

**Time period: February 2012 to May 2016**  
**Population: Multnomah County Mental Health members**  
**4,220 hospitalizations; 2,549 individuals**

## Introduction

The goal of this project was to examine the risk of psychiatric patients readmitting to the hospital within 30 days. Length of stay, receiving outpatient services, hospital facility, primary diagnosis, and age were all considered.

## Summary of results

The 30-day readmission rate across all hospitalizations was 11.1%; 16.4% for 60-day readmission. The average hospitalization lasted for 8.5 days, and the most common primary diagnostic category was depressive disorders.

However, raw percentages can only tell us so much. For example, does a hospital have a higher readmission rate because of quality of care, or because of the higher acuity of patients they take in? Do some diagnoses really readmit less than others, or are there other factors to take into account? Does length of stay really matter? We use multivariate analysis to answer these types of question--the combined impact of multiple relevant variables on the outcome.

For the sake of simplicity, we focused on the 30-day readmission rate, although some raw counts relevant to 60-day readmission are also shown in the data summary in the sidebar. We found the following:

While length of stay had a significant impact on reducing the likelihood of readmission, that impact was small, at an estimated 2.1% for each additional day.

The far greater impact came from receiving outpatient services after discharge. New encounters with any outpatient service after hospitalization decreased the risk of readmission by 55.2%, controlling for all other variables; for clients who had already been receiving services in the 30 days before their hospitalization, the readmission risk was decreased by 31%.

Among diagnoses, patients with bipolar/manic disorders represented the greatest risk of readmission, at 25.2% more likely than other diagnoses; anxiety disorders represented the least risk, at 66.4% less likely.

Patients coming out of Legacy Good Samaritan were significantly less likely to readmit (19.5%), while patients coming out of OHSU were significantly more likely, compared to other hospitals (34.5%).

There was no significant difference between adults and children.

Type and frequency of outpatient services also matters. Instead of looking at just having had any encounter occur, even one, we also looked at what types of services were rendered, how many different services the client received, and how often they received them.

Clients with at least one assessment, test, or office visit for evaluation/management were 46.7% less likely to readmit. Clients who received skills training were 39% less likely to readmit, and clients who received therapy or counseling were 31.2% less likely to readmit, while controlling for all other factors--including the other types of services received.\*

Diversity of services also mattered. For clients returning to services, each additional

## Highlights:

New outpatient services reduced the risk of readmission by over 55%; returning to outpatient services reduced the risk by 31%.

Each additional day a client received outpatient services after hospitalization reduced the risk by 19.7% for new clients and 10.8% for returning clients.

The more diverse array of services a client received (e.g. therapy, case management, etc.), the less likely the risk of readmission.

Length of stay in the hospital was significant, but the impact was small.

Patients with bipolar/manic disorders were most likely to readmit. Patients with anxiety disorders were least likely to readmit.

## Select summary data

### Raw readmission rates:

30-day readmission rate, total population:  
11.1%

60-day readmission rate, total population:  
16.4%

Highest readmission rate among diagnoses:  
other psychoses/psychotic disorders, 13.6%

### Length of stay:

Average length of stay: 8.5 days  
Median length of stay: 5 days  
Longest average length of stay among diagnoses: schizophrenia, 14.4 days

Age: 89.1% adult, 10.9% child

### Outpatient services:

Patients receiving new outpatient services after discharge: 21.6%  
Patients returning to outpatient services after discharge: 37.5%

(continued on page 2)

service type received (see sidebar at right for categories) reduced risk of readmission by 18.2%. For new clients, that risk was reduced by 34% for each additional service type received, although fewer new clients received as many different services as returning clients did—which is likely attributable to the short 30 day timeframe analyzed. (A client returning to services may already have established relationships and types of care, whereas a new client is still going through assessment processes and becoming established. Access issues may also slow this process.) For an alternate comparison: a quick examination of all clients, returning and new, showed that those who received at least one type of service were 40.2% less likely to readmit overall; comparatively, those receiving five or more of the different service types were 71.6% less likely to readmit than those receiving fewer or no services.

Finally, we can also consider how many days clients received services.

For those with prior services, each day they received outpatient services after hospitalization reduced readmission risk by an estimated 10.8%.

For new clients, the risk was reduced by an estimated 19.7% for each additional day services were received.

## Discussion

While adding additional days in the hospital may reduce risk, the impact is relatively small, at about 2% less risk for each additional day when taking into account hospital, diagnosis, age, and outpatient encounters. Focusing on comprehensive outpatient services appears to be a much stronger investment, in terms of both results and cost. Both diversity and frequency of services also appear to have significant impact in averting future hospitalization, suggesting a multi-faceted approach with rapid initiation into services where possible.

This data opens up many future possibilities—for example, we can use these results to aid in future predictions of the risk of a specific type of client readmitting to the hospital; e.g., an adult with bipolar discharging from OHSU after 4 days.

## Limitations and future considerations

If a hospital retained a patient for longer than we authorized payment, we would not have that data. Thus, lengths of stay may be longer than they appear, and follow-up periods would also be impacted. This study is based on approved claims alone.

We cannot know if clients who have terminated their Medicaid enrollment after a hospitalization have had further hospitalizations. The short time period of analysis (30 days after discharge) minimizes this risk. Additionally, initial matching to OHP eligibility files estimated that this risk is very small, with no significant impact on results or their practical applications, but it is worth keeping in mind.

While diagnosis clusters help to give us an idea of how different types of patients present different risks, there is a range of severity within each of these diagnoses. Finding ways to better define severity would improve estimations of the risk of different diagnoses and the relative impact of different interventions, whether by further breaking down diagnosis groups or finding ways to match these records to actual patient assessment data.

Adding in emergency department and non-psychiatric hospital admissions before and after psychiatric hospitalization would give an improved picture of what happens to patients after leaving the hospital and allow us to better assess client risks.

Doing more work with the interactions of specific combinations of services—e.g., skills training plus therapy, or case management plus medication support, and so forth—could be enlightening.

\*When separating new clients from those who had been outpatient clients before their hospitalization, the effects were largely the same, except skills training's significance disappeared for new clients. It remained strong for returning clients.

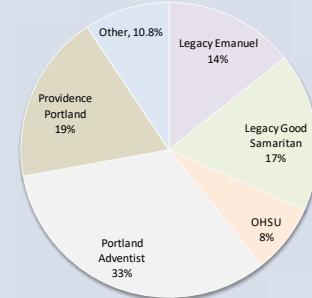
## Readmission rates by year (30 day | 60 day):

2012: 9.8%		15.1%
2013: 11.9%		16.9%
2014: 11.4%		17.4%
2015: 11.6%		17.5%
2016: 9.8%		12.1% (first half of year only)

## Data categories

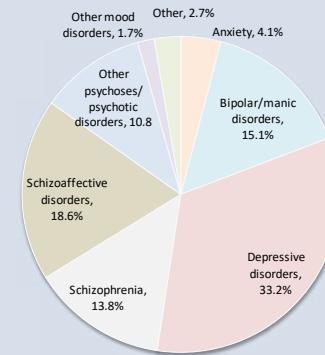
### Hospitals

Legacy Emanuel
Legacy Good Samaritan
OHSU
Portland Adventist
Providence Portland
Other



### Diagnostic categories

Anxiety disorders
Bipolar/manic disorders
Depressive disorders
Other mood disorders
Schizophrenia
Schizoaffective disorders
Other psychoses/psychotic disorders
Other mental health disorders



### Outpatient services

New engagement after hospitalization (no outpatient services within 30 days prior to hospitalization)

Reengagement after hospitalization (received outpatient services within 30 days prior to hospitalization)

### Specific categories of outpatient services

Assessments, testing, and office visits for evaluation/management
Case management
Medication support and training
Skills training
Therapy/counseling
Other

### Age

Adult (18+ at time of admission)
Child (under 18)