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Research Paper

The impact of a voluntary alcohol and other drug diversion program on reoffending, imprisonment, and health

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ABSTRACT

Background: The Magistrates Early Referral into Treatment (MERIT) program is a voluntary, pre-plea diversion program for defendants appearing in the New South Wales (NSW), Australia, Local Court who have issues related to their alcohol and other drug (AOD) use.

Methods: Matched treatment and comparison groups were created using propensity score matching. The outcomes examined were AOD-related hospital admissions, AOD-related Emergency Department (ED) admissions, ED admissions (general), hospital admission (general), ambulance callouts, AOD related deaths, and deaths from any cause, as well as reoffending and imprisonment. Differences between outcomes were analysed using Cox regression (health outcomes), negative binomial regression (reoffending) and logistic regression (imprisonment).

Results: Survival times for participants in the MERIT program were significantly shorter for all health outcomes except one (death). At the 12-month mark, MERIT participants offended 21 per cent less frequently than comparison group participants (IRR: 0.793. CI: 0.748–0.841). This gap increased to 27 per cent after 24 months (IRR: 0.870. CI: 0.829–0.912). At the conclusion of criminal proceedings participants in the MERIT program were significantly less likely to receive a prison sentence (OR: 0.728. CI: 0.674–0.787) or to die (OR: 0.674. CI: 0.502–0.904)

Conclusion: The Magistrates' Early Referral Into Treatment Program appears to be an effective way of reducing the short-term risk of re-offending, imprisonment, and death.

Introduction

The notion that it is both more humane and more effective to divert offenders with mental health and/or alcohol and other drug (AOD) problems into treatment emerged in the early 1990s. Therapeutic jurisprudence, as it later became known, was a response to rising court workloads, overcrowded prisons and a growing sense that purely legal responses to these problems were failing to stop the revolving door of arrest, imprisonment, release, rearrest (Freiberg, 2002; Wexler, 2001). Bi-partisan political support for therapeutic jurisprudence in the mid-1990s gave rise to a wide variety of criminal justice diversion schemes, some prior to arrest (Baker & Goh, 2004), some after criminal proceedings have been initiated (Wright & Levine, 2021), and some at the point of sentencing (James, 2010).

Munetz and Griffin (2006) offer a useful structure for classifying these diversion schemes according to the point at which they seek to divert people with mental health problems away from the criminal justice system. Their Sequential Intercept Model (SIM) identifies five points at which it is possible to prevent individuals entering or penetrating more deeply into the criminal justice system. They are: (1) the point of first contact with law enforcement and emergency services (2) the point where a person is detained and hearings occur (3) the point where a person enters custody or where forensic evaluations and commitments occur (4) the point where re-entry to custody or forensic hospitalisation occurs and (5) the point where community supervision (e.g., following release from custody) occurs. Although originally directed at defendants with a mental illness, the model is equally applicable to defendants with a substance use problem (or both mental illness and substance use problems).

Blais et al. (2022) conducted a systematic review of evaluations

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directed at the point of first contact with law enforcement and emergency services (viz. point (1)). They identified 19 studies, which together generated 159 estimates of treatment effect across six outcomes (health of people who use drugs, drug consumption, socioeconomic conditions, recidivism, drug availability and social/case management costs). The majority of estimates were favourable to diversion; however the authors note that the evaluations of treatment effect on recidivism were more rigorous than those examining drug use, drug accessibility, or changes in participants' economic conditions. Their general conclusion, therefore, was that police-based diversion measures can be effective in preventing drug-related criminal offences and harm, but further research is needed to evaluate the effect of police drug diversion programs on socioeconomic outcomes, drug use and drug accessibility.

Drug Courts are an example of a diversion program at the second level of the Munetz and Griffin (2006) Sequential Intercept Model. . They are underpinned by the assumption that, if an offender's crime is drug-related, reducing their drug consumption should reduce their involvement in drug-related crime. The available evidence suggests that Drug Courts are effective in reducing re-offending (Mitchell et al., 2012; US Government Accountability Office, 2011; Wilson et al., 2006; Belenko, 2019; Lind et al., 2002). Drug Courts programs, however, involve significant coercion. Offenders are typically given an opportunity to avoid a sanction for offending (usually prison) if they plead guilty and submit themselves to a strict regime of close and regular supervision, random (or frequent) urine checks for drug use, sanctions for non-compliance with program conditions and rewards for progress in reducing illicit drug use. Some have questioned the necessity of intense judicial supervision and its associated scheme of rewards and punishments (Stevens, 2012). Virtanen et al. (2024), for example, found significant reductions in substance misuse, adverse mental health events and crime, even though the Swedish Drug Court involves no oversight by a judge and no court appearances where the client's treatment progress is praised or castigated. Others have also found support for criminal justice diversion programs that do not rely on coercion or only rely on it to a limited extent (e.g., Brecht et al., 1993; Huang et al., 2021).

Unfortunately, most studies of the effectiveness of voluntary drug diversion schemes have suffered from methodological problems. Brecht et al. (1993), for example, compared three groups of defendants entering methadone maintenance treatment, with the groups being those entering treatment voluntarily (n = 383), those entering treatment under a moderate degree of coercion (n = 119) and those strongly coerced into treatment (n = 116). They found no difference between the groups in the response to treatment, but the controls included in the study (ethnicity and gender) were limited. Moreover, the sample size in each group would have made it difficult to detect an effect, if had there been one. Huang et al. (2021) is another study that sought to examine the effectiveness of voluntary treatment programs for offenders with AOD problems, in this case by comparing outcomes in two programs, one of which involved coerced treatment and the other of which involved voluntary treatment. Huang et al. (2021) reported no difference in what they called relapse rates between the two programs, but they made no attempt to match participants in the two programs on key demographic and drug use factors.

In this article we report the results of an evaluation of the Magistrates Early Referral into Treatment (MERIT) program, a voluntary AOD treatment program in NSW Australia, which seeks to reduce AOD use and offending and improve client health and well-being. MERIT was introduced as a pilot program in 2000 and is now available at 73 of the 137 Local Courts in NSW. The MERIT program has been the subject of several evaluations but, as with other studies examining court-based voluntary diversion programs, these studies have certain methodological limitations. The most important of these are small sample sizes and a failure to control for differences between treatment and control groups in pre-diversion health and drug use status. In the next section of this article, we describe the MERIT program and the problems inherent in previous attempts to evaluate it. We then describe our study in more detail.

The MERIT program

The NSW Local Court is the lowest and largest tier of the NSW court system, dealing annually with over 100,000 criminal cases. Magistrates who sit in that jurisdiction can impose a maximum prison sentence of two years (or three if the offender is already serving a sentence of one year). MERIT is a voluntary, pre-plea diversion program for adults in the NSW Local Court who:

- Have a treatable alcohol or other drug use (AOD) problem,
- Are eligible for bail (or bail is not required),
- Consent to participate,
- Live in or have a connection (e.g., employment) to an area that provides MERIT,
- Have not committed a strictly indictable or sexual assault offence.

MERIT provides access to a range of AOD treatment services for 12 weeks while court matters are adjourned. The MERIT team develop a care plan to address AOD use and the factors that may influence offending behaviour. Case management and/or psychosocial AOD counselling are core treatment components of the program. Other AOD treatment and social services are facilitated for participants as needed, including withdrawal management, residential rehabilitation, and opioid agonist treatment (NSW Health, 2021). Defendants can be referred by police officers at the time of the offence, or by a magistrate or solicitor at the first court appearance. MERIT is something of a hybrid model when viewed from the perspective of the Sequential Intercept Model, combining as it does, elements of both level 1 (law enforcement and emergency services) and level 2 (initial hearings and initial detention) of that model (Munetz & Griffin, 2006). A small proportion of defendants refer themselves or are referred by a family member after police detection of the offence. Participants can voluntarily withdraw from the program at any time without penalty. At the completion of the program the magistrate dealing with the case is provided with a final report from the MERIT team which includes information about client progress on the program and any recommendations for future treatment. Although defendants are not overtly coerced into the program, participation in MERIT may be considered favourably at the point of sentencing. Approximately 63 per cent (62.73 %) of the MERIT participants included in the current study completed the program. The MERIT program itself has remained unchanged since its inception, except for a small number of courts (n = 7) accepting alcohol as the principal drug of concern.

The MERIT program has undergone several earlier evaluations, but all have significant limitations. Passey et al. (2006) compared ninety defendants who completed the program with seventy-nine defendants who did not complete the program. The results indicated that those who completed MERIT were about half as likely to re-offend at any point in time following referral when the outcome measure was elapsed time, and slightly less when the outcome was free time. As the authors themselves point out, however, it is possible the differences between treatment and control group outcomes were due to factors they were unable to measure. The study included no controls for differences between treatment and comparison groups in drug use offence type, or prior criminal record. The difference between treatment and comparison groups in re-offending may therefore have been due to the fact that those failing to complete treatment are less motivated to change their drug use than those who complete it.

The MERIT evaluation conducted by Larney and Matire (2010) raises similar concerns. This study compared outcomes for those who did not complete the MERIT program and those who completed it and found those who completed MERIT were 30 per cent less likely to reoffend than those who did not complete the program. The authors controlled for gender, Indigenous status and principal drug of concern but did not

control for offence type or level of illicit drug use. As the authors themselves acknowledge, these or other unmeasured differences between program completers and non-completers may have been responsible for the lower rates of reoffending among those who completed the MERIT program. Lulham (2009) endeavoured to get around the problem of omitted variable bias using a method known as recursive bi-probit analysis. Recursive bi-variate models deal with the risk of selection bias by including a variable (known as an instrument) in the selection into treatment model that has no direct causal effect on the outcome of interest. This limits the analysis to variation in treatment unconfounded with treatment outcomes. Lulham found no effect of treatment on risk of re-offending when the two groups were compared, based on intention to treat. Completion of treatment, however, of the MERIT program was associated with a 12-percentage point reduction in reoffending. Unfortunately, Lulham's study has two major weaknesses. The first is that the instrument he relied on to deal with selection bias was whether the defendant had legal representation. Access to legal representation depends on a defendant's income, and income may exert a direct influence on a defendant's risk of re-offending. This violates a key assumption of the recursive bi-variate method. The second is that study did not control for differences between treatment completers and non-completers in AOD use. Differences in AOD use rather than treatment may have been responsible for the unfavourable outcomes associated with treatment non-completion.

McSweeney et al. (2016) conducted the most recent evaluation of the MERIT program. They employed propensity score matching in a bid to ensure comparability of treatment and comparison groups in terms of measurable factors related to recidivism. Unlike earlier studies, however, they found a slightly higher rate of reoffending in the treatment than in the control group. Although one ought not to dismiss the possibility that a program designed to reduce recidivism has the opposite effect, the more plausible explanation for the higher rate of re-offending in the MERIT group is that it differed in some way from the control group and this difference rendered those in treatment more likely to reoffending. It is worth noting in this connection that McSweeney et al. (2016) were unable to link information relating to the main drug of concern for MERIT cases as part of the study to ensure a closer match with members of the comparison group..

Most studies of diversion at level two of the Sequential Intercept Model have focused their attention on re-offending rather than on health outcomes. The few studies that have focussed on health outcomes have reported some health improvements within the treatment period and post-release, but not consistently (Freeman, 2003; Dugosh et al., 2016; Wittouck et al., 2013). Some have reported an estimated increase in healthcare costs as clients shift from the judicial to the healthcare system (Bernard et al., 2020; Anglin et al., 2013). In contrast, after engagement in AOD treatment, unplanned health care utilisation is often reduced (Lubman et al., 2014; Iturralde et al., 2022). It is unclear what impact the MERIT program might have on a client's healthcare utilisation in the short and long term.

Only one study, to date, has examined the impact of MERIT on the health outcomes of participants. The NSW Health (2007) study analysed recorded entry interviews for 2833 of the 3450 participants accepted on the MERIT program between 1 April 2004 to 30 June 2006. Exit interviews were conducted among those who completed the program during the study period, with 1411 completing both an entrance and exit interview. Those who completed the program but were not interviewed at exit were more likely to be Aboriginal and/or to cite amphetamines as their principal drug of concern. The authors reported significant improvements at exit and program completion on all health dimensions measured. As with all self-report studies, social desirability bias may have influenced the results. It is also possible those who did not experience improvements dropped out of the program and/or failed to complete an exit interview.

The current study

The study reported below was approved by the NSW Population and Health Services Research Committee on the 9th of June 2021. Approval no. 2021/ETH00616/2021.15.

The present study improves on past international and Australian research (including past evaluations of MERIT) in two ways. First, rather than attempt to control for potential confounding factors by including them in a regression analysis, we employ propensity score matching (PSM). PSM attempts to address selection bias by matching treatment and comparison group subjects in terms of factors thought to influence selection into treatment. PSM has three major advantages over efforts to deal with omitted variable bias via traditional regression modelling. First, it makes no assumption about the functional form of the relationship between covariates and outcome. Second, it permits the user to inspect and test the balance between covariate distributions in treatment and control groups. This reduces the risk of bias. Third, it permits the user to check whether there is sufficient overlap in propensity score distributions to warrant an assumption that allocation to treatment is random, conditional on covariates. Properly implemented, PSM guarantees that treatment and control subjects are matched in terms of observable factors (Rosenbaum & Rubin, 1983).

Secondly, we employ a much larger sample (n = 22,464) than in previous studies and match treatment and comparison groups on a much broader range of variables. This is critical to minimising the risk of confounding in our estimate of treatment effects. Table 1 provides a full list of the variables. The demographic controls include age, race (Indigenous status), gender, remoteness of residence, SEIFA (a measure of socioeconomic disadvantage). The criminal justice controls include principal offence type, number of concurrent offences, types of concurrent offences, and an extensive array of variables measuring both the type and frequency of prior convictions as well as the participant's prior drug and non-drug convictions. Perhaps most importantly, we match treatment and control groups on 22 variables capturing pre-treatment AOD-related emergency department and hospital admissions, and six non-AOD related emergency department and hospital admissions. The large sample size and extensive controls provide much greater assurance than previous studies that our comparison group provides a valid basis on which to gauge treatment effects.

Material and methods

Data sources

The parent cohort for the study consists of all adults with a first appearance in the NSW Local Court between 1 January 2007 and 31 December 2020 (n = 1008,900). This data was obtained from the NSW Bureau of Crime Statistics and Research Reoffending Database (ROD) (Hua & Fitzgerald, 2006). From this cohort, we selected those with a first court appearance between 2012 and 2017 who met the eligibility criteria for MERIT, that is, they had no conviction for a sexual offence, a strictly indictable offence, or a driving offence[1] and their charge or charges were not dismissed on mental health grounds. Where there were multiple court appearances resulting in a MERIT referral by the same person, the record of their first referral was accepted and records involving subsequent MERIT referrals removed from the dataset. This reduced the sample to 354,333 court appearances, of which 16,138 involved a referral to MERIT. MERIT is not available in every Local Court. Those eligible for MERIT but whose cases were heard in a court without access to MERIT (and who were therefore not referred to

[1] Although eligible for MERIT, driving defendants were excluded because they are rarely referred to MERIT.

Table 1
Variables and values in the PSM analysis.

Variable	Values
Age	18–24, 25–34,35–44,45–54,55+
Gender	Male, Female
Remoteness of residence	Major cities, inner regional, outer regional, remote/very remote
SEIFA quartile	Highly disadvantaged, disadvantaged, advantaged, highly advantaged
Aboriginality at current contact	Aboriginal, non-Aboriginal, unknown
Principal offence type	Serious violence, property, drug, breach, other
Year of first appearance	2012, 2013, 2014, 2015, 2016, 2017
Number of concurrent offences at index court appearance	1, 2–4, 5+
Any acts intended to cause injury offence at index appearance	Yes, no
Any property offence at index appearance	Yes, no
Any driving offence at index appearance	Yes, no
Any drug offence at index appearance	Yes, no
Age at first contact with the criminal justice system	10–17, 18–24, 25–44, 45+
Number of prior finalised court appearances	0, 1–2, 3–5, 6+
Prior proven drug offence	Yes, no
Prior prison sentence	Yes, no
Prior proven violent offence	Yes, no
Prior proven property offence	Yes, no
Prior proven domestic violence offence	Yes, no
Prior drug offences	Count
Prior use/possess drugs offences	Count
Cannabis caution in 5 years prior to index contact	Yes, no
# of prior court apps. involving a use/possess offence in the last 5 years	Count
Any prior court app. involving a drug driving in the last 5 years (yes)	Yes, no
# of prior court apps. involving ATS as the principal drug in the last 5 years	Count
# of prior court apps involving cannabis as the principal drug in the last 5 years	Count
# of prior court apps involving opioids as the principal drug in the last 5 years	Count
Variable	Values
# of prior ambulance callouts in 2 years before index appearance	Count
# of prior drug-related ambulance callouts in 2 years before index appearance	Count
# of prior alcohol-related ambulance callouts in 2 years before index appearance	Count
# of prior ambulance callouts in 1 year before index appearance	Count
# of prior drug-related ambulance callouts in 1 year before index appearance	Count
# of prior alcohol-related ambulance callouts in 1 year before index appearance	Count
# of prior AOD-related emergency department episodes within 5 years	Count
# of prior alcohol-related emergency department episodes within 5 years	Count
# of prior drug-related emergency department episodes within 5 years	Count
# of prior opioid-related emergency department episodes within 5 years	Count
# of prior emergency department episodes within 5 years	Count
# of prior emergency department episodes within 2 years	Count
# of prior AOD-related emergency department episodes within 2 years	Count
# of prior alcohol-related emergency department episodes within 2 years	Count
# of prior drug-related emergency department episodes within 2 years	Count
# of prior opioid-related emergency department episodes within 2 years	Count
# of prior AOD-related emergency department episodes within 2 years	Count
# of prior hospital admissions within 5 years	Count
# of prior AOD-related hospital admissions within 5 years	Count
# of prior alcohol-related hospital admissions within 5 years	Count
# of prior drug-related hospital admissions within 5 years	Count
# of prior opioid-related hospital admissions within 5 years	Count
# of prior hospital admissions within 2 years	Count
# of prior AOD-related hospital admissions within 2 years	Count
# of prior alcohol-related hospital admissions within 2 years	Count
# of prior drug-related hospital admissions within 2 years	Count
# of prior opioid-related hospital admissions within 2 years	Count
OTP episode within 2 years of first appearance	Yes, no

MERIT), constitute the pool from which our comparison group was formed.[2] Selection of the final treatment and comparison groups is explained in the analysis section below.

The health data required for the study were obtained by linking the 354,333 criminal justice records with the following health databases:

- MERIT Information Management System (MIMS)
- NSW Emergency Department Data Collection (EDDC)
- NSW Ambulance Computerised Automated Dispatch (CAD)
- NSW Ambulance Emergency Medical Record (EMR) and Patient Healthcare Record (PHCR)
- NSW Admitted Patient Data Collection (APDC)
- NSW Minimum Data Set for Drug and Alcohol Treatment Services (MDS DATS)
- NSW Controlled Drugs Data Collection (CoDDaC)
- NSW Registry of Births, Deaths, and Marriages (RBDM)

Ethics approval

Data linkage produced a de-identified Project Person Number (PPN) in each dataset, which is the primary identifier. In this study, the codes used to classify ED and hospital admissions as AOD are listed in Appendix Tables 1 and 2.

Treatment measure

Our treatment measure is a dichotomous variable, coded `1′ if the defendant was referred to MERIT and `0′ if eligible for MERIT but not referred to MERIT.

[2] Those eligible for MERIT and referred to MERIT but not accepted onto the MERIT program were excluded from the study.

Outcome variables

The outcomes examined in the study comprise the following:

1. Number of times convicted at one and two years (free time) after referral
2. Whether the current charge or charges led to the defendant receiving a prison sentence
3. Whether admitted to hospital for an AOD related reason in the two years after referral.
4. Whether admitted to hospital for any unplanned[3] reason after referral.
5. Whether admitted to an emergency department for an AOD reason in the two years after referral.
6. Whether admitted to an emergency department for any reason in the two years after referral.
7. Whether the defendant was the subject of an ambulance call out in the two years after referral.
8. Whether the defendant died in the two years after referral.
9. Whether the defendant died for an AOD-related reason in the two years after referral.

Control/matching variables

We estimate a probit model predicting referral to MERIT to create two groups matched on gauge the impact of MERIT on these outcomes. The covariates included in that probit model are shown in Table 1. We follow Brookhart et al. (2006) and include not only variables that are predictive of exposure (treatment), but any variable potentially related to the outcome as well. Most variables had no missing values but around 16 per cent (15.51 %) of the values for Indigenous status were missing. Cases with missing Indigenous status were dropped from the propensity score matching analysis. The matching process produced 11,232 matched pairs of observations; one member which was referred to and entered the MERIT program and the other of which, though eligible for MERIT, was not referred to the program.

Analysis

We use propensity score matching (PSM) to ensure that treatment and control groups on factors that might otherwise influence treatment outcomes. In PSM, we first regress a variable measuring whether a study participant received treatment against a set of covariates. We then match treatment and control group subjects that have similar or identical predicted probabilities of receiving treatment. This has the effect of matching treatment and control subjects in terms of the covariates included in the regression model.

The predicted probability of treatment referral derived from the probit model forms the propensity score for the purposes of the PSM analysis. For each MERIT referral we find the closest comparison group observation in terms of its propensity score. If the propensity score falls within a calliper of 0.05, we select it as a control without replacement.[4] This results in a matched group consisting of 9651 court appearances where a person was referred to MERIT and 9651 court appearances involving comparable individuals not referred to MERIT. The outcomes associated with the two groups were obtained by regressing the outcome against the variable measuring treatment status. Cox regression was used to assess the impact of treatment on all health outcomes The effect of treatment on re-offending was assessed using negative binomial regression. The effect of diversion on imprisonment risk was assessed using logistic regression. Follow-up periods for the analyses commenced at the date of referral for the MERIT group and from the date of case finalisation for the comparison group. We do this as most of those referred to MERIT would have otherwise had their matter finalised on the date of referral. It should be noted that propensity score matching estimates ATT, that is, the average treatment effect on the treated, not ATE (the average treatment effect). ATT is more appropriate than ATE when the patient's characteristics are more likely to determine the treatment received (Greifer & Stuart, 2021; Benedetto et al., 2018).

As a sensitivity test we re-ran the analyses using entropy matching (Hainmueller, 2011). Entropy matching (EM) is a method that assigns weights to the units in the treatment and control groups to directly balance the moments (for example, means, variances) of the covariate distributions across groups. Entropy matching is not applicable to survival time analyses, so the outcomes were all analysed using logistic regression except for the reoffending outcomes, which, as in the PSM analysis, were analysed using negative binomial regression. The results of the balancing are shown in Appendix Table 4.

Results

Appendix Table 3 shows the standardised bias for each variable included in the probit model prior to matching (light grey bars) and after matching (black bars) .[5] The standardized bias for continuous covariates is the difference in means of the covariate between the treated group and the comparison group divided by the standard deviation of the treatment group. The standardised bias for categorical variables is the difference in proportion of each level of the measured covariate divided by the standard deviation of the treatment group. Significant differences in several variables were observed prior to matching, including age, the proportion whose Indigenous status is unknown, principal offence type, number of concurrent offences, prior criminal record, and number of health contacts. After matching, the absolute standardised bias for all variables is lower than the conventionally accepted value of 0.1 (10 %) (Stuart et al., 2013, p. 3).

Table 2 summarises the health outcome results of the study.

In the two-year follow-up period from referral, the treatment group face significantly higher risks of AOD-related ED (1.098: 1.028–1.173), any cause ED (1.169: 1.134–1.206), AOD-related hospital admission (1.352: 1.288–1.420) any cause hospital admission (1.169:

Table 2
Health outcomes.

	Haz. ratio	*P*>|z|	Lower 95 % CI	Upper 95 % CI
Ambulance callouts	1.094	<0.001	1.054	1.135
AOD ED admissions	1.098	<0.001	1.028	1.173
ED admissions (gen)	1.169	<0.001	1.134	1.206
AOD hospital admissions	1.352	<0.001	1.288	1.420
Hospital admissions (gen)	1.169	<0.001	1.128	1.212
AOD related death	0.812	0.348	0.525	1.255
Death by any cause	0.674	0.009	0.502	0.904

[3] An admission is defined as 'unplanned' if it involves either an emergency presentation, an unplanned visit for continuing condition, a person in transit, a person who is dead on arrival, a disaster, or a current admitted patient.

[4] Studies with large samples often use a calliper of 0.01 (e.g., Rahman, 2023; Trevena & Weatherburn, 2015). We chose 0.05 because our sample is comparatively small, and it seemed to us to offer a better trade-off between bias reduction and statistical power. Monte Carlo simulations have shown that when compared with other methods, calliper matching results in estimates with less bias when compared with optimal and nearest neighbour matching and shows the best performance when assessed using mean squared error (Benedetto et al., 2018)

[5] The table is too large to include in the main text.

1.128–1.212) and ambulance callouts (1.094: 1.054–1.135). The exception to this pattern is death (from any cause), where the hazard ratio indicates a significantly lower mortality risk for the treatment group (0.674: 0.502–0.904)

Table 3 presents the results for the criminal justice outcomes.

The incident rate ratios (IRRs) for re-offending frequency at 12 and 24 months are both below one and significant; indicating that re-offending frequency is significantly lower for the treatment group than the comparison group. MERIT participants offend approximately 21 per cent less often than comparison group participants at 12 months (IRR: 0.793. CI: 0.748–0.841). The offending rate of the treatment group is 13 per cent lower at the 24 months mark (IRR: 0.870. CI: 0.829–0.912). At the conclusion of criminal proceedings participants in the MERIT program were significantly less likely to receive a prison sentence (OR: 0.728. CI: 0.674–0.787).

Sensitivity testing

The comparison of PSM and EM are shown in Appendix Table 5. There were only two changes to the results. Ambulance call outs were significantly lower for the treatment group using PSM (0.91: 0.87–0.96) but higher (1.14: 1.08–1.19) when we used EM. Death from any cause was significantly lower in the treatment group using PSM (0.75: 0.57–0.98) but non-significant using EM (0.84: 0.65–1.07). Some differences are to be expected given that EM makes greater use of the data than PSM. The key point to note is that the direction and significance of all other outcomes remained unchanged.

Discussion

This study examines the impact of a criminal justice diversion program involving voluntary treatment on a range of criminal justice and health outcomes for individual defendants. Our study improves on past research by using a larger sample, a stronger set of controls, a wider range of outcomes and a longer follow-up period. The study findings provide strong evidence that MERIT reduces both the risk of re-offending and imprisonment. This is an important outcome. A large body of evidence has shown that, at the margin, prison exerts little if any specific deterrent effect (Nagin et al., 2009; Chalfin & McCrary, 2017; Bhuller et al., 2020; Villettaz et al., 2006; Green & Winik, 2010; Killias et al., 2000). Past research has also shown that treatment of offenders whose crime is drug related is much more cost-effective than prison (Drake et al., 2009). If the increase in post intervention treatment seeking is a response to the treatment received in MERIT, (see below), it cannot be said that the MERIT program reduced demand for treatment services. The available evidence, however, has shown that the benefits of AOD treatment far outweigh the costs (see, for example, Cartwright, 2000).

The discovery that MERIT participants had higher rates of healthcare seeking than the control group is both surprising and puzzling. On the one hand, MERIT significantly and substantially reduces the risk of participant mortality. On the other hand, MERIT participants are at greater risk than their comparison group counterparts of planned and unplanned hospital and ED admissions and ambulance call-outs. This finding is at odds with earlier research showing strong evidentiary support for the effectiveness of AOD treatments such as residential rehabilitation, psychosocial interventions, and opioid agonist treatment (NSW Health, 2007; Darke, Lappin & Farrell, 2019; Lubman et al., 2014; McKetin et al., 2023; Iturralde et al., 2022), all of which are used in MERIT.

Table 3
Criminal Justice outcomes.

Reoffending frequency	IRR	$P>\|z\|$	Lower 95 % CI	Upper 95 % CI
Years				
1	0.793	<0.001	0.748	0.841
2	0.870	<0.001	0.829	0.912
Imprisonment	Odds ratio	$P>\|z\|$	Lower 95 % CI	Upper 95 % CI
	0.728	<0.001	0.674	0.787

There are two explanations for the higher rate of health service utilization in the treatment group. Firstly, despite the careful matching of treatment and comparison groups on pre-treatment indicators of AOD use, it is possible that some unmeasured difference between treatment and comparison groups, such as severity of dependence, polysubstance use, injecting drug use, or co-occurring mental or physical health conditions (Armoon et al., 2021) is biasing our estimate of treatment effectiveness on healthcare utilisation. Selection bias is a risk on all observational studies; however we think it is hard to reconcile the selection bias explanation with the fact that mortality post intervention was substantially lower in the treatment group than in the control group. It is also hard to reconcile with the fact that our treatment and control groups were matched on pre-treatment rates of AOD related and general ED and hospital admission. It is also important to note that ours is not the first study to find that people in AOD treatment have higher rates of hospitalisation or ED use among those with alcohol as their primary drug of concern, those in residential rehabilitation services compared with those in outpatient treatment, and those with multimorbidity including mental health, chronic illness and multiple substance use disorders (Cederbaum et al., 2014; Fleury et al., 2022). A pooled analysis of five randomised clinical trials of different AOD treatments found increases in visits to several types of medical and psychiatric outpatient services, reductions in hospitalisation for mental health reasons but no change in hospitalisation for medical reasons (Olmstead et al., 2012).

An alternative, and more likely explanation for the higher rate of treatment seeking among MERIT participants, is that the experience of AOD treatment increased the likelihood of seeking healthcare. This would explain the paradoxical result of increased healthcare utilisation, yet fewer deaths. There is some evidence to support this conjecture. Past research indicates that MERIT participants experience high levels of satisfaction with the service. NSW Health (2007) interviewed 82 per cent sample of all MERIT participants ($n = 3450$) about their satisfaction with the program. More than 90 per cent reported that they were extremely or very satisfied with the program, that it had met all or most of their needs, that they were extremely or very satisfied with their counsellor and that if a friend needed similar help, they would recommend the MERIT program. Other studies of participant experience in AOD treatment have found comparable results (McLellan & Hunkeler, 1998; Connors & Franklin, 2000).

Even if the treatment process is not uniformly satisfying, the experience of receiving help and peer support may encourage future help seeking. A study of AOD interventions with low threshold for entry found that they may remove barriers to treatment and engagement and may help individuals engage in subsequent treatment (McKellar, Austin & Moos, 2012). Enrolment of clients into the MERIT program overcomes a range of potential barriers or resistance to accessing treatment for AOD use and other physical and mental health needs. As part of the MERIT assessment, clients are screened for a range of health conditions including blood borne viruses and mental health risks. Treatment and healthcare needs are incorporated into care planning with ongoing care needs transferred at exit from the MERIT program (NSW Health, 2021). Once engaged in treatment, clients' fears of stigma and acceptability of subsequent health service engagement may be reduced (Iturralde et al., 2022) and they may receive encouragement from service providers or peers to seek further help (Tucket et al., 2004). A qualitative study of Australian AOD clients found that engagement in treatment assisted clients to gain knowledge and skills that improved future access and engagement with treatment (Bryant et al., 2022).

Although we have improved on past research in matching treatment and control subjects, our study is not without limitations. The retrospective nature of our study forced us to rely on administrative data for

measures of improvement in health and social functioning. The ability to discern specific AOD related healthcare use by clients was limited by the information available in the different administrative datasets, which rarely contain specific details recorded in other settings such as specialised AOD services. A prospective design would make it possible to use more direct measures of health and social functioning, such as the Opiate Treatment Index (Darke et al., 1991), the SF36 (Hays et al., 1993) or the Kessler Psychological Distress Scale (Kessler et al., 2002). Such measures are less likely to be contaminated by changes in a person's willingness to seek treatment for AOD related problems. Such a design would allow researchers to explore the details of healthcare utilisation and investigation of health and social outcomes, such as quality of life.

Our findings have important implications for both criminal justice administrators and policy makers. The principal difference between the criminal justice diversion program examined here and other criminal justice diversion programs is that the present program involved no coercion. Unlike Drug Court Programs, which dominate the field of criminal justice diversion, the MERIT program has no presiding judge, no team of prosecutors, defence lawyers or police, no regime of random urine testing, and no penal sanctions for non-compliance with program rules. Although we are unaware of any comparison between Drug Courts and voluntary treatment in terms of cost-effectiveness, voluntary treatment programs like MERIT program are much less expensive than Drug Court programs. They appear, nonetheless, to be no less capable in reducing drug-related crime.

Conclusion

Referring offenders with AOD-related problems to MERIT appears to be effective in reducing the short-term risk of reoffending, imprisonment, and death.

CRediT authorship contribution statement

Don Weatherburn: Writing – review & editing, Writing – original draft, Project administration, Formal analysis, Conceptualization. **Sara Rahman:** Writing – review & editing, Methodology, Formal analysis, Data curation. **Stephanie Todd:** Writing – review & editing, Validation, Data curation, Conceptualization. **Suzanne Poynton:** Writing – review & editing, Conceptualization. **Samantha Black:** Writing – review & editing. **Tanya Merinda:** Writing – review & editing. **Michael Farrell:** Writing – review & editing, Conceptualization.

Declaration of competing interest

None to declare.

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Appendix

Table A1
Drug and alcohol-related diagnosis codes, ED presentations.

Type of episode	ICD-9	ICD-10	SNOMED-CT
Alcohol-related episodes, unplanned ED presentations*	291, 303, 305.0, 535.3, 790.3, 980, E860	F10, K29.2, R78.0, T51, Y90.9, Y91, Z72.1,	25,702,006, 15,167,005, 191,480,000, 66,590,003, 231,466,009, 2,043,009, 191,802,004, 228,326,007, 274,776,000, 219,006, 82,782,008, 29,212,009, 67,426,006, 8,635,005, 42,344,001, 7,052,005, 269,765,000, 73,097,000, 160,592,001, 7,200,002, 102,897,001, 183,098,002, 32,553,006, 35,637,008, 365,967,005, 53,041,004, 63,267,000, 64,297,001, 85,561,006, 86,933,000, 87,106,005, 102,612,005, 135,827,004, 160,573,003, 160,580,001, 160,581,002, 160,593,006, 160,599,005, 161,466,001, 163,184,002, 171,208,001, 183,486,001, 18,653,004, 191,471,000, 191,472,007, 191,473,002, 191,476,005, 191,477,001, 191,478,006, 191,479,003, 191,481,001, 191,482,008, 191,803,009, 191,804,003, 191,805,002, 191,806,001, 191,807,005, 191,809,008, 191,811,004, 191,812,006, 191,813,001, 191,814,007, 191,815,008, 191,882,002, 191,883,007, 191,885,000, 192,206,005, 192,207,001, 192,208,006, 192,209,003, 192,210,008, 192,211,007, 192,212,000, 192,213,005, 192,214,004, 192,215,003, 192,216,002, 198,431,000,000,105, 20,093,000, 205,351,000,000,101, 207,273,009, 21,000,000, 212,806,006, 212,807,002, 212,808,007, 212,809,004, 212,810,009, 212,811,008, 212,812,001, 212,813,006, 212,814,000, 212,815,004, 212,816,003, 212,817,007, 212,818,002, 212,819,005, 212,820,004, 213,687,005, 216,632,000, 216,633,005, 216,634,004, 216,635,003, 216,636,002, 216,637,006, 216,638,001, 216,639,009, 216,640,006, 216,643,008, 216,644,002, 216,645,001, 216,646,000, 216,648,004, 216,649,007, 216,650,007, 216,652,004, 216,653,009, 221,842,002, 221,843,007, 221,844,001, 221,845,000, 221,846,004, 221,847,008, 221,848,003, 221,849,006, 221,850,006, 221,851,005, 221,852,003, 222,103,001, 222,104,007, 222,105,008, 222,106,009, 222,107,000, 222,108,005, 222,110,007, 222,111,006, 222,112,004, 222,113,009, 222,114,003, 222,702,003, 222,703,008, 222,704,002, 222,705,001, 222,706,000, 222,707,009, 222,708,004, 222,709,007, 222,710,002, 222,711,003, 222,713,000, 223,333,005, 223,334,004, 223,335,003, 223,336,002, 223,337,006, 223,338,001, 223,339,009, 223,340,006, 223,341,005, 223,342,003, 223,343,008, 223,344,002, 223,345,001, 223,346,000, 223,347,009, 223,348,004, 223,349,007, 226,136,002, 228,273,003, 228,281,002, 228,312,003,

(continued on next page)

Table A1 (*continued*)

Type of episode	ICD-9	ICD-10	SNOMED-CT
			228,313,008, 228,315,001, 228,316,000, 228,317,009, 228,330,005, 228,350,009, 228,351,008, 228,353,006, 228,357,007, 228,358,002, 228,364,009, 231,463,001, 231,464,007, 231,465,008, 231,467,000, 24,165,007, 242,263,000, 242,265,007, 268,639,004, 268,645,007, 268,683,008, 268,684,002, 268,685,001, 273,265,007, 273,802,002, 274,257,003, 28,045,007, 281,004, 281,078,001, 284,591,009, 287,166,006, 292,880,007, 294,420,000, 300,939,009, 302,237,007, 304,605,000, 304,606,004, 307,730,003, 308,742,005, 311,492,009, 316,322,002, 316,494,009, 34,938,008, 361,267,005, 365,973,006, 371,434,005, 386,449,006, 38,670,004, 408,945,004, 408,946,003, 408,947,007, 408,948,002, 412,198,003, 413,473,000, 415,685,003, 417,096,006, 417,633,001, 419,442,005, 419,572,002, 420,140,004, 427,013,000, 429,501,006, 429,775,004, 431,260,004, 440,652,002, 441,685,000, 442,766,007, 444,810,000, 445,628,007, 4,953,006, 53,527,002, 53,936,005, 57,346,004, 61,144,001, 62,213,004, 6,749,002, 69,482,004, 77,475,008, 78,524,005, 79,578,000, 87,460,008, 89,507,002, 95,906,008
Illicit drug-related episodes, unplanned ED presentations*	292, 304, 305.2, 305.5, 305.9, 965.0, 968.6, 969.8, 970.8, E850.0, E850.1, E854.1, E855.2, E935.0, E938.5, E939.6, E940	F11, F12, F14, F15, F16, F19, T40, Z50.3, Z722	1,383,008, 2,403,008, 3,298,001, 4,863,002, 5,602,001, 6,348,008, 6,514,006, 6,525,002, 7,071,007, 8,686,000, 8,837,000, 9,769,006, 9,982,009, 10,140,002, 10,327,003, 11,061,003, 11,196,001, 11,387,009, 12,898,000, 13,187,008, 14,784,000, 15,233,006, 15,277,004, 18,052,008, 18,159,001, 18,768,006, 19,445,006, 20,260,003, 20,385,005, 20,871,009, 21,647,008, 22,574,000, 23,527,004, 25,753,007, 26,416,006, 26,714,005, 27,956,007, 28,602,001, 29,733,004, 30,310,000, 30,491,001, 31,715,000, 31,956,009, 32,267,003, 33,871,004, 34,743,008, 37,344,009, 38,247,002, 39,807,006, 39,951,001, 40,571,009, 41,016,007, 41,906,002, 43,497,001, 44,870,007, 45,421,006, 45,775,001, 46,975,003, 47,836,003, 50,026,000, 50,320,000, 50,722,006, 51,339,003, 51,443,000, 51,493,001, 52,866,005, 53,050,002, 55,967,005, 56,194,001, 57,005,003, 58,727,001, 60,199,004, 63,649,001, 66,214,007, 67,893,003, 68,099,003, 70,328,006, 70,545,002, 70,655,008, 70,932,007, 71,328,000, 74,264,003, 74,934,004, 75,544,000, 77,355,000, 77,721,001, 78,092,008, 78,267,003, 78,358,001, 80,868,005, 81,270,000, 82,339,009, 82,768,008, 83,367,009, 84,758,004, 84,916,005, 85,005,007, 85,975,005, 87,132,004, 87,858,002, 88,926,005, 91,388,009, 95,635,002, 95,661,003, 105,546,006, 105,547,002, 105,550,004, 160,607,006, 160,608,001, 160,609,009, 160,610,004, 160,611,000, 160,615,009, 191,483,003, 191,492,000, 191,494,004, 191,816,009, 191,818,005, 191,819,002, 191,820,008, 191,821,007, 191,822,000, 191,829,009, 191,830,004, 191,831,000, 191,832,007, 191,833,002, 191,834,008, 191,842,009, 191,843,004, 191,844,005, 191,845,006, 191,846,007, 191,865,004, 191,866,003, 191,867,007, 191,868,002, 191,869,005, 191,870,006, 191,871,005, 191,872,003, 191,873,008, 191,874,002, 191,875,001, 191,876,000, 191,909,007, 191,911,003, 191,912,005, 191,913,000, 191,914,006, 191,915,007, 191,916,008, 191,917,004, 191,918,009, 191,919,001, 191,920,007, 191,921,006, 191,923,009, 191,924,003, 191,925,002, 191,926,001, 191,927,005, 192,205,009, 192,217,006, 192,218,001, 192,219,009, 192,220,003, 192,221,004, 192,222,006, 192,223,001, 192,224,007, 192,225,008, 192,226,009, 192,227,000, 192,228,005, 192,229,002, 192,230,007, 192,231,006, 192,232,004, 192,233,009, 192,234,003, 192,235,002, 192,236,001, 192,237,005, 192,238,000, 192,251,005, 192,252,003, 192,253,008, 192,254,002, 192,255,001, 192,256,000, 192,257,009, 192,258,004, 192,259,007, 192,260,002, 192,261,003, 192,262,005, 192,263,000, 192,264,006, 192,265,007, 192,266,008, 192,267,004, 192,268,009, 192,269,001, 192,270,000, 192,271,001, 192,272,008, 192,273,003, 192,275,005, 192,276,006, 192,278,007, 192,279,004, 192,280,001, 192,281,002, 192,282,009, 192,283,004, 192,284,005, 192,285,006, 192,286,007, 192,287,003, 192,288,008, 192,289,000, 192,290,009, 192,291,008, 192,292,001, 192,293,006, 192,294,000, 192,295,004, 192,307,004, 192,308,009, 192,309,001, 192,310,006, 192,311,005, 192,312,003, 192,313,008, 192,314,002, 192,315,001, 192,316,000, 192,317,009, 207,300,005, 207,301,009, 207,302,002, 207,304,001, 207,639,009, 212,587,008, 212,588,003, 212,591,003, 212,667,003, 212,668,008, 212,670,004, 212,671,000, 213,658,009, 213,659,001, 213,660,006, 213,661,005, 216,463,005, 216,464,004, 216,465,003, 216,466,002, 216,467,006, 216,468,001, 216,469,009, 216,470,005, 216,550,002, 216,551,003, 216,552,005, 216,553,000, 216,554,006, 216,555,007, 216,556,008, 216,557,004, 216,558,009, 216,560,006, 216,561,005, 216,562,003, 216,563,008, 216,565,001, 216,566,000, 216,583,009, 218,791,008, 221,797,001, 221,798,006, 221,799,003, 221,800,004, 221,801,000, 221,802,007, 221,803,002, 221,805,009, 221,806,005, 221,807,001, 221,808,006, 221,809,003, 221,810,008, 221,811,007, 221,812,000,

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Table A1 (*continued*)

Type of episode	ICD-9	ICD-10	SNOMED-CT
			221,813,005, 221,814,004, 221,815,003, 221,816,002, 221,817,006, 221,818,001, 221,819,009, 222,059,008, 222,060,003, 222,061,004, 222,062,006, 222,063,001, 222,064,007, 222,065,008, 222,066,009, 222,067,000, 222,068,005, 222,069,002, 222,070,001, 222,071,002, 222,072,009, 222,073,004, 222,074,005, 222,075,006, 222,076,007, 222,077,003, 222,078,008, 222,079,000, 222,080,002, 222,657,009, 222,658,004, 222,659,007, 222,660,002, 222,661,003, 222,662,005, 222,663,000, 222,664,006, 222,665,007, 222,666,008, 222,667,004, 222,668,009, 222,669,001, 222,670,000, 222,671,001, 222,672,008, 222,673,003, 222,674,009, 222,675,005, 222,676,006, 222,677,002, 222,678,007, 226,034,001, 228,366,006, 228,369,004, 228,371,004, 228,372,006, 228,373,001, 228,375,008, 228,388,006, 231,451,006, 231,466,009, 231,468,005, 231,469,002, 231,477,003, 231,478,008, 231,479,000, 231,480,002, 231,481,003, 231,482,005, 236,815,006, 241,749,009, 241,750,009, 241,752,001, 241,761,001, 241,768,007, 242,253,008, 242,257,009, 242,828,004, 242,829,007, 242,830,002, 242,831,003, 255,641,001, 268,642,005, 268,648,009, 268,686,000, 268,687,009, 268,688,004, 268,689,007, 268,690,003, 269,264,002, 269,745,007, 271,439,001, 274,777,009, 274,778,004, 274,779,007, 274,780,005, 275,471,001, 288,457,001, 290,137,009, 290,139,007, 290,150,005, 290,151,009, 290,152,002, 290,153,007, 290,154,001, 290,155,000, 290,156,004, 290,157,008, 290,158,003, 290,159,006, 290,160,001, 290,161,002, 290,162,009, 290,163,004, 290,164,005, 290,165,006, 290,166,007, 290,167,003, 290,168,008, 290,169,000, 290,170,004, 290,171,000, 290,172,007, 290,173,002, 290,174,008, 290,175,009, 290,176,005, 290,177,001, 290,178,006, 290,179,003, 290,180,000, 290,181,001, 290,182,008, 290,183,003, 290,184,009, 290,185,005, 290,186,006, 290,188,007, 290,189,004, 290,190,008, 290,191,007, 290,192,000, 290,193,005, 290,194,004, 290,196,002, 290,197,006, 290,198,001, 290,199,009, 290,200,007, 290,201,006, 290,202,004, 290,203,009, 290,204,003, 290,205,002, 290,206,001, 290,207,005, 290,208,000, 290,209,008, 290,210,003, 290,211,004, 290,216,009, 290,217,000, 290,218,005, 290,219,002, 290,220,008, 290,221,007, 290,222,000, 290,412,009, 290,413,004, 290,414,005, 290,415,006, 290,543,000, 290,544,006, 290,545,007, 291,240,006, 291,241,005, 291,242,003, 291,246,000, 291,247,009, 291,248,004, 291,249,007, 291,250,007, 291,251,006, 291,252,004, 291,253,009, 291,254,003, 291,255,002, 291,256,001, 291,257,005, 291,258,000, 291,259,008, 291,260,003, 291,261,004, 291,263,001, 291,264,007, 291,265,008, 291,266,009, 291,267,000, 292,052,006, 292,053,001, 292,054,007, 292,055,008, 292,059,002, 292,063,009, 292,181,009, 293,587,005, 293,594,008, 293,595,009, 293,597,001, 293,601,001, 293,604,009, 293,605,005, 295,127,002, 295,128,007, 295,129,004, 295,130,009, 295,131,008, 295,133,006, 295,140,007, 295,141,006, 295,142,004, 295,143,009, 295,144,003, 295,145,002, 295,146,001, 295,147,005, 295,148,000, 295,149,008, 295,150,008, 295,151,007, 295,152,000, 295,153,005, 295,154,004, 295,155,003, 295,156,002, 295,157,006, 295,158,001, 295,159,009, 295,160,004, 295,161,000, 295,163,002, 295,164,008, 295,165,009, 295,166,005, 295,167,001, 295,168,006, 295,169,003, 295,170,002, 295,171,003, 295,172,005, 295,173,000, 295,174,006, 295,175,007, 295,176,008, 295,177,004, 295,178,009, 295,179,001, 295,180,003, 295,181,004, 295,182,006, 295,183,001, 295,184,007, 295,185,008, 295,186,009, 295,187,000, 295,188,005, 295,189,002, 295,190,006, 295,191,005, 295,192,003, 295,193,008, 295,194,002, 295,195,001, 295,196,000, 295,197,009, 295,198,004, 295,199,007, 295,200,005, 295,201,009, 295,202,002, 295,203,007, 295,204,001, 295,209,006, 295,210,001, 295,211,002, 295,212,009, 295,213,004, 295,415,009, 295,416,005, 295,417,001, 295,418,006, 295,566,002, 295,567,006, 295,568,001, 295,570,005, 296,291,005, 296,292,003, 296,293,008, 296,294,002, 296,300,004, 296,301,000, 296,302,007, 296,303,002, 296,304,008, 296,305,009, 296,306,005, 296,307,001, 296,308,006, 296,309,003, 296,310,008, 296,311,007, 296,312,000, 296,313,005, 296,314,004, 296,315,003, 296,316,002, 296,317,006, 296,318,001, 296,319,009, 296,320,003, 296,321,004, 296,322,006, 296,323,001, 296,324,007, 296,325,008, 296,326,009, 296,327,000, 296,328,005, 296,329,002, 296,330,007, 296,331,006, 296,333,009, 297,199,006, 307,052,004, 308,374,001, 309,279,000, 315,747,008, 315,748,003, 316,233,002, 361,049,005, 361,055,000, 363,101,005, 363,908,000, 371,341,003, 371,422,002, 391,102,000, 398,747,000, 410,942,007, 413,367,002, 413,368,007, 413,369,004, 413,370,003, 413,371,004, 413,372,006, 413,373,001, 413,374,007, 413,375,008, 413,376,009, 413,377,000, 414,874,007, 416,479,009, 417,284,009, 424,461,008, 441,668,002, 699,449,003, 735,235,000, 762,323,002, 19,754,100,000,010, 20,296,100,000,010, 20,299,100,000,010, 20,464,100,000,010

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Table A1 (*continued*)

Type of episode	ICD-9	ICD-10	SNOMED-CT
Opioid-related episodes, unplanned ED presentations* (used for matching primary drug)	304, 305.5, 965.0, E850.0, E850.1, E850.2, E935.0, E935.1, E935.2	F11, T40	5,602,001, 9,982,009, 11,196,001, 12,898,000, 13,187,008, 14,784,000, 15,233,006, 18,052,008, 18,768,006, 19,445,006, 20,385,005, 29,733,004, 34,743,008, 41,016,007, 47,836,003, 52,866,005, 60,199,004, 67,893,003, 68,099,003, 70,545,002, 71,328,000, 74,264,003, 75,544,000, 77,721,001, 81,270,000, 82,768,008, 85,975,005, 87,132,004, 88,926,005, 191,818,005, 191,819,002, 191,820,008, 191,821,007, 191,822,000, 191,865,004, 191,866,003, 191,867,007, 191,868,002, 191,869,005, 191,870,006, 191,909,007, 191,911,003, 191,912,005, 191,913,000, 191,914,006, 191,915,007, 191,916,008, 191,917,004, 191,918,009, 191,919,001, 191,920,007, 191,921,006, 192,217,006, 192,218,001, 192,219,009, 192,220,003, 192,221,004, 192,222,006, 192,223,001, 192,224,007, 192,225,008, 192,226,009, 192,227,000, 212,587,008, 212,588,003, 212,591,003, 212,667,003, 212,670,004, 213,658,009, 213,659,001, 213,660,006, 213,661,005, 218,791,008, 231,477,003, 231,478,008, 231,479,000, 231,480,002, 241,749,009, 241,750,009, 241,752,001, 241,761,001, 241,768,007, 242,253,008, 242,828,004, 242,829,007, 242,830,002, 242,831,003, 268,686,000, 268,687,009, 269,264,002, 290,137,009, 290,139,007, 290,150,005, 290,151,009, 290,152,002, 290,153,007, 290,154,001, 290,155,000, 290,156,004, 290,157,008, 290,158,003, 290,159,006, 290,160,001, 290,161,002, 290,162,009, 290,163,004, 290,164,005, 290,165,006, 290,166,007, 290,167,003, 290,168,008, 290,169,000, 290,170,004, 290,171,000, 290,172,007, 290,173,002, 290,174,008, 290,175,009, 290,176,005, 290,177,001, 290,178,006, 290,179,003, 290,180,000, 290,181,001, 290,182,008, 290,183,003, 290,184,009, 290,185,005, 290,186,006, 290,188,007, 290,189,004, 290,190,008, 290,191,007, 290,192,000, 290,193,005, 290,194,004, 290,196,002, 290,197,006, 290,198,001, 290,199,009, 290,200,007, 290,201,006, 290,202,004, 290,203,009, 290,204,003, 290,205,002, 290,206,001, 290,207,005, 290,208,000, 290,209,008, 290,210,003, 290,211,004, 290,216,009, 290,217,000, 290,218,005, 290,219,002, 290,220,008, 290,221,007, 290,222,000, 290,412,009, 290,413,004, 290,414,005, 290,415,006, 290,543,000, 290,544,006, 290,545,007, 291,246,000, 291,247,009, 291,248,004, 291,249,007, 291,250,007, 291,251,006, 291,252,004, 291,253,009, 291,254,003, 291,255,002, 291,256,001, 291,257,005, 291,261,004, 291,263,001, 291,264,007, 292,052,006, 292,053,001, 292,054,007, 292,055,008, 292,059,002, 292,063,009, 292,181,009, 293,587,005, 293,594,008, 293,595,009, 293,597,001, 293,601,001, 293,604,009, 293,605,005, 295,127,002, 295,128,007, 295,129,004, 295,130,009, 295,131,008, 295,133,006, 295,140,007, 295,141,006, 295,142,004, 295,143,009, 295,144,003, 295,145,002, 295,146,001, 295,147,005, 295,148,000, 295,149,008, 295,150,008, 295,151,007, 295,152,000, 295,153,005, 295,154,004, 295,155,003, 295,156,002, 295,157,006, 295,158,001, 295,159,009, 295,160,004, 295,161,000, 295,164,008, 295,165,009, 295,166,005, 295,167,001, 295,168,006, 295,169,003, 295,171,003, 295,172,005, 295,173,000, 295,174,006, 295,175,007, 295,176,008, 295,177,004, 295,178,009, 295,179,001, 295,180,003, 295,181,004, 295,182,006, 295,183,001, 295,184,007, 295,185,008, 295,186,009, 295,187,000, 295,188,005, 295,189,002, 295,190,006, 295,191,005, 295,192,003, 295,193,008, 295,194,002, 295,195,001, 295,196,000, 295,197,009, 295,198,004, 295,199,007, 295,200,005, 295,201,009, 295,202,002, 295,203,007, 295,204,001, 295,209,006, 295,210,001, 295,211,002, 295,212,009, 295,213,004, 295,415,009, 295,416,005, 295,417,001, 295,418,006, 295,566,002, 295,567,006, 295,568,001, 295,570,005, 296,300,004, 296,301,000, 296,302,007, 296,303,002, 296,304,008, 296,305,009, 296,306,005, 296,307,001, 296,308,006, 296,309,003, 296,310,008, 296,311,007, 296,312,000, 296,313,005, 296,314,004, 296,315,003, 296,316,002, 296,321,004, 296,322,006, 296,323,001, 296,324,007, 296,325,008, 296,326,009, 296,327,000, 296,328,005, 297,199,006, 371,341,003, 391,102,000, 410,942,007, 20,299,100,000,010

Table A2
Drug and alcohol-related diagnosis codes, hospital admissions.

Type of episode	ICD-10 (any diagnosis)
Alcohol-related episodes, hospitalisations	F10, G31.2, K29.2, I42.6, K70, K85.2, K86.0, T51, Z71.4
Drug-related episodes, hospitalisations	F11- F19, F55, T39, T40, T41, T42, T43, T52, T53, Z71.5
Opioid-related episodes, hospitalisations	F11, T40

Table A3
Variables used in propensity score matching.

Variable	Unmatched			Matched		
	Mean (Treated)	Mean (Control)	Standardised bias	Mean (Treated)	Mean (Control)	Standardised bias
Age categories						
18–24	0.27	0.27	−1.48	0.27	0.27	−0.95
25–34	0.35	0.30	11.72	0.35	0.35	0.19
35–44	0.27	0.24	7.09	0.27	0.27	0.33
45–54	0.09	0.13	−12.61	0.09	0.09	1.69
55+	0.02	0.06	−20.55	0.02	0.02	−2.13
Gender						
Male	0.79	0.79	−1.80	0.79	0.79	−0.84
Remoteness Area						
Major cities	0.67	0.65	5.21	0.67	0.66	2.54
Inner regional	0.24	0.21	8.48	0.24	0.25	−0.24
Outer regional	0.04	0.07	−12.67	0.04	0.04	−1.44
Remote/very remote	0.01	0.01	−7.59	0.01	0.01	−1.97
Missing remoteness	0.04	0.06	−10.83	0.04	0.05	−3.23
SEIFA Quartile						
Most disadvantaged	0.26	0.29	−5.86	0.26	0.26	0.14
More disadvantaged	0.29	0.26	8.12	0.29	0.29	0.82
Less disadvantaged	0.26	0.24	4.22	0.26	0.26	−0.02
Least disadvantaged	0.14	0.15	−1.26	0.14	0.14	0.65
Missing	0.04	0.06	−10.85	0.04	0.05	−3.23
Indigenous						
Aboriginal	0.16	0.12	9.25	0.15	0.16	−2.43
Non-Aboriginal	0.79	0.77	5.42	0.79	0.79	1.83
Unknown	0.05	0.11	−20.37	0.05	0.05	0.66
Principal offence type						
Serious violence	0.18	0.31	−30.24	0.18	0.18	−1.02
Property	0.24	0.13	27.06	0.24	0.23	1.10
Drug	0.29	0.17	28.26	0.29	0.29	0.07
Breach	0.14	0.17	−8.48	0.14	0.14	−0.53
Other	0.15	0.21	−16.22	0.15	0.15	0.23
Year of first appearance						
2012	0.2	0.2	0.8	0.2	0.2	0.8
2013	0.2	0.2	−0.6	0.2	0.2	−0.4
2014	0.2	0.2	−0.4	0.2	0.2	−0.6
2015	0.2	0.2	1.8	0.2	0.2	0.8
2016	0.2	0.2	1.2	0.2	0.2	−1.3
2017	0.1	0.2	−3.0	0.1	0.1	0.8
No. concurrent offences						
1	0.22	0.56	−74.44	0.22	0.23	−0.79
2–4	0.45	0.36	18.61	0.45	0.44	0.83
≥5	0.33	0.08	65.28	0.33	0.33	−0.18
Concurrent offence types						
Acts intended to cause injury	0.30	0.32	−5.02	0.30	0.31	−2.15
Property	0.34	0.14	47.51	0.35	0.34	1.04
Driving	0.16	0.06	34.83	0.17	0.17	0.00
Drug	0.48	0.20	62.05	0.49	0.50	−1.61
Age at first contact						
10–17	0.37	0.26	25.38	0.37	0.38	−2.58
18–24	0.38	0.34	7.99	0.38	0.37	1.82
25–44	0.23	0.32	−20.06	0.23	0.23	1.00
45+	0.02	0.08	−30.41	0.02	0.02	−0.39
No. finalised court appearances						
0	0.11	0.30	−47.30	0.11	0.11	1.85
1–2	0.21	0.24	−7.31	0.21	0.20	1.87
2–5	0.23	0.19	10.52	0.23	0.23	−0.66
≥6	0.45	0.28	36.54	0.45	0.46	−2.12
Prior sentences						
Prison	0.22	0.12	21.15	0.20	0.20	−1.70
Cannabis cautions	0.07	0.04	12.47	0.07	0.07	−0.41
Prior offences (5 years)						
Violent	0.32	0.27	12.09	0.32	0.34	−3.90
Property	0.36	0.18	40.04	0.36	0.37	−1.98
Domestic violence	0.23	0.18	10.30	0.22	0.24	−3.51
Drug	0.37	0.17	47.86	0.37	0.37	0.47
Use/possess drugs	0.48	0.31	9.02	0.49	0.49	−0.16
Drug driving	0.38	0.17	47.59	0.37	0.37	0.43
Amphetamines	0.81	0.27	21.19	0.81	0.75	2.02
Cannabis	1.15	0.49	23.63	1.14	1.13	0.59
Opioids	0.29	0.09	14.78	0.28	0.27	0.97
Prior ambulance callouts (2 years)						
All callouts	1.07	0.86	7.63	1.06	1.10	−1.60
Alcohol-related	0.03	0.04	−1.58	0.03	0.03	−1.21
Drug-related	0.11	0.05	14.96	0.11	0.12	−1.81

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Table A3 (*continued*)

Variable	Unmatched			Matched		
	Mean (Treated)	Mean (Control)	Standardised bias	Mean (Treated)	Mean (Control)	Standardised bias
Prior ambulance callouts (1 year)						
All callouts	0.63	0.51	7.20	0.62	0.64	−1.37
Alcohol-related	0.02	0.02	−1.78	0.02	0.02	−1.56
Drug-related	0.07	0.03	13.70	0.07	0.08	−2.20
Prior ED presentations (5 years)						
All presentations	5.26	4.11	13.81	5.22	5.48	−2.78
AOD-related	0.34	0.24	7.48	0.33	0.37	−2.35
Alcohol-related	0.12	0.13	−1.14	0.11	0.12	−0.89
Drug-related	0.23	0.11	13.10	0.22	0.25	−2.33
Opioid-related	0.06	0.03	5.35	0.05	0.06	−0.33
Prior ED presentations (2 years)						
All episodes	2.56	2.00	12.43	2.54	2.68	−2.58
AOD-related	0.20	0.13	7.02	0.20	0.22	−2.38
Alcohol-related	0.06	0.07	−1.14	0.06	0.07	−0.81
Drug-related	0.14	0.06	11.52	0.14	0.16	−2.31
Opioid-related	0.03	0.01	3.25	0.03	0.03	−1.39
Hospital admissions (5 years)						
All admissions	1.71	1.42	8.52	1.69	1.76	−1.82
AOD-related	0.79	0.46	17.20	0.78	0.82	−1.46
Alcohol-related	0.25	0.21	3.25	0.25	0.27	−0.96
Drug-related	0.69	0.33	22.06	0.68	0.71	−1.21
Hospital admissions (2 years)						
All admissions	0.81	0.67	7.33	0.81	0.83	−1.45
AOD-related	0.42	0.24	15.33	0.41	0.42	−0.80
Alcohol-related	0.13	0.11	2.33	0.13	0.13	−0.34
Drug-related	0.37	0.18	19.74	0.37	0.38	−0.75
Prior OTP episodes (2 years)	0.16	0.05	24.75	0.16	0.15	1.60

Table A4
Entropy matching of treatment and control groups.

Variable	Before balancing						After balancing					
	Treat			Control			Treat			Control		
	mean	variance	skewness	mean	variance	skewness	mean	variance	skewness	mean	variance	skewness
Age categories												
25–34	0.35	0.23	0.61	0.30	0.21	0.88	0.35	0.23	0.61	0.35	0.23	0.61
35–44	0.26	0.19	1.07	0.23	0.18	1.27	0.26	0.19	1.07	0.26	0.19	1.07
45–54	0.09	0.08	2.83	0.13	0.11	2.22	0.09	0.08	2.83	0.09	0.08	2.83
55+	0.02	0.02	7.18	0.06	0.05	3.88	0.02	0.02	7.18	0.02	0.02	7.18
Male	0.79	0.17	−1.41	0.79	0.16	−1.45	0.79	0.17	−1.41	0.79	0.17	−1.41
Remoteness												
Inner regional	0.24	0.18	1.19	0.21	0.17	1.40	0.24	0.18	1.19	0.24	0.18	1.19
Outer regional	0.04	0.04	4.61	0.07	0.07	3.33	0.04	0.04	4.61	0.04	0.04	4.61
Remote/very remote	0.01	0.01	13.69	0.01	0.01	8.69	0.01	0.01	13.69	0.01	0.01	13.69
Missing remoteness	0.04	0.04	4.68	0.06	0.06	3.56	0.04	0.04	4.68	0.04	0.04	4.68
SEIFA Quartile												
More disadvantaged	0.29	0.21	0.90	0.26	0.19	1.11	0.29	0.21	0.90	0.29	0.21	0.90
Less disadvantaged	0.26	0.19	1.08	0.24	0.18	1.20	0.26	0.19	1.08	0.26	0.19	1.08
Least disadvantaged	0.14	0.12	2.03	0.15	0.13	1.99	0.14	0.12	2.03	0.14	0.12	2.03
Missing	0.04	0.04	4.68	0.06	0.06	3.56	0.04	0.04	4.68	0.04	0.04	4.68
Aboriginality												
Non-Aboriginal	0.80	0.16	−1.47	0.77	0.17	−1.31	0.80	0.16	−1.47	0.80	0.16	−1.47
Unknown	0.05	0.05	4.21	0.10	0.09	2.62	0.05	0.05	4.21	0.05	0.05	4.21
Property	0.24	0.18	1.24	0.14	0.12	2.11	0.24	0.18	1.24	0.24	0.18	1.24
Drug	0.29	0.21	0.92	0.18	0.15	1.64	0.29	0.21	0.92	0.29	0.21	0.92
Breach	0.14	0.12	2.02	0.18	0.15	1.70	0.14	0.12	2.02	0.14	0.12	2.02
Other	0.15	0.13	1.96	0.22	0.17	1.32	0.15	0.13	1.96	0.15	0.13	1.96
Concurrent offences												
2–4	0.45	0.25	0.19	0.36	0.23	0.59	0.45	0.25	0.19	0.45	0.25	0.19
≥5	0.32	0.22	0.76	0.08	0.07	3.18	0.32	0.22	0.76	0.32	0.22	0.76
Types of concurrent offences												
Violent offence	0.31	0.21	0.84	0.36	0.23	0.56	0.31	0.21	0.84	0.31	0.21	0.84
Property offence	0.35	0.23	0.64	0.16	0.14	1.84	0.35	0.23	0.64	0.35	0.23	0.64
Driving offence	0.16	0.13	1.86	0.06	0.06	3.65	0.16	0.13	1.86	0.16	0.13	1.86
Drug offence	0.48	0.25	0.06	0.22	0.17	1.35	0.48	0.25	0.06	0.48	0.25	0.06
Prior offences												
Prior prison sentence	0.20	0.16	1.48	0.12	0.11	2.30	0.20	0.16	1.48	0.20	0.16	1.48
Prior violent offence	0.32	0.22	0.75	0.26	0.19	1.07	0.32	0.22	0.75	0.32	0.22	0.75
Prior property offence	0.36	0.23	0.59	0.19	0.15	1.61	0.36	0.23	0.59	0.36	0.23	0.59
Prior DV offence	0.22	0.17	1.38	0.17	0.14	1.72	0.22	0.17	1.38	0.22	0.17	1.38

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Table A4 (*continued*)

Variable	Before balancing						After balancing					
	Treat			Control			Treat			Control		
	mean	variance	skewness	mean	variance	skewness	mean	variance	skewness	mean	variance	skewness
Prior drug offence	0.37	0.23	0.56	0.17	0.14	1.78	0.37	0.23	0.56	0.37	0.23	0.56
Prior cannabis cautions	0.07	0.06	3.47	0.04	0.04	4.62	0.07	0.06	3.47	0.07	0.06	3.47
Prior driving offence	0.37	0.23	0.56	0.17	0.14	1.77	0.37	0.23	0.56	0.37	0.23	0.56
Prior use/possess drugs	0.49	4.62	8.67	0.31	2.77	10.95	0.49	4.62	8.67	0.49	4.53	9.61
Prior amphetamines offence	0.75	8.63	8.43	0.26	3.17	17.29	0.75	8.63	8.43	0.75	11.01	12.40
Prior cannabis offence	1.14	10.80	6.38	0.49	4.71	10.38	1.14	10.80	6.38	1.14	10.68	6.70
Prior opioids offence	0.28	2.76	9.25	0.09	0.91	24.69	0.28	2.76	9.25	0.28	3.07	14.72
Age at first contact												
18–24	0.38	0.23	0.51	0.35	0.23	0.65	0.38	0.23	0.51	0.38	0.23	0.51
25–44	0.23	0.18	1.26	0.32	0.22	0.78	0.23	0.18	1.26	0.23	0.18	1.26
45+	0.02	0.02	7.11	0.08	0.07	3.09	0.02	0.02	7.11	0.02	0.02	7.11
Number of prior contacts (5 years)												
1–2	0.21	0.16	1.45	0.24	0.18	1.22	0.21	0.16	1.45	0.21	0.16	1.45
3–5	0.23	0.18	1.29	0.19	0.15	1.61	0.23	0.18	1.29	0.23	0.18	1.29
≥6	0.45	0.25	0.20	0.28	0.20	1.00	0.45	0.25	0.20	0.45	0.25	0.20
Prior health contacts												
Prior ambulance callouts (1 years)	0.55	1.88	6.35	0.49	3.32	17.25	0.55	1.88	6.35	0.55	2.15	8.39
Prior ambulance callouts (2 years)	0.93	4.77	8.02	0.82	9.24	21.18	0.93	4.77	8.02	0.93	5.45	9.34
Prior ambulance callouts - drug related (1 year)	0.02	0.02	14.55	0.02	0.08	38.07	0.02	0.02	14.55	0.02	0.03	22.25
Prior ambulance callouts - drug related (2 year)	0.06	0.10	7.21	0.03	0.05	13.26	0.06	0.10	7.21	0.06	0.13	10.20
Prior AOD-related ED episodes (5 years)	0.29	1.08	11.70	0.23	2.78	33.73	0.29	1.08	11.70	0.29	1.97	28.48
Prior alcohol-related ED episodes (5 years)	0.10	0.40	25.16	0.12	1.64	38.13	0.10	0.40	25.16	0.10	0.57	30.30
Prior drug-related ED episodes (5 years)	0.19	0.59	11.04	0.10	0.92	67.68	0.19	0.59	11.04	0.19	1.24	43.38
Prior opioid-related ED episodes within 2 years	0.05	0.18	29.38	0.03	0.42	110.40	0.05	0.18	29.38	0.05	0.36	82.24
Prior ED episodes (5 years)	4.56	51.02	7.39	3.83	79.46	23.31	4.56	51.02	7.39	4.56	65.30	9.65
Prior hospital admissions (5 years)	1.48	7.81	5.89	1.31	13.15	22.29	1.48	7.81	5.89	1.48	10.80	11.86
Prior AOD-related hospital admissions (5 years)	0.68	3.40	6.58	0.44	3.26	13.96	0.68	3.40	6.58	0.68	6.87	18.56
Prior alcohol-related admissions (5 years)	0.22	0.92	9.49	0.20	1.69	22.22	0.22	0.92	9.49	0.22	3.40	40.56
Prior drug-related admissions (5 years)	0.60	2.85	7.34	0.32	1.87	15.91	0.60	2.85	7.34	0.60	5.91	19.63
Prior OTP episodes (5 years)	0.38	1.38	5.03	0.11	0.33	7.94	0.38	1.38	5.03	0.38	1.57	5.46
Prior AOD-related ED episodes (2 years)	0.17	0.51	14.48	0.13	1.15	39.84	0.17	0.51	14.48	0.17	0.87	36.72
Prior alcohol-related ED episodes (2 years)	0.05	0.18	28.74	0.07	0.61	37.98	0.05	0.18	28.74	0.05	0.23	31.78
Prior drug-related ED episodes (2 years)	0.12	0.31	14.72	0.06	0.46	86.63	0.12	0.31	14.72	0.12	0.58	56.11
Prior opioid-related ED episodes within 2 years	0.02	0.10	53.70	0.01	0.23	156.30	0.02	0.10	53.70	0.02	0.07	47.52
Prior ED episodes (2 years)	2.24	15.15	6.80	1.90	22.81	18.05	2.24	15.15	6.80	2.24	19.19	9.29
Prior hospital admissions (2 years)	0.71	2.50	6.20	0.63	3.87	20.07	0.71	2.50	6.20	0.71	3.39	11.77
Prior AOD-related hospital admissions (2 years)	0.36	1.31	8.49	0.23	1.06	12.50	0.36	1.31	8.49	0.36	2.35	17.97
Prior alcohol-related admissions (2 years)	0.11	0.31	9.66	0.11	0.56	21.24	0.11	0.31	9.66	0.11	1.17	41.98
Prior drug-related admissions (2 years)	0.32	1.15	9.45	0.17	0.61	12.14	0.32	1.15	9.45	0.32	2.15	19.69
Prior OTP episodes (2 years)	0.17	0.39	5.56	0.05	0.10	10.62	0.17	0.39	5.56	0.17	0.51	8.85
Year of first appearance												
2012	0.14	0.12	2.13	0.13	0.12	2.16	0.14	0.12	2.13	0.14	0.12	2.13
2013	0.14	0.12	2.12	0.14	0.12	2.09	0.14	0.12	2.12	0.14	0.12	2.12
2014	0.15	0.12	2.00	0.15	0.13	1.97	0.15	0.12	2.00	0.15	0.12	2.00
2015	0.16	0.13	1.88	0.15	0.13	1.92	0.16	0.13	1.88	0.16	0.13	1.88
2016	0.16	0.14	1.82	0.16	0.14	1.83	0.16	0.14	1.82	0.16	0.14	1.82
2017	0.12	0.11	2.31	0.14	0.12	2.10	0.12	0.11	2.31	0.12	0.11	2.31

Table A5
Comparison of PSM and EM results for all outcomes.

Outcome	Odds ratio	$P > z$	Lower 95 % CI	Upper 95 % CI
Ambulance call outs				
PSM	0.91	0.00	0.87	0.96
EM	1.14	0.00	1.08	1.19
AOD ED admissions				
PSM	1.13	0.00	1.05	1.21
EM	1.24	0.00	1.16	1.33
ED admissions (general)				
PSM	0.96	0.14	0.90	1.01
EM	1.43	0.00	1.35	1.52
AOD hospital admissions				
PSM	1.18	0.00	1.11	1.25
EM	1.34	0.00	1.27	1.42
Hospital admissions (general)				
PSM	1.05	0.07	1.00	1.11
EM	1.24	0.00	1.18	1.30
AOD related death				
PSM	1.00	1.00	0.67	1.49
EM	0.99	0.98	0.69	1.43
Death from any cause				
PSM	0.75	0.03	0.57	0.98
EM	0.84	0.15	0.65	1.07
Imprisonment				
PSM	0.71	0.00	0.66	0.76
EM	0.72	0.00	0.68	0.77
Reoffending frequency (PSM)	IRR	$P > z$	Lower 95 % CI	Upper 95 % CI
Year				
1	0.82	0.00	0.78	0.87
2	0.81	0.00	0.77	0.85
Reoffending frequency (EM)				
Year				
1	0.90	0.00	0.86	0.94
2	0.88	0.00	0.84	0.92

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