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Trends in Utilization of Adult Psychiatric Beds in Virginia

R.J. Bonnie, S.A. Larocco

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Institute of Law, Psychiatry, and Public Policy

1228 CEDARS CT. | SUITE 102 | CHARLOTTESVILLE, VIRGINIA 22903

PHONE: 434.924.5435 | FAX: 434.924.5788 | WEBSITE: UVAMENTALHEALTHPOLICY.ORG



Institute of Law, Psychiatry,
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Summary: Over the past five years, admissions to state psychiatric hospitals have increased by 55%. This report looks at the changing nature of those admissions, as admissions under temporary detention orders are taking up an increasing share of hospital capacity. The greatest increase in state hospital admissions occurred in the 2016 fiscal year, and this increase was driven by temporary detention orders. Forensic admissions have been increasing steadily, but more slowly, and other civil admissions have been in sharp decline.

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I. Introduction

A troubling symptom of system failure in delivery of psychiatric care is the increasing pressure on emergency departments, acute care psychiatric hospitals, and state hospitals, where beds should be reserved for persons with the most severe conditions that cannot be addressed in other settings. Another symptom is the spillover effect on jails, which have become placements of necessity for many persons with severe mental illness. The Commonwealth is trying to cope with these problems and develop long-term solutions. However, this can be accomplished successfully only if private and public systems work together to identify and address the need for psychiatric beds and alternatives models of responding to psychiatric crises.

A first step is to take inventory of the available beds and how they are now being used, preparatory to considering approaches for using them more efficiently and effectively and developing and implementing alternatives. The purpose of this paper is to characterize the current utilization of psychiatric beds in state hospitals as an initial step in such a planning process.

II. Data Sources

Most of the data were provided by the Department of Behavioral Health and Developmental Services (DBHDS). Data were retrieved from the Avatar database, which tracks state hospital usage, and the Psychiatric Bed Registry (PBR), which tracks some bed searches made for psychiatric patients seeking inpatient treatment, in addition to other internal datasets, created for other purposes. Data on overall adult temporary detention orders were provided by the Supreme Court of Virginia.

III. Available Data on Admissions to Psychiatric Hospitals

Inpatient psychiatric admissions are traditionally classified as either: civil temporary detention order (TDO) admissions, other civil admissions (mainly civil commitments), or forensic admissions of various types*. All admissions to state hospitals are included in the DBHDS data. However, the analyses undertaken in this report are severely limited by the lack of comprehensive information about the substantial numbers of persons who are voluntarily admitted to private hospitals. The only readily available data regarding private hospital admissions relate solely to involuntary admissions. Yet, a substantial proportion of psychiatric admissions to private hospitals are believed to be voluntary, while most of the admissions to state hospitals are involuntary.

* Forensic commitments take place for one of five reasons. The longest forensic commitments are for people who have had criminal charges brought against them and were judged not guilty by reason of insanity (NGRI). Other forensic commitments include commitment for competency evaluation, in which a mental health professional evaluates whether a person is competent to stand trial; commitment for restoration of competency if the person was determined not to be competent; and commitment for protection of self or others if the person is found to be unrestorably incompetent; and forensic TDO for emergency treatment of jail inmates.

The actual number of voluntary admissions to psychiatric hospitals is unknown. The VHI and the electronic health records of most hospitals do not indicate whether the admission is voluntary or involuntary. ILPPP studies of community services board (CSB) face-to-face emergency evaluations in June 2007 and April 2013 showed that 18-19% of these evaluations lead to voluntary residential treatment (including hospitals and crisis stabilization units) without any judicial involvement, although, by November 2016, that proportion had increased to 25%, due entirely to increased usage of crisis stabilization units. In addition, many, if not most, voluntary admissions to psychiatric hospitals do not involve CSBs at all. This missing information about voluntary admissions to private hospitals is important because people who are voluntarily admitted to private use the same resources as those who are involuntarily committed and significant changes in the frequency of voluntary admissions clearly affect system capacity to treat involuntary patients. **This gap in available data regarding voluntary admissions to private hospitals (in both emergency departments as well as psychiatric units) should be rectified as soon as possible.**

IV. Historical State Hospital Usage

Five years ago, admissions to state hospitals were far less frequent than they are now, especially civil TDO admissions¹. In fiscal year (FY) 2013, there were 3269 adult admissions to state hospitals, of which only 1008 were civil TDO admissions (31%, Table 1). Although TDOs are the focus of this report, it is important to consider other types of clients as well because they can use the same beds and services that might otherwise be used by a TDO client. The category “Other Civil” includes involuntary commitments, court-mandated voluntary admissions and voluntary self-admissions.

Table 1: Adult admissions to state psychiatric hospitals in fiscal year 2013.		
Population	2013 Admissions	Range across hospitals
Ages 18-65		
Civil TDO	944	11-512
Other Civil	1142	26-516
Forensic	986	18-444
Age 65 and older		
Civil TDO	64	2-35
Other Civil	103	6-48
Forensic	30	6-10

1. More detailed information about trends in crisis outcomes and involuntary commitments can be found in the DBDHS publication “Annual Statistical Report Adult: Civil Commitment Proceedings in Virginia, FY 2016” available at <http://www.dbhds.virginia.gov/library/mental%20health%20services/adult-civil-commitment-proceedings-in-virginia-fy2016.pdf>.

In FY 2013, 83% of the adult civil TDOs to state psychiatric hospitals originated in 10 CSBs (Table 2). Mount Rogers CSB alone was responsible for 20% of adult TDO admissions to state hospitals that year. In FY 2017, these same ten CSBs accounted for only 47% of civil TDO admissions to state hospitals, in spite of the fact that all but one of them saw increases in absolute numbers, and most of them continue to be among the ten highest contributors of civil TDO admissions to state hospitals. Table 2 includes all adult patients who were admitted under a civil TDO.

Table 2: The ten CSBs with the highest volumes of civil TDOs to state hospitals in fiscal year 2013, volume and percentage of total in fiscal years 2013 and 2017.

CSB	Number of Civil TDO admissions to state hospitals 2013 (% of total)	Number of Civil TDO admissions to state hospitals 2017 (% of total)	Rank in number of TDOs to state hospitals in 2017 (out of 40 CSBs)
Mount Rogers	200 (20)	233 (7)	3
Highlands	164 (16)	156 (5)	6
Danville-Pittsylvania	106 (10)	147 (4)	7
Planning District 1	75 (7)	123 (4)	8
Prince William	67 (7)	236 (7)	2
New River Valley	64 (6)	196 (6)	4
Cumberland Mountain	43 (4)	52 (2)	26
Arlington	41 (4)	121 (4)	9
Fairfax-Falls Church	39 (4)	195 (6)	5
Piedmont	36 (4)	98 (3)	12
Total 2013 Top Ten	835 (83)	1557 (47)	--

V. Recent Increases in State Hospital Usage

A. Changes in Admissions

Table 3 shows changes in admissions from fiscal years 2014 to 2017. **Comparing fiscal years 2013 to 2014**, total psychiatric hospital admissions increased from 3269 to 3442. There was a statistically significant increase in forensic admissions that year, from 1016 to 1140 ($t=2.9$, $p=0.0058$). **In FY 2015**, total admissions increased to 4327 ($t=4.4$, $p=0.0001$). This was driven by an increase in TDO admissions, from 1117 to 1670 ($t=4.2$, $p=0.0001$). **In FY 2016**, admissions increased to 5315 ($t=4.5$, $p<0.0001$). There was a huge increase in total TDO admissions – to 2885 ($t=5.7$, $p<0.0001$). A decline in other civil admissions, from 1375 to 1068 ($t=-3.7$, $p=0.0006$), did not compensate for the increase in TDO admissions. **In FY 2017** total state psychiatric admissions increased to 5515 and the increase in forensic admissions that year

was statistically significant, from 1362 to 1595 ($t=2.9$, $p=0.0066$). This increase was counterbalanced by a decline in civil non-TDO admissions, to 683 ($t=-2.8$, $p=0.0074$).

Table 3: State psychiatric hospital admissions across fiscal years, by age group and reason for admission.

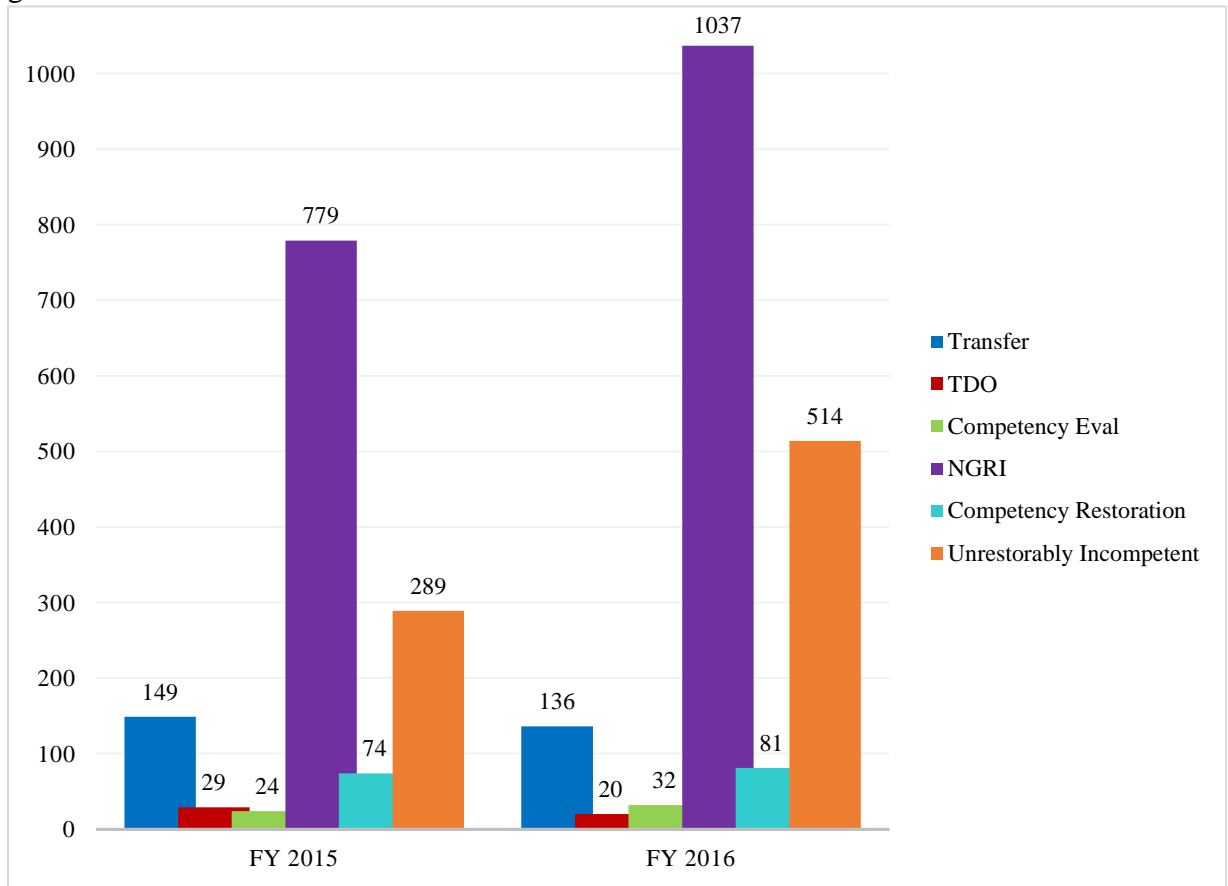
Population	2014 Admissions	2015 Admissions	2016 Admissions	2017 Admissions	Mean Change per hospital 2013-2017*
Ages 18-64					
Civil TDO	1013	1428	2574	2961	187
Other Civil	1098	1279	1031	631	-73
Forensic	1091	1233	1317	1540	79
Age 65 and older					
Civil TDO	104	242	311	276	53
Other Civil	87	96	37	52	-13
Forensic	49	49	45	55	5

*While the numbers in the admissions columns count all admissions in that category, the means in this column are computed by excluding those hospitals that very rarely take admissions of the indicated sub-type. For example, the mean changes for civil geriatric admissions only include the four state hospitals that contain geriatric wards (Catawba, Eastern, Piedmont Geriatric and Southwestern), even though there are rare cases when civil geriatric patients are admitted to non-geriatric wards in other hospitals.

B. Length of Stay

While state hospital admissions increased, particularly TDO admissions, average length of stay declined for TDO admissions between 2015 and 2016 (-39 days, $t=-3.28$, $df=38$, $p=0.0023$). Overall length of stay averages for non-geriatric adults were provided by DBHDS for fiscal years 2015 and 2016 only (Figure 1). For TDO admissions, length of stay was reduced by 9 days (recall that the TDO category includes people who went on to be civilly committed, thus the average length of stay is longer than 72 hours). In contrast, length of stay is rising dramatically for forensic patients, particularly those who are NGRI (33% increase) or unrestorably incompetent (78% increase).

Figure 1: Changes in average length of stay, in days, between 2015 and 2016, for non-geriatric adults.



Additional data was provided from the Avatar database for civil admissions in all age groups. Between 2014 and 2015, average length of stay decreased for TDO admissions (-292 days, $t=-3.3$, $df=25$, $p=0.0033$). In that same year, average length of stay decreased for other civil admissions among adult non-geriatric patients (-120 days, $t=-2.5$, $df=39$, $p=0.0186$). For children and geriatric patients, length of stay did not change statistically significantly between 2015 and 2016. From fiscal years 2016 to 2017, the average length of stay for all types of civil admissions declined statistically significantly except for geriatric TDOs. The sharpest decline was in other geriatric civil admissions (-1075 days, $t=-3$, $df=39$, $p=0.0045$), followed by civil non-TDO admissions for adults under 65 (-287 days, $t=-4$, $df=39$, $p=0.0003$), TDO admissions for adults under 65 (-21.5 days, $t=-3$, $df=39$, $p=0.0085$), juvenile non-TDO admissions (-7.5 days, $t=-4$, $df=39$, $p=0.0001$) and juvenile TDO admissions (-4.6 days, $t=-4$, $df=39$, $p=0.0005$).

Average length of stay was different for different regions (Table 4), with Region 1 having the longest average length of stay, and Region 2 having the shortest. Region 3 data was given by sub-regions (West, North and East). Region 5 was the only region that did not see a permanent

decrease in average length of stay. Of the region that did experience a decline in average length of stay, Region 3 East had the smallest decrease, while Regions 1 and 4 had the greatest.

Table 4: Average length of stay for adult non-geriatric TDO admissions by region

Region	FY 2014	FY 2015	FY 2016	FY 2017	% decrease from 2014 to 2017
1	399	192	123	53	87
2	91*	48	22	19	71
3 West	115	115	85	41*	64
3 North	90	58*	43*	37	41
3 East	59	58*	51	41*	31
4	147	87	37	22	85
5	36	15	20	46	-28

*Median for the year.

C. Bed Days

Data is also available on bed days used in fiscal years 2015 and 2016, allowing for analysis for differences between groups on this measure. A bed day is an entire day spent in a hospital by one patient; thus, bed days used can serve as an indicator of the capacity at which hospitals are operating. Table 5 shows the number of beds in each state hospital. The available data on bed days does not differentiate between different types of child admissions, different types of geriatric admissions, or different types of civil admissions for adults under 65. This means that the information on TDO days is under different categories along with other types of stays. Full year data for fiscal years 2014 and 2017 were unavailable.

Table 5: Beds available in each hospital, and maximum possible number of bed days for fiscal years 2015 and 2016.

State hospital	Number of beds	Bed day capacity 2015	Bed day capacity 2016
Catawba	110	40150	40260
Central	100 Regular Security	36500	36600
	66 Medium Security (Forensic Only)	24090	24156
	111 Max. Security (Forensic Only)	40515	40626
Commonwealth Center for Children and Adolescents (age < 18 only)	48	17520	17568
Eastern	302	110230	110532
Northern Virginia	134	48910	49044
Piedmont Geriatric (age 65+ only)	123	44895	45018
Southern Virginia	72	26280	26352
Southwestern Virginia	179	65335	65514
Western	246	89790	90036
Total	1491	544215	545706

Table 6 shows the changes in bed days between 2015 and 2016. Civil adult bed days increased from 2015-2016 ($t=2.4$, $df=39$, $p=0.0192$). Geriatric bed days decreased ($t=-2.4$, $df=39$, $p=0.0194$). Changes in other groups were not statistically significant. Overall, state hospital bed days increased by 7816, equivalent to over 21 bed years. This resulted in use of 88% of the bed day capacity for fiscal year 2016, as compared to 86.5 % in fiscal year 2015, which is also unacceptably high. Table 7 shows changes in civil adult bed days within the different regions. The only statistically significant change was in Region 5 ($t=3.59$, $df=8$, $p=0.0071$), which saw a huge increase of 20827 bed days, a 56% change.

Table 6: State hospital bed days, by type of patient.

Type of Patient	2015 Bed Days	2016 Bed Days	Avg difference per CSB from 2015 to 2016
Under age 18	12499	11277	-30.6
Civil, age 18-64	205585	228982	584.9
Forensic, age 18-64	153923	161776	196.3
Age 65 or over	99312	77100	-555.3
Total	471319	479135	195.4

Table 7: Civil bed days, for clients aged 18-64, by DBHDS region.

Region	2015 Bed Days	2016 Bed Days	Avg difference per CSB
1	52981	51543	-159.8
2	29099	33082	796.6
3	64799	58040	-675.9
4	17234	19406	310.3
5	37503	58330	2314.1

D. Conclusions about State Hospital Usage

In comparing 2016 with 2015, TDO admissions to state hospitals increased by 60% and bed days for civilly admitted adults increased 11%. Offsetting these increases, the average length of stay for TDO admissions was reduced by nine days and the number of non-TDO civil admissions declined. In 2017, civil TDO and forensic admissions increased, while civil non-TDO admissions decreased. In that same year, average length of stay declined dramatically for civil admissions. It is unclear if this compensated for the increase in admissions.

VI. Private Hospital Usage

A. State TDO Admissions as a Proportion of all TDO Admissions

Over the past few years, DBHDS psychiatric facilities have taken on an increasing percentage of TDO admissions in Virginia. In fiscal year 2014, 6.9% of TDOs went to state facilities. A year later, 8.8% went to state facilities, and in 2016 13.9% did (Table 8). TDOs that are not sent to state psychiatric facilities are sent to private hospitals, either free-standing psychiatric hospitals, or departments within medical hospitals. Trends in TDO admissions to private facilities are discussed below.

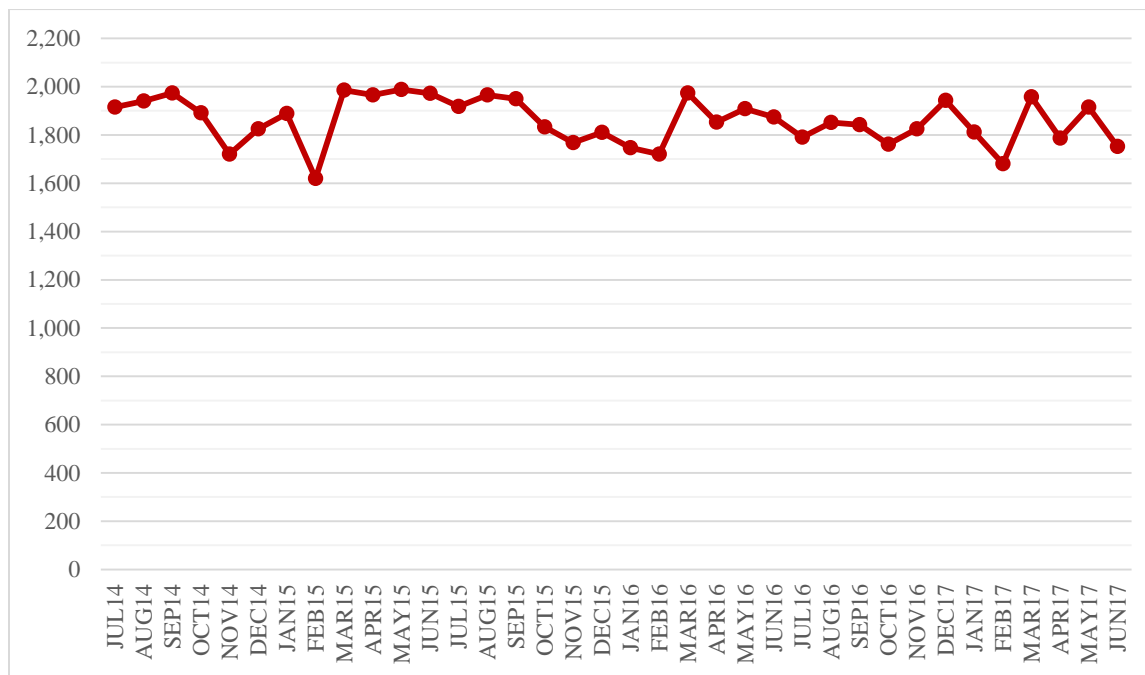
Table 8: TDO Locations from 2013-2017.

Fiscal Year	TDOs to Private Hospitals	TDOs to State Hospitals	% Sent to State Hospitals
2013	20253	1361	6.3
2014	21330	1582	6.9
2015	22818	2194	8.8
2016	22544	3630	13.9
2017	22236	3930	15

B. Private Hospital Admissions

One theory proposed to explain increased TDOs to state hospitals is that private hospitals are becoming more selective and taking fewer TDO admissions, because they know that the state hospitals have to accept them. Looking at the data, from July 2014, private hospital TDO admissions did not **decrease**, aside from the usual seasonal fluctuations, until the last quarter of fiscal year 2016 (Figure 2). April 2016 saw the start of a decline in private TDO admissions, but even this reduction could be related to unknown patterns in voluntary admissions. It should be noted that, in FY 2017, private TDO admissions were comparable to previous years during the less busy seasons of fall and winter.

Figure 2: TDO admissions to private hospitals.



C. Reasons for Rejection

In March 2014, the Psychiatric Bed Registry was established to provide a more organized platform for conducting a psychiatric bed search. Up until late August 2016, a person conducting a bed search could write in the reasons that the representative from a private hospital gave for rejecting a psychiatric patient. The reasons given were analyzed for changes over time. Before discussing the results, some limitations should be acknowledged. PBR users were not required to write in the reason for rejection, meaning that these results are potentially subject to selection bias. In addition, no distinction was made between voluntary admissions and TDOs. This could be a problem if reasons for rejection differed between the two groups.

The reasons were classified into 11 categories, shown in Table 9. The distribution of the reasons changed over the course of the 2.5-year period from March 2014 to September 2016 ($F=32, p<0.0001$). For ease of comparison, the time period has been split around the median time, April 1, 2015, in order to create a “before” period and “after” period in Table 9. Among the reasons recorded, there was a statistically significant increase in the number of rejections due to bed unavailability ($F=9.0, p=0.0028$), criminal history ($F=69.0, p<0.0001$), medical complexity ($F=14.8, p=0.0001$), distance-related ($F=22.7, p<0.0001$), and substance use ($F=14.6, p=0.0002$). It should be noted that, in Table 9, the total number of rejections does not add up to 100 percent of the reasons for non-placement, as the latter includes clients whose bed negotiations were cancelled at one place because they found a bed at another.

Table 9: Reasons for private hospital rejection of psychiatric patients of all ages (4193 queries total).

Reason	Before Frequency	Before Percent	After Frequency	After Percent
No Appropriate Vacant Bed	2088	44.23	2345	49.75
Patient History of Crime or Violence	265	5.61	443	9.40
Patient Medical Needs	268	5.68	317	6.72
Patient from out of Catchment Area	211	4.47	316	6.70
Unclear	291	6.16	307	6.51
Other	281	5.95	301	6.39
Patient Source of Funding	285	6.04	213	4.52
Patient Substance Use Disorder	80	1.69	137	2.91
Current Demands on Psychiatric Ward	108	2.29	114	2.42
Patient Neurological Condition	116	2.46	95	2.02
Total Rejections	3993	85	4588	97

Data on comorbidities among state hospital patients were obtained from the Avatar database, to determine if there were changes over time (Table 10). While the percentage of people with substance use disorder among civil TDO admissions rose sharply in fiscal year 2016, and plateaued in fiscal year 2017, medical comorbidities returned to previous percentages in fiscal year 2016 after a sharp increase in 2015. In both cases, absolute numbers have increased dramatically from 2014 to 2017. It is noteworthy that the increase in the number of TDO patients with substance use disorder in 2017 (269) is almost as great as the overall increase in the number of TDO admissions (300). Taken in light of the fact that the number of TDOs did not change, this suggests that increases in state hospital TDO admissions that year were driven by increased private hospital rejection of people with substance use disorder. In Table 10, absolute numbers are not included for fiscal year 2018, as data is only available for part of the year and comparisons with full year data would be inappropriate.

Table 10: Numbers of civil TDO admissions for people with substance use disorder, and people with medical comorbidities.

Fiscal Year	Number of TDO admissions for people with substance use disorder (% of TDO admissions)	Number of TDO admissions for people with medical comorbidities (% of TDO admissions)
2014 (n=1580)	299 (18)	487 (31)
2015 (n=2191)	471 (22)	920 (42)
2016 (n=3500)	1015 (29)	1126 (32)
2017 (n=3828)	1284 (34)	1069 (28)
2018	(33)	(27)

VIII. Summary and Conclusions

Over the past five years, dramatic increases in TDOs to state hospitals have occurred across the state. Increases in forensic admissions have been more modest, and, civil non-TDO admissions have been declining. In spite of declines in numbers of civil non-TDO admissions and in length of stay for civil admissions, bed day utilization at state hospitals has been on the rise. In fiscal years 2014 through most of 2016, private hospitals absorbed most of the increase in TDOs, but in late 2016, private TDO admissions declined. The impact on state hospitals may be exacerbated by increased private hospital rejection of patients with histories of crime or substance use disorder. Better access to information on private hospitals would lead to improved understanding of the changes in TDOs to state hospitals, as the decisions made at private hospitals have an obvious impact.

Appendix: Statistical Methods

A. State Hospital Usage

Data on state psychiatric hospital admissions and bed days were obtained through DBHDS from the Avatar database. Data on different types of forensic admissions were combined into a single forensic category, as those groups are not the focus of this report. Admissions from adjacent years were compared using a paired t-test ($\alpha=0.025$) for each subgroup for admissions: TDO, other civil, forensic. The same method was used for comparing overall bed days by age and subgroup, as well as regional bed days for civil adult patients.

Average length of stay data, by CSB catchment area, was provided for TDOs and transfers for the years 2014-2016. The data, stratified by age and type of admission, were compared for adjacent years using a paired t-test ($\alpha=0.025$). Overall numbers for average length of stay among different types of adult non-geriatric admissions were provided in aggregate by DBHDS.

B. Admissions to Private Hospitals

Data on TDO cases admitted to private hospitals were provided by DBHDS. Data on reasons for private hospital rejections were obtained from the PBR. PBR searches were included in the analysis whether they were initiated by a CSB prescriber or someone from a private organization. Reasons were placed into categories as the data was read, with new categories developed as needed. An “Other” category was created for the less common reasons, which included sexual acting out, disputes with the client’s family, technical difficulties, client preference, and no reason given, among others. Welch Anova was used to test for an association between date as a continuous variable and reasons for rejection as an 11-category variable. In determining the significance of the association between individual reasons and time, a dichotomous variable was created for each reason. Welch’s t-test was used to determine association with time.