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ADMINISTRATIVE UPDATE

Impact of State Mental Health Reform on Patterns of Service Delivery

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ABSTRACT: Legislation enacted in 1988 in Ohio, aimed at redistributing funding from state hospitals to community support services and prioritizing the funding for treatment of individuals with severe mental disabilities (SMD), raises important questions from a service system perspective. To assess the impact of this reform legislation on Ohio's mental health service delivery system, cluster analyses of community mental

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health service data were conducted for five yearly samples of approximately 4,000 adults with SMD. An analysis of resulting service patterns demonstrated a decrease in service clusters comprised of individuals receiving little more than medication check-ups and an increase in clusters comprised of individuals receiving combinations of two or more services. Increases were found in most community mental health services; however, in each year, approximately 50% of the sample received few services of any kind, while approximately 10% of the sample received voluminous amounts of highly individualized services.

In response to a variety of factors, mental health reform has been occurring in many states during the last several years (Hanig, Perry & Johnson, 1994). Deinstitutionalization and increased economic burdens felt at the state and national level have driven states to reform the way in which mental health services are organized, financed, and delivered (Hanig, Perry & Johnson, 1994; Elliot, Cohen, & Evans, 1995; Hogan, 1992; Robinson, 1991). At the same time, shifts in treatment philosophy have played a major role in many of these processes (Robinson, 1991). In this era of change, the Ohio Department of Mental Health (ODMH) has been in the forefront of reform, moving from twenty-third place in the 1986 Public Citizen/NAMI rankings to fourth place in 1990 (Torrey, Erdman, Wolfe, Flynn, 1990). This article will first briefly highlight the catalyst behind Ohio's reform and some of the strategies adopted. Secondly, it will report on the impact reform has had on Ohio's mental health service delivery system.

The system change initiated by the Ohio Department of Mental Health (Hogan, 1992; Robinson 1991) had as its major philosophical underpinning the tenets of the national Community Support Program (CSP) movement (Tessler & Goldman, 1982; Turner & TenHoor, 1978). Two of the primary goals of the CSP movement were to decrease service fragmentation and to increase appropriate services based on the needs of severely mentally disabled (SMD) individuals residing within the community. To accomplish this, NIMH recommended that there be an individual or team (including case managers or other mental health professionals) responsible for maintaining contact with consumers on a regular basis, coordinating their services, and assessing the continuing appropriateness of services as the needs of consumers change (Tessler & Goldman, 1982).

As part of Ohio's reform strategies, a specific emphasis was placed on funding more units of case management. In line with CSP principles, case management was viewed as a critical mechanism to assist individuals in accessing needed medical, social, educational and mental health services essential to meeting their needs. In addition, policy

initiatives were developed to increase funding for services designated for Ohio's SMD population. These reform strategies culminated in the Mental Health Act of 1988, which was the impetus for the research reported in this paper.

Under the Act, Ohio's 53 local Mental Health Boards were required to develop a local Community Support System and, over a six year period, were given phased-in control of resources that historically had been allocated to state hospitals. These mental health boards, endowed with broad powers to manage local service systems (including the ability to fund service agencies through local tax levies), were encouraged to reinvest resources in community support rather than in state-run hospitals.

The 1988 reform legislation achieved many of its stated goals (Roth, Lauber, Vercellini, Frazier and Hogan, 1995); in particular, more resources were invested in community mental health services. However, questions still remain as to the potential impact the legislation has had on the patterns or combinations of services being delivered to Ohio's SMD population. Very little is known concerning the impact the reallocation of resources into local communities and the statewide promulgation of the CSP philosophy have had on service delivery at the local level.

Much of the evaluation work done on CSPs has focused on the effectiveness of specific model Community Support Programs without addressing the generalizability of these programs across sites (Bachrach, 1982; Brekke, 1988). A more appropriate way of evaluating the implementation of CSPs may be to examine the typical patterns of services received by subgroups of individuals, thus using the consumer as the unit of analysis instead of the program under study (Brekke, 1988). In the current research, the impact of the CSP philosophy was investigated by examining the various patterns of services delivered locally to the SMD population in Ohio. Changes in these service patterns occurring during the five years following the Mental Health Act of 1988 (1989–1993) were also examined. It was expected that over time an increase would be observed in the average amount of community service received by individuals with SMD. Furthermore, due to the greater reliance on case managers to help consumers obtain needed services, it was hypothesized that service patterns would become increasingly more individualized/diversified over time.

As a way to meaningfully describe service delivery change in a large mental health system, the current study investigated how clients could be grouped into clusters according to the amounts and types of

public mental health services received annually. Cluster analytic techniques were applied to statewide public mental health service data in order to explore and describe the yearly patterns of services received by Ohio's adult SMD population over the five year period. This paper reports the resultant groupings of clients by patterns of service utilization, the particular services which characterize each cluster, and the changes in these patterns of services over the five years following the Mental Health Act. Results of these analyses fostered a better understanding of a complex service system in an era of change, as well as the possible factors that impact service receipt.

METHODS

The data used in this study were obtained from the Ohio Mental Health Information System (MHIS), a system designed to track services provided by community mental health agencies. MHIS provides service information and demographic information for all consumers of mental health services, and also identifies service recipients ages 18 years and older who have been certified by the state as meeting the criteria for a severe mental disability (SMD). The state criteria for SMD certification are based on diagnosis, duration of illness, and functional impairment (Bean, Townsend, Champney, & Garrett, 1988). Five samples of SMD consumers were drawn for fiscal years 1989 (N = 4346), 1990 (N = 4292), 1991 (N = 4278), 1992 (N = 4279), and 1993 (N = 4335). Each sample comprised approximately 12% of Ohio's open cases of adult consumers with SMD. The samples were drawn randomly with the exception of counties with 40 or fewer consumers with SMD, in which all consumers were included in the sample to ensure adequate representation of all 88 Ohio counties.

Demographic and clinical characteristics of the yearly samples were representative of the population of consumers with SMD in Ohio. Overall, the samples were 54.1% female and 77.2% white. The mean age was 45.3 years (*SD* = 16.2). Of the 56% of participants with known marital status, few were married (21.7%) and most were single (41.9% were never married and 36.3% were divorced).

The most common primary psychiatric diagnosis per DSM III-R was schizophrenia (34.4%), followed by psychosis and schizoaffective disorders (8.9%); anxiety disorders (8.9%); personality disorders (5.3%); and major affective disorders, including major and bipolar depression (4.3%). Approximately 7% of the participants had received another mental health diagnosis (including adjustment, substance abuse, and environmental stress disorders), and for approximately 30%, primary diagnosis was not recorded in the information system.

Service data for 10 types of community services were obtained from the state information system. These included (1) case management, (2) medical services (the sum of medication prescription, medication management, and physical health services), (3) outpatient services (the sum of individual counseling, group counseling, family therapy, and diagnostic services), (4) emergency services (the sum of emergency services and pre-hospital screening), (5) rehabilitation services, (6) day services (the sum of day treatment and partial hospitalization), (7) crisis residential services (intensive crisis care and supervision), (8) residential treatment services (housing and clinical mental health service), (9) residential support services (housing without clinical mental health

service), and (10) community residential services (community housing that is monitored, but not operated, by a mental health agency).

Analysis Strategy

Changes in the mean number of units of service over time were examined using Analysis of Variance (ANOVA) for each service (a log transformation was completed prior to this analysis to correct for unequal variance). To identify clusters of individuals receiving similar patterns of services, data on the amounts and types of services received each year were analyzed using SAS FastClus, a K-means procedure appropriate for use with large data sets (SAS, 1987). Squared Euclidean distances were used to measure similarity. Service amounts were standardized prior to clustering. Selection of the optimal number of clusters involved interpreting several clustering solutions and examining distances between cluster centroids graphically (Aldenderfer & Blashfield, 1984; Kaufman & Rousseeuw, 1990). The final number of clusters was determined by disregarding those solutions that produced clusters that were difficult to distinguish meaningfully, with relatively small Euclidean distances.

Finally, a Chi-Square model was used to explore yearly changes in the proportions of individuals in each cluster and to examine socio-demographic (gender, race, and marital status) and clinical characteristics of each cluster. Due to the possibility that the large sample sizes would result in inflated Chi-Square statistics, contingency coefficients (C) were calculated in addition to Chi-Squares. Age differences in cluster membership were examined using ANOVA (Kendall & Stuart, 1979).

RESULTS

Service Utilization

Results of the ANOVA indicated that, over the five-year period measured, consumers received increasing amounts of case management, medical service, day service, residential treatment, residential service, community residential treatment, and crisis residential treatment ($F(1, 21525) = 74.74$, $p < .001$; $F(1, 21525) = 50.84$, $p < .001$; $F(1, 21525) = 6.01$, $p < .05$; $F(1, 21525) = 11.14$, $p < .001$; $F(1, 21525) = 34.56$, $p < .001$; $F(1, 21525) = 21.55$, $p < .001$; and $F(1, 12911) = 8.68$, $p < .01$, respectively). For example, mean units of case management increased from 13.2 hours in 1989 to 24.3 hours in 1993; medical service increased from 1.9 hours in 1989 to 2.8 hours in 1993; day service increased from 20 days in 1989 to 26.3 days in 1993. No changes were observed in the units of rehabilitation services or emergency services. A decrease was found in the mean hours of outpatient services (from 8.8 hours in 1989 to 6.4 hours in 1993; $F(1, 21525) = 16.93$, $p < .001$).

Service Clusters

Five separate cluster analyses were completed to identify annual service patterns received. The findings revealed a basic structure that remained stable across all time periods examined (see Table 1). The largest cluster identified in each year comprised approximately 50% of the sample and was composed of individuals who received very few services of any kind. Total service for individuals in this cluster ranged from a mean of 7.7 units in 1989 to 10.2 units in 1993. This cluster was referred to as the *Few Services Cluster*. Another cluster, referred to as the *Medical Cluster*, included individuals receiving greater than average amounts of medical service (a mean of 17 units per year), but few other services (12 units per year).

In each year, there was a set of moderately sized clusters designated as the *Other Clusters*. This category included two types of clusters: *single service clusters*, composed of individuals receiving greater than average amounts of a single type of service (such as outpatient, case management, or day services), and *multiple service clusters*, composed of individuals receiving greater than average amounts of two or more services (such as case management and day service). Individuals in these Other Clusters tended to receive greater amounts of service per year than individuals in either the Few Services or Medical Clusters.

TABLE 1

Percentage of Adults with SMD in Service Clusters by Year

	Year				
	1989	*1990*	*1991*	*1992*	*1993*
Cluster Type	*N=4226*	*N=4292*	*N=4278*	*N=4279*	*N=4335*
Few Services Cluster	47.7	47.8	52.8	53.1	46.0
Medical Cluster*	22.9	22.9	12.9	9.9	9.5
Other Clusters*	19.8	25.2	24.3	27.1	33.3
Custom Care Group	9.6	9.2	10.1	9.9	11.12

Note. Table values for each year represent the percentage of the sample in each cluster type. Other Clusters include single and multiple service clusters.
*Significant linear effect of year: Medical Cluster, $\chi^2(1)=418.77$, $p<.001$; Other Clusters, $\chi^2(1)=189.40$, $p<.001$

For example, the Outpatient Services Cluster (a single service cluster) included individuals receiving a mean of 48 units of service, 30.6 hours of which were outpatient service. The Case Management and Day Services Cluster (a multiple service cluster) included individuals receiving a mean of 118.1 units of service; 80.1 were hours of case management, and 17.2 were days of day service.

Finally, approximately 10% of the sample formed a number of very small clusters, each including less than 1% of the sample. Individuals from these clusters typically received relatively voluminous amounts of service (a mean of 339.7 units of service), and their service patterns were very different from those of consumers in any of the other clusters. Because of the intense and unique nature of their services, individuals in these "miniclusters" were thought to be receiving highly individualized patterns of service. Therefore, they were referred to as the *Custom Care Group*.

Demographic and Clinical Characteristics of Clusters

Chi-Square and ANOVA were used to identify the characteristics of individuals who received different patterns of services. The results revealed significant differences among clusters in terms of socio-demographic variables (age, gender, race, and marital status) and primary clinical diagnoses (see Table 2).

The more intense Custom Care and multiple services clusters included a larger proportion of young males from racial minorities who had never married. The Medical Cluster also included more males and minorities; however, the members of this cluster were generally older and more likely to be married than individuals in either the Custom Care or multiple services clusters. The Few Services Cluster included a larger proportion of consumers who were older, white, and married. The single service clusters included more females than did other cluster types.

Consumers diagnosed with schizophrenia were more likely to be found in the Custom Care, multiple services, or Medical Clusters. The Few Services Cluster included a larger proportion of individuals with forms of psychoses other than schizophrenia, and consumers with anxiety disorders and other diagnoses. The single service clusters included a larger proportion of consumers with anxiety disorders, personality disorders, major affective disorders, and other diagnoses.

TABLE 2

Demographic and Clinical Characteristics of Clusters

			Other Services			
	Few Services	*Medical*	*Single Service*	*Multiple Service*	*Custom Care*	*Total*
Demographics Characteristics						
Mean age (& SD) in years	46.6[a]	45.3[a]	44.7[a]	42.7[b]	42.3[b]	45.3
	(17.0)	(14.6)	(16.2)	(14.0)	(15.1)	(16.2)
Gender (percentage of male)	45.8[a]	48.4[b]	41.4[a]	47.5[b]	47.5[b]	45.9
Minority (percentage)	12.4[a]	19.2[b]	13.8[a]	17.0[b]	19.2[b]	14.7
Never married (percentage)	37.6[a]	40.0[a]	42.1[a]	50.5[b]	58.9[b]	41.9
Clinical Characteristics (percentages)						
Schizophrenia	28.5[a]	42.3[b]	32.7[a]	48.2[b]	46.0[b]	34.4
Other psychoses	9.2[a]	7.1[b]	8.4[c]	7.0[b]	9.3[a]	8.6
Anxiety disorders	10.3[a]	7.5[b]	9.8[a]	6.4[b]	4.4[b]	8.9
Personality disorders	5.5[a]	2.9[b]	6.2[a]	3.9[b]	6.0[a]	5.2
Major affective disorder	4.2[a]	4.1[a]	5.2[b]	3.7[a]	3.9[a]	4.3
Other diagnoses	8.6[a]	3.7[b]	8.1[a]	6.3[c]	6.6[c]	7.4

Note. Significant differences between clusters were found for all demographic and clinical characteristics: for age, $F(4,21010) = 45.22$ $p < .001$; for the remaining demographic and clinical characteristics, $\chi^2(4, N = 21530) \geq 60.20$, $p < .001$; $C \geq .02$, $p < .01$. Cluster types that share common superscripts do not differ significantly.

Service Cluster Change

Although the basic structure of the clusters remained stable across the five years, there was a substantial amount of change, especially within the single and multiple services clusters, which comprised the Other Clusters grouping (see Table 1). Changes were observed in both the size and composition of clusters in this category. The proportion of consumers in the Other Clusters increased in each subsequent sample, from approximately 19.8% in 1989 to 33.3% in 1993, $\chi^2(1, N = 21530) = 189.40, p < .001$; $C = .10, p < .001$. There was also an increase in the number and complexity of clusters in this category. For example, in 1989 this grouping included four single service clusters (Case Management, Outpatient, Day Services, and Emergency Services) and one multiple service cluster (Outpatient and Day Services). In 1993, the same four single service clusters were observed (Case Management, Outpatient, Day, and Emergency Services); however, the number of multiple service clusters had increased to five (Case Management, Medical and Emergency Services; Medical, Case Management, Outpatient, and Emergency Services; Case Management and Medical Services; Residential and Case Management Services; Day, Case Management, and Rehabilitation Services).

Corresponding to the increase in Other Clusters, was a decrease in the number of individuals in the Medical Cluster, $\chi^2(1, N = 21530) = 418.77, p < .001, C = .14, p < .001$. It should be noted that this decrease in the size of the Medical Cluster was not due to a decrease in the amount of medical service. In fact, the amount of medical service that consumers received increased during this time, as did most of the other services described above. Rather, the decrease in size of the Medical Cluster could be attributed to the fact that a growing number of consumers were receiving medical service combined with other services, rather than medical service alone.

Two patterns of services that did not change in proportion over the five years were Few Services and Custom Care. Approximately 50% of the sample received very low annual levels of service. In each year about 10% of the sample received highly individualized and intense patterns of service, which were included in the category of Custom Care.

DISCUSSION

The findings of the current study have resulted in a better understanding of the actual patterns of community mental health care dur-

ing a period of reform. The most apparent impact of the Mental Health Act was an overall increase in the amount of service units delivered via the public mental health system in Ohio. Additionally, and more importantly, the results of the cluster analyses demonstrated that a wide range of service patterns were received by individuals with SMD in Ohio, and that while some patterns remained relatively stable over time, others underwent significant change.

In the years directly following the Mental Health Act, the statewide system was characterized primarily by single services, such as case management or day services. Over time, two important changes emerged. Most prominent was an increase in the number and proportion of multiple service clusters, suggesting that more people are receiving more diverse and individualized packages of services. The other noteworthy trend seen during this time period was the overall decrease in the percentage of people in the Medical Cluster, concomitant with an actual increase in units of medical service. The system appears to be moving away from medication management alone as a service modality, and toward adding other services to the medication management base. These trends suggest a shift in service delivery that is consistent with the guiding philosophies of the CSP movement (Tessler & Goldman, 1982; Turner & TenHoor, 1978).

The reduction in size of the Medical Cluster and increase in size and composition of the Other Clusters may be attributed, in part, to the increase in hours of case management service. As mentioned previously, one of Ohio's reform strategies was the provision of increased funding for case management services with the expectation that case managers would help consumers access appropriate services. The brokering function of case managers is suggested by the multiple service clusters, in which increased case management was consistent with increases in other services. In these instances, case managers appear to have followed CSP tenets by facilitating connections to a wider variety of services that better address the varied needs of the consumers (Tessler and Goldman, 1982).

The results also suggest that the system is responding with highly individualized service packages to a small but constant proportion of people in the Custom Care Group. These individuals, like those in the multiple service clusters, tended to be unmarried, non-white and have a diagnosis of schizophrenia. Speculation can only be made as to why these various packages of services are being delivered. One conceivable interpretation is that the recipients are individuals who have the greatest service needs and their needs are being addressed with these

highly individualized packages. Another possible hypothesis is that these individuals, regardless of level of functioning, are successfully utilizing the system to its capacity by securing a complete package of services. In either scenario the fact that the proportion of people in this group stayed constant over time should be an important consideration for system and program planning.

The large and unchanging proportion of people in the Few Services Cluster is not an expected or a well understood finding. In a system designed to address the most severe problems by allotting money to boards based on the number of individuals certified as SMD, it is unclear why nearly half of those individuals received very low levels of service (an average of approximately 10 hours per year). Some have speculated that, because Ohio's SMD criteria include multiple certification pathways, its system serves individuals less severely or chronically mentally ill than those in other states (Schinnar, Rothbard, Kanter, & Adams, 1990). This speculation is corroborated by the diagnostic profile of the Few Services Cluster. People experiencing adjustment disorder, substance abuse, anxiety or dementia/organic disorders were more likely to be members of this cluster, whereas individuals with more severe diagnoses were more likely to be in clusters characterized by greater amounts of service.

Individuals in the Few Services Cluster could be comparable to the "adapted" group of individuals identified by Bartsch and colleagues (Bartsch, Shern, Coen, Wilson, 1995). In their recent study, individuals with SMD were classified based on clinical characteristics, sociodemographic information and service need and receipt. Those in the "adapted" group had fewer service needs and received fewer service units than other individuals with SMD. Similarly, groups of relatively high functioning clients within the SMD population have been identified by other researchers (Braucht & Kirby, 1986; Herman & Mowbray, 1991). Thus, individuals comprising the Few Services Cluster may be those who needed mental health services only to help maintain current levels of functioning, rather than to improve day-to-day functioning significantly. Another speculation is that the system lacks the capacity to address the needs of all consumers, and those with alternate support systems, for example, married individuals, tend to receive fewer services.

One limitation of this study is that these data can only suggest relationships between cluster membership and service appropriateness. The database used for these analyses does not include such variables as level of functioning, service need or social support. The extent to

which these variables mediate service delivery is an important future research question.

Another limitation of the study is that it provides little information about the changes occurring at the local level. Although it is necessary to examine statewide changes to evaluate state reform, a better understanding of Ohio's overall mental health system might be supplemented by examining changes in each of the 53 local mental health boards. As Lehman notes in his evaluation of different strategies used to implement services (1989), while local mental health authorities integrate services at a local administrative level, they do not necessarily dictate how services are to be provided. The state guides the overall policy direction, but local authorities may still lack the resources or may not have internalized the directives (i.e. the CSP philosophy) to change services accordingly. In addition, a large state such as Ohio has a great deal of variability across its 53 boards, in terms of local cultures, differing philosophies of service delivery, as well as different levels of resources. These and other board-specific factors should be taken into account when attempting to explain local variability in service delivery.

CONCLUSION

A meaningful first step in evaluating the impact of state-level policy changes on the local service delivery system is through the examination of statewide service data. We believe that through the use of a statewide service delivery database and the statistical technique of cluster analysis we have been able to capture the service delivery changes occurring within Ohio in response to a major system change initiative. The redistribution of money into the community has not only increased the amount of service being received, but it has also increased the number of different combinations of services being received. Ohio's mental health system has slowly been moving away from one in which consumers tend to get one type of service to a system in which distinct and variable packages of services are being delivered.

Although the system appeared to show more stability than change, the change that was detected was significant in that the program under study was a state's mental health system rather than one localized Community Support Program. Studying the impact of statewide directives across 53 separate service systems creates a great deal of vari-

ability, making it difficult to detect change. Statewide reform is difficult to implement uniformly across a large system, and it is equally challenging to evaluate large scale reform and to be able to demonstrate change. For example, these changes could not have been detected without the use of a multi-year longitudinal research design.

Evaluation of statewide reform does not end with these results. Future work is still needed to understand the direct impact of these state level policies on consumers. We must further test the assumption that services are being delivered based on the needs of the consumers and that the services consumers are receiving have an impact on consumer outcome. At the same time, we must be able to address the mediating effect that local service systems have on statewide evaluation.

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