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# Mortality-Risk With “Capacity” Constraints On Community Treatment Order Utilization

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**Background:** Assignment to a community treatment order (CTO) has been associated with reduced mortality risk. In Victoria Australia civil-rights enhancements involving capacity to refuse involuntary treatment have contributed to a 15% reduction between 2010 and 2019 in CTO assignments among first hospitalized patients with Schizophrenia diagnoses. Has this change impacted patient mortality risk? **Study Design:** This study considered mortality-risk between 2010 and 2019 for 3 patient groups with schizophrenia diagnoses: All 4848 hospitalized patients who were assigned to a CTO for the first time in the period; 3988 matched and randomly selected patients, who were first hospitalized in the decade, without CTO assignment; and 1675 never hospitalized or CTO-assigned outpatients. Deaths of Schizophrenic patients in each group were evaluated against expected deaths given standardized mortality ratios for Victoria. Logistic regression was used to evaluate mortality risk for each treatment group while taking account of race, demographics, differential access to initial diagnoses of life-threatening physical illness, mental health service resources, and indicators of social disadvantage. **Study Results:** A total of 78% of the 777 deaths of schizophrenia patients in all 3 groups were premature. The 2 hospitalized groups did not differ in mortality risk. Among Victoria’s 2010–2019 outpatients (inclusive of treatment refusers with a recorded service contact), 16.2% had a Schizophrenia diagnosis—up from 0.2% in 2000–2009, the prior decade. Outpatients with Schizophrenia were at 48% greater risk of death than individuals in the hospitalized groups, taking all the afore mentioned risk factors into account. **Conclusions:** Reductions in CTO utilization associated with potential treatment refusals of involuntary community-treatment supervision, seem to have increased mortality risk for this vulnerable population. The line between civil-rights protection and abandonment has been blurred.

**Key words:** Schizophrenia/capacity to refuse treatment/Civil Commitment/community treatment orders/outpatient commitment

## Background and Hypotheses

Community treatment orders (CTOs) in European and Commonwealth nations, and outpatient commitment in the United States, are part of mental health law worldwide. The CTO is a legal requirement for patients to participate in needed treatment. It is enforced in lieu of, and as a less restrictive alternative (LRA) to inpatient care, since in most jurisdictions, patients must meet the same standard for continuance on a CTO as they would for involuntary detention in a hospital. The problem addressed by the CTO assignment is helping people with severe mental illness survive through a potentially harmful crisis posing imminent threats to health and safety by providing needed treatment that due to their illness they are refusing to accept.<sup>1–5</sup> Protection of harm to self and others is the only behavioral basis for CTO assignment in 23 of the 46 US jurisdictions, 5 of the 8 Australian mainland states and territories, the United Kingdom, Norway, Canada, and Israel.<sup>4</sup> Failure to comply with CTO treatment requirements results in return to hospital and a determination of whether the patient still meets the involuntary care criteria. The US Supreme Court has ruled that there is “. . . no constitutional basis for confining [persons with mental illness] involuntarily if they are dangerous to no one and can live safely in freedom”.<sup>2</sup> The UK Parliament’s intention for the use of the CTO in the UK Mental Health Act of 2007 was to “. . . put [the assignment to a CTO] to the clinical decision about the risk in the community . . .”.<sup>6</sup> Even in US state supreme court decisions that have expanded the interpretation of

the dangerous standard to include grave disablement, the provision of needed treatment offered on a preventive basis is tied to a likelihood of an anticipated present behavioral threat to health and safety.<sup>7</sup>

In July 2008, Australia ratified the UN Convention on the Rights of Persons with Disabilities (CRPD).<sup>8</sup> Since that time, Australian advocates have successfully lobbied for changes to mental health legislation that either prohibit or strongly discourage involuntary care in hospital or with the use of CTOs. Assignment to involuntary care under Victoria Australian law is confined to patients who, due to their mental illness are “in need of treatment” to protect the health and safety of themselves and others. Treatment must also be available. Though retaining the aforementioned provisions, the law in Victoria now limits the use of involuntary treatment for individuals deemed to have the “capacity” to refuse such care.<sup>9</sup>

### *Mortality Risk and CTO Assignment*

Population research has consistently shown increased mortality risk among persons with severe mental illness, placing them at risk of premature death.<sup>10–17</sup> Mortality research in England,<sup>18</sup> Victoria,<sup>19,20</sup> and Western Australia<sup>21</sup> has demonstrated the utility of CTOs in reducing such risks. The question raised herein, is whether rights advocacy focused on limiting involuntary care provision for people with severe mental illness, who are refusing treatment,<sup>22</sup> has enabled continued protection of this vulnerable population?

Given positive outcome expectations, our initial hypothesis is:

*Hypothesis 1.* CTO assignment will be associated with less mortality risk than that characterizing individuals hospitalized though not assigned to a CTO—ie, the positive associations,<sup>18–21</sup> between CTO assignment and reduced mortality risk will be reaffirmed.

*“Capacity” Restraints and Mental Health System Change.* The “capacity” restraint provision in the law now effectively takes people deemed to have the “capacity” to refuse treatment out of the involuntary-treatment population.<sup>23</sup> In fact, of all people with a Schizophrenia diagnosis first hospitalized between 2010 and 2017, 42.8% were released to a CTO, down from 57.7% between 2000 and 2009.<sup>24</sup> Patients brought to the attention of the mental health system “with capacity” can refuse treatment focused on addressing their health and safety risks. However, this does not erase their contact with the system of care since all contacts with the system are recorded as service contacts, a community mental health service. This is true even if the contact results in a refusal of future service. In fact, while a patient may accept voluntary hospitalization, many patients refusing care are now likely to be found with records of outpatient

mental health service—evidencing 1 or perhaps 2 “service contacts”, recorded as service episodes, during which they have exercised their right of treatment refusal. During the 2000–2010 decade, only 0.2% of outpatients in Victoria were diagnosed with Schizophrenia.<sup>25</sup> Given the option to refuse treatment, either hospitalization and or CTO assignment, it is expected that the representation of people with Schizophrenia diagnoses among those who are recorded as “outpatients” will increase. The consequences of the shift to the capacity criterion will, perhaps, be most evident among patients generally believed to be at greatest risk of premature death, those patients with a Schizophrenia diagnosis recorded as outpatients.

People are assigned to CTOs because of threats to health and safety due to their mental illness. Advocates have suggested that CTOs may, in fact, be “far more potent when their use is restricted to those who lack decision-making capacity”<sup>22</sup> [p.12]. Given this expectation, has the change in the law taking patients with capacity out of the involuntary system effectively achieved the sought-after goal of protecting their civil liberties without harmful consequences? The following additional hypothesis is considered:

*Hypothesis 2.* Those who choose outpatient treatment, or have opted out of hospitalization and/or CTO assignment though listed as outpatients, will have less mortality risk than individuals assigned to involuntary care when other risk factors are taken account of—ie, as those individuals will have “capacity” to protect their own health and safety.

This study considers the mortality-risk consequences for people with schizophrenia of “capacity restraints” on the use of involuntary treatment in hospitals and via CTOs in a third decade of newly recruited Victorian patients.

## **Study Methods**

### *Sample*

This study used the Victorian Psychiatric Case Register and the Client Management Interface—Operational Data Store (CMI-ODS) records of patient utilization for the years 2010–2017 with a 2-year follow-up period through 2019. It studied three groups of adult ( $\geq 18$  years of age) patients with Schizophrenia diagnoses all selected with the same sampling methodology employed during 2 previous decades. (1) The CTO-cohort: All 4848 patients who had experienced psychiatric hospitalization and a first-time CTO placement in the study period—that is, patients believed to be in need of involuntary supervision because of their refusal to accept mental health care required to address their behavior that, due to their illness, posed a threat to health and safety. (2) The Non-CTO-cohort: 3988 psychiatrically hospitalized patients with a schizophrenia diagnosis who never experienced

CTO exposure and were believed to be voluntarily able to participate in treatment and able to address their own imminent threats to health and safety, and (3) The outpatient cohort: 1675 mental health outpatients who were never psychiatrically hospitalized or placed on a CTO—individuals potentially more likely to have never been hospitalized due to the adoption of the “capacity” criterion allowing patients to refuse involuntary care. Patients in the hospitalized non-CTO and outpatient cohorts were matched with the CTO-cohort on age, gender, and diagnosis (to the extent possible) and otherwise randomly selected.

VPCR/ CMI-ODS mental health records were linked to National Death Index Records, the Socio-Economic Indexes for Areas (SEIFA) records of neighborhood disadvantage, the Victorian Emergency Minimum Dataset’s (VEMD) clinical episode data from emergency departments of Victorian-public-hospitals, and the Victorian Admitted Episodes Dataset (VAED) clinical episode data for admitted episodes of care in Victorian medical hospitals. Age and sex-specific death rates during the study period were available from the Australian Bureau of Statistics online table search engine: Explore Data. Gov <https://explore.data.abs.gov.au/>.

### Design

This 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 harmful and dangerous outcomes is not ethically possible. No physician would allow such a patient to participate in the study—that is, knowingly releasing a patient to the community who is refusing voluntary treatment and poses continuing harm to self and others without oversight. Data reported from the British OCTET trial,<sup>26</sup> a trial that relied on their medical team to recruit participants, appears to validate this observation. The OCTET sample’s baseline Brief Psychiatric Rating Scale (BPRS) scores were respectively for the comparison groups (CTO vs control)  $M = 36$  and  $M = 37$  and their Global Assessment of Functioning (GAF) scores were  $M = 38$  and  $M = 40$ .<sup>26</sup> Such BPRS scores would indicate Mild to Moderate Illness, while the BPRS Severe or Extreme Illness score range would be 70–85.<sup>27</sup> OCTET GAF scores indicate the presence of some impairment while scores of 11–20 would characterize “a person in danger of hurting themselves or others”.<sup>28</sup> Patients assigned to a CTO must be refusing treatment and under current Victorian law lack the capacity to understand their need for treatment. Yet OCTET patients’ baseline Attitude to Treatment scale scores were respectively 9 and 8 for the comparison groups, with a score of 12 on the 0–12-point scale indicating full insight; their respective scores on the Awareness of Illness Scale 6 out of 10 where 10 is “full insight”.<sup>26</sup> The CTO is designed and limited by

law to the delivery of involuntary treatment to get people through a severe mental illness episode without them causing harm to self or others. People assigned to a CTO must in most jurisdictions meet the criteria for involuntary inpatient care and the duration of their assignment is limited by the time they continue to exhibit behavior conforming to those criteria. Consequently, the OCTET study failed to find between-group differences in their hospitalization and psycho-social outcome measures because neither group required the intervention—they were not severely ill, at risk of harming themselves and others, or apparently lacking the capacity to refuse treatment; they had almost full treatment insight.<sup>26</sup> Randomized studies conducted on participants to test the effectiveness of an intervention when the inclusion criteria exclude 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 current study begins with three groups, 2 of which have, over the course of 2 decades been shown at both admission to hospital and discharge to differ in their degree of harmful behavior to self and others.<sup>29,30</sup> CTO patients, though admitted under the same commitment criteria, were more severely ill and in greater need for treatment than individuals released from hospital without CTO assignment, and both were at greater risk of harm to self and others than outpatients.<sup>29,30</sup> It has further been documented in the past<sup>25</sup> and in the current cohorts<sup>31</sup> that both hospitalized groups share approximately the same physical morbidity risks for 5 life-threatening physical illnesses (ie, cancer, ischemia, cerebrovascular disorder, diabetes, and physical trauma) and that their risk for such illness was significantly higher than both outpatient cohorts.<sup>31</sup>

Given that the CTO-cohort is more severely ill,<sup>29–31</sup> then the “null hypothesis” (no effect pertaining to harmful outcomes) is a finding that the more severely ill patients in the CTO-cohort are at greater risk of death that is, they are more severely ill and at greater risk of episodic harm to self and/or others due to their illness than the Non-CTO control. This is the expected (no effect) outcome. Both groups would be expected to be at greater risk than the outpatients who have never been admitted to a hospital in need of treatment to protect health and safety. The alternate hypothesis, is a finding of “no difference” or “better mortality outcomes” by the CTO cohort than a less severely ill Non-CTO cohort or assumedly the outpatient sample—that is, these are positive results since poorer performance should be the expected outcome for CTO and the hospitalized non-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,

Logistic Regression analysis is used to adjust for clinical and demographic mortality-risk factors.

### *Measurement of Mortality-Risk Factors*

**Mental Health Service.** In documenting the patient's history of mental health treatment/supervision, all contacts with the mental health system (inpatient, voluntary outpatient community care, and CTO) were organized into episodes of care. Each psychiatric hospitalization (from day of admission to day of discharge) was considered a separate inpatient episode. Each continuous period of outpatient care without a service break for 90 days or more was considered a community care episode.<sup>32</sup> A service break of 90 days or more followed by re-initiation of care was considered the start of a new community care episode. Each CTO-episode begins when a patient is placed on an order and ends when the order is terminated. A treatment/service contact day is any day in which the patient had one or more service contacts regardless of the nature or outcome of those contacts.

Because CTO effectiveness as an alternative to the hospital is dependent on the availability of community treatment, treatment contact days per community care episode provides a measure of service provision most relevant to Hypothesis 1, the assessment of the impact of CTO assignment on mortality risk.

Because a treatment refusal by a patient with capacity would be recorded as a single service contact, patients with only one service contact are contrasted with other patients to determine whether such patients have, as suggested in Hypothesis 2, less mortality risk.

**Measuring Provision of Needed Treatment and Resource Constraints.** Case management resources vary by the Adult Mental Health Service as does the 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. We assessed 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 patient outcomes. As an example, the recommended case manager-to-patient ratio for Assertive Community Treatment (ACT) is ten patients to one case manager.<sup>33</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, 100 patients to 5 case-managers yields a 20 to 1 result, twice the recommended ACT ratio. Logistic regression models below report on the impact of a unit increase or decrease in the service's patient to community case manager ratio on mortality risk.

**Physical Disorder Threats.** VEMD and VAED records provided all diagnoses of 1 of the 5 life-threatening

physical illnesses—that is, cancer, ischemia, cerebrovascular disorder, diabetes, and physical trauma.

**Measuring Social Disadvantage.** The Socio-Economic Indexes for Areas (SEIFA) records neighborhood disadvantage.<sup>34</sup>

### *Analyses*

The unit of analysis was the individual. The primary dependent measure was the patient's reported death. Analyses were performed with SPSS-27<sup>35</sup> and an Excel Spreadsheet program. Excel was used for computing expected deaths based on Victoria's age and sex-specific death rates during the study period.<sup>36</sup>

Logistic regression was used for assessing the mortality risk for the 3 cohorts. The Logistic model enabled measurement of the contribution of a given factor to mortality risk after all other factors in the model are taken into account, that is, given priority in explaining patient death. Three categories of independent/control variables included in the model were considered as potential contributors to mortality risk.

1. Measures of mental health service including the following variables:
  - a. Categorical treatment strategy reflected in the treatment group—that is, Hospitalized and CTO Assigned, Hospitalized without CTO assignment, and Never hospitalized or CTO assigned (Outpatients), for addressing hypothesis 1.

Each treatment group was coded 1 for group membership; 0 for the non-group member.

Only 2 of the 3 group identifier variables can be entered into the model together, the third is the contrast group. Thus to illustrate how each individual group compares to the contrast group the model is run twice—first with the CTO and non-CTO groups in contrast to the Outpatients; then with the non-CTO and Outpatients in contrast with the CTO group. [Table 3](#) (in Results section below) lists the results from the first run with the Outpatients as the contrast. It then lists the results from the second run with the CTO group as the contrast. Since the risk estimate for any variable in the model, is the result after all other variables have been allowed to explain all they can in accounting for patient mortality, all other control results yield the same outcomes regardless of which treatment group is the chosen contrast. Thus all the results for the controls variables appear in [table 3](#) directly under the reported results of the 2 runs used to contrast the treatment groups.

- b. Treatment days per community care episode, a direct measure of service provision for addressing

Hypothesis 1; a single service contact vs more than one service contact (coded 1/0 respectively) for addressing Hypothesis 2.

- c. Mental health system case management resources available at the time of an episode. Case management resources in Victoria vary by Area of Mental Health Service as does the current patient load and available staff at the time to address each patient episode. Variances in case management resources will influence the availability of treatment services. Thus, case management resource variance for each case was assessed with *the ratio of community-based patients currently served in the service to case managers*. This measure assesses 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 from the internationally recommended case manager ratio of 10/1 for patients in the CTO category<sup>32</sup> are potential constraints on resources that might affect patient outcomes.
2. Demographics: Age and gender.
3. Potential sources of under-service, discrimination, and circumstance leading to known group mortality-risk including: Residence in a socially disadvantaged area, measured by the lowest SEIFA index score associated with a person’s neighborhood residence. Minority group membership, including Indigenous and being “Born in a Region with a Majority People of Color Population”. Homelessness/Marginally housed status.
4. Number of life-threatening physical illnesses—that is, cancer, ischemia, cerebrovascular disorder, diabetes, and physical trauma.

The Logistic Regression was run 4 times: Twice, to address Hypothesis 1 with “Treatment days per community care episode” as the service contact measure, and show the effect on mortality risk for the 3 contrast groups. Twice to address Hypothesis 2 with “1 service contact (coded 1) vs more than 1 service contact (coded 0) as the service contact measure and again show the effect of mortality risk for the 3 contrast groups.

## Study Results

### Sample Characteristics

Patients with Schizophrenia diagnoses in the full sampling frame represented 70.9% ( $N = 5552$  of  $N = 7826$ ) of the CTO-cohort, 33.6% ( $N = 4665$  of  $N = 13\,896$ ) of the Non-CTO-cohort; and 16.2% ( $N = 1964$  of  $N = 12\,101$ ) of the outpatient cohort.

Of the 12181 patients with Schizophrenia diagnoses 10 511 were adults. The diagnostic, social, and service characteristics of the adult Schizophrenia samples are reported in [table 1](#).

Of those patients, 58.2% of the CTO-cohort were men, 57.2% of the non-CTO-cohort, and 58.5% of the outpatient-cohort. Respectively the mean average ages of 3 cohorts were 35.1, 35.2, and 35.7. The groups differed in the intensity of service provision with the CTO-cohort experiencing a mean average of 6.8 episodes of community care (median = 6.0; mode = 4) and a mean average of 27.5 community treatment contact days per community care episode (median = 20.2; mode = 12); the Non-CTO-cohort had 4.4 episodes (median = 3.0; mode = 2) with 16.5 contact days per episode (median = 9.8; mode = 1.0); and, outpatients experienced 2.2 episodes (median = 2; mode = 1) having 23.3 contact days per episode (median = 11.3; mode = 1).

Forty percent of the CTO cohort, 37.9% of the non-CTO cohort, and 18.4% of the outpatients received a diagnosis of 1 of the 5 life-threatening physical illnesses (ie, cancer, ischemia, cerebrovascular disorder, diabetes, and physical trauma).

The treatment resource ratio for outpatients to case managers averaged  $17.7 \pm 7.2$  for all patients. It was 18.8 for CTO patients—ie, almost twice the internationally recommended standard.<sup>32</sup>

### Mortality

The average age-specific death rate per 1000 for Victoria’s population over the 9.5-year period (July 1, 2010–December 31, 2019) was 64.1. The expected patient deaths over these 9.5 years given Victoria’s age/sex-specific death rate was 167. 777 patients died, 610 in excess of expectation—that is, prematurely given Victoria’s age/sex specific death rates.

Among male patients, there were 443 deaths, 353 (80%) in excess of age-specific expectation Similarly there were 334 female deaths, 257 (77%) in excess of expectation deaths (see [table 2](#))

### Mortality Risk

The logistic regression focused on Hypothesis 1, including treatment group, ie, cohort membership, treatment days per community care episode, and the additional risk-factors noted above were significant ( $\chi^2 = 506.27$ ;  $df = 11$ ;  $P < .001$ ) ([table 3](#)). All factors in the [table 3](#) model are taken account of, given explanatory priority, when the effect of any variable is determined. CTO-patients experienced a 32% [ $\text{Exp}(b) = 0.68$ ;  $P = .011$ ] lower mortality risk than Outpatients. The Non-CTO patients had a 35% [ $\text{Exp}(b) = 0.65$ ;  $P = .005$ ] lower mortality risk than Outpatients; while both groups did not differ in mortality risk from each other. Finally, the outpatient group had a 48% [ $\text{Exp}(b) = 1.48$ ;  $P = .011$ ] greater mortality risk when contrasted with both of the hospitalized groups. Service days per episode were not significant [ $\text{Exp}(b) = 1.00$ ;  $P = .370$ ] nor was the patient/staff ratio [ $\text{Exp}(b) = 0.99$ ;  $P = .197$ ].

**Table 1.** Characteristics of Adult Mental Health Patients With Schizophrenia Diagnoses in Victoria, Australia, Between 2010 and 2017

Variable	Three cohorts (N = 10 511)			Hospitalized and CTO assigned (N = 4848)			Hospitalized, Non-CTO (N = 3988)			Outpatients (N = 1675)		
	N	M ± SD or %	N	M ± SD or %	N	M ± SD or %	N	M ± SD or %	N	M ± SD or %	N	M ± SD or %
Age at study outset in 2010	10 511	36.7 ± 13.7	4 848	36.0 ± 12.6	3 988	36.9 ± 14.1	1 675	38.5 ± 15.7				
Gender*: Male	6082	57.9%	2821	58.2%	2281	57.2%	980	58.5%				
Female	4425	42.1%	2024	41.7%	1706	42.8%	695	41.5%				
Aboriginal and/or Torres Strait Islander	171	1.6%	81	1.7%	82	2.1%	8	0.5%				
Born in a region with a majority people of colour population	1328	15.3%	716	15.8%	554	15.2%	58	12.1%				
Homeless/marginally housed	1419	13.5%	697	14.4%	566	14.2%	156	9.3%				
Neighbourhood SEIFA Disadvantage Score	9964	993.0 ± 72.3	4664	991.1 ± 72.8	3665	996.0 ± 71.6	1 635	991.7 ± 71.9				
Number of community treatment episodes	10 399	5.2 ± 4.2	4848	6.8 ± 4.5	3879	4.4 ± 3.8?	1 672	2.2 ± 1.6				
Community treatment days per episode	10 511	22.6 ± 28.9	4848	27.5 ± 29.9	3988	16.4 ± 22.5	1 675	23.2 ± 36.0				
Ratio Inpatients to CMH staff in episode	10 389	3.7 ± 3.0	4848	4.0 ± 2.6	3879	2.9 ± 2.4	1 662	4.4 ± 4.4				
Ratio community patients to CMH Staff in episode	10 389	17.7 ± 7.2	4848	18.6 ± 6.3	3879	15.7 ± 5.7	1 662	19.9 ± 10.9				
Diagnosed with one of 5 life-threatening physical conditions**	3759	35.8%	1939	40.0%	1512	37.9%	308	18.4%				

CTOs, Community treatment orders.

\*Four individuals were non-binary.

\*\* An initial medical diagnosis of cancer, ischemia, cerebrovascular disorder, diabetes, or physical trauma.

**Table 2.** Mortality by Gender and Cohort Among Patients With Schizophrenia Diagnoses

Gender by cohort	Patients with schizophrenia						
	<i>N</i> <sup>a</sup>	Deaths	Crude death rate	Deaths per 1000	Expected deaths over 9.5 years given Victoria’s age/sex specific death rates	Excess/premature deaths given victoria’s age/sex-specific death rates	% of Deaths in excess
All patients	10 507	777	0.0739	73.9	167	610	78
Men							
CTO cohort	2821	205	0.0727	72.7	35	170	83
Non-CTO	2281	172	0.0754	75.4	36	136	79
Outpatients	980	66	0.0673	67.3	19	47	71
Total males	6082	443	0.0728	72.8	90	353	80
Women							
CTO cohort	2024	138	0.0681	68.1	28	110	80
Non-CTO	1706	134	0.0785	78.5	31	103	77
Outpatients	695	62	0.0892	89.2	18	44	71
Totalfemales	4425	334	0.0755	75.5	77	257	77

<sup>a</sup>There were 10 511 individuals with Schizophrenia diagnoses in the total sample. There were 4 cases where information on gender was not available. None of these 4 cases died, Given the need to adjust for gender in computing life expectancy and other statistics, the reported statistics for individuals with Schizophrenia other than the total deaths statistics are based on  $N = 10\,507$ .

**Table 3.** Hypothesis 1: CTO-assignment and Mortality-Risk

Risk factors for death in period	<i>b</i>	<i>SE</i>	Sig	Exp ( <i>b</i> )	95% CI for EXP( <i>b</i> )	
					Lower	Upper
Intervention groups						
CTO and non-CTO cohorts vs outpatients						
CTO-cohort	−0.39	0.15	0.011	0.68	0.50	0.92
Non-CTO-cohort	−0.43	0.15	0.005	0.65	0.48	0.88
Outpatients	–	–	–	–	–	–
Non-CTO and outpatients vs CTO-cohort						
Non-CTO-cohort	−0.05	0.09	0.62	0.96	0.80	1.14
Outpatients	0.39	0.15	0.011	1.48	1.09	1.99
CTO-cohort	–	–	–	–	–	–
Mental health service measures						
Treatment days per community episode	0.00	0.00	0.370	1.00	0.99	1.00
Ratio of community-based patients currently served to case management staff	−0.01	0.01	0.197	0.99	0.97	1.01
Other risk factors are taken into account in each model						
Gender (male = 1; female = 0)	−0.33	0.09	0.000	0.72	0.61	0.86
Indigenous (aboriginal and/or Torres strait islander)	0.18	0.30	0.552	1.20	0.66	2.15
Homelessness/marginally housed	0.31	0.11	0.007	1.36	1.09	1.71
Majority of people of the colour birth region	−0.79	0.16	0.000	0.45	0.33	0.62
Socio-economic disadvantage index score (SEDI)	0.00	0.00	0.982	1.00	1.00	1.00
Age at 2010 study outset	0.05	0.00	0.000	1.06	1.05	1.06
Five life-threatening conditions	0.07	0.02	0.000	1.07	1.04	1.11
Model statistics	Model $\chi^2 = 506.27$ ; $df=11$ ; $\sigma < 0.001$					

CTOs, Community treatment orders.

Outside of patient cohort effects, sex, and age, 3 other factors contributed significantly to mortality risk. For each additional diagnosis of 1 of the 5 life-threatening physical illnesses mortality risk increased by 7% [ $\text{Exp}(b) = 1.07$ ;  $P < .001$ ]; being homeless or marginally housed increased risk by 36% [ $\text{Exp}(b) = 1.36$ ;  $P < .007$ ] and “Being from a region with a majority population

being people of color” exclusive of indigenous status *decreased* risk by 55% [ $\text{Exp}(b) = 0.45$ ;  $P < .001$ ] (see [table 3](#)).

The Logistic regression in [table 4](#) focuses on Hypothesis 2, substituting “One service contact” vs “More than one” for the number of services received per episode indicating such individuals experienced an 84%



[Exp( $b$ ) = 1.84;  $P < .013$ ] increase in mortality risk. All other significant factors reporting similar findings as in table 3. (See table 4).

## Discussion

### Main Findings

**Hypothesis 1 Stated.** “CTO-assignment will be associated with less mortality-risk than that characterizing individuals hospitalized though not assigned to a CTO—that is, the positive associations,<sup>18–21</sup> between CTO-assignment and reduced mortality risk will be reaffirmed”.

**Hypothesis 1 was Not Confirmed.** Advocates focused on “defeating the CTO”<sup>13</sup> seem to have been successful as after 2 decades of findings documenting reduced mortality risks when contrasting the CTO-cohort and non-CTO cohorts,<sup>15,17</sup> there was no longer a significant mortality risk-reduction effect associated with CTO assignment in contrast with the non-CTO patients. Both groups experienced significant excess mortality. It is possible that the exclusion of patients with capacity from the CTO-cohort may have made the remaining CTO-population more vulnerable to medical comorbidities. Previous research, however, indicated that both the CTO and non-CTO cohorts accessed acute medical care for life-threatening illnesses at equivalent rates between 2000 and 2010 (53%). Between 2010 and 2017, there was a significant reduction in such access for both groups, 40% for the CTO vs 37.9%

for the non-CTO. Since such CTO patient access was mediated by CTO assignment,<sup>30,31</sup> it is likely that this reduction may have been the result of reduced CTO use and limited community care resources. In an initial Victorian study, when CTO assignment was most favored, results of the models testing the effect of the days of CTO assignment per 30 days at risk of death indicated that for each such day on orders, there was, respectively, a 4 percent reduction in the risk of non-injury related death and a 24% reduction in the risk of death from injury.<sup>19</sup> Cuts in involuntary mental health services seem to have limited CTO-oversight to crisis intervention<sup>31,37</sup> resulting in less community oversight and the confinement of mortality-risk protection to re-hospitalization,<sup>38,39</sup> the mandated CTO-intervention in the absence of adequate community care. This conclusion is supported by the findings associated with Hypothesis 2.

**Hypothesis 2 Stated.** “Those choosing outpatient treatment, or having opted out of hospitalization and/or CTO assignment though listed as outpatients, will have less mortality-risk than individuals assigned to involuntary care when other risk factors are taken account of—that is, as those individuals will have “capacity” to protect their own health and safety”.

**Hypothesis 2 was Not Supported.** Moving into the “capacity decade” while using the same sampling algorithm, people with Schizophrenia constituted 16.2% of the

**Table 4.** Hypothesis 2: CTO Mortality-Risk, With “Capacity” Constraint

Risk factors for death in period	<i>B</i>	<i>SE</i>	Sig	Exp ( <i>b</i> )	95% CI for EXP( <i>b</i> )	
					Lower	Upper
<b>Intervention groups</b>						
CTO and non-CTO cohorts vs outpatients						
CTO-cohort	−0.31	0.15	0.041	0.73	0.54	0.99
Non-CTO-cohort	−0.37	0.15	0.018	0.69	0.51	0.94
Outpatients						
Non-CTO and outpatients vs CTO-cohort						
Non-CTO-cohort	−0.05	0.09	0.557	0.95	0.79	1.13
Outpatients	0.31	0.15	0.041	1.37	1.01	1.85
CTO-cohort						
<b>Mental health service measures</b>						
One service contact vs More than one service contact	0.61	0.25	.013	1.84	1.13	2.97
Ratio of community-based patients currently served to case management staff	−0.01	0.01	0.12	0.99	0.97	1.00
<b>Other risk factors are taken into account in each model</b>						
Gender (male = 1; female = 0)	−0.31	0.09	0.000	0.73	0.61	0.87
Indigenous (aboriginal and/or Torres strait islander)	0.14	0.30	0.651	1.14	0.64	2.06
Homelessness/marginally housed	0.32	0.11	0.006	1.37	1.09	1.72
Majority of people of the colour birth region	−0.75	0.16	0.000	0.47	0.34	0.65
Socio-economic disadvantage index score (SEDI)	0.00	0.00	0.905	1.00	0.99	1.01
Age at 2010 study outset	0.05	0.00	0.000	1.05	1.05	1.06
Five life-threatening conditions	0.51	0.09	0.000	1.66	1.41	1.97
Model statistics	Model $\chi^2 = 532.77$ ; df-11; $\sigma < 0.001$					

CTOs, Community treatment orders.

outpatient sample, up from 0.2% in the previous decade, an increase of 80-fold or 8000%.<sup>31</sup> The representation of people among those hospitalized and never placed on a CTO dropped from 62.0%<sup>31</sup> to 33.6%—likely a partial result of hospitalization refusal and being recorded as an “outpatient” service contact. Seventy-eight percent of the recorded deaths of outpatients with a diagnosis of Schizophrenia was premature. Contrary to expectations the outpatient-cohort experienced 48% in excess-mortality risk when the major risk factors in the model were taken account of in contrast with both hospitalized cohorts. Perhaps hospitalization was the only protective factor remaining for these vulnerable groups. Of concern is the fact that “rights” advocacy has been associated with reductions in inpatient bed availability in Victoria and around the world.<sup>40</sup>

### *Links to Literature, Hypothesis 1*

Relevant to the risk of death is the medical condition of each of the groups. Previous investigations have demonstrated that CTO-assignment moderates antipsychotic utilization and where life-threatening physical illness is concerned mediates access to a diagnosis. The literature links both these CTO contributions to mortality outcomes.

*Mortality and Antipsychotic Medication Use Moderated by CTO Assignment.* The use of antipsychotic drugs (ie, use of any antipsychotic compared with nonuse) among all patients treated for schizophrenia in inpatient care was linked to the risk of all-cause mortality between 1972 and 2014 in Finland ( $N = 62\ 250$ ) with up to 20 years of follow up (median: 14.1 years). The cumulative mortality rates during the maximum follow-up of 20 years were 46.2% for no antipsychotic use, 25.7% for any antipsychotic use, and 15.6% for clozapine use.<sup>41</sup>

Several studies have found CTO assignment, termed outpatient commitment, and or assisted treatment in their venues, was associated with improvement in use of psychotropic medications, and medication compliance. A New York study compared CTO patients with assertive community treatment (ACT), to ACT patients without CTO, and patients without either intervention. Overtime, the medication possession ratio (MPR) for the “CTO/ACT” group increased by 31–40%, while in the “ACT only” group it increased by 15%–22%, and in the “neither treatment group” it increased by only 8–19%.<sup>42</sup> Similar findings are replicated in another investigation where psychotropic medication use increased in the CTO group vs the non-CTO-comparisons even though prior history indicated the CTO group had been less medication compliant than the non-CTO-comparisons.<sup>43</sup> When CTO-cohort-studies are considered, medication compliance improves during the period of CTO supervision and deteriorates in the post period.<sup>44</sup>

*Access to Medical Care Mediated by CTO Assignment.* In Australia’s single-payer National Health Scheme where care is universally available, between 2000 and 2010, 53% of each of a CTO and Non-CTO hospitalized cohort in Victoria accessed acute care to obtain an initial diagnosis of 1 of the 5 life-threatening physical illnesses (ie, cancer, ischemia, cerebrovascular disorder, diabetes, and physical trauma) compared to 32% of outpatients.<sup>25</sup> While *not under* mental health system supervision, however, the likelihood that a CTO patient in this period would receive an initial physical illness diagnosis was 31% lower than patients released from the hospital without a CTO, and no different from lower morbidity-risk outpatients. While, *under* mental health system supervision, the likelihood that CTO patients would receive a life-threatening physical illness diagnosis was 40% greater than non-CTO patients and 5.02 times more likely than outpatients. Each CTO episode was associated with a 4.6% increase in the likelihood of a member of the CTO group receiving a diagnosis.<sup>25</sup>

These findings were replicated in 3 new cohorts in Victoria Australia for the years 2010–2017.<sup>31</sup> During this period, validating their shared elevated morbidity risk, 44% and 47%, respectively, of each hospitalized cohort (CTO and non-CTO patients), accessed an initial acute-care diagnosis for a life-threatening physical condition vs 26% of outpatients. Outside community mental health supervision, the likelihood that a CTO patient would receive a diagnosis of physical illness was 36% lower than non-CTO patients—1.3 times that of outpatients. Under community mental health supervision, CTO-patient likelihood was two times greater than that of non-CTO patients and 6.6 times that of outpatients. Each CTO episode was associated with a 14.2% increase in the likelihood of a CTO-patient receiving a diagnosis.<sup>31</sup>

In a Western Australian mortality study, access to medical care was noted as replacing the CTO as the cause of reduced patient mortality.<sup>21</sup> Unfortunately, the authors failed to take their analysis forward which in all likelihood would have demonstrated that, as in the Victorian studies, such access was mediated by CTO assignment.<sup>25,31</sup>

Of particular concern in the Victoria studies is the finding that 53% of the hospitalized cohorts and 32% of the outpatients in the 2000–2009 sample received a diagnosis of 1 of the 5 conditions while the comparable proportions in the 2010–2017 sample were 40% and 37.9% for the hospitalized groups and 18.4% for the outpatients. These statistics would indicate a reduction in diagnostic rates across the decades. While this might be initially viewed as a positive result, the Australian bureau of statistics has reported a 6% increase in 4 of the 5 conditions across the decades. Since CTO assignment seems to enable people with severe mental illness to have their life-threatening illness diagnosed, the reductions appear to be an indicator of the failure to receive a diagnosis, somewhere between 13% and 19% for the 2 hospitalized cohorts, and as much as 20% for the outpatients.<sup>45</sup>

*Links to the Literature, Hypothesis 2*

“Victoria’s Mental Health Act 2014 places people with a mental illness at the center of decision making about their treatment and care.... [It] promotes voluntary treatment in preference to compulsory treatment, and establishes robust safeguards and oversight mechanisms to protect the rights, dignity, and autonomy of people living with a mental illness”.<sup>9</sup> It relies heavily on an assessment of a patient’s capacity to refuse needed treatment.<sup>9</sup> A review of studies looking into the reliability of capacity-criterion assessments found most to be based on analogue situations whereby inter-rater agreement was high between researchers performing structured or semi-structured mental capacity assessments but when compared with clinician views varied considerably from “slight to substantial” with a median  $K = 0.45$ .<sup>46</sup> The review concludes by noting that “further work needs to be done to understand the implications of capacity-based mental health legislation . . . (p. 295)”.<sup>46</sup> We would suggest such work needs to address real-life threats to health and safety (eg, accessing medical care for severe pain or injury, victimizations and perpetrations of crimes against persons, familial disruptions, and homelessness) as potential consequences of capacity-based decision making in psychiatric emergency assessment.

There are many types of capacity. As one consumer was fond of telling the Director of the Center for Self-Help Research at the University of California Berkeley: “I may be crazy, but I ain’t stupid”. Though involved in delusion-driven assaultive behavior, when brought to the Psychiatric Emergency Room he clearly had the capacity to refuse involuntary treatment, denying the facts of a police officer’s statements. Whether the evaluating clinicians believed him or given their crowded unit, and their knowledge of him as a difficult patient, simply decided to accept his story as a way of avoiding his disruptive presence on the unit, the result was a clear capacity-assessment outcome—release.

*Summary*

There has been a 14.9% reduction in the number of first hospitalizations of people with Schizophrenia between 2000 and 2017. The outpatient population, those never hospitalized or placed on a CTO with schizophrenia diagnoses having at least one service contact, has increased by eight-fold. These “outpatients” experienced 48% excess mortality risk compared to both hospitalized patients groups. Potential “capacity” releases experienced 84% excess mortality risk. Community service contacts per patient episode—the adequacy of which is necessary for the maintenance of community residence as an alternative to hospital return under CTO supervision<sup>38,39</sup>—were no longer associated with reduced mortality-risk. Patient/case manager ratios for CTO-type care were higher than the international recommendation, potentially accounting for the loss of CTO mortality-risk advantage over hospitalized

non-CTO patients. Though this outcome needs to be qualified by the fact that the assessed severity of the mental disorder in the current CTO cohort was, and in the previous decade has been, more severe in the CTO vs the non-CTO sample.<sup>29,30</sup> Thus, bringing the CTO group to an equivalent outcome is a positive result indicating the protective function of crisis returns to the hospital. Yet, 78% of all patients’ deaths were in excess of age/sex expectations (ie, premature deaths). And, there have been significant reductions in access to life-threatening illness diagnoses across the decades, a documented contribution of CTO supervision.<sup>25,31</sup> All these findings document major shifts associated with the “defeat” of CTOs<sup>23</sup> that has coincided with the move into the “capacity” decade. While these findings do not provide direct causal proof, they seem to justify the expression of concern noted by Dr. Treffert when he wrote: “Certainly the right of the psychiatric patient to be free is a precious and important one, yet even that right must be reasonably weighed against the right of the patient and those around him to be protected from tragic and serious untoward effects of the patient’s illness<sup>47</sup>, [p.1041]”.

*Limitations*

This research has limitations. It makes no direct determination of whether the newly increased numbers in the outpatient population were released because they were assessed as having the capacity to refuse treatment other than the inordinate increase in the numbers of the most vulnerable in the outpatient cohort, and the fact that the Model number of service contacts for individuals in this cohort was one. It is based on administrative data, though the data are linked to reimbursement. Its analyses are correlational and do not confirm causation as might be true of an RCT if such a study were ethically possible (c.f. design above). Yet, the study looks at an entire state population’s mental health experience over 3 decades, employing multivariate methods and a quasi experimental design.

**Conclusion**

Reductions in CTO utilization, and taking away community supervision, seem to have increased mortality-risk for this vulnerable population. It would seem “paternalism” has been “defeated” and the line between civil-rights protection and abandonment of one of the most vulnerable populations in society has been blurred.

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