

Service access and service system development in a children's behavioral health system of care

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Abstract

Systems of care provide comprehensive services to children with emotional and behavioral disorders through a network of local agencies and providers that function as a multi-agency case review team. A primary objective in any system of care is to provide individuals with access to appropriate services. In the present study, access is defined as services received relative to those recommended by a multi-agency review team and barriers to services identified by that team. These indicators, which provide a system-level assessment of service access and function as a proxy for the development of the system of care, fill a gap in the existing literature for more system-level indicators of outcome. A total of 2073 children and youth are assessed upon entry into Rhode Island's behavioral health system of care and then followed for three months to determine the extent of services received relative to those recommended as well as barriers to services identified at service entry. Multi-agency reviews are conducted over an 8-year-period through three phases of system of care implementation—early in the establishment of the system of care, at the midpoint of implementation after substantial funding was received for service enhancements, and after full implementation of the system of care philosophy. The results indicate that, as a system of care matures, access increases significantly on both of these indicators, and that more and different types of children are served and agencies are involved in the system of care. The results are discussed for their implications for assessing systems of care through establishment of system-level empirical benchmarks of service system development.

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1. Introduction

Systems of care have been defined as a 'comprehensive spectrum of mental health and other necessary services which are organized into a coordinated network to meet the changing needs of children and adolescents with severe emotional disturbances and their families' (Stroul & Friedman, 1986; p. iv). Over the past 15 years, systems of care have been developed for children and youth with serious emotional and behavioral problems, often involving participation from service providers, parents and family members, school personnel, health care and social service

professionals, child protective service workers, and other key community members important to the welfare of the child and family (Pumariega & Winters, 2003). The philosophy underlying the development of systems of care is that services should be: accessible, individualized, child-centered, and family-focused, delivered in the least restrictive service setting, comprehensive and coordinated among relevant community providers, and culturally-competent (Holden et al., 2003; Stroul & Friedman, 1986). Typically, the various community stakeholders function as a multi-agency case review team that determines a child and family's eligibility for services in the system of care, reviews treatment options, makes recommendations for services, and then evaluates the effectiveness of the service plan. Thus far, over 40,000 children have been served through systems of care in the United States, a number that represents only a fraction of children who

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have serious emotional and behavioral disorders (Holden, Friedman, & Santiago, 2001).

A primary objective in any system of care is access to appropriate services (Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001). Service access has been defined by the Institute of Medicine as ‘the extent to which those in need of mental health and substance abuse care receive services that are appropriate to the severity of their illnesses and the complexity of their needs’ (Moran & Kiser, 2001). Operational definitions of access have included the geographical location of services, satisfaction with services, service affordability, the cultural competence of service provision, and service utilization/penetration (Pandiani, Banks, Bramley, Pomeroy, & Simon, 2002). In the area of children’s mental health, access to care has been an important concern among mental health policy makers, researchers, and family members for almost three decades (Lourie & Hernandez, 2003), and has emphasized such factors as funding for necessary services, the receipt of appropriate services that meet individual needs, and the reduction of barriers to service (Hoagwood et al., 2001; Holden et al., 2003). Among the most common barriers to service access that have been examined are: waiting lists, the high cost of services, lack of culturally-competent providers, inappropriate levels of service, inconvenient service locations and hours, stigma, lack of quality providers, and lack of transportation to services (Hoagwood et al., 2001; Holden et al., 2003; Moran & Kiser, 2001; Owens, Hoagwood, Horwitz, Leaf, Poduska & Kellam, 2002).

Previous research has shown that reduced access to services coupled with the underdevelopment of appropriate services are common problems encountered in the establishment of a system of care for children and youth with emotional and behavioral problems (Holden et al., 2001; Kutash & Rivera, 1995). However, systems of care that have been able to target needs effectively have generally increased service access over previous levels of service participation (Overstreet, Casel, Saunders, & Armstrong, 2001; Santarcangelo, Bruns, & Yoe, 1998; Woodbridge, Furlong, Casas, & Sosna, 2001).

Although access has been shown to increase when appropriate services are developed in a system of care, very little is known about how this takes place, mostly because empirical benchmarks on the course of service system development are lacking (Burns, 2001; Hernandez & Hodges, 2003; Lourie, 1994). One reason for this is that there are few agreed upon parameters with which to gauge service system development, especially as it pertains to service access. For example, when new services are introduced to meet identified local needs, is there a commensurate increase in the number of services received by children and families in the system of care relative to those recommended? Furthermore, are there corresponding reductions in service barriers? And finally, are these changes in service access reflected in observed changes in

the characteristics of children and families served as the system matures? The assessment of such changes over time would provide useful system-level benchmarks regarding access in specifying how systems of care develop and mature.

In a recent critique of the literature on systems of care, Hernandez and Hodges (2003) note that currently there are few system-level indicators of service system change and development. One of the reasons for this, they maintain, is that the field has mistakenly regarded systems of care as if they were actual interventions, rather than a philosophy about how services should be organized and delivered. They further argue that if systems of care are viewed as an intervention, they may be expected to impact individual outcomes. Thus, one could reasonably assess system change through examination of individual outcomes over time. However, if systems of care are regarded as a philosophy on how care is organized and delivered, then it is not reasonable to expect there to be a direct impact on individual-level outcomes as the system changes. Rather, one should use system-level indicators of change to monitor service system development (Hernandez & Hodges, 2003). From this perspective, the general failure to find differential improvement in individual-level outcomes for children and families in recent comparative outcome studies (Bickman, 1996, 2000; Bickman, Noser, & Summerfeldt, 1999), reflects not a failure of the system of care philosophy, but a misunderstanding of what systems of care actually are, and what they may be expected to impact. Although system-level or organizational change strategies for delivering services may or may not have an effect on individual-level outcomes, they certainly should impact system-level indicators relevant to the strategies used.

In this study, we examine two system-level indicators of service access following implementation of the system of care philosophy in a single state and then track these indicators over almost eight years. The indicators selected may be regarded as potential system-level empirical benchmarks of service access that can be used to track the impact of service system development.

1.1. Study hypotheses

This study examines services received as a proportion of those recommended and barriers to service by local multi-agency review teams in the Rhode Island children’s behavioral health system of care. Since these indicators of access are based on the operation of the multi-agency review teams, rather than on individual levels of service utilization, they represent system-level indicators of service access. Access is examined over an almost eight-year period using multi-agency case reviews conducted with all youth enrolled in the service system during the years early in the development of the system of care (Phase 1) and at two time points after service system enhancements were implemented—at the midpoint of implementation

(Phase 2) and after full implementation (Phase 3). We hypothesize: (1) that as a system of care matures, a greater proportion of services recommended will be received by children and youth referred to multi-agency review teams in the overall system of care; and, (2) that as access to services increases—as assessed by the proportion of services received to those recommended—barriers to access will be reduced correspondingly. Finally, we expect changes in service access to be accompanied by observed changes in the characteristics of children and families served, with shifts in the types of children involved in the system of care and the types of referrals made.

1.2. Background: the Rhode Island children's behavioral health system of care

For more than a decade, Rhode Island has provided services to children with serious emotional and behavioral disorders and their families within a statewide network of eight local coordinating councils, known as LCCs, and organized by catchment areas that are managed through the Rhode Island Department of Children, Youth, and Families (DCYF). These LCCs are part of the overall statewide system of care for children's behavioral health that consists of local networks of providers, families, advocates, and representatives from community organizations that work together to develop coordinated services for children and youth with serious challenging behaviors. In Rhode Island, systems of care for children and families emphasize: (1) integrated services across providers; (2) services that are child-centered and strength-based; (3) family-focused service planning; (4) culturally competent services; (5) services that are flexible, least restrictive, and close to home; (6) the integration of natural community supports into the provision of services; and (7) community ownership through the active involvement of key community stakeholders, such as family members, providers, funders, and community representatives (Tebes, Helminiak, Kaufman, & Ross, 2000). DCYF-funded behavioral health services for children and youth are organized through a central office at DCYF with contracts to local mental health centers and LCCs to provide 24-h emergency services, screening for inpatient psychiatric hospitalization, and a vast array of traditional and non-traditional therapeutic services for the child and family. A primary goal of each LCC is to prevent out-of-home placement and out-of-community placements.

The Rhode Island DCYF-funded behavioral health system of care for children and youth was formally established in 1990, when Rhode Island received its initial funding to implement the Child and Adolescent Service System Program, or CASSP, from the National Institute of Mental Health. The CASSP grant established the LCCs and provided support to coordinate and evaluate the system of care. The initial focus of the CASSP initiative was to develop effective interventions for children at risk for out-of-home placement, and this emphasis continues to

the present day. LCCs meet at least monthly and are responsible for assessing the service needs of families, identifying system barriers that impede effective service delivery, reaching out to families and local community organizations, advocating for system changes, and managing a multi-agency case review process through community planning teams.

In 1994, the CASSP structure was expanded through an additional federal service development grant to the Rhode Island DCYF from the Center for Mental Health Services (CMHS). This second grant ensured that the CASSP philosophy and orientation to service delivery was sustained statewide. In that same year, Rhode Island was successful in obtaining another major new grant from CMHS that enabled the state to enhance existing services within each of the LCCs. Known as Project REACH Rhode Island, this initiative consisted of a five-year, \$15.8 million grant from CMHS that was part of the Comprehensive Community Mental Health Services for Children and their Families Program. The overall goal of Project REACH was to develop and implement non-residential and community-based integrated services statewide, particularly for children at risk for out-of-home placement. The five specific project goals of REACH were to: (1) augment existing services; (2) develop new services when indicated; (3) monitor and evaluate the system of care; (4) assure diverse participation; and, (5) strengthen the existing interagency framework (Kaufman, Tebes, Ross, & Grabarek, 2000).

In this study, changes in service access during three historical phases of implementation of Rhode Island's behavioral health system of care for children and youth are examined in the context of the study hypotheses described earlier. The two indicators of access used—services received as a proportion of those recommended and barriers per service recommended—complement prevailing definitions of access based primarily on individual service utilization. They also provide indicators of access that take into account the views of system stakeholders—such as family members and community service providers—that is critical when examining community phenomena in a scientifically rigorous manner (Tebes, *in press*). Finally, the collection of statewide data offers a unique opportunity to examine the system-level impact on service access that results from a well-funded system of care service development initiative.

Three distinct phases in the development of the system of care are examined: (1) the period after initial receipt of CASSP funding to establish the system of care; (2) the period at the midpoint of service system development following the allocation of CASSP continuation funding and REACH service enhancement funding to expand the system of care; and (3) system-wide adoption of the CASSP philosophy and full implementation of system of care service enhancements. Tracking access across these three phases begins to establish empirical benchmarks for understanding access in the context of a developing system of care.

2. Method

2.1. Participants

A total of 2073 children and youth were enrolled in the system of care during the almost eight years tracked in this study. Table 1 provides a summary of selected demographic information for children and youth collapsed across all study years. As is shown in the table, 70.5% of youth participants were male, and about three-quarters (74.9%) were between the ages of 6 and 16, with 10.7% under 5 years old, and 14.4% age 16 and older. The largest ethnic/racial group represented in the system of care was White at 69.9%, with 12.3% African American, 9.7% Hispanic, and the remaining 8.2% of children and youth American Indian/Alaskan Native, Asian/Pacific Islander, and Other or Biracial.

The vast majority of children referred (75.7%) demonstrated moderate levels of functioning and symptomatology (scores of 41–60) as assessed by the Children's Global Assessment Scale, or CGAS (Schaffer et al., 1983), with the remaining about equally split between children exhibiting lower (14.0%) or higher (10.3%) levels of functioning. Children scoring between 41–60 on the CGAS ranged in their functioning from 'Moderate degree of interference in functioning in most social areas or severe impairment of

functioning in one area' (41–50) to 'Variable functioning with sporadic difficulties or symptoms in several areas but not all social areas' (51–60). Children and youth in these two areas are considered to be at-risk of out-of-home placement. Finally, referrals to the system of care came primarily from mental health agencies (41.2%), schools (19.2%), and parents/friends/self (17.9%), with the remaining 21.7% coming from the DCYF, the judiciary, social service agencies, physicians, and other sources.

2.2. Procedures

All children and youth who participated in the study were referred to the multi-agency team within one of eight LCCs. Each LCC has at least one multi-agency team that reviews cases to assist the family in identifying and coordinating needed services within the local system of care, and if necessary, from other local systems of care statewide. LCCs meet monthly and are responsible for assessing the service needs of families, identifying system barriers that impede effective service delivery, providing outreach to families and local community organizations, advocating for system changes, and managing the multi-agency case reviews. Much of this work is done by Family Service Coordinators, who are parents/caregivers employed by the system of care within each LCC. Services that are available and initiated through the LCC case review process include: therapeutic recreation, respite, in-home behavior therapy and parent training, day treatment, therapeutic foster care, and wrap-around services (which are non-traditional supports for children, youth, and families). The LCCs do not provide direct clinical services; rather, these and other direct non-clinical services are provided by contracted community agencies, many of whom are participants in the LCCs.

2.3. Measures

Two types of measures were used in this study. The *Intake and Referral Form* was developed to provide demographic and residential information about children and families referred for services to a multi-agency review team. This form is completed by a Family Service Coordinator as part of the determination of eligibility for the receipt of system of care services.

The *Resource and Outcome Data Form (RAODF)*, developed explicitly for tracking system of care outcomes for children, youth, and families, was also used in this study. The RAODF was developed in collaboration with providers, family members, and DCYF personnel to gather descriptive information about the families enrolled in the system of care and to document system level indicators and outcomes, including service access. The RAODF allows for check-off documentation of services across seven domains: mental health, social services, educational, recreational, operational (which includes case management), vocational, and health. For the present study, services recommended at the initial

Table 1
Demographic characteristics of children entering the Rhode Island system of care (N=2073)

Characteristic	Overall sample	
	Number	Percent
<i>Gender</i>		
Female	612	29.5
Male	1461	70.5
<i>Age</i>		
5 years and younger	221	10.7
6–12 years old	1012	48.8
13–15 years old	542	26.1
16 and older	298	14.4
<i>Race/ethnicity</i>		
African American	255	12.3
American Indian/Alaskan Native	29	1.4
Asian/Asian American/Pacific Islander	23	1.1
White	1448	69.9
Hispanic	201	9.7
Other/Biracial	117	5.7
<i>Level of functioning: C-GAS scores</i>		
0–40	290	14.0
41–60	1570	75.7
61–100	213	10.3
<i>Referral source</i>		
Mental health agency	854	41.2
School	397	19.2
Parent/friend/self	371	17.9
DCYF	126	6.1
Judicial agency/courts	93	4.5
Social service agency	69	3.3
Physician/health care professional	28	1.4
Other sources	135	6.5

case review meeting are tracked by the Family Service Coordinator with the team for three months to determine whether they were received.

Also included on the RAODF is a list of eight possible barriers to services, including: service not available in the community, service not available in state, waiting lists, culturally appropriate services not available, funds not available through identified funder, no identified funder, level of services not sufficient for need, and lack of team consensus on plan. Any applicable barrier for a given service recommended is checked off, and then followed up after three months. Barriers on the RAODF are noted by the Family Service Coordinator in collaboration with the multi-agency review team, with final scores made by team consensus.

Extensive training was provided to all Family Services Coordinators prior to completion of the RAODF with follow-up technical assistance provided on an ongoing basis to ensure sensitivity in working with families and the accuracy of data tracking.

3. Results

As described earlier, access to services was examined pertaining to three phases in Rhode Island's system of care: (a) Phase 1: May 1992–December 1994, the period early in the development of the system of care shortly after receipt of initial CASSP funding and implementation; (b) Phase 2: January 1995–June 1997, the period at the midpoint of service system development following the award of a CASSP continuation grant and the REACH service enhancement grant; and (c) Phase 3: July 1997–January 2000, the period during which the CASSP philosophy was widely known in the system of care and service enhancements were fully implemented.

3.1. Changes in access based on child and family demographic characteristics

Chi-square analyses were conducted to examine changes in demographic and client characteristics that were observed during each of the three phases of system of care implementation. Since these analyses involved comparisons across three periods, the adjusted standardized residuals of each chi-square were examined to identify the system of care phase and the cell demographic category where the effect was most pronounced. Those cells in which the absolute value of the residual (distributed as a z score) was greater than or equal to 1.96 indicated a significant contribution by that cell to the overall chi square; residuals with values of 1.96 or higher indicate that the number of cases in that cell is significantly higher than would be predicted by the independent model, while values of -1.96 or lower indicate that the number of cases in that cell is significantly lower than expected (Agresti, 2002; SPSS, 2004).

As is shown in Table 2, very little substantive changes were observed over time in access to system of care services by gender and age ($X^2=2.19$, $df=2$, $p<n.s.$ and $X^2=11.67$, $df=6$, $p<0.08$, respectively). Examination of the adjusted residuals indicated that slightly more youth ages 13–15 entered the system of care in the initial phase under study ($z=2.7$) and slightly more children under 5 years of age entered the system of care during its final phase ($z=2.0$). In terms of race/ethnicity, there was a marked change over time in the racial composition of the children served within the system of care ($X^2=21.15$, $df=2$, $p<0.0001$); more children of color ($z=3.0$) entered the system of care during the final phase examined as compared to proportionally more White children enrolled in the system of care during the initial phase ($z=4.4$). This relative decrease over time in serving White children and increase in serving children of color is evident when examining the declining percentage of White children served over time (81.6–70.0–67.0%).

Some changes in service access were also observed in terms of the level of functioning for children referred to the system of care ($X^2=28.98$, $df=4$, $p<0.0001$). Children with CGAS scores in the moderate range were more likely to enter the system of care during the final phase examined, as is shown by the adjusted residual ($z=3.2$). Since an emphasis in the Rhode Island system of care was to develop effective services for children at risk for out-of-home placement, it is not surprising that access for children in the moderate range of functioning increased over time, since this group was identified as 'at risk' for such placement. Examination of the adjusted residuals further indicates that children with lower levels of functioning entered the system of care through multi-agency review teams at rates higher than would be expected by chance during the middle phase examined ($z=3.2$), and at lower rates than would be expected by chance during the final phase ($z=-5.2$). Although this may imply that proportionally fewer lower functioning children and youth were referred to multi-agency review teams during the third period examined, the number of children with severe levels of functioning and symptomatology reviewed actually more than doubled over time (from 53 to 125 to 112). These findings suggest that multi-agency case review teams may have served a gate-keeping function for children considered most appropriate for community-based services, rather than for those requiring residential services or inpatient care.

Finally, Table 2 shows how referral sources to the system of care changed over time ($X^2=211.99$, $df=14$, $p<0.0001$). Examination of the adjusted standardized residuals indicates that, referrals from judicial agencies/courts ($z=7.6$) and parent/friend/self ($z=6.0$) increased significantly over the 8-year period while those from schools ($z=-6.3$), DCYF ($z=-4.9$), and other sources ($z=-3.7$) decreased significantly over time. Clearly, referral networks changed with the development of the system of care, opening up access for many children

Table 2
Demographic characteristics of children entering the Rhode Island system of care during three phases* ($N=2073$)

Characteristic	Period 1 ($N=256$)		Period 2 ($N=717$)		Period 3 ($N=1100$)	
	Number	Percent	Number	Percent	Number	Percent
<i>Gender</i>						
Female	82	32.0	220	30.7	310	28.2
Male	174	68.0	497	69.3	790	71.8
<i>Age</i>						
5 years and younger	22	8.6	68	9.5	131	11.9
6–12 years old	119	46.5	365	50.9	528	48.0
13–15 years old	85	33.2	179	25.0	278	25.3
16 and older	30	11.7	105	14.6	163	14.8
<i>Race/ethnicity</i>						
African American	28	10.9	85	11.9	142	12.9
American Indian/Alaskan Native	4	1.6	13	1.8	12	1.1
Asian/Asian American/Pacific Islander	2	.8	5	.7	16	1.5
White	209	81.6	502	70.0	737	67.0
Hispanic	13	5.1	75	10.5	113	9.8
Other/Biracial	0	0	37	5.1	80	7.3
<i>Level of functioning: C-GAS scores</i>						
0–40	53	20.7	125	17.4	112	10.2
41–60	178	69.5	527	73.5	865	78.6
61–100	25	9.8	65	9.1	123	11.2
<i>Referral source</i>						
Mental health agency	87	34.0	308	43.0	459	41.7
School	70	27.3	173	24.1	154	14.0
Parent/friend/self	27	10.5	95	13.2	249	22.6
DCYF	31	12.1	55	7.7	40	3.6
Judicial agency/courts	0	0	8	1.1	85	7.7
Social service agency	0	0	29	4.0	40	3.6
Physician/health care professional	0	0	6	.8	22	2.0
Other sources	41	16	43	6.0	51	4.6

Period 1: May 1992–Dec. 1994, $N_1=256$; Period 2: Jan. 1995–June 1997, $N_2=717$; and Period 3: July 1997–Jan. 2000, $N_3=1100$.

who might not otherwise have been referred for multi-agency reviews.

3.2. Access as the proportion of services received to those recommended

Fig. 1 depicts the proportion of services received to those recommended for each of the three phases in the system of care. During Phase 1, three months after the initial case review, 47.7% of all types of services—mental health, social, educational, operational, recreational, vocational, and health—were received as a proportion of those recommended by multi-agency review teams. This proportion increased dramatically during Phases 2 and 3, to 68.7 and 79.6%, respectively. A one-way analysis of variance for this difference was significant, $F(2,2065)=132.1$, $p<0.0001$, and posthoc analyses using the LSD procedure to compare each of the phases to one another was also significant in all instances.

More detailed analyses were also conducted to determine whether the proportion of services received to those recommended differed for any of the seven types of services tracked. Table 3 presents the results of these analyses. As is shown, the overall F tests for each type of service—mental

health, social, educational, operational, recreational, vocational, and health—was highly significant. Furthermore, in all but two instances—recreational services and vocational services in which no significant differences were observed between Phases 2 and 3—the LSD comparisons revealed significant differences at each phase. Overall, the pattern of services received relative to those recommended was remarkably similar for mental health, social, educational, operational, and health services, with proportions beginning roughly near 45–50% during Phase I, increasing about

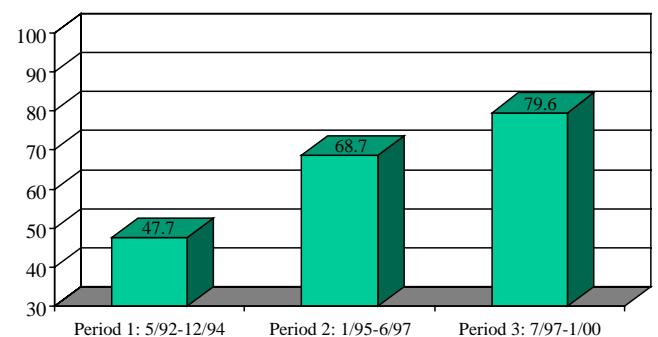


Fig. 1. Proportion of service recommended by multi-agency review teams that were actually received within 3 months during each of three periods across 8 years in the Rhode Island's System of Care ($N=2073$).

Table 3

Mean and standard deviation ratios of specific types of services received to those recommended by multi-agency review teams within 3 months of the initial case review during three Phases of Rhode Island's system of care (N=2073)

Characteristic	Period 1 (N=256) Mean ratio (Standard deviation)	Period 2 (N=717) Mean ratio (Standard deviation)	Period 3 (N=1100) Mean ratio (Standard deviation)	F	p
Mental health services	49.1 (40.8)	72.2 (35.1)	82.9 (29.1)	106.9	0.000 ^{a,b,c}
Social services	51.4 (49.1)	65.0 (45.3)	82.6 (34.3)	32.6	0.000 ^{a,b,c}
Educational services	55.5 (47.8)	76.0 (39.9)	86.6 (31.8)	53.2	0.000 ^{a,b,c}
Operational services	43.1 (47.9)	62.6 (45.5)	76.4 (39.4)	24.4	0.000 ^{a,b,c}
Recreational services	24.1 (41.0)	61.7 (45.5)	65.7 (44.2)	34.0	0.000 ^{a,c}
Vocational services	28.8 (45.1)	57.4 (48.3)	55.3 (48.8)	4.8	0.000 ^{a,c}
Health services	40.5 (49.8)	72.6 (44.8)	85.2 (35.3)	17.6	0.000 ^{a,b,c}

^a Phase 1 significantly different from Phase 2.

^b Period 2 significantly different from Phase 3.

^c Period 1 significantly different from Phase 3.

15–20 percentage points during Phase 2, and then increasing once again about 10–15% points during Phase 3. The results for recreational and vocational services suggest that these types of services were generally underdeveloped during Phase 1, with less than 30% of services actually received to those recommended, and presumably needed by children referred to the system of care. However, with the infusion of service enhancement and additional CASSP funding during Phase 2, these services increased most dramatically, increasing by about 29–37% points, only to level off in Phase 3.

3.3. Access as the mean number of barriers reported per service recommended

In addition to providing children and youth access to services recommended in the multi-agency review process, systems of care must also reduce barriers that may impede service provision. Eight such barriers were tracked and monitored over a three-month period by Family Service Coordinators at multi-agency team reviews—service not available in the community, service not available in state, waiting lists, culturally appropriate services not available, funds not available through identified funder, no identified funder, level of services not sufficient for need, and lack of team consensus on plan. As many barriers that were applicable for each service were noted for each service recommended.

Fig. 2 graphically depicts mean barriers calculated per service recommended for each of the three phases examined. During Phase 1, there were 1.83 barriers per service recommended (SD=2.06); during Phase 2, there were 1.76 barriers per service recommended (SD=2.69), and during Phase 3, there were 0.61 barriers per service recommended (SD=1.40). A one-way analysis of variance was significant, $F(2, 2070)=86.99, p<0.0001$, and post-hoc analyses using the LSD procedure comparing each of the phases to one another revealed a significant difference only between the full implementation phase and either of the other two phases. Although comparable to the findings

involving services received relative to those recommended, the pattern of findings for these analyses suggest that reducing barriers may require more time to impact system-level indicators; only after the CASSP philosophy was widely known throughout the system of care and service enhancements were fully implemented were barriers significantly reduced.

4. Discussion

The present results provide strong support for the study hypotheses. Service access increased as determined by the proportion of services received relative to those recommended upon entry into the system of care. Furthermore, a significant increase in this system-level indicator was observed at each phase of implementing the system of care philosophy. In addition, detailed tracking and analyses of mental health, social, educational, operational, and health services further revealed that services received as a proportion of those recommended increased significantly at each phase of system of care implementation. However, for two types of services, vocational and recreational services, which both may have been underdeveloped when

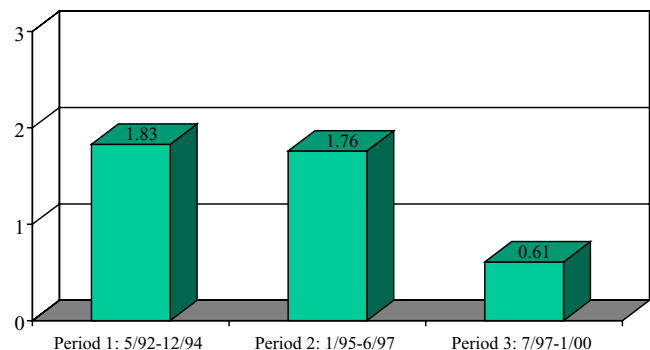


Fig. 2. Number of barriers per service recommended by multi-agency review teams that were identified in the 3-month period following completion of a case review during each of three periods across 8 years in the Rhode Island's System of Care (N=2073).

the system of care philosophy was first implemented, significant increases at Phase 2 were followed by leveling off of the proportion of services received to those recommended at Phase 3.

In terms of the second study hypothesis, a commensurate expected decrease in barriers to service access was also supported by the results. The mean barriers per service recommended were significantly reduced after full implementation of the system of care (from Phase 1 to Phase 3 and from Phase 2 to Phase 3). However, no significant reduction in system-level barriers was observed from Phase 1 to Phase 2.

Finally, support for the study hypotheses was also reflected in the characteristics of children served by the system of care over time. Proportionally more children of color entered the developing system of care and more different types of referral sources and service types were represented in the system over time. However, children that were referred tended to exhibit mostly moderate levels of functioning and symptomatology-consistent with children at risk for out-of-home placement—rather than the most severe forms of emotional and behavioral disturbance. Finally, no substantial changes were observed for children referred to the system of care by gender or age, although the system was serving substantially more children after full implementation than early in the adoption of the system of care philosophy.

4.1. Implications

Lourie (1994) has articulated several critical processes involved in the development of systems of care. First, he argues that implementation of system of care principles is slow and incremental, with the substance and rate of implementation dependent on local conditions and contexts. In some communities, the existing service structure may facilitate movement to a system of care philosophy, while in others this structure may impede implementation of specific system components, such as family-focused services or interagency collaboration. Second, he notes that implementation is varied across systems of care because of changes in leadership over time. Since systems of care are slow to develop fully, it is not uncommon for there to be several different individuals over time that must be brought together to implement the system of care. Leadership changes at the highest levels may derail progress toward implementation or require a shift in vision to what the system will be. And third, he points out that in building any system of care there is always tension between the needs of an individual agency and needs of the collaborating agencies that are part of the emerging system. This leads to conflict that may require changing the system to address specific concerns.

The present study suggests that despite incremental progress observed in a system of care, the inevitable changes in leadership that may be expected over an almost 8-year period, and the inherent tension between agencies

delivering services in seven different service domains, the selected empirical indicators of service access reveal steady progress toward system development. Children and youth referred to a newly-established system of care increasingly receive the services that are recommended for them by local multi-agency teams comprised of community stakeholders. Barriers to service are gradually reduced, albeit requiring a longer interval than services received, so that service access is increased. And finally, the range of children served and number and types of agencies that become part of the referral network for the system of care increase as the system of care matures. Importantly, these favorable impacts on service access were evident in the Rhode Island children's behavioral health system of care despite dramatic increases in the number of children served and collaborating agencies involved.

This study also suggests that two indicators of service access, the number of services received relative to the number initially recommended as well as barriers to service, may be useful as empirical benchmarks of service system development in a system of care. These indicators of access are based on the operation of the multi-agency review teams, and thus, represent system-level indicators of service access. The consistency of findings over time and across the different types of services monitored is suggestive of the types of changes that can be observed when system-level indicators are used to monitor change in a developing system of care. Despite the variability across agencies in implementing system of care principles and in carrying out services (Hernandez & Hodges, 2003; Lourie, 1994), both of these indicators were sensitive to change in service access over time, yet were relatively consistent with one another. In this connection, they begin to address a critical need in the literature for more system-level indicators of service system change (Hernandez & Hodges, 2003), and provide an empirical basis for advancing theory and practice in the area of system development and system change (Tebes, Kaufman, & Watts, 2002).

The findings from this study are also consistent with previous research by Brannan, Baughman, Reed, and Katz-Leavy (2002) that found federally-funded sites in the Comprehensive Community Mental Health Services for Children and their Families Program to be much more likely to implement system of care principles than unfunded comparison communities, particularly in relation to family focused services, accessibility, and individualized care. In Rhode Island, implementation appeared to be relatively consistent across types of services, with only recreational and vocational services unable to build upon gains made in the initial phase of implementation. Given that both of these types of services made the highest initial proportional increase of any of the seven types of services examined, it may well have been difficult to introduce further growth in these areas given their likely underdevelopment to begin with.

4.2. Study limitations

The present study has a number of limitations. First, changes tracked were for one statewide system over time, and did not include comparisons on the same indicators observed in another state. Such a comparison would have made it possible to monitor the impact of selection and maturation as threats to the validity of study findings. However, when similar comparisons have been made in previous research examining other system-level indicators, the findings have been equivocal and have failed to account for local conditions that may have contributed to the results (Brannan et al., 2002; Holden et al., 2003). In the present study, careful documentation of system changes was made to establish empirical benchmarks of two system-level indicators of service access that may be useful in future research.

Another limitation of this study is that service utilization data was not drawn from a management information system (MIS) to track services received. Such data may have been useful in providing a more detailed accounting of service outcomes following the initial multi-agency review process. For example, encounter data on the level of service involvement and the types of mental health or vocational services a child received may have yielded a better understanding of the specific impact of system of care involvement. Although the present study may have benefited from the addition of more detailed service utilization encounter data, the study hypotheses did not require it, and may have been better served without it. The careful monitoring of multi-agency reviews by Family Service Coordinators in each of the LCCs reflected the consensus of the team in each site about the child's service plan and its implementation. This allowed for inclusion of more information into the data collection process than is ordinarily available to a case manager who is entering encounter data but who may or may not be in contact with all the child's service providers.

5. Conclusions

This study shows that substantial positive changes in the development of a system of care are possible in less than eight years, and that two system-level measures of service access are useful indicators of those changes. Services received relative to those recommended and barriers to service as determined by a multi-agency review team represent critical system-level indicators of service access that were carefully monitored as the system of care developed over an almost 8-year period. Changes in these indicators across three assessment periods about two and one-half years apart provide evidence of significant system change toward ever increasing access over time. These changes in access were also reflected in increases in the number and types of children served and types of agencies involved in the system of care. These findings demonstrate that the effective implementation of system of care

principles increases service access in a developing system of care, and that those changes can be monitored successfully through collection of system-level indicators.

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