

APPENDIX

THE UTILITY OF OUTPATIENT COMMITMENT:

REDUCED-RISKS OF VICTIMIZATION AND CRIME PERPETRATION

SECTION I: CHARACTERISTICS OF OUTPATIENT COMMITMENT LAW, COMMUNITY TREATMENT ORDERS IN VICTORIA AUSTRALIA AND OTHER COMMONWEALTH NATIONS

This study considers the utility of outpatient civil commitment statutory provisions, also called community treatment orders in commonwealth nations, focusing on the objective of protecting safety of self and others. Involuntary commitment statutes require individual participation in mental health care either in a psychiatric inpatient facility, involuntary inpatient commitment (IIC), or under community treatment orders (CTOs) while remaining in community residence. The requirement is enforced only after an evaluation finding an individual's behaviour conforms to specific criteria, is believed to be the result of a mental disorder, and a finding that the individual is refusing to accept mental health treatment. CTOs are generally described as "a least restrictive alternative to psychiatric hospitalization" for those meeting the IIC behaviour criteria of the jurisdiction. There is almost universal statutory agreement that at least one behavioural criterion precipitating an IIC or CTO is protection against "danger to self or others." (also expressed as "harm to self or others", or "safety of self or others"). Despite this consensus, there is considerable statutory variation in IIC and CTO behavioral criteria, and several of their other statutory provisions. This appendix section provides a description of the CTO statute and process in Victoria to enable a basis for comparison to the reader's jurisdiction. CTOs in Victoria require individuals to comply with outpatient treatment. They are issued to individuals residing in the community and to inpatients upon early hospital release.

A. Eligibility criteria: all of the following must be met

- ◆ The person appears to be mentally ill.
- ◆ The illness requires immediate treatment that can be obtained...
- ◆ For health or safety (whether to prevent a deterioration in physical or mental condition or otherwise) or for community protection.
- ◆ The person has refused treatment or is unable to consent to necessary treatment.
- ◆ No less restrictive option is available.

B. Implementation

- ◆ An authorized psychiatrist makes the order, and the authorized psychiatrist or his or her delegate must monitor the treatment.
- ◆ Treatment can involve an assertive community treatment (ACT) team.
- ◆ Patients may be placed on orders following hospital discharge or directly from the community.
- ◆ The order can be extended indefinitely.
- ◆ The order can be revoked by an authorized psychiatrist for noncompliance.
- ◆ Patients whose community treatment orders are revoked may be apprehended by the police and taken to an inpatient facility.
- ◆ Procedural safeguards for hospital admission are somewhat less involved than for a regular admission.
- ◆ Patients are informed of all their rights in the comprehensively detailed pamphlet: Patients' rights: A self-help guide to Victoria's Mental Health Act. They can appeal the decision placing them on a CTO at any time, request changes in their required treatment plan, and be given free legal representation.

C. Obligations of the patient and oversight requirements

- ◆ Compliance with the order can require an individual to live in a particular apartment, to take prescribed medications, and to attend counselling sessions.
- ◆ Patients are required to receive a medical examination of their physical health.
- ◆ The residence provision under the act is rarely used. When used, it just requires people to live at a particular address (usually a supported accommodation facility).
- ◆ The person may be required to be at home at particular times of the day to receive supervision of medication.
- ◆ Daily home visits would only be for those patients being treated by mobile support teams or under very temporary crisis team treatment--i.e. a small percentage of the total number of people on CTO.
- ◆ A CTO itself does not enable continuous supervision and restriction of movement - generally people requiring those things would be subject to other orders - perhaps a guardianship or community corrections order.
- ◆ The Mental Health Review Board is obligated to review placement, continuance, and exit from a CTO, to supervise the process.
- ◆ The Mental Health Review Board is a statutorily created body, headed by an attorney, and a part of the legal system. The Board is notified of patient placement on a CTO, as is the

patient, significant others and treatment team. Since patients are not retained on hospital patient roles, are not the responsibility of a hospital superintendent, can be placed on a CTO from the community without hospitalization, and are overseen by a part of the legal system, the procedure is viewed as outpatient commitment as opposed to the more traditional procedure of conditional release.

- ◆ A Mental Health Review Board hearing is conducted by three Board sessional employees: an attorney, a psychiatrist, and a community member within eight weeks of placement. Attendees include the patient, patient's psychiatrist and/or case manager, significant others, and patient's counsel (should one be requested).
- ◆ A review by the Mental Health Review Board is again held within 12 months.
- ◆ A review by the Mental Health Review Board may be held at any time upon request of the patient, the psychiatrist, an attorney, or staff of the Mental Health Review Board.

SECTION II: STUDY METHODS

A. Procedure for Extracting Matched and Randomly Selected Cohorts of Hospitalized Psychiatric Patients from the Victoria Psychiatric Case Register/RAPID System for 2000 -2010

The following are the analytic procedures used to develop the code to select the Community Treatment Order (CTO) cohort and a matched and randomly selected cohort of hospitalized patients who were not placed on a CTO during the course of the study. As is described below, we were unable to fully match all CTO patients on age, diagnosis and sex. Where there was a shortfall in matched clients compared to the master frequency table, we used the remaining unmatched clients in the hospitalized non-CTO cohort pool to randomly select the shortfall in matched rows, this time with client age up to 5 years either side of the original client age.

The total number of patients hospitalized (acute inpatient admission) during the study period was 69,186.

1. Selection of Community Treatment Order Cohort (First CTO after 1 Jul, 2000)
 - a. Take base set of all mental health clients who had been on a CTO from 1 Jul, 2000 - 30 Jun 2010.
 - b. Exclude any clients that had been on a CTO prior to 1 Jul, 2000.
 - c. Create an indicator for all clients who had been in a cohort of the original (pre 2000) project.

- d. Exclude any clients that were in cohort of the original project (i.e. who had an earlier CTO)

2. Creation of base client pool of hospitalized patients.

- a. Create base set of all mental health clients in current Mental Health information system (covers all activity from 2000 onwards).
- b. Exclude clients with no recorded service activity post Jul 1, 2000 (must have had a MH admission > 24 hrs).
- c. Get the AN-DRG diagnostic category for every diagnosis recorded against each client (excluding non-MH and Mental Retardation categories).
- d. Find the most severe hierarchical diagnostic category (AN-DRG) recorded for each client.
- e. Calculate the clients' age at date of data extraction, sex. Use these to create an 'age-ANDRG-sex' group for each client. Also add these 'age-ANDRG-sex' groups to Cohort 1-- the CTO cohort.
- f. Get the first acute admission date post 1 Jul, 2000 for each client - indicates whether they have been hospitalised or not.
- g. Create indicator showing if client appears in CTO cohort (cohort 1).
- h. Create indicator showing if client appeared in any cohort of the original (pre 2000) project.
- i. Create indicator showing if client appeared in cohort 1 of the original (pre 2000) project.
- j. Attach a random number (0-99,999) to each record.

3. Selection of Cohort 2 (No CTO, Hospitalised, Matched)

When we remove the clients in the CTO sample, and clients who appeared in the original project (pre 2000) we have 48,316 patients remaining, who were all potential matches with the CTO sample.

- a. Take set of rows from base client pool who had a first acute admission date post 1 Jul, 2000, did not appear in the CTO cohort (cohort 1), and did not appear in any cohort of the original (pre 2000) project – this is the Cohort 2 pool—i.e. non-CTO and Hospitalized.

- b. Create a master frequency table, based on Cohort 1, of the numbers of clients in each ‘age-ANDRG-sex’ grouping.
- c. For each ‘age-ANDRG-sex’ group in the master frequency table, randomly select the same number of rows (clients) from the Cohort 2 pool as occur in the master frequency table, that match that particular ‘age-ANDRG-sex group’.
- d. For each ‘age-ANDRG-sex’ group where there was a shortfall in matched clients compared to the master frequency table, use the remaining unmatched clients in the Cohort 2 pool to randomly select the shortfall in matched rows, this time with client age up to 5 years either side of the original client age.

4. Diagnostic history procedure

- a. Take every registered client record in the VPCR.
- b. Get every recorded diagnosis (and date) for each client and map them to an AN-DRG diagnostic category code.

AN-DRG	Hierarchical Diagnostic Category
54	Other Disorders of the Nervous System
56	Dementia and Global Disturbances of Cerebral Function
841	Schizophrenia Disorders
842	Paranoia and Acute Psychotic Disorders
843	Major Affective Disorders
844	Other Affective and Somatoform Disorders
845	Anxiety Disorders
846	Eating & Obsessive-Compulsive Disorders
848	Childhood Mental Disorders
850	Personality Disorders (Part AN-DRG 847)
851	Acute Stress Reactions (Part AN-DRG 847)
852	Conduct Disorders (Part AN-DRG 847)
854	Sexual Disorders (Part AN-DRG 847)
860	Alcohol Intoxication and Withdrawal
861	Drug Intoxication and Withdrawal
862	Alcohol Use Disorder & Dependence
863	Other Drug Use Disorder & Dependence
Other	Non-psychiatric Diagnosis
Missing	No Discharge Diagnosis Recorded

B. Design

1. Sample and Data

Mental health records from the state of Victoria, Australia were obtained from the Victorian Psychiatric Case Register/RAPID system for all 11,424 who experienced psychiatric hospitalization and/or their first CTO between 2000 and 2010, and 16,161 (matched and randomly selected patients) who had experienced psychiatric hospitalization without CTO-exposure. Mental health records were linked via the Victoria Police Law Enforcement Assistance Program (LEAP)[1] to the patients' records of all police contacts in the State associated with the perpetration and victimization by major crimes against persons extending for an additional 2.4 year-period, yielding a 12.4-year study period. The records were also linked to the records of: Corrections Victoria (documenting detention in police custody or prison), the Socio-Economic Indexes for Areas (SEIFA) (documenting neighbourhood disadvantage [2]), and the Australian Mental Health Outcomes and Classification Network's (AMHOCN) Health of the Nation Outcome Scale (HoNOS) (behavior and social circumstance assessments of patients using Australia's mental health systems [3]).

2. Measurement

All mental health treatment contacts (inpatient, voluntary outpatient community care, and CTO) were organized into episodes of care. Each psychiatric hospitalization (from day of admission to day of discharge) defines a separate inpatient episode. Each continuous period of outpatient care, without a break in service ≥ 90 -days, defines a community care episode [4]. A service-break ≥ 90 -days, followed by re-initiation of care, starts a new community care episode. Each CTO-episode begins when a patient is placed on orders and ends when the order is terminated without renewal. A new CTO issued following a non-renewed CTO-termination begins a new CTO-episode.

Measurement of Service/Treatment Contacts. In Victoria, people with severe mental illness will be served in specialist mental health services that are required to provide a range of service components so that consumers have access to similar service responses and functions wherever they live. However, the health services and hospitals deliver their public specialist mental health services differently depending on the local service environment and catchment area. Some services have separate teams for each component function; others operate 'integrated teams' which perform a number of functions by rostering staff to undertake the required activities for a given period. The critical factor assumed by the system is that all area mental health services provide the full range of functions. In order to insure the most consistent evaluation of the services offered given the variance in the types of treatment teams and their organization in different areas of the state we relied on the 'service contact' as the measure of care.

Service contacts in Victoria include medication, supervision, and support in daily activities. A treatment contact is a "Reportable activity which is clinically significant in nature [and] includes activity which directly contributes towards assessment of a client's condition; or towards the therapeutic needs of a client's condition. It is inclusive of preventative activity that supports the needs of a client's dependents, and supportive activity

for a client's family, support person, or carer." See: <https://www2.health.vic.gov.au/mental-health/research-and-reporting/reporting-requirements-for-clinical-mental-health-services/service-contacts>. Also see: <http://www.health.vic.gov.au/mentalhealthservices/service-components.pdf> for a detailed description of the types of treatment delivery options available throughout the state.

Measurement of Crime Incidents. Crimes considered all posed a threat to health and safety. No minor crimes or property crimes were considered, since the objective was to relate the nature of the crime to the dichotomous legal criterion allowing for CTO-placement. Psychiatric emergency room determinations of whether a patient meets the civil commitment standard use evidence from police reports. LEAP data report codes were categorized to enable discussion of major crimes and victimizations against persons, including all homicides, rapes, assaults/abductions, and robberies—major crimes that would lead to a conclusion of present imminent dangerousness [5].

Victoria's crime incident rates were computed using LEAP data from 2000-2012 [1, 6], the 12.4-year study period, and Victoria's Australian Bureau of Statistics population data [7]. Crime incident rates were computed for each year and the mean of the rates over the 12.4-year period are reported herein. The objective was to answer the first study question addressing population characteristics: Do hospitalized psychiatric patients who are refusing treatment and are placed on OCC pose a greater threat to safety of self and others than do other psychiatrically hospitalized patients and the public? The data available at the individual level also provide the criterion variables necessary to address the second and third study questions: Is the use of OCC associated with reducing the risk of a patient's involvement in the perpetration of, and victimization by, major crimes against persons? In addition, are OCC-linked-treatment-efforts associated with achieving these outcomes?

Measuring Neighbourhood Disadvantage. Neighbourhood disadvantage, coupled with poverty and race bias, are major factors associated increased risk of recorded involvement in crimes [8]. The Socio-economic Indexes for Areas (SEIFA) reports the level of socio-economic disadvantage characterizing a given postal-code [2]. All the postal codes in Victoria are SEIFA-ranked, ranging from 1 to 644, with 1 being the most disadvantaged postal-code. In order to control for context-risk working against the efforts associated with the CTO, the lowest postal-code rank for the district in which the individual lived during the study was used as the indicator of the individual's neighbourhood socio-economic disadvantage.

Measuring individual need for treatment. The HoNOS is a 12-item measure of a person's mental health, overall health, and relationship to their social context, a validated assessment of a person's need for treatment [9]. It has established reliability and validity [3]. AMHOCN-trained and retrained clinicians complete HoNOS assessments routinely as part of an effort to evaluate the national mental health system. These assessing clinicians, usually psychiatric nurses, are not the same clinicians, psychiatrists, who make the decision regarding a CTO-placement [10]. These independent and routine HoNOS measurements indicated that

the CTO-population was more severely ill and suffered more negative social circumstances than the non-CTO-cohort [11].

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 [11]. Clinicians completing the HoNOS determine the degree to which patients show problems with aggression, non-accidental self-injury, drug or alcohol problems, cognitive problems, general medical illness or disability, hallucinations or delusions, depressed mood, other mental or behavioural 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 [12], this usage is not recommended [13] because of the multidimensional structure of the instrument [14,15]. 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. A serious problem with any HoNOS dimension would contribute to a decision of eligibility for CTO-placement [13,14,16] Since the HoNOS assessments were not part of the CTO evaluative process in Victoria these scores, the result of independent evaluations, were used to adjust for between group differences in behaviour and social circumstance that could account for differential impacts on the crime and victimization outcome criteria.

C. Creating A Propensity Score: Methods and Theoretical Basis for Variable Selection

Since we were unable to completely match the universe of CTO patients (i.e. all patients placed on a CTO during the decade) with a non-CTO hospitalized sample on age, gender and diagnosis with the above procedures in the first round of sampling, we chose covariate adjustment using propensity scores (CAUPS) for a second round of control to account for potential confounders of the effects of CTOs [17]. We chose CAUPS over propensity score matching (PSM) as a method of adjustment for confounding effects because PSM, as King & Nielsen [18] demonstrate, “as it is most commonly used in practice (or with many of the refinements that have been proposed), increases imbalance, inefficiency, model dependence, research discretion, and statistical bias at some point in both real data and in data generated to meet the requirements of PSM theory. In fact, the more balanced the data, or the more balanced it becomes by pruning some observations through matching, the more likely PSM will degrade inferences — a problem [they] refer to as the PSM paradox [18, p. 1].” Pruning of unmatched sample members, the basis for PSM, discards information relevant to both samples. Therefore, in the second and third phases of control procedures described herein we do not seek to match the samples but accord confounders **explanatory priority** in the interpretation of the results indicated by the multiple-partial slopes. The results indicate

the outcomes after the regression derived propensity score and the regression covariates have explained all they can in a variable's relationship to the outcome criterion.

Logistic regression was used to create a score that would take account of the relative importance of factors contributing to a patient's propensity to be selected into the CTO cohort from the total group of hospitalized patients. The score is a predicted probability of membership derived from the Logistic model. The score's purpose was to enable adjustment for between group differences in comparisons with hospitalized patients not given the CTO experience. The propensity score was first created based on mental health system administrative data used in our first study [19]. We first thought to replicate the findings of a normative function in the system associated with selecting people for a CTO so that this could be accounted for in evaluating the effects of the CTO experience. Having been able to replicate the score from the initial decade [19, 20] we chose to add information obtained in additional data linkages to create a more comprehensive score used in the evaluation of the result obtained in this second decade of research, 2000-2010.

The variables that were chosen for inclusion in the Logistic model used to create our propensity score were those that had been most predictive of poor outcomes for people with severe mental illness during the last half century of research, the variables that had characterized CTO patients in the administrative data in Victoria in the decade previous to this research, evaluations of the patients' psychosocial situations that mimic the "need for treatment" legal criterion used to justify placement on a CTO, as well as indicators of potential bias resulting from cultural miss-understanding. These variables are proxies for factors discussed related to hospitalization history and risk in mental health team meetings and mental health tribunal hearings associated with CTO placement decisions. The model included:

1. Indicators of inpatient hospitalization episode experience distinguishing CTO patients [17]:
 - a. The number of inpatient episodes a patient had experienced
 - b. Whether the patient had experienced an inpatient episode longer than the 34-day average inpatient episode for the entire population.
 - c. The interaction between having an inpatient episode of longer than the 34-day average and the number of episodes.
 - d. The amount of time that elapsed from the first date known to the mental health system and the last face-to-face contact with the mental health system. (included in the original model but later deleted in constructing the final score due to being collinear with patient age)
2. Indicators of poor premorbid adjustment [21]:
 - a. Never having been married.

- b. Early age of entry into the mental health system.
 - c. Less than an 11th grade education
- 3. Indicators of good premorbid adjustment, expected to be associated with earlier release to the community given greater likelihood of having a functional support system [21].
 - a. Current marriage
 - b. Current employment
- 4. Indicators related to the course of illness and potential involvements in dangerous behaviour.
 - a. Age (generally younger)
 - b. Gender (expected of males)
- 5. Diagnoses (i.e., schizophrenia, major affective disorder, dementia, and paranoia or other psychoses), as those with schizophrenia have consistently dominated the CTO group.
- 6. Socioeconomic Disadvantage: SEIFA neighbourhood rank of the poorest neighbourhood of residence.
- 7. Psychosocial profile: Twelve HoNOS scores assessed at admission to inpatient and again assessed at release. The individual HoNOS items were rated 0–4 (0 = no problem, 4 = an extremely problematic situation). Clinicians completing the assessment determine the degree to which patients evidenced problems with: aggression; non-accidental self-injury; drinking or drug-taking; cognition; physical illness or disability; hallucinations and delusions; depressed mood; other mental and behavioural disorder; relationships; activities of daily living; living conditions; and occupation and/or activities.
- 8. Indicators of potential bias resulting from cultural miss-understanding.
 - a. Aboriginal Torres Strait Islander Status
 - b. Required an interpreter in their Mental Health Review Tribunal hearing.
 - c. Was not born in Australia (included in the original model and deleted because of collinearity with “Required Interpreter”).
 - d. Preferred to communicate in a language other than English (included in the model and deleted because of collinearity with “Required Interpreter”).

The propensity score derived from this Logistic model was used for all models tested in subsequent analyses of the impact of CTO selection on the protection of safety of self and others.

D. The Community Treatment Order Outcome Model: Theory and Specification

People with severe mental illness, throughout their lives may experience episodes of acute illness, and consequently during such episodes may find themselves in situations that imminently threaten the safety of themselves or others. Little is certain about the origins, timing, and frequency of such episodic occurrences during the life course of the individual. At the time such acute episodes do occur, however, individuals often are civilly committed to an inpatient psychiatric facility. Outpatient commitment, the community treatment order (CTO) in Australia, generally follows an inpatient civil commitment as a means of reducing the duration of that particular confinement period. Thus, the CTO accomplishes the objective of providing least restrictive care by reducing the duration of an inpatient confinement preceding it. To help protect safety, the CTO functions in coordination with inpatient commitment by providing a legal framework for involuntary supervision via case managers during an exacerbated episode of illness. This supervision functions in two ways: it provides advocacy for and a legal framework requiring patient participation in needed treatment or service that is urgently required to address safety concerns and it provides a means of removing a person from a context or social circumstance that has potentially dangerous consequences. The achievement of these objectives often are not recorded as an affirmative act; rather, the benefit is in the reduction in the probability of involvement in a dangerous act. The CTO is not a vaccine that prevents recurrences of illness, the receipt of treatment it mandates may achieve this objective.

Patients who are civilly committed are involuntarily retained in hospital as long as they continue to meet the standard for retention, i.e. they are refusing treatment due to their mental illness and remain dangerous or in need of treatment to protect health and safety. The CTO, when assigned at release from a period of involuntary hospitalization is an analogue parole, a law that allows for early release from a hospital episode. Without the CTO the patient would be retained in the hospital for a longer period of time as he continues to meet the standard for commitment excepting the fact that in accepting assignment to a CTO he is pledged to cooperate with a treatment plan (given the alternative of staying in the hospital he is no longer refusing treatment). When a patient fails to conform to the treatment plan, he is brought back to hospital to continue his treatment, often to prevent deterioration that might compromise the safety of self and others. Due process is accorded to him in that the continuation of his hospitalization is validated by a determination that he meets the civil commitment standard for continuing his hospitalization.

This paper is designed to evaluate the effect of community treatment order (CTO) exposure on a selected objective specified in the outpatient commitment law—herein reduced threats to self and others. The CTO effect can be both a primary prevention effect associated with reducing the risk of involvement in any major crime or victimization and a secondary prevention effect of reducing involvement in repeat offences. Herein the primary prevention risk-reduction-effect and the secondary prevention effect are evaluated using Logistic Regression. The former evaluates the risk of engaging in a major crime against a person or being a victim of such a crime over the course of a decade. The latter, focuses only on those

who have committed a crime or who have been victimized by a major crime against a person and considers repeat crimes or victimizations as its criterion variable.

Criterion variable for CTO as a Primary Prevention Effect

In testing the utility of the CTO requirement to protect the safety of self and others, the criterion variables selected are “having committed at least one major crime against a person”, and “being a victim of at least one major crime against a person”.

The model addresses the following hypotheses:

1. The experience of a CTO and or multiple CTOs within the decade will be associated with reduced probability of committing and or being victimized by a major crime against a person.
2. Providing community-based treatment and employing CTO supervision to return a person to the hospital will be associated with a reduced probability of committing and or being a victim of a major crime against a person.

Independent variables:

In each case, the exponentiated partial slopes associated with the selected independent variable will be the estimate of the extent of reduction/increase in the risk of such action.

Effect measures as independent variables

- Membership in the CTO cohort (COT cohort member=1; non-CTO cohort indicator=0)
- OR
- Having a CTO initiated return to the hospital.
 - Plus
 - Number of community-based treatment days per community care episode. (Initial models included actual number of treatment days. Re-estimated model included number of ten-day-community-based treatment contact day unites the patient experienced and an evaluation of observed significant interaction effects between ten treatment day provision and CTO-exposure.

The model was run twice, once with the CTO-cohort membership indicator as the primary independent variable and once with having a CTO initiated return to hospital as the primary independent variable. Both models included a variable measuring “number of community-based treatment days per community care episode.” All other factors are the same in each regression.

Criterion variable for CTO as a Secondary Prevention Effect

The model addresses the following hypothesis: The CTO will be associated a reduced risk of a repeat perpetration or victimization.

Independent variables:

In each case, the exponentiated partial slopes associated with the selected independent variable will be the estimate of the extent of reduction/increase in the risk of a repeated perpetration or victimization.

Effect measures as independent variables

- Membership in the CTO cohort (COT cohort member=1; non-CTO cohort indicator=0)

OR

- Having a CTO initiated return to the hospital.
- Plus
- Number of community-based treatment days per community care episode. (Initial models included actual number of treatment days.

The model was run twice, once with the CTO-cohort membership indicator as the primary independent variable and once with having a CTO initiated return to hospital as the primary independent variable. Both models included a variable measuring “number of community-based treatment days per community care episode.”

Confounding influences as independent variables: The following variables are also included in both the primary and secondary prevention outcome models. The confounders were all selected based on a review of the literature as well as the investigators’ attempt to take into account any potential alternative explanations for a CTO effect.

a. Adjustment for having committed a crime against a person or being a victim of a crime against a person prior to being placed on a CTO.

b. Between-group difference adjustments for differences not fully adjusted for with the sampling selection algorithm that was described above in Section A:

- A score describing the propensity of a patient being selected by staff for a CTO was generated by the Logistic model described above in Section B. That propensity score is included in these regression models to enable adjustment for between-group

differences in factors associated with selection into the CTO cohort from the group of all hospitalized patients.

c. Adjustments for any remaining demographic and diagnostic between-group differences.

- Gender: male=1; female=0
- Age at the middle of the study
- Schizophrenic disorder diagnosis across career (dummy variable)
- Major affective disorder diagnosis across career (dummy variable)
- Dementia diagnosis across career (dummy variable)
- Paranoid or psychotic disorder diagnosis across career (dummy variable)

d. Adjustments for potential stereotype and communication effects

- Non-English Speaker
- Aboriginal and/or Torres Strait Islander status
- Imprisonment or held in custody during the study period

e. Adjustments for risk-period associated with the study and institutional involvements:

- Age at mental health system entry: A chronicity indicator
- Mean mental health episode start-year: A control for the deinstitutionalization/trend effect (given the trending down in hospital episode duration and potential service availability across the years.)
- Summed duration of all inpatient episodes: A chronicity indicator control
- Total time in the mental health system: Overall exposure time.

f. Adjustment for socio-economic status contributions beyond between-group differences

- Less than 11th grade education,
- Unemployed (dummy variable),
- Lowest Victorian Socio-Economic Index Area (SEIFA) ranking (not raw score) at mental health episode beginning: An indicator of social disadvantage reflecting research indicating that neighbourhood has an impact in the potential for an individual to be involved with higher risk behaviours that could be a threat to safety and areas where health needs would be less likely to be addressed. The model included the SEIFA ranking describing the social disadvantage of the most disadvantaged neighbourhood in which the patient lived. If a patient lived in more than one area, the score indicating the greatest disadvantage was selected. Whenever risk of crime perpetration and victimization is associated it has to take into account the risk associated with the context in which the person resides in order to attribute the cause of the perpetration and/or victimization to the intervention rather than to living in the wrong neighbourhood. As it turned out this is a conservative approach since the CTO sample lived in more disadvantaged neighbourhoods and in fact still had a reduced risk associated with the intervention.

The initial multivariate analyses conducted for this manuscript did not include all forty-six potential confounding factors. Initially, it included only the administrative and demographic

differences and control for risk period variables used Segal and Burgess (2006) [19]. The effort in the 2006 investigation was to locate an explanation for the reduced mortality-risk associated with being on a CTO reported in that study. The results of this initial analysis showed that CTO intervention was significantly associated with reduced crime and victimization risk. Considering the literature on context and bias, however, we then added the neighbourhood context and bias variables to the models and gave them first priority in a bloc entry approach. Adding the context and bias variables showed that associations of CTO intervention with reduced crime and victimization were still maintained and increased. At that point, the 24 HoNOS variables describing the independent assessments of behaviour and social circumstances defining a person's need for treatment were viewed as essential independent assessments of the potential between group differences needing control in order to be further assured of the independent effect of the CTO.

In summary, the study uses a three-stage process to control for potential selection bias/confounding influences in its outcome models. First, it employs a sampling process that matches on age, sex and diagnosis. Second, it uses a propensity score generated via logistic regression based on forty-six factors that is included in the outcome regressions herein described. Third, it statistically adjusts for potential confounders within the outcome regressions described in this appendix.

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