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Abstract | Psychosis is commonly associated with an elevated risk of violence. This population-based study of people diagnosed with psychosis in New South Wales (*n*=126,198) found that 15.2 percent committed a violent offence, most commonly within four years following diagnosis. Those who had offended tended to have histories of non-violent offending, to have been diagnosed at a younger age, to have substance-related psychosis and to have several risk factors associated with criminal behaviour. Being subject to a community treatment order was generally associated with a higher risk of violence, but results suggest a delay in violent offending for those subject to these orders.

First-time violent offending following psychosis diagnosis: Exploring community treatment order use and sociodemographic risk factors

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Introduction

Background

Reducing the risk of violence perpetration is of interest to public health and criminal justice stakeholders. Psychosis, among other schizophrenia spectrum disorders, has been associated with an increased risk of aggression and violence perpetration compared with community controls with no known psychosis (Li et al. 2020; Whiting et al. 2022). Psychosis is a psychological condition that can include a range of symptoms characterised by impaired reality perception (eg delusions or hallucinations; American Psychiatric Association 2013). A systematic review and meta-analysis of 24 studies across 15 countries (1970–2021) confirmed a heightened risk of violence perpetration by those with schizophrenia spectrum disorders compared with community controls (Whiting et al. 2022).

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The pooled odds ratio of violence perpetration was 4.5 for men (95% CI [3.6, 5.6]) and 10.2 for women (95% CI [7.1, 14.6]), albeit with high heterogeneity.

People with psychosis accounted for 10 percent of all criminal convictions in New South Wales between 2001 and 2015 (Chowdhury et al. 2020). Moreover, they are up to five times more likely to have a criminal conviction for violence than those without psychosis (adjusted OR=4.90, 95% CI [4.73, 5.07]). Several socio-environmental and behavioural factors have been consistently identified as being related to the risk of violence in people with severe mental illness, particularly comorbid substance use, violent victimisation, co-occurring personality disorders and structural brain abnormalities. These factors likely have complex and compounded effects on the individual's use of violence.

A focus on prevention and early intervention is central to violence reduction efforts in those with psychosis (Hwang et al. 2020). Several studies have recognised the early stages of psychosis as a time of heightened risk of criminal justice involvement, and especially risk of serious violence (Nielssen et al. 2007; Wasser et al. 2017). These older studies relied on self-reported violence or included only a short follow-up period. For example, one study in the United Kingdom reported up to 25 percent of its sample with first-episode psychosis (*n*=177) had perpetrated acts of violence in the 12 months following contact with early intervention services (Whiting, Lennox & Fazel 2020). Of these, 10 percent were arrested or charged for violence (Whiting, Lennox & Fazel 2020). One Australian study examining 1,453 individuals diagnosed with schizophrenia spectrum disorder between 2000 and 2005 found significant differences between those who offended within five years post-diagnosis and those who did not in terms of life experiences, sociodemographics, offence history, health service use and victimisation (Hachtel et al. 2018). This was an important contribution towards understanding earlier life experiences and how they affect violence use following diagnosis. However, the authors did not specifically observe factors precipitating first-time violence use and only observed up to five years following diagnosis. Overall, there is a need for a more robust and lengthier examination of data on first-time violence use in people with psychosis.

One increasingly implemented violence prevention tool for those with severe mental illness who are living in the community is the community treatment order (CTO). In Australia, CTOs are legal orders made by a magistrate or Mental Health Review Tribunal (MHRT) that mandate mental health treatment for people with mental illness in the community who require involuntary oversight for their care. They are implemented for individuals living in the community with mental illnesses who pose some risk of harm to themselves or others, and are usually made for a period of six to 12 months. CTOs set out the terms under which a person must commit to a combination of treatments, which may include medication, counselling, rehabilitation or other services. CTO use is high and rising in Australia (Light 2019; Light et al. 2012), despite ongoing contention regarding their effective and ethical use (Corring et al. 2018; Kisely, McMahon & Siskind 2023; Kisely et al. 2021). Key issues include a lack of conclusive or consistent evidence for their effectiveness in improving either health or justice outcomes, such as medication adherence, subsequent hospitalisation or crime perpetration (Kisely et al. 2021; Segal 2022). There are also concerns over their infringement of human rights due to their involuntary nature (Brophy et al. 2021; Goulet et al. 2019).

CTO use for those with psychosis warrants additional attention from a preventative standpoint, as they have the potential to improve the recognition of risk and prevent offending for those who are in the community. To our knowledge, no studies have investigated first-time violent offending in people who are subject to CTOs. In general, the literature regarding CTO use and violence is scarce and dated. One literature review of studies published up to 2021 found nine studies in which CTOs were associated with reduced crime risk and perpetration and were notably effective for reducing violence while in place, but without lasting effects (Segal 2022). Two additional studies reported no advantage in terms of violent behaviour for those who were on CTOs compared with controls (Hiday & Scheid-Cook 1987; Pollack et al. 2005). Four of these reviewed studies were Australian, and all but one of these reported on work prior to 2005 (Churchill et al. 2007; Hough & O'Brien 2005; Segal, Rimes & Hayes 2019; Vaughan et al. 2000). Similarly, the international studies identified in this review were not recent (1997–2011). While it is likely that people with psychosis represented a large proportion of the study samples, none of these studies included a focus on those with psychosis either as the target sample or as a population of interest. First-time violence perpetration was not an outcome of interest in any of these studies.

Two additional Australian studies have been published on CTO use and violence in the past five years (Ogilvie & Kisely 2022; Segal, Rimes & Hayes 2019). One study followed a Victorian birth cohort from 1990 to 2014 to examine CTO use and a range of health- and justice-related outcomes (Segal, Rimes & Hayes 2019). The authors concluded that individuals at higher risk of offending are more likely to be placed on CTOs, and that CTOs appear to reduce the risk of offending in this higher risk group, at least to the extent that they are of similar offending risk to the non-CTO (less risky) group. Another study used linked data from Victoria to observe health and justice outcomes for a sample of 11,424 people who experienced psychiatric hospitalisation and a CTO, with a matched sample of 16,161 between 2000 and 2010 (Ogilvie & Kisely 2022). Interestingly, significant reductions (17%) were found for the risk of initial perpetrations in the CTO group.

Moving forward, there are several important knowledge gaps to be filled regarding violent offending after psychosis diagnosis. Specifically, more work is needed using a preventative lens to examine first-time violent offending in those with psychosis using robust longitudinal data. Moreover, further investigation of the potential for CTOs as a violence prevention tool is needed to justify their widespread and growing use in Australia.

Method

Aims

This study aimed to explore the rate of violent offending after psychosis diagnosis in those with no history of violent offending prior to their diagnosis. It further aimed to examine a range of sociodemographic risk factors for violent offending, including CTO involvement.

Study design

This study employed a retrospective, longitudinal, population-based cohort design, with data derived from statewide (NSW) and nationwide Australian administrative linked data. Records for individuals with psychosis were probabilistically linked and de-identified by the NSW Centre for Health Record Linkage (CheReL) from several national and state-based data collections (Table 1). Ethics approval was provided by the NSW Population and Health Services Research Ethics Committee (2019/ETH01721), the Aboriginal Health and Medical Research Council Ethics Committee (1089/15), the Justice Health and Forensic Mental Health Network Human Research Ethics Committee (G324/14) and Corrective Services NSW (D2023/1555831).

Table 1: Datasets included in linkage

Dataset source	Dates available	Data type	Purpose in current study
NSW Mental Health Review Tribunal	January 2002 – October 2021	Administrative contact with the tribunal (eg for hearings, reviews)	CTO use
NSW Admitted Patient Data Collection	July 2001 – March 2021	Public and private hospital admissions	Identification of cases and diagnosis
NSW Emergency Department Data Collection	Jan 2005 – March 2021	Emergency department presentations	Identification of cases and diagnosis
NSW Mental Health Ambulatory Data Collection	July 2001 – June 2021	Community/outpatient/ non-admitted mental health services	Community mental health service contacts after being diagnosed with psychosis
NSW Bureau of Crime Statistics and Research—Reoffending Database	July 2001 – December 2020	Criminal convictions	Offending outcome
NSW Registry of Births, Deaths and Marriages	July 2001 – March 2021	Death records	Death outcome
Australian Bureau of Statistics—Cause of Death Unit Record File	July 2001 – December 2019	Australian death certificate—cause of death	Death outcome

Study population and variables

The population for this study included individuals who were diagnosed with psychosis on admission to NSW hospitals and/or when presenting at a NSW emergency department between January 2002 and December 2019. Those who committed violent offences prior to their diagnosis were not included. Psychosis diagnoses were defined as the presence of at least one record including relevant codes in the 9th and 10th revisions of the International Classification of Diseases (ICD-9 and ICD-10) or the Systematized Nomenclature of Medicine—Clinical Terms (SNOMED-CT). Psychosis was divided into three categories with according diagnostic codes:

- schizophrenia and related psychoses (ICD-10 diagnostic codes F06.0, F06.2, F20.0, F20.1, F20.2, F20.3, F20.4, F20.5, F20.6, F20.8, F20.9, F22.0, F22.8, F22.9, F23.0, F23.1, F23.2, F23.3, F23.8, F23.9, F24, F25.0, F25.1, F25.2, F25.8, F25.9, F28, F29 and F53.1; ICD-9 diagnostic codes 293.81, 293.82, 295.0, 295.1, 295.2, 295.3, 295.4, 295.6, 295.7, 295.8, 295.9, 297.0, 297.1, 297.2, 297.3, 297.8, 297.9, 298.3, 298.4, 298.8 and 298.9);
- affective psychoses (ICD-10 diagnostic codes F30.2, F31.2, F31.5, F32.3 and F33.3; ICD-9 diagnostic codes 296.04, 296.14, 296.24, 296.34, 296.44, 296.54, 296.64 and 298.0); and
- substance-related psychoses (ICD-10 diagnostic codes F10.5, F11.5, F12.5, F13.5, F14.5, F15.5, F16.5, F17.5, F18.5 and F19.5; ICD-9 diagnostic codes 291.3, 291.5, 292.1, 292.11 and 292.12).

We used a hierarchical approach to categorise psychosis. Those with a diagnosis of schizophrenia and related psychoses were coded as 'schizophrenia and related psychoses'; diagnoses of affective psychoses without schizophrenia and related psychoses were coded as 'affective psychoses'; and substance-related psychoses without the other two groups were coded as 'substance-related psychoses'.

Variables of interest in the analyses included gender, age, Aboriginal and/or Torres Strait Islander status, psychosis type, age at diagnosis, marital status (at first diagnosis), socio-economic status (at first diagnosis, determined by scores on the Socio-Economic Indexes for Areas (SEIFA)—advantaged versus disadvantaged), offending (violent and non-violent), emergency department use and hospitalisation due to psychosis, and contact with community mental health services. Criminal convictions were coded according to the Australian and New Zealand Standard Offence Classification (ANZSOC; Australian Bureau of Statistics 2023). We grouped offences into violent (ANZSOC codes 111–621) and non-violent (ANZSOC codes 711–1699). Offences that did not result in convictions were not included in this study.

Analyses

Descriptive statistics were used to describe the overall sample. The incidence of violent offending following psychosis diagnosis was described by year for the overall sample and for two subgroups: those who were subject to CTOs and those who were not. Survival analysis (Cox proportional hazard ratio (HR)) was used to observe sociodemographic risk factors for violent offending following psychosis diagnosis. Follow-up time began at first diagnosis of psychosis and ended with any record of violent offending, death, or the end of the study follow-up period. Kaplan–Meier survival curves were used to illustrate the cumulative survival probability of violent offending for the overall sample, and for the two subgroups: those who were subject to CTOs and those who were not.

Results

Violent offending after psychosis diagnosis

The study population consisted of 126,198 individuals with no history of violent offending prior to being diagnosed with psychosis (Table 2). The median age at first psychosis diagnosis in this sample was 41.7 years with an interquartile range (IQR) of 28.4 to 61.9 years. The sample was evenly split in terms of gender (53.4% male, *n*=67,353), and 4.7 percent were Aboriginal and/or Torres Strait Islander (*n*=5,931). One in seven individuals (14.3%) had a history of non-violent offences prior to their psychosis diagnosis.

In total, 19,121 (15.2%) individuals in the overall sample committed a violent offence within 10 years of their psychosis diagnosis. Median follow-up time was 2,186 days (approximately six calendar years) with an IQR of 799 to 4,394 days. Of the 126,198 individuals, 7.1 percent (*n*=8,906) were subject to a CTO during the study period, and 28.5 percent of those subject to a CTO committed a violent offence (*n*=2,534) in the follow-up period. By comparison, 16,587 (14.1%) individuals who were not subject to a CTO offended during the study period.

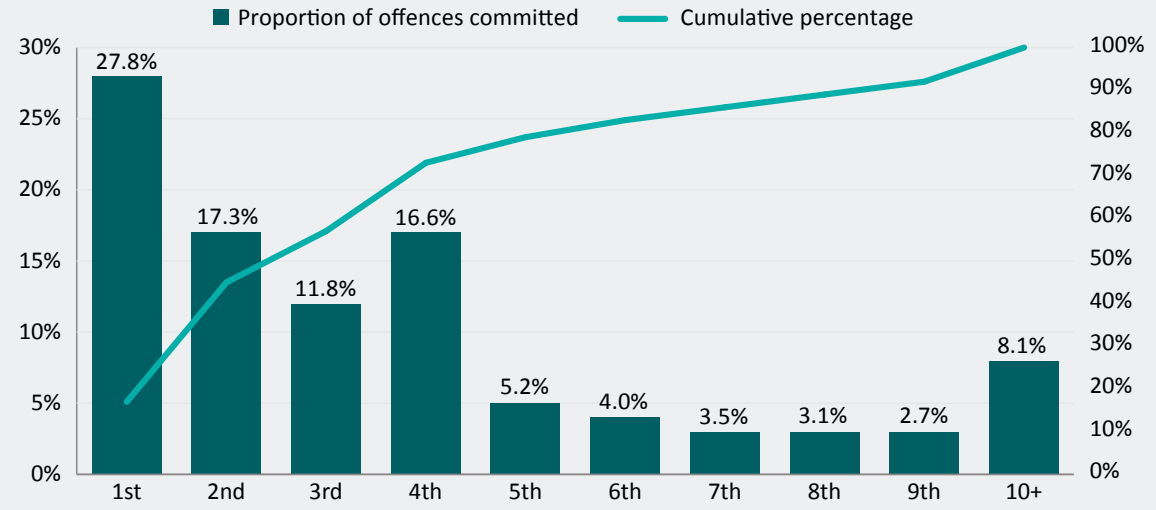
Table 2: Demographics and CTO status for study population, by offending status at end of study

		Offended during study period (*n*=19,121, 15.2%)	No offending during study period (*n*=107,077, 84.9%)	Total sample (*n*=126,198)
		n (%)	*n* (%)	*n* (%)
CTO	Yes	2,534 (13.3)	6,372 (6.0)	8,906 (7.1)
	No	16,587 (86.7)	100,705 (94.0)	117,292 (92.9)
Gender (male)	Yes	14,536 (76.0)	52,817 (49.3)	67,353 (53.4)
	No	4,585 (24.0)	54,260 (50.7)	58,845 (46.6)
Aboriginal and/or Torres Strait Islander	Yes	2,686 (14.1)	3,245 (3.0)	5,931 (4.7)
	No	16,435 (85.9)	103,832 (97.0)	120,267 (95.3)
Diagnosis type	Schizophrenia and related psychosis	12,916 (67.6)	82,314 (76.9)	95,230 (75.4)
	Affective psychosis	1,525 (8.0)	15,623 (14.6)	17,148 (13.6)
	Substance-related psychosis	4,680 (24.4)	9,140 (8.5)	13,820 (11.0)
Median age at diagnosis (IQR) in years		29.4 (22.6–37.2)	45.6 (30.7–66.5)	41.7 (28.4–61.9)
Age at diagnosis (years)	<20	2,871 (15.0)	7,152 (6.7)	10,023 (7.9)
	20–29	7,083 (37.0)	18,595 (17.4)	25,678 (20.4)
	30–39	5,614 (29.4)	18,344 (17.1)	23,958 (19.0)
	40+	3,553 (18.6)	62,986 (58.8)	66,539 (52.7)
Marital status	Married (including de facto)	2,313 (12.1)	22,893 (21.4)	25,206 (20.0)
	Single	16,808 (87.9)	84,184 (78.6)	100,992 (80.0)
Socio-economic status (SEIFA)	Advantaged	6,710 (35.1)	49,175 (45.9)	55,885 (44.3)
	Disadvantaged	57,902 (64.9)	12,411 (54.1)	70,313 (55.7)
Non-violent offence prior to diagnosis	No	9,920 (51.9)	98,252 (91.8)	108,172 (85.7)
	Yes	9,201 (48.1)	8,825 (8.2)	18,026 (14.3)
No. of community mental health contacts during follow-up	0	4,056 (21.2)	32,296 (30.2)	36,352 (28.8)
	1–10	6,114 (32.0)	24,795 (23.1)	30,909 (24.5)
	11–20	2,065 (10.8)	9,598 (9.0)	11,663 (9.2)
	> 20	6,886 (36.0)	40,388 (37.7)	47,274 (37.5)

Note: All the unknown/missing values were combined with the most common category of the variables

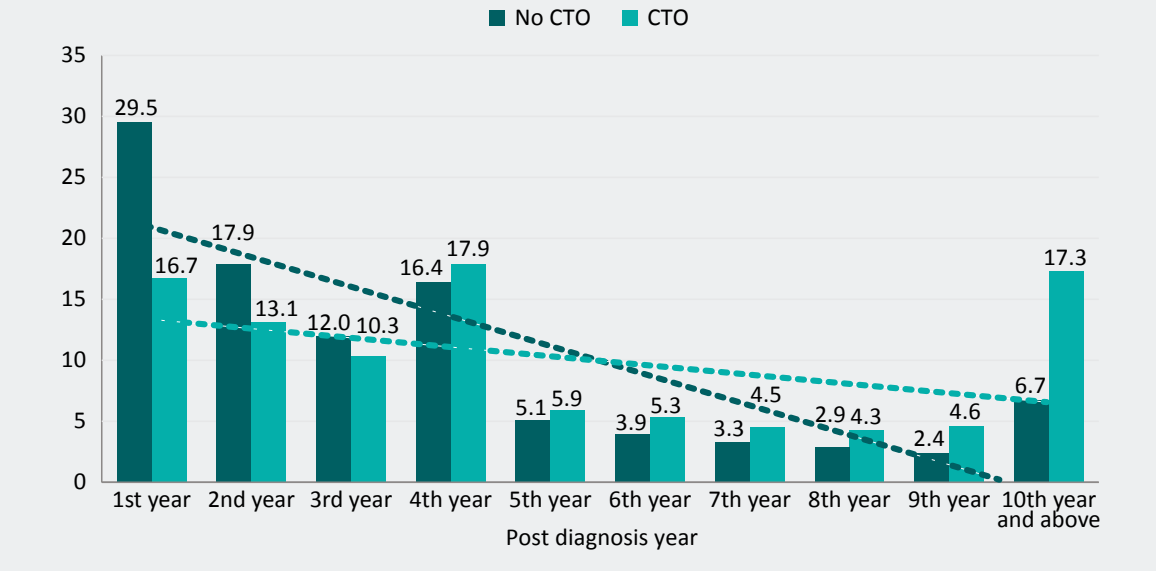
Figure 1 shows the percentage of first violent offences that occurred each year following diagnosis for the entire sample. Almost half of this offending (*n*=8,615, 45.1%) occurred within two years following psychosis diagnosis, and 73.5 percent of this offending occurred within the first four years (*n*=14,045) following psychosis diagnosis.

Figure 1: Proportion and cumulative percentage of offences committed by year following psychosis diagnosis (%)



The year in which violent offences were committed was compared across two groups: those who were subject to CTOs and those who were not. These data are presented in Figure 2. For both groups, the majority of violent offending occurred within four years post-diagnosis. Notably, there was a marked (17.3%) proportion of offences committed by the CTO group at 10+ years following diagnosis.

Figure 2: Percentage of violent offences committed each year following diagnosis, by CTO status



Note: Linear trend lines depicted

Violent offending and community treatment order use

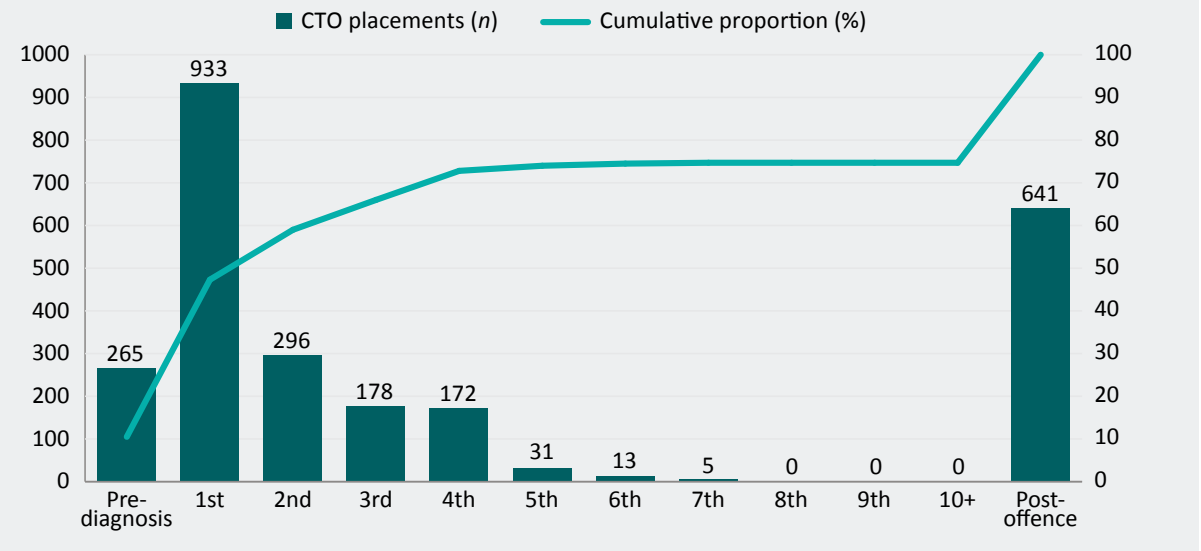
Table 3 presents offending for those on CTOs who offended and the year (relative to psychosis diagnosis) that individuals were first subject to CTOs. Up to half of those who were subject to CTOs and committed a violent offence during the study period had commenced CTOs within the first two years following their psychosis diagnosis (*n*=1,229, 48.5%). One in 10 had been on a CTO prior to being diagnosed (*n*=265, 10.5%). Another 25.3 percent of cases did not commence their first CTO until after their first violent offence.

Table 3: Year of CTO placement for those who offended (*n*=2,534)

Year (relative to psychosis diagnosis)	Number of CTO placements	% placements
Pre-diagnosis	265	10.5
1 year post-diagnosis	933	36.8
2 years	296	11.7
3 years	178	7.0
4 years	172	6.8
5 years	31	1.2
6 years	13	0.5
7 years	5	0.2
8 years	0	0.0
9 years	0	0.0
10+ years	0	0.0
CTO placement after offence	641	25.3

Figure 3 further illustrates this data, including a cumulative percentage of CTO placement over the years.

Figure 3: Number of CTOs administered each year relative to psychosis diagnosis, for those who offended during the study period (*n*=2,534)



Factors associated with risk of violent offending after psychosis diagnosis

Table 4 depicts the results of the survival analysis regarding the risk of violent offending in the sample. Significant risk of offending was associated with CTO placement, male gender, being Aboriginal and/or Torres Strait Islander, having substance-related psychosis, being less than 20 years of age, being single and living in a disadvantaged socio-economic area. Median follow-up time was 2,186 days with an IQR of 799 to 4,394 days. There was a significant elevated risk of violent offending for those who had prior non-violent offence histories. Further, while there was a significantly higher risk of violent offences for those who had more than one contact with community mental health services, this relationship reversed after more than 20 contacts. That is, having more than 20 contacts was related to a significantly lower risk of violent offending (compared with no contact).

Table 4: Risk factors for violent offending following psychosis diagnosis (*n*=126,198)

Characteristics		Overall (*n*=126,198)				
		n (%)	HR (95% CI)	*p*	aHR (95% CI)[a]	*p*
CTO	No	117,292 (92.9)	1		1	
	Yes	8,906 (7.1)	1.45 (1.39, 1.52)	<0.001	1.22 (1.17, 1.27)	<0.001
Gender	Female	58,845 (46.6)	1		1	
	Male	67,353 (53.4)	3.00 (2.88, 3.08)	<0.001	2.54 (2.45, 2.62)	<0.001
Aboriginal and/or Torres Strait Islander	No	120,267 (95.3)	1		1	
	Yes	5,931 (4.7)	4.10 (3.93, 4.27)	<0.001	3.20 (3.07, 3.34)	<0.001
Diagnosis type (first)	Schizophrenia and related psychosis	95,230 (75.4)	1		1	
	Affective psychosis	17,148 (13.6)	0.61 (0.58, 0.64)	<0.001	0.75 (0.81, 0.88)	<0.001
	Substance-related psychosis	13,820 (11.0)	3.01 (2.91, 3.11)	<0.001	2.03 (1.96, 2.10)	<0.001
Age at first diagnosis (years)	<20	10,023 (7.9)	1		1	
	20–29	25,678 (20.4)	0.89 (0.85, 0.93)	<0.001	0.84 (0.81, 0.88)	<0.001
	30–39	23,958 (19.0)	0.72 (0.69, 0.75)	<0.001	0.71 (0.68, 0.74)	<0.001
	40+	66,539 (52.7)	0.19 (0.18, 0.20)	<0.001	0.21 (0.20, 0.22)	<0.001
Marital status	Married (including de facto)	25,206 (20.0)	1		1	
	Single	100,992 (80.0)	1.90 (1.81, 2.00)	<0.001	1.20 (1.15, 1.26)	<0.001
Socio-economic status (SEIFA)	Advantaged	55,885 (44.3)	1		1	
	Disadvantaged	70,313 (55.7)	1.49 (1.44, 1.53)	<0.001	1.39 (1.35, 1.43)	<0.001
Non-violent offence prior to diagnosis	No	108,172 (85.7)	1		1	
	Yes	18,026 (14.3)	7.62 (7.41, 7.84)	<0.001	5.15 (5.00, 5.30)	<0.001

Table 4: Risk factors for violent offending following psychosis diagnosis (*n*=126,198) (cont.)

Characteristics		Overall (*n*=126,198)				
		n (%)	HR (95% CI)	*p*	aHR (95% CI)[a]	*p*
No. of community mental health contacts during the follow-up time	0	36,352 (28.8)	1		1	
	1–10	30,909 (24.5)	1.71 (1.65, 1.78)	<0.001	1.45 (1.39, 1.51)	<0.001
	11–20	11,663 (9.2)	1.46 (1.38, 1.54)	<0.001	1.25 (1.18, 1.32)	<0.001
	> 20	47,274 (37.5)	0.94 (0.90, 0.97)	0.001	0.74 (0.72, 0.77)	<0.001

a: aHR=adjusted hazard ratio

Note: The table is adjusted for age and sex. All the unknown/missing values were combined with the most common category of the variables

The survival probability of the two groups—those who were subject to CTOs versus those who were not—is further depicted in Figure 4. Median time to offending was 1,479.5 days with an IQR of 594 to 3,010 days for the CTO group and 798 days with an IQR of 291 to 1,775 for the non-CTO group. The number of individuals at risk of offending at each time point of Figure 4 is displayed in Table 5.

Figure 4: Kaplan–Meier survival curve for probability of violent offending over study period, by CTO status

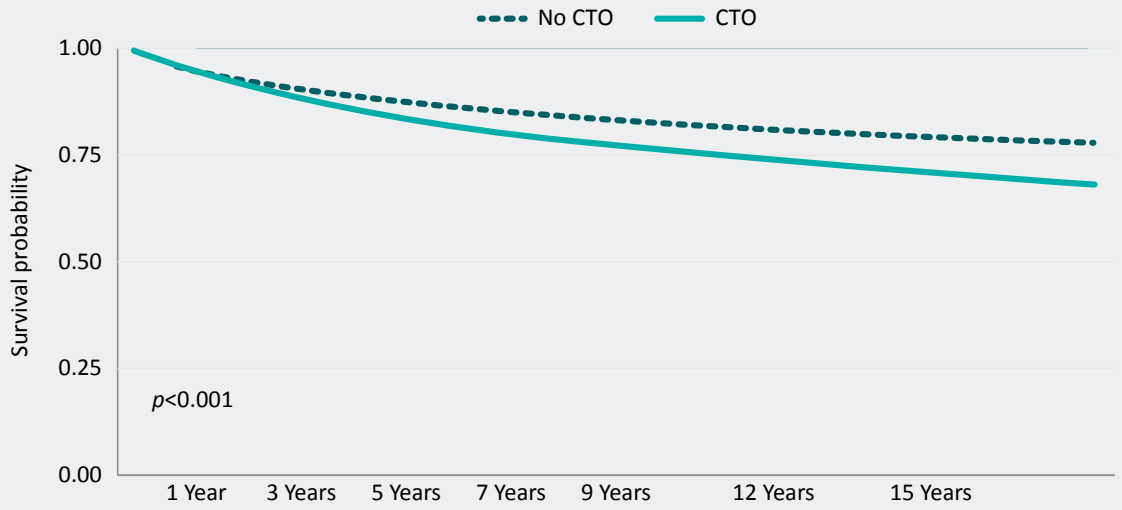


Table 5: Number of individuals at risk of violent offending over study period, by CTO status (*n*=126,198)

	Year 1	Year 3	Year 5	Year 7	Year 9	Year 12	Year 15
No CTO (*n*=117,292)	100,015	79,223	62,964	50,412	40,032	26,578	12,932
CTO (*n*=8,906)	8,417	7,641	6,989	6,505	6,069	5,144	3,386

Discussion

This is the first population-based study to examine violent offending following a diagnosis of psychosis and while being subject to a CTO. The findings make several important contributions to the literature. First, 15.2 percent of those diagnosed with psychosis with no known history of violence committed a violent offence following their diagnosis, with a median follow-up time of 2,186 days (approximately six years). While there are no directly comparable statistics in the literature, this estimate is similar to the results of other studies regarding aggression and violence following first-episode psychosis or psychosis diagnosis (Langeveld et al. 2014; Whiting, Lennox & Fazel 2020; Winsper et al. 2013). It is also slightly more conservative than the impression given by studies examining violence in people with psychosis included in the most recent systematic review by Whiting and colleagues, who reported an absolute rate of violence of 25 percent in men and five percent in women with schizophrenia spectrum disorders (Whiting et al. 2022). The more conservative findings in the current study were expected, as the sample excluded those with any history of violent offending, more stringent markers of violence were used than past studies (recorded offences as opposed to self-reported violence), and the study used a population-based sample rather than a sample recruited from specific intervention services.

The majority of violent offences (73.5%) were committed within the first four years following diagnostic contact, with a notable drop in offences committed after the fifth year. This is the first study to observe this phenomenon. This finding aligns with the notion that the first few years following psychosis emergence present a particular risk of violence. As yet, there are no theoretical or evidence-based explanations available in literature for why this may be so. Additional studies, both quantitative and qualitative, are needed to elucidate the reasons why certain periods are marked by elevated (and reduced) risk.

These findings provide useful direction for violence reduction, as they give time-based targets for prevention and early intervention, which are key principles from a public health preventative perspective. They suggest a heightened need for violence prevention efforts in the first four years following a person's receipt of a psychosis diagnosis on presentation to a hospital or emergency department, and the need for risk assessment tools to consider time since diagnostic contact as a predictive factor. Hospital contact appears to be an opportune time to commence preventative treatments and supervision aimed at violence prevention. However, compulsory or involuntary treatment methods such as CTOs are already contentious due to ethical issues surrounding their administration and a lack of robust evidence regarding their effectiveness. Care must be taken to ensure that only the most necessary and effective strategies are used, and this requires more specific evidence regarding 'what works when and for whom' in terms of mental health treatment for violence prevention. Approaches to risk management should be strengths-based, focusing on the periods and factors that reduce risk and encourage desistance.

The study finds that those who are subject to CTOs and those who are not exhibit a different pattern of offending over time. While we are unable to draw any conclusions about the specific effects of CTOs on subsequent offending behaviour from the analysis presented here, overall, those subject to CTOs appear to have a generally higher risk of violent offending compared with those who are not subject to CTOs. This is evident in the higher proportion of the CTO group that offended compared with those who were not subject to CTOs (28.5% and 15.1%, respectively) as well as CTO status being significantly related to an elevated risk of violent offending in the survival analysis (aHR=1.22). The steeper survival curve for those who were subject to CTOs also demonstrates both the higher rate and likelihood of violent offending in this group compared with those who were not subject to CTOs. Segal, Rimes and Hayes (2019) similarly concluded that CTOs appear to reduce offending in a group who are at a generally higher risk of offending.

Notwithstanding this elevated risk, the longer median time to offending suggests that CTOs may play a role in delaying violent behaviour. While there was a clear peak in offending for the non-CTO group during the first year (29.5% of offences), the peak for the CTO group was in the fourth year (17.9%), with a generally more even spread during the first four years. In most cases, CTOs are initially made for six to 12 months, and can be extended subject to review. Taken together with the distribution of CTO placements by year (Figure 3), it appears that there may be a suppression of violence in the year of CTO placement, and a rise in that risk afterwards, manifesting in a higher rate of offending by the fourth year. This finding suggests the need to consider how CTOs may be implemented in a way that produces a sustained effect on a person's prosocial behaviours over time, after the end of the order. Additional analytic approaches are needed to better understand this relationship. In particular, further exploration of comorbid psychiatric conditions and matched samples would be of benefit for drawing further conclusions.

In one-quarter of cases, people were placed on CTOs only after they had committed a violent offence. This suggests an opportunity for earlier risk monitoring of people who may warrant earlier CTO placement to manage their risk. Conversely, this could also represent a group who exhibit minimal warning signs of violence during their hospital contact or while in the community. It could also be a group lacking the visibility to MHRTs or health services that would trigger CTO placement. To our knowledge, pathways to placement on CTOs and issues of access to MHRT services have not yet been studied. This phenomenon warrants further investigation to enable earlier identification and risk mitigation.

In terms of the risk of violent offending following diagnosis, the factors associated with higher risk were generally aligned with what is known from literature about risks for criminal behaviour generally, such as being male, not being married, have lower socio-economic status and being Aboriginal and/or Torres Strait Islander. Adding to the argument for early intervention, this study found younger age at first diagnosis to be significantly related to the risk of committing a violent offence. A particularly strong risk was found for those with prior non-violent offence histories, who exhibited a fivefold risk of committing a violent offence following diagnosis. While past offending is a known and reliable predictor of future offending, this finding also illustrates a trajectory from non-violent to violent offending in people with psychosis, and suggests a history of non-violent offending should be considered both a priority risk factor and an intervention target in earlier life to prevent subsequent violence.

The study makes an interesting observation regarding contact with community mental health services and the risk of offending. That is, a higher risk of offending is associated with having 1 to 10 or 11 to 20 mental health contacts over the study period, compared with receiving none. The most plausible explanation for this is that these individuals represent a generally higher risk group who have been recognised as needing additional services and have been ordered to receive these (eg via a CTO). This aligns with a hypothesised relationship between higher treatment need and higher violence risk in those with psychosis. Further, a significant decrease in the risk of offending is observed for those who have more than 20 contacts with community mental health services, suggesting that a higher number of contacts is beneficial for reducing violence. This aligns with existing studies that have found that a higher number of contacts and continued engagement with mental health services for those with psychosis who have already offended or have left prison can decrease the risk of recidivism (Adily et al. 2023; Hwang et al. 2020). However, we acknowledge the limitations of these interpretations based on the present data, with further work required to identify an optimal level and length of treatment for violence prevention in this population.

Taken together, the practical implications of these findings require health and justice systems to work collaboratively to tackle the issue of violence prevention among those with psychosis. The findings provide guidance for factors that should contribute to individualised risk assessment tools to enhance decisions around appropriate treatment and supervision. Cross-sector collaboration will be required to develop and administer these tools at the right time for a person travelling through health and justice systems, for maximum effectiveness.

Limitations

The results of this study should be considered within the limitations of the available data and the scope of the analyses. The observation of administrative data at a population level was a strength of the study, but its high-level nature also limits the type and level of inferences that can be made. In addition to those sociodemographic factors that were considered in this work, there are other factors that are important considerations in the development of violence for those with psychosis; these include, for example, early life antisocial behaviour or education experiences (Hodgins & Klein 2017). Similarly, although contact with mental health services was included, we were unable to observe the specific treatments administered or medication adherence, or factors such as insight, which can only be assessed at a more personal level than was available in the present data.

The precise temporal relationship between CTO onset and offending was also unclear and not part of the present analysis, limiting the causal inferences that can be made between CTO use and subsequent offending. Similarly, results regarding offending over time were descriptive. The discussion of these results takes this limitation into account. Notwithstanding these limitations, the findings fill important knowledge gaps and provide strong impetus for future causal investigations. In this vein, future studies may wish to compare post-diagnostic violence among those who had previous violence histories, who were not included in the current study.

In this study, psychosis diagnosis was based on hospital admission or presentation at an emergency department and may have missed those who were diagnosed in other settings. It also means we could not ascertain which stage of psychosis a person was experiencing, which may have important clinical implications. When considered in light of the present findings, this would suggest that, for people with psychosis, periods of medical care resulting in a psychosis diagnosis also coincide with (or trigger) a period in which there is a heightened risk of violence. Following from this, these points of individuals' healthcare journeys are also important touchpoints for violence intervention.

Finally, the findings are specific to the state of New South Wales. CTOs are administered independently in states and territories across Australia, though the overarching aims are not greatly different. This means that the study would not have captured offences or diagnoses that were made in other jurisdictions.

Conclusion

Mental health treatment status and violence use are closely related in those with psychosis. Overall, this study showcases the need for individualised risk assessment and identifies specific temporal intervention points for violence prevention. The findings also highlight the need for further causal analyses to elucidate whether and in what cases CTOs can be used effectively to prevent first-time violent offending in those with psychosis, to improve their effective and responsible delivery. To this end, the health and justice systems will need to work collaboratively to share relevant information about individuals' histories and needs, and implement ways to identify and direct individuals to treatment at the right time.

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