

# Need for Treatment, A Less Restrictive Alternative to Hospitalization, and Treatment Provision: The Utility of Community Treatment Orders

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**Background:** Provision of involuntary care is an abridgment of civil rights and a source of controversy. Its circumstances require continued monitoring. This study asks 4 questions: Whether, in an era, focused on allowing patients with capacity to refuse community-treatment-order (CTO)-assignments, CTO use decreased. And whether CTOs fulfilled 3 statute mandates: Were CTO-assigned patients in greater need of treatment than other psychiatric inpatients? Was CTO assignment a less-restrictive alternative to psychiatric hospitalization? and Did CTO assignment provide needed treatment at internationally recommended levels with consequences for patient outcomes?**Method:** All 214 388 Victoria, Australia mental health admissions between 2000–2017 were reviewed. Two cohort samples were drawn and followed through 2019—ie, all 7826 hospitalized patients who were first placed on CTOs from 2010 to 2017 and 13 896 hospitalized patients without CTO placement. Logistic Regression was used to specify determinants of CTO assignment from the psychiatric inpatient population. OLS Regression with propensity score control to evaluate study questions.**Results:** In the 2010–2017 decade, initial CTO assignments decreased by 3.5%, and initial hospitalizations increased by 5.9% compared to the 2000–2009 period. At hospital admission and discharge, based on Health of the Nations Score ratings, the CTO-cohort's need for treatment exceeded that of non-CTO patients. CTO patients had 3.75 fewer days in average inpatient episode duration than other inpatients, when adjusted for CTO-assignment determinants, the ratio of patients to community case managers, and patient housing status. CTO patients needing rehospitalization spent 112.68 more days in the community than re-hospitalized non-CTO patients. Patient to case-manager ratios falling above recommended levels and the patient marginal housing

status contributed to longer hospital stays and reduced community tenure.**Conclusions:** Victoria relied less on CTOs as an LRA, consequently, experiencing increased initial hospitalizations. CTO patients were in greater need of treatment than non-CTO patients, yet, with required oversight had shorter hospitalizations and more time out of hospital prior to rehospitalization than the less severely ill non-CTO group. Patient LRA outcomes were adversely affected by higher than recommended community patient to case-manager ratios limiting needed treatment provision to hospital.

## Background

Community-treatment-order (CTO) provisions have been written into laws worldwide.<sup>1</sup> Described in statutes as “conditional release,” “outpatient civil commitment,”<sup>2</sup> or “assisted treatment,”<sup>3</sup> CTOs are a means to deliver involuntary community-based treatment,<sup>4</sup> and a way to engender treatment compliance for those refusing treatment.<sup>5</sup> In civil commitment law, CTOs are almost universally recognized as “a less restrictive alternative” (LRA) to psychiatric hospitalization for persons meeting the involuntary civil commitment standard of the jurisdiction.<sup>6</sup> Community-treatment-orders (CTOs) were introduced in Victoria Australia under the Mental Health Act 1986 and remain an option under the Mental Health Act 2014.<sup>7,8</sup>

Over the course of 3 decades, Victoria Australia has made major changes to its mental health policies, changes that have influenced the use and effectiveness of CTOs. In the first decade, 1990–2000, Victoria developed a strong community-based treatment program centered around the use of CTOs, driven by a specially established state government unit of community care advocates to

enable the depopulation of its psychiatric hospitals.<sup>4</sup> At the outset of the second decade, 2000–2010, Victoria closed all its psychiatric hospitals, reorganized acute care to general hospital psychiatric units, and dissolved its state department of community care unit, but retained its extensive use of CTOs.<sup>4</sup> Results, from both these 2 decades<sup>9,10</sup> evaluating the effectiveness of CTOs in Victoria with the same study design proposed herein contribute to a literature establishing the effectiveness of CTOs in enabling reduced use of hospitalization for patients with severe mental illness meeting the law's assignment criteria.<sup>11</sup>

In July 2008, Australia ratified the U.N. Convention on the Rights of Persons with Disabilities (CRPD).<sup>12</sup> Since that time, Australian advocates have successfully lobbied for reform of mental health legislation to either prohibit or strongly discourage the use of a CTO for those patients who have the “capacity” to refuse it.<sup>13</sup> In fact, they suggest that CTOs may be “far more potent when their use is restricted to those who lack decision-making capacity” p.12.<sup>14</sup> Though the law in Victoria now limits the use of CTOs to such individuals, effectively taking people with “capacity” out of the involuntary treatment population, other legal criteria justifying CTO assignment remain unchanged—ie, individuals may still be assigned to a CTO if they present with a mental illness needing immediate treatment to prevent harm to self and others, are refusing such treatment, and such treatment is available (see Appendix: Victoria Mental Health Law).

This significant change in mental health policy has been conceived as entering a post-CRPD “new era”<sup>15</sup> with expectations of increased “CTO-potency”<sup>14</sup> This expectation is based on the assumption that the elimination of those with the capacity to care for themselves would enable the use of CTOs to effectively focus on those most in need. Thus, given the consistency of legal criteria and previous findings documenting savings in hospital utilization favoring CTO-assigned patients, it is herein hypothesized that the rate of CTO utilization in Victoria will decrease due to the elimination of “false positives” (those with capacity), while the positive impact on those assigned to CTOs will remain constant, all other factors staying the same. Since, however, “all other factors” never stay the same,<sup>16</sup> this study attempts to further understanding of CTO assignment by considering 3 additional hypotheses related to the implementation of the CTO law in this new era. It suggests that CTOs under the newly conceived policy of 2008, will continue to satisfy 3 of their statute-mandated objectives:

1. The selection of patients posing significant threats to health and safety of self and others.

A necessary condition for CTO assignment in both the 1986 and 2014 versions of the Victoria Mental Health Act is the presence of a threat to health and safety.<sup>7,8</sup> Are selected patients more in need of treatment to protect

health and safety than other psychiatrically hospitalized patients?

2. Less restrictive alternative to hospitalization (LRA).

In Victoria Law, the same criteria apply to justification for in-hospital involuntary treatment as to CTO assignment.<sup>7,8</sup> A person involuntarily admitted to a hospital or placed on a CTO can only be served involuntarily as long as he/she continues to meet the criteria outlined in sections 8.1 and 5 of their 2 Mental Health Acts.<sup>7,8</sup> Therefore, a CTO in Victoria, Australia, all Australian jurisdictions and most commonwealth-nations, meets its mandate to provide an LRA to hospitalization in at least 2 ways considered herein. First, it is primarily a form of conditional release whereby the patient is allowed to leave the hospital with symptomology qualifying for involuntary inpatient care because he/she is being placed on an order requiring participation in treatment. The procedure thus shortens the duration of a current hospitalization but allows for involuntary return to hospital when the treatment participation agreement is violated (either for nonparticipation or lack of available treatment) and/or a new crisis develops. Thus while duration of hospitalization is an adequate CTO outcome measure; rehospitalization is not, since this act can be the intervention—the provision of needed treatment unavailable in the community.<sup>17</sup> Second, the CTO is an LRA enabling persons who continue to meet the involuntary inpatient standard to maintain community residence while receiving needed treatment. This study considers the duration of such residence for patients needing rehospitalization—the group at highest risk of relapse and of long-term confinement in hospital, or where hospital beds are no longer available and dangerous behavior persists in prisons and jails.

In summary, given that the same legal criteria apply to receipt of involuntary treatment in hospital and under CTO assignment, as defined in law (see: U.S. Court of Appeals Judge David L. Bazelon [1910–1993] in 1966: *Rouse v. Cameron* and *Lake v. Cameron*) the latter being the LRA to the former, this study tests 2 expected LRA outcomes—ie, whether CTO assignment results in briefer hospital stays for all hospitalized patients and extended duration of community residence for those in need of rehospitalization.<sup>9,10,18</sup>

3. Insuring the provision of needed treatment and case-management resource constraints.

Australia's community care approach was built on its successful replication of the Wisconsin trial in Assertive Community Treatment.<sup>19,20</sup> Based on multiple investigations the recommended patient to case-manager ratio for successful provision of Assertive Community Treatment is 10 to 1.<sup>21</sup> Between 2010 to 2019 the Victoria mental health system, experienced significant cuts in its community care services, a reorganization of care focused on the general hospital with concomitant decreases

in hospital bed availability and an increase in a revolving door pattern of care.<sup>22,23</sup> CTO-law mandates the provision of needed treatment. If such treatment is not available in the community the default is a return to hospital for the provision of such treatment which may create a revolving door pattern of care. We also might expect that under conditions of constrained case-management resources—ie, ratios of patients to case managers exceeding recommended levels—the effort to provide rapid rehospitalization of patients who are deteriorating will be impeded/delayed, as fewer case managers per patient load may be available to even meet this secondary CTO objective.<sup>16–18</sup> This study will assess the contribution of treatment contacts to maintaining patients in community residences and the consequences of variance in ratios of patients to case managers in different area services, for efforts to provide needed treatment to a patient. It asks: Did CTO assignment provide needed treatment at internationally recommended levels with consequences for patient outcomes? And how much do constrained case-management resources (measured by increases in ratio between the numbers of patients to case managers in a specific area) impede/delay rapid rehospitalization, a CTO requirement to provide needed treatment absent of adequate community care?

## Methods

### Sample

The Victorian Psychiatric Case Register (VPCR) provides records of all clinical contacts, area mental health service (AMHS) patient loads, and case manager availability at the time of clinical contact. The study, in addressing its initial hypothesis, considers hospital and CTO utilization for all Victoria's patients across 2 decades. To address its 3 CTO statute conformity hypotheses in the new era, all patients hospitalized between July 1, 2010, and June 30, 2017 were identified and 2 cohorts were drawn and followed through December 31, 2019. Cohort-1 included all patients hospitalized and CTO-assigned for the first time during the study period ( $N = 7826$ ). Cohort-2, the comparison cohort, were hospitalized patients who were not placed on a CTO during the study period ( $N = 13\,896$ ). Cohort 2 patients were matched with Cohort 1 patients on age, sex, and diagnosis to the extent possible and randomly selected. Patient records were then linked to their Socioeconomic Indexes for Areas record of neighborhood disadvantage,<sup>24</sup> and their Australian Mental Health Outcomes and Classification Network's (AMHOCN) Health of the Nation Outcome Scale (HoNOS) and Focus of Care assessments.<sup>25,26</sup>

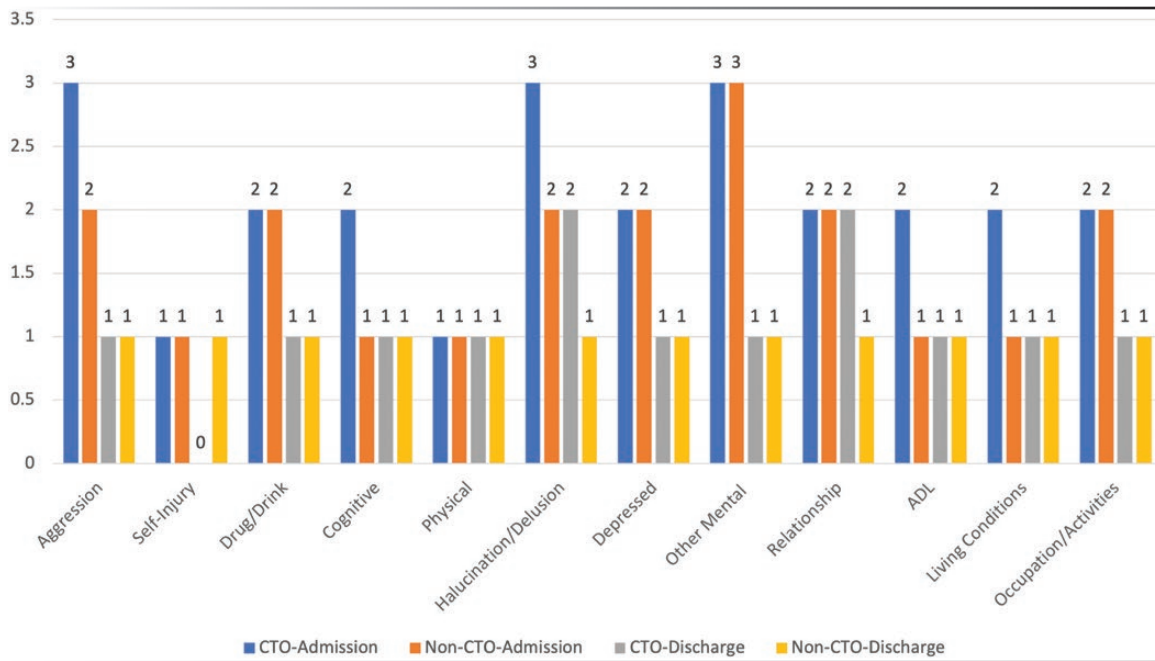
### Design

Our quantitative research is a non-randomized trial. Randomization of cases to a non-supervised control

group when such individuals are believed to require supervision to avoid dangerous outcomes is not ethically possible. No physician would allow such a patient to participate in the study—ie, knowingly releasing a patient to the community who is refusing voluntary treatment and poses continuing danger without oversight. Studies previously using random assignment have included only non-dangerous patients capable of independent control of their illness in both the CTO a Non-CTO groups.<sup>17</sup> Consequently, these studies failed to find between-group differences in their hospitalization outcome measures as neither group required the intervention—they were not dangerous.<sup>27</sup> Randomized controlled trial studies conducted on participants to test the effectiveness of an intervention when the inclusion criteria excluded the major reason for the intervention's purpose are the equivalent of a study designed to test the efficacy of Aspirin for headache relief that randomized individuals without head pain to Aspirin vs Placebo groups and found no difference in head pain or hospitalization due to head pain.

The first design challenge in the study of CTOs is to establish that there is a meaningful difference between the groups that will yield objectively different outcomes for 2 groups admitted to hospital under the same commitment criteria. This study first attempts to establish the fact that CTO patients, though admitted under the same commitment criteria, are more severely ill, dangerous, and in greater need of treatment than individuals released from hospital without CTO assignment. *If and only if* the CTO cohort is determined to be more severely ill, then the “null hypothesis” (no effect) is a finding that the more severely ill CTO cohort will spend more time in hospital and less time in the community than the non-CTO comparisons. The CTO group, if they are more severely ill and at greater risk of episodic danger to self and or others due to their illness than the Non-CTO control, should demonstrate these outcomes if the CTO intervention has no effect. The alternate hypothesis is a finding of “no difference” or “better performance” on the outcomes by the CTO cohort than a less severely ill Non-CTO cohort—i.e. these are positive results since poorer performance should be the expected outcome for CTO-selected patients.

The second design enhancement is to be sure that group differences associated with CTO assignment are not accounting for the outcome. Since several cohort differences in patient characteristics remained between the 2 cohorts after the sampling process was complete, a propensity score procedure was used in the analysis to adjust for clinical and demographic historical differences relevant to CTO assignment (see Appendix: Propensity Score Adjustment). In addition to statistical control, given the observed difference in the proportion of people with Schizophrenia in the 2 cohorts, analyses were rerun solely for this diagnostic group.



**Fig. 1.** HoNOS ratings of problem area severity at inpatient admission and discharge rounded to closest clinically descriptive anchor point for CTO and non-CTO cohorts.

*Measurement*

*Need for Treatment.*

*Propensity for Selection into the CTO-sample—*

Propensity scores enable adjustment for historical between-group differences related to CTO assignment. The propensity score was based on 46 patient characteristics including demographics, potential communication barriers as a non-English speaker, socio-economic status or vocational challenge, risk periods associated with study and institutional involvements, diagnoses, and the patient’s psychosocial profile at both inpatient admission and release. Those variables significantly involved in the production of the score are shown with the reported model results below (see Appendix for complete list).

*Measuring Need for Treatment With HoNOS Psychosocial Profiles at Inpatient Admission and Release—*

The HoNOS is a 12-item measure of a person’s mental health, overall health, and relationship to their social context—their behavioral presentation and its potential relationship to mental illness.<sup>26</sup> Its item content includes: Aggression, Self-Injury, Drugs/Drink, Cognitive Dysfunction, Physical Health, Hallucinations/ Delusions, Depression, Other Mental Health Issues, Relationships, ADLs, Living Conditions, and Occupation/Activities.<sup>26</sup> HoNOS

items<sup>28</sup> were scored at entry and discharge from inpatient care when CTO placement typically occurs. HoNOS items range from 0= no problem, to 4 = extremely problematic situation. HoNOS profiles (based on the maximum item scores the patient received on a given item at hospital admission and release) are considered indicators of the 2 cohorts’ differing treatment needs (see figure 1).

CTO-assigned cases, as a necessary condition confirming their need for treatment, display mentally disordered behavior and behavior and circumstance that pose a threat to health and safety. The HoNOS ratings of patient behavior were performed independently of the CTO evaluation. The HoNOS score sheet reads: “Using HoNOS ... allows clinicians to build a picture of service users’ needs....”<sup>29</sup> Serious problems reported on a HoNOS item and the patient’s denial of a need for treatment, describe behavior confirming the need for treatment requirement for CTO placement.<sup>30-33</sup> Thus, herein, HoNOS items, because they are independent evaluations of such, are used to determine if the character of the CTO-assigned population is consistent with this necessary condition. They are also used to determine whether this behavior, in its severity, exceeds that of patients released from hospital who were not CTO-assigned. This analysis validates the conformity of CTO assignment with the aforementioned CTO criteria indicating that at least at admission and discharge these patients had a greater need for treatment than the comparison non-CTO-cohort.

*Less Restrictive Alternative. .**Measuring the LRA—*

Each hospitalization (from day of admission to day of discharge) was considered to be a separate inpatient episode.<sup>34</sup> An LRA to involuntary hospitalization maximizes time outside hospital while the patient still meets the criteria for inpatient involuntary care. Thus we used 2 criterion variables: “Average Inpatient Episode Duration” and for those patients who were re-hospitalized: “Duration of Community Residence Between Hospitalizations.”

*Needed Treatment. .**Measuring Availability of Needed Treatment.*

Treatment days per community care episode provides a direct measure of service provision. In addition case-management resources vary by the Adult Mental Health Service as does current patient load and available staff at the time of each patient episode. Variances in case-management resources will influence the availability of treatment services. Thus case-management resource variance for each individual was assessed with 3 measures: 1. Ratio of inpatients currently being served on the unit to which the patient had been admitted to the number of case managers in the community service to which they would be released; 2. The ratio of community-based patients currently served in the service to community case managers; and, 3. The ratio of all patients in the mental health service to case managers. With each of these measures, we assess the number of case managers available to meet the needs of a given patient population in an area service at the time of the patient’s episode of care and consequently how variance or constraints of such resources affected treatment availability. As an example, the recommended patient to case-manager ratio for Assertive Community Treatment is 10 patients to one case-manager.<sup>21</sup> In an area with 50 patients and 5 case managers the ratio would be  $50/5 = 10$ , an increase of 10 patients will yield a ratio of  $60/5 = 12$ , a 2-unit increase in the ratio. All regression models described below report on the impact of a unit increase or decrease on this treatment availability measure. If the outcome measure were number of days to return to hospital and the finding was a partial regression coefficient of  $b = -2.0$  then the 2 unit increase in the patient to case-manager ratio, from 10 to 12, would be associated with a 4-day reduction in community residence, a 3 unit increase with a 6-day reduction, etc.

*Additional Factors Considered Included—*

The Focus of Care Scale, measures the presumed objective of a given hospital admission. Assessed at hospital release and pertaining to the completed inpatient

episode, it was scored dichotomously—1, indicating an acute episode vs 0, indicating a hospitalization related to promoting functional gain or prevention of deterioration.<sup>25</sup> Also coded 1/0 was whether the patient was marginally housed (score 1) vs stably housed (0).

**Analyses**

Analyses were conducted with SPSS 27.0. Descriptive statistics were used to present the characteristics of the sample. Chi-Square, difference of proportions, and ANOVA were used for assessing group differences.

*Impact of Change on CTO Policy*

Descriptive statistics and difference of proportions tests were used to determine whether, relative to the population of patients receiving mental health services in the previous decade, there were changes in the use of initial hospitalizations, and/or CTO assignment during this study decade.

*Three CTO Criteria Conforming Analyses*

## 1. Selecting patients in greater need of treatment.

Differences in HoNOS items were evaluated with *t*-tests. A Logistic regression for developing a propensity score controlling for historical differences documenting the probability of being selected into the CTO cohort (described above) was completed.

## 2. Least restrictive alternative, and the treatment availability evaluation.

Three OLS multivariate regression models were run to evaluate conformity with the least restrictive criterion and assess the impact of resource availability on the provision of needed treatment.

The first OLS regression model assessed savings in hospital days per average inpatient episode per person—ie, given that a reduction of inpatient episode duration has been most frequently replicated as a positive outcome of CTO assignment.<sup>9,10,35,36</sup> In this model “average inpatient episode duration” was regressed on CTO exposure during the study period, average number of community-based treatment contacts, the interaction of these 2 factors, the Focus of Care score, the patient’s housing status, the Ratio of patients in the individual’s hospital-unit to case-managers, the Ratio of patients in the mental health service to case managers, and the propensity of a patient to be selected into the CTO sample from among patients who were hospitalized.

The second OLS regression model in this group was a re-run of the first, substituting the number of CTO episodes a patient experienced to estimate the

contribution of each CTO episode to reducing average inpatient episode duration.

A third OLS regression model in this group was run focused only on those patients readmitted to hospital. In this model “Duration of community residence between hospitalizations” was regressed on all the same variables as for the “average-inpatient-episode” model with one exception—ie, Ratio of all patients in the mental health service to case managers was substituted for the “Ratio of inpatients to case-managers.” Individuals re-hospitalized are patients at risk of long-term treatment and potentially long-term hospitalization and/or confinement in the correctional system. Thus, helping them maintain community residence is a significant objective. We are not the first to use this criterion.<sup>18</sup> We choose this criterion, rather than rehospitalization since the latter is not a failure; in the absence of adequate community care; it is the default for the provision of needed treatment, the intervention. Rehospitalization, the typical criterion in CTO studies, conflates the outcome with the intervention.<sup>9,10</sup>

#### *Challenging Diagnostic Difference Between Cohorts..*

Finally, the robustness of the propensity-score control for differences in cohort characteristics was tested by re-running the 3 criteria conformity outcome models using only patients in both groups with a diagnosis of schizophrenia, the greatest disparity between cohort characteristics remaining after drawing the samples.

## Findings

### *Impact of Change in CTO Policy: Hospital and CTOs Utilization Between 2 Decades*

Of the 214 388 patients listed in the VPCR as served in the 2010–2017 period, 7826 (3.7%) experienced an initial CTO compared with 3.6% ( $N = 8870$ ) of the 243 291 listed as served in the 2000–2009 period ( $Z = 0.08$ ;  $P = .936$ ). Of the 62 916 patients experiencing an initial hospitalization in the 2010–2017 period, 12.4% ( $N = 7826$ ) had an initial CTO, down from 15.6% ( $N = 8870$ ) of the 56,844 in the previous decade ( $Z = -15.79$ ;  $P < .000$ ). Conversely, of the 62 916 VPCR patients initially hospitalized in the 2010–2017 period, 87.5% ( $N = 55 070$ ) were released having never been assigned to a CTO--up from 84.4% (47 974) of initially hospitalized patients in the previous decade ( $Z = 48.31$ ;  $P < .000$ ). Overall, of the 214 388 VPCR patients in the 2010–2017 period, 29.3% ( $N = 62 916$ ) had an initial hospitalization, up from 23.4% ( $N = 56 844$  of 243 291 patients) in the previous period ( $Z = 45.95$ ;  $P < .000$ ).

### *Sample Characteristics*

The sample’s demographic characteristics are described in [table 1](#). The average age of the sample at mid-study was

$36.0 \pm 16.1$ ; 53.7% were males; 24.3% were not educated beyond the 11th grade; 54.9% were unemployed; 45.8% had never been married; 12.9% were homeless or marginally housed at the end of their hospitalization-episode, and 6.1% were in supported accommodation.

[table 2](#) describes the diagnostic and treatment experiences of the 2 cohorts. They differed considerably in diagnosis; 71% of the CTO-cohort were diagnosed with schizophrenia vs 33.8% of the non-CTO-cohort. CTO-cohort-patients entered the mental health system at an earlier age than non-CTO-patients ( $31.2 \pm 14.8$  vs  $35.6 \pm 19.1$ ). During the study period, they experienced  $4.0 \pm 4.1$  inpatient episodes on average, compared to  $2.0 \pm 2.3$  experienced by the non-CTO-patients. They averaged  $32.7 \pm 68.9$  inpatient days per episode in comparison to  $21.1 \pm 76.4$  days for the non-CTO cases.

The CTO-cohort experienced more than twice the number of community treatment days than the non-CTO-cohort ( $156.0 \pm 162.6$  vs  $59.9 \pm 89.4$ ), 74% more community treatment episodes ( $6.6 \pm 4.8$  vs  $3.8 \pm 2.4$ ) averaging  $25.6 \pm 28.0$  vs  $15.1 \pm 22.0$  days-per-episode. Of the community treatment episodes,  $2.2 \pm 2.2$  involved CTO placement. Overall, the CTO-cohort experienced 17 518 total CTO episodes with only 99 (0.6%) being initiated from the community (ie, the patient being brought to hospital and then immediately released to a CTO without hospital admission).

### *Selecting Patients in Greater Need of Treatment*

#### *HoNOS Profiles..*

Although both cohorts entered inpatient care with clinically significant problems meriting inpatient admission as measured by HoNOS scores, the CTO-cohort’s scores were statistically ( $P < .001$ ) and clinically higher or more severe than their non-CTO comparisons on Aggression, Cognitive Dysfunction, Hallucinations/Delusions, ADL, and Poverty of Living Conditions. The groups failed to differ only on Self-Injury ( $P = .421$ ) and the other items (see [figure 1](#)).

HoNOS scores at discharge—the point at which CTO placement typically occurred—showed an abatement of problems associated with most HoNOS dimensions. However, the CTO group still presented with more severe problems than their non-CTO counterparts on all dimensions ( $P < .001$ ) except for “Self-Injury” ( $P = .006$ ) where the non-CTO cohort presented slightly more severe problems. Additionally, compared to their non-CTO counterparts, the CTO group presented with clinically significant elevations in Hallucinations/Delusions as well as problematic Relationship issues ([figure 1](#)).

### *Controlling for History and Post-CTO Effects..*

[table 3](#) summarizes the results of the Logistic-regression (including both patient cohorts) describing the patients’

**Table 1.** Sociodemographic Characteristics of Psychiatric Patients in Victoria, Australia, Who Were or Were Not Placed on a Community-Treatment-Order for the First Time Between 2010 and 2017

Variable	Total (N = 21 722)		CTO (N = 7826)		Hospitalized, non-CTO (N = 13 896)	
	N*	M±SD or %	N	M±SD or %	N	M±SD or %
Age at Study Outset (M±SD)	20 175	36.0 ± 16.1	7826	35.1 ± 15.4	12 123	36.6 ± 16.5
Gender						
Male	11 675	53.7	4500	57.5	7175	51.6
Female	10 033	46.2	3323	42.5	6710	48.3
Undeclared	14	0.1	3	0.0	11	0.1
Education (5 categories)						
Never attended	44	0.2	17	0.2	44	0.2
Attended up to 11th grade	5114	24.1	2096	24.1	3214	23.6
Educated 11th grade and Beyond	4824	34.7	7719	35.5	2895	37.0
Vocational	433	2.0	167	1.9	266	2.1
Unknown	5436	39.1	8314	38.3	2878	36.8
Aboriginal &/or torres strait islander	385	1.8%	141	1.8	244	1.8
Birth Region with Majority People of Color Populations	2396	11.9%	1044	14.2	1352	10.6
Employment						
Unemployed/Pensioner	11 917	54.9	5226	66.8	6691	48.2
Employed	3212	14.7	808	10.3	2404	17.3
Not in labor force	2762	12.7	611	7.8	2151	15.5
Unknown	3757	17.3	1,107	14.1	2650	19.1
Marital status						
Never married	9955	45.8	4013	51.3	5942	42.8
Currently married	4775	22.0	1243	15.9	3532	25.4
Once married	2104	9.7	841	10.7	1263	9.1
Separated	1717	7.9	608	7.8	1109	8.0
Widowed	605	2.8	147	1.9	458	3.3
Unknown	2566	11.8	974	12.4	1592	11.5
Housing status						
Independent living (House or Flat)	17 473	80.5	6,116	78.2	11 357	81.7
Hospitalized	118	0.5	43	0.6	75	0.5
Supported accommodation	1354	6.1	522	6.6	794	5.7
Homeless/ Marginally Housed	2817	12.9	1147	14.8	1670	12.0
Neighborhood disadvantage						
Lowest SEIFA rank of neighborhood residence at episode start date	17 019	261.2 ± 211.2	7792	228.0 ± 203.1	9227	289.2 ± 213.8
Lowest SEIFA decile ranking of neighborhood residence at episode start date	17 019	4.3 ± 3.0	7792	3.8 ± 2.8	9227	4.7 ± 3.0

Notes: "Total sample numbers are listed in the column headings. Ns reported for each characteristic are actual numbers of individuals for which the information was available."

characteristics and the situations that significantly contributed to increasing their probability of CTO assignment more than other psychiatric inpatients. The model evaluated 42 of 46 non-collinear characteristics and was significant ( $X^2 = 6889.03$ ;  $df = 42$ , 19 363;  $P < .000$ ;  $N = 19 406$ ). Patients with a Schizophrenia diagnosis were most likely to be CTO-assigned (4.92 times more likely than others). Patients were 2.74 times more likely to be CTO-assigned if they experienced a hospitalization episode  $\geq 34$  days, and 16% more likely with each additional hospitalization. Their chance of CTO assignment was increased by 30% in association with each unit increase in HoNOS-item-assessments made for Hallucinations and Delusions, by 14% for Aggression, and 5% for Abuse of Drugs and Drink.

Patients of Indigenous heritage were 27% less likely to be CTO-assigned. While patients from birth regions with a majority population including People of Color were 37% more likely to be CTO-assigned than others. The latter finding is likely attributable to the correlation between "People of Color Birth regions" and "requiring an interpreter" ( $r = 0.27$ ). Needing an interpreter is not a part of the statutory criteria for CTO assignment, but at times in an evaluation of a person's disordered state, the patient's lack of ability to communicate in English may lead to a lack of clarity as to whether they continue to meet the statutory criteria or not. Thus a conservative decision to release the patient with CTO oversight may be made to reduce potential risk.

**Table 2.** Diagnostic and Service Characteristics of Hospitalized Psychiatric Patients in Victoria, Australia, Who Were or Were Not Placed on a CTO Between 2010 and 2019

Cohort:	Total (N = 21 722)		CTO (N = 7826)		Non-CTO (N = 13 896)	
	Mean $\pm$ SD N	%	Mean $\pm$ SD N	%	Mean $\pm$ SD N	%
Diagnosis						
Schizophrenic disorder	10 217	47.3	5552	71.0	4665	33.8
Paranoia and acute psychotic disorder	2247	10.4	700	9.0	1547	11.2
Major affective disorder	4105	19.0	635	8.1	3470	25.2
Dementia or other nervous system disorder	2392	11.0	791	10.2	1601	11.6
Other disorder	2653	12.2	139	1.9	2514	18.1
Age at entry to mental health system <sup>1</sup>	34.0 $\pm$ 17.8		31.2 $\pm$ 14.8		35.6 $\pm$ 19.1	
Had inpatient episode $\geq$ 34 days	5542	25.5	3384	43.2	2158	15.5
During the study period:						
Total inpatient days	84.2 $\pm$ 211.7		147.8 $\pm$ 282.8		48.4 $\pm$ 146.6	
Total inpatient episodes	2.7 $\pm$ 3.2		4.0 $\pm$ 4.1		2.0 $\pm$ 2.3	
Patients needing rehospitalization	7614	35.1	5050	64.5	2564	18.5
Community residence days before rehospitalization	62.6 $\pm$ 101.4		62.3 $\pm$ 94.5		63.2 $\pm$ 113.8	
Inpatient days per inpatient episode	25.2 $\pm$ 74.0		32.7 $\pm$ 68.9		21.0 $\pm$ 76.4	
Community-treatment days	104.2 $\pm$ 137.1		156.0 $\pm$ 162.6		59.9 $\pm$ 89.4	
Community-treatment episodes	5.0 $\pm$ 4.3		6.6 $\pm$ 4.8		3.8 $\pm$ 3.4	
CTO episodes	—		2.2 $\pm$ 2.2		—	
Treatment days per community care episode	19.9 $\pm$ 25.5		25.6 $\pm$ 28.0		15.1 $\pm$ 22.0	
Mean year of inpatient episode initiation	2014.1 $\pm$ 2.0		2014.2 $\pm$ 2.0		2014.1 $\pm$ 2.0	
Required a language interpreter	513	2.4	195	2.5	318	2.3

### *Less Restrictive Alternative, and the Impact of Resources Evaluation*

#### *Average Inpatient Episode Duration as a Less Restrictive Alternative and Mental Health Service Resources.*

The first OLS regressions in [table 4](#) considered the effect of CTO assignment on average inpatient episode duration as well as the impact of variance in adult mental health service patient to case-manager ratios in achieving this objective. The model's summary statistics are:  $R = 0.277$ ,  $\text{Adj } R^2 = 0.076$ ,  $df = 8$ ,  $19\,396 F = 200.71$ ,  $P < .001$ . Results indicate that CTO assignment resulted in 3.75 fewer days per inpatient episode over the course of the study period ( $b = -3.75$ ,  $SE = 1.21$ ,  $t = -3.10$ ,  $P = .002$ ). When the model was rerun including only Schizophrenia patients, CTO-assignment resulted in 3.20 fewer days per inpatient episode ( $b = -3.20$ ,  $SE = 1.26$ ,  $t = -2.53$ ,  $P = .011$ ).

Second OLS regression: Rerunning this model with the "number of CTOs" as the primary independent variable for all cases indicated that each CTO accounted for 1.85 fewer days ( $b = -1.85$ ,  $SE = 0.336$ ,  $t = -5.51$ ,  $p < .000$ ). When run only for people with Schizophrenia diagnoses the estimated savings due to each CTO-assignment was 1.94 days ( $b = -1.95$ ,  $SE = .335$ ,  $t = -5.79$ ,  $P < .000$ ).

#### *Duration of Community Residence as a Less Restrictive Alternative.*

The third: OLS regression in [table 4](#), focused on all patients requiring rehospitalization; 7614 (35% of the

total sample), 5050 (64.5% of the CTO-cohort) and 2564 (18.5% of the non-CTO-cohort). It considered the impact of CTO assignment on the duration of community residence until rehospitalization;  $626 \pm 1014$  days for all patients.  $623 \pm 945$  for CTO-assigned, and  $632 \pm 1138$  for non-CTO-patients. The Model's summary statistics are:  $R = 0.135$ ,  $\text{Adj } R^2 = 0.018$ ,  $df = 8$ ,  $7232 F = 16.70$ ,  $P < .001$ . Taking account of the aforementioned controls, CTO-assigned patients averaged 112.68 ( $b = 112.68$ ,  $P < .000$ ) more days in community residence than non-CTO cohort patients who needed rehospitalization. Rerunning the same model for patients with Schizophrenia diagnoses showed CTO-patients averaged 117.47 more days in community residence than non-CTO cohort patients ( $b = 117.47$ ,  $SE = 42.44$ ,  $t = 2.77$ ,  $P = .006$ ).

Both models in [table 4](#) linked adult mental health service case-management resources to their outcome criteria. In the first model, Average-Inpatient-Episode-Duration showed a 6.53-day increase ( $b = 6.53$ ;  $P < .000$ ) for each unit increase in the ratio of inpatients to case-management staff and a half-day reduction ( $b = -0.51$ ;  $P < .001$ ) in episode duration for each unit increase in the ratio of adult mental health service case-managed patients in the community to case-managed staff. Being homeless/marginally housed also contributed to a 3.46-day ( $b = 3.46$ ;  $P = .003$ ) increase in inpatient episode duration. In the second model, the duration of community residence between hospitalizations increased by 10.86



**Table 3.** Characteristics That Significantly Enhanced the Probability of a Decision to Place a Person on a CTO Between the Years of 2010 and 2019

Characteristics*	B	S.E.	Sig.	Exp(B)	95% C.I.
<i>Clinical Condition at Discharge**</i>					
Hallucinations and Delusions (HoNOS Item #6)	0.26	0.02	0.000	1.30	1.24–1.36
Aggression (HoNOS Item #1)	0.13	0.03	0.000	1.14	1.08–1.20
Drugs and Drink (HoNOS Item #3)	0.05	0.02	0.031	1.05	1.00–1.10
Other/ Mental Health Problems (HoNOS Item #8)	–0.13	0.03	0.000	0.88	0.84–0.92
Depressed (HoNOS Item #7)	–0.19	0.03	0.000	0.83	0.78–0.87
Self-Harm (HoNOS Item #2)	–0.28	0.03	0.000	0.76	0.71–0.81
<i>Social Situation at Discharge**</i>					
Relationships (HoNOS Item #9)	0.08	0.03	0.002	1.09	1.03–1.15
Occupation Activities (HoNOS Item # 12)	0.07	0.03	0.009	1.07	1.02–1.13
Living Conditions (HoNOS Item #11)	–0.12	0.03	0.000	0.89	0.85–0.94
<i>Clinical Condition at Admission**</i>					
Aggression (HoNOS Item #1)	0.32	0.02	0.000	1.38	1.32–1.44
ADLs (HoNOS Item #10)	0.09	0.02	0.001	1.09	1.04–1.14
Cognitive Problems (HoNOS Item #4)	0.08	0.02	0.000	1.08	1.04–1.13
Hallucinations and Delusions (HoNOS Item #6)	0.07	0.02	0.001	1.07	1.03–1.11
Depressed Mood (HoNOS Item #7)	–0.19	0.02	0.000	0.82	0.79–0.86
Self-injury Non-accidental (HoNOS Item # 3)	–0.17	0.02	0.000	0.84	0.81–0.88
<i>Social Situation at Admission**</i>					
Relationships (HoNOS item #9)	0.07	0.02	0.006	1.07	1.02–1.12
<i>Mental Health Service History</i>					
Inpatient episode 34 or more days	1.01	0.04	0.000	2.74	2.51–2.98
Total number of inpatient episodes	0.15	0.01	0.000	1.16	1.13–1.19
Age at first Mental Health System Contact	0.06	0.01	0.000	1.06	1.04–1.08
Time is known to Mental Health System, (in days)	0.00	0.00	0.000	1.00	1.00–1.00
<i>Diagnosis</i>					
Schizophrenia	1.59	0.08	0.000	4.92	4.23–5.72
Paranoia or Other Psychosis	1.19	0.09	0.000	3.29	2.77–3.92
Dementia	0.71	0.09	0.000	2.03	1.68–2.44
Major Affective Disorder	0.47	0.09	0.000	1.60	1.35–1.90
<i>Demographics</i>					
Birth Region with Majority People of Color Populations	0.32	0.06	0.000	1.37	1.22–1.53
Age at study 3 mid-point	–0.06	0.01	0.000	0.94	0.93–0.96
Education less than 11th Grade	–0.11	0.04	0.008	0.89	0.82–0.97
Currently married at the end last episode	–0.20	0.05	0.000	0.82	0.74–0.90
Indigenous dichotomized	–0.32	0.14	0.019	0.73	0.56–0.95

\*Only characteristics, among the 46 considered, that significantly increased or decreased the probability of assignment to a CTO are shown here.

\*\* HoNOS items were assessed at inpatient admission and discharge and are scored 1 to 4 with one being the least severe and 4 the most severe manifestation of the behavior.

days ( $b = 10.86$ ;  $P < .001$ ) for each unit increase in the ratio of adult mental health service patients served by case managers to case-management staff.

## Discussion

### *Impact of Change on CTO Policy*

The decrease in the rate of initial CTO assignments, from 15.6% to 12.4% of hospitalized patients, across the decades would seem to confirm the success of CTO advocacy. The efficiency of CTO assignment in bringing needed services also seems to be confirmed as indicated by the fact that those assigned to a CTO vs the non-CTO population did not differ in the number of episodes nor the number of services received on average per episode across the decades. Yet

a parallel consequence of entry into the “capacity” decade<sup>37</sup> was an increase of 6.2% of patients initially hospitalized who were not assigned to a CTO in the decade. Furthermore, in the 2000–2009 decade 5.9% ( $N = 1516$ ) of CTO episodes were initiated from the community,<sup>7</sup> while in the 2010–2019 period only 0.6% ( $N = 99$ ) were so initiated. Did CTOs reduce initial hospitalizations for those placed on orders from the community during the 2000–2009 period? Were people initially believed to have capacity to refuse hospitalization during 2010–2019 given the opportunity to choose an involuntary order over hospitalization and subsequently hospitalized because their refusal of this less restrictive alternative provoked a reassessment of their capacity and a determination of a need for hospitalization?

**Table 4.** Service Characteristics Associated With a Person’s “Average Inpatient Episode Duration” and “Duration of Community Residence Between Hospitalizations”

Model Dependent Predictor Variables	Average-Inpatient-Episode-Duration <sup>a</sup>				Duration of Community Residence Between Hospitalizations <sup>b</sup>			
	B	SE	T	sig.	B	SE	T	sig.
CTO cohort exposure	-3.75	1.21	-3.10	.002	112.68	28.81	3.91	.000
Treatment days per community care episode	-.07	.03	2.65	.008	2.23	.62	3.57	.000
Interaction CTO exposure by treatment days per community care episode	.04	.03	1.28	.202	-1.60	.18	-8.67	.000
Propensity for CTO assignment	22.10	1.77	12.46	<.000	-158.56	51.87	-3.06	.002
Focus of Inpatient Admission	-.031	.79	-.039	.969	-27.42	26.38	-1.04	.299
Homeless/Marginally Housed	3.46	1.18	2.94	.003	-41.94	34.09	-1.23	.219
Ratio of inpatients currently being served to case managers	6.53	.27	24.42	<.000	—	—	—	—
Ratio of community-based patients currently served to case managers	-.51	.08	-6.11	<.000	10.86	3.42	3.18	.001
Ratio of patients in the mental health service to case-managers	—	—	—	—	-3.96	7.91	-.50	.617

<sup>a</sup> The average duration of inpatient episode model refers to assessing whether ever having been placed on a CTO has an impact on the average number of days associated with all inpatient episodes. Model summary statistics:  $R = .277$ , Adj.  $R^2 = .076$ ,  $df = 8$ , 19 396  $F = 200.71$ ,  $P < .001$ .

<sup>b</sup> The duration of community residence between hospitalizations model considers the role of CTO assignment for inpatients who required re-hospitalization. Model summary statistics:  $R = .135$ , Adj.  $R^2 = .018$ ,  $df = 8$ , 7232  $F = 16.70$ ,  $P < .001$ .

### Selecting Patients in Greater Need of Treatment and Providing It

Replicating findings from Victoria’s previous decade,<sup>9</sup> the 2010–2019 CTO-cohort presented with more severe and clinically significant health and safety issues, particularly in the areas of aggression, hallucination and delusions, cognitive disturbance, and relationships. It continues to be the case that a major vehicle for the provision of needed treatment to this group comes in the form of extended inpatient stays (34-plus days) and an elevated number of inpatient episodes, compared to the non-CTO group. Herein the CTO-cohort’s symptoms at hospital release persisted at clinical significance indicating that it is unlikely that their health and safety issues had been resolved. Their HoNOS profiles indicated that they had a greater need for treatment than non-CTO patients.

### Delivery of Needed Treatment

The CTO-cohort experienced more community-treatment episodes ( $6.6 \pm 4.8$  vs  $3.8 \pm 2.4$ ) averaging  $25.6 \pm 28.0$  vs  $15.1 \pm 22.0$  days per episode. The comparison cohorts in the previous decade had a very similar experience with CTO cases also having 6 community-treatment episodes vs 3.3 for the non-CTO-cohort, and averaging 26.6 vs 16.1 days per episode.<sup>9</sup> The question that remains is the whether the CTO patients would fail to obtain this needed treatment without the involuntary provisions of the law. Previous research supports the “involuntary component” of the law with findings indicating that once brought under CTO supervision, patients increased their use of mental health care to the level of a voluntary population, but stopped making use of this level of service

after CTO termination.<sup>38</sup> In the current population, largely one lacking in “capacity”, this result would likely be magnified.

Patients placed on a CTO must be refusing treatment and believed to be in need of treatment to protect the health and safety of themselves and/or others. An additional study<sup>39</sup> based on international findings of elevated morbidity risk from life-threatening physical illness validated this risk noting that 53% of all hospitalized psychiatric patients accessed acute care for life-threatening illness compared to 32% of outpatients, putatively members of the general population. Among people with severe mental illness, however, it reported that in Australia’s universal health care system, where individuals have complete access to health care, while not under mental health system supervision the likelihood that a CTO patient would receive a life-threatening physical illness diagnosis was 31% lower than for non-CTO patients, and no different from lower morbidity risk outpatients without severe mental illness. While, under mental health system supervision, however, the likelihood that CTO patients would receive a physical illness diagnosis was 40% higher than non-CTO patients and 5.02 times more likely than for outpatients. Each CTO episode in this study was associated with a 4.6% increase in the likelihood of a member of the CTO group receiving a diagnosis of a life-threatening condition. These study findings are also consistent with the results of a survey of carers which reports that among those with experience of caring for a person on a CTO, most believed the CTO had been of benefit, though in 89% of the cases the person relapsed and needed further treatment when the CTO was stopped.<sup>40</sup>

*Least Restrictive Alternative, and the Impact of Resources Evaluation*

Did CTO assignment provide an LRA for psychiatric hospitalization? The simple answer is yes. CTO assignment on average accounts for 3.75 fewer days in each hospital episode via early release and was associated with an additional 112.68 days of community residence for those individuals who had to be re-hospitalized.

With respect to hospital episode duration, however, the 3.75-day savings is down 2.2 days compared to the previous round of this study (the 2000–2009 decade),<sup>9</sup> and 5.1 days compared to its initial round (the 1990–1999 decade),<sup>10</sup> when Victoria was fully committed to provision of community-care for people with severe mental illness. These findings seem to indicate that a reduction in the investment in community care affects the use of the CTO for mediating early release.

The decision to discharge an individual with remaining behavioral issues that characterize CTO patients is complex and influenced by the availability of case-management resources both at the time of release to facilitate the discharge and in the community to be assured of a safe transition. The findings indicate that the timing of the release and thus the potential savings of hospital days, is influenced by resource allocations as each increase in the ratio of inpatients to case managers available to facilitate the transition was associated with a 6.5-day increase in the duration of hospitalization.

When considering the second CTO LRA effect, an increase in the number of community residence days between hospitalizations, it is important to note that the actual number of treatment contacts per community care episode represents a sustained cut in case-management services across 2 decades from 35.6 to 25.6 (28.1% down) from the CTO-cohort's first-decade experience when Victoria was fully invested in the provision of community-care.<sup>4,38</sup> Given what appears to be reduced community-based treatment resources in the system of care, there is a need to recognize that “prevention of hospitalization” is not necessarily a CTO objective. CTOs may appropriately address crises that disrupt a community care episode and bring patients back to the hospital when they need this level of treatment. From this perspective, the CTO is a way of providing supervision while in the community under less restrictive care. This perspective may explain why a unit increase in the ratio of patients to case-managers is also associated with 1086 additional days of community residence between hospitalizations. In this case, there may not be enough coverage to get a patient back to hospital when they need to be hospitalized.

Finally, while advocates, focused on “defeating the CTO,”<sup>14</sup> attempted to minimize its effect by inappropriately using the “number needed to treat” (NNT) statistic relating to the single CTO outcome of shortened hospital stay, they fail to indicate that the CTO has in

several studies been associated with reduced mortality risk, reduced risks of crime against persons and victimization by crime against persons, increased medication compliance, increased use of mental health services, and increased access to initial diagnoses of life-threatening physical illnesses.<sup>41</sup> It also addresses at least 155 threats to health and safety reliably assessed in involuntary placement decisions following psychiatric emergency evaluation, potentially adding to its potential for health and safety risk-reduction.<sup>42</sup> If accumulated across all such threats the NNT for CTO use is likely to be small.

The limitations of this study derive from its reliance on administrative data which are usually less carefully compiled than research study data. Though differing in cross-jurisdiction language, the criteria for involuntary inpatient care and CTO assignment in the mental health acts within each of the 8 Australian jurisdictions, are the same.<sup>7,8,43–49</sup> Each jurisdiction recognizes that the hospital is more restrictive than involuntary community care. The design for determining whether CTO assignment is a less restrictive alternative, however, may not be generalizable to jurisdictions where the CTO criteria are more or less restrictive than those for inpatient commitment.

The study analyses rely on correlational measures that do not yield full certainty of causal inference due to potential selection bias. This said, known potential sources of selection bias have been controlled in the analysis and the study reports on the experience of an entire population over the course of 10 years. It adds additional understanding and replication of findings now spanning 30 years. It reports the experiences of over 25 000 CTO-assigned-patients. Selection bias is an issue with all comparison-group-studies, such bias seems less pertinent to this study since the reported savings in hospital days and additions to the duration of community residence allowing for less restrictive community care are opposite of expectations for the more severely ill cohort in contrast to other patients requiring hospitalization.

## Conclusions

CTO placement enabled shorter hospital stays and longer community stays between hospitalizations. Its delivery of a less restrictive alternative to hospitalization was impeded by case-management resource constraints as was the CTO's ability to provide needed treatment via rapid rehospitalization in the absence of adequate community care.

The effort to reduce the use of CTOs, apparently successful, seems to have resulted in increased use of hospitalizations to address the treatment needs of this severely ill group, denying qualifying individuals access to an effective less restrictive alternative.

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## Research in context and Evidence before this study

All available literature on the effectiveness of CTOs has been reviewed through 2021. Also considered was the context of deinstitutionalization within which CTOs are used.

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## Ethics

Human Subjects/Ethics Committees approved study procedures.

Role of funding source: National Institute of Mental Health, U.S.A. provided support for study with no other involvement.

## Contributors

All authors contributed to the preparation of the manuscript and have access to the data on which its conclusions are based.

## Declaration of Interests

The authors have no conflicts of interest.

## Data Sharing

The data come from multiple sources/organizations and are deidentified and linked with unique research ID numbers. Access has been approved by multiple ethics committees and is not available from the authors per multiple human research ethics committee-imposed restrictions.

## Added Value of This Study

Provision of involuntary care is an abridgment of civil rights, a source of controversy, and as such its circumstances require continued monitoring. This study adds a third decade of replication of positive results associated with CTO use to the largest study of their utility.

## Implications of all the Available Evidence

The addition of a focus on the importance of hospital and community mental health resources as well as patient housing status in limiting CTO utility adds new understanding of how to address the protection of health and safety of self and others while providing an LRA to hospitalization to those in need-of-treatment and refusing it.

## Choice of Primary Measure

The CTO involves early and or immediate release from a current episode of hospitalization. We, therefore, chose savings in average hospital duration as the primary dependent measure. The second dependent measure, “average days in community residence between episodes of hospitalization” for those patients requiring rehospitalization was selected since it represents the effort to maintain very ill patients in the community while providing a less restrictive alternative to hospitalization.

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