APPENDIX

THE UTILITY OF OUTPATIENT COMMITMENT
II. MORTALITY-RISK, PROTECTING HEALTH, SAFETY, AND QUALITY OF
LIFE

Section I: CHARACTERISTICS OF COMMUNITY TREATMENT ORDERS IN VICTORIA AUSTRALIA

Community treatment orders (CTOs) require individuals to comply with outpatient treatment. They are issued to individuals residing in the community and to inpatients upon early hospital release. This section relates to the characteristics of CTOs as they existed throughout the study under the Mental Health Act (1986). It does not the cover the changes made to CTOs in the current Mental Health Act of 2014).

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 usually involves an assertive community treatment (ACT) team.

♦ Patients may be placed on a CTO as part of the hospital discharge process (94.1% of the study cohort) or directly from the community (5.9% of the cohort).

♦ As part of the hospital discharge process, the patient participates in a review board hearing to discuss whether he/she is ready for release. The patient is part of the discussion including the patient's clinician, the chair of the review board hearing (an attorney), a community representative, and a psychiatrist. Family members and legal counsel for the patient may also be present. After the inclusive discussion the patient is asked to leave while the hearing officers come to a decision. Then the patient comes back to the meeting and the review board's decision is explained to the patient.

♦ The decision to place a person on a CTO is driven by a determination of whether or not the patient continues to meet the standard for involuntary care. If the patient continues to meet

the standard, then the question is: Can their health and safety be guaranteed outside the hospital with CTO supervision?

♦ Patients have significant input into the decision process. Patients can present their case and address any comments made in the hearing. They can influence the determination of whether or not they are placed on a CTO and the duration of that placement. Also, once out of hospital on a CTO the patient can ask for a hearing at any time to reconsider their CTO status.

♦ A CTO may vary in duration, though the duration must be specified and cannot exceed 12 months.

♦ If the patient does not agree with the Board's decision of CTO placement, fails to convince the Board of the validity of their disagreement, says they will not cooperate with a treatment plan on a CTO, and continues to meet the standard for involuntary care, they are retained in hospital. People do not leave the hospital who continue to need protection of health and safety unless they are on a CTO with a treatment plan to oversee them in the community. They do not have the right to reject the CTO status if it is deemed appropriate. The CTO is a form of involuntary outpatient commitment.

♦Patients may appeal the decision and obtain legal representation in the appeals process.

♦ The order can be revoked by an authorized psychiatrist for noncompliance—i.e. "If a person placed on a Community Treatment Order fails to comply with a condition of that order, regardless of all reasonable steps having been taken by the treating team to procure their compliance, and there is a significant risk that their mental health will deteriorate or has deteriorated as a result of their noncompliance, they can be taken into protective custody and detained in an approved hospital for up to 14 days." (1)

♦ Patients whose CTOs 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 it at any time, request changes in their required treatment plan, and be given free legal representation.

 ♦ Study findings indicate that 39% of CTOs in the decade under study ended in re-hospitalization, thus the revocation of a CTO. Hospitalization marks the end of a CTO. An additional 10% of patients with "revoked" CTOs are discharged from involuntary status, rather than hospitalized, because they are individuals who are failing to show up for their treatment and are brought in for review and are found to no longer meet the criteria for hospital detention." (1). The remainder of CTOs time-out—i.e. according to the law the CTOs "expire" and the patient is notified of such expiration.

♦ A break in care extending beyond the CTO end date would require a new CTO as would a discharge from a hospital episode.

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

Three methods were employed in adjusting for confounding influences due to between group differences in the two hospitalized cohorts: matching to the universe of CTO patients, propensity score adjustment, and according explanatory priority via control variables in the regression models.

A. <u>Procedure for Selecting Matched Cohorts of Hospitalized Psychiatric Patients from the Victoria Psychiatric Case Register/RAPID System for 2000 -2010</u>

The following are the analytic procedures used to develop the code to select the Community Treatment Order (CTO) cohort and a matched cohort of hospitalized patients who were not placed on a CTO during the course of the study.

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 July, 2000)

  a. Take base set of all mental health clients who had been on a CTO from 1 July, 2000 - 30 Jun 2010.

  b. Exclude any clients that had been on a CTO prior to 1 July, 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 July, 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. 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 sampling procedures (1, see Table 1), we chose covariate adjustment using propensity scores (CAUPS) for a second round of control to account for potential confounders of the effects of CTOs. We chose CAUPS over propensity score matching (PSM) as a method of adjustment for confounding effects because King & Nielsen (2) have demonstrated that PSM, "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 King & Nielsen refer to as the PSM paradox (2, 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 the first study. 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 and results from the initial decade (3) we chose to add information obtained in additional data linkages to create a more comprehensive score used in the evaluation of results 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 particular 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:

   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:

   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.

    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 or 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 herein.

C. 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 their health and safety, and their lives. 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 health and mental health, 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 compulsory supervision functions in two ways: it provides advocacy for needed treatment or service that is urgently required to address safety health and mental health 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.

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 analogous to 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/she continues to meet the standard for commitment excepting the fact that in accepting assignment to a CTO he/she is pledged to cooperate with a treatment plan. In fact, when a patient fails to conform to the treatment plan the patient 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 the patient in that the continuation of hospitalization is validated by a determination that the patient meets the civil commitment standard for continuing his hospitalization.

This paper evaluates the effect of community treatment order (CTO) exposure on the ultimate threat to health and safety, mortality risk.

Criterion variables:

In testing the utility of the CTO requirement to protect against mortality risk, the criterion variables selected are:

- All mortality occurring within the period post-CTO.
- Non-injury-related mortality.
- Death from injury (that is, ICD-10 codes including assault, homicide, suicide, and injury due to undetermined intent).
- Self-harm

 The model addresses the following hypotheses:

1. The experience of a CTO within the decade will be associated with reduced probability of death due to all causes, non-injury related deaths, and deaths due to injury.

2. Reduced risk of death will be associated with CTO placements that are associated with increased access to acute health care and reduced involvements in the perpetration of and being a victim of a major crime against a person.

Independent variables:

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

Effect measures:

- Membership in the CTO cohort (CTO cohort member=1; non-CTO cohort indicator=0)
- Having received an acute physical health related diagnosis under mental health supervision.
- The interaction of CTO placement and having received an acute physical health related diagnosis under mental health supervision.
- The interaction of having a CTO and having perpetrated or been victimized by a violent crime.

Confounding influences as independent variables: The following variables are also included in the outcome models.

a. 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.

b. 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)

c. 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

d. 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.

e. 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.

f. Adjustment for the patient's psychosocial profile reflected in their twelve HoNOS scores at both inpatient admission and release.

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. Third, it statistically adjusts for potential confounders within the outcome regressions described in this appendix.

REFERENCES

1. Rigby D Mental Health Tribunal: Annual Report, 2009-2010. Melbourne, AU: Mental Health Tribunal. 30 September 2010. Downloaded 13/04/2017. https://stors.tas.gov.au/store/exlibris1/storage/STORS/2012/06/14/file_10/au-7-0023-00291_1.pdf

2. King G Nielsenz R (2016). Why Propensity Scores Should Not Be Used for Matching? www. gking.harvard.edu/files/gking/files/psnot.pdf Downloaded December 21, 2016.

3. Segal SP, Burgess PM. Conditional release: A less restrictive alternative to hospitalization? Psychiatric services. 2006;57(11):1600-6.