divided between males and females, with females accounting for slightly more. Although the age of clients in these encounters ranged from 3 to 17, there was a significant skew to the right, indicating a proportionately high number of adolescents (mean ± SD = 14.3 ± -2.6; mode = 16). Fifty-seven percent of EMHS child and adolescent episodes were covered by Medicaid, 21% were covered by an HMO, 14% were covered by private indemnity insurance, and 7% were uninsured.

Of the 877 EMHS episodes included in this study, 25% resulted in inpatient admissions to either a public or a private psychiatric hospital. The largest portion of the remaining episodes (46% of the original sample) involved clients who were sent to home while the remainder went to short-term crisis stabilization, residential treatment or some other setting.

As part of our univariate analysis, we compared two different variables. First, we compared the number of EMHS episodes in the pre-managed care period and the post-managed care period in order to determine if there were differences in the volume of child and adolescent episodes. Second, we compared the proportion of EMHS dispositions to inpatient settings in the pre- and post-periods to determine if there was a change in the likelihood of children and adolescents being hospitalized.
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Results and Implications

There was a significant increase in the number of child and adolescent EMHS episodes in the post-managed care period when compared with the pre-managed care period (episodes post, N = 393; episodes pre-, N = 297; Chi square = 13.36; $p < .001$). This is probably due, at least in part, to new regulations in the post-managed care period requiring that all Medicaid recipients referred for inpatient

mental health services be screened by EMHS.

While there was an increase in the overall volume of child and adolescent episodes in the post-managed care period, there was a sharp drop in the proportion of inpatient dispositions (percent admitted to inpatient pre- = 31.7%; percent admitted to inpatient post- = 19.3%; Chi square = 14.626; $p < .001$).

This finding has both economic and clinical implications. One of the explicit goals of the move to managed care is to decrease psychiatric hospitalizations since these services are by far the most expensive in the system of care. At least in this setting, this goal is being met.

In addition to financial considerations, the CASSP principles established by Stroul and Friedman (1986) also argue that mental health treatment should be accomplished in the least restrictive setting possible. Since admissions to highly restrictive inpatient settings appear to have been diverted to less restrictive alternatives, this goal is also being realized.

The next step for our project will be to consider the role that clinical factors play in determining inpatient admission in the managed care era. One of the fears of therapists and clinically-oriented researchers concerning managed care is that clinical considerations will be replaced by decision-making that is entirely driven by finances. Our data will allow us to further explore this possibility.
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The Cost of Residential Schools for Children with Severe Emotional Disturbance

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Introduction

Inpatient hospitalization for children with severe emotional disturbance (SED) is an expensive, resource-intensive treatment modality. This summary considers the costs of an alternative treatment setting, the residential school or treatment center which provides services to children with SED. The study examined the following questions: (1) What are the costs of residential schools that treat children with severe emotional disturbance? and (2) Does ownership or facility size affect the cost per child in the residential schools?

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Methods

Data for the study came from a national, stratified sample survey of day and residential schools for children with disabilities conducted by the Department of Education in 1988. Eligible facilities included those operated by education agencies as well as other state agencies or private organizations. Facilities were selected for inclusion if one of the following criteria were met:

1. the facility identified itself as primarily treating children with SED or autism or childhood schizophrenia,
2. the facility reported that it treated a subset of children with SED, although not as their primary population treated, or
3. the facility treated children with a non-physical handicap and SED as a secondary handicapping condition (i.e., definition of a secondary handicapping condition states that the child would be classified as handicapped under the secondary condition in absence of the primary handicapping condition.).

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Results

These residential schools represented significant expenditures on each child, although not as large as alternatives such as inpatient psychiatric hospital care, which can cost as much as $500 per day, or mental health residential treatment centers, which cost between $50,000 and $75,000 per year (Burns & Friedman, 1990).

For residential programs, the average cost per child per year was $42,215 and for facilities with both residential and day (R&D) programs, the cost per child was $47,615 for residential students and $16,962

for day students. These costs implied a 2.9 billion dollar industry. Some medical, residential and educational costs incurred by the institutions might have been paid by different agencies and were not included in these estimates; therefore, the actual size of this industry might have been larger.

The average facility size varied with type of ownership (see Table 1). Non-profit programs were smaller on average than either public or for-profit programs. For-profit schools had larger than average residential programs; 131 students on average, compared to 57 students overall in combined R&D facilities, and 110 students compared to 78 overall in residential-only facilities. Size of an institution is often considered an indicator of quality, with larger institutions offering lower quality. However, large size may also be associated with economies of scale, e.g., quality adjusted cost per case falls with the institute size. The relatively large differences in average size of the facilities by type of ownership may indicate that non-profit institutions are providing a higher level of quality. On the other hand, if there are economies of scale in terms of cost (or quality), the larger institutional size may actually indicate better economic performance.

Ordinary least squares, regressing facility characteristics on the natural log of the cost per-child were used to examine the independent effects of ownership form and facility size on cost (see Table 2). The average teacher salaries were included to control for differences in cost of doing business by state.

Ownership form did not have a significant effect on cost per-child, except for non-profit combined R&D programs. The non-profit programs were significantly more costly per child than the public programs. The coefficient on the non-profit ownership for the residential only facility was consistent with this result, but did not reach statistical significance. The number of children enrolled in the program was included to determine if there were any economies of scale. None of the coefficients on the size of the program were significant, which suggested that there were no significant economies or diseconomies of scale.

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Conclusions

From this brief look at residential schools for children with emotional disturbances we can make several observations. Cost per child did vary by ownership form, but was statistically significant only for non-profit R & D programs relative to public facilities. Residential services offered by publicly owned R&D facilities were more expensive than either for-profit or non-profit programs. Potential reasons for this cost difference may have been the case-mix or severity of illness of children served. There also is some evidence that public programs examined may treat a different population (see Table 3). For example, public programs reported providing treatment to proportionately more children with multiple disabilities than did the others, and were more likely to report the primary disability as something other than SED.

Size of the facility did not appear to influence the cost per child. This result suggests that there are no economies or diseconomies of scale.

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Table 1
General Description of Facilities (Weighted Data)

	Public	For-Profit	Non-Profit	All
Residential only				
Number of facilities	94	61	207	362
Average number of children	102.3	109.7	57.8	78.1
Average cost per child ($)	45,254	72,361	39,696	42,215
Average operating budget ($)	3,830,421	1,735,391	2,057,992	3,183,054
Percent with excess capacity	34.0	19.7	12.6	19.3
Residential and day				
Number of facilities	43	24	248	315
Average number of children	128.8	166.3	75.0	89.3
Day students	39.1	35.6	31.1	32.5
Residential students	89.7	130.7	43.9	56.8
Cost per child (day)	22,676	38,849	15,196	16,962
Cost per child (residential)	67,622	58,955	45,261	47,615
Average operating budget	3,512,371	2,900,000	2,296,129	2,479,423
Percent with excess capacity	11.6	33.3	12.5	14.0

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Table 2
OLS Regression Results for the Natural Log of the Cost per Child by Facility Type

Dependent Variable: Ln Cost Per Child

	Facility Type	
	Residential and Day	Residential Only
Variables	Coefficient (Std. Error)	Coefficient (Std. Error)
Intercept	3.576387 (3.57908)	16.412825** (7.19662)
Ln (number of children)	0.097348 (0.07785)	0.048536 (0.10355)
For-profit facility	-0.473488 (0.31799)	0.503528 (0.36684)
Non-profit facility	0.643700** (0.17458)	0.018393 (0.19538)
Ln (average teacher salary)	0.643700* (0.35218)	-0.602572 (0.70460)
Primary sed	0.373116** (0.14915)	-0.101613 (0.30505)

*p<.10
**p<.05

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Table 3
Casemix indicators

	Public	For-Profit	Non-Profit	All
Residential only				
Percent SED primary	94.7	98.4	95.7	95.9%
Percent of				
All children	34.0	23.7	42.3	100.0%
Multiply handicapped	42.7	0	57.3	100.0%
Age distribution				
0 to 5	0.3	1.1	1.5	1.1%
6 to 17	91.1	93.2	92.9	92.5%
18 to 21	8.7	5.7	5.6	6.4%
Residential and day				
Percent SED primary	81.4	100.0	94.4	93.0%
Percent of				
All children	19.7	14.2	66.1	100.0%
Multiply handicapped	47.9	7.5	44.6	100.0%
Age distribution				
0 to 5	6.0	1.5	12.0	10.4%
6 to 17	85.6	96.2	82.7	84.1%
18 to 21	8.4	3.8	5.3	5.6%

Note: weighted data

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A Comparison of Children and Adolescents Funded by Medicaid and Commercial Insurance in an Inpatient Psychiatric Facility

Authors

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Introduction

As capitation becomes the norm for the provision of publicly funded mental health services, it is increasingly important to have information about different population subgroups. Capitation will require astute providers to have an understanding of the different kinds of patients and payers they are serving. This research project explores the differences between patients funded by Medicaid and patients with commercial insurance in an adolescent and child psychiatric hospital.
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Methodology

We reviewed and selected data from the computerized client database at Cleo Wallace Center (CWC), a not-for-profit psychiatric facility for children and adolescents located in the Denver metropolitan area. Cleo Wallace Center serves 175 children and adolescents daily in three settings constituting a continuum of care&shyp;hospital, residential, and day treatment. For the purpose of this study, we selected child and adolescent patients who were discharged from the hospital program between November 1, 1993, and October 31, 1994. Patients are assigned to the child or adolescent inpatient programs based on age, diagnosis, maturity, risk factors, program design, and space availability. Typically, patients under the age of 12 are placed in the child program and patients 12 years of age and older are placed in the adolescent program. For this study we accepted the program at discharge as the delineation between child and adolescent. We extracted a total of 732 patient records with either Medicaid or a commercial insurance company as their primary payer. Individual medical records were reviewed for any data that was missing in the initial extraction.

Data was transferred from the computerized patient database to SPSS (Statistical Package for the Social Sciences) and analyzed. Key variables included length of stay in the hospital, number of re-admissions, diagnosis at discharge, gender, ethnicity, age at admission, where the patient was prior to placement, and where the patient went after treatment. For comparative purposes, only patients with an inpatient stay were reviewed.

An 18% random sample of patients was identified for each funding type (41 with Medicaid, 44 with commercial insurance). Medical record reviews were done to collect information on the number and type of previous out-of-home placements and/or psychiatric treatments and medication usage before, during, and after treatment at CWC (see Table 1).
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Findings

Length of Stay
Patients with Medicaid funding (both adolescents and children) had longer lengths-of-stay than patients with commercial insurance (see Table 2 & Figure1).

We reviewed an additional 132 adolescent and 43 child patients&shyp; not included in the previous analysis&shyp;who had commercial insurance and moved from the inpatient program to the day hospital program. Patients with commercial insurance (both adolescents and children) who moved from the inpatient program (average LOS = 6.6 days) to the day hospital program (average LOS for adolescents is 7.3 days and for children 7.4 days) had a combined average LOS of 14 days. This was less than the average LOS for adolescents or children with Medicaid funding.

Previous Psychiatric Experience
Eighty-five patient charts were reviewed for previous psychiatric experience. Almost twice as many adolescents with Medicaid, versus adolescents with commercial insurance, had at least one previous psychiatric experience. In contrast, 54% percent of children with commercial insurance had at least one previous psychiatric experience compared to 36% of children with Medicaid.

Diagnosis at Discharge
Fifty-six percent of adolescents with Medicaid were diagnosed at discharge with a behavioral disorder compared to 35% of adolescents with commercial insurance. Fifty-five percent of adolescents with commercial insurance had an affective disorder diagnosis at discharge compared to 30% of adolescents with Medicaid funding.

About half of the children with commercial insurance or Medicaid had a behavioral disorder at discharge. However, children with commercial insurance were more likely to have an affective disorder (39%) while children with Medicaid are more likely to have an anxiety disorder (26%).

Before Placement
Adolescents with commercial insurance were twice as likely as Medicaid patients to come from a psychiatric/medical hospital or from being on-the-run prior to admission at CWC. Adolescents with Medicaid were more likely to come from an out-of-home placement (foster home, group home, residential child care facility, shelter care) or from detention/police custody.

Most children (93%) with commercial insurance came from home prior to placement at CWC. Only sixty-eight percent of children with Medicaid came from home; another 30% came from an out-of-home placement.

After Treatment
Seventy-eight percent of adolescents with commercial insurance returned home after treatment, while only 52% of Medicaid adolescents returned home. Thirty-three percent of Medicaid adolescents went to an out-of-home placement and 10% went to a more restrictive psychiatric setting like a state hospital. Only 3% of adolescents with commercial insurance moved to a more restrictive psychiatric setting. Almost all (93%) children with commercial insurance returned home. Seventy-four percent of children with Medicaid returned home after treatment, and 22% went to an out-of-home placement.

Demographics

- Average age at admission: Medicaid-funded patients discharged from the adolescent inpatient program were, on average, slightly older (15 years) than patients with commercial insurance (14.3 years). The average age for children discharged from the child inpatient program was the same (9 years).
- Adolescents were fairly evenly divided between male and female regardless of payer source. There tended to be more young male than female children regardless of payer source.
- Ethnicity: About one third of patients with Medicaid (both adolescents and children) were non-White. Twenty-two percent of adolescents with commercial insurance and 12% of children with commercial insurance were Non-white. Based on Colorado public school enrollment data, 74% of youth under 18 years of age were Caucasian and 26% were from other non-White ethnic

groups.

Medication Usage
More patients with Medicaid were using psycho-tropic drugs at the time of admission than patients with commercial insurance: 45% of adolescents and 66% of children with Medicaid; and 30% of adolescents and 56% of children with commercial insurance.

Seventy-seven percent of adolescents with Medicaid who were admitted on medications, had their medications changed while in the hospital compared to 100% of the adolescents with commercial insurance. Seventy-five percent of children with Medicaid who were admitted on medications had their medications changed while in the hospital compared to 83% of the children with commercial insurance.

More adolescents and fewer children with Medicaid funding were discharged on medications than had been admitted while on medication. More patients with commercial insurance (both adolescents and children) were discharged on medications than admitted.
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Summary

Based on our study results, patients with Medicaid funding in a psychiatric hospital setting were different from patients with commercial insurance.

- Patients with Medicaid funding had longer lengths-of-stay, and were more likely to have been diagnosed with behavioral disorders.
- There were some race and age differences; adolescents with Medicaid funding were older, patients with Medicaid were more ethnically diverse than patients with commercial insurance.
- Patients with Medicaid funding disproportionately came from out-of-home placements (such as group homes, foster homes, etc.) and detention, while adolescents with commercial insurance were twice as likely as patients with Medicaid to come from a psychiatric/medical hospital.
- Patients (both children and adolescents) with commercial insurance returned home after treatment at a higher rate than Medicaid patients.
- Both Medicaid and commercially insured patients appeared to use inpatient services appropriately for medication evaluation and stabilization.
- Adolescents with Medicaid were more likely to have had previous psychiatric experiences than adolescents with commercial insurance. Children with commercial insurance are more likely than children with Medicaid to have had previous psychiatric treatment.

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Table 1
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Table 1
Number of Patients in the Study

	Medicaid	Commercial insurance
Adolescents	147	182
Children	92	41

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Figure 1
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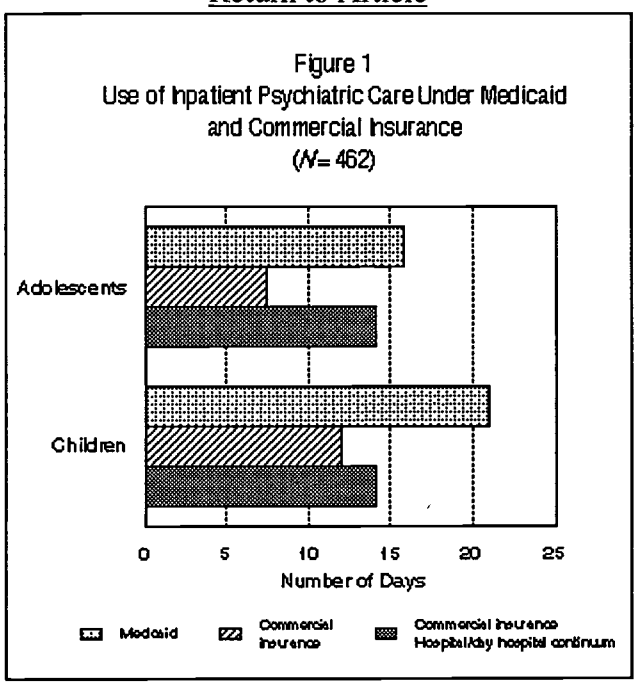

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Table 2
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Table 2
Comparison of Length of Stay *

	Medicaid	Commercial insurance
Adolescents	15.9 days	7.3 days
Children	20.8 days	12.2 days

* $p < .05$

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