

Providence

Providence Digital Commons

Articles, Abstracts, and Reports

6-2015

Intensive Transition Team - analysis of program impacts

Bill J. Wright

Center for Outcomes Research and Education (CORE), Providence Health & Services, Portland, OR, USA

Keri B Vartanian

Center for Outcomes Research and Education (CORE), Providence Health & Services, Portland, OR, USA

Megan Holtorf

Center for Outcomes Research and Education (CORE), Providence Health & Services, Portland, OR, USA

Follow this and additional works at: <https://digitalcommons.providence.org/publications>



Part of the [Behavioral Medicine Commons](#), [Health and Medical Administration Commons](#), [Health Services Administration Commons](#), and the [Health Services Research Commons](#)

Recommended Citation

Wright, Bill J.; Vartanian, Keri B; and Holtorf, Megan, "Intensive Transition Team - analysis of program impacts" (2015). *Articles, Abstracts, and Reports*. 8578.

<https://digitalcommons.providence.org/publications/8578>

This Report is brought to you for free and open access by Providence Digital Commons. It has been accepted for inclusion in Articles, Abstracts, and Reports by an authorized administrator of Providence Digital Commons. For more information, please contact digitalcommons@providence.org.

INTENSIVE TRANSITION TEAM

ANALYSIS OF PROGRAM IMPACTS

CONDUCTED BY:

Bill Wright, PhD
Keri Vartanian, PhD
Megan Holtorf, MPH, CCRP

The Center for Outcomes Research & Education
Providence Health & Services
5211 NE Glisan St., Bldg. C
Portland, OR 97213

For questions about this report, please contact:

Bill Wright (Bill.Wright@providence.org)
503-215-7184

ITT PROGRAM

PROGRAM EVALUATION RESULTS: EXECUTIVE SUMMARY

PURPOSE OF THE STUDY

Conducted at the Providence Center for Outcomes Research & Education (CORE), this report describes findings from an evaluation of the Health Commons Grant Intensive Transition Team (ITT) program. The ITT program, based in Clackamas, Washington, and Multnomah counties in Portland, Oregon, provides short-term intensive services for individuals discharging from psychiatric inpatient treatment. The goal is to provide patients with continuity of care following discharge that connects them to outpatient care and reduces readmissions. Our study was designed to assess the impact of ITT on patient utilization patterns and costs.

KEY FINDINGS

ITT CLIENTS ARE HIGHLY MEDICALLY COMPLEX: ITT clients had mental illness at rates as high as 20 times the typical Medicaid population and an average of three chronic health conditions. *SEE PAGE 5*

OUTPATIENT BEHAVIORAL HEALTH VISITS ARE INCREASED: ITT clients in all counties saw increases in connection with outpatient behavioral health services following engagement with ITT compared to prior, where Clackamas county clients had the largest increase. Working with Washington County increased the likelihood of having an outpatient behavioral health visit. *SEE PAGES 7 & 9*

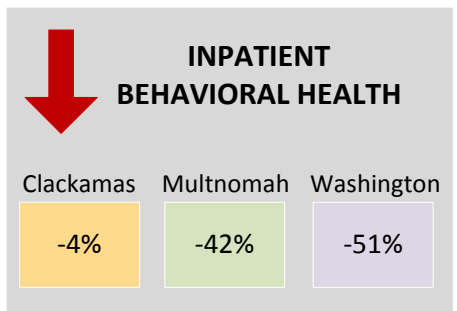
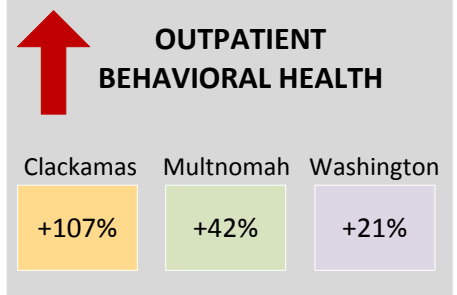
INPATIENT MENTAL HEALTH ADMISSION ARE REDUCED: ITT clients in Multnomah and Washington county had significantly reduced inpatient mental health admissions following enrollment with ITT compared to prior, while Clackamas county had minimal impact. Again, working with Washington county was a key factor that decreased the likelihood of having an inpatient mental health admission 30 days following enrollment. *SEE PAGES 7 & 9*

CHANGES IN UTILIZATION IS REFLECTED IN COSTS: Medical costs generally reflected the changes in utilization— costs for outpatient behavioral health services were increased and costs for inpatient mental health were decreased. *SEE PAGE 8*

DATA & METHODS

We used program records and claims data to evaluate ITT implementation and outcomes. We compared the utilization and costs of ITT clients prior to their admission to a similar period of time after engagement with the ITT program. To understand the significant drivers of utilization after discharge, we estimated the likelihood of outpatient mental health connection or inpatient mental health readmission after discharge using a logistic regression model. We also evaluated the combined impact of the Peers program, in Clackamas county, on ITT participants.

Percent Change in Yearly per Member Visits Following ITT enrollment



THE BOTTOM LINE

The ITT program served highly medically complex clients and, following enrollment with ITT, these clients had increased connection with outpatient behavioral health services and reduced inpatient mental health admissions. The changes in utilization were reflected in the medical costs, whereby outpatient behavioral health costs increased and inpatient mental health costs went down. Taken together, these findings suggest that the ITT program is a successful transitional care intervention that connects patients to needed health services that, as a result, may stabilize conditions to avoid further inpatient mental health treatment.

For questions about the evaluation, please contact:

Keri Vartanian, PhD
Project Manager
keri.vartanian@providence.org
503-215-2594

For questions about ITT, please contact:

Jeffrey Anderson
Program Supervisor
jeffreyand@clackamas.us
503-722-6689

ITT PROGRAM

ANALYSIS OF PROGRAM IMPACTS

INTRODUCTION

This report summarizes results from an evaluation of the ITT program in Oregon. Conducted at the Providence Center for Outcomes Research & Education (CORE), this study describes the impact of the ITT program on patient utilization and costs.

BACKGROUND

ITT is an intensive, short-term transitional support intervention for Health Share's mental health patients discharged from acute inpatient psychiatric hospitalizations. The ITT program was originally implemented through Lifeworks NW in Washington County. Under the CMMI-funded Health Commons Grant, ITT was scaled-up in Washington County and expanded to Multnomah and Clackamas County in 2012. The goal of the ITT program is to provide continuity of care following hospital discharge that connects patients to primary care medical homes and reduces inpatient readmissions.

KEY CONTEXT

The transition to self-managed care following hospitalization can be particularly challenging for patients as they assume responsibility for treating their medical problems, administering medication, and accessing outpatient care. This transition can be especially challenging for individuals with mental illness as their condition may further impede

their ability to manage their personal and medical needs. In fact, mental health conditions rank among the top ten reasons for all-cause 30 day readmissions in the Medicaid population (1). Data indicates that 13% of psychiatric patients are readmitted within 30 days of discharge (2) and approximately 50% are readmitted within a year (3). Further, following discharge, research shows that less than half of patients have an outpatient care visit within 7 days, a key measure of care continuity (3). This indicates that patients are not getting the services they need following discharge and that many end up right back in the hospital.

Intensive transition interventions that assist with mental health patients following discharge have demonstrated effectiveness in reducing readmission rates and increasing connection to care (2,3). These interventions have become increasingly important due to the substantial readmission problem and the high prevalence of mental illness in America. ITT is an intensive transition program specifically aimed at serving mentally ill patients on Medicaid, which represents some of the most socioeconomically disadvantaged patients with mental illness. In this report, we evaluate the impact of ITT on their connection with outpatient care and their inpatient utilization. We also estimate the influence of ITT on medical costs.

CONTENTS

Pg. 1	Introduction
Pg. 2	Methodology
Pg. 3	Program Summary
Pg. 4-5	Program Data
Results	
Pg. 6-7	Utilization
Pg. 8	Cost
Pg. 9	Impact analysis
Pg. 10	Conclusions

KEY OBJECTIVES

This evaluation study was designed around two key objectives:

1. EVALUATE IMPACT OF ITT ON HEALTH CARE UTILIZATION

We set out to assess whether the ITT program impacted patterns of care utilization, focusing on outpatient care (including primary care and outpatient behavioral health services), and acute care (including ED visits and inpatient hospital admissions).

2. ESTIMATE IMPACT ON COSTS OF CARE

We also wanted to estimate program savings by care domain associated with any changes in utilization.

References

1. Hines AI, Barrett ML, Jiang HJ, et al. Conditions With the Largest Number of Adult Hospital Readmissions by Payer, 2011. HCUP Statistical Brief #172. Rockville, MD: Agency for Healthcare Research and Quality, April 2014
2. Vigod SN, Kurdyak PA, Dennis CL, et al. Transitional Interventions to Reduce Early Psychiatric Readmissions in Adults: Systematic Review. Br J Psych. 2013; 202(3):187-94.
3. Viggiano T, Incus HA, Crystal S. Care transitions Interventions in Mental Health. Curr Opin Psychiatry. 2012; 25(6):551-8.
4. Ogundipa B, Alam F, Gazula L, et al. Remaking the American Health Care System: A Positive Reflection on the Affordable Care Act With Emphasis on Mental Health Care. JHCPU. 2015; 26(1): 49-61

METHODOLOGY

OVERVIEW

We employed a retrospective, pre-post, longitudinal cohort design to assess program impacts. We evaluated utilization and costs for the following domains of care: outpatient primary medical, outpatient behavioral health, outpatient specialty, ED, inpatient physical health (non-obstetric), and inpatient behavioral health. For utilization, we determined the percent of patients that had one of the above visits at 7 or 30 days following enrollment with ITT (Exhibit 1A). We also determined that average number of each type of visit that occurred in the 12 months prior to enrollment with ITT compared to 12 months post enrollment (Exhibit 1B). Likewise, for cost, we evaluated the average medical expenditures for ITT patients by domain of care in the 12 months prior compared to 12 months post ITT enrollment (Exhibit 1B).

DATA SOURCES

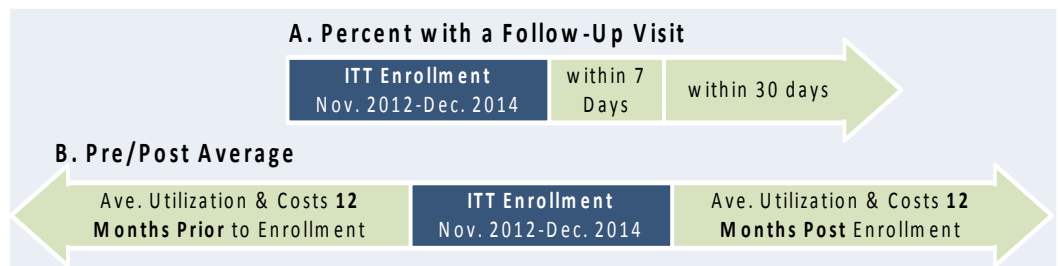
PROGRAM DATA: Records maintained by the program capturing information on all individuals served.

CLAIMS DATA: Aggregated claims dataset containing comprehensive utilization and cost data on all Health Share Members.

STUDY DESIGN

POPULATION: Study participants included Health Share members who were referred to the ITT program in Multnomah, Clackamas, and Washington counties between November 2012 and December 2014. Our unit of analysis for this study was an admission for a mental health condition; individual members could have multiple admissions events during the time period and admissions in more than one county.

Exhibit 1. Outcome Measures for Study.



We applied the following exclusions to the data. For follow-up visits and readmissions rates within 7 and 30 days after program enrollment, we excluded clients with less than 2 months of coverage following program enrollment in order to ensure availability of follow-up data. For evaluating the average per member per month (PMPM) costs and per member per year (PMPY) utilization in the 12 months prior to and the 12 months after enrollment, we excluded clients with less than 3 months of coverage before and after enrollment in order to ensure availability of baseline and follow-up data. We used the less stringent requirement of 2 months of coverage for the 7 and 30 day follow-up data because that measure did not require data beyond 30 days of enrollment.

DATA: We treated each program enrollment as a marker date, then used claims data to construct a dataset capturing the members' utilization before and after that marker date. The inpatient event associated with the marked date was excluded from the analysis.

COHORTS: We measured program impact on post-enrollment utilization for ITT clients by county of admission. We also identified Medicaid members with admissions for mental health conditions who were not served by ITT to serve as a population reference group for the 7 and 30 day follow-up rates.

STATISTICS

Pre/post comparisons: We used a two-tailed t-test to identify differences in utilization or costs prior to ITT enrollment compared to following ITT enrollment, $p < 0.1$ was considered significant.

Outcomes Modeling: To identify the most important predictors of having an outpatient follow-up visit or readmission, we used multivariate regression analysis to test the influence of multiple explanatory factors on the outcome of interest while controlling for differences in demographics, program contacts, and health status. We used generalized estimating equations (GEE) to account for multiple hospitalizations and the longitudinal nature of our data.

Difference-in-differences (DiD): We performed a difference-in-differences (DiD) analysis using generalized estimating equations (GEE) to evaluate the impact of the Peers Program on ITT clients. The DiD estimator assesses whether the pre-post change seen in the cases (Peers participants) is different from the pre-post change seen in the controls (non-Peers participants). The estimator allows us to distinguish between program impacts and the natural changes in outcomes that might occur in a population over time. Using the GEE appropriately accounts for the matched nature of the study.

PROGRAM SUMMARY

PROGRAM OVERVIEW

The ITT programs were established in Clackamas, Multnomah, and Washington County to provide support for patients during and after discharge from a mental health-related hospital admission. They utilize a “reach-in” approach to connect with patients while they are still in the hospital to enroll them in ITT and to assess their transitional care needs. The overall objective is to connect patient with community services and primary care providers to maintain the continuity of care for these high-needs patients, and as a result, reduce readmissions and medical costs.

TARGET POPULATION

The intervention focuses on high-acuity individuals with mental health issues who have had a psychiatric hospitalization but that are *not already connect to a community mental health provider*. These patients tend to be high utilizers and represent the most vulnerable patients with complex psychosocial needs, such as history of trauma, disenfranchisement, and poverty. Patients were prioritized for ITT enrollment if they were one of the following:

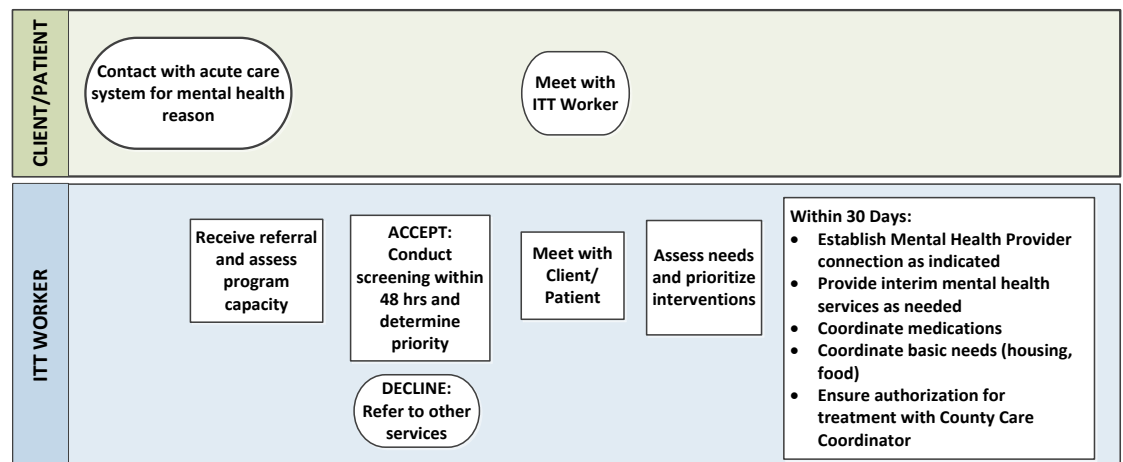
PRIORITY 1	PRIORITY 2	PRIORITY 3
Currently on an acute care unit with a psychiatric factor being a primary reason for the admission.	In an Emergency Room and are at risk of psychiatric hospitalization.	Had multiple contacts with the crisis system or assigned community mental health is unable to provide the needed transitional support.

Clackamas county served Health Share members and individuals that were uninsured; Multnomah county only served Health Share members; and Washington County served all payors. It is important to note that this report only includes data for ITT participants that were Health Share members.

ITT WORKFLOW

An overview of the program workflow is described in Exhibit 2. ITT patients are identified and referred to the ITT program from hospital psychiatric units, hospital EDs, crisis centers, and Health Share. Once eligibility is confirmed, an ITT worker meets with the ITT client, ideally while the client is still in the hospital/center. The ITT client’s needs are assessed and the ITT worker establishes an individualized intervention plan to meet the client’s transitional care needs including establishing the client

Exhibit 2. Overview of ITT workflow.



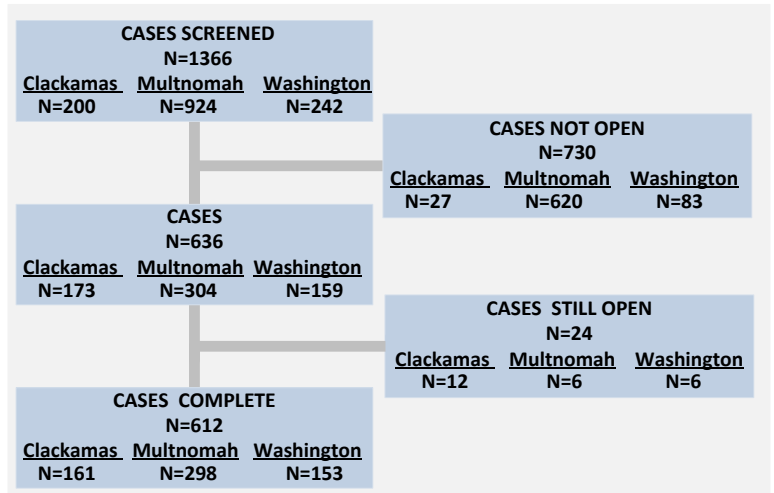
with a mental health provider, coordinating medication, assisting with basic needs, and providing interim mental health services. The ITT workers also provide case management and psycho-education about mental health, addiction, and recovery for patients and their families. ITT is a short-term program, therefore, clients were ideally enrolled for no longer than 30 days.

PROGRAM DATA

CLIENT ENROLLMENT

Enrollment in the ITT program, in total and by county, is described in Exhibit 3. The values represent the number of cases— an individual that enrolled with the program more than once would have more than one case. A total of 1366 cases were screened for ITT, of which 730 were not enrolled. A large portion of the cases that were screened and subsequently not opened came from Multnomah county, which is likely due to the differences in the referral process. Clackamas and Washington county received referrals based on the prescribed program priorities; however, ITT in Multnomah county served as a front-end contact for all unaffiliated individuals leaving the hospital. Hence, more people were referred and, because many of these individuals did not fall within the priorities of the ITT program, many cases were screened-out by the health plan. At the time of this report, there were 29 cases still open and 612 complete cases. Multnomah county had the most complete cases (n=298) and Clackamas (n=161) and Washington county (n=153) had a similar number of completed cases.

Exhibit 3. Enrollment Flow Diagram.



COMPLETED CASES & PROGRAM DATA

Status of completed cases: Of the 612 completed cases, overall 50% were considered connect to care. Clackamas county had the most cases connected to care (67%) while Multnomah county had 44% and Washington county had 45%. An average of 29% of clients disengaged with the ITT program, with Clackamas county having the least (14%) amount of disengagement. The program was not able to make contact with 11% of clients, and therefore their cases were closed. (Exhibit 4)

Program Data: The average number of interactions or “touches” per client, was 7.1. Clackamas had the most touches per client, followed by Washington County, and then Multnomah County. The average and median data indicates a high frequency of interactions between ITT workers and clients over the 30 day engagement. (Exhibit 4)

Exhibit 4. Case Status and Program Data

	All	Clack.	Mult.	Wash.
Client Connected	50%	67%	44%	45%
Client Disengaged	29%	14%	35%	32%
No Touches	11%	7%	14%	11%
Other	10%	12%	7%	12%
	All	Clack.	Mult.	Wash.
Ave. # Touches	7.1	9.9	5.2	7.9
Median # Touches	5.0	8.0	4.0	5.0

Exhibit 5. Demographics

		All (N=570)	Clack. (N=155)	Mult. (N=277)	Wash. (N=147)
Gender	Female	55%	64%	50%	60%
Ethnicity/ Race	White	74%	84%	69%	73%
	Black	9%	3%	14%	6%
	Hispanic	7%	5%	7%	9%
	Other	2%	1%	2%	3%
	Unknown	8%	8%	8%	10%
Language	English	85%	84%	86%	84%
	Spanish	1%	1%	1%	2%
	Other	14%	15%	13%	14%
Age Group	<18	2%	4%	<1%	5%
	18 - 24	14%	15%	10%	20%
	25-44	49%	48%	48%	50%
	45 - 64	34%	32%	40%	24%
	65+	2%	1%	2%	1%

CLIENT DEMOGRAPHICS

Exhibit 5 details the demographics for the ITT clients. This data is represented on an individual, and not a case, basis. Thus, across all counties, ITT served 570 clients. Some clients enrolled with ITT in multiple counties, and that is reflected in the N for each county (thus, summing the N for all counties results in a number greater than 570). The client demographics were similar across all counties, except Multnomah County served more black clients. Overall, clients were typically white and English was the primary language. There was an average of 55% female clients, although Clackamas county served more women (64%). The majority of clients were age 25-44, very few were younger than 18 or older than 65.

PROGRAM DATA

CLIENT DIAGNOSES

We evaluated the mental health diagnoses and overall physical health of the ITT clients (Exhibit 6). As expected, they all have a high level of mental health disorders compared to a typical Medicaid member. Affective disorder was the most prevalent as it was seen in 83% of clients, followed by depression (62%). Non-organic psychosis was present at almost 20 times the typical population rates and chemical dependency, bi-polar disorder, and paranoid states were all approximately 10 times the typical rates. The distribution of the types of mental illness was consistent across all three counties. Further, the ITT clients suffered from an average of 2.5 mental illnesses and 3.6 chronic illness. We also calculated Chronic Illness

and Disability Payment System Risk Score, which is an overall estimate of medical complexity derived from historical claims data. This number also projects future medical expenditures—the higher the score the higher the expected future costs. The results show the average Risk Score of an ITT client is 2.4, indicating high complexity that predicts costs to be greater than two times the average. Taken together, this data highlights the high medical complexity and mental health burden faced by ITT clients.

Exhibit 6. Client Mental and Physical health

	All ITT N=570	Clackamas N=155	Multnomah N=277	Washington N=147	Typical Medicaid N=104,367
Chemical Dependency	25%	27%	26%	20%	2%
Depression	62%	69%	59%	61%	11%
Bipolar Disorder	26%	22%	31%	20%	2%
Affective Disorder	83%	83%	83%	83%	15%
Psychotic Disorder	29%	25%	34%	26%	4%
Paranoid States	10%	8%	12%	9%	1%
Non-organic Psychosis	38%	30%	47%	31%	2%
Ave. # Mental Illnesses	2.5	2.4	2.7	2.3	0.3
Ave. # Chronic Illnesses	3.6	3.7	3.9	3.0	2.2
Risk Score	2.4	2.6	2.4	2.2	1.2

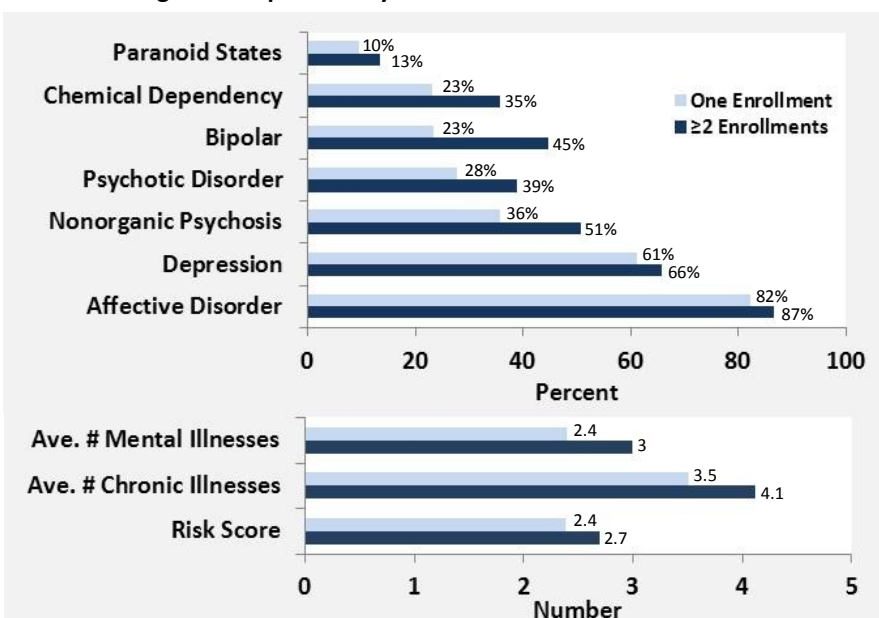
Exhibit 7. Multiple Enrollments

	All	Clack.	Mult.	Wash.
One Enrollment	88%	86%	87%	88%
≥ 2 Enrollments	12%	14%	13%	12%

MULTIPLE ENROLLMENTS

The ITT program allowed clients to re-enroll following a subsequent inpatient mental health hospitalization. Sometimes this re-enrollment would occur in a different county. Overall, 12% of clients had two or more enrollments in the ITT program (Exhibit 7). To understand which clients were enrolling multiple times, we evaluated the mental and overall physical health of clients with two more enrollments compared to those with only one. The cohort of clients with two or more enrollments had a greater prevalence of mental illnesses than those with only one enrollment—the largest differences were in chemical dependency, bipolar disorder, psychotic disorder, and nonorganic psychosis (Exhibit 8). Additionally, these clients with two or more enrollments and a greater average number of mental and chronic illnesses and had a greater Risk Score (see definition above) (Exhibit 8). This data demonstrates that clients with two or more enrollments overall were more medically complex than those with one enrollment, and that they had a greater prevalence of certain mental health conditions. The increased health burden for these clients likely contributed to their need for additional inpatient care and subsequent re-enrollment with ITT.

Exhibit 8. Diagnoses of patients by enrollment



RESULTS:

UTILIZATION

WHAT DID WE STUDY?

We wanted to know if participation in ITT improved client connections to outpatient care and decreased inpatient readmissions. We analyzed Medicaid claims data to assess the impact of ITT on post-enrollment utilization including outpatient (OP) primary care, OP mental health, OP specialty medical, inpatient (IP) physical health, and IP mental health. We took two approaches to measuring the outcomes. First, we examined whether each patient had at least one of a given type of visit within 7 or 30 days after enrolling with ITT. Second, we assessed the average number of visits per member per year (PMPY) to see if total mean utilization changed after participating in the ITT program.

OUTCOME MEASURES

ANY VISIT: Whether the individual had at least one visit (yes/no) within 7 or 30 days of engagement. For ITT clients, this was 7 or 30 days from enrollment with ITT.

AVERAGE NUMBER OF VISITS: The average number of visits by domain of care per member per year (PMPY).

RESULTS

ANY VISIT: Exhibit 9 describes the percent of ITT clients that had at least one of the listed health care visits at 7 or 30 days following enrollment with ITT. The reference group is comprised of patients that had a mental health inpatient stay but did not subsequently qualify for ITT. The patients in the reference group should represent individuals with mental illness that are already connected with care and, therefore, provide a reasonable goal for patient follow-up rates in the ITT program. It is important to note that results for the referent group are calculated from the date of discharge and results from the ITT group are calculated from the date of enrollment with ITT. ITT typically engaged with clients while they were still in the hospital, therefore, the ITT enrollment date should be closely aligned with the date of discharge; however, in some cases, there may be a few days difference. The results show that for most domains of care, the ITT program rates are approaching those observed for the reference group by 7 days and are generally comparable by 30 days. The result by domain are as follows:

OP-Primary Medical—Washington county had the lowest primary medical follow-up rates at 7 days (7%) while Clackamas (12%) and Multnomah county (16%) were closer to the reference group value of 19%. At 30 days, Clackamas county and Multnomah county had met or exceeded the reference group and Washington county was still slightly low.

OP-Mental Health—Washington county had the highest 7 and 30 day OP mental health follow-up rates, both of which were higher than the reference group. Multnomah county had the lowest 7 and 30 day rates, which were far below the reference group and the ITT clients in the other counties. Clackamas county's rates were slightly lower than the reference group.

OP-Specialty Medical—All counties rates were slightly lower than the reference at 7 days but comparable at 30 days.

OP-ED—Clackamas county had the highest 7 day ED visit rates (22%), but this leveled out to a value more comparable to the reference group and other counties by 30

days. Multnomah and Washington county had 7 and 30 day rates that were comparable to the reference group.

IP-Physical Health: At 7 days, all counties had rates that were similar to the reference group. By 30 days, Clackamas and Washington county were both slightly lower than the reference group, a positive finding for ITT, and Multnomah county was comparable to the reference group.

IP-Mental Health: Clackamas county had the highest 7 day inpatient mental health readmission rate (7%) compared to the ITT clients in other counties and the reference group. Washington county had a slightly lower 30 day inpatient mental health readmission rate (9%) compared to the other groups.

Exhibit 9. Percent of Clients That Had Any Visit Within 7 or 30 days Following ITT Enrollment.

	PERCENT WITH AT LEAST ONE VISIT AT 7 OR 30 DAYS							
	Clackamas		Multnomah		Washington		Reference	
	7 Days	30 Days	7 Days	30 Days	7 Days	30 Days	7 Days	30 Days
OP- Primary Medical	12%	43%	16%	52%	7%	32%	19%	42%
OP - Mental Health	38%	53%	16%	28%	59%	71%	49%	67%
OP - Specialty Medical	6%	23%	6%	22%	9%	29%	12%	28%
OP - ED	22%	39%	14%	38%	14%	32%	14%	34%
IP - Physical Health	2%	6%	4%	10%	4%	6%	3%	10%
IP - Mental Health	7%	13%	2%	12%	4%	9%	3%	12%

RESULTS:

UTILIZATION

AVERAGE NUMBER OF VISITS: We calculated the average number of visits PMPY before and after enrollment with ITT to identify changes in utilization patterns (Exhibit 10). Across all counties there were trends demonstrating increased connection with outpatient care and decreased utilization of inpatient services. These calculations include the outpatient mental health visits that occurred as part of the ITT program. However, the results show comprehensive increases in all domains of ambulatory outpatient care, which suggests an overall increase in outpatient connection that extends beyond interaction with the ITT program. The results by county are as follows:

Clackamas County: There were significant increases in utilization of OP-primary medical, OP-mental health, and OP-specialty care following enrollment with ITT compared to prior. Utilization of OP-ED, IP-physical health, and IP-mental health showed decreases following enrollment with ITT compared to prior, but the differences were not significant.

Multnomah County: There were large increases in OP-primary medical and OP-mental health care that were approaching significance, and a significant decrease in OP-specialty medical following enrollment with ITT compared to prior. Utilization of OP-ED, IP-physical health, and IP-mental health were all significantly decreased in the year following enrollment with ITT compared to prior.

Washington County: We observed a significant increase in OP-primary medical and OP-specialty medical, and an upward trend for OP-mental health that is approaching significance, for utilization following ITT enrollment compared to prior. There was a non-significant downward trend for OP-ED and IP-physical health, and a significant decrease in IP-mental health utilization.

Exhibit 10. Average Utilization Before and After ITT by County.

AVERAGE UTILIZATION												
	Clackamas				Multnomah				Washington			
	Before	After	%Δ	p-val	Before	After	%Δ	p-val	Before	After	%Δ	p-val
OP- Primary Medical	4.46	6.19	39%	0.021	5.05	5.69	13%	0.102	3.06	4.01	31%	0.015
OP - Mental Health	4.72	9.76	107%	0.004	3.84	5.46	42%	0.148	5.89	7.15	21%	0.104
OP - Specialty Medical	2.28	2.94	29%	0.014	2.35	2.84	21%	0.059	2.42	3.75	55%	0.038
OP - ED	6.92	6.78	-2%	0.555	7.69	6.51	-15%	0.074	7.02	5.22	-26%	0.996
IP - Physical Health	0.57	0.71	25%	0.556	0.87	0.60	-31%	0.056	0.75	0.42	-44%	0.336
IP - Mental Health	0.57	0.55	-4%	0.849	0.92	0.53	-42%	<.0001	0.92	0.45	-51%	0.014

CLACKAMAS COUNTY PEERS PROGRAM: Through FolkTime, Clackamas county offers Peer Support Specialists (PSS), people that have previously experienced similar mental health issues and have trained to assist others. PSS meet with ITT clients in clinics and in the community and provide empathy and support through shared personal experiences and coping mechanisms. We wanted to understand if these services, in addition to emotional support, had an impact on utilization of health care services for ITT clients; thus, we compared outpatient care connection for patients in Clackamas county with (n=93) and without (n=435) a PSS. Results show that clients with a PSS had significantly increased number of OP-mental health visits compared to clients without a PSS (Exhibit 11). Overall, PSS increased OP-mental health connection by 2.9 visits per member per year (Exhibit 11). This data suggests that having a PSS furthers ITT's primary goal of connecting patients with outpatient mental health care.

Exhibit 11. Impact of Peers Providers on Utilization of Outpatient Care.

Clackamas								
PEERS PROGRAM								
	Worked w/ PSS (N=93)			Did not work w/PSS (N=435)			DiD	
	Before	After	Δ	Before	After	Δ	Net	p-val
Primary Medical	3.93	5.55	1.62	3.94	4.93	0.99	0.63	0.380
Mental Health	4.47	7.95	3.48	5.21	5.60	0.39	3.09	0.023
Specialty Medical	1.96	2.94	0.98	2.25	3.02	0.77	0.21	0.897

BOTTOM LINE

The utilization data demonstrates that ITT client follow-up rates are approaching and, in some cases, exceeding 7 and 30 day follow-up rates for psychiatric patients that have been recently hospitalized but are already connected with care. Additionally, our data shows that, generally, outpatient care increased and inpatient care decreased in the year following enrollment with ITT compared to the year prior. The addition of Peer Support Specialists further improved outpatient mental health utilization in Clackamas county, suggesting that other ITT programs may benefit from adding this service.

RESULTS:

COST

WHAT DID WE STUDY?

We wanted to determine the impact of ITT on medical costs for all of the health care domains studied in the utilization section. To accomplish this, we used Health Share claims data to calculate health care costs in the 12 months before enrollment with ITT compared to the 12 months after enrollment. We assessed these costs by health care domain separately for each county.

OUTCOME MEASURES

COSTS: Allowed costs from HealthShare claims broken out by key domains of care.

RESULTS

We determined the medical costs for outpatient and inpatient treatment before and after engaging with ITT (Exhibit 12). Across all counties, we found increased costs for in outpatient mental health and decreased costs for inpatient mental health following ITT engagement compared to prior. These changes in cost are consistent with the altered utilization patterns described in the previous section (pages 5&6), and therefore likely reflect increased connection with outpatient services and decreased inpatient re-admissions. The results by county are as follows:

Clackamas county: The cost of outpatient care increased significantly for mental health and specialty medical, and there was a trend for increased cost in primary medical in the year following ITT enrollment compared to prior. There was a downward trend for costs associated with ED visits and inpatient mental health, but these values did not reach significance.

Multnomah county: Outpatient mental health medical costs increased significantly in the year following ITT enrollment compared to prior. The cost of outpatient mental health increased by 119%, the greatest increase among all of the counties. Outpatient primary and specialty medical also had a trend towards increased cost. In the year following ITT enrollment, the costs for ED, inpatient physical health, and inpatient mental health all significantly decreased compared to the previous year.

Washington County: The cost for outpatient mental health care increased significantly in the year following ITT enrollment compared to prior. Outpatient primary and specialty medical also had an upward trend in costs. ED and inpatient mental health cost significantly declined following enrollment with ITT, and there was a downward trend in cost for inpatient physical health. The cost for inpatient mental health declined by 71%, a substantial decrease that represents the greatest decline in costs across all counties for this domain and manifests as a potential savings of approximately \$300.00 per member per month.

Exhibit 12. Average Cost Per Member Per Month Before and After ITT by County.

AVERAGE COST PMPM												
	Clackamas				Multnomah				Washington			
	Before	After	%Δ	p-val	Before	After	%Δ	p-val	Before	After	%Δ	p-val
OP- Primary Medical	\$35	\$41	18%	0.258	\$32	\$34	9%	0.119	\$18	\$26	43%	0.977
OP - Mental Health	\$26	\$54	108%	0.009	\$16	\$34	119%	0.0004	\$36	\$66	81%	0.0003
OP - Specialty Medical	\$12	\$21	82%	0.002	\$13	\$17	29%	0.187	\$15	\$18	24%	0.336
OP - ED	\$1,289	\$1,124	-13%	0.310	\$1,463	\$1,347	-8%	0.072	\$1,251	\$742	-41%	0.077
IP - Physical Health	\$105	\$110	5%	0.705	\$200	\$121	-39%	0.014	\$113	\$69	-39%	0.298
IP - Mental Health	\$202	\$175	-14%	0.665	\$244	\$153	-37%	0.001	\$495	\$175	-71%	0.017

BOTTOM LINE

Across all counties, we found significantly increased outpatient mental health costs following ITT engagement compared to prior. We also found decreases in inpatient mental health expenditures following ITT engagement compared to prior. Importantly, these changes in costs are consistent with the altered utilization patterns and therefore likely reflect increased connection with outpatient care and reduced usage of inpatient mental health services.

RESULTS:

OPTIMAL IMPACT ANALYSIS

WHAT WE WANTED TO KNOW

We wanted to know which factors contributed to the changes in outpatient and inpatient behavioral health visits following engagement with ITT. We used multivariate regression analysis to model the predictors of having an outpatient behavioral health visit 7 days following engaging with ITT and having an inpatient behavioral health visit 30 days after engaging with ITT. The results yield an odds ratio that indicates the likelihood of the event occurring: an odds ratio greater than 1 indicates an increased likelihood while an odds ratio of less than 1 indicates a decreased likelihood.

RESULTS

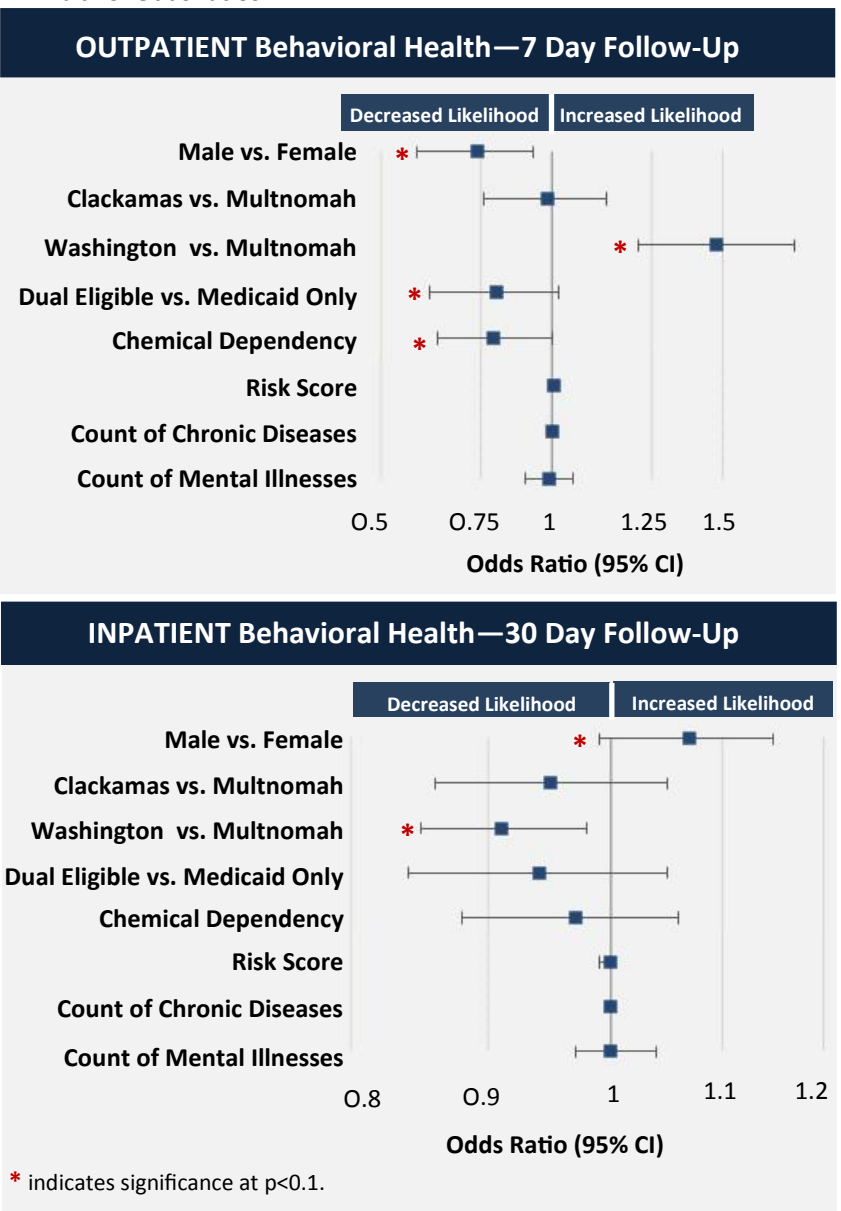
OUTPATIENT BEHAVIORAL HEALTH: The goal of the ITT program was to connect patients with outpatient behavioral health care. Results of the multivariate regression identified several factors that impact having an outpatient behavioral health visit 7 days after engaging with ITT (Exhibit 13). Male clients, individuals that were chemically dependent, and dual eligible clients were significantly less likely to have 7 day follow-up with outpatient behavioral health. Participating in ITT in Washington County dramatically increased the likelihood of having a follow-up visit compared to the other counties. Interestingly, factors related to health status including risk score, count of chronic diseases, and count of mental illnesses did not influence 7 day outpatient behavioral health follow-up.

Inpatient Behavioral Health: The goal of the ITT program was to reduce inpatient behavioral health readmissions. Results of the multivariate regression show that participation in the ITT program in Washington county significantly decreased the likelihood of having an inpatient behavioral health readmission within 30 days of enrolling with ITT. Males had a significantly increased likelihood of having an inpatient behavioral health admission within 30 days (Exhibit 13).

BOTTOM LINE

We found that being male, having chemical dependency, and being dual Medicare-Medicaid status negatively impacted whether a ITT client has a 7 day outpatient behavioral health appointment. We also found that being male increased your likelihood of having an inpatient mental health readmission within 30 days. Washington county was highly influential in increasing a client's likelihood of having an outpatient behavioral health care visit and reducing the likelihood of having an inpatient behavioral health readmission.

Exhibit 13. Odds ratios



CONCLUSIONS

PROGRAM & STUDY GOALS

The goals of the ITT program are to provide hospital-to-home transitional support services that enable psychiatric patients to connect with needed outpatient care and to avoid subsequent inpatient readmissions. We used a pre-post comparative design to assess the impact of the ITT program on two main types of outcomes: utilization of health services, such as outpatient primary care and mental health visits, and medical costs.

PROGRAM IMPACTS

PROGRAM DATA: We found the ITT workers had frequent interactions or “program touches” with the ITT clients during their 30 day engagement period. The clients that ITT served were highly complex patients with multiple mental health issues and chronic health problems. The rates of mental illness among ITT clients were substantially greater than in the typical Medicaid population—in some cases as high as 20 times the average. Taken together, this data indicates that, as intended, the ITT program serves highly medically complex patients with a high degree of mental illness.

UTILIZATION: We assessed the utilization for several domains of outpatient and inpatient care following enrollment with ITT. We found that, across all counties, ITT clients had increased number of outpatient services including primary care and mental health in the year following enrollment compared to prior. In Clackamas county, this connection was further enhanced for clients that also worked with a Peers Support Specialist. Further, we also found that ITT clients in two of the three counties had reduced inpatient mental health and physical health readmissions. This data suggests that the ITT program connected their clients with outpatient care and managed to reduce readmissions for their highly complex clients.

COST: We evaluated the medical cost by health care domain in the year following enrollment with ITT compared to prior. We found that costs for outpatient services typically went up while costs for inpatient services went down. In particular, costs for inpatient mental health care in Multnomah and Washington counties went down by 37% and 71%, respectively, which represents an average cost savings between \$100.00 and \$300.00 dollars per client per month. Importantly, the changes in cost reflect the changes in utilization, suggesting that costs represent the difference in the number of services utilized.

OPTIMAL IMPACT ANALYSIS: As the major goal of the program was to link clients to outpatient mental health care and to reduce inpatient mental health readmissions, we evaluated which key variables influence the likelihood of these outcomes. We found that, within 7 days of enrollment, men, clients that were chemically dependent, and dual Medicare-Medicaid clients were less likely to

have a outpatient mental health visit while clients in Washington county were more likely to have an outpatient mental health visit. For inpatient mental health readmissions, we found that clients in Washington county had decreased likelihood of having a readmission within 30 days while men had an increased likelihood.

IMPLICATIONS

This data demonstrates that, overall, the ITT intervention is meeting its goal of connecting clients with outpatient care while simultaneously reducing inpatient readmissions. This is consistent with previous research on other interventions aimed at patients with mental illness (2,3), but, to our knowledge, ITT is the first program that is specifically focused on the Medicaid population and therefore targets patients that are not only mentally ill, but also have substantial socioeconomic challenges. Our analysis also revealed that the ITT program worked better for certain clients; in particular, we found that men and clients that are chemically dependent were less likely to have outpatient mental health follow-up, suggesting that these clients may need additional interventions to improve their outcomes. Finally, we found that clients in Washington county had increased likelihood of having both increased outpatient mental health connection and reduced inpatient mental health readmissions. Thus, it may be productive to assess Washington county’s program protocols compared to the other counties to identify potential key learnings for program improvement.

LIMITATIONS

This study utilized with-in group comparison instead of having a propensity-matched control group. The lack of a control group makes it unclear whether the results were specifically due to the ITT program itself, or if the changes represent a natural regression to the mean that would have been observed in the absence of the program. However, in the absence of a randomized control trial, it is difficult to obtain an adequate control group for such a complex population.

BOTTOM LINE

Results from this study suggest that ITT connected their highly complex psychiatric patients with outpatient health services and reduced inpatient readmissions. The changes in utilization are reflected in changes in medical costs, and may represent substantial savings in inpatient care. These results are consistent with the program’s goals and suggest that the ITT program is a successful transitional care intervention for Medicaid patients with a high level of mental health needs.