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The Utility of Outpatient Commitment: I. A Need for Treatment and a Least Restrictive Alternative to Psychiatric Hospitalization

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Abstract

Objectives: This study examined whether psychiatric patients assigned to community treatment orders (CTOs), outpatient commitment in Victoria, Australia, have a greater need for treatment to protect their health and safety than patients not assigned to CTOs. It also considered whether such treatment is provided in a least restrictive manner—that is, in a way that contributes to reduced use of psychiatric hospitalization.

Methods: The sample included 11,424 patients first placed on a CTO between 2000 and 2010, and 16,161 patients not placed on a CTO. Need for treatment was independently assessed with the Health of the Nation Outcome Scales (HoNOS) at hospital admission and at discharge. Ordinary least-squares and Poisson regressions were used to assess savings in hospital days attributable to CTO placement.

Results: HoNOS ratings indicated that at admission and discharge, the CTO cohort's need for treatment exceeded that of the non-CTO cohort, particularly in areas indicating potential dangerous behavior. When analyses adjusted for the propensity to be selected into the CTO cohort and other factors, the mean duration of an inpatient episode was 4.6 days shorter for the CTO cohort than for the non-CTO cohort, and a reduction of 10.4 days per inpatient episode was attributable to each CTO placement.

Conclusions: CTO placement may have helped patients with a greater need for treatment to experience shorter hospital stays. Whether the CTO directly enabled the fulfillment of unsought but required treatment needs that protected patient health and safety is a question that needs to be addressed in future research.

Outpatient commitment provisions have been written into law around the world (1) and exist in 45 U.S. states and the District of Columbia (2). These provisions have been described as assisted treatment (3), a means to deliver involuntary treatment (4), and a way to engender

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treatment compliance (5). In civil commitment law, outpatient orders are almost universally recognized as “a least restrictive alternative to psychiatric hospitalization” for persons meeting the involuntary civil commitment standard of the jurisdiction. Outpatient commitment, which is initiated by a community treatment order (CTO) in Victoria, Australia, and most Commonwealth nations, is carried out in two primary ways. First, it is a form of conditional release whereby a patient is placed on an order after involuntary hospitalization as part of an aftercare plan and as a means to shorten the duration of the current hospital episode. This is by far the oldest and most used approach (6). Second, a patient can be placed on a CTO while living in the community as a way of avoiding hospitalization, although this occurs infrequently (7).

The utility of a CTO depends on the extent to which it meets the stated objectives written into the law (7). For individuals who refuse intervention because of their symptoms of mental illness, these objectives include ensuring access to needed treatment by various means of service, focusing on the protection of the health and safety of self and others, and using the least restrictive alternative to psychiatric hospitalization to accomplish these goals. [A description of CTO use in Victoria is included in an online supplement to this article.]

The CTO is designed to be a delivery system enabling the provision of unsought but required services that are thought to lead to positive health and safety outcomes with limited use of hospitalization (7). In fact, a CTO is typically part of a package that includes the hospitalization preceding it. By design, the CTO should enable savings in hospital days by allowing clinicians to shorten the inpatient stay it follows. It should protect against untoward events after the inpatient stay, with either additional service provision or, as a result of the additional supervision it provides, rehospitalization to prevent negative health and safety outcomes.

This study built on previous work (7–9) by considering the effects of various components of the CTO legal mandate. It analyzed a second decade of new data to attempt to replicate the earlier findings and to add to the understanding of how CTOs fulfill the stated objectives written into the law. In 2000, at the outset of the decade under study, Victoria closed all its state hospitals and began relying on general hospital psychiatric services and CTOs to help ensure delivery of needed treatment objectives in a fully integrated health and mental health care system. This study addressed two considerations in the use of CTOs in Victoria, Australia. First, to what extent are patients selected for CTOs in need of treatment related to protecting their health and safety? Second, is the provision of such treatment delivered in a least restrictive manner—that is, in a way that contributes to reduced use of psychiatric hospitalization (10)?

METHODS

Sample

The Victorian Psychiatric Case Register/RAPID data system provides a record of the characteristics of all clinical contacts that occur in the State of Victoria, Australia. All patients who were hospitalized for psychiatric reasons between July 1, 2000, and June 30, 2010, were identified (N=69,186), and two cohorts were drawn. The first included all

individuals placed on a CTO for the first time during the period (N=11,424). The second was a matched and randomly selected comparison cohort of persons hospitalized for psychiatric reasons who were never placed on a CTO (N=16,161). [Additional details about cohort selection are included in the online supplement.] These records were then linked to the records of Corrections Victoria, which document detention in police custody or prison; the Socio-Economic Indexes for Areas, which indicate neighborhood disadvantage (11); and the Australian Mental Health Outcomes and Classification Network's (AMHOCN'S) Health of the Nation Outcome Scales (HoNOS) records of clinical quality-of-life assessments of patients who use Australia's mental health systems.

Measuring Need for Treatment: HoNOS Item Profiles

The HoNOS is a 12-item measure of a person's mental health, overall health, and relationship to their social context—their quality of life and its potential relationship to mental illness (12). The HoNOS has established reliability and validity (13). Clinicians in Australia—those who are AMHOCN-trained and retrained—complete HoNOS assessments routinely as part of an effort to evaluate the national mental health system. The assessing clinician, usually a psychiatric nurse, is not the same clinician who makes the recommendation or decision regarding a CTO placement (13)—that person is a psychiatrist. Inclusion of these independent and routine HoNOS measurements enabled an evaluation of patients' need for treatment at hospital admission and at hospital discharge and also enabled a determination of whether the judgment exercised in hospitalizing and placing individuals on CTOs was reflected in differences in patients' observed behavioral and situational lives at these points in time.

Clinicians provided scores on the HoNOS items at inpatient admission and discharge, which is when CTO placement typically occurred for members of the CTO cohort. Individual HoNOS items are rated from 0, no problem, to 4, an extremely problematic situation (14). Clinicians completing the HoNOS determine the degree to which patients show problems with aggression, nonaccidental self-injury, drug or alcohol problems, cognitive problems, general medical illness or disability, hallucinations or delusions, depressed mood, other mental or behavioral problems, relationships, activities of daily living, living conditions, and occupation and activities. Although the total HoNOS score has been used as a measure of overall psychiatric morbidity (15), this usage is not recommended (16) because of the multidimensional structure of the instrument (17,18). In this study, HoNOS profiles, which were based on the maximum score that the patient received on a given item at admission and at discharge, were considered potential indicators of the two cohorts' differing treatment needs. This procedure provided a 12-item profile of the cohorts at their worst—their most severe clinical assessment or their lowest quality-of-life rating. It provided a case-mix profile of group membership. Each item severity rating of 0 to 4 was anchored in HoNOS guidelines. Thus each integer rating served as an anchor point for clinicians when they evaluated the seriousness of the patients' problems.

A serious problem with any HoNOS dimension would contribute to a decision of eligibility for CTO placement (16,17,19). The HoNOS assessment, however, is not part of the CTO

evaluative process in Victoria. In this study, scores on HoNOS items were the result of independent evaluations and were used to assess the validity of the CTO process.

Measuring Treatment Delivery

In documenting a patient's receipt of treatment, all treatment contacts were organized into episodes of care. Each hospitalization (from day of admission to day of discharge) was considered to be a separate inpatient episode, and each continuous period of outpatient care without a break in service for 90 days or more was considered to be a community care episode (20). Reinitiation of care after a break in service of 90 days or more was considered the start of a new community care episode. All occasions of community service were reported as community treatment days; multiple occasions of community service on the same day were counted as one community treatment day. Units of analysis were the same for both cohorts.

Analyses

All analyses were conducted with SPSS 23.0 (21). Chi-square tests and analyses of variance were used for descriptive statistics and group differences. Logistic regression was used to develop a propensity score designed to assess a patient's probability of being selected into the CTO cohort [see online supplement for details]. Ordinary least-squares (OLS) and Poisson regressions were used to assess savings in hospital days per average inpatient episode per person—given that a reduction in the duration of inpatient episodes has been most frequently replicated as a positive outcome of CTO assignment (7,15,22). For OLS and Poisson regressions, the average duration of the inpatient episode experienced by a patient during the study was regressed on CTO exposure over the course of the study period, average number of community-based treatment contacts, and the interaction of these two factors, after adjustment for the following: the propensity of a patient to be selected into the CTO sample from among patients who were hospitalized, demographic characteristics, potential communication barriers as a non-English speaker, socioeconomic status or vocational challenge, risk periods associated with the study, institutional involvement (that is, number of inpatient episodes or had a longer than average inpatient episode), diagnoses, experience of police custody or imprisonment, and a patient's psychosocial profile reflected in his or her 12 HoNOS scores at both inpatient admission and release. This model was then rerun, substituting the number of CTO episodes that a patient experienced for "CTO exposure" in order to estimate the contribution of each CTO episode to reducing the average duration of an inpatient episode [see online supplement for more details about the theory used to build the model].

Ethics

The human subjects committees of the Victoria Department of Human Services, the Victoria Department of Justice, and the University of California, Berkeley, approved study procedures.

RESULTS

Data on demographic and diagnostic characteristics of the sample are presented in Table 1. The mean age of the sample at study outset was 34.0. More than half of the patients (56%) were male, were not educated beyond the 11th grade (52%), and were unemployed (60%). About half (49%) had never been married, and two-thirds (66%) had a diagnosis of schizophrenia.

Table 2 presents data on the treatment experiences of the two cohorts. Patients in the CTO cohort entered the mental health system at an earlier age than those in the non-CTO cohort (age 32.1 versus 35.5). During the study period, patients in the CTO cohort experienced 4.0 inpatient episodes on average (range 1–65), compared with 1.3 (range 1–39) for those in the non-CTO cohort. The CTO cohort averaged 38.0 inpatient days per episode, compared with 29.1 for the non-CTO cohort.

The CTO cohort experienced almost twice the number of community treatment episodes compared with the non-CTO group (6.0 versus 3.3), with almost 40% more treatment days per episode (26.6 versus 16.1). For the CTO cohort, an average of 2.3 of the community treatment episodes involved placement on a CTO. Overall, the CTO cohort experienced 25,696 total CTO episodes; 39.2% (N=10,021) of the CTO episodes ended in rehospitalization, and only 5.9% (N=1,516) were initiated from the community (that is, either initiated on the same day of hospital admission—the patient was brought in and immediately released on a CTO—or initiated more than three days after hospital admission).

The CTO cohort entered inpatient care with clinical profile scores more severe than their non-CTO counterparts on all 12 HoNOS dimensions. Differences between cohorts in HoNOS scores on admission were statistically significant ($p<.001$) on all dimensions except for physical health, which was statistically significant at $p=.002$. The profile was more severe not only statistically but also clinically (that is, when scores are rounded to their nearest clinical anchor value). Although both groups manifested clinically significant problems at admission on all dimensions, clinically adjusted scores of the CTO group exceeded those of the non-CTO group on the following items: aggression, drugs and alcohol, cognitive dysfunction, and hallucinations or delusions (Figure 1). The scores of both groups indicated not only a statistically but also a clinically significant problem on the eight other items, sufficient to allow inpatient care recommendations (23).

HoNOS scores at discharge—the point at which CTO placement typically occurred for members of the CTO cohort—showed an abatement of problems associated with most HoNOS dimensions. However, the CTO group continued to have more severe problems than their non-CTO counterparts on all dimensions at discharge. The differences between cohorts were statistically significant differences ($p<.001$) on all dimensions except for other mental disorder ($p=.009$) and physical health ($p=.051$). In addition, compared with their non-CTO counterparts, the CTO patients continued to have clinically significant elevations in hallucinations or delusions and relationship issues (Figure 1).

Table 3 summarizes the results of the logistic regression describing patient characteristics that were associated with an increased likelihood of being released from inpatient care on a

CTO. The model evaluated 42 of 46 noncollinear variables and was significant ($\chi^2=9,056.94$, $df=42$, $p<.001$). Patients were 5.47 times more likely to be selected for a CTO if they experienced a hospitalization of greater than the 34-day mean length of stay. In addition, the likelihood was greater ($\text{Exp}(b)=1.60$) with each additional hospitalization. For each unit increase in severity on the 4-point HoNOS item on hallucinations or delusions at hospital discharge, the likelihood of CTO assignment was increased ($\text{Exp}(b)=1.28$); the likelihood was also increased ($\text{Exp}(b)=1.12$) for each unit increase in severity on this item at hospital admission. In addition, the likelihood of CTO assignment was increased for each unit increase in severity at admission on the following three items: aggression ($\text{Exp}(b)=1.15$), disturbance in relationships ($\text{Exp}(b)=1.05$), and cognitive disturbance ($\text{Exp}(b)=1.03$). Being a male also increased the likelihood of CTO assignment ($\text{Exp}(b)=1.13$), as did having an interpreter at the mental health tribunal hearing ($\text{Exp}(b)=1.23$).

The OLS regressions considered the role of the CTO in the duration of an inpatient episode when all aforementioned controls and the propensity of a patient to be selected into the CTO sample were taken into account (Table 4). The first model considered the overall effect of CTO assignment on average inpatient episode duration; its summary statistics were as follows: $R=.704$; adjusted $R^2=.494$, $F=463.84$, $df=44$ and $20,780$, $p<.001$. Results indicated that placement on a CTO resulted in 4.6 fewer days per inpatient episode over the course of the study period ($b=-4.61$, $p<.001$). The second model considered the impact of a given CTO on inpatient episode duration; its summary statistics were as follows: $R=.722$, adjusted $R^2=.522$, $F=515.66$, $df=44$ and $20,780$, $p,.001$. The model results indicated that each individual placement on a CTO resulted in a reduction of 10.4 days in the associated inpatient episode ($b=-10.38$, $p,.001$).

Results from the OLS regressions were replicated in the Poisson analyses. The average episode duration for the CTO cohort was estimated to be shorter than for the non-CTO cohort ($\text{Exp}(b)=.960$, 95% confidence interval [CI]=.955–.966), likelihood ratio $\chi^2=8,372.35$, $df=20$, $p<.001$). Each CTO episode was associated with fewer inpatient days ($\text{Exp}(b)=.913$; $CI=.911-.914$, model likelihood ratio $\chi^2=8,500.39$, $df=45$, $p<.001$).

DISCUSSION

This study replicated findings from an analysis of data from a previous decade in Victoria (7). As in the previous study, longer and repeated hospitalizations were strongly associated with selection for the CTO delivery system. Thus, from 2000 to 2010, it continued to be the case that a major consideration in the selection of individuals for placement on a CTO was experience of longer inpatient stays (34 days) and more inpatient episodes, compared with individuals not placed on a CTO

In terms of least restrictive care, the results seem to support the objective of providing care in a way that involved reduced use of psychiatric hospitalization in each episode of care. After the analysis adjusted for treatment history, diagnosis, demographic factors, psychosocial profile, prison time, cultural disadvantage, social disadvantage of the postal code in which the patient resided, and the propensity of a patient to be selected into the CTO

sample, placement on a CTO resulted in 4.6 fewer days per inpatient episode over the course of the study and a reduction of 10.4 inpatient days per CTO episode. These findings seem to confirm the goal of using CTOs to reduce the duration of inpatient episodes. They also replicate earlier findings in Victoria (7) and in Western Australia (15,22). From 1990 to 2000, 8.3 days were saved per inpatient episode (7). The decline to 4.6 days saved in 2000–2010 may indicate a shift in the system’s investment in community care.

Compared with the non-CTO cohort, the CTO cohort had more severe and clinically significant health and safety issues, particularly in the areas of aggression, hallucinations or delusions, cognitive disturbance, and disturbances in relationships. The CTO group was characterized by persistent health and safety problems, as indicated by repeated long-term hospitalizations, as well as persistent clinically significant symptoms. Thus the findings provide added justification, under the legal requirement to “prevent future deterioration” (7), for the protective measures specified in a CTO treatment plan; these measures are considered in mental health board hearings, where independent assessments are conducted in the presence of rights advocates (24).

It remains an open question with respect to the need- for-treatment component of the CTO criteria whether the patient would fail to get needed treatment without the involuntary provisions of the law. Previous research has supported the “involuntary component” of the law; findings indicate that when patients were brought under CTO supervision, they increased their use of mental health care to the level of a voluntary population and that they stopped making use of this level of service after CTO termination (23). This finding is also consistent with results of a recent survey of caregivers, which reported that among those with experience caring for a person on a CTO, most believed that the CTO had been of benefit; in 89% of the cases, the person relapsed when the CTO was stopped and needed further treatment (25).

The CTO is a delivery system for available treatment; it is not a vaccine with a potential to have carryover effects once the order is terminated; it does not prevent the recurrence of episodes of mental illness. Therefore, the CTO is only as effective as the treatment delivery system in which it is embedded and the extent to which that system makes treatment and supervision available (26). At the outset of this second decade of research on CTO use in Victoria’s mental health system, all state hospitals were closed, and the state governmental unit, composed of individuals who were viewed as effective community care advocates and whose unit’s mission was the promotion of enhanced community care, was disbanded (4). The system focus changed to one of integrated general medical and mental health care centered around the general hospital. Although community treatment during this second decade was available at a rate 40% higher for the CTO cohort than for the non-CTO cohort (26.6 contacts versus 16.1 contacts per community episode), the actual number of treatment contacts per community care episode fell from 35.6 to 26.6 (25%) for the CTO cohort, compared with 1990–2000, and from 23.0 to 16.1 (30%) for the non-CTO cohort (7). Our previous work indicates that in this environment of more constrained resources, clinicians appear to have adopted a de facto triage system for investing their time in the most serious cases by discharging 15.9% of the patients with less severe symptoms prior to a CTO legal hearing and focusing on making the case for legal retention of patients with more serious

illness—the result being that only 2% of patients who remained on a CTO long enough to get to a hearing (at eight weeks after the CTO start date) were discharged after the hearing (24).

The objective of CTO community care contacts also seems to have changed. The analyses regarding the impact of community treatment days went from a negative relationship in the 1990–2000 cohort, indicating that treatment days contributed to a reduction in inpatient days per episode over the decade, to a finding in 2000–2010 indicating that treatment days were associated with an increase of a fraction of a day in the duration of an inpatient episode in interaction with a CTO. These results appear to show that the objective of the community treatment delivered in the second decade changed from aggressive action to maintain people in the community to a focus on providing services when absolutely required, such as by following up with patients who had a longer hospital stay and posed greater risk on release, meeting patients' special needs, dealing with crises, and salvaging potentially failing CTO-associated community care episodes by bringing patients back to the hospital for needed treatment. In fact, 39% of the CTOs ended in patient rehospitalization.

The limitations of this study derive from its reliance on administrative data, which are not collected for purposes of research. Quality-of-life psychosocial assessments were based on clinician, not patient, perspectives. Future studies should take into account patients' points of view (even if by a simple quantitative self-rating) when evaluating the impact of CTOs on quality of life. In addition, the analyses relied on correlational measures that did not yield full certainty of causal inference because of potential selection bias. Nevertheless, the study examined the experience of an entire population over the course of ten years, and it replicates and adds depth to previous findings. Also, no randomized controlled trials (RCTs) of outpatient commitment have been completed that randomized at the outset of an inpatient episode that was followed by release to a CTO—that is, as opposed to randomization at release from the hospital. Thus

RCTs discount and provide no documentation on a random basis of the saving of hospital days attributable to early release to a CTO (27,28), and by doing so they ignore the true contribution of the CTO to limiting hospitalization time. Furthermore, for ethical reasons, studies do not use random assignment with individuals who are believed to be dangerous, which, as demonstrated in this study, is a core behavioral criterion that separates those placed on a CTO from those not placed on a CTO. As a consequence, completed RCTs involving outpatient commitment suffer from selection bias. If strict causal inference limits are used, then the conclusions of those studies apply only to patients who are not deemed to be dangerous—that is, those who are less likely to be selected for outpatient commitment (28). Finally, the issue of selection bias seems less pertinent to this study; the finding that hospital days were saved because patients assigned to CTOs were discharged to less restrictive community care is opposite to the expected finding, which is that the more severely ill CTO cohort would require more hospitalization than the non-CTO cohort.

CONCLUSIONS

At inpatient admission, the problems of the CTO cohort were substantially more severe than those of the non-CTO cohort and were directly related to issues of health and safety. Although these problems abated somewhat by hospital discharge, it is likely that the CTO cohort had a continuing need for treatment given their history of a greater number of recurring hospitalizations and hospitalizations of longer duration. Given the procedural protections of the Victoria mental health board, CTO use that involves placing limits on patients' behavior—measures that are included in the CTO framework—seems justified to prevent patients' future deterioration.

The CTO is a delivery system designed to address the need for treatment in a least restrictive manner—one that reduces the need for inpatient care. To the extent that CTO placement was associated with reduced inpatient days during an illness episode, it appears to have achieved this objective. Questions remain as to whether the supervision provided by CTOs enables patients to receive unsought but required treatment that protects their health and safety.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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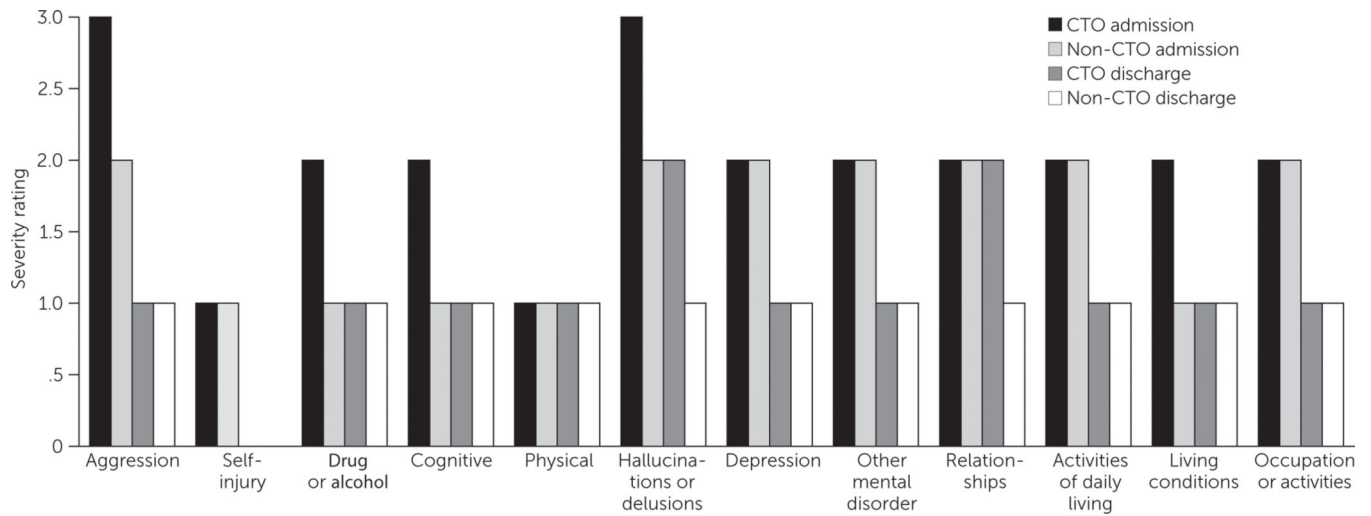


FIGURE 1. HoNOS ratings of problem area severity at inpatient admission and discharge for CTO and non-CTO cohorts^a

^a Problem areas are rated on Health of the Nation Outcome Scales on a scale from 0, no problem, to 4, extremely problematic. Clinicians' ratings were rounded to the closest clinically descriptive anchor point. CTO, community treatment order

Characteristics of psychiatric inpatients, by whether they were placed on a community treatment order (CTO) from 2000 to 2010 in Victoria, Australia^a

TABLE 1.

Characteristic	Total (N=27,585)		CTO cohort (N=11,424)		Non-CTO cohort (N=16,161)	
	N	%	N	%	N	%
Age at study outset (M±SD)	34.0±16.7		32.4±15.3		35.4±17.5	
Gender						
Male	15,480	56	6,646	58	8,834	55
Female	12,103	44	4,776	42	7,327	45
Education						
Never attended	102	<1	39	<1	63	<1
Up to 11th grade	14,347	52	6,071	53	8,276	51
Beyond 11th grade	4,376	16	1,868	16	2,508	16
Unknown	8,389	30	3,307	29	5,082	31
Aboriginal or Torres Strait Islander	718	3	287	3	431	3
Employment						
Unemployed	16,604	60	7,817	68	8,787	54
Employed	4,038	15	1,259	11	2,779	17
Not in labor force	3,224	12	952	8	2,272	14
Unknown	3,719	14	1,396	12	2,323	14
Marital status						
Never married	13,410	49	6,005	53	7,405	46
Currently married	5,854	21	1,790	16	4,064	25
Once married	3,998	15	1,738	15	2,260	14
Separated	1,937	7	850	7	1,087	7
Unknown	2,386	9	1,041	9	1,345	8
Diagnosis						
Schizophrenic disorder	18,260	66	8,240	72	10,020	62
Paranoia and acute psychotic disorder	2,157	8	719	6	1,438	9
Major affective disorder	2,760	10	920	8	1,840	11
Dementia or other nervous system disorder	3,167	12	1,131	10	2,036	13
Other disorder	912	3	305	3	607	4

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Characteristic	Total (N=27,585)		CTO cohort (N=11,424)		Non-CTO cohort (N=16,161)	
	N	%	N	%	N	%
Unspecified	329	1	109	1	220	1
Imprisoned or in police custody during study period	95	<1	46	<1	49	<1

^aTotal sample numbers are listed in the column headings. Ns reported for each characteristic are actual numbers individuals for which the information was available.

Service characteristics among psychiatric inpatients, by whether they were placed on a community treatment order (CTO) from 2000 to 2010 in Victoria, Australia^a

TABLE 2.

Characteristic	Total (N=27,533)		CTO cohort (N=11,411)		Non-CTO cohort (N=16,122)	
	N	%	N	%	N	%
Age at entry to mental health system (M±SD)	34.1±16.7		32.1±15.3		35.5±17.5	
Inpatient episode 34 days (lifetime)	7,160	26	5,082	45	2,078	13
During study period						
Total inpatient days (M±SD)	85.7±247.1		150.8±313.7		39.6±171.7	
Total inpatient episodes (M±SD)	2.4±3.4		4.0±4.2		1.3±2.1	
Inpatient days per inpatient episode (M±SD)	33.8±105.8		38.0±102.1		29.1±109.7	
Community treatment days (M±SD)	91.2±126.9		146.4±154.0		50.9±81.8	
Community treatment episodes (M±SD)	4.4±3.9		6.0±4.4		3.3±2.9	
CTO episodes (M±SD)	—		2.3±2.4		—	
Treatment days per community care episode (M±SD)	20.5±28.6		26.6±30.1		16.1±26.7	
Lowest SEIFA rank of neighborhood residence (M±SD) ^b	300.7±197.1		302.4±199.1		299.4±195.6	
Year of inpatient episode initiation	2005.7±2.7		2005.9±2.7		2005.5±2.8	
Required a language interpreter	1,115	4	485	4	630	4

^aMinimum N for which complete service characteristic information was available

^bSEIFA, Socio-Economic Indexes for Areas. Possible rankings range from 1 to 644, with lower scores indicating a neighborhood with greater social disadvantage.

TABLE 3.

Analysis of variables as predictors of placement on a community treatment order (CTO) from 2000 to 2010 among inpatients in Victoria, Australia^a

Characteristic	b	SE	P	Exp(b)	95% CI
Inpatient episode >34 days	1.70	.05	<.001	5.47	4.94–6.06
N of inpatient episodes	.47	.01	<.001	1.60	1.56–1.63
Severity of hallucinations or delusions at discharge	.25	.02	<.001	1.28	1.23–1.33
Interpreter used in mental health tribunal hearing	.20	.08	.007	1.23	1.06–1.42
Severity of aggression at admission	.14	.02	<.001	1.15	1.11–1.19
Gender (male=1; female=0)	.12	.03	<.001	1.13	1.06–1.20
Severity of hallucinations or delusions at admission	.11	.01	<.001	1.12	1.09–1.15
Severity of disturbance in relationships at admission	.05	.02	.001	1.05	1.02–1.09
Severity of cognitive disturbance at admission	.03	.02	.038	1.03	1.00–1.07

^a Among the 44 considered characteristics, only those that significantly increased the probability of CTO assignment are shown.

Analysis of variables as predictors of a patient's average inpatient episode duration among psychiatric inpatients placed on a community treatment order (CTO) from 2000 to 2010 in Victoria, Australia^a

TABLE 4.

Variable	Overall effect of CTO exposure ^b			Direct effect of CTO exposure ^c			
	b	SE	t	b	SE	t	p
CTO cohort	-4.61	1.23	-3.75	—	—	—	—
Treatment days per community care episode	.11	.07	1.69	-.05	.06	-.77	.445
Interaction: CTO exposure X treatment days per community care episode	.02	.08	.24	.22	.07	2.93	.003
N of CTO episodes	—	—	—	-10.38	.30	-34.14	<.001

^aIn both models, CTO effect estimates were adjusted for the propensity of a patient to be selected into the CTO sample from among hospitalized patients, age, gender, socioeconomic status or vocational challenge (that is, >11th grade education, unemployment, and the lowest Socio-Economic Indexes for Areas rank of a neighborhood in which the patient lived), risk period associated with study and institutional involvement (that is, age at first date known to the mental health system, total time known to the mental health system, and lifetime total inpatient days), diagnoses (major affective disorder, dementia, schizophrenia, and paranoia or other psychosis), imprisonment or police custody during the study, Aboriginal or Torres Strait Islander status, language interpreter required at the tribunal, and psychosocial profile reflected in the 12 Health of the Nation Outcome Scales scores at both inpatient admission and release [see online supplement].

^bThe model refers to assessing whether ever having been placed on a CTO had an impact on the average number of days associated with all inpatient episodes, not just the episodes associated with CTO stays. Model summary statistics: $R^2 = .704$, adjusted $R^2 = .494$, $F = 463.84$, $df = 44$ and $20,780$, $p < .001$.

^cModel summary statistics: $R = .722$, adjusted $R^2 = .522$, $F = 515.66$, $df = 44$ and $20,780$, $p < .001$