**Assessing the impact of Substance abuse treatment (SUT) on the justice system contact prevention in Chile**

# Background

Substance use can affect health and multiple social dimensions, including criminal behaviours and the likelihood of contacting the justice system. SUT is one possible intervention to reduce the risk of committing crimes and having contact with the justice system. Outcome evaluation of SUT is relevant due it helps to improve the quality of care, enhances crime prevention, and informs policymaking on effective interventions (WHO, 2000). Consistent findings on outcomes of SUT concur that reducing substance abuse through effective treatment leads to a reduction in criminal activity [1].

However, most of the prior evidence comes from developed countries and regions (e.g., the United States, Australia, and western Europe), and results from the Latin American context are largely unknown [2]. Using results from other regions, particularly from high-income countries, can be misleading because the context, populations, and specific nature of substance use disorders are different, along with the fact that such SUT are designed to the country-specific epidemiologic context (e.g., harm reduction or emphasis in detoxification, etc.) [3]. While the Latin-American population seems to be less affected by heroin [4], alcohol and noninjected drug use (e.g., cocaine paste-base) are more prevalent [5]. Moreover, the international research usually assesses structured intervention approaches (e.g., cognitive-behavioural) that are differentiated according to specific substances (.e.g., cocaine); however, it may not be the case for SUT provision in other contexts, such as Chile.

Indeed, the Chilean SUT policy is an interesting case of study since it is one of the oldest and most developed policies in Latin America [6], even when it involves multiple intervention approaches, and it does not consider specific interventions according to each substance. This feature makes it worthy to note that most of the studies on SUT impact have been mainly restricted to randomized controlled trials or pre-post observational studies focused either on a specific approach or substance, while large-scale, longitudinal, multi-site treatment, and administrative data-based outcome studies are rare but necessary to address SUT policy [7].

The present proposal aims to examine the impact of SUT on the justice system contact prevention in Chile, in the short (3 and 6 months), middle (1 year), and long term (3 years). To do so, we use a registered-based retrospective cohort design of the population of people of 18+ years of age in publicly-funded Chilean SUT, which is being linked to the National prosecutor’s data of all criminal causes registered for this population in the period 2010-2019. This study will add evidence to the body of literature on the effects of SUD treatments and on the drug-crime link in the criminology field. These results will have a public health impact by informing about the benefits and potential pitfalls of the current SUD treatment system.

# Research questions, goals, and hypothesis

* **Research question:** What is the impact of SUT on the justice system contact prevention in Chile, in the short (3 and 6 months), middle (1 year), and long term (3 years)?
* **Goals:**

1. Describe the contact with the justice system of the Chilean population according to treatment completion of treatments at baseline

2. Estimate the effect of treatment on the probability of contact with the justice system, according to (i) different treatment completion stages (i.e., early dropout, therapeutic discharge) and (ii) short (3 and 6 months), middle (1 year), and long term (3 years).

1. **Hypothesis:** Users who achieve treatment completion are less in contact with the justice system than users who do not complete treatment, although this effect may decrease as observation time passes (3 and 6 months, 1 and 3 years).

# Analytic strategy

This research relies on an population-based record-linkage open cohort design. By linking electronic records of individuals in publicly funded SUT with Prosecutor’s Office data at the national level, we aim to usea deterministic linkage process (through an encrypted mask of the Chilean Unique National Role) (More information in Annex 1 & 2). The main exposure variables will be the treatment outcomes (administrative discharge, early and late dropouts, therapeutic discharge). However, the so-called “revolving-door syndrome” have been observed either in substance treatments and judiciary events (White,[REF ABAJO];[NO SE SI HAY UNA DE JUSTICIA, PONDRIA HASTA VALENZUELA]). Preliminary analyses showed that individual characteristics may be different between patients who completed treatment and who did not (See Annex 3). Hence. our first analytic approach will be non/semi/parametric survival models (e.g., multistate, incubation periods, hidden-markov, etc.), to estimate the risks and time-to-event of different treatment outcomes to contacts with the justice system, as well as adjusting for covariate effects (REFS: Jackson,Williams,Luchansky,Titman). As the study progresses, we may incorporate other strategies or models to strengthen the analysis. For data analysis up to date, please refer to Annex 3.

# Project milestones

* Progress report: It will include at least: (1) A theoretical framework; (2) a descriptive analysis (Specific goal Number 1).
* Paper: It will be sent to a Journal by 12 months after starting the study.
* Presentation in Scientific meeting: Our aim is to present this study at least at one international conference such as the National Institute on Drug Abuse Forum, or similar, and in possible scientific community activities organized either by Griffith University (Australia), Universidad de Chile or other national institutions.

# Research team

* *Mariel Mateo: PhD candidate (School of Criminology and Criminal Justice, Griffith University, Australia). She coordinated the first Outcome Study of Substance Use Treatment in Chile (DIPRES, 2020) and led the paper ‘Evidence-based policymaking: lessons from the Chilean substance use treatment policy’ (In prep.), in partnership with Andrés González and Álvaro Castillo-Carniglia. She will dedicate 6 hours per week during the research duration.*
* *Andrés González: PhD candidate (School of Public Health, Universidad de Chile). He has worked as technical staff in research projects related to occupational health and substance use treatments. He has been working on the dataset on Treatment users since 2019 along with Alvaro Castillo-Carniglia. He collaborated in the data analysis of two papers entitled “Changes in opioid prescribing after implementation of mandatory registration and proactive reports within California’s prescription drug monitoring program” and “Treatment outcome and readmission risk among women in women-only versus mixed-gender drug treatment programs in Chile”. He will dedicate 3 hours per week during the research duration.*
* *Álvaro Castillo-Carniglia: PhD, Professor and Director of the PhD Programme in Public Policy, Universidad Mayor. He has a strong background in epidemiology and data analysis and his main research areas are the measurement of alcohol and other drug use in the population. He has co-directed several theses in public health related to treatment dropouts and readmissions (e.g., Rodrigo Portilla, Carla Olivari). His role in this project will be to guide the analysis.*
* *Christine Bond: PhD, Griffith University’s Professor. She has a strong background in criminology and outcome evaluations. Her role in this project will be to guide the analysis.*
* *Tara McGee: PhD, Griffith University’s Professor. She holds a long experience in criminology and longitudinal data analysis. Her role in this project will be to guide the analysis.*

Texto

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# Timeline

Since justice system records were recently obtained (July 2021), we are advancing in a preliminary codebook of the data and explore their structure in terms of conditional variables, determine the granularity (e.g., analyse contacts by cause or by relationships as a unit of study), check discordant dates (See Annex 4 for preliminary products).

As part of the FONDECYT No. 1191282 leaded by Dr. Castillo, we interviewed several SENDA professionals that allowed us to acknowledge the data structure, determine casuistic criteria based on the experience of everyday practice (eg., cutpoints of reference and hierarchy of variables). Also, we cross-validated some of the time-invariant information of patients with records of the Treatment Outcomes Profile databases.

We are collecting and systematizing bibliographical material related to the research objectives through electronic databases. Yet, we need to standardize variables, label fields, correct data integrity issues (e.g., typographical errors, automation bias, or variations in name spelling or form) to advance to the analyses and test our hypothesis.

Depending on the unit of analysis and due to the longitudinal nature of our data, we may need to discuss whether to discard overlapped events (e.g., people in treatment and incarcerated at the same time) or discordant dates (e.g., people that committed a crime after the justice process was finished).

Figure 1. Gantt chart of activities involved in research progress

Diagrama

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Note. MM= Mariel Mateo; AGS= Andrés González.

# Budget

The study budget will be used as conference registration (if needed), workshops helpful to update and strengthen knowledge necessary to analyse time-to-event data, manuscript edition, and as an incentive for the researcher who will lead and spend more time working on the study (Mariel Mateo).

# Annex 1 - Database description and data linking processing

Diagrama

Descripción generada automáticamente

*Note. Rel.= Relationships or the combination of a victim (Vic), an offender (Imp), a judicial cause (RUC).*

# Annex 3 – Baseline characteristics of the cohort by Completion of the first treatment, up to date (preliminary summary)

|  |  |  |
| --- | --- | --- |
| **Variables** | **Completion N=19278** | **Non-completion N=60249** |
| Primary Substance at Admission: |  |  |
| Alcohol | 8522 (44.2%) | 18102 (30.0%) |
| Cocaine hydrochloride | 3279 (17.0%) | 11459 (19.0%) |
| Marijuana | 1326 (6.88%) | 4046 (6.72%) |
| Other | 516 (2.68%) | 959 (1.59%) |
| Cocaine paste | 5635 (29.2%) | 25682 (42.6%) |
| First Substance Used: |  |  |
| Alcohol | 11794 (61.2%) | 31241 (51.9%) |
| Cocaine hydrochloride | 566 (2.94%) | 2351 (3.90%) |
| Marijuana | 4123 (21.4%) | 17517 (29.1%) |
| Other | 480 (2.49%) | 1374 (2.28%) |
| Cocaine paste | 631 (3.27%) | 3083 (5.12%) |
| 'Missing' | 1684 (8.74%) | 4683 (7.77%) |
| Educational Attainment: |  |  |
| 3-Completed primary school or less | 4997 (25.9%) | 17673 (29.3%) |
| 2-Completed high school or less | 10272 (53.3%) | 33427 (55.5%) |
| 1-More than high school | 3927 (20.4%) | 8868 (14.7%) |
| 'Missing' | 82 (0.43%) | 281 (0.47%) |
| Psychiatric co-morbidity: |  |  |
| Without psychiatric comorbidity | 9252 (48.0%) | 21046 (34.9%) |
| Diagnosis unknown (under study) | 353 (1.83%) | 14662 (24.3%) |
| With psychiatric comorbidity | 9673 (50.2%) | 24541 (40.7%) |
| Drug Dependence Diagnosis: |  |  |
| FALSE | 5876 (30.5%) | 15710 (26.1%) |
| TRUE | 13402 (69.5%) | 44538 (73.9%) |
| 'Missing' | 0 (0.00%) | 1 (0.00%) |
| Employment Status: |  |  |
| Employed | 9789 (50.8%) | 28832 (47.9%) |
| Inactive | 2364 (12.3%) | 5940 (9.86%) |
| Looking for a job for the first time | 49 (0.25%) | 134 (0.22%) |
| No activity | 986 (5.11%) | 3215 (5.34%) |
| Not seeking for work | 214 (1.11%) | 590 (0.98%) |
| Unemployed | 5876 (30.5%) | 21537 (35.7%) |
| Tenure status of household: |  |  |
| Illegal Settlement | 193 (1.00%) | 651 (1.08%) |
| Others | 518 (2.69%) | 1705 (2.83%) |
| Owner/Transferred dwellings/Pays Dividends | 7726 (40.1%) | 20197 (33.5%) |
| Renting | 3283 (17.0%) | 10301 (17.1%) |
| Stays temporarily with a relative | 6674 (34.6%) | 23807 (39.5%) |
| 'Missing' | 884 (4.59%) | 3588 (5.96%) |
| Had contacts with the judiciary system: |  |  |
| No | 3583 (18.6%) | 6207 (10.3%) |
| Yes | 15695 (81.4%) | 54042 (89.7%) |

Note. Counts and percentages by column in parenthesis. Source: SENDA

# Annex 4 – Link to data analysis up to date

Data and markdown with all software codes and outputs are available at:

* Step 1: Explore data environment and define variables and their properties ([link](https://tinyurl.com/projectndp1))
* Step 2: Correct dates and explore birth and cohort dynamics ([link](https://tinyurl.com/projectndp2))

**Annex 3 – Hypothetical data structure**

Gráfico

Descripción generada automáticamente

Figure shows different potential trajectories in our retrospective cohort, including people with and without contact with the justice system. Patient’s entry to the retrospective cohort starts at the time they were admitted for the first time to an SUD treatment listed in the SENDAs yearly databases with information of treatments between 2010-2019 (independently if they had treatments prior). We considered patients that had ongoing treatments from 2010 (e.g., patient no. 11). Censoring occurred after SENDA sent us the data (November 13, 2019), after an outcome event occurred (e.g., the blue dot after 2020), or when a patient leaved the cohort with no other outcomes. The time in a treatment (especially residentials) or a prison sentence (yet we need to know if we might be able to acknowledge this information) might be the reason why the risk of incarceration might compete with admission. Part of the research work we will be related to this matter.

# References

(Prendergast et al. 2002; Wilson, Mitchell, and MacKenzie 2006)

(Obot, 2016; Klingemann, 2020)

(Castro et al., 2021; Rawson et al., 2015)

(Pacururu-Castillo, Ordoñez-Mancheno, Hernández-Cruz, Alarcón, 2019)

(Hidalgo-Carmona, Santis-Barros, Rodrízuez-Tobar, Hayden-Canobra, Anselmo-Montequín, 2008; Olivari et al, 2021)

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**PARTES DESCARTADAS (USO INTERNO MARIEL, NO LEER)**

Although a number of studies have examined the impact of treatment on outcomes for heroin dependence, these have been restricted largely to randomized controlled trials or pre–post observational studies [4]. Large-scale, naturalistic prospective longitudinal, multi-site treatment outcome studies of heroin dependence are rare. These studies allow for the examination of the impact of treatment over time, as it is delivered in the real world.

\*\*\*\*\*PUBLIC POLICY POINT: Treatment evaluation helps to improve quality of care and save money and resources for services that are effective (WHO, 2000). The ultimate goal is to gather credible evidence on programme implementation, treatment results, and cost-efficiency that will help in the decision making process to improve quality of care. Other reasons for treatment evaluation include the following (DHHS, 2005)

o not have this specialisation, as all of them are aimed at users who enter due to the use of different substances, and in addition, each implementer in our country is free to implement a mixture of intervention approaches. This should be taken into account as a limitation that affects the comparability of international evidence with the national reality.

Research on the drug-crime link has been extensive, showing a clear association between substance abuse and offending (Bennett, Holloway & Farrington 2008; Hammersley 2011; Stevens, Trace, and Bewley-Taylor 2005). However, there is no consensus about its causality. It has been variously argued that drug use causes crime, that crime causes drug use, that crime and drug use are reciprocally related, and finally, that there is not a single connection, but rather, multiple drug-crime associations that vary across time and situational contexts (Glen, 2018). Beyond these questions, **the drug-crime fact points to the need to evaluate treatment outcomes on criminality**.

While the primary aim of SUT is to decrease substance use or reach abstinence, other treatment outcomes may have important implications for individuals' short- and long-term functioning (Skogens & von Greiff, 2020), such as criminal behavior (Luchansky et al., 2006).

Criminal behavior is often linked to substance use (Guimar˜ aes et al., 2017;Gustavson et al., 2007 ; Ståhlberg et al., 2017), particularly among individuals who develop substance use problems at an early age (Gustavson et al., 2007; Ståhlberg et al., 2017), and adolescents (Pianca et al., 2016) and adults (Brennan et al., 2000; Sariaslan et al., 2020) with elevated psychiatric symptoms or disorders. Decreasing illegal activities among youth may have important benefits given that a criminal record has adverse effects on one's life opportunities (Lageson, 2016).

\*\*\*\*\*\*\*\*\*INTRO: An increasing number of adolescents and emerging adults are entering treatment for drug use disorders in high-income countries. This fact points not only to a need to evaluate treatment outcomes related to drug use reduction, but also to evaluate other indicators of treatment success. The aim of this study was to examine treatment effects on predicting readmission to drug use treatment and being convicted for a criminal offence among youth. A second aim was to examine whether a psychiatric history had an impact on these outcomes.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*INTRODUCTION: Treatment for substance use has been shown to be effective in reducing the criminal behaviour of people with substance use problems (Gerstein & Johnson, 2000; Hubbard et al., 2003; Johannessen et al., 2019; Prendergast et al., 2002)

Although consent to take part in drug treatment is not always an alternative to prison (in Chilean drug treatment courts-TTD, for example), this belief or ignorance means that it is precisely the fear of imprisonment that motivates a high number of subjects to accept participation in drug treatment courts.