



Community treatment orders in Western Switzerland: A retrospective epidemiological study



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ABSTRACT

Purpose: Community treatment orders (CTOs) are legal procedures that authorise compulsory community mental health care to people affected by severe mental disorders. Nowadays, CTOs are regulated in 75 countries, with important variations in terms of legal criteria and practices. In Switzerland CTOs were introduced on the 1st January 2013, following the amendment of the Swiss Civil Code. The aim of this study was to provide a first understanding of the use of CTOs in Western Switzerland in terms of incidence and prevalence rates, population profile, orders duration and reasons for discharge.

Methods: Incidence and prevalence rates of CTOs between 2013 and 2017 were estimated. Survival analysis was used to investigate time to CTO discharge and associated factors. Logistic regression was performed to identify factors associated with CTOs' success as reason for discharge.

Results: CTOs' incidence rates per 100'000 inhabitants ranged between 4.8 for 2013 and 9.6 for 2017, while their prevalence raised from 4.8 to 19.5. People placed under CTO were mainly male, in their forties, of Swiss origin, single and living independently. Primarily affected by Schizophrenia, schizotypal and delusional disorders (F20-F29), they frequently presented substance use problems, and severe danger for themselves. CTOs were mainly ordered by the guardianship authority as a form of conditional release. The estimated mean time to discharge was almost three years. Not being of Swiss origin and being prescribed to take a medication were associated with longer CTO while living in hospital, as a consequence of a long-lasting hospitalisation, and having a non-medical professional in charge of the order were associated with shorter time to discharge. Neither clinical factors nor legal criteria predicted time to discharge. Moreover, spending more days under CTO increased the likelihood of success at discharge, whereas not being of Swiss origin reduced it.

Conclusions: To the best of our knowledge, no previous studies have examined the CTOs' implementation in Switzerland. CTOs prevalence increased rapidly despite the lack of evidence on positive outcomes. Our results suggested that once under CTO, it takes a long time for a patient to be released, in case of both positive and negative outcomes.

1. Introduction

Community treatment orders (CTOs) are legal procedures that authorise the compulsory provision of community mental health care to people affected by severe mental disorders.

Since their first development in the United States during the 60's and 70's, a common stated aim of CTOs has been to offer a "least restrictive" alternative to involuntary hospitalisation and to reduce the "revolving-door" phenomenon (Hiday & Goodman, 1982). Despite that, in many jurisdiction CTOs shifted rapidly towards a more "preventative" role, aimed at preventing the deterioration of patients' mental state and the consequent potential danger to themselves or

others (Churchill, Owen, Singh, & Hotopf, 2007). Nowadays, CTOs are regulated in 75 countries, with important variations of legal criteria and practices (Dawson, 2005; Rugkasa, 2016). While in some countries like Canada, UK, Norway, Sweden and Denmark, CTOs can be initiated by clinicians, in others like the United States are usually court-initiated (Rugkasa, 2016). The order can be justified by the need for treatment ("treatment criterion") and/or a danger for the patient or others ("danger criterion"), and can be initiated at discharge from hospital or directly within the community (Kisely et al., 2013b; Løvsletten, Haug, Granerud, Nordby, & Smaaberg, 2016; Rugkasa et al., 2019). The main obligations for people under CTOs are usually to take a medication and to maintain contact with the mental health team (Dawson, 2005; S.

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Morandi, 2016). Other restrictions can be imposed, like blood test to check treatment adherence or abstinence, conditions of residency, abstinence from drug and alcohol, and occupational activities (Morandi et al., 2014; Rugkasa, Yeeles, Koshiaris, & Burns, 2017).

Rates of CTOs vary widely among and within countries. In 2016/2017 in Australia, rates of CTO use ranged from 40.0 per 100'000 inhabitants in Western Australia to 112.5 per 100'000 inhabitants in South Australia (Light, 2019). In the UK, important differences in the use of CTOs were registered between England and Wales, despite the fact of being submitted to the same legislation ((Prior & Behan, 2013)). Clinicians' attitudes towards CTOs seem to strongly impact the rates of CTOs' use (Dawson, 2005). In UK, a study found significant variations in the use of CTOs among clinicians, ranging between 0 and more than 100 (DeRidder, Molodynski, Manning, McCusker, & Rugkasa, 2016).

Despite these variations, after an initial "bedding in" period (Dawson, 2005), the prevalence rates of CTOs seem to increase almost everywhere over time (Lawton-Smith, 2005). In England, the prevalence of CTOs rose from 74 to 82 per 100'000 inhabitants in two years (from 2010 to 2012) (Manning, Molodynski, Rugkasa, Dawson, & Burns, 2011; Prior & Behan, 2013). Similar increments were registered in New Zealand (Ministry of Health, 2014; O'Brien, 2014) and Canada (Malatest, 2012). This global trend have been partially explained by the spread reticence of clinicians and courts to discharge a CTO, regardless of its effectiveness (Dawson, 2005; Morandi et al., 2014).

Moreover, the characteristics of patients on CTOs are remarkably consistent across countries. People under CTO are mainly single males, in their forties, with a main diagnosis of schizophrenia, schizotypal and delusional disorders, a long history of service use and concomitant substance abuse and aggressive behaviours (Bardell-Williams et al., 2019; Churchill et al., 2007; Kisely et al., 2013; Kisely, Xiao, & Jian, 2015; Løvsletten et al., 2016; Morandi, 2016; Rugkasa et al., 2019; Rugkasa et al., 2017; Zetterberg, Sjostrom, & Markstrom, 2014). Moreover, a recent Australian study showed that specific social characteristics, like coming from culturally and linguistically diverse (CALD) backgrounds, increased the likelihood of compulsory community treatment, especially if associated with the use of an interpreter (Moss, Wyder, Braddock, Arroyo, & Kisely, 2019).

Nowadays, weak evidence exists for CTOs' positive outcomes, in terms of service use, treatment adherence, clinical state and social functioning (Burns et al., 2013; Kisely, Campbell, & O'Reilly, 2017; Steadman et al., 2001; Swartz et al., 1999), making it mandatory to tightly monitor and evaluate their use.

The aim of this study was to provide a first understanding of the use of CTOs in Western Switzerland in terms of incidence and prevalence rates, population profile and CTOs' criteria and obligations. The second goal was to investigate the association between these factors and CTOs' duration and reasons for discharge.

In Switzerland, CTOs were introduced for the first time in 2013. Until now, to the best of our knowledge, no previous studies have examined their implementation. This study aims to fill this gap.

2. Methods

2.1. Study setting

The Swiss Confederation is a country of 8.5 million people divided into 26 cantons. With a density of 49.1 psychiatrists per 100'000 inhabitants (versus 17.2 for Europe) (World Health Organisation, 2013) and 90.5 psychiatric beds per 100'000 inhabitants (versus 73.1 for Europe) (OECD, 2014; World Health Organisation, 2014), Switzerland has one of the most highly developed psychiatric system in the world. Besides, Switzerland counts also one of the highest rate of involuntary psychiatric admission in Europe (1.6 per 1'000 inhabitants), ranging from 2.3 for the Canton of Vaud to 0.4 for the Canton of Valais (Observatoire suisse de la santé, 2016; Schuler, Tuch, & Peter, 2018).

The guardianship legislation is regulated by the Swiss Civil Code (Articles 426 and 427), which was amended on the 1st January 2013 in order to offer coercive measures more proportional to the needs of the person, avoiding the systematic use of hospitalisation, and to increase individual autonomy and protection. Following the amendment, CTOs were introduced, with the Article 437 stating that each canton "may provide for out-patient measures" (The Federal Authorities of the Swiss Confederation, 1907). Before 2013, only few cantons had a legal provision for CTOs (Morandi & Burns, 2014). As for involuntary admission, each canton has the responsibility of implementing the federal law within its own health legislation, defining its content and limitations.

This study focused on the analyses of CTOs pronounced in the Canton of Vaud, Switzerland. The Canton of Vaud, which in 2017 counted a population of 794'384 people, is divided into four psychiatric districts, each one with a main psychiatric hospital. In this canton, CTOs are regulated by the Article 29 of the Vaud Law of Application of the Federal Law on the Adult and Child Protection. This article states that when the conditions for compulsory treatment exist (a person suffering from mental disorder, mental disability or serious neglect, requiring a treatment or presenting a danger for themselves or for others (The Federal Authorities of the Swiss Confederation, 1907) but the care can be provided in an outpatient setting, a CTO can be pronounced (Grand Conseil du Canton de Vaud, 2012). Both the "treatment criterion" and the "dangerousness criterion" are taken into account by the law. Only psychiatrists authorised by the Department of Health and Social Action (DSAS), and the guardianship authority, called Adult Protection Authority (APA), are allowed to order a CTO. In both cases, CTOs can be pronounced within the community as an alternative to an involuntary hospitalisation or at discharge after a compulsory admission. No forced medication is allowed under the CTOs legislation. Consequently, the collaboration of the person is essential to the implementation of the measure. Re-evaluations are requested after 6 months, 1 year and then every year. The legislation does not detail the content or duration of the CTO, which is left at the discretion of the authorised psychiatrist or guardianship authority pronouncing it.

In the Canton of Vaud, the Public Health Service (PHS) is in charge of the monitoring of inpatient and outpatient compulsory treatments. Each CTO pronounced by an authorised psychiatrist has to be announced via a specific form to the PHS. The official decisions of CTOs pronounced by the guardianship authority are also transmitted to the PHS and data extracted through a standardised coded form.

2.2. Study design

This retrospective epidemiological study focused on the analysis of the PHS's data on CTOs pronounced between the 1st January 2013 and the 31st December 2017. Available data included sociodemographic characteristics, clinical characteristics and CTOs' characteristics. Sociodemographic characteristics were age, gender, marital status, origin and housing conditions. The country of origin was defined as the country of birth or the country of descent for children born in Switzerland to non-Swiss parents. Furthermore, we were able to know if the person was under legal guardianship and/or involuntarily admitted when the CTO was ordered.

Clinical characteristics included main diagnoses, aggregated into seven categories, based on the ICD 10 classification. A secondary diagnosis of addiction and/or personality disorders was also registered. Finally, the available data provided information about the existence of an alcohol and/or substance use secondary problem (in absence of a primary or secondary diagnosis of addiction), of a danger for themselves and/or for others.

CTOs' characteristics included information about who requested and who pronounced the order, based on which legal criteria, the content of the measure and who was in charge of its implementation and follow up. Moreover, data concerning the CTO's psychiatric

district, its status at the 31st December 2017, the date of order and eventually discharge, and the reasons for discharge were also available. Reasons for discharge were classified as: 1. CTO success (when CTO conditions were respected and its objectives, such as improved treatment adherence, improved clinical and/or social conditions, etc., were successfully achieved); 2. Breached conditions without involuntary admission; 3. Breached conditions with involuntary admission; 4. Death; 5. Other.

All data were anonymized and the study approved by the Swiss Ethics Committee on research involving human of Lausanne (N. 2019-00426).

2.3. Statistical analysis

Incidence and prevalence rates of CTO were estimated for the years between 2013 and 2017. The incidence rate was defined as the annual number of new CTO cases per 100'000 inhabitants. The point prevalence was defined as the total number of CTO per 100'000 inhabitants at the 31st December of each year.

Descriptive analyses were applied to sociodemographic, clinical and CTOs' characteristics.

Time to CTO discharge was estimated by Kaplan-Meier survival analysis, using as time origin the time point of CTO order and as endpoint, the time point of CTO discharge or of the end of data collection (fixed at the 31st December 2017) for CTOs still underway.

In order to determine which factors were associated with shorter time to CTO discharge, a series of Cox's proportional hazards regression models were estimated on the whole sample (N = 241). The CTO's status was introduced as the dependent variable (event = discharged). The number of days under CTO was included as the time variable. Univariate analyses were performed on all the sociodemographic, clinical and CTOs' characteristics. Only variables reaching a $p < .10$ level of significance at the univariate tests were introduced as one block in the multivariate final model.

Factors associated with CTO success as reason for discharge were estimated on discharged orders (N = 86) through multivariate logistic regression analysis. Reason for discharge was included as the dependent variable, (CTO success = 1; other categories = 0) and socio-demographic, clinical and CTOs' characteristics reaching a $p < .10$ level of significance at the univariate tests were introduced in one block as independent variables.

All statistical tests were two-tailed and significance was determined at the .05 level. Analyses were performed with the IBM SPSS 25.

3. Results

3.1. CTOs' incidence and prevalence rates

Incidence and prevalence rates are shown in Fig. 1. Between 2013 and 2017, 241 CTOs were ordered in the Canton of Vaud (36 in 2013, 35 in 2014, 50 in 2015, 44 in 2016 and 76 in 2017), giving an incidence rate per 100'000 inhabitants that ranged from 4.8 to 9.6. With the exception of 2017, incidence rates of CTOs were rather constant during the first four years following their introduction.

A more persistent increment was registered for CTOs' point prevalence. Indeed, as only 86 measures were discharged between 2013 and 2017 (6 in 2014, 15 in 2015, 30 in 2016 and 35 in 2017), the CTOs' prevalence per 100'000 inhabitants raised continuously during the studied period, from 4.8 to 19.5.

3.2. Sociodemographic and clinical characteristics of people under CTO

As shown in Table 1, people under CTO were mainly male, with an average age of 49 years, of Swiss origin, single and living in independent housing. Almost 67% of them were under legal guardianship when the order was enforced. Moreover, 68% of CTOs were ordered at discharge from an involuntary admission.

Looking at the clinical profile, data showed that even though the main diagnosis was Schizophrenia, schizotypal and delusional disorders (F20-F29), 30% of people was diagnosed for Mental and behavioural disorders due to psychoactive substance use (F10-F19), primarily alcohol (F10). Besides, even when alcohol and/or substance use was not identified as a primary diagnosis, it was frequently registered as a comorbidity or a secondary problem. Mood [affective] disorders and Disorders of adult personality and behaviour were less frequent as main diagnosis, even though in more than 16% of cases the latter was identified as a secondary diagnosis. Lastly, 6% of people under CTO presented an Organic, including symptomatic, mental disorder. The remaining 6% of cases were gathered under the category "Other", which included all the remaining ICD 10 mental and behavioural disorder groups (with the exception of Behavioural and emotional disorders with onset usually occurring in childhood and adolescence), plus two people with no psychiatric disorder. In four cases, information about diagnosis were missing.

Finally, data concerning the presence of a danger for themselves and/or for others showed that while the first concerned more than 45% of people, the latter was less frequent (23%).

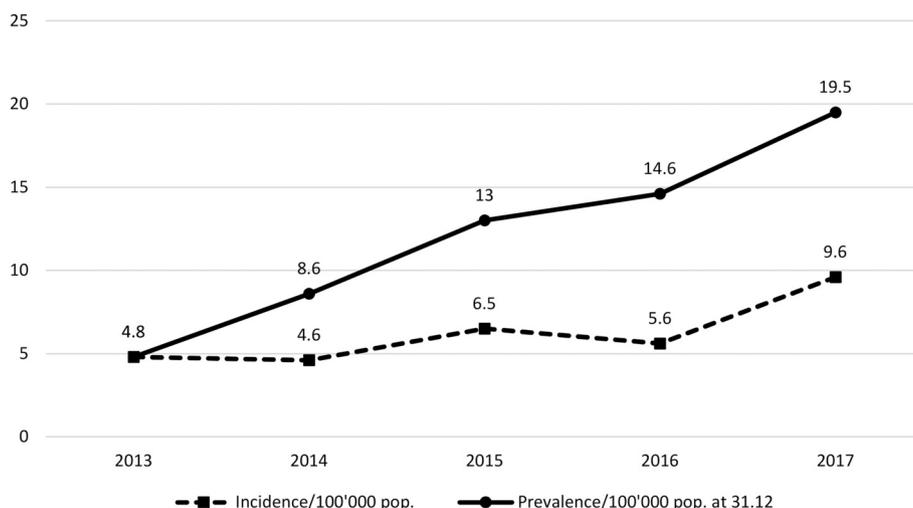


Fig. 1. Incidence and prevalence of CTOs between 2013 and 2017 in the Canton of Vaud, Switzerland.

Table 1

Socio-demographic and clinical characteristics of people under CTO between 2013 and 2017 in the Canton of Vaud, Switzerland (N = 241).

| Characteristics | |
|--|-------------|
| Age | |
| Mean (SD) | 48.8 (15.9) |
| Mdn (IQR) | 49.0 (24.0) |
| Min/Max | 18/92 |
| Sex, % (n) | |
| Male | 54.8 (132) |
| Origin, % (n) | |
| Swiss | 74.1 (172) |
| Marital status, % (n) | |
| Single | 47.9 (114) |
| Married/Registered partnership | 15.1 (36) |
| Divorced/Separated | 30.3 (72) |
| Widowed | 6.7 (16) |
| Housing conditions, % (n) | |
| Independent housing | 72.0 (172) |
| Residential centre | 19.2 (46) |
| Hospital | 1.7 (4) |
| Homeless | 5.9 (14) |
| Other | 1.3 (3) |
| Legal guardianship underway at CTO order, % (n) | 66.8 (161) |
| Involuntary admission underway at CTO order, % (n) | 67.9 (163) |
| Main diagnosis (ICD-10), % (n) | |
| Organic, including symptomatic, mental disorders (F00-F09) | 6.3 (15) |
| Mental and behavioural disorders due to use of alcohol (F10) | 24.5 (58) |
| Mental and behavioural disorders due to psychoactive substance use (F11-F19) | 5.9 (14) |
| Schizophrenia, schizotypal and delusional disorders (F20-F29) | 41.8 (99) |
| Mood [affective] disorders (F30-F39) | 9.3 (22) |
| Disorders of adult personality and behaviour (F60-F69) | 5.9 (14) |
| Other | 6.3 (15) |
| Comorbidity (ICD-10), % (n) | |
| F10-F19 | 13.9 (33) |
| F60-F69 | 15.6 (37) |
| Alcohol and/or substance use secondary problem (in absence of a primary or secondary diagnosis of addiction), % (n) | |
| Danger for themselves, % (n) | 45.2 (109) |
| Danger for others, % (n) | 23.2 (56) |

Note. SD Standard Deviation Mdn Median, IQR Interquartile Range.

3.3. CTOs' characteristics

CTOs' characteristics are presented in [Table 2](#).

Between 2013 and 2017, CTOs were mainly advised by forensic psychiatrists, in the context of psychiatric expertise ordered by the civil justice. Psychiatric hospitals requested 27.8% of CTOs and ambulatory psychiatrists 17%, while the percentage of CTOs' requested by general practitioners was even lower. In 9.1% of cases, CTO was required by other people, like legal guardians, residential centres, family members or the patients themselves.

CTOs' applications were mainly addressed to the guardianship authority, which ordered 93% of civil commitments. Only a minority of CTOs was pronounced by an authorised psychiatrist. Moreover, the distribution of CTOs among psychiatric districts ranged from 38.6% of District 3 to 5% of District 2.

Concerning the legal criteria, data showed that almost 60% of CTOs were ordered based on the treatment criterion, while only 5% were justified by the dangerousness criterion. Both criteria were applied in 34.9% of situations. In two cases the applied criterion was not specified.

People under CTO were mainly required to respect their appointments with the mental health team. Home visits were imposed in 52.9% of situations and medication in 51.7%. Other obligations were: to follow a somatic treatment; to comply with an addiction treatment and

Table 2

Characteristics of CTOs ordered between 2013 and 2017 in the Canton of Vaud, Switzerland (N = 241).

| Characteristics | |
|---|------------|
| CTO requested by, % (n) | |
| Forensic psychiatrist | 31.5 (76) |
| Civil judge | 11.6 (28) |
| Psychiatric hospital | 27.8 (67) |
| Ambulatory psychiatrist | 17.0 (41) |
| General practitioner | 2.9 (7) |
| Other | 9.1 (22) |
| CTO ordered by, % (n) | |
| Guardianship authority | 93.4 (225) |
| Authorised psychiatrist | 6.6 (16) |
| Legal criteria | |
| Treatment criterion | 59.3 (143) |
| Dangerousness criterion | 5.0 (12) |
| Both | 34.9 (84) |
| Not specified | 0.8 (2) |
| CTO content, % (n) | |
| Medication | 51.7 (124) |
| Appointments with mental health professionals | 86.3 (207) |
| Home visits | 52.9 (127) |
| Addiction treatment | 17.5 (42) |
| Blood test | 13.8 (33) |
| Somatic treatment | 31.3 (75) |
| Other | 37.5 (90) |
| Person in charge of CTO, % (n) | |
| Psychiatrist | 83.0 (200) |
| General practitioner | 15.8 (38) |
| Non-medical professional | 1.2 (3) |
| Psychiatric district of reference, % (n) | |
| District 1 | 27.0 (65) |
| District 2 | 5.0 (12) |
| District 3 | 38.6 (93) |
| District 4 | 29.5 (71) |
| CTO's status at 31 st December 2017, % (n) | |
| Underway | 64.3 (155) |
| Discharged | 35.7 (86) |
| Discharge reasons, % (n) | |
| CTO success | 43.0 (37) |
| Breached conditions without involuntary admission | 14.0 (12) |
| Breached conditions with involuntary admission | 20.9 (18) |
| Death | 8.1 (7) |
| Other | 14.0 (12) |

Note. SD Standard Deviation Mdn Median, IQR Interquartile Range.

to undergo blood tests. Finally, 37.5% of people were also required to respect a variety of "other" restrictions. This category included participation in occupational activities and/or therapy, support in daily activities (meals preparation, housecleaning, personal care, etc.) and/or housing, attendance of a day hospital, etc.

Regarding the person in charge of CTO implementation and follow up, psychiatrists were appointed in 83% of cases, followed by GPs and non-medical professionals, as social workers or legal guardians.

3.4. Factors associated with shorter time to CTO discharge and reasons for discharge

As mentioned above, 86 CTOs out of 241 (35.7%) were discharged at the 31st December 2017. In 43% of the cases the measure was withdrawn because it had successfully achieved the predetermined objectives, while in 35% of the situations the decision of discharge was justified by the breached of CTO's conditions, leading in some cases to an involuntary admission. Seven people died while under CTO, and 12 were discharged for other reasons, like a relocation out of the canton, the implementation of a penal measure, the voluntary admission to a residential centre ([Table 2](#)).

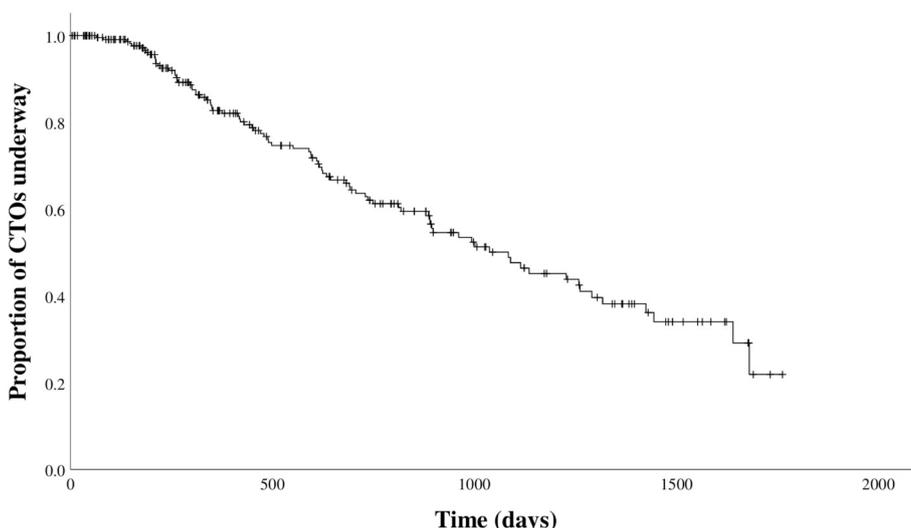


Fig. 2. Kaplan-Meier survival curve for time to CTO discharge. Note. N = 241 (Event = 86; Censored = 155).

The mean CTO duration calculated on discharged orders (N = 86) was 602.7 days (SD 387.4) and the median was 494.0 (IQR 598.0), with a minimum duration of 65 days and a maximum of 1'680 (4.5 years). Nevertheless, focusing on discharged orders may underestimate the CTO duration by excluding long lasting CTOs still in process. We therefore used Kaplan-Meier survival curve (Fig. 2) to include ongoing censored cases (total sample N = 241). The estimated survival mean (SE) and the estimated survival median (SE) were considerably higher, with 1'060.1 (49.7) days for the former and 1'084.0 (128.5) for the latter. Moreover, the Kaplan-Meier curve showed that a person under CTO has an 80% chance of being released within five years.

The univariate analyses to investigate factors associated with time to CTO discharge performed on the sociodemographic, clinical and CTOs' characteristics showed that only four variables reached the $p < .10$ level of significance, namely origin, housing conditions, person in charge of CTO and the CTO content variable medication. Therefore, these factors were introduced in the multivariate analysis as independent variables. The estimates of the final Cox's proportional hazards regression model are presented in Table 3. Results showed that not being-Swiss increased the risk of longer CTO (OR = 0.467; $p = .011$). Time to discharge was also longer when the person was required to take a medication, compared to CTOs without this restriction (OR = 0.625; $p = .045$).

On the contrary, living in hospital (not having a home because of a long-lasting hospitalisation), instead of in independent housing, (OR = 34.605; $p < .001$), as well as having a non-medical professional in charge of the CTO rather than a psychiatrist (OR = 33.221;

Table 3
Factors associated with shorter time to CTO discharge between, 2013 and 2017 in the Canton of Vaud, Switzerland.

| Predicting factors | B (S.E.) | OR | 95% C.I. | p-value |
|--|----------------|--------|---------------|---------|
| Origin (ref. Swiss) | | | | |
| Other | -0.761 (0.299) | 0.467 | 0.260 0.839 | .011 |
| Housing conditions (ref. Independent housing) | | | | |
| Hospital | 3.544 (0.796) | 34.605 | 7.273 164.660 | < .001 |
| Person in charge of CTO (ref. Psychiatrist) | | | | |
| Non-medical professional | 3.506 (.823) | 33.221 | 6.640 167.212 | < .001 |
| CTO content (ref. No medication) | | | | |
| Medication | -0.470 (0.235) | 0.625 | 0.394 0.990 | .045 |

Note. C.I = Confidence Interval; OR = Odds Ratio. $\chi^2(11) = 81.6$; $p < .001$; N = 213 (Event = 83; Censored = 130).

$p < .001$), were associated with a significantly shorter time to discharge.

Finally, the univariate analyses estimated on discharged orders to identify factors associated with CTO success as reason for discharge showed that three variables reached the $p < .10$ level of significance, namely origin, main diagnosis and number of days under CTO, but only two reached a $p < .05$ at the multivariate analysis. Indeed, spending more days under CTO increased the likelihood of positive outcomes at discharge (OR = 1.002; $p = .026$), whereas not being Swiss reduced it (OR = 0.159; $p = .026$).

4. Discussion

4.1. CTOs' incidence and prevalence rates

In the Canton of Vaud, CTOs' incidence rates ranged from 4.8 per 100'000 population in 2013 to 9.6 in 2017. While small fluctuations were registered during the first four years after their introduction, the number of new CTOs rose remarkably in 2017. Since nor a reduction in the number of psychiatric beds (62.5 per 100'000 population in 2016 and 62.6 in 2017) neither other important changes in the cantonal mental health system were concurrently registered, the reasons for this growth should be found elsewhere. A possible explanation is that both guardianship authorities and authorised psychiatrists, after the initial "bedding in" period (Dawson, 2005), became more familiar with the CTOs' procedure and were more willing to use this less restrictive measure. This could also partially explain the slight downward trend of involuntary hospitalisations recorded between 2016 and 2017 in the same area (from 326.8 per 100'000 pop. in 2016 to 310.1 in 2017). However, because of their very recent implementation, CTOs' pattern of use and impacts can still largely fluctuate and definitive conclusions are difficult to draw.

The CTOs' point prevalence rates ranged from 4.8 to 19.5 per 100'000 inhabitants, showing a four-fold increase over five years. This constant growth is in line with what observed in other countries (Lawton-Smith, 2005; Løvsletten, Haug, Granerud, Nordby, & Smaaberg, 2016; Malatest, 2012; Manning, Molodynski, Rugkåsa, Dawson, & Burns, 2011; Ministry of Health, 2014; O'Brien, 2014; Prior & Behan, 2013). If this trend were to remain constant, in few years' time the Canton of Vaud would reach a CTOs' prevalence rate similar to England (82 per 100'000 pop. in 2012) (Prior & Behan, 2013) and Norway (71 per 100'000 pop. in 2012) (Løvsletten et al., 2016).

Based on these results and on the existent weak evidence for CTOs'

positive outcomes, further studies are warranted to evaluate their longer-term evolution and impacts.

4.2. Sociodemographic and clinical characteristics of people under CTO

Our results on the sociodemographic and clinical characteristics of people under CTO are in line with the existent literature (Bardell-Williams et al., 2019; Kisely et al., 2013; Kisely et al., 2015; Rugkasa et al., 2019; Rugkasa et al., 2017), confirming their remarkable consistency across cultures (Churchill et al., 2007; Morandi, 2016). In the present study, people placed under CTO were mainly male, in their forties, of Swiss origin, single and living independently. Primarily affected by Schizophrenia, schizotypal and delusional disorders (F20-F29), they frequently presented a substance use problem, especially with alcohol, and a severe danger for themselves. Danger for others was identified in less than one third of the cases. This result could indicate that authorised psychiatrist and guardianship authorities, underpinned by the bioethical principle of beneficence (Bertolin Guillen, 2011), interpreted CTOs as a way to preserve the patient's health and safety more than a way to protect others from potentially harmful behaviours. In this perspective, they might have considered aggressiveness as requiring more restrictive measures in order to be addressed. Indeed, a recent study analysing factors associated with involuntary hospitalisations in the same region, showed that aggressive behaviours increased significantly the risk of being involuntarily admitted (Silva, Golay, & Morandi, 2018).

CTOs were mostly ordered at discharge from involuntary placement. These results confirmed what observed in previous studies about the largest use of CTOs as a form of conditional release (Dawson, 2005; Swartz, Swanson, & Steadman, 2009). However, the proportion of CTOs initiated in the community in our study was higher compared to what observed in the literature (Kisely et al., 2013; Rugkasa et al., 2019; Segal & Burgess, 2008; Segal & Burgess, 2009). In these cases, the orders were mainly used as "least restrictive" alternatives to the originally requested involuntary admissions.

4.3. CTOs' characteristics

CTOs were mainly requested by a psychiatrist (forensic, hospital or ambulatory), but almost exclusively ordered by the guardianship authority. Several reasons could explain the lack of CTOs initiated by authorised psychiatrists. First, considering the very recent implementation of the law, CTOs' procedures may have remained unknown to many professionals. Secondly, the DSAS procedure was more complex and burdensome compared to a simple request to the guardianship authority. Indeed, through the DSAS procedure, the person who requests a CTO has to fill a form to explain the aims of the CTO and detail the means and the expected time to reach them. Finally, some clinicians might have felt reassured by being able to rely on the guardianship authority as a third party imposing the coercive measure, even though there is scarce evidence that such procedure is actually more effective in protecting the legal rights of coerced patients (Sjöström, 1997; Zetterberg et al., 2014).

Most of the orders were justified by the treatment criterion. This result is in line with previous studies (Løvsletten et al., 2016; Rugkasa et al., 2019) and confirmed that CTOs use was mainly related to patients' need for treatment and welfare rather than to risk behaviours (Churchill et al., 2007). The widespread reluctance to use the dangerousness criterion could be partly due to the great complexity of its accurate prediction (Feiring & Ugstad, 2014; Stuen, Landheim, Rugkasa, & Wynn, 2018).

Different types of restrictive treatments were imposed through CTOs, which could raise questions about what "least restrictive" means. CTOs primarily required people to keep in contact with the mental health team, either through clinic appointments (86.3%) or home visits (52.9%). Medication adherence was stated as a condition in slightly

more than half of the cases, a significantly lower percentage compared to the over 90% reported in other countries (Lepping & Malik, 2013; Monnery & Belgamwar, 2011; Rugkasa et al., 2017; Rugkasa et al., 2019; Smith, Branton, & Cardno, 2014). Moreover, contrary to what found in previous studies (Lepping & Malik, 2013; Monnery & Belgamwar, 2011; Rugkasa et al., 2017), compliance with residency was stated as an obligation in only 3 cases out of 241. In order to better understand these discrepancies, which may point at different interpretations of the CTO regimen, qualitative studies focusing on authorised psychiatrists' and guardianship authorities' views of CTOs are warranted.

Despite the fact that almost half of the CTO population presented a primary or secondary diagnosis of Mental and behavioural disorders due to psychoactive substance use (F10-F19), and that another 11% had an alcohol and/or substance use secondary problem, only 17.5% of people were required to follow an addiction treatment. This result questions about the adequate management of addiction problems under CTO and the skills and knowledge required to those who have the responsibility to define the treatment plans of the orders. A similar finding was registered by Lepping et al. in North Wales and interpreted as a lack of consistent approach in the generation of CTOs' conditions (Lepping & Malik, 2013).

Finally, like in many other jurisdictions, the use of CTOs seems to extend to other aspects of mental health services, and to other social policy areas. Moreover, the high percentages of somatic treatment and support in daily activities and/or housing as discretionary conditions might confirm that CTOs were mainly used to preserve the patient's health and safety rather than to ensure social control.

Even though no directives are provided by the law about who must be in charge of the CTO implementation and follow up, results were very consistent appointing in more than 80% of the cases a psychiatrist, and only seldom a GP or a non-medical professional. The choice of a non-medical professional, even if sporadic (1.2%), may question about the importance of clearly define the role and skills required to implement and follow up a coercive measure.

4.4. Factors associated with shorter time to CTO discharge and reasons for discharge

During the five years follow-up, only 35.7% of CTOs were discharged after on average two years. When all the CTOs were taken into account in the survival analysis, the estimated median time to discharge was around three years, with 80% chance of discharge within five years. These results are comparable to what found in previous studies (Bardell-Williams et al., 2019; Burns et al., 2015; Rugkasa et al., 2019), on the basis of which the "lobster pot" hypothesis was theorized (Morandi, 2016; Riley, Lorem, & Hoyer, 2018; Rugkåsa & Burns, 2009). Based on this assumption, both positive and negative outcomes would be used by clinicians as a justification for ongoing compulsion, reducing the possibilities of discharge and extending the orders duration. Our study showed that in Western Switzerland, CTOs, far from being a never ending condition, were nevertheless a long lasting one. In 2006, Gibbs et al. published a qualitative study showing that mental health professionals actually struggled to find the best time for CTO discharge, concluding that clearer criteria and objectives would help them to better cope with such a decision (Gibbs, Dawson, & Mullen, 2006). Similar studies should be fostered within the Swiss context.

In the present study, CTOs were discharged due to both successful outcomes and breached of conditions. In case of failure only 60% of patients were involuntarily readmitted to hospital, while for the remaining 40% the CTO was revoked with no consequences. The small percentage of recall after breached conditions was highlighted also in previous studies (Lepping & Malik, 2013; Smith et al., 2014) and partially explained as related to the clinicians interpretation of the immediate risk of harm as condition for recall (Smith et al., 2014). In our case, there is no provision within neither the federal nor the cantonal

law about recall's criteria. Therefore, further studies are essential to better understand the authorised psychiatrists' and guardianship authorities' decision-making process leading to readmission.

During the five years of the study, 7 people died. A previous study aimed at evaluate if CTOs could reduce all-cause mortality among psychiatric patients (Kisely et al., 2013a). During their 11 years follow-up population-based study, Kisely et al. found that CTOs reduced mortality among psychiatric patients from 9.6% to 6.5%. Although, this effect vanished when the analyses were adjusted for increased outpatient and community contacts with mental health services, suggesting that this latter, rather than the order itself, was the key element explaining the reduction (Kisely, Siskind, & Rugkasa, 2017). In our study, because of the absence of a control group, no conclusion can be drawn about the eventual association between CTOs and mortality rates. Future research should take into account this matter.

The multivariate logistic regression analysis on discharged orders showed that spending more days under CTO increased the likelihood of CTO success as reason for discharge, whereas not being of Swiss origin reduced it. These results are only partially in line with previous studies, showing that also clinical characteristics, as diagnosis and substance abuse status, were important predictors of CTO outcomes (Churchill et al., 2007).

Lastly, very few variables among those available were found to have an impact on time to CTO discharge. Namely, while not being of Swiss origin and being prescribed to take a medication were associated with a longer CTO, living in hospital and having a non-medical professional in charge of the order were associated with a significantly shorter time to discharge. Neither clinical factors nor legal criteria predicted time to CTO discharge. This result is in contrast with a recent Norwegian study showing that being affected by schizophrenia, the use of dangerousness criterion and having substance abuse problems were associated with longer CTOs (Rugkasa et al., 2019).

Other factors, not taken into account in the present study, could be associated with time to discharge. Several studies have shown that CTOs' duration is strongly related to clinicians' attitudes (DeRidder et al., 2016; Mullen, Dawson, & Gibbs, 2006; Riley et al., 2018). Moreover, development of insight, clinical improvement, treatment adherence and reduced risk to others and self were found to be crucial factors in the clinicians' decision-making process towards discharge (DeRidder et al., 2016; Gibbs et al., 2006; Romans, Dawson, Mullen, & Gibbs, 2004). Future research should specifically focus on the study of authorised psychiatrists' and guardianship authorities' attitudes towards CTOs and their impact on CTOs' rates and duration within the Swiss context.

5. Conclusions

In Switzerland, CTOs were introduced on the 1st January 2013, following the amendment of the Swiss Civil Code, with the aim of offering coercive measures more proportional to the needs of the person, avoiding the systematic use of hospitalisation, henceforth increasing individual autonomy and protection. Hitherto, to our knowledge, no previous studies have examined their implementation in this context. The present study started to fill this gap. Our results showed that CTOs prevalence is increasing rapidly despite the lack of evidence on positive outcomes. With an estimated mean time to discharge of almost three years, our results confirmed that once under CTO, it takes a long time for a patient to be released, in case of both positive and negative outcomes. Therefore, further studies are recommended and a longer-term monitoring of their use and impact is mandatory.

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Declaration of Competing Interest

The authors report no conflict of interest.

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