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, 2018
July, 2020

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

Three hundred forty-seven (347) MIRCI clients who enrolled in MIRCI services at some point between January 1, 1997 and December 31, 2018 and who currently receive services and housing from MIRCI 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 (339 clients) between January 1, 2001 and December 31, 2018 (to accommodate for the later beginning of specialty hospital data in the RFA system).

Summary of Findings

Utilization of Hospital Services:

For the 347 clients linked to the RFA **general hospital data** system:

- The total number of inpatient hospitalizations for the cohort of 347 clients for the year subsequent to beginning MIRCI services dropped by 58% from the year preceding entry into MIRCI (from 167 to 70). Decreases in mental Illness and substance abuse hospitalizations (from 122 discharges pre-enrollment to 31 discharges post-enrollment) were the major reason for the overall decline.
    - Considering Mental Illness/SA as the reason for the hospitalization, the number of hospitalizations dropped by 75%, pre- to post-entry into MIRCI.
    - Considering hospitalizations for physical illness and accidents, the current analysis reflects a decrease from 45 to 39 discharges (a 13% drop).
    - 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 37% from an average of 13.7 days pre-MIRCI to 8.6 days post-MIRCI.
    - The combination of decreases in numbers of hospitalizations and length of stay resulted in a significant drop in inpatient charges of $4,211,231, a 62% 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 or substance abuse (122 clients pre-enrollment and 31 clients post-enrollment).
- The number of emergency department visits dropped by 49% once the clients enrolled in MIRCI.
    - Emergency department visits where mental illness/substance abuse was the reason for the visit dropped by 65%. ED visits for physical illness dropped by 44% and for injuries by 43%.
        - Schizophrenic disorder was the most common mental illness reason for visiting the ED; these visits dropped by 70% (from 49 to 9).

For the 339 clients linked to the RFA **psychiatric specialty hospital** database:

- The number of inpatient hospitalizations dropped by 85% in the year following enrollment, from 40 to 6, continuing their trend of drastically reducing the use of specialty inpatient services through strong 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 **over $6.8 million 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 a 22-year period, health care charges have been adjusted to 2019 dollars using the GDP index for the latest year available. Inpatient general hospitalization decreases accounted for 62% of these savings, with ED visits and specialty hospital discharges accounting for 27% and 11% respectively.

Discussion

The results of pre- and post- enrollment 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 6.8 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 for Cohort of 347 Linked Clients

Reason for Inpatient	Number of Hospitalizations		Percent Change
	12 Months Before	12 Months After	
All	167	70	-58.1%
Mental Illness/SA	122	31	-74.6%
Schizophrenia	49	9	-81.6%
Affective Psychoses	37	14	-62.2%
Physical Illness/Injury	45	39	-13.3%

Reason for Inpatient	Average Days in Hospital		Actual Change in Average Days
	12 Months Before	12 Months After	
All	13.7	8.6	-5.1 days
Mental Illness/SA	16.9	14.2	-2.7 days
Physical Illness/Injury	5.2	4.2	-1.0 days

Averages can be affected by small numbers and length of stay outliers

Reason for Inpatient	Total Hospital Charges		Percent Change
	12 Months Before	12 Months After	
All	$6,759,953	$2,548,722	-62.3%
Mental Illness/SA	$5,063,674	$1,181,770	-76.7%
Physical Illness/Injury	$1,696,278	$1,366,952	-19.4%

Emergency Department Visits for Cohort of 347 Linked Clients

Reason for ED Visit	Number of ED Visits		Percent Change
	12 Months Before	12 Months After	
All	1,168	597	-48.9%
Mental Illness/SA	297	104	-65.0%
Schizophrenia	94	28	-70.2%
Injuries	122	70	-42.6%
Other Physical Illness	749	423	-43.5%

Reason for ED Visit	Total ED Charges		Percent Change
	12 Months Before	12 Months After	
All	$3,601,413	$1,777,470	-49.4%
Mental Illness/SA	$1,011,905	$305,118	-69.8%
Injuries	$325,299	$254,047	-21.9%
Other Physical Illness	$2,264,210	$1,218,305	-46.2%

Psychiatric Specialty Hospitalizations for Cohort of 339 Linked Clients

Reason	Number of Hospitalizations		Percent Change
	12 Months Before	12 Months After	
Mental Illness/SA	40	6	-85.0%

Reason	Average Days in Hospital		Actual Change in Days
	12 Months Before	12 Months After	
Mental Illness/SA	29.5	11.5	-18.0 days

*Small numbers introduce variability

Reason	Total Specialty Hospital Charges		Percent Change
	12 Months Before	12 Months After	
Mental Illness/SA	$913,097	$129,427	-85.8%
Schizoph./Affect.Psychoses	$736,001	$98,559	-86.6%

Schizophrenia and Affective Psychoses Diagnoses account for 81.3% of the savings in charges.

Extended Longitudinal Analysis

A cohort of 247 (236 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	247	67	117	48	37	43
Emergency	247	519	639	307	255	246
Specialty Hosp	236	18	30	*	7	6

*indicates less than 5 visits

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	247	12.0 days	13.9	6.1	8.4	11.3
Specialty*Hosp	236	17.1 days	33.0	*	20.4	19.8

*Indicates less than 5 visits

General Inpatient Hospitalizations by Reason

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/ Subst. Abuse	247	40	89	26	12	20
Physical Illness/ Injury	247	27	28	22	25	23

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

Extended Longitudinal Analysis (continued)

ED Visits by Reason

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/ Subst. Abuse	247	138	170	61	23	30
Physical Illness/ Accident	247	381	469	246	232	216

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