

# Using a County-Wide Database To Improve Performance

## *How One New York County Is Employing Clinical Event Data to Reduce Hospital Readmissions and Emergency Department Visits*

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### Introduction

The time for data-driven behavioral health care quality assurance monitoring, performance improvement, strategic planning, and decision-making has arrived. Especially within the context of a managed care environment, where there is an increased emphasis on accountability, providers need responsive and sophisticated information systems for myriad purposes (Kamin & Zastowny, 2000). Many national accreditation systems also have increased their use of information and data for performance improvement efforts and regulatory reviews. (Cesare-Murphy, McMahill, & Schyve, 1997). Furthermore, federal and state governments are less willing to fund mental health services without detailed performance and outcome data (Kelly, 1997). Other sources of financial support, such as county governments and the United Way, have also begun to routinely and aggressively require mental health providers to assess outcomes to justify continued funding. This confluence of factors has resulted in many public mental health agencies developing and implementing a variety of outcome measurement systems. Often, these providers have relied on existing computerized information systems within the agency, purchased more sophisticated management information systems, or both, in order to

increase the efficiency of their internal operations and enhance their ability to assess outcomes.

As detailed elsewhere in this book, much is gained by instituting routine measurement systems and assessment protocols that utilize standardized tools. However, we believe that the use of real clinical event data is equally useful and potentially more powerful than the use of standardized measures alone. This article outlines the use of two clinical processes that we have employed as "outcome data":

1. identification and tracking of frequent emergency department users and
2. inpatient hospital readmissions.

Our unique county-wide database enables these types of data to be generated, analyzed, and used for regulatory reviews and performance improvement initiatives.

### The Monroe County Mental Health Database

All 18 publicly funded community mental health providers in Monroe County NY are contractually obligated to submit data to a centralized database. The current database has been in existence since 1995 and tracks a variety of demographic, program, and service data. During 1999, service records for 29,250 people were maintained in the database (Mental Health Services in Monroe County NY, 2000). This county-wide system spans all providers and enables tracking of individuals across programs and agencies. Routine and

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ad hoc analyses are conducted for a variety of purposes, including service planning, funding allocations, and outcome evaluation. Because this county-wide system spans all publicly-funded mental health agencies, we are able to provide feedback to individual agencies that extends beyond their own internal information management ability and comparative capacity. Database queries easily yield aggregate data such as the length of stay and average number of sessions per patient across various program types, by provider. Case mix analyses investigating diagnostic composition, payer source, and ethnicity are other examples of inquiries that can be generated from the database. One important area of inquiry has been the study of specific populations with special needs. Over the last few years increasing emphasis has been placed on assessing and tracking various "high risk" and "high need" groups. Examples of these groups include those who frequently use emergency departments and those who are readmitted to inpatient psychiatric units within 60 days of discharge.

## Examples of Performance Improvement Initiatives

### Emergency Department Frequent Users

Studies have shown that more than half of the frequent users of emergency departments (EDs)

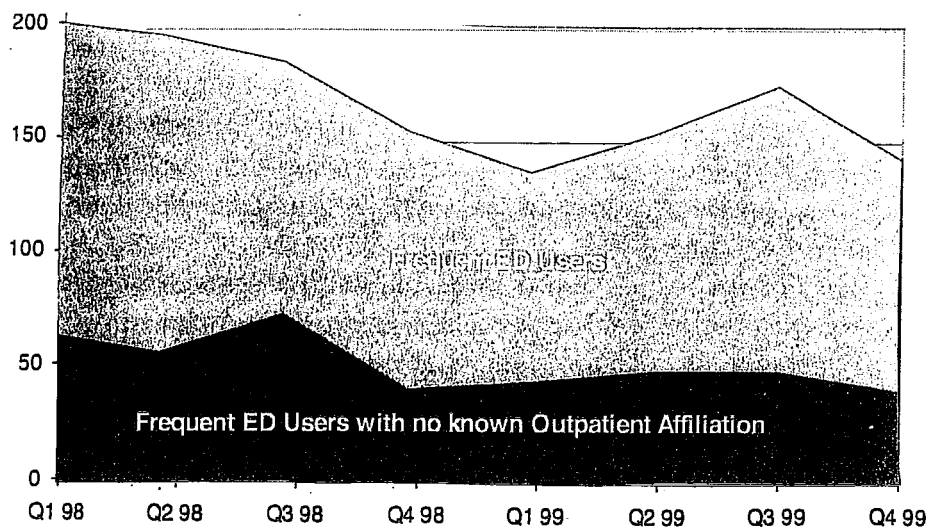


Figure 1

have psychiatric or substance abuse problems (Kne, Young, & Spillane, 1998) and that repeat visitors can account for up to one-third of all visits in a psychiatric ED (Dhossche & Ghani, 1998). For our purposes, we operationalized a "frequent user" of EDs as an individual who is seen three or more times in an ED (for psychiatric reasons) within a 90-day period. This definition was developed by group consensus, and in all likelihood identifies individuals who are not fully engaged in an optimal level of ongoing, outpatient treatment. Because all four hospital-based emergency psychiatric services in Monroe County are required to submit data to our community-wide database, we are able to track clients who present in different emergency rooms across the county. On a routine basis, database queries generate specific lists of frequent ED users, complete with the dates of the ED visits as well as where the individual encounter took place. Each agency is provided a list of frequent ED users for whom they are the primary outpatient provider.

The data analysis and feedback process is directed at improving clinical processes and system performance. From an individual clinical management perspective, we encourage supervisors and individual clinicians within each agency to review these lists and evaluate whether modifications to the current treatment plan are indicated (e.g., initiating a referral for case management services). By providing aggregate data to each agency (which includes all other agencies' aggregate data as well), we hope to advance each agency's internal performance improvement processes.

Figure 1 summarizes data from a two-year period, 1998 to 1999. The overall number of

individuals who were identified as frequent ED users within a particular quarter is graphed sequentially. For example, 198 different individuals were identified as having visited Monroe County EDs three or more times within the second quarter of 1998. Obviously, the actual number of ED visits generated by these individuals is much greater; some frequent ED users present to EDs as many as 10 to 15 times within a quarter. As the graph demonstrates, there has been some fluctuation in the volume of frequent ED users over the two-year period. However, there is a trend toward decreasing the overall number of frequent ED users (correlated samples t-test comparing each quarter in 1998 with the same quarter in 1999 is significant,  $p=.04$ ). As part of this initiative we are also exploring ways to evaluate and provide feedback to agencies regarding the extent to which the same individuals continue to use the ED on a frequent basis from quarter to quarter.

A striking feature in Figure 1 is that nearly one-third of the frequent ED users have no known outpatient affiliation. That is, the database query identifies no outpatient treatment program for close to one-third of the frequent ED users. Clinical and strategic planning efforts are underway to address this subgroup of individuals who utilize the ED frequently, but who do not enroll in follow-up outpatient treatment. For example, developing additional referral strategies to help clients attend an initial outpatient appointment after an ED visit has been found to have a significant effect on referral compliance (Spooren, Van Heeringen, & Jannes, 1998). Thus, we hope, in addition to other efforts, to implement referral protocols to

increase the probability that these individuals will engage in outpatient treatment.

In addition to the overall decrease in the number of frequent ED users in the county, we were interested in understanding the distribution of data at individual agencies and whether there was any correlation with the pattern of frequent ED users for each agency. Figure 2 shows the same sequential pattern of frequent ED users on a quarterly basis for two of the larger agencies within the county. Agency 1 shows no clear pattern across the two years and a high degree of variability across quarters. Inquiries revealed that the agency did not routinely distribute the quarterly lists to program directors or individual clinicians. In contrast, Agency 2 shows a slow, steady decrease in the number of frequent ED users associated with their outpatient programs. Compared to Agency 1, Agency 2 routinely circulated its quarterly list of frequent ED users to all relevant program managers. Because of the use of a naturalistic experimental design, we cannot make firm causal inferences. Nevertheless, we suggest there is a significant association between collection, aggregation, distribution, and review of these data with increased opportunities for improved management and care of clients frequently using ED services. This association is highlighted in comparing the

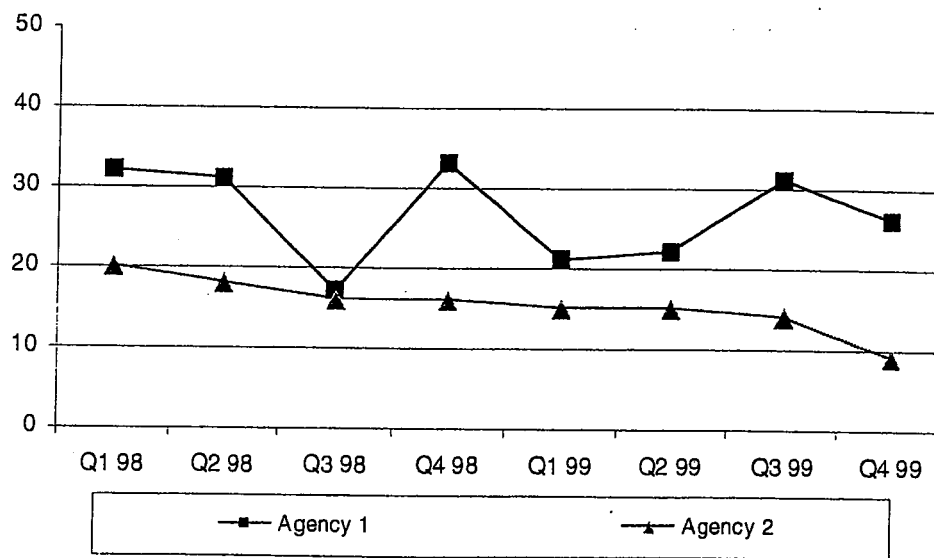


Figure 2

**Table 1**  
**Inpatient Readmissions Summary Tables**

*Discharges and Readmissions by Facility (7/1/99 – 8/31/99)*

Measure	Facility				
	Hospital 1	Hospital 2	Hospital 3	Hospital 4	TOTAL
Total number of inpatient discharges	169	107	174	262	712
Total number of discharges readmitted	26	14	28	47	115
Total number of individuals readmitted	24	13	25	41	103
Ratio of readmissions to total inpatient discharges	15 %	13 %	16 %	18 %	16 %

*Readmissions Within 30 and 60 days by Facility (7/1/99 – 8/31/99)*

Frequency	Facility				
	Hospital 1	Hospital 2	Hospital 3	Hospital 4	TOTAL
Individuals admitted within 30 days of discharge	17	11	18	36	82
Individuals admitted within 60 days of discharge	7	2	7	5	21
TOTAL	24	13	25	41	103

pattern of results from Agency 1 (which did not routinely distribute and review these data) to Agency 2 (which routinely distributed and reviewed the data). This kind of comparison can encourage organizations to adopt more effective information management strategies that could improve practice patterns.

### **Acute Care Psychiatric Hospital Readmissions**

The second example of using the database for performance improvement initiatives involves the study of readmissions. Although early readmission appears to be significantly associated with the process and quality of inpatient care on medical-surgical units (Ashton, Del Junco, Soucek, Wray, & Mansyur, 1997), there is less evidence to suggest that poor hospital outcome or premature discharge is associated with an increased risk for psychiatric readmission (Lyons, O'Mahoney, Miller, Neme, Kabat, & Miller, 1997). Nevertheless, tracking readmission rates, across providers and in the system as a whole, is one way to assess the efficacy of inpatient treatment and the overall coordina-

tion of care with outpatient services (Solomon, Gordon, & Davis, 1984).

Using our county-wide database, we generate readmission lists based on the facility from which a patient is discharged. That is, if a client is discharged from Hospital A and admitted to Hospital B within 60 days, that client will appear on Hospital A's readmission list. If that same patient is then admitted to Hospital C, this admission will count on Hospital B's list. It will not appear on Hospital A's list even if the admission to Hospital C occurred within 60 days of discharge from Hospital A. This methodology highlights the characteristics of the "last" episode of inpatient care.

Table 1 is an example of aggregate data presented in a summary table and distributed on a routine basis to the inpatient providers in Monroe County. The aggregate data shows every hospital in the county for purposes of comparison, benchmarking, and to stimulate performance assessment and improvement activities within each facility. Each hospital receives an individualized list of its patients who were readmitted (to any hospital in the county for psychiatric reasons) within 60 days of discharge from its facility. Similar to the

frequent ED user lists, the name of the hospital(s) where patients were readmitted along with the date(s) of admission is provided.

Readmission data across the four inpatient providers over eight months is displayed in Figure 3. Overall, 16 percent of all psychiatric discharges across the county were readmitted to inpatient care within 60 days. Of those readmitted within 60 days, approximately two-thirds were readmitted within the first 30 days. Consistent with previous research that highlights the importance of continuity of care to prevent readmissions (Solomon et al., 1984; Moos & Moos, 1995), subsequent analyses are planned that will examine "system" variables that might contribute to readmission rates. For example, the number of days from the inpatient discharge that the first outpatient appointment occurs and the settings where this appointment takes place (relative to the location of the inpatient stay and/or the patients' residence) are variables to explore in future analyses. It is interesting to note, as Figure 3 demonstrates, there is limited variance among the providers for readmission rates within the first 30 days. Without additional data it is premature to reach any conclusion at this point, although the data suggest that there may be some differential process occurring among providers and their patients that result in different readmission rates primarily within the 31- to 60-day time period.

### Methodological And Practical Challenges

We are indeed fortunate to work in a system whose leaders many years ago had the foresight and energy to

initiate a county-wide management information system. New York and other states have also demonstrated the vision to create such a system (e.g., Carpinello, Felton, Pease, DeMasi, & Donahue, 1998; *Vital Signs: Final Report of the Ohio Mental Health Outcomes Task Force*, 1998), although we are unaware of any other local community-wide databases that are designed to provide the functionality and purpose that we described here. As detailed above, the database allows us to monitor, track, and provide data so that health care service organizations can intervene to effect important clinical outcomes.

In our ongoing work we have discovered a variety of methodological and practical challenges related to the use of community-wide databases, especially for performance management efforts. Some of the pitfalls in working with the current system are noted below.

The pitfalls are organized according to several areas:

- data submission problems,
- reliability and validity of data, and
- information management problems that relate to how the data are used to support

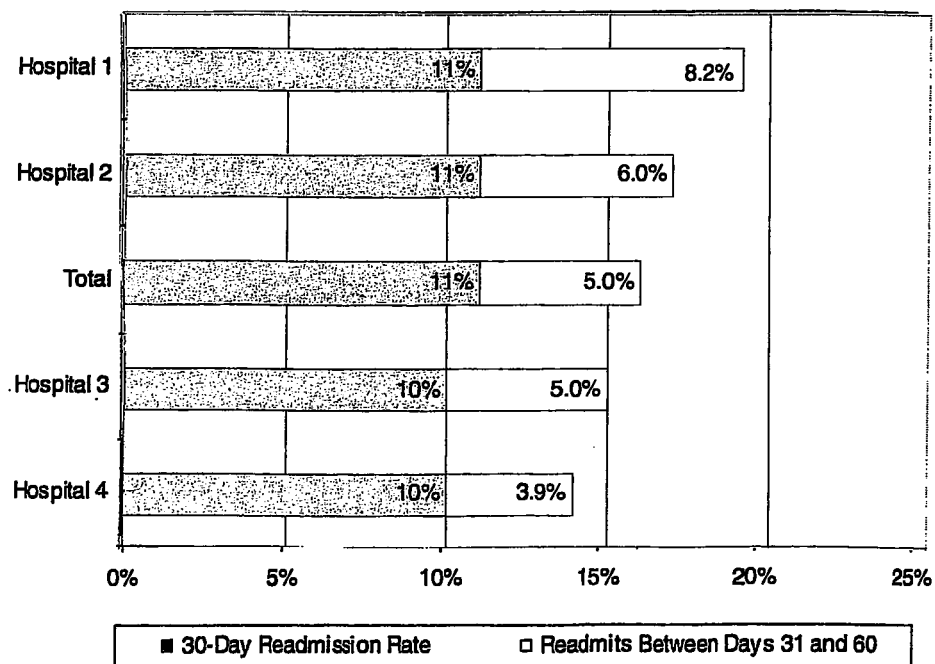


Figure 3

effective clinical and administrative decisionmaking.

Although public mental health providers in our county are contractually obligated to submit data to the database, myriad problems arise that contribute to less-than-timely data submissions. Thus, our feedback regarding frequent ED users and inpatient readmissions has not always been provided to agencies in a timely manner. The greater the delay in providing feedback to practitioners, the less helpful it is. The less helpful the database is viewed by providers, the less emphasis individual agencies may devote to future timely and comprehensive submissions. We are hoping to short-circuit this cycle by transforming the database in the future to enable online queries directly from clinical managers and other agency-based personnel. Provision of such state-of-the-art functionality will naturally lead to increased emphasis on ensuring the right data get submitted in a timely fashion.

Sometimes more problematic than late data submissions are partial data submissions. Although the data submission protocol allows for a three-month window in which providers can submit updates to previous submissions, it is not always clear in our current system when the data are complete. In fact, as we were in the process of preparing this article, we discovered that the frequent ED user data we had was flawed. Because of updated submissions that occurred well into 2000 for 1999 data (well past the usual three-month window), the 1999 frequent ED user data had to be re-calculated.<sup>1</sup>

## Discussion and Comments

Never before has there been such interest in outcome, performance measurement, and improvement. Practitioners in the field of behavioral health care are under increasing pressure to demonstrate the effectiveness and efficient delivery of services. This has resulted in tremendous growth in the number of measurement tools available for assess-

ment and comparison as well as the proliferation of organizations using and developing outcome systems (e.g., JCAHO, NCQA). Many advances also have been made in the area of defining performance improvement and measurement models for behavioral health care.

The current challenges in the field include:

- implementing performance management approaches in cost-effective and operationally sound manner,
- incorporating performance improvement and outcome assessment into daily work activities,
- adapting and adopting the existing improvement and measurement models to a variety of different settings and different organizational types, and
- using external databases for comparative purposes.

An emerging emphasis, in this context, is the use of wider-range comparative data for benchmarking and performance management assessment, including community, state, national, and international data. Use of comparative data, such as the examples herein, addresses questions often raised before but seldom answered, including:

- “How does our organization compare with others?”
- “What is acceptable performance from a national perspective?”
- “What can we learn from community wide data about our services?”
- “How much variability between and among community health care organizations is acceptable?”
- “How can we effectively use feedback from the community level to drive performance improvements within single organizations?”

As always, answers to these questions will come from a sound balance of data-driven performance management efforts and proactive imaginative leadership. One promising approach includes the use of county and community-wide data for performance improvement efforts. Our examples

of frequent emergency department users and hospital readmissions serve to illustrate the potential of using a county-wide database for performance improvement and also foreshadow what will become standard practice in the next several years.

### Endnote

1. We were pleased to discover the error and correct our data; we were, however, disappointed that our time series graph was far less impressive with the accurate data.

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