

Adult Psychiatric Inpatient Capacity Demand Analysis for the State of Vermont

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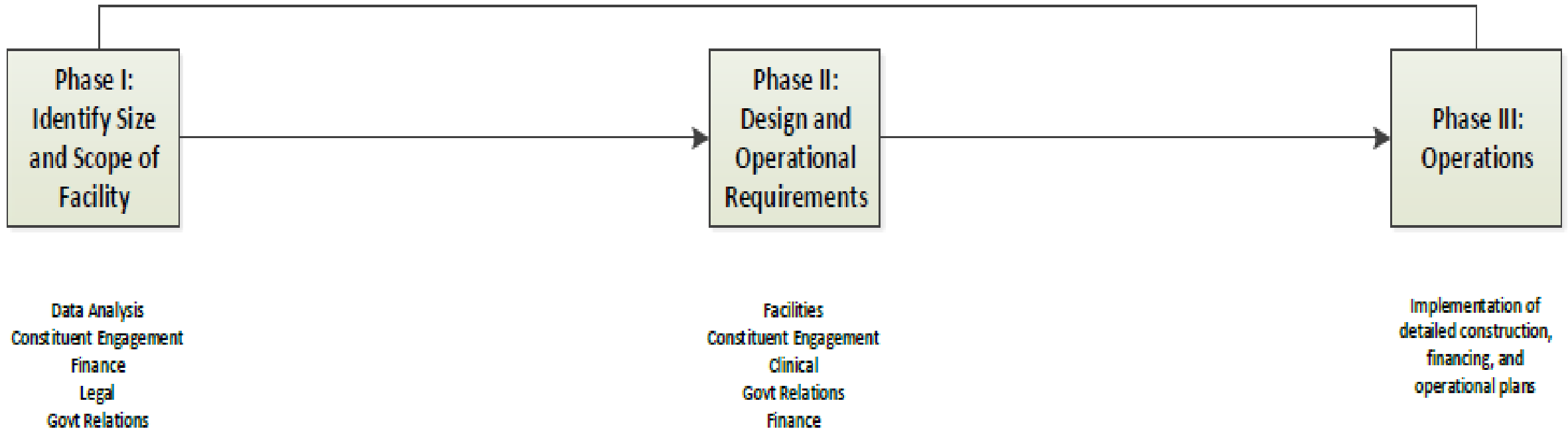
Background

- 2017 Legislative Session: Growing concerns related to mental health care
 - Future of Medicaid funding for VPCH and Brattleboro Retreat (“IMD Issue”)
 - Increasing wait times for mental health patients in EDs
- Spring 2018: Green Mountain Care Board Budget Meetings
 - UVMHC unbudgeted Net Patient Revenue \$21M
 - GMCB Order:
 - Invest \$21M to “measurably increase inpatient mental health capacity in Vermont”
 - Build in 3-4 years
 - July update: CVMC location, focus on adult IP need
- Sept. 2018: UVM Health Network Mental Health Strategic Plan

Inpatient Mental Health Facility Planning

- Design and create a UVM Health Network inpatient psychiatric facility/unit on the Central Vermont Medical Center Campus that will substantially improve access to inpatient mental health care as part of an integrated system of care in Vermont.
- Anchor planning in data-driven, evidence-based process.
- Create opportunities to share information publicly, including community forums, legislative briefings, media relations, public reporting, etc.

Psychiatric Inpatient Capacity (PIC) Planning Process



Psychiatric Inpatient Planning Stakeholders (PIPS)

Committee Charge and Purpose

Provide a forum for interested stakeholder input to inform the psychiatric inpatient expansion planning process underway at UVMHN- Central Vermont Medical Center.

PIPS will serve as a consistent forum for stakeholder engagement throughout the planning process.

PIPS will convene quarterly throughout the three primary phases of planning.

****Charter and membership distributed**

Commitment to Community Engagement

Quarter 1 -- PIC Engagement, Outreach, and Communications 7/1/18 – 9/30/2018

Date	Tactic	Audiences
9/6/2018	Presentation: PIC Modeling Analysis	Internal Sub-group preliminary
9/6/2018	Presentation: PIC Overview	Community Collaborative
9/7/2018	Presentation: PIC Modeling Analysis	Full internal group review
9/17/2018	Presentation: PIC Modeling Analysis	PIC Steering Committee
9/18/2018	Presentation: PIC Overview	BOT Planning
9/19/2018	Presentation: PIC Modeling Analysis	THRIVE: Barre
9/24/2018	Presentation: PIC Modeling Analysis	DMH
9/26/2018	Presentation: PIC Modeling Analysis	Network Board Planning
9/27/2019	PIPS Meeting	Community Stakeholders Group

Quarter 2 -- PIC Engagement, Outreach, and Communications 10/1/18 - 12/31/2018

Date	Tactic	Audiences
10/4/2018	Presentation: PIC Modeling Analysis	Community Collaborative
10/5/2018	GMCB Meeting	Green Mountain Care Board and Staff
10/12/2018	Presentation: PIC Modeling Analysis	VAHHS Board meeting
10/12/2018	Presentation: PIC Modeling Analysis	VAHHS CMO Meeting
10/15/2018	Presentation: PIC Modeling Analysis	Howard Center (Catherine Simonsen and Charlotte McCorkel)
10/15/2018	GMCB Report Distribution	A) Green Mountain Care Board
10/16/2018	PIC overview	Program Quality Meeting
10/16/2018	CVMC Community Town Hall	CVMC key influencers and public
10/22/2018	VT Digger Request for a quote	Media
10/23/2018	Bob Bick: Invite to next PIPs and copy of GMCB Report	
10/23/2018	Presentation: PIPs Follow-up Deep Dive	Anna Donnahue, Ward Nial and Dan Towle
10/25/2018	GMCB Report Distribution	PIPs Committee; UVMCMC Program Quality Committee
10/25/2018	AHS Update to HROC[1]	Health Reform Oversight Committee and friends
10/26/2018	Meeting with Legislators	Representatives Houghton and Jickling
10/31/2018	CVMC Newsletter: Centerpost	Internal: CVMC Staff and Providers
10/31/2018	CVMC Email from President	Internal: CVMC Staff and Providers
11/2/2018	CVMC Employee Forums	Internal: CVMC staff and providers
11/6/2018	Meeting with Al Gobeille	
11/15/2018	IMD Report – Solutions	Vermont House and Senate Committees of Jurisdiction
11/27/2018	Legislative Update	Rep. Mary Hooper
11/28/2018	GMCB Hearing	Green Mountain Care Board
12/1/2018	CVMC Med Staff Email	Internal: CVMC Providers AHS Secretary and key staff (Al Gobeille, Michael Costa, Ena Backus, Cory Gustafson,
12/5/2018	AHS Meeting	
12/20/2018	Inpatient Psych Presentation	Vermont Medical Society
12/20/2018	PIPS Meeting	Community Stakeholders Group

Phase I: Data Analysis

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Analysis Scope

Objective:

Estimate the number of additional beds needed for adult inpatient psychiatry, focusing particularly on the problem of psychiatric patients waiting in EDs statewide for bed placement

Key Assumption:

Currently existing adult inpatient bed capacity across the state remains in place (i.e., IMD issue for VPCH, Brattleboro Retreat is set aside while quantifying the incremental bed requirement issue)

Data Sources, Date Ranges, Acknowledgements

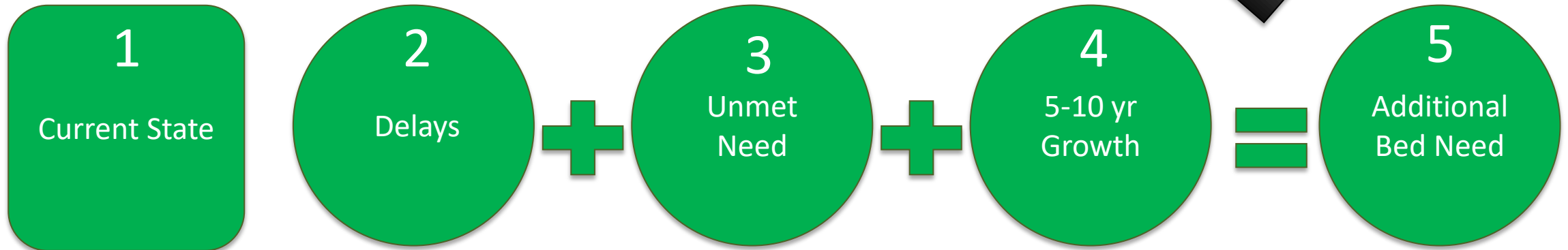
Data Sources	Date Range
VUHDDS Data Set	CY 2017
VAHHS IP Psychiatric Capacity Analysis Summary Data (via DUA with VAHHS, Halsa, UVMHN)	Sept. 2017 – Feb. 2018
UVMHC and CVMC Internal Data	May 2017 – April 2018

- Acknowledgements
 - UVMHN Work Group and PIC Steering Committee
 - Halsa Advisors: Kristin Anderson, Scott Walters
 - VAHHS: Devon Green, Sean Judge, Mike Del Trecco

Estimate of Additional Adult Bed Need



Presentation: 5 Segments



Adult IP Psych Capacity: Current State



- 137 Adult IP Psych Beds today:
 - 45 Level One
 - 92 General IP Psych
 - 6 Locations: VPCH, Brattleboro Retreat, Rutland, Springfield, CVMC, UVMMC
- 95% or higher occupancy, 100% for Level 1 Beds (DMH reports, June 2018)
- Increase in patient acuity driving longer average length of stay (ALOS)
- Constrained to meet mental health needs for additional patients

46% (63 beds) under
IMD reimbursement

Hospital	Mental Health Inpatient Discharges (MDC = 19)								
	Discharges			Total Patient Days			ALOS		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
CVMC	379	370	408	4,013	3,979	4,572	10.6	10.8	11.2
Rutland	583	486	523	7,381	6,340	6,239	12.7	13.0	11.9
Springfield	357	329	322	2,383	2,700	2,349	6.7	8.2	7.3
UVMMC	502	497	530	8,599	8,859	10,750	17.1	17.8	20.3
Total	1,821	1,682	1,783	22,376	21,878	23,910	12.3	13.0	13.4

VAHHS Mental
Health Data:
ALOS = 23 days for
discharged patients,
151 days for non-
discharged patients



ED: Significant increase in mental health patients needing beyond-emergent care

- 42% increase in number of long stay ED patients
- ED volumes and wait times increase to critical levels
- VAHHS: ED days increasing by 29% per yr, excess days driving change at 47% per yr
CY 2015 – CY 2017

Hospital	Total Outpatient ED Discharges		Long Stays (2+ Midnights)			Average Midnight Census		
	2016	2017	2016	2017	Change	2016	2017	Change
Brattleboro	1,040	1,160	59	72	22%	1.8	1.9	6%
CVMC	1,199	1,199	63	107	70%	1.5	2.0	33%
Rutland	1,738	1,667	95	91	-4%	2.4	2.3	-4%
Southwest	972	1,007	93	110	18%	1.7	2.2	34%
Springfield	735	803	49	66	35%	1.2	1.5	24%
UVMHC	3,438	3,551	149	277	86%	3.9	5.6	45%
Total	9,122	9,387	508	723	42%	12.5	15.6	25%

Hospital	Number of ED Patients Waiting		Avg. Wait Time	
	12-28 Hours	28+ Hours	for Admission	for Transfer
Porter	18	9		41 hours
CVMC	120	112	14 hours	72 hours
UVMHC	579	598	49 hours	71 hours

Data Sources: Porter: CY 2017 data, CVMC & UVMHC: Internal data May 2017-April 2018

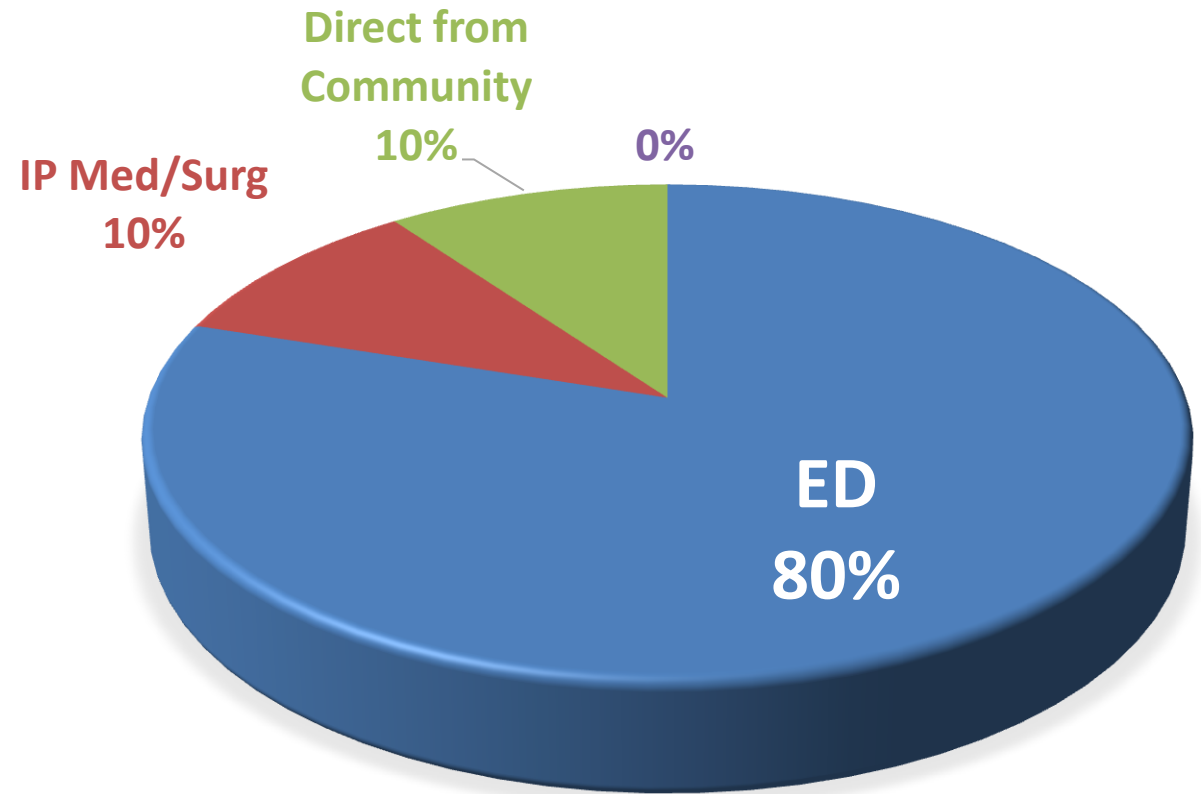
Adult Inpatient Psychiatric Patients: Sources



ED

IP
Med/Surg
Bed

Direct
Admit from
Community



UVMMC Adult IP Psych Patients May 2017-April 2018

2017 Data: Adult Psych Patients in EDs a Challenge for All VT Hospitals

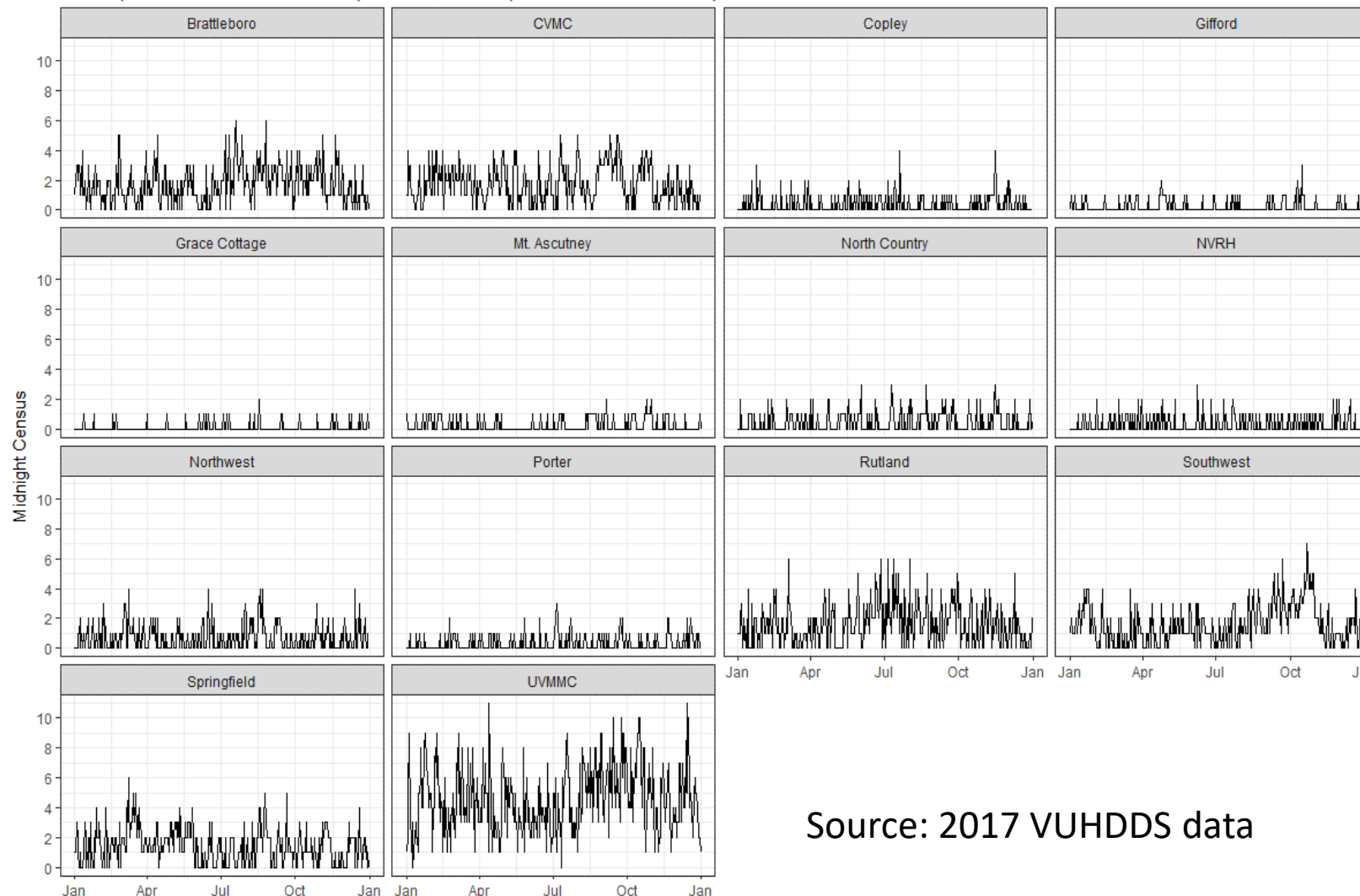


- Often at least one psych patient at any ED around VT at midnight

Important Note: because outpatient ED data excludes those admitted to inpatient psych at same hospital, these graphs understate the reality at Rutland, Springfield, CVMC, UVMHC

Outpatient ED – Patients with a Primary Mental Health Diagnosis Present at Midnight

Includes patients transferred elsewhere for inpatient care, excludes patients admitted to same hospital. Source: VUHDDS 2017 OP Data Set



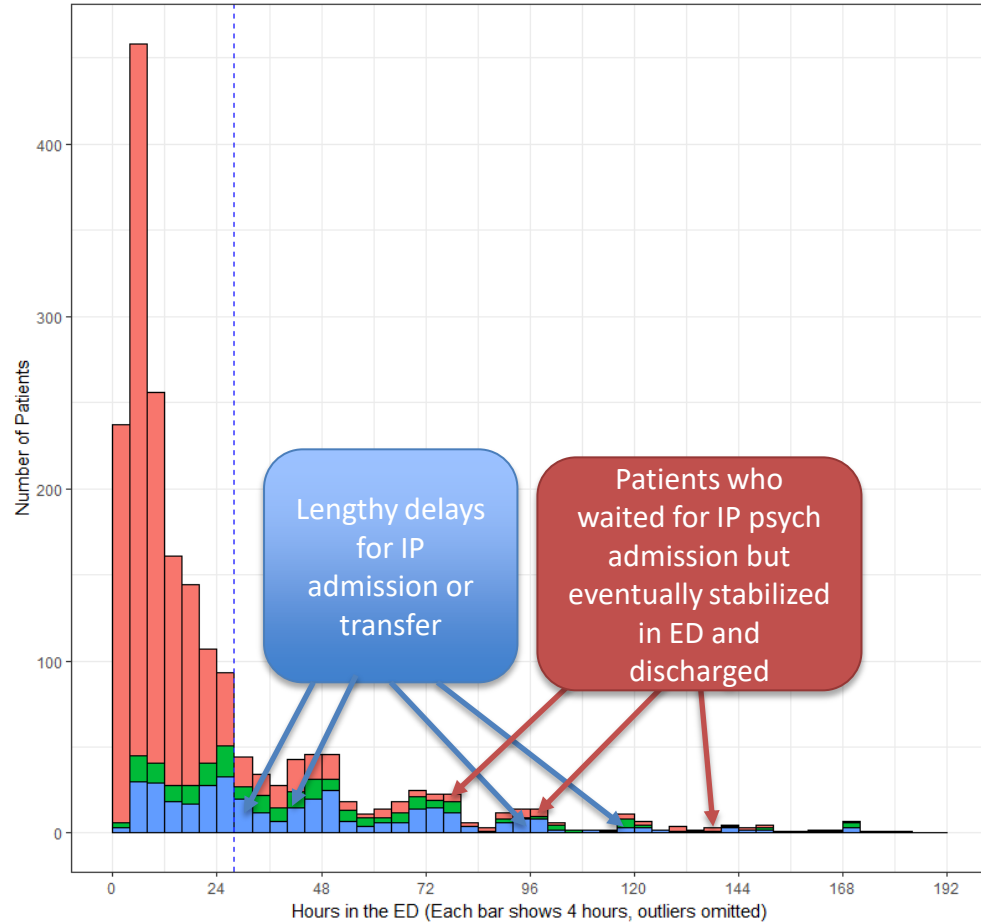
Source: 2017 VUHDDS data

ED Psych Patient Volumes High, Significant Number of Longer Stays



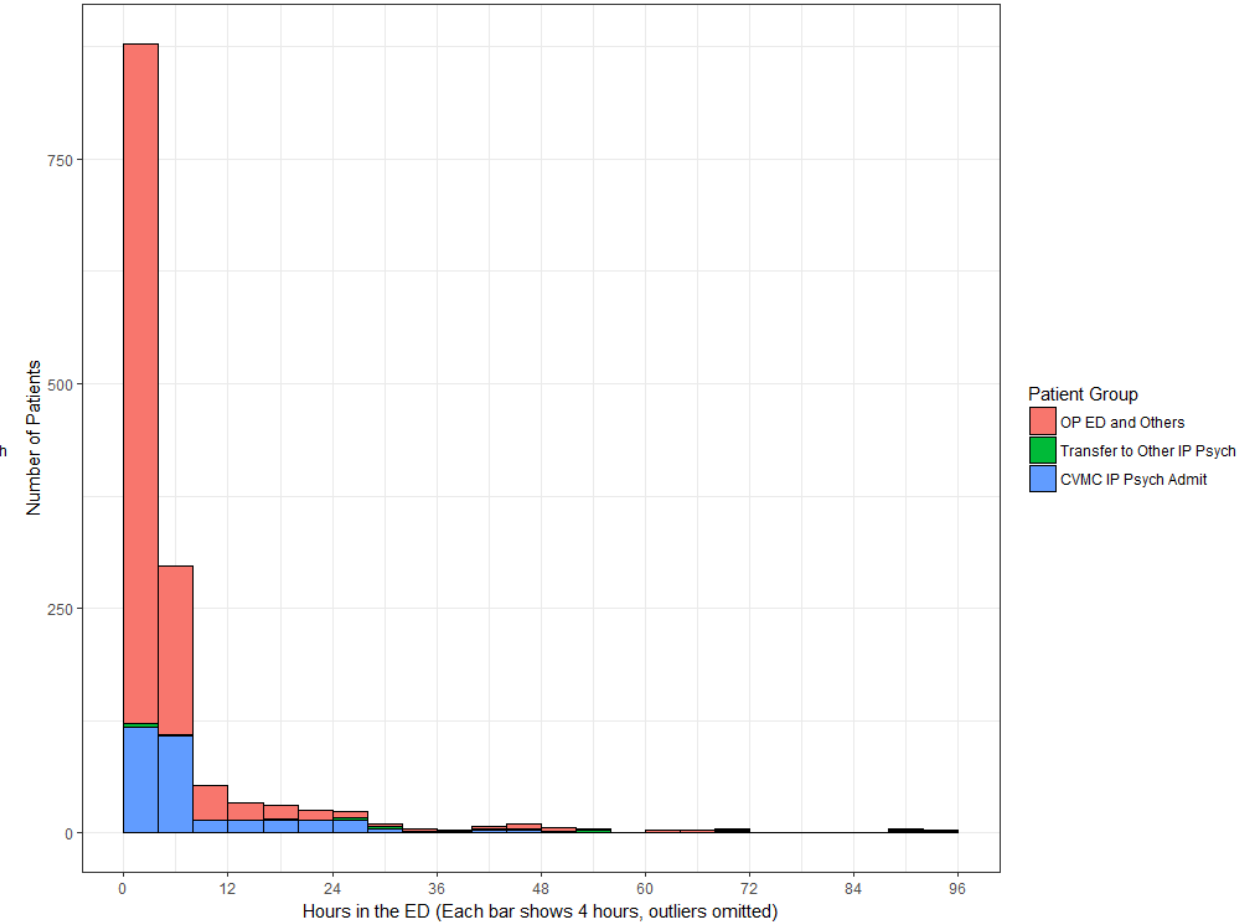
UVMHC Adult Psych Patient Wait Times in the ED

Patients Arriving between May 2017 and April 2018



CVMC Adult Psych Patient Wait Times in the ED

Patients Arriving between May 2017 and April 2018

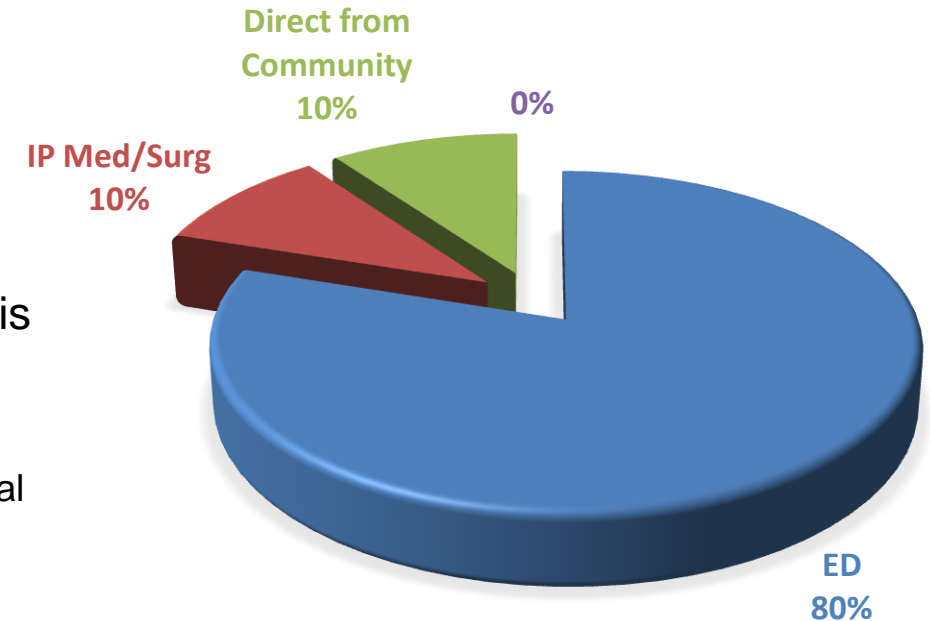


Note: while outliers are not shown on the graphs above for improved readability, models and simulations include all patients, including outliers.

How much need do Med/Surg transfers and community admits add?



- Some patients who present with both medical and psychiatric diagnoses are treated first in med/surg, then transfer to inpatient psychiatry when they are stable.
 - UMVHN providers report delays in transferring patients to psychiatry due to bed availability. Patients are treated for their psychiatric condition on med/surg, but belong in IP psychiatry.
- Quantifying the magnitude of the problem assumes patients should have experienced at least the average length of stay for their diagnosis
 - Not many patients appear to have had excess time (13 IP med/surg transfers identified)
 - Only a part of their total LOS should have been on a psych unit
 - Increases IP Psych need only a little because only a small amount of incremental psych days are added
- Validation using Psych consult service data in process
- Direct admits from the community are not included on the assumption that they are unlikely to go without inpatient treatment
 - Patients who wait for care but are ultimately admitted are not *incremental* patients...they are served at the wrong time, but they receive services
 - Patients who can safely wait in the community are less likely to leave the wait list



Additional Adult IP Psych Bed Need: Our Approach

What is the number of additional beds to address the needs of adult patients needing IP psychiatric care?

- Timely placement in IP Psych bed
- Include impact of forecasted growth for next 5-10 yrs





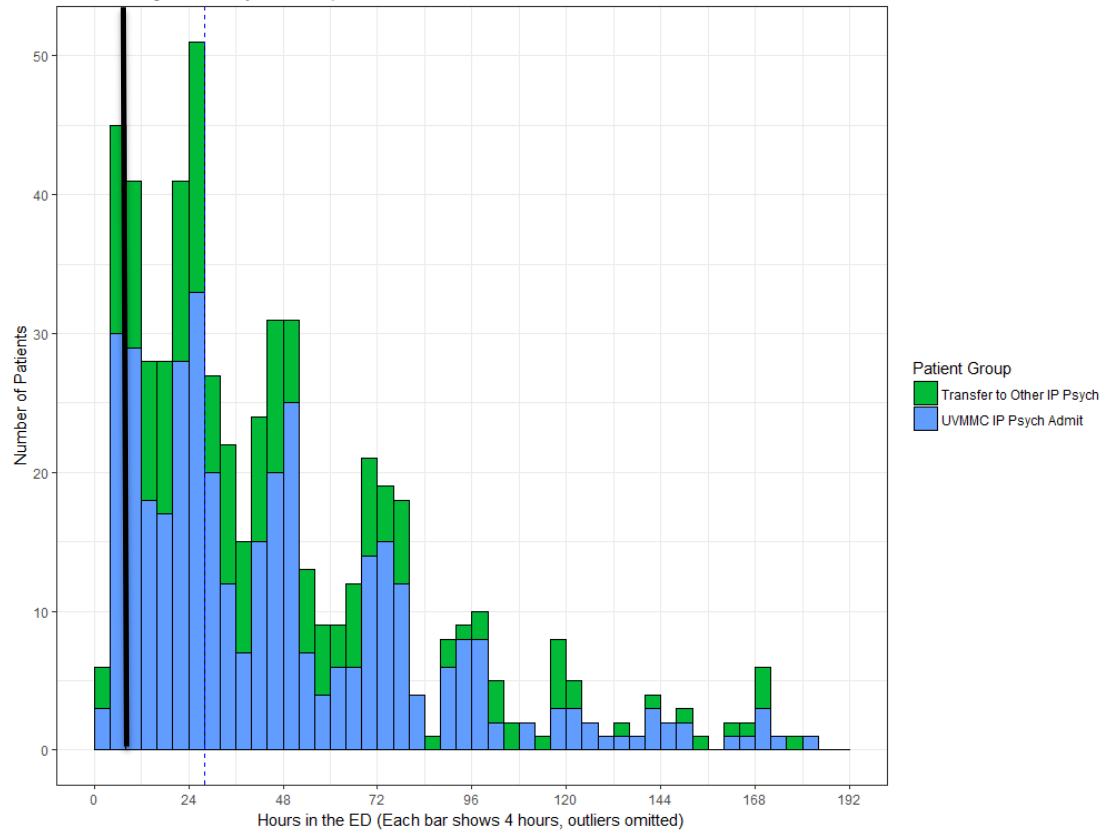
UVMMC and CVMC Data:

Many patients who were admitted had to wait days in the ED first

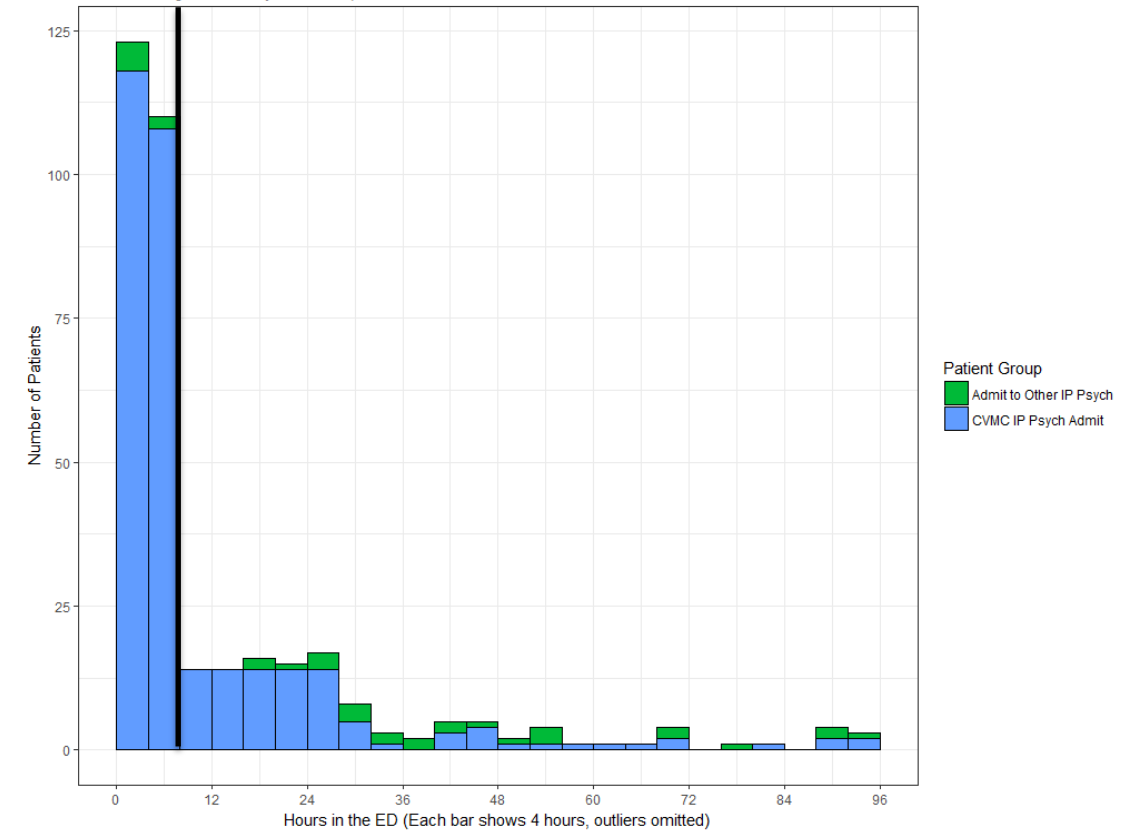


- Use internal UVMMC and CVMC data to connect ED stay with IP Psych stay
- Use to develop delay models for same-hospital admit delays, transfer delays

UVMMC Adult Psych Patient Wait Times in the ED
Patients Arriving Between May 2017 and April 2018



CVMC Adult Psych Patient Wait Times in the ED
Patients Arriving between May 2017 and April 2018

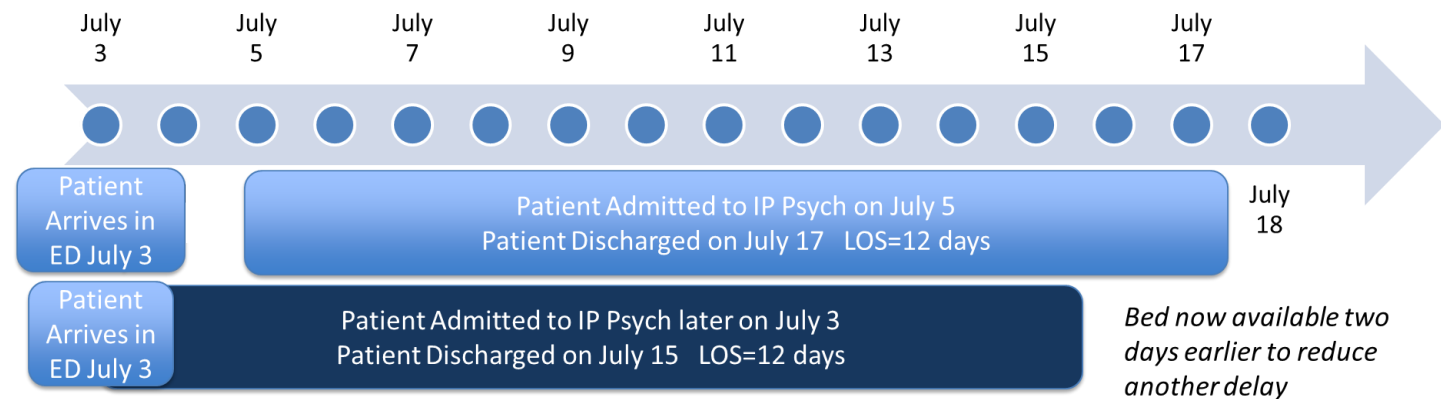


Problem 1: How many additional beds to reduce delays?



Example: Patient arrived at ED on 7/3, was admitted to IP psych on 7/5, discharged from IP psych on 7/17

- Patient received 12 inpatient psychiatric bed days
- Without wait time, patient would have been admitted on 7/3, discharged on 7/15 – still 12 days
- Patient discharges from IP Psych two days sooner, so bed now available two days earlier for next waiting patient



Planning Assumption: Actual patient IP LOS should not be adjusted to include ED wait time when we model patient IP stay beginning at ED arrival. We assume total IP psych bed days needed does not change because patient is not receiving fully effective treatment in the ED.



Results from Delay Models: 5-9 Beds Needed

IP Admit Delay Model: Add'l Need

UVMHC	1 - 3 beds
CVMC	0.5 bed
<i>Rutland est</i>	0.5 bed
<i>Springfield est</i>	0.5 bed

Total 3 - 4 beds

Transfer Model: Additional Need

Total Statewide Need: 2 – 5 beds

Model Totals: 5 -9 beds

To reduce ED wait time to 8 hrs or less for patients who were admitted for IP Psych care

- **IP Admission Delays Model**

- Take actual IP admissions
- Admit on arrival ≤ 8 hr
- Discharge after actual LOS
- Move PT who can't be admitted w/o wait to new bed need

- **Transfer Delays Model**

- Similar approach to above
- Model statewide for all EDs
- Includes additional capacity needed at VPCH, Brattleboro Retreat
- Estimated LOS based on VAHHS IP Psych LOS Data (all patients)

5-9 Beds Needed to Address Delays for Patients Admitted or Transferred

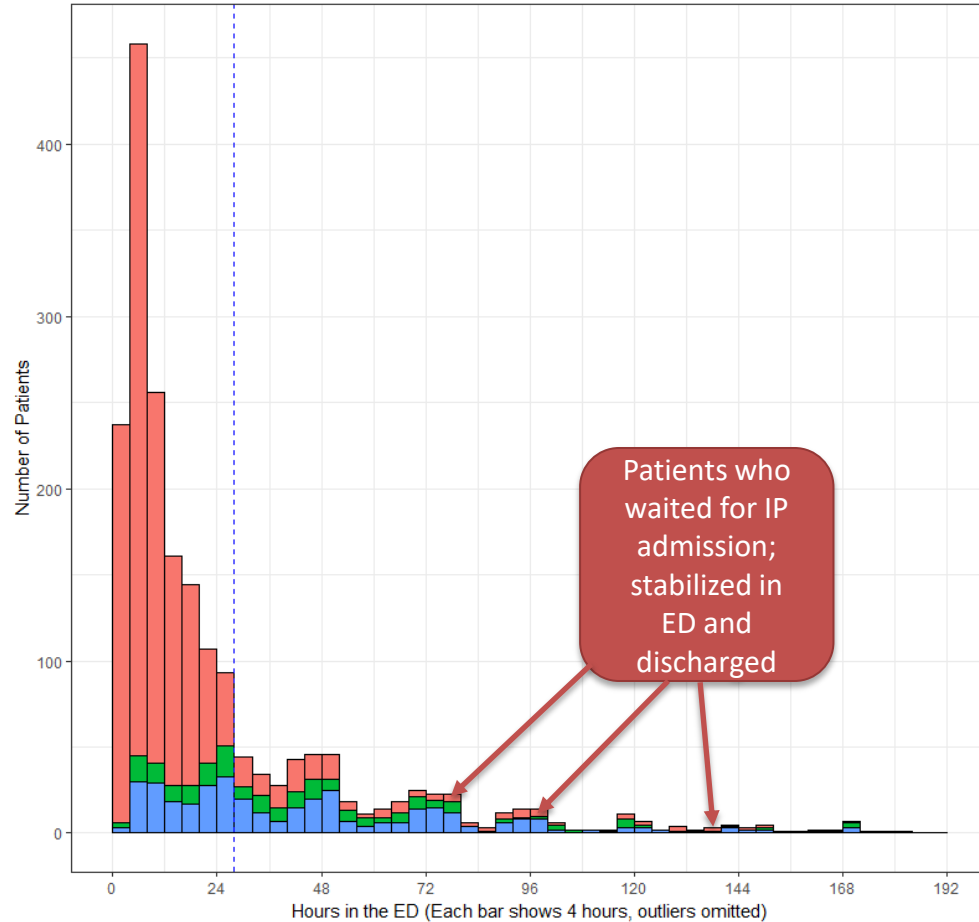


ED Psych Patient Volumes High, Significant Number of Longer Stays



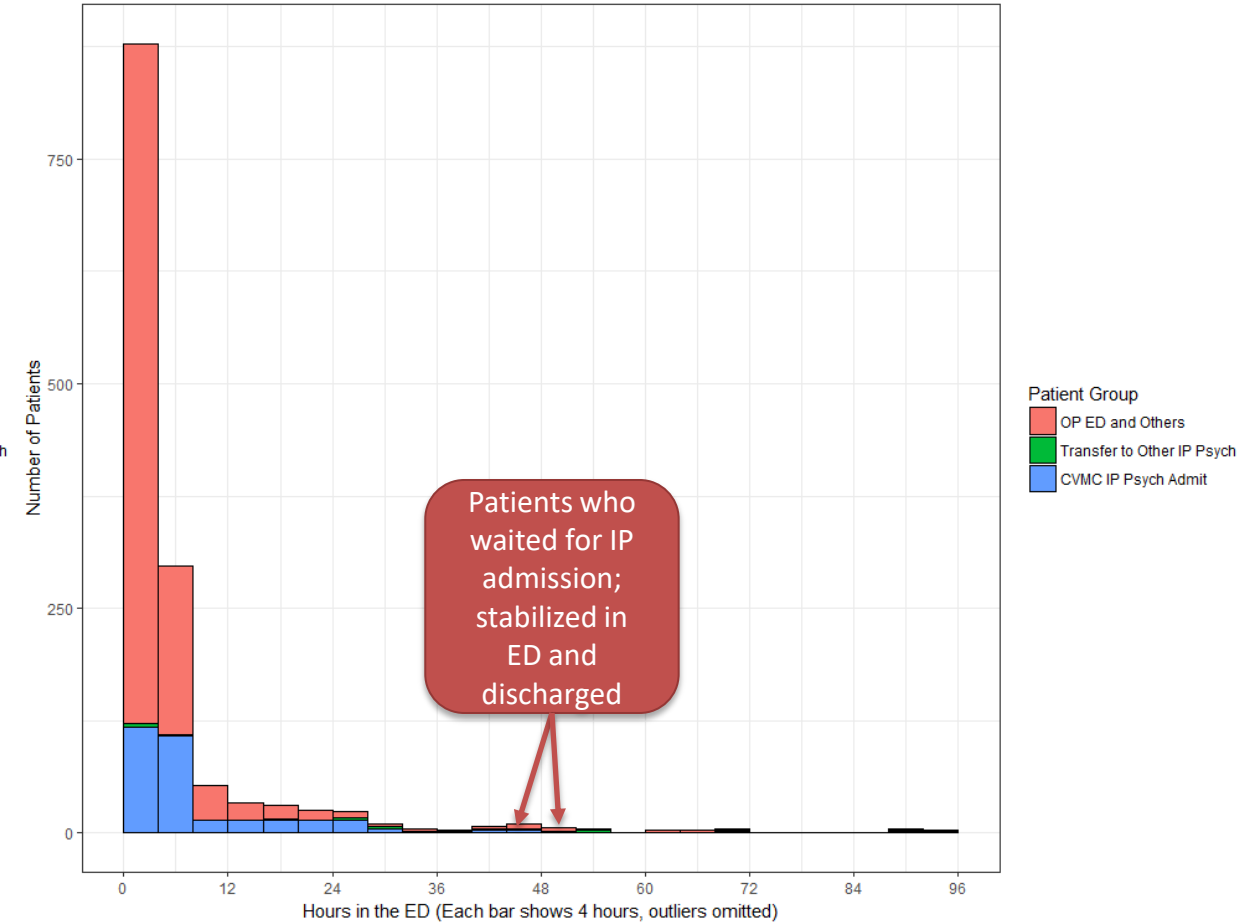
UVMHC Adult Psych Patient Wait Times in the ED

Patients Arriving between May 2017 and April 2018



CVMC Adult Psych Patient Wait Times in the ED

Patients Arriving between May 2017 and April 2018



Problem 2: How many additional beds for ED patients never admitted



Current State Findings:

Our EDs are the appropriate place to provide mental health emergent care, as they do for other emergent medical conditions.

- Some patients need a safe place to recover during a brief acute crisis and then can safely go home
- Many patients assessed by psychiatry are not indicated for inpatient care (but rather for outpatient placements, residential treatment, etc.)

Some patients who left the ED after an extended stay may have benefited from inpatient treatment, but either left because the wait for a bed was too long, or they were treated and stabilized in the ED to enable them to go home.

- *These are patients we need to solve for with additional inpatient capacity*

Problem 2: How many additional beds for ED patients never admitted



How many more patients should have been admitted?

“Gold standard” is a chart review for all patients waiting in the ED.

- ✓ Patient had a psychiatric assessment completed
- ✓ Patient was indicated for admission to an inpatient psychiatry unit

Completing thousands of chart reviews for everyone with a mental health diagnosis who left the ED without admission is a practical impossibility.

How many more patients should have been admitted (continued)?

In UVMMC’s chart review sample data, ED LOS for mental health conditions is strongly correlated with eventual admission

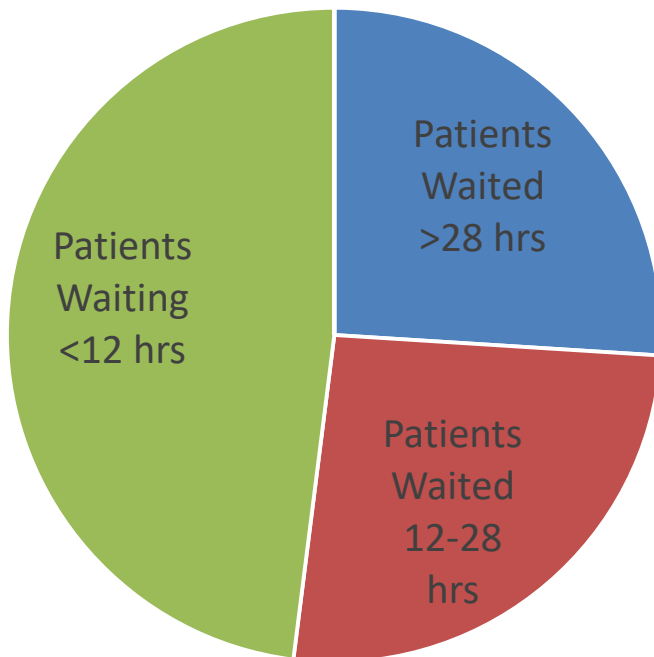
- Almost all (69%) patients who waited in the ED for >28 hours were eventually admitted to a hospital in the State (not necessarily to UVMMC).
 - *The analysis assumes that **all** of these patients were indicated for inpatient psychiatry*
- Almost all (85%) patients who stayed in the ED for <12 hours were eventually discharged without admission
 - *The analysis assumes that **none** of these patients were indicated for inpatient psychiatry*

Planning Assumptions

Based on Analysis of UVMMC ED Data



Patients with Psych Assessment
Discharged from ED



ED patients with mental health evaluations discharged from the ED

1. Those who waited >28 hours

- For most patients in this group, ED LOS is comparable to low-acuity IP stay LOS
- Would have been admitted to IP Psych or transferred if a bed was available

Include 100% of these patients in unmet need

2. Those who waited between 12 and 28 hours

- Chart review of sample indicated that approx. 20% of these patients were recommended for IP psychiatric care
- These 20% would have been admitted to IP Psych or transferred if bed available
- The remaining 80% of these patients would still be treated in the ED

Include 20% of these patients in unmet need

3. Those who waited 12 hours or less*

- Assumed that these patients received appropriate ED care for their mental health condition

Exclude these patients

*Does not include patients in the ED who did not receive a psych assessment

617 Additional IP Psych Patients from EDs across VT in 12 month period



Hospital	Data Source	ED Wait Time		Total
		28 + Hours ¹	12-28 Hours ²	
UVMHC	Internal Data - May	160	59	219
CVMC	2017-April 2018	33	8	41
Porter	VUHHDS 2017 Outpatient Data (Data collected by VAHHS)	9	3	12
Brattleboro		38	19	57
Rutland		55	51	106
Southwest		47	17	64
Springfield		36	13	49
Other VT Hospitals		46	23	69
Total		424	193	617

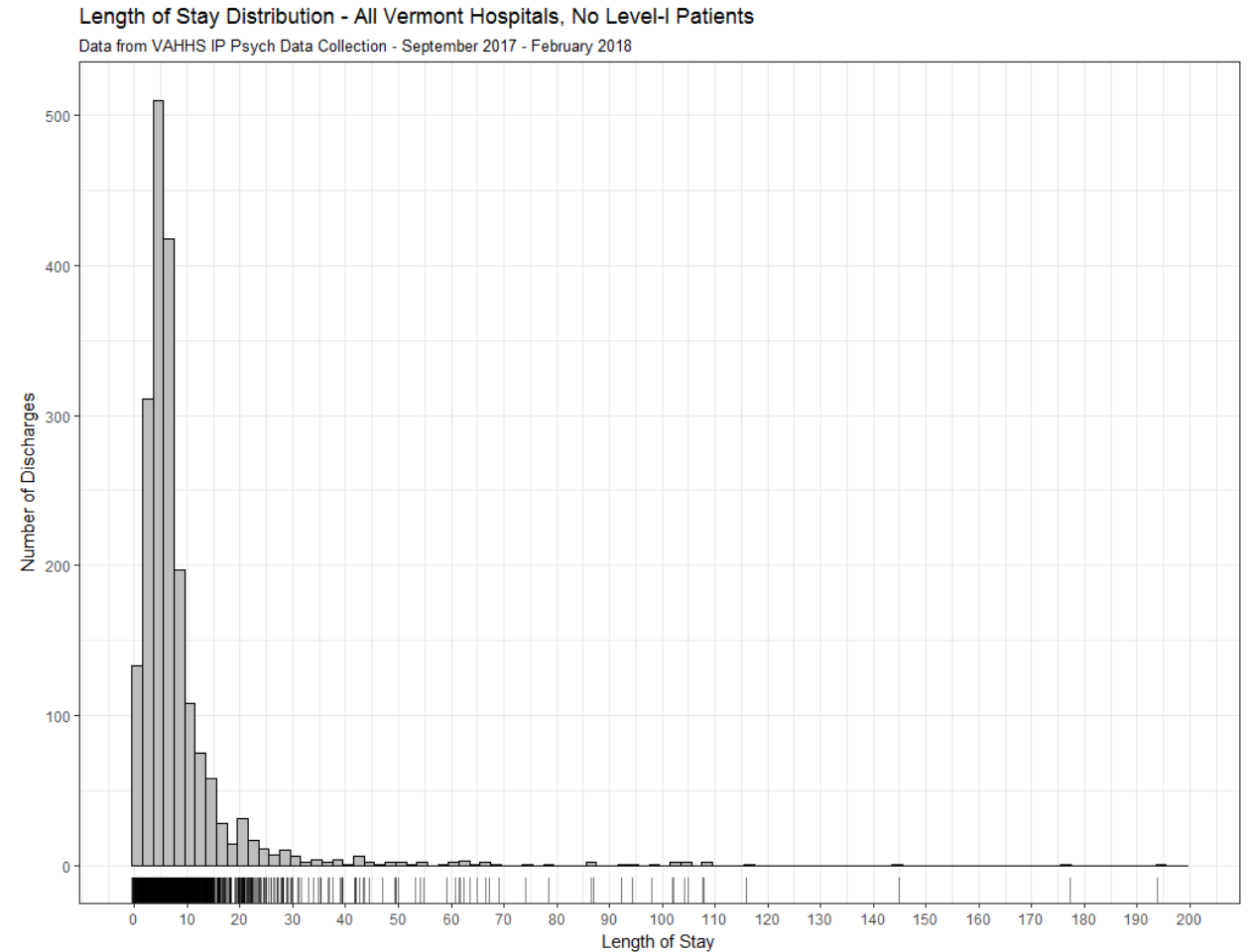
¹ 100% of all patients waiting 28 hrs or more

² Approximately 20% of all ED psych patients who waited in the 12-28 hr range

How long would these additional patients have stayed in an IP Psych bed?



- Assumed length of stay
 - VAHHS IP Psych data for non- Level 1 patients
 - LOS range: 0 -194 days
 - ALOS = 8.4 days
- Simulations randomly select from this distribution rather than using ALOS to better imitate reality

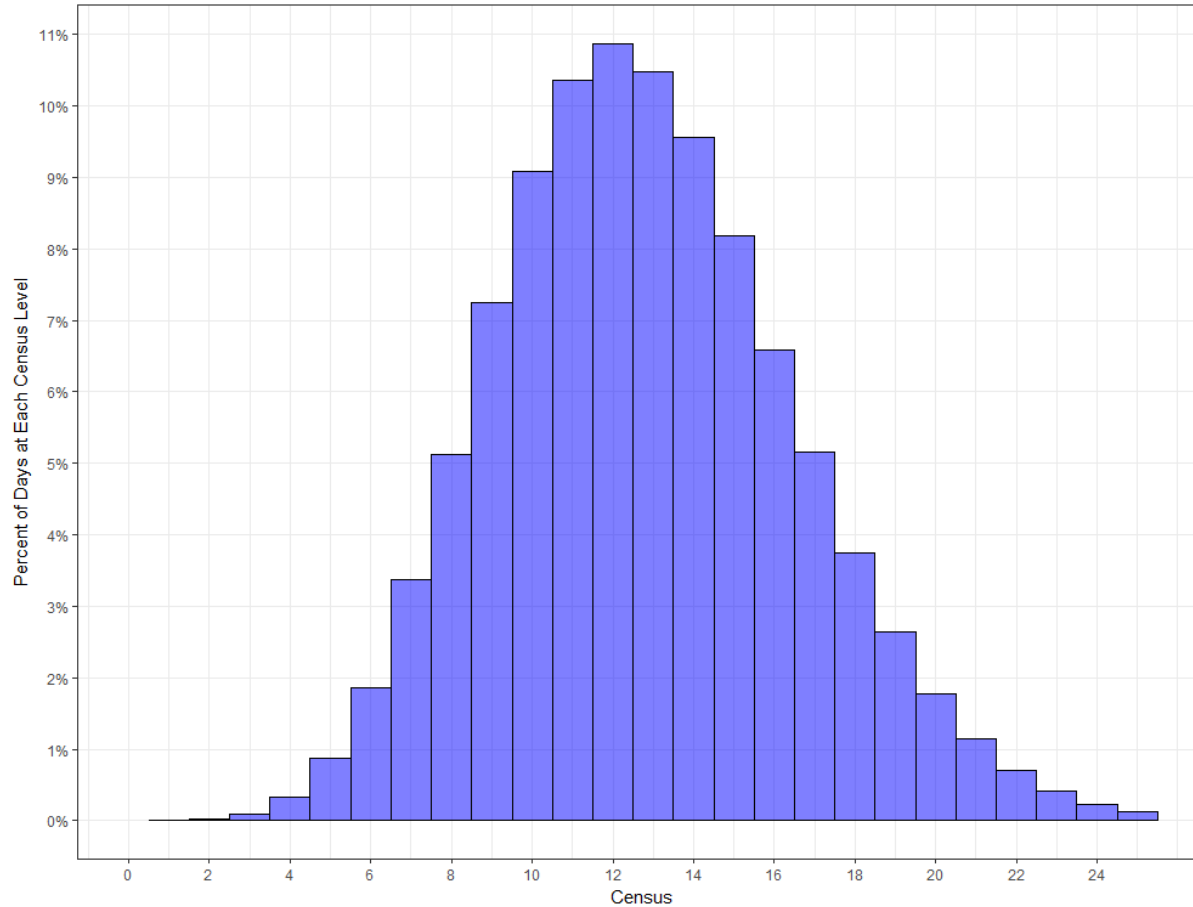


Additional Census Distribution: 1000 Simulations



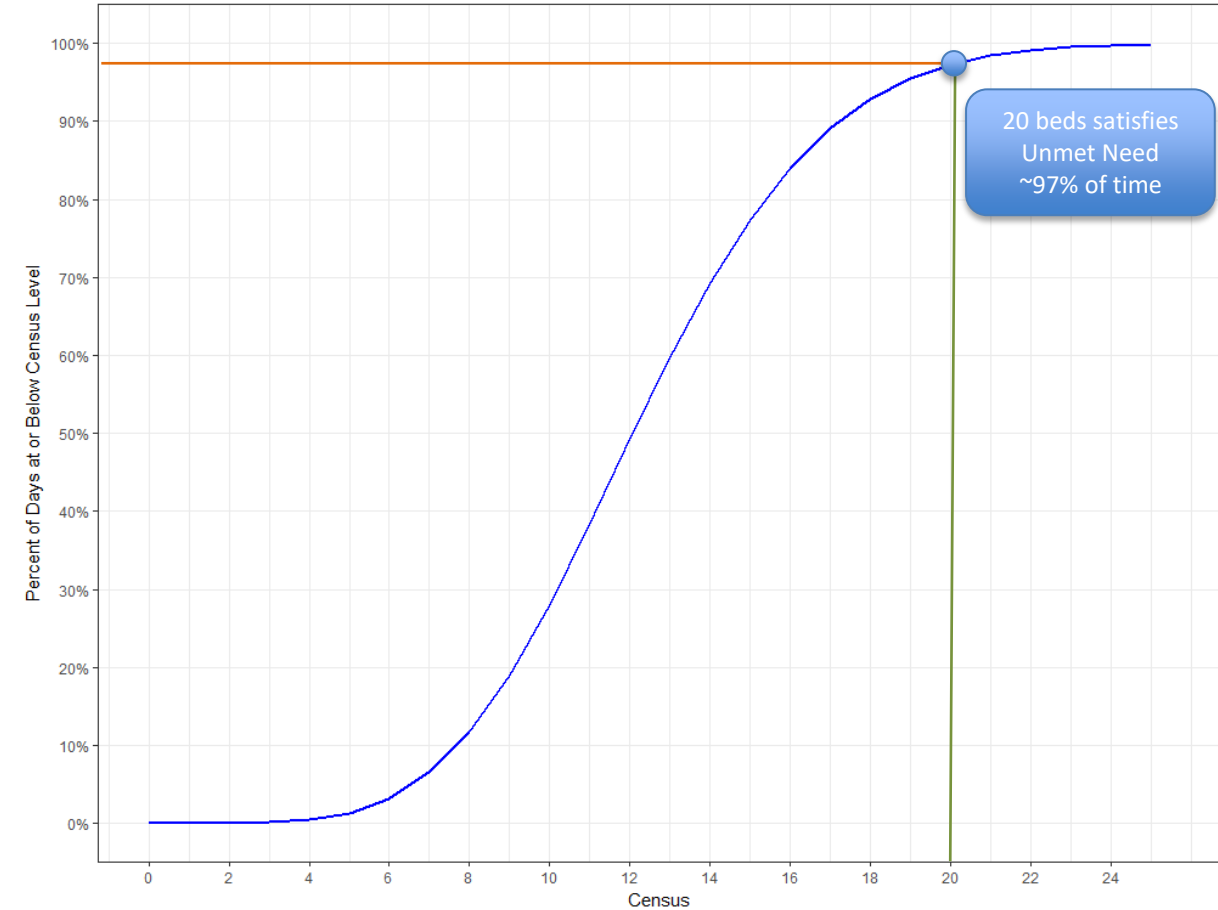
Full State Distribution of Additional Need - Patients Not Currently Admitted

New Census Histogram - LOS excludes Level I Beds



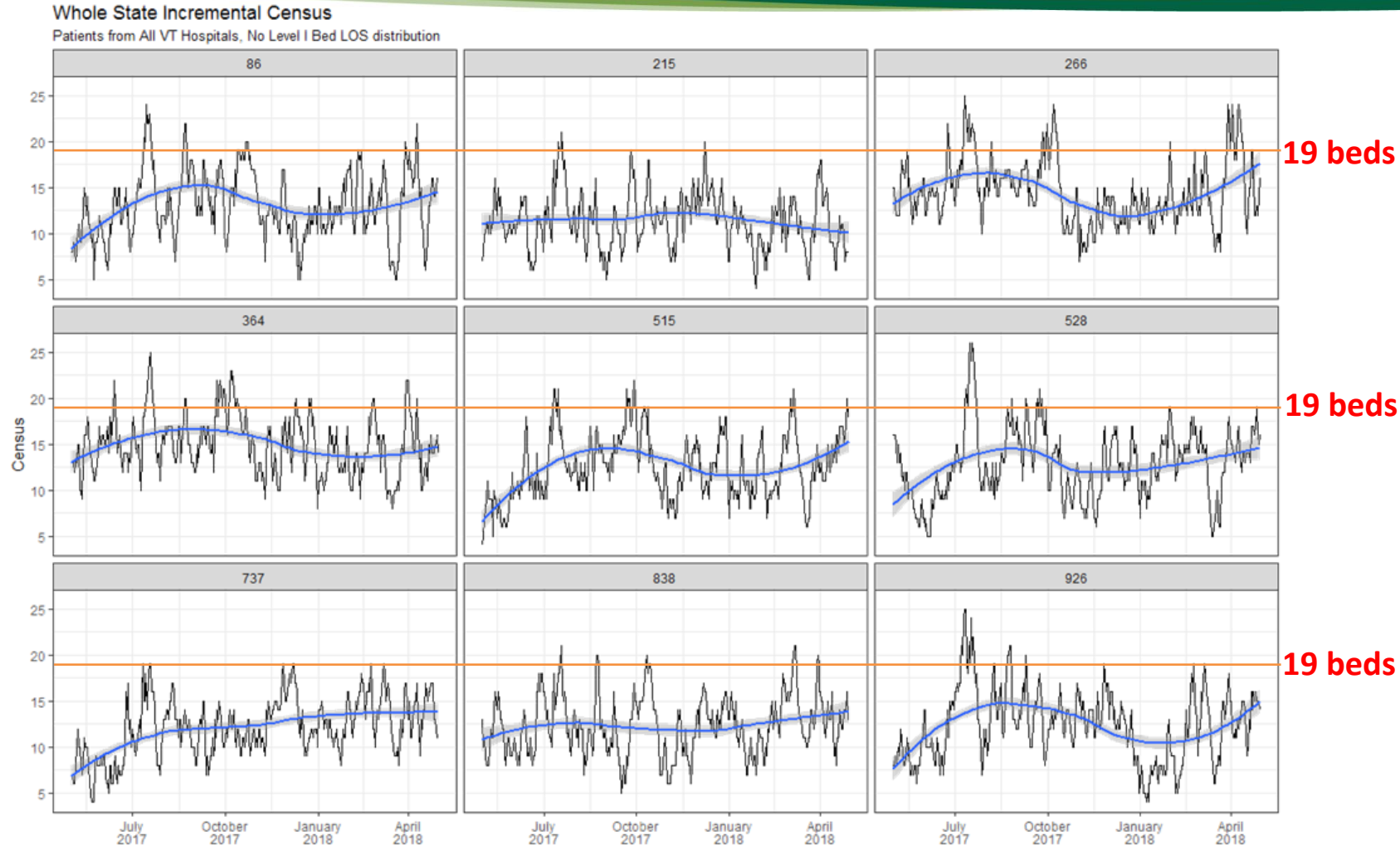
Cumulative Additional Need

Percent of Days at or Below Each Census Level - LOS excludes Level I Beds



IP Psych Incremental Census Simulations

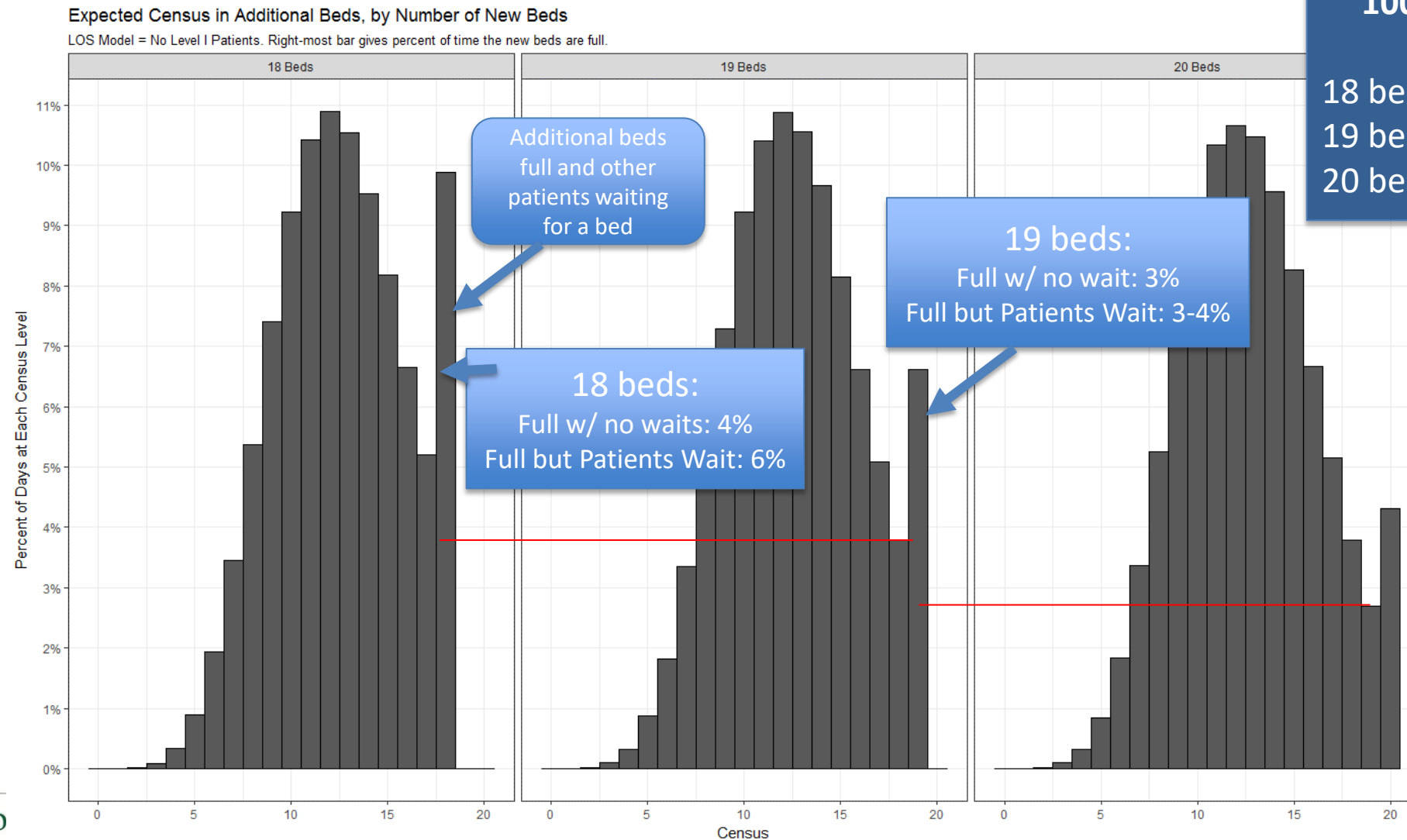
How Would 19 Additional Beds Work?



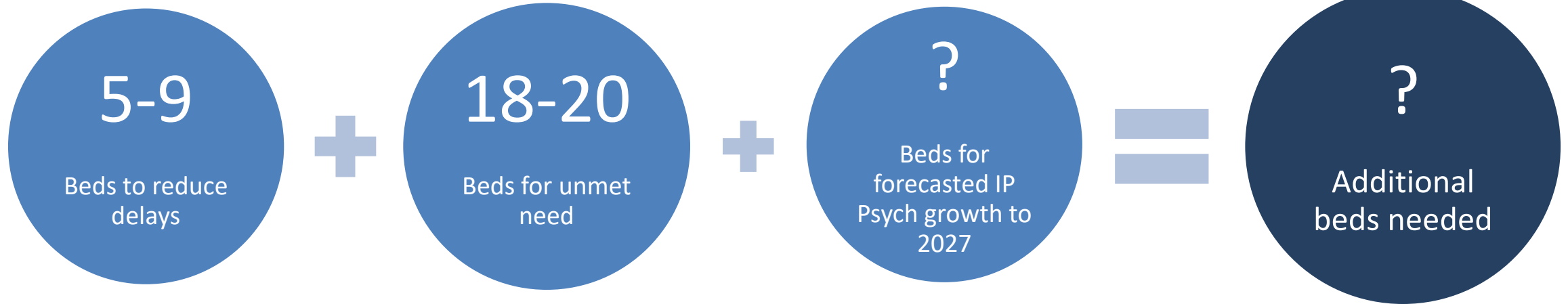
- Actual patient arrival dates
- Variations due to:
 - Arrival dates for the ~20% of 12-28 hr patients randomly selected*
 - Random selection for LOS along VAHHS actual non-Level 1 LOS curve

* A patient from the 12-28 hr group has a random 1-in-5 chance of being selected in the Unmet Need group in each simulation

Combined Results for 1000 Simulations: Additional 18-20 beds



Estimated Current Additional Bed Need: 23-29 Beds



Model Results: No Wait for IP Admission for 98%

Estimated Wait Times for Impacted Patients - Currently Waiting Prior to Admission or Never Admitted - with 26 Additional Beds

Wait Time for Admission	Patients Currently Admitted	Expected New Admissions	Total	Percent of Total Admissions
No Wait	1,024	523	1,547	98%
<= 8 Hours		6	6	0%
8-24 Hours		21	21	1%
24-48 Hours		8	8	1%
48 + Hours		1	1	0%

* Patients Currently Admitted includes all patients transferred to another IP Psych facility after staying more than 8 hours in a Vermont ED (697 patients), and patients waiting and ultimately admitted at UVMHC and CVMC (301 and 26 respectively). We expect that numbers for Rutland and Springfield will be similar to CVMC.

System-wide
Occupancy Rate
88%

Simulation Results: +26 IP beds

>55% reduction in patient hours* in EDs



Combined Outpatient ED Change - Brattleboro, CVMC, Rutland, Springfield, Southwest, and UVMHC

Excludes impact of patients admitted to same hospital

Patient Disposition	Patients Affected	Patient Hours in ED		Change
		Current State	26 Additional Beds	
Admitted: New Bed	478		2,268	
Admitted: Transfer	810	31,410	6,480	-79%
OP ED	4,865	59,973	32,335	-46%
Grand Total	6,153	91,382	41,083	-55%

* Does not include reduction in wait time for patients admitted to IP bed in same facility due to data availability.

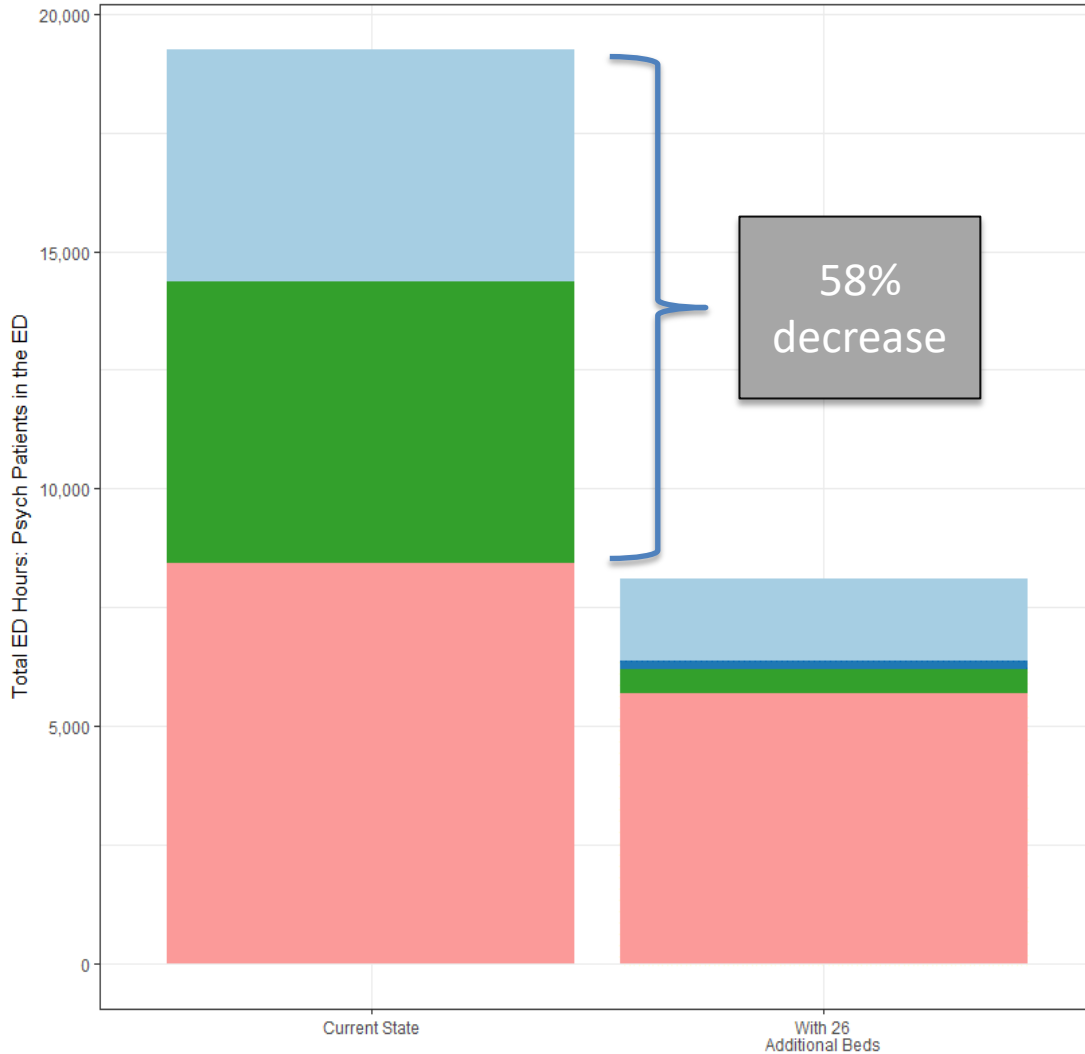
Simulation Results: +26 IP beds

ED Impact – all psych ED patients at CVMC + UVMMC



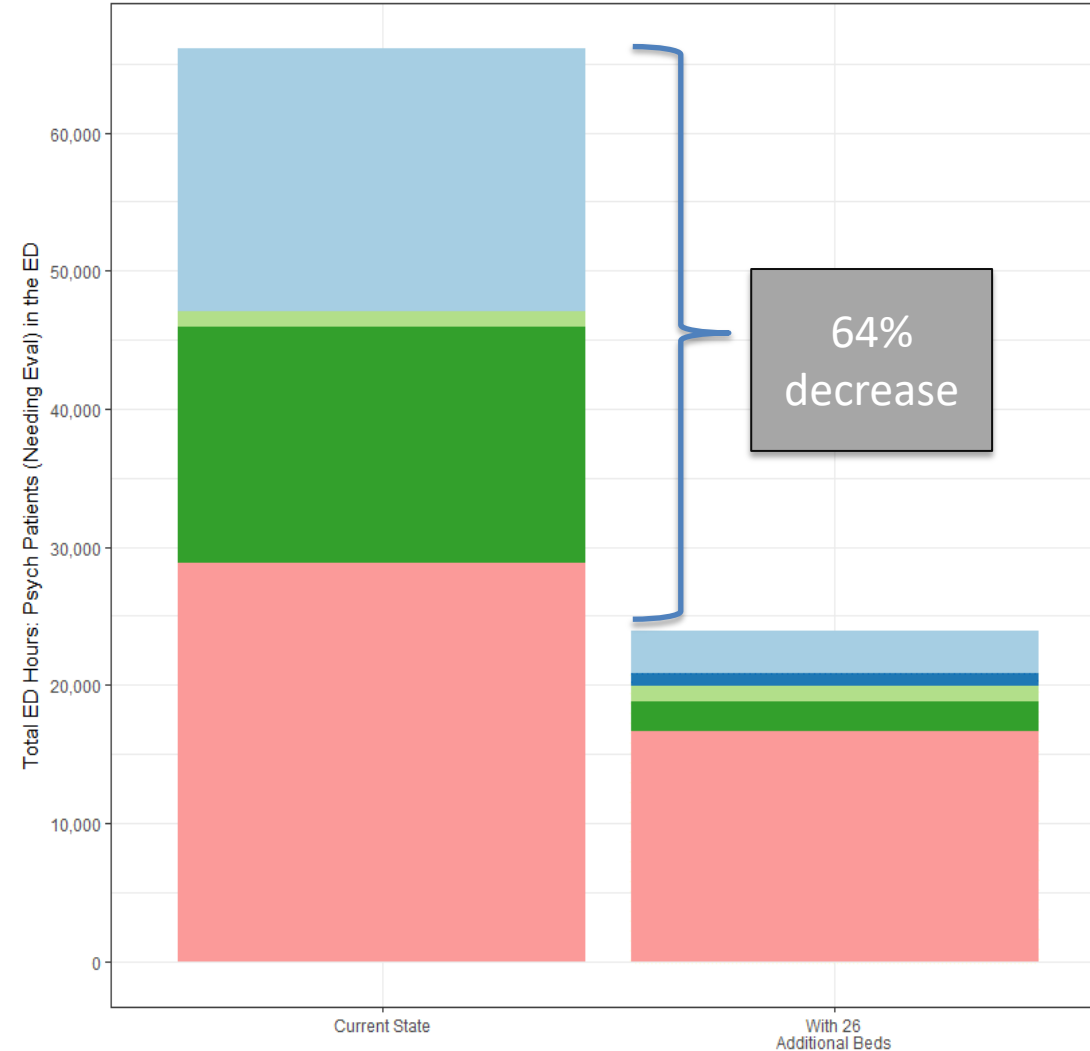
CVMC ED Psych Volumes with New Beds Added

Total Annual ED Hours For Patients with Psychiatric Primary Diagnoses



UVMMC ED Psych Volumes with New Beds Added

Total Hours in ED for Patients Needing Psych Evaluation



Patient Disposition

- Admitted: Existing Bed
- Admitted: New Bed
- Admitted: Other IP
- Admitted: Transfer
- OP ED

Simulation Results: +26 IP beds

CVMC + UVMMC: 1300 patient impact + 53,000 ED hrs



	CVMC		UVMMC	
	# Patients	Reduction in Total ED Hrs	# Patients	Reduction in Total ED Hrs
Delay Patient Group:				
Admitted Patients	350	-65%	386	-84%
Transferred Patients	65	-92%	270	-87%
OP ED:				
Patients Needing IP Care	38		197	
Total Hrs for Psych Patient Care		-32%		-42%
Est Total Impact	453	-58%	853	-64%
Est Total Decrease in ED Hrs		11,143		42,148

Forecasted Growth for Adult IP Psych



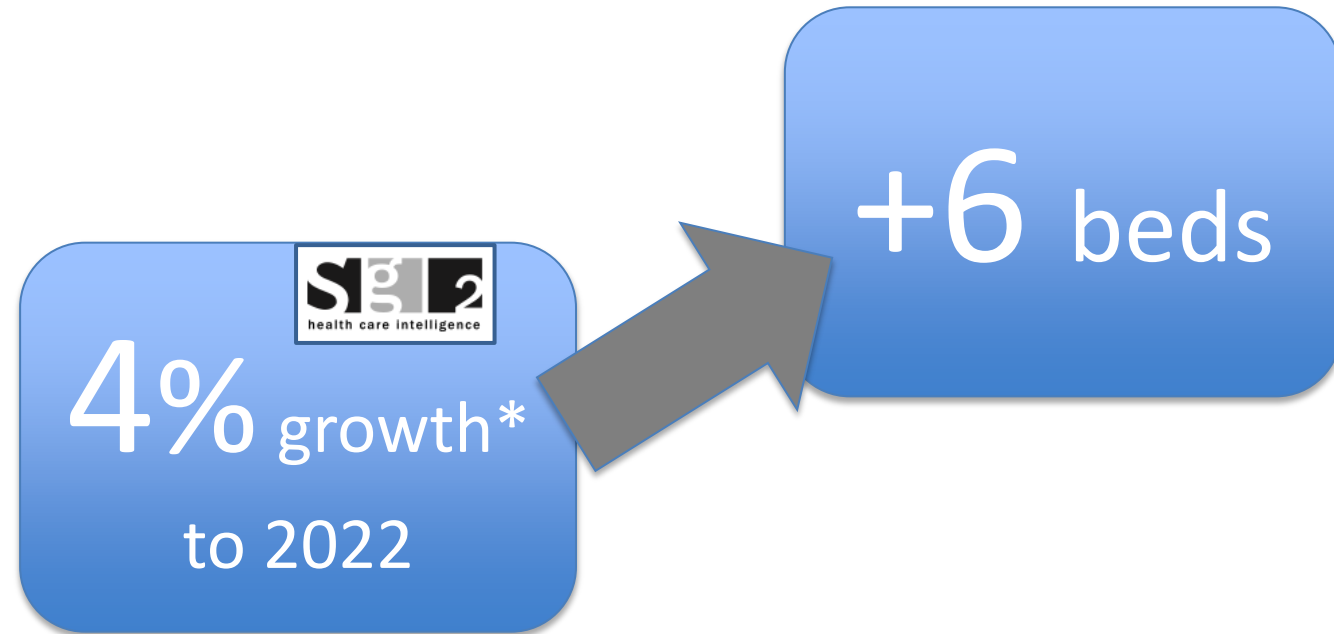
Sg2 Growth Forecast: IP Psychiatry Patient Days

- Forecast takes into account

- Demographic factors
- Epidemiology
- Policy, regulatory factors
- Economy
- Innovation
- Outpatient alternatives
- Acuity

- 4% growth in patient days to 2022, flat 2022-2027

- Applied to current + estimated additional patient census



Estimate of Additional Bed Need



Questions & Discussion

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Adult IP Psych Bed Detail

Hospital	Location	Total Adult Inpatient Beds
Brattleboro Retreat	Brattleboro, VT	38
Central Vermont Medical Center	Berlin, VT	14
University of Vermont Medical Center	Burlington, VT	27
Rutland Regional Medical Center	Rutland, VT	23
Windham Center at Springfield Hospital	Springfield, VT	10
Vermont Psychiatric Care Hospital	Berlin, VT	25

IMD

IMD

Beds under IMD Reimbursement:

63

46% of total

Questions.....

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