A Pre and Post Study of Inpatient Hospitalization and Emergency Department Use
By Clients of the Mental Illness Recovery Center, Inc. (MIRCI)
For Clients Entering MIRCI Management between January 1, 1997 and December 31, 2014
June, 2016

The South Carolina Integrated Health and Human Services Data System

South Carolina is perhaps the only state in the country that has in place a data system that provides program administrators a method of measuring outcomes of their services without the burden of extensive and difficult data collection. The Department of Revenue and Fiscal Affairs, Health and Demographics, (RFA) manages a series of detailed databases including, among other things, all inpatient hospitalizations, all emergency room visits and all health and human service state agency services (such as social services, SCDMH services, criminal justice incidents). What makes this system so unique is that individuals are not known by personal identifiers, but rather by a unique tracking number that enables linkage across the various databases at the individual level while still maintaining the utmost privacy standards. Furthermore, for outside programs such as those provided by MIRCI, a roster of their clients may be assigned the unique tracking number so that a de-identified statistical data set can be created containing the RFA information for just the MIRCI clients. The linkage of the MIRCI client database with the RFA Integrated Health and Human Services Data System has demonstrated that meaningful outcomes measures can be gathered without additional data collection.

Linkage with the RFA Integrated Data System

Two hundred forty-two (242) MIRCI clients who enrolled in MIRCI services at some point between January 1, 1997 and December 31, 2014 and who currently receive all services and housing from MIRCI alone were linked via the unique tracking number to the RFA general inpatient hospitalization and emergency room visits databases. Each client's hospital/ED experience for the 12 months preceding the entry date and for the 12 months following the entry date were captured and placed into a statistical analysis file. A similar method was used with psychiatric specialty hospital data but for MIRCI entrants (237 clients) between January 1, 2001 and December 31, 2014 (to accommodate for the later beginning of specialty hospital data in the RFA system).

Summary of Findings

Utilization of Hospital Services:

For the 242 clients linked to the RFA **general hospital data** system:

- The total number of inpatient hospitalizations for the cohort of 242 clients for the year subsequent to beginning MIRCI services dropped by 44% from the year preceding entry into MIRCI (from 136 to 76). Decreases in mental Illness and substance abuse hospitalizations (from 105 discharges pre-enrollment to 38 discharges post-enrollment) were the entire reason for the overall decline.
    - Considering Mental Illness/SA as the reason for the hospitalization, the number of hospitalizations dropped by 64%, pre- to post-entry into MIRCI.
    - As in past analyses, hospitalizations for physical illness and accidents actually increased, from 31 (pre-) to 38 (post-). This type of change is not unexpected because of variability introduced by small numbers; in this case, one client with five hospitalizations post-MIRCI explains almost the entire increase.
    - A second finding for inpatient hospitalizations is that the intensity of services required when hospitalization was needed (measured by average number of days in the hospital) dropped by 44% from an average of 13.1 days pre-MIRCI to 7.4 days post-MIRCI.
    - The combination of decreases in numbers of hospitalizations and length of stay resulted in a significant drop in inpatient charges of $1,957,991, a 41% drop.
- It should be noted that not every client requires an inpatient hospitalization. Drops in overall number of inpatient hospitalizations were primarily driven by drops in the number of clients requiring one or more inpatient stays for mental illness (70 clients pre-enrollment and 26 clients post-enrollment). This is indicative of MIRCI's strong efforts to bring new clients into managed outpatient and drug therapy services.
- The number of emergency department visits dropped by 39% once the clients enrolled in MIRCI.
    - Emergency department visits where mental illness was the reason for the visit dropped even more, by 59%. Unlike inpatient hospitalizations, ED visits for physical illness dropped by 31% and for injuries by 35%.
        - Schizophrenic disorder was the most common mental illness reason for visiting the ED for a mental illness; these visits dropped by 51%.

For the 237 clients linked to the RFA **psychiatric specialty hospital** database:

- The number of inpatient hospitalizations dropped by 84% in the year following enrollment, from 37 to 6, virtually containing the use of inpatient services by good outpatient management.

Monetary Savings: Considering all hospital services combined (inpatient general, inpatient specialty and emergency department visits), total charges for services in the year following MIRCI enrollment were $2,914,775 less than charges for services in the year prior to MIRCI enrollment. Note: Because this analysis is longitudinal and spans clients enrolling in MIRCI over an 18-year period, health care charges have been adjusted to 2015 dollars using the GDP index for the latest year available. Inpatient general hospitalization decreases accounted for 67% of these savings, with ED visits and specialty hospital discharges accounting for 20% and 13% respectively.

Discussion

The results of pre and post hospital and emergency department use analysis show substantial observed decreases once clients are assisted by MIRCI programs. Decreases are most dramatic for diagnoses of mental illness and substance abuse but are also reflected in the declining use of hospital emergency departments even for physical illness. MIRCI case management offers emphasis on appropriate outpatient psychiatric services, stability in medication adherence, life skills, and housing. The significance of their success is borne out in the substantial drop in expensive service utilization expressed in avoided hospital charges of over 2.9 million dollars.

Detailed Findings

For each outcome measure, the "Percent Change" column denotes the change from the rate of use in the year prior to enrolling in MIRCI to the rate of use in the year following enrollment in MIRCI.

General Inpatient Hospitalizations

Reason for Inpatient	Number of Hospitalizations		Percent Change
	12 Months Before	12 Months After	
All	136	76	-44.1%
Mental Illness/SA	105	38	-63.8%
Schizophrenia	43	17	-60.5%
Affective Psychoses	39	12	-69.2%
Physical Illness/Injury	31	38	+22.6%

Reason for Inpatient	Average Days in Hospital		Actual Change in Average Days
	12 Months Before	12 Months After	
All	13.1	8.3	-4.8 days
Mental Illness/SA	15.4	10.8	-4.6 days
Physical Illness/Injury	5.8	5.8	0 days

Reason for Inpatient	Total Hospital Charges		Percent Change
	12 Months Before	12 Months After	
All	$4,758,715	$2,800,734	-41.4%
Mental Illness/SA	$3,572,859	$1,108,646	-69.0%
Physical Illness/Injury	$1,185,856	$1,692,078	+42.7%

Emergency Department Visits

Reason For ED Visit	Number of ED Visits		Percent Change
	12 Months Before	12 Months After	
All	692	421	-39.2%
Mental Illness/SA	187	76	-59.4%
Schizophrenia	55	27	-50.9%
Injuries	63	41	-34.9%
Other Physical Illness	442	304	-31.2%

Reason For ED Visit	Total ED Charges		Percent Change
	12 Months Before	12 Months After	
All	$1,802,574	$1,210,050	-32.9%
Mental Illness/SA	$604,604	$173,997	-71.2%
Injuries	$131,321	$153,327	+16.7%
Other Physical Illness	$1,066,649	$882,725	-17.2%

Psychiatric Specialty Hospitalizations

Reason	Number of Hospitalizations		Percent Change
	12 Months Before	12 Months After	
Mental Illness	29	3	-89.6%
Substance Abuse	8	3	-62.5%

Reason	Average Days in Hospital		Actual Change in Days
	12 Months Before	12 Months After	
Mental Illness	26.1	61.7*	+35.6 days*
Substance Abuse	26.2	25.7*	-0.5 days

*Small numbers introduce variability

Extended Longitudinal Analysis

A cohort of 165 (152 for specialty hospital analysis) was identified for a longer pre and post period to assess the immediate and prolonged impact of MIRCI services on client utilization of the same services discussed above. For the cohort, the following tables depict the observed service utilization for each pre- and post-MIRCI period.

Number of Inpatient Discharges/ED Visits/Inpatient Specialty Hospital Discharges

Setting	Cohort Size	2 Years Pre-MIRCI	1 Year Pre-MIRCI	1 Year Post-MIRCI	2 Years Post-MIRCI	3 Years Post-MIRCI
Gen. Inpatient	165	65	84	48	56	42
Emergency	165	359	358	257	234	207
Specialty Hosp	152	20	25	4	8	5

Both inpatient and emergency department visits declined fairly dramatically after beginning MIRCI services and appear to have stabilized (inpatient) or dropped (emergency) over the next two years of MIRCI management. Note the almost complete drop in the need for specialty hospital inpatient psychiatric services.

Average Time in Hospital (in Days)

Setting	Cohort Size	2 Years Pre-MIRCI	1 Year Pre-MIRCI	1 Year Post-MIRCI	2 Years Post-MIRCI	3 Years Post-MIRCI
Gen. Inpatient	165	10.3	12.2	7.2	7.7	6.8
Specialty*Hosp	152	18.1	23.3	28.5	26.7	14.2

*Small numbers of cases with discharges in this setting can cause wide variation in average length of stay.

By Reason for General Inpatient Hospitalization

Reason for Hospitalization	Cohort Size	2 Years Pre-MIRCI	1 Year Pre-MIRCI	1 Year Post-MIRCI	2 Years Post-MIRCI	3 Years Post-MIRCI
Mental Illness/ Sub. Abuse	165	41	63	22	21	18
Physical Illness/ Injury	165	25	20	26	35	25

As noted earlier, keeping clients out of the inpatient hospital setting was observed only for diagnoses of mental illness and substance abuse.

By Reason for ED Visit

Reason for ED Visit	Cohort Size	2 Years Pre-MIRCI	1 Year Pre-MIRCI	1 Year Post-MIRCI	2 Years Post-MIRCI	3 Years Post-MIRCI
Mental Illness/ Sub.Abuse	165	81	92	51	25	27
Physical Illness/ Accident	165	278	266	206	209	180

Decreases in ED use, both for mental and physical reasons, are dramatic and for the most part have continued downward in the subsequent years of MIRCI case management.