



The Magistrates Early Referral Into Treatment Program

Impact of program participation on re-offending by defendants with a drug use problem

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This bulletin reports on the evaluation of re-offending outcomes for the Magistrates Early Referral Into Treatment (MERIT) drug diversion program. MERIT provides defendants in NSW Local Courts with the option of undertaking formal drug treatment while on bail. Re-offending outcomes for a cohort of 2,396 defendants who participated in the MERIT program were compared with a comparison group of defendants who did not participate in the MERIT program but who broadly met the eligibility criteria. To estimate the impact of the program we used a treatment effects model with correction for selection bias. Acceptance into the MERIT program, regardless of completion, was found to significantly reduce the number of defendants committing any theft re-offence by an estimated four percentage points. Acceptance and completion of the MERIT program significantly reduced the number of defendants committing any type of offence by an estimated 12 percentage points, and any theft re-offence by four percentage points. This evaluation provides strong support that participation in the MERIT program reduces defendants' propensity to commit theft offences and, for those who complete the program, substantially reduces their propensity to commit any type of re-offence.

Keywords: drug diversion, adult offenders, re-offending outcomes, selection bias, treatment effects model

INTRODUCTION

Many people who offend have substance use problems, and these problems are often intrinsically related to their offending behaviour (Dowden & Brown 2002). As such, effectively treating the substance use problems of offenders often leads to a reduction in their offending behaviour (Latimer et al. 2006; Weatherburn et al. 2008). The Magistrates Early Referral Into Treatment (MERIT) program is targeted at defendants appearing in NSW local courts who have illicit drug use problems. An intended outcome of the MERIT program is to reduce the rate of re-offending of defendants who participate in the program. This evaluation has the specific purpose of evaluating this outcome and the impact of the MERIT program on recidivism. As

such, the evaluation aims to establish if the MERIT program reduces the likelihood of re-offending by defendants with a drug problem to a greater degree than is achieved with typical judicial processing in NSW local courts.

THE MERIT PROGRAM

The MERIT program was developed in response to recommendations from the NSW Drug Summit (NSW Government 1999). In July 2000 the program was piloted in five courts in the Northern Rivers region of NSW. By 2007 the program operated in 61 NSW local courts where 80 per cent of defendants appear (Matruglio 2007).

The MERIT program is funded through the Commonwealth Government's Illicit Drug Diversion Initiative. The program

is an interagency initiative between NSW government departments, agencies and some non-government organisations (NGOs). The Attorney General's Department is the lead agency and has specific responsibility for the administration of MERIT within the court system. The NSW Police Force, Legal Aid Commission and the Chief Magistrates Office are other justice agencies with program partnership responsibilities. The Department of Health, and some participating NGOs, are responsible for clinically assessing the suitability of individuals for participation on the MERIT program and, for those individuals accepted into the program, undertaking the ongoing case management for the defendants' three-month program.

A summary of how the MERIT program operates is provided in Table 1.

The MERIT program is a 'pre-plea' drug diversion program as both referral and treatment occur prior to the defendant making a plea of guilty or not guilty for the relevant offence(s). A MERIT treatment program is typically three months in duration and occurs prior to sentencing while the defendant is on bail. An individual can be referred for a MERIT assessment by the magistrate, the defendant's lawyer or by self-referral. While referrals can also be made prior to court by the arresting police officer, this method is rarely used (Matruglio 2007).

A MERIT health professional assesses defendants referred to the program. From this assessment, a report is written and submitted to the Magistrate regarding the defendant's suitability for the program. As such, acceptance into the program is conditional on the defendant being assessed as suitable by the MERIT health professional and the Magistrate, and the defendant remaining committed to volunteering for the program.

Defendants accepted into the program are assigned a MERIT case manager who works with the defendant to implement an agreed treatment plan. Interventions in the treatment plan can include drug and alcohol counselling, pharmacotherapy interventions, welfare assistance and inpatient or outpatient detoxification. During the intervention period, the court is informed if a participant fails to attend appointments, commits an offence or breaches their bail conditions. On completion of the program, the MERIT caseworker provides the Magistrate with a final report for consideration in sentencing. In terms of sentencing, point 13.1 of the MERIT Local Court Practice¹ note states:

On sentence, the successful completion of the MERIT programme is a matter of some weight to be taken into account in the defendant's favour. At the same time, as the MERIT programme is a voluntary optional programme, its unsuccessful completion should not, on sentence, attract any additional penalty.

Table 1: Description of MERIT program process

Referral to Program

A MERIT referral can be made for an eligible individual by:

- The magistrate, the defendant's lawyer or the defendant at or before the first court appearance
- The charging police officer at arrest

Eligibility Criteria

An individual appearing in a local court is eligible for the program if they:

- Are over the age of 18 years
- Are suitable for release on bail
- Live within the effective catchment area
- Have a demonstrable illicit drug problem (excluding alcohol as primary substance)
- Have no current or pending matters for violent, sexual or other indictable offences
- Are deemed by a MERIT team health professional to be suitable for drug treatment
- Are approved to participate in the program by the Magistrate
- Are willing to consent to a drug treatment program

Program Treatment Options

Individuals on the 3 month MERIT program receive treatment that can include:

- Detoxification
- Methadone and other pharmacotherapies
- Residential rehabilitation
- Individual and group counselling
- Case management
- Welfare support and assistance

Treatment Process

The treatment process includes:

- Undertaking drug treatment as agreed with the caseworker and Magistrate
- Abiding by all conditions of bail and the MERIT program undertaking
- Being provided with the support and guidance of a MERIT caseworker
- Appearing before the Magistrate during this period, to provide an update on treatment progress

Disobey program conditions

The court is notified if an individual on the program:

- Consistently fails to attend scheduled appointments
- Commits further offences
- Does not comply with the bail conditions

Sentencing or Final Hearing

The Magistrate hearing the case is provided with a report from the MERIT team. The report details;

- the defendant's participation and progress while on the program
- an aftercare treatment plan, where relevant

In sentencing;

- the implications of a participant's compliance or non-compliance with the drug treatment program is at the discretion of the Magistrate
- failure to respond to the MERIT drug treatment program is not dealt with by punitive measures

PREVIOUS RESEARCH

This section briefly reviews the research literature on drug diversion programs, and the effectiveness of interventions similar to MERIT. In Australia and internationally there is a large and growing body of research on drug diversion programs in the criminal justice system. This body of research includes a number of reviews and meta-analyses (Harvey et al. 2006; Latimer et al. 2006; Wilson et al. 2006, Wundersitz 2007). While these reviews highlight the diversity of programs, they also identify that much of the research in this area is methodologically weak (Harvey et al. 2006; Wilson et al. 2006). These weaknesses generally relate to not adequately accounting for likely sources of selection bias in the design and analysis of the research. We first review some Australian studies, and then aspects of the international literature.

Drug diversion programs broadly similar to MERIT operate in most Australian states. In addition to the MERIT pilot evaluation in the Northern Rivers region, recidivism outcomes have been evaluated for two other programs similar to MERIT. The Court Referral and Evaluation for Drug Intervention and Treatment Program (VicCREDIT)² operates in Victoria and, with a few exceptions (i.e. defendants are eligible with outstanding violent or sexual offences), is very similar to the MERIT program (Wundersitz 2007). An evaluation of the VicCREDIT program was conducted during its first two years of operation comparing the recidivism of VicCREDIT participants with those who were referred but did not participate in the program (Heale & Lang 1999). Re-offending was evaluated within an 84-day proxy bail period, and while VicCREDIT participants re-offended slightly less and took a little more time to re-offend, none of the differences were statistically significant.

Two programs broadly similar to MERIT operate in Western Australia: the Pre-Sentence Opportunity Program (POP) and the Supervised Treatment Intervention Regime (STIR) (Crime Research Centre 2007). Using a methodology of comparing participants'

predicted and actual rates of offending, those who completed the POP program were estimated to offend at a rate 15 percentage points lower than predicted and, for the STIR program, 6.6 percentage points lower than predicted. However, sample sizes were less than 25 for both groups and no tests of significance were reported (Crime Research Centre 2007).

As noted earlier, the MERIT program was piloted in July 2000 in five courts in the Northern Rivers region of NSW. An evaluation of this pilot program found that in a 12-month follow-up period defendants who completed MERIT (n=91) were significantly less likely to re-offend than those who did not complete the program (n=84) (Passey 2003; Passey et al. 2007). While their results appear promising, the research design was relatively weak because some of the inherent differences between the non-randomly selected groups were not taken into account. It is probable that unaccounted for characteristics and reasons for defendants completing the MERIT program were also strongly related to their propensity to re-offend (Wilson et al. 2006). As a consequence, while program completers were found to offend at a rate 16 percentage points lower than non-completers, it is likely that these effects were due to unaccounted for differences as much as any effects of the program.

In the international literature, the vast majority of drug diversion evaluations are for programs identified as 'drug courts'. While MERIT is not considered a drug court in NSW, it does have similarities to many North American drug court programs in terms of its administration within the criminal justice system, target population and treatment regime (Harvey et al. 2006; Latimer et al. 2006). The meta-analyses of drug court programs by Wilson et al. (2006) and Latimer et al. (2006) are the most recent and comprehensive reviews in the international literature. In their meta-analysis Wilson et al. (2006) used the results from 50 individual drug court evaluations. Among these studies, they found substantial variation in the results. Some studies reported significant

moderate (Lind et al. 2002) and large (Gottfredson et al. 2003) decreases in the offending, while others reported no significant effects (Deschenes et al. 1995) and increases in offending (Miethe et al. 2000). While the variation could partly be due to differences in the operation of the drug courts, the authors also stated that a number of studies were methodologically weak, limiting their ability to make firm conclusions. As such, Wilson et al. (2006, p. 459) stated that they could only tentatively conclude that drug offenders who participate in a drug court program were less likely to re-offend. Interestingly, while Latimer et al. (2006) used a very similar collection of studies, they made stronger conclusions reporting that across all drug court studies there was an average 13 percentage point decrease in re-offending.

In summary, MERIT represents an innovative treatment program for defendants with illicit drug use problems. With its wide reach in the NSW criminal justice system, the MERIT program, if effective, could have a substantial impact on drug-related offending in NSW communities. Past research suggests that some drug diversion programs are effective in reducing re-offending, however there is substantial criticism that many observational studies ignored likely sources of selection bias. In light of such criticism, and within the predetermined constraints, we sought to implement a robust evaluation of the effectiveness and efficacy of MERIT. We now proceed to describe the methods used to evaluate the MERIT program.

THE CURRENT STUDY

METHODOLOGICAL CHALLENGE

The challenge in this study is to estimate the independent effect of the MERIT program on defendants' re-offending. As random selection was not used to create equivalent treatment and control groups, we needed to use other methods to account for those factors that were likely to influence re-offending and also vary between the MERIT group and

the control group. Typically, we would use statistical techniques to remove the effects of all other relevant factors before comparing the rates of re-offending between the groups. The effects of factors such as age and prior offending would be removed using standard regression methods or propensity score matching. Using these methods, the logic is that if we can be confident that the effects of all other relevant factors on the outcome have been removed, then we can also be confident that the results reflect the independent effect of the MERIT program on defendants' rates of re-offending. Unfortunately, this was not the case in this study. We did not have information on all variables that were likely to both influence re-offending and also vary between the MERIT group and the control group. Using typical observational research methods, such as regression analysis, would lead to biased estimates of the effect of the MERIT program.

OMITTED VARIABLE BIAS

In this evaluation we did not have information on whether control group participants had a drug use problem. Conversely we knew that most, if not all, of the MERIT group had a drug use problem because the presence of a drug use problem is fundamental to selection into the program. It was also known that a drug use problem is strongly correlated with offending, with some research suggesting a causal effect. In a meta-analysis, Dowden and Brown (2002) found that across 45 studies the presence of a drug use problem had a weighted mean effect size of 0.19 on the outcome of any re-offence (i.e. a drug problem increased the likelihood of committing any re-offence by 19 percentage points). Not accounting for important information such as drug use in an evaluation leads to a problem commonly called 'omitted variable bias'. When omitted variable bias is a problem, treatment effect estimates will not only reflect the impact of the program, but also reflect the impact of the omitted variables on the outcome.

In addition to our primary concern of not being able to account for the impact of a

drug use problem, we also had concerns that unaccounted self-selection and referral processes were potential sources of bias. These concerns were due in part to where the MERIT program is situated in the criminal court process. While participation in MERIT is voluntary, it is offered to defendants prior to conviction and sentencing and, as such, it may implicitly coerce into the program those with serious offending histories who are facing heavy penalties. Similarly, Magistrates and legal representatives may find that for particular high-risk defendants, encouraging participation in MERIT is the only viable means of reducing the likelihood of the imposition of restrictive punitive sanctions. While we are able to control for criminal history variables in the analysis, we do not have information (variables) on the dynamic risk factors that may have influenced selection into MERIT and also be related to re-offending.

TREATMENT EFFECT MODEL WITH SELECTION BIAS CORRECTION

When omitted variable bias is a problem, treatment effect models with correction for selection bias can be used to consistently estimate the effect of a treatment program. We use this method to consistently estimate the effect of the MERIT program on re-offending outcomes. Treatment effect models utilise information known about the selection process to account for omitted variable bias in making estimates about the effect of a program. To achieve this, two equations are estimated simultaneously. The first equation is a model predicting treatment (i.e. who receives MERIT), and the second is a model predicting the outcome (i.e. who re-offends) (see Figure 1 for an example). If there is an omitted variable causing selection bias (i.e. drug use), it will be part of the unexplained error term in each equation. Consequently, testing for a correlation between the error terms for the two equations operates as a formal test of whether omitted variables are causing selection bias. In addition to significant correlation being evidence of

omitted variable bias, it forms the basis for deriving consistent treatment effect estimates that correct for selection bias.

INSTRUMENTAL VARIABLES

Treatment effect models correcting for selection bias are made more efficient and precise if there is at least one variable that uniquely contributes to predicting treatment that does not predict and is excluded from the equation predicting the outcome (Wooldridge 2009). Such variables that identify the unique effect of treatment are often called instrumental variables (IV). In this study an instrument is needed that is predictive of defendants receiving MERIT, while being unrelated to their propensity to re-offend. We use as the instrument in this study a variable that represents whether a person did or did not have legal representation at their index court appearance. Due to its technical nature, we justify why legal representation is regarded as a relevant and valid instrument in Technical Appendix 1.

RESEARCH DESIGN

The basic research design used in this study is similar to that commonly used in program evaluation. A quasi-experimental design is used in which we select a group of cases similar to the MERIT sample for the purpose of making comparisons. In this section we detail the specific parameters used to collate the data, select the samples and build the treatment effect models that correct for omitted variable bias.

DATA SOURCES

Two sources of data were used in the study. The primary source for the demographic and offending data was the Re-offending Database (ROD) managed by the NSW Bureau of Crime Statistics and Research (BOCSAR) (Hua & Fitzgerald 2006). ROD consists of linked individual offender-level data for all finalised criminal matters in NSW courts from January 1994. Because ROD does not contain information about program participation, data from the

NSW Department of Health’s MERIT Information Management System (MIMS) was used to identify MERIT participants.

STUDY PERIOD

The study period for the evaluation was the three-year period between 1st July 2002 and 30th June 2005. All MERIT participants who had a MIMS program exit date within this period were selected for inclusion in the treatment sample. To minimise the impact of implementation issues, the study period began six months after the start of the rollout of the MERIT program across NSW courts. The end date for the study period was chosen so that all participants had a minimum two-year follow-up period. As some participants’ court finalisation date was up to six months after their MERIT program exit date, it was necessary to allow a two-year follow-up period from 1st January 2006.

TREATMENT SAMPLE

The total treatment sample in this study consisted of all defendants who had a MERIT episode in the study period that could be matched to a court appearance in ROD. Only one MERIT episode per person was included in the treatment sample. For defendants who had multiple MERIT episodes, one episode within the study period was chosen at random. This resulted in excluding 295 MERIT episodes. The matching procedure involved a number of stages. Firstly, defendants identified in the MIMS database were matched to person records in ROD using their Criminal Name Index number and date of birth information. Of the 3,573 defendants recorded as having a MERIT episode in the MIMS database, 3,441 defendants (96.3%) were matched to person records in ROD. In the second stage of the matching procedure, the

specific MERIT episodes were matched to the relevant finalised court appearance record for the defendant in ROD. Table 2 outlines how the MERIT episodes were matched to court finalisation dates. MERIT episodes were matched to court finalisation dates using two methods resulting in 84 per cent of all episodes being matched. After both methods were implemented, and data cleaning procedures were implemented³, the proportion of cases in the treatment sample who completed the program was slightly higher (68.3%) than before matching (64.2%).

CONTROL SAMPLE

A comparison group was identified in ROD using the following broad criteria:

- the finalised court appearance was in a NSW local court within the three-year study period;

Figure 1: Example of a two-equation treatment effects model to evaluate the MERIT program

$$\begin{aligned}
 \text{Treatment (MERIT)} &= \text{age} + \text{prior offences} + \text{prior prison} + \text{other variables} + \text{instrumental variable} + \text{error term} \\
 \text{Any re-offence} &= \text{treatment (MERIT)} + \text{age} + \text{prior offences} + \text{prior prison} + \text{other variables} + \text{error term}
 \end{aligned}$$

Table 2: Matching MERIT episodes to court finalisation dates

Task	Description	Matched
Match MERIT participants to person records in ROD	MERIT participants, each with only one selected episode in the study period, matched to the ROD database using: - CNI number; and - 2 of 3 date of birth portions correct (i.e. day and year)	3,441 (96.3%)
Method 1 for matching MERIT episodes to court finalisation dates	MERIT episodes matched to ROD if the MERIT program exit date is within one day of a court finalisation date in the ROD database	1,567 (45.5%)
Method 2 for matching MERIT episodes to court finalisation dates	MERIT episodes matched to ROD if: - the MERIT program exit date is within 180 days prior and 30 days after a court finalisation date in the ROD database; and - an offence recorded for that ROD court finalisation date matches an offence recorded for the MERIT episode in the MIMS database	1,324 (38.5%)
	▶ Total number of MERIT participant episodes matched using both methods	2,891 (84.0%)

- at the time of the finalised appearance, the defendant was aged between 18 and 55 years;
- one finalised court appearance per defendant (where a defendant had multiple episodes in the study period, one episode was selected at random);
- the defendant has not been a MERIT participant; and
- the defendant was not appearing for a driving offence.

Defendants over the age of 55 years were excluded from the study sample because the treatment sample included only six defendants over this age. Defendants appearing on driving offences were also excluded because driving offences are often committed by less serious offenders, and the proportion of defendants with an index driving offence was much higher in the control sample (45.8%) in comparison to the MERIT sample (10.9%). Excluding defendants with driving offences led to 293 MERIT cases being removed from the sample. While this slightly reduced the representativeness of the sample, it greatly improved the validity of comparisons derived using the analysis techniques chosen for this study.

After employing these criteria and various data cleaning procedures,³ a pool of 96,081 comparison group participants was obtained. The final control group sample used in the study was a random sample of 23,960 cases, leading to a treatment to control case ratio of one to ten. A relatively large control group was selected due to treatment effect models generally having less statistical power than traditional analysis methods.

ANALYSIS VARIABLES

INDEPENDENT VARIABLES

Treatment variables

The independent variables in this study are indicators of whether defendants participated in MERIT (treatment group) or received typical judicial processing (control group). Participation in MERIT was defined

Table 3: Percentage of defendants in each sample with each covariate characteristic

		MERIT samples			Control sample
		All accepted	All completed	Not completed	
Number of cases		2,396	1,638	758	23,960
Gender	Female	21.9	21.5	22.7	19.3
	Male	78.1	78.5	77.3	80.7
Indigenous status	Indigenous	20.4	18.0	25.5	14.5
	Non-Indigenous	79.6	82.0	74.5	85.5
Age (years)	18 – 22	24.6	22.9	28.4	24.4
	23 – 27	26.4	26.4	26.5	18.6
	28 – 33	24.8	24.7	25.2	20.0
	34 +	24.1	26.1	19.9	37.0
Concurrent offences	0	29.1	30.5	26.0	60.4
	1	37.9	40.5	32.5	31.1
	2 +	33.0	29.1	41.6	8.5
Index theft offence	Yes	46.1	47.5	51.8	23.2
	No	53.9	57.3	55.3	77.9
Prior offences	0 - 1	22.9	24.6	19.1	61.6
	2 - 4	30.7	31.9	28.1	23.2
	5 - 7	22.1	21.6	23.2	8.7
	8 +	24.3	21.9	29.6	6.5
Offence two years prior	Yes	65.4	62.3	72.2	30.5
	No	34.6	37.7	27.8	69.5
Custody two years prior	Yes	46.5	39.3	62.0	14.7
	No	53.5	60.7	38.0	85.3
Prior theft offence	0	35.1	37.7	29.4	75.3
	1-3	30.8	30.6	31.1	17.2
	4+	34.1	31.7	39.5	7.5
Any drug offence	Yes	45.4	44.5	47.4	15.6
	No	54.6	55.5	52.6	84.4
Offence seriousness ¹	High	21.3	21.9	19.9	34.5
	Other	78.7	78.1	80.1	65.5
Remote index ²	More remote	52.9	50.6	58.1	46.0
	More urban	47.1	49.5	42.0	54.0
Disadvantage index ³	More disadv.	53.5	53.8	52.9	52.6
	Less disadv.	46.5	46.2	47.1	47.4

¹ derived from the National Offence Index (NOI) (Australian Bureau of Statistics 2003). 'High' relates to any offence with a NOI score below 610

² derived from the Australian Standard Geographical Classification (ASGC) (Australian Bureau of Statistics 2008a). 'More remote' category relates to postcodes with ASGC score below 0.11

³ derived from the Socio-Economic Indexes for Areas (SEIFA) (Australian Bureau of Statistics 2006). 'More disadvantaged' category relates to postcodes with SEIFA score below 972.6

in two ways. First, participation in MERIT was defined as any defendant accepted into the MERIT program, regardless of whether they completed the MERIT program. This definition corresponds with the notion of evaluating programs on an intention-to-treat basis, rather than only investigating those who complete the program. As participants receive some treatment and take up resources whether or not they complete the program, evaluation on the basis of intention-to-treat is often regarded as being a better measure of the practical effectiveness of a program. When receiving treatment is defined in this way we refer to the evaluation as being on an ‘intention-to-treat’ basis, with the corresponding sample the ‘MERIT accepted’ sample.

The second approach was to define treatment as any person who completed the program. Most evaluations of drug diversion programs have defined treatment in this way (Latimer et al. 2006). This definition corresponds with the notion of evaluating the efficacy of a program when it is delivered as intended. When defined in this way we refer to the evaluation as being on the basis of ‘program completion’. The corresponding sample, which is a subset of the accepted sample, is referred to as the ‘MERIT completion’ sample.

For each outcome analyses are conducted separately with the MERIT completion sample and the MERIT accepted sample. The control group in each analysis is the same sample of 23,960 defendants selected from ROD. In both analyses, cases that received MERIT were coded one (1) and control group cases were coded zero (0).

Covariates

Similar to the approach in standard regression analysis, covariates are included in treatment effects models to account for any factors that may influence the outcome and vary between the treatment and control groups. In both the outcome equation and treatment equation the same set of covariates are used (Wooldridge 2009), with the exception that the instrumental variable is only included in the treatment equation. All demographic, court and criminal history

covariates were derived from ROD. Past research has shown that ROD contains a number of factors that are strongly related to re-offending and to selection into various treatment programs (Moffatt & Poynton 2007; Smith & Jones 2008; Weatherburn & Bartels 2008).

Table 3 displays all the covariates used in the analysis with the percent of defendants with each covariate characteristic in the control sample, MERIT accepted sample, MERIT completed sample and MERIT not-completed sample. It is evident that the MERIT samples had a higher percentage of cases with many characteristics associated with re-offending such as more prior offences, prior time in custody and prior theft offences.⁴

DEPENDENT VARIABLES

The dependent variables in this study are all measures of re-offending. Re-offending was operationalised by deriving binary variables from ROD that represented whether each defendant had committed a re-offence within two years of their index court appearance. If a defendant committed a re-offence the variable was coded one (1), and zero (0) otherwise.⁵ Separate variables were derived for the categories of any re-offence, any theft offence and any drug re-offence, with the percentages for each sample displayed in Table 4.⁶ Theft and drug offences were included as dependent variables as they are both commonly regarded as being ‘drug related’ offences (Dowden & Brown 2002).⁷

Table 4: Percentage of defendants who committed each type of re-offence in each sample

		MERIT samples			Control sample
		Accepted	Completed	Not completed	
Number of cases		2,396	1,638	758	23,960
Any re-offence	Yes	57.9	52.9	68.6	27.5
	No	42.2	47.1	31.4	72.5
Any theft re-offence	Yes	30.3	25.6	40.2	7.1
	No	69.7	74.4	59.8	92.9
Any drug re-offence	Yes	15.2	13.3	19.3	4.2
	No	84.8	86.7	80.7	95.8

Table 5: Percentage of defendants with legal representation in each sample

		MERIT samples			Control sample
		Accepted	Completed	Not completed	
Number of cases		2,396	1,638	758	23,960
Legal representation	Yes	90.0	91.6	86.4	65.8
	No	10.0	8.4	13.6	34.2

INSTRUMENTS

The primary instrumental variable used in the analysis of MERIT is the binary variable ‘legal representation’. This variable corresponds to whether the defendant had a legal representative at the index court appearance. Table 5 shows that a substantially larger percentage of defendants who received MERIT had legal representation. As previously stated, in Technical Appendix 1 we provide justification as to why legal representation is a relevant and valid instrument.

ANALYSIS TECHNIQUE

A number of different computational techniques can be used to calculate treatment effect models with correction for selection bias. When the outcome, treatment variable and the instrument are all binary variables, the technique commonly recommended is the bivariate probit model (Greene 2007). As such, in this research we primarily use a recursive bivariate probit model that employs a maximum likelihood method to estimate consistent treatment effect estimates (Greene 2007). We used the STATA package’s seemingly unrelated biprobit procedure to conduct the analysis, including the treatment variable in the outcome model (Greene 2007, p. 35). The recursive bivariate probit model has previously been used in the analysis of offending outcomes (Uggen 1999), health outcomes (Yoo & Frick 2006) and in a wide variety of applications in the econometrics field (see Greene 2003).⁸

RESULTS

In this section we report the results from applying a treatment effects model to estimate the impact of the MERIT program on re-offending outcomes. The effect of being accepted into MERIT, and for completing MERIT, is evaluated for the outcomes of any offence, any theft offence and any drug offence. The marginal effect of the MERIT program is provided with the treatment effect estimates. The marginal effects represent

the proportional change in the number of defendants estimated to re-offend due to receiving MERIT, while holding at the average the effects of all other covariates on the outcome. When converted into a percentage point difference, the marginal effect is the difference in the percentage of defendants estimated to re-offend in the MERIT group compared to the control group.

We also provide overall model statistics for each model. While most are typical of probit analyses, the RHO statistic and the associated likelihood ratio (LR) tests are specific to treatment effects models. The RHO statistic is a measure of the correlation between the error terms for the outcome and selection equations. The LR test of RHO assesses whether the correlation in the error terms is significantly different to zero, with a significant correlation being evidence of omitted variable bias (as discussed previously). Once the relevant covariates were included, the RHO test statistic was highly significant in each outcome model investigated in this study. This provides support for our proposition that selection bias was an issue and that a treatment effects model was the appropriate analysis technique.

ANY RE-OFFENCE

As noted earlier, the effect of the MERIT program on the outcome of any re-offence within a two-year follow-up period was evaluated on an ‘intention-to-treat’ and ‘program completion’ basis, as shown in Table 6.

On the basis of ‘intention-to treat’, the estimated effect of being accepted into the MERIT program, regardless of completion, was not statistically significant for the outcome of committing any re-offence. When evaluated on the basis of completing treatment, the MERIT program had a statistically significant and substantial impact on the outcome of any re-offence. Completion of the MERIT program was estimated to reduce the number of defendants’ re-offending in a two-year follow-up period by 12 percentage points.

ANY THEFT RE-OFFENCE

Table 7 displays the results for the outcome of any theft re-offence.

On the basis of ‘intention-to-treat’, acceptance into the program was estimated to result in a 3.9 percentage point reduction in defendants committing any theft offence in the two-year follow-

Table 6: Estimated treatment effect of the MERIT program on the outcome of any re-offence

Accepted into MERIT sample					
	Coef	Std Error	P-value	95% CI	Marginal Effect
Treatment (MERIT)	-0.12	0.14	0.4	-0.38, 0.16	-3.84
LR Test (RHO = 0)	chi ² = 12.76, p-value < .001				
Overall model statistics	n=26356, Wald chi ² (38) = 5993.91, p-value < .001				
Completed MERIT sample					
	Coef	Std Error	P-value	95% CI	Marginal Effect
Treatment (MERIT)	-0.42	0.15	< .01	-0.71, -0.13	-12.26
LR Test (RHO = 0)	chi ² = 21.48, p-value < 0.001				
Overall model statistics	n=25598, Wald chi ² (38) = 4703.08, p-value < .001				

Covariates included in models: gender, Indigenous status, age, concurrent offences, prior offences, prior offence in last two years, prior theft, prior drug, custody in previous two years, offence seriousness (high), remoteness indicator, disadvantage indicator. Full model statistics are provided in Technical Appendix 2 and 3, respectively.

up period. For those defendants who completed the MERIT program, the estimated treatment effect on committing theft offences was highly significant ($p < 0.01$). Completion of the MERIT program was estimated to reduce the number of defendants committing a theft offence by 4.2 percentage points.

ANY DRUG RE-OFFENCE

For the outcome of any drug offence, as shown in Table 8, the treatment effect for defendants accepted into MERIT was very close to statistical significance ($p = 0.06$). For the sample who completed the program, the result also approached statistical significance ($p = 0.08$). By

contrast to the previous two outcomes, the treatment effect for those who completed MERIT was not larger or more significant on the ‘any drug offence’ outcome. As drug offences are relatively rare events, it is possible that the analysis technique was imprecise in detecting the effects.

DISCUSSION

The MERIT program is a voluntary drug diversion program administered in NSW local courts and provides defendants with the option of undertaking formal drug treatment while on bail. This evaluation aimed to establish if participation on the MERIT program reduces defendants’ likelihood of re-offending relative to typical judicial processing and sanctioning. Completion of the MERIT program was estimated to significantly reduce the number of defendants who committed any re-offence and any theft re-offence within a two-year follow-up period. Completion of MERIT was estimated to reduce the numbers of defendants committing any offence by 12 percentage points and any theft offence by four percentage points. When treatment effects were estimated on the stronger intention-to-treat basis (i.e. all defendants accepted into the program), the program was found to significantly reduce the number of defendants who committed any theft offence by four percentage points. On the ‘any drug offence outcome’, the impact of the MERIT program approached significance for both the intention-to-treat and program completion samples. While the estimated proportional effects of the program may seem relatively small, particularly for the intention to treat sample (i.e. 4% for theft offences), the criminology literature (Greenberg 1979) strongly suggests that small changes in the rate of convictions are associated with much larger changes in actual offending (i.e. both detected and undetected offending).

Before drawing conclusions based on these findings, it is important to consider the potential limitations of the methods used in this evaluation. In this study the

Table 7: Estimated treatment effect of the MERIT program on the outcome of any theft re-offence

Accepted into MERIT sample					
	Coef	Std Error	P-value	95% CI	Marginal Effect
Treatment (MERIT)	-0.43	0.19	0.03	-.80, -.05	-3.93
LR Test (RHO = 0)	chi ² =15.80, p-value > chi ² = .001				
Overall model statistics	n=26356, Wald chi ² (40) = 5306.25, p-value > .001				
Completed MERIT sample					
	Coef	Std Error	P-value	95% CI	Marginal Effect
Treatment (MERIT)	-0.53	0.20	< .01	-0.92, -0.15	-4.15
LR Test (RHO = 0)	chi ² =13.00, p-value > 0.001				
Overall model statistics	n=25598, Wald chi ² (40) = 4099.95, p-value < .001				

Covariates included in models: gender, Indigenous status, age, concurrent offences, prior offences, prior offence in last two years, prior theft, prior drug, custody in previous two years, index theft offence, offence seriousness (high), remoteness indicator, disadvantage indicator. Full model statistics are provided in Technical Appendix 4 and 5, respectively.

Table 8: Estimated treatment effect of the MERIT program on the outcome of any theft re-offence

Accepted into MERIT sample					
	Coef	Std Error	P-value	95% CI	Marginal Effect
Treatment (MERIT)	-0.3	0.16	0.06	-0.62, 0.01	-2.04
LR Test (RHO = 0)	chi ² =14.22, p-value < .001				
Overall model statistics	n= 26356, Wald chi ² (40)= 3966.07, p-value < .001				
Completed MERIT sample					
	Coef	Std Error	P-value	95% CI	Marginal Effect
Treatment (MERIT)	-0.31	0.18	0.08	-0.63, 0.04	-1.92
LR Test (RHO = 0)	chi ² =8.42, p-value < .001				
Overall model statistics	n=25598, Wald chi ² (40) = 2944.41, p-value < .001				

Covariates included in models: gender, Indigenous status, age, concurrent offences, prior offences, prior offence in last two years, prior theft, prior drug, custody in previous two years, index drug offence, offence seriousness (high), remoteness indicator, disadvantage indicator. Full model statistics are provided in Technical Appendix 6 and 7, respectively.

treatment effects model with correction for selection bias technique relies on the justification of key assumptions to derive consistent estimates of the treatment effect. We were confident that the assumption of instrument relevance was met as legal representation was found to have a strong, independent influence on selection into MERIT. Although not directly testable, we were also confident that we could justify that legal representation was a valid instrument, unrelated to the re-offending outcomes. However, evident in the justification provided in the technical appendix was that the validity of the legal representation instrument was dependent on controlling for other covariates. Legal representation was related to other factors such as prior offences, offence seriousness and prior custody that, if not controlled for, would have led to correlations between the instrument and the omitted variables (Frölich 2007; Wooldridge 2009). Thus, while we believe the estimates from the treatment effect models are valid, we acknowledge that the modelling methods were dependent on complex justifications. Our confidence would be substantially higher had the treatment effect estimates been derived using a randomised controlled trial in which selection bias was explicitly managed in the research design (Farrington 2006).⁹ Considering the importance and investment made in the MERIT program, this point should not be overlooked.

Incapacitation bias, or differences in the time available to re-offend, was a potential limitation (i.e. in the follow-up period, control participants may spend more time in prison such that they have less opportunity to offend). In an attempt to minimise incapacitation bias, defendants were only included in the study if, in the follow-up period, they had at least 100 days in the community. Analyses were also conducted using only defendants who spent no time in custody during the follow-up period. These analyses lead to very similar results to those reported in this bulletin. From implementing these restrictions and conducting exploratory analyses we were confident that any effects of incapacitation bias were minimal.

In future evaluations of the MERIT program it would be useful to explore the effect of MERIT on other outcome measures. In addition to reducing the re-offending of participants after finishing the program, an intended outcome of the MERIT program was to reduce participants' re-offending while on bail. In this study, we only sought to evaluate the impact of MERIT on re-offending after the finalised court date due to our dependence on data from ROD. ROD is structured around finalised court appearances and, as such, it was difficult to identify bail periods for control cases. It is also acknowledged that evaluating MERIT using outcome measures that represent the number of re-offences and offence seriousness may be valuable areas for future evaluation. While we would have liked to extend the current evaluation to investigate other specifications of the outcome, we believe that it was appropriate to focus this study on the comprehensive evaluation of the binary re-offence outcome measures.

Notwithstanding these limitations, this study represents a systematic and robust evaluation of the impact of the MERIT program on re-offending. In comparison to other drug diversion evaluations, the sample of participants was large, the two-year follow-up period was comparable, and the type and number of covariate controls similar (Latimer et al. 2006). We identified and addressed the issue of omitted variable bias; a common but often overlooked problem in drug diversion evaluation (Wilson et al. 2006). The treatment effects model with correction for selection bias was an appropriate and powerful tool for the task (Angrist 2006). Our finding that among those who completed MERIT there was an estimated marginal effect of a 12 percentage point reduction in re-offending is very similar to Latimer et al.'s (2006) finding of an average 13 percentage point reduction across 50 studies. We consider this evaluation of MERIT to be among the more robust observational studies of a drug diversion program.

We would like to highlight three important points related to the findings. It is

evident that the impact of the program largely depends on people completing the program. While the efficacy of the MERIT program was demonstrated for defendants who complete the program, the evidence for program effectiveness was less compelling. It is apparent, however, that program effectiveness should improve if the number of people who complete the program is increased. Further research to understand which factors are associated with program completion may assist program administrators to increase completion rates and improve the effectiveness of MERIT. Second, we would like to highlight that while by name MERIT is an 'early referral' program, the prior criminal histories of MERIT participants suggested that most had substantial previous contact with the criminal justice system (see Table 3). Many of the defendants who were accepted and/or completed MERIT had spent time in prison. As such, MERIT is best considered a program that provided drug treatment and impacted on the re-offending of defendants who, on average, had the characteristics of high-risk offenders.

The third point to highlight regarding the results is that MERIT is a relatively short duration program in comparison to most other efficacious drug diversion programs. In Latimer et al.'s (2006) meta-analysis programs with an intervention period under 12 months had a smaller average marginal effect size (7%) than programs with an intervention period of 12 to 18 months (18%). Other studies have also suggested that to reduce recidivism, drug treatment interventions need to be at least 90 days, with 12 months generally being the minimum effective treatment period (Goldsmith & Latessa 2001, p. 662). In the context of this literature, the estimated efficacy of MERIT as a short three-month program is interesting and warrants further investigation. It may be the case that while the MERIT program is typically only three months in duration, drug treatment including pharmacotherapy, residential rehabilitation and counselling may often continue after the program officially ends. It is also possible that other factors may contribute to the efficacy of

MERIT including:

- MERIT’s operation as a pre-plea option within the court process;
- dedicated health resources, including residential treatment places, for the program;
- the type of treatment interventions used;
- the intensity of treatment interventions used;
- the delivery of interventions by health department employees that are independent to the justice system; and/or
- judicial oversight by local court magistrates familiar to some defendants.

In summary, this evaluation provides clear support for the proposition that MERIT is an efficacious drug diversion program that reduces re-offending among defendants who complete the program. On an intention-to-treat basis the evaluation also supports that MERIT is an effective program in reducing the likelihood of committing further theft offences among all defendants accepted into the program. While considered a valid application of the techniques, the treatment effects model with correction for selection bias does not provide the level of confidence or depth of information about the impact of the program that would have been achieved had a randomised controlled design been implemented.

NOTES

1. See Staunton 2002, MERIT - Local court practice note number 5, [http://www.lawlink.nsw.gov.au/lawlink/local_courts/ll_localcourts.nsf/vwFiles/PRACTICE%20NOTE%205%20of%202001.pdf/\\$file/PRACTICE%20NOTE%205%20of%202001.pdf](http://www.lawlink.nsw.gov.au/lawlink/local_courts/ll_localcourts.nsf/vwFiles/PRACTICE%20NOTE%205%20of%202001.pdf/$file/PRACTICE%20NOTE%205%20of%202001.pdf), accessed on 6 June, 2008.
2. The prefix Vic is used for the CREDIT acronym (i.e. VicCREDIT) so as not to confuse the Victorian program with a NSW program that uses the same CREDIT acronym, the Court Referral of Eligible Defendants into Treatment.

Table 9: Data cleaning exclusions and the number of affected cases

<i>Exclusion Criteria</i>	<i>Treatment (n = 2,813)</i>	<i>Control (n = 221,566)</i>
Unknown indigenous status	20	29,106
Legal Representation is missing	22	456
Remoteness Index Missing	43	7,914
SEIFA Disadvantage Index Missing	48	8,024
Less than 100 free follow-up days	32	1,357
Over the age of 55 years	6	9,304
Driving Index Offence	293	84,690
Total Cases Excluded from Samples	417	125, 485
Cleaned Samples	2,396	96,081
Study Samples	2,396	23,960 (randomly selected)

3. Cases were excluded if they had unknown or missing data values as the analysis predominantly involved using multivariate models. A summary of cases excluded from the study samples is provided in Table 9. Cases were excluded if they had less than 100 days out of custody within the two-year follow-up period; to include cases that had limited free time to re-offend may compromise the analysis. As some cases met multiple exclusion criteria, the total number of cases is less than the sum of those who meet each criterion.
4. It is also worth highlighting that the continuous and count variables such as age and prior offences were recoded into sub-categories. The main reason for using sub-categories was that many of the count variables had non-linear relationships with the outcome. While using polynomials captured much of the non-linearity, it also led to instability in the models and an increase in the number of influential outliers.
5. Binary measures were used to evaluate re-offending because they presented as the most robust outcome on which to evaluate MERIT. Treatment effect models can be implemented with count measures (i.e. number of re-offences), however different techniques are required for modelling the distribution of these variables. We decided not to extend the evaluation to look at count outcomes, but consider such analyses a logical next step for future research.
6. The outcome measure ‘any re-offence’ included any criminal offence committed in the follow-up period, except for breach of a legal order. The outcome measure ‘any theft offence’ included any theft offences in the follow-up period with an Australian Standard Offence Classification number between 0700 and 0999 (Australian Bureau of Statistics 2008b). The outcome measure ‘any drug offence’ included any offence with an Australian Standard Offence Classification number between 1000 and 1099.
7. It is also worth noting that within the treatment effects model, participation in MERIT was the dependent variable in the second treatment equation as well as being the primary independent variable in the outcome model.
8. In addition to the bivariate probit technique, generalised method of moments (GMM) techniques were used in a supplementary capacity to estimate the treatment effect models. The GMM technique uses a linear estimator and alternative computational methods to the bivariate probit model. GMM analyses were conducted as a means of testing the robustness

and validity of our results to different computation methods. The results obtained using GMM with the same covariate models and a tightly specified legal representation instrument (i.e. interaction of legal representation with index drug offence) were substantively the same as those reported for the bivariate probit model. When reporting the results we focus on the bivariate probit model as this technique is regarded as more appropriate when outcomes, treatments and instruments are binary variables.

9. While randomised controlled trials can vary in design, in essence, they involve randomly assigning eligible participants (i.e. defendants with a drug problem) to either a treatment (i.e. MERIT) or a control condition (i.e. normal judicial processing) (Farrington 2006). Randomisation ensures that the treatment and control samples are equivalent on all known and unknown factors, and leads to unbiased estimates of the treatment effects. The NSW Drug Court evaluation is a relevant example of such a design (Lind et al. 2002).

REFERENCES

- Angrist, J 2006, 'Instrumental variables methods in experimental criminological research: what, why and how', *Journal of Experimental Criminology*, vol. 2, no. 1, pp 23-44.
- Angrist, J 2001, 'Estimation of limited-dependent variable models with dummy endogenous regressors: simple strategies for empirical practice', *Journal of Business and Economic Statistics*, vol. 19, no. 1, pp 2-15.
- Australian Bureau of Statistics 2003, 'National offence index - technical paper', in *Criminal Courts, Australia, 2001-02* (4513.0), Australian Bureau of Statistics, Canberra, pp 65-70.
- Australian Bureau of Statistics 2006, *Information paper: An introduction to socio-economic indexes for areas (SEIFA)* (2039.0), Australian Bureau of Statistics, Canberra.
- Australian Bureau of Statistics 2008a, *Australian standard geographical classification (ASGC)*, Australian Bureau of Statistics, Canberra.
- Australian Bureau of Statistics 2008b, *Australian standard offence classification (2nd edition)*, Australian Bureau of Statistics, Canberra.
- Crime Research Centre 2007, *WA diversion program: evaluation framework (POP/STIR/IDP): report to drug and alcohol office*, Crime Research Centre, University of Western Australia, Perth.
- Deschenes, E, Turner, S & Greenwood, P 1995, 'Drug court or probation: an experimental evaluation of Maricopa county's Drug Court', *Justice System Journal*, vol. 18, pp 55-61.
- Dowden, C & Brown, SL 2002, 'The role of substance abuse factors in predicting recidivism: a meta-analysis', *Psychology, Crime & Law*, vol. 8, no. 3, pp 243-264.
- Farrington, D 2006, 'Methodological quality and the evaluation of anti-crime programs', *Journal of Experimental Criminology*, vol. 2, no. 3, pp 329-337.
- Frölich, M 2007, 'Nonparametric IV estimation of local average treatment effects with covariates', *Journal of Econometrics*, vol. 139, no. 1, pp 35-75.
- Goldsmith, R & Latessa, E 2001, 'Coerced treatment of addictions in the criminal justice system', *Psychiatric Annals*, vol. 31, no. 11, pp 657-664.
- Gottfredson, D, Najaka, S & Kearley, B 2003, 'Effectiveness of drug treatment courts: evidence from a randomized trial', *Criminology & Public Policy*, vol. 2, no. 2, pp 171-196.
- Greenberg, D 1979, *Mathematical criminology*, Rutgers University Press New Brunswick, New Jersey.
- Greene, W 2003, *Econometric analysis*, Prentice Hall, New Jersey.
- Greene, W 2007, *Discrete choice modelling*, New York University working paper EC-07-07, <http://ideas.repec.org/p/ste/nystbu/07-7.html>, accessed on 15 April 2009.
- Harvey, E, Shakeshaft, A, Hetherington, K, Sannibale, C & Mattick, R 2006, *Methodological review: outcome studies of diversion and aftercare programs for adult drug-involved offenders*, National Drug and Alcohol Research Centre, Sydney.
- Heale, P & Lang, E 1999, *Court referral and evaluation for drug intervention and treatment (CREDIT): final evaluation report*, Turning Point Alcohol and Drug Centre, Melbourne.
- Hua, J & Fitzgerald, J 2006, Matching court records to measure re-offending, *Crime and Justice Bulletin* no. 95, NSW Bureau of Crime Statistics and Research, Sydney.
- Latimer, J, Morton-Bourgon & K, Chrétien, J 2006, *A meta-analytic examination of drug treatment courts do they reduce recidivism?* Research and Statistics Division, Canadian Department of Justice.
- Lind, B, Weatherburn, D, Chen, S, Shanahan, M, Lancsar, E, Haas, M & De Abreu Lourenco, R 2002, *NSW Drug Court evaluation: cost-effectiveness*, NSW Bureau of Crime Statistics and Research, Sydney.
- Matruglio, T 2007, *MERIT: a program overview from 2000-2006*, Crime Prevention Division, Attorney General's Department, NSW Government, Sydney.
- Miethe, T, Lu, H & Reese, E 2000, 'Reintegrative shaming and recidivism risks in drug court: explanations for some unexpected findings', *Crime & Delinquency*, vol. 46, no. 4, pp 522-538.
- Miranda, A & Rabe-Hesketh, S 2005, *Maximum likelihood estimation of endogenous switching and sample selection models for binary, count, and ordinal variables*, Centre for Economic Research, Keele University.
- Moffatt, S & Poynton, S 2007, 'The deterrent effect of higher fines on recidivism: driving offences', *Crime and Justice Bulletin*, no. 106, NSW Bureau of Crime Statistics and Research, Sydney.
- NSW Government 1999, *NSW Drug Summit 1999: Government plan of action*, NSW Government, Sydney.

Passey, M 2003, *Evaluation of the Lismore MERIT pilot program: final report*, NSW Attorney General's Department, Sydney.

Passey, M, Bolitho, J, Scantleton, J & Flaherty, B 2007, 'The Magistrates Early Referral Into Treatment (MERIT) pilot program: court outcomes and recidivism', *The Australian and New Zealand Journal of Criminology*, vol. 40, no. 2, pp 199-217.

Smith, D & Paternoster, R 1990, 'Formal processing and future delinquency: deviance amplification as selection artefact', *Law & Society Review*, vol. 24, pp 1109-1132.

Smith, N & Jones, C 2008, 'Monitoring trends in re-offending among adult and juvenile offenders given non-custodial sanctions', *Crime and Justice Bulletin*, no. 110, NSW Bureau of Crime Statistics and Research, Sydney.

Uggen, C 1999, 'Ex-offenders and the conformist alternative: a job quality model of work and crime', *Social Problems*, vol. 46, pp 127-151.

Weatherburn, D & Bartels, L 2008, 'The recidivism of offenders given suspended sentences in New South Wales, Australia', *British Journal of Criminology*, vol. 48, no. 5, pp 667-683.

Weatherburn, D, Jones, C, Snowball, L & Hua, J 2008, *The NSW Drug Court: A re-evaluation of its effectiveness*, NSW Bureau of Crime Statistics and Research, Sydney.

Wilson, D, Mitchell, O & MacKenzie, D 2006, 'A systematic review of drug court effects on recidivism', *Journal of Experimental Criminology*, vol. 2, no. 4, pp 459-487.

Wooldridge, JM 2009, *Introductory econometrics: a modern approach*, South-Western Cengage Learning, Mason (US).

Wundersitz, J 2007, *Criminal justice responses to drug and drug-related offending: are they working?*, Australian Institute of Criminology, Canberra.

Yoo, B & Frick, K 2006, 'The instrumental variable method to study self-selection mechanism: a case of influenza vaccination', *Value in Health*, vol. 9, no. 2.

TECHNICAL APPENDIXES

TECHNICAL APPENDIX 1: JUSTIFICATION OF INSTRUMENT RELEVANCE AND VALIDITY

Formal justification of the relevance of legal representation as an instrument is given by conducting a likelihood ratio test of two different selection equation models. The model with legal representation and the other covariates explained significantly more variation in predicting selection into MERIT in comparison to a model that only included the covariates (LR $\chi^2(1) = 279.9$; $p = .000$). The result demonstrated that legal representation is a strong and relevant instrument in predicting treatment.

The validity of the instrument relates to the assumption that, after controlling for the other covariates and omitted variables, legal representation is unrelated to re-offending. The formal testing of instrument validity is more difficult than instrument relevance as by definition we do not know the specific nature of the omitted variables. As we did not have any alternative instruments known to be valid it was not possible to conduct over identification tests. The literature is consistent in stating that when other instruments known to be valid are not available, justification should be made primarily through providing a clear argument as to why the proposed instrument is unrelated to the outcome (Wooldridge 2009).

We argue that there is no logical reason why in itself, legal representation, should be related to whether a defendant re-offends. Any interaction between a legal representative and the defendant prior to or during the court proceedings is unlikely to change a defendant's propensity to re-offend. It is argued that, in the model, we have controlled for all variables likely to be related to both legal representation and re-offending. We have controlled for a variety of criminal history variables, socio-economic disadvantage (using the SEIFA index) and seriousness of the primary offence at the index court

date (using a covariate representing the most serious offences in the National Offence Index). We also argue that, after controlling for all other variables, defendants with a drug use problem are no more or less likely to be legally represented than similar defendants without a drug use problem.

It is sometimes possible to test instrument validity with some treatment effect estimation techniques by assuming identification off functional form, however these tests are often unreliable (Angrist 2001). We did test the validity of the legal representation instrument off the functional form of the bivariate probit model. Legal representation was significant in the outcome equation, indicating it could be invalid. However, testing instrument validity off the functional form of the bivariate probit model is known to be problematic (Angrist 2001). Consequently, we tested instrument validity using an alternative computational technique to derive the treatment effects model. Using the generalised method of moments (GMM) technique and with legal representation tightly specified (interaction of legal representation with index drug offence), the test of instrument validity off functional form provided support for the validity of the legal representation instrument. Further, the findings obtained using the GMM technique and the tightly specified legal representation instrument were substantively the same as those derived from the bivariate probit model.

Technical Appendix 2: Treatment effects models for the impact of the MERIT program on the any re-offence outcome for the intention-to treat sample

<i>Outcome Model</i>		<i>Model 1</i>			<i>Model 2</i>			<i>Model 3</i>			<i>Model 4</i>		
<i>Variable</i>	<i>Categories</i>	<i>Coef.</i>	<i>Std. Err</i>	<i>P-value</i>	<i>Coef.</i>	<i>Std. Err.</i>	<i>P-value</i>	<i>Coef.</i>	<i>Std. Err</i>	<i>P-value</i>	<i>Coef.</i>	<i>Std. Err</i>	<i>P-value</i>
Treatment	MERIT	0.41	0.16	0.01	-0.02	0.15	0.88	-0.14	0.15	0.35	-0.12	0.14	0.40
	*Control												
Gender	Male	0.19	0.02	> 0.01	0.09	0.02	> 0.01	0.09	0.02	> 0.01	0.09	0.02	> 0.01
	*Female												
Indigenous status	Yes	0.63	0.02	> 0.01	0.33	0.02	> 0.01	0.33	0.02	> 0.01	0.32	0.03	> 0.01
	*No												
Age (years)	18-22	0.29	0.02	> 0.01	0.39	0.02	> 0.01	0.35	0.02	> 0.01	0.35	0.02	> 0.01
	23-27	0.20	0.03	> 0.01	0.12	0.02	> 0.01	0.11	0.02	> 0.01	0.10	0.02	> 0.01
	28-33	0.15	0.02	> 0.01	0.07	0.02	> 0.01	0.07	0.02	0.01	0.06	0.02	0.01
	*34+												
Concurrent offences	*0												
	1				0.07	0.02	> 0.01	0.06	0.02	> 0.01	0.06	0.02	> 0.01
	2+				0.29	0.04	> 0.01	0.22	0.04	> 0.01	0.22	0.04	> 0.01
Prior offences	*0-1												
	2-4				0.50	0.02	> 0.01	0.31	0.02	> 0.01	0.30	0.02	> 0.01
	5-7				0.86	0.03	> 0.01	0.50	0.04	> 0.01	0.50	0.04	> 0.01
	8+				1.19	0.04	> 0.01	0.70	0.05	> 0.01	0.69	0.05	> 0.01
Offence two years prior	Yes							0.24	0.02	> 0.01	0.24	0.02	> 0.01
	*No												
Custody two years prior	Yes							0.22	0.03	> 0.01	0.21	0.03	> 0.01
	*No												
Prior theft offences	*0												
	1-3							0.12	0.03	> 0.01	0.12	0.03	> 0.01
	3+							0.26	0.04	> 0.01	0.25	0.04	> 0.01
Prior drug offence	Yes							0.08	0.03	> 0.01	0.07	0.03	0.01
	*No												
Offence seriousness	High										-0.04	0.02	0.04
	*Low												
Disadvantage	Less										0.03	0.02	0.07
	*More												
Remoteness	Less										-0.02	0.02	0.23
	*More												
Constant		-0.96	0.03	> 0.01	-1.17	0.03	> 0.01	-1.20	0.03	> 0.01	-1.19	0.03	> 0.01
<i>Treatment Model</i>		<i>Coef.</i>	<i>Std. Err</i>	<i>P-value</i>	<i>Coef.</i>	<i>Std. Err.</i>	<i>P-value</i>	<i>Coef.</i>	<i>Std. Err</i>	<i>P-value</i>	<i>Coef.</i>	<i>Std. Err</i>	<i>P-value</i>
Legal Representation	Yes	0.73	0.03	> 0.01	0.56	0.03	> 0.01	0.55	0.03	> 0.01	0.56	0.03	> 0.01
	*No												
Gender	Male	-0.06	0.03	0.02	-0.21	0.03	> 0.01	-0.18	0.03	> 0.01	-0.16	0.03	> 0.01
	*Female												
Indigenous status	Yes	0.14	0.03	> 0.01	-0.21	0.03	> 0.01	-0.18	0.03	> 0.01	-0.21	0.03	> 0.01
	*No												
Age (years)	18-22	0.23	0.03	> 0.01	0.33	0.03	> 0.01	0.26	0.03	> 0.01	0.23	0.03	> 0.01
	23-27	0.40	0.03	> 0.01	0.28	0.03	> 0.01	0.24	0.03	> 0.01	0.23	0.04	> 0.01
	28-33	0.32	0.03	> 0.01	0.23	0.03	> 0.01	0.21	0.03	> 0.01	0.21	0.04	> 0.01
	*34+												
Concurrent offences	*0												
	1				0.35	0.03	> 0.01	0.35	0.03	> 0.01	0.36	0.03	> 0.01
	2+				0.82	0.03	> 0.01	0.74	0.03	> 0.01	0.74	0.03	> 0.01
Prior offences	*0-1												
	2-4				0.61	0.03	> 0.01	0.22	0.04	> 0.01	0.22	0.04	> 0.01
	5-7				0.93	0.04	> 0.01	0.23	0.05	> 0.01	0.23	0.05	> 0.01
	8+				1.12	0.04	> 0.01	0.17	0.06	> 0.01	0.18	0.06	> 0.01
Offence two years prior	Yes							0.26	0.03	> 0.01	0.24	0.03	> 0.01
	*No												
Custody two years prior	Yes							0.20	0.03	> 0.01	0.21	0.03	> 0.01
	*No												
Prior theft offences	*0												
	1-3							0.31	0.03	> 0.01	0.30	0.03	> 0.01
	3+							0.57	0.05	> 0.01	0.55	0.05	> 0.01
Prior drug offence	Yes							0.36	0.03	> 0.01	0.35	0.03	> 0.01
	*No												
Offence seriousness	High										-0.25	0.03	> 0.01
	*Low												
Disadvantage	Less										-0.05	0.03	0.03
	*More												
Remoteness	Less										-0.19	0.03	> 0.01
	*More												
Constant		-2.09	0.04	> 0.01	-2.49	0.05	> 0.01	-2.56	0.05	> 0.01	-2.38	0.05	> 0.01
RHO		0.18	0.08		0.25	0.08		0.28	0.08		0.27	0.07	
LR test of rho (Chi ²)		Chi ² (1) =4.99, p > 0.01			Chi ² (1) =9.92, p > 0.01			Chi ² (1) =12.48, p > 0.01			Chi ² (1) =12.76, p > 0.01		
Log Likelihood		-22784.84			-20844.82			-20457.65			-20391.06		

* reference category

Technical Appendix 3: Treatment effects models for the impact of the MERIT program on the any re-offence outcome for the treated sample

<i>Outcome Model</i>		<i>Model 1</i>			<i>Model 2</i>			<i>Model 3</i>			<i>Model 4</i>		
<i>Variable</i>	<i>Categories</i>	<i>Coef.</i>	<i>Std. Err</i>	<i>P-value</i>	<i>Coef.</i>	<i>Std. Err.</i>	<i>P-value</i>	<i>Coef.</i>	<i>Std. Err</i>	<i>P-value</i>	<i>Coef.</i>	<i>Std. Err</i>	<i>P-value</i>
Treatment	MERIT	0.16	0.18	0.37	-0.26	0.17	0.13	-0.44	0.15	> 0.01	-0.42	0.15	0.01
	*Control												
Gender	Male	0.19	0.02	> 0.01	0.08	0.02	> 0.01	0.09	0.02	> 0.01	0.09	0.02	> 0.01
	*Female												
Indigenous status	Yes	0.63	0.02	> 0.01	0.33	0.03	> 0.01	0.32	0.03	> 0.01	0.31	0.03	> 0.01
	*No												
Age (years)	18-22	0.28	0.02	> 0.01	0.39	0.02	> 0.01	0.35	0.02	> 0.01	0.34	0.02	> 0.01
	23-27	0.20	0.03	> 0.01	0.10	0.03	> 0.01	0.10	0.02	> 0.01	0.09	0.02	> 0.01
	28-33	0.14	0.02	> 0.01	0.06	0.02	0.02	0.06	0.02	0.02	0.06	0.02	0.02
	*34+												
Concurrent offences	*0												
	1				0.08	0.02	> 0.01	0.07	0.02	> 0.01	0.07	0.02	> 0.01
	2+				0.26	0.04	> 0.01	0.22	0.04	> 0.01	0.22	0.04	> 0.01
Prior offences	*0-1												
	2-4				0.50	0.02	> 0.01	0.32	0.02	> 0.01	0.32	0.02	> 0.01
	5-7				0.86	0.03	> 0.01	0.51	0.04	> 0.01	0.51	0.04	> 0.01
	8+				1.19	0.04	> 0.01	0.71	0.05	> 0.01	0.70	0.05	> 0.01
Offence two years prior	Yes							0.24	0.02	> 0.01	0.23	0.02	> 0.01
	*No												
Custody two years prior	Yes							0.19	0.03	> 0.01	0.19	0.03	> 0.01
	*No												
Prior theft offences	*0												
	1-3							0.12	0.03	> 0.01	0.12	0.03	> 0.01
	3+							0.28	0.04	> 0.01	0.27	0.04	> 0.01
Prior drug offence	Yes							0.08	0.03	> 0.01	0.07	0.03	0.01
	*No												
Offence seriousness	High										-0.04	0.02	0.05
	*Low												
Disadvantage	Less										0.03	0.02	0.09
	*More												
Remoteness	Less										-0.02	0.02	0.17
	*More												
Constant		-0.96	0.03	> 0.01	-1.16	0.03	> 0.01	-1.19	0.03	> 0.01	-1.18	0.03	> 0.01
Treatment Model		Coef.	Std. Err	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err	P-value	Coef.	Std. Err	P-value
Legal Representation	Yes	0.78	0.04	> 0.01	0.65	0.04	> 0.01	0.65	0.04	> 0.01	0.67	0.04	> 0.01
	*No												
Gender	Male	-0.05	0.03	0.10	-0.18	0.03	> 0.01	-0.14	0.03	> 0.01	-0.12	0.04	> 0.01
	*Female												
Indigenous status	Yes	0.05	0.03	0.11	-0.25	0.04	> 0.01	-0.22	0.04	> 0.01	-0.24	0.04	> 0.01
	*No												
Age (years)	18-22	0.15	0.03	> 0.01	0.25	0.04	> 0.01	0.18	0.04	> 0.01	0.15	0.04	> 0.01
	23-27	0.34	0.03	> 0.01	0.24	0.04	> 0.01	0.19	0.04	> 0.01	0.18	0.04	> 0.01
	28-33	0.27	0.04	> 0.01	0.19	0.04	> 0.01	0.17	0.04	> 0.01	0.17	0.04	> 0.01
	*34+												
Concurrent offences	*0												
	1	-2.27	0.05	> 0.01	0.34	0.03	> 0.01	0.33	0.03	> 0.01	0.35	0.03	> 0.01
	2+	0.25	0.09		0.69	0.04	> 0.01	0.65	0.04	> 0.01	0.66	0.04	> 0.01
Prior offences	*0-1												
	2-4				0.57	0.03	> 0.01	0.22	0.04	> 0.01	0.23	0.04	> 0.01
	5-7				0.85	0.04	> 0.01	0.23	0.05	> 0.01	0.24	0.06	> 0.01
	8+				1.01	0.04	> 0.01	0.17	0.07	0.01	0.19	0.07	> 0.01
Offence two years prior	Yes							0.23	0.03	> 0.01	0.22	0.03	> 0.01
	*No												
Custody two years prior	Yes							0.03	0.04	0.33	0.04	0.04	0.26
	*No												
Prior theft offences	*0												
	1-3							0.29	0.04	> 0.01	0.28	0.04	> 0.01
	3+							0.55	0.05	> 0.01	0.52	0.05	> 0.01
Prior drug offence	Yes							0.36	0.03	> 0.01	0.35	0.03	> 0.01
	*No												
Offence seriousness	High										-0.24	0.03	> 0.01
	*Low												
Disadvantage	Less										-0.04	0.03	0.14
	*More												
Remoteness	Less										-0.13	0.03	> 0.01
	*More												
Constant		-2.27	0.05	> 0.01	-2.64	0.05	> 0.01	-2.72	0.05	> 0.01	-2.58	0.06	> 0.01
RHO		0.25	0.09		0.32	0.09		0.39	0.08		0.38	0.08	
LR test of rho (Chi ²)		Chi ² (1) =6.65, p= 0.01			Chi ² (1) =12.47, p > 0.01			Chi ² (1) =21.31, p > 0.01			Chi ² (1) =21.48, p > 0.01		
Log Likelihood		-20476.29			-18970.80			-18689.16			-18646.88		

* reference category

Technical Appendix 4: Treatment effects models for the impact of the MERIT program on the any theft offence outcome for the intention-to treat sample

Outcome Model		Model 1			Model 2			Model 3			Model 4		
Variable	Categories	Coef.	Std. Err	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err	P-value	Coef.	Std. Err	P-value
Treatment	MERIT *Control	0.84	0.19	> 0.01	0.29	0.22	0.19	-0.56	0.17	> 0.01	-0.43	0.19	0.03
Gender	Male *Female	-0.11	0.03	> 0.01	-0.25	0.03	> 0.01	-0.16	0.03	> 0.01	-0.15	0.03	> 0.01
Indigenous status	Yes *No	0.38	0.03	> 0.01	0.06	0.03	0.08	0.06	0.03	0.08	0.08	0.03	0.02
Age (years)	18-22	0.30	0.03	> 0.01	0.43	0.03	> 0.01	0.36	0.03	> 0.01	0.35	0.03	> 0.01
	23-27	0.27	0.03	> 0.01	0.18	0.04	> 0.01	0.17	0.04	> 0.01	0.16	0.04	> 0.01
	28-33	0.18	0.03	> 0.01	0.11	0.04	> 0.01	0.12	0.04	> 0.01	0.11	0.04	> 0.01
	*34+												
Concurrent offences	*0												
	1				0.02	0.03	0.45	0.08	0.04	0.03	0.07	0.04	0.06
	2+				0.35	0.06	> 0.01	0.34	0.06	> 0.01	0.32	0.06	> 0.01
Prior offences	*0-1												
	2-4				0.47	0.04	> 0.01	0.14	0.04	> 0.01	0.14	0.04	> 0.01
	5-7				0.89	0.05	> 0.01	0.20	0.05	> 0.01	0.20	0.05	> 0.01
	8+				1.23	0.06	> 0.01	0.26	0.06	> 0.01	0.26	0.06	> 0.01
Index theft offence	Yes No							0.44	0.03	> 0.01	0.37	0.03	> 0.01
Offence two years prior	Yes *No							0.24	0.03	> 0.01	0.22	0.03	> 0.01
Custody two years prior	Yes *No							0.34	0.03	> 0.01	0.34	0.03	> 0.01
Prior theft offences	*0												
	1-3							0.41	0.03	> 0.01	0.41	0.03	> 0.01
	3+							0.82	0.04	> 0.01	0.80	0.05	> 0.01
Prior drug offence	Yes *No							0.18	0.04	> 0.01	0.16	0.04	> 0.01
Offence seriousness	High *Low										-0.14	0.03	> 0.01
Disadvantage	Less *More										0.03	0.02	0.30
Remoteness	Less *More										0.08	0.03	0.01
Constant		-1.62	0.03	> 0.01	-1.85	0.04	> 0.01	-2.07	0.04	> 0.01	-2.08	0.05	> 0.01
Treatment Model		Coef.	Std. Err	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err	P-value	Coef.	Std. Err	P-value
Legal Representation	Yes *No	0.73	0.03	> 0.01	0.56	0.03	> 0.01	0.53	0.03	> 0.01	0.54	0.03	> 0.01
Gender	Male *Female	-0.06	0.03	0.02	-0.22	0.03	> 0.01	-0.13	0.03	> 0.01	-0.12	0.03	> 0.01
Indigenous status	Yes *No	0.14	0.03	> 0.01	-0.21	0.03	> 0.01	-0.15	0.03	> 0.01	-0.19	0.03	> 0.01
Age (years)	18-22	0.23	0.03	> 0.01	0.33	0.03	> 0.01	0.25	0.03	> 0.01	0.23	0.03	> 0.01
	23-27	0.41	0.03	> 0.01	0.29	0.03	> 0.01	0.23	0.03	> 0.01	0.23	0.04	> 0.01
	28-33	0.33	0.03	> 0.01	0.23	0.03	> 0.01	0.21	0.03	> 0.01	0.20	0.04	> 0.01
	*34+												
Concurrent offences	*0				0.36	0.03	> 0.01	0.35	0.03	> 0.01	0.36	0.03	> 0.01
	1				0.83	0.03	> 0.01	0.71	0.03	> 0.01	0.71	0.04	> 0.01
	2+												
Prior offences	*0-1												
	2-4				0.61	0.03	> 0.01	0.24	0.04	> 0.01	0.23	0.04	> 0.01
	5-7				0.93	0.04	> 0.01	0.27	0.05	> 0.01	0.26	0.05	> 0.01
	8+				1.12	0.04	> 0.01	0.20	0.06	> 0.01	0.20	0.06	> 0.01
Index theft offence	Yes *No							0.32	0.03	> 0.01	0.29	0.03	> 0.01
Offence two years prior	Yes *No							0.26	0.03	> 0.01	0.25	0.03	> 0.01
Custody two years prior	Yes *No							0.19	0.03	> 0.01	0.20	0.03	> 0.01
Prior theft offences	*0												
	1-3							0.25	0.03	> 0.01	0.26	0.03	> 0.01
	3+							0.44	0.05	> 0.01	0.46	0.05	> 0.01
Prior drug offence	Yes *No							0.37	0.03	> 0.01	0.36	0.03	> 0.01
Offence seriousness	High *Low										-0.13	0.03	> 0.01
Disadvantage	Less *More										-0.05	0.03	0.03
Remoteness	Less *More										-0.20	0.03	> 0.01
Constant		-2.10	0.04	> 0.01	-2.49	0.05	> 0.01	-2.67	0.05	> 0.01	-2.49	0.05	> 0.01
RHO		0.04	0.10		0.16	0.12		0.55	0.10		0.47	0.11	
LR test of rho (Chi ²)		Chi ² (1)=0.18, p= .67			Chi ² (1)=2.01, p= .16			Chi ² (1)=19.84, p > 0.01			Chi ² (1)=15.80, p > 0.01		
Log Likelihood		-14989.68			-13316.80			-12536.90			-12475.10		

* reference category

Note: Theft index offence variable is included in the model

Technical Appendix 5: Treatment effects models for the impact of the MERIT program on the any theft offence outcome for the treated sample

Outcome Model		Model 1			Model 2			Model 3			Model 4		
Variable	Categories	Coef.	Std. Err	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err	P-value	Coef.	Std. Err	P-value
Treatment	MERIT *Control	0.71	0.24	> 0.01	0.29	0.27	0.28	-0.68	0.17	> 0.01	-0.53	0.20	0.01
Gender	Male *Female	-0.12	0.03	> 0.01	-0.25	0.03	> 0.01	-0.16	0.03	> 0.01	-0.16	0.03	> 0.01
Indigenous status	Yes *No	0.38	0.03	> 0.01	0.06	0.03	0.10	0.05	0.03	0.13	0.08	0.04	0.03
Age (years)	18-22	0.30	0.03	> 0.01	0.42	0.03	> 0.01	0.34	0.03	> 0.01	0.33	0.03	> 0.01
	23-27	0.26	0.04	> 0.01	0.17	0.04	> 0.01	0.14	0.04	> 0.01	0.14	0.04	> 0.01
	28-33	0.17	0.03	> 0.01	0.09	0.04	0.02	0.10	0.04	0.01	0.09	0.04	0.02
	*34+												
Concurrent offences	*0												
	1				0.02	0.03	0.50	0.07	0.03	0.04	0.06	0.03	0.07
	2+				0.30	0.06	> 0.01	0.30	0.05	> 0.01	0.28	0.05	> 0.01
Prior offences	*0-1												
	2-4				0.46	0.04	> 0.01	0.15	0.04	> 0.01	0.15	0.04	> 0.01
	5-7				0.87	0.05	> 0.01	0.22	0.05	> 0.01	0.22	0.05	> 0.01
	8+				1.21	0.06	> 0.01	0.29	0.06	> 0.01	0.29	0.06	> 0.01
Index theft offence	Yes							0.44	0.03	> 0.01	0.37	0.03	> 0.01
	No												
Offence two years prior	Yes *No							0.21	0.03	> 0.01	0.20	0.03	> 0.01
Custody two years prior	Yes *No							0.30	0.03	> 0.01	0.30	0.03	> 0.01
Prior theft offences	*0												
	1-3							0.41	0.03	> 0.01	0.40	0.03	> 0.01
	3+							0.81	0.05	> 0.01	0.79	0.05	> 0.01
Prior drug offence	Yes *No							0.17	0.04	> 0.01	0.15	0.04	> 0.01
Offence seriousness	High *Low										-0.14	0.03	> 0.01
Disadvantage	Less *More										0.02	0.03	0.35
Remoteness	Less *More										0.08	0.03	> 0.01
Constant		-1.61	0.03	> 0.01	-1.84	0.04	> 0.01	-2.06	0.04	> 0.01	-2.07	0.05	> 0.01
Treatment Model		Coef.	Std. Err	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err	P-value	Coef.	Std. Err	P-value
Legal Representation	Yes *No	0.77	0.04	> 0.01	0.64	0.04	> 0.01	0.63	0.04	> 0.01	0.64	0.04	> 0.01
Gender	Male *Female	-0.05	0.03	0.10	-0.19	0.03	> 0.01	-0.09	0.04	0.02	-0.08	0.04	0.02
Indigenous status	Yes *No	0.05	0.03	0.14	-0.26	0.04	> 0.01	-0.19	0.04	> 0.01	-0.22	0.04	> 0.01
Age (years)	18-22	0.15	0.03	> 0.01	0.25	0.04	> 0.01	0.16	0.04	> 0.01	0.15	0.04	> 0.01
	23-27	0.35	0.03	> 0.01	0.24	0.04	> 0.01	0.19	0.04	> 0.01	0.18	0.04	> 0.01
	28-33	0.27	0.04	> 0.01	0.19	0.04	> 0.01	0.17	0.04	> 0.01	0.17	0.04	> 0.01
	*34+												
Concurrent offences	*0												
	1				0.34	0.03	> 0.01	0.34	0.03	> 0.01	0.35	0.03	> 0.01
	2+				0.70	0.04	> 0.01	0.62	0.04	> 0.01	0.63	0.04	> 0.01
Prior offences	*0-1												
	2-4				0.58	0.03	> 0.01	0.24	0.04	> 0.01	0.24	0.04	> 0.01
	5-7				0.85	0.04	> 0.01	0.26	0.06	> 0.01	0.26	0.06	> 0.01
	8+				1.01	0.04	> 0.01	0.20	0.07	> 0.01	0.20	0.07	> 0.01
Index theft offence	Yes							0.32	0.03	> 0.01	0.28	0.03	> 0.01
	No												
Offence two years prior	Yes *No							0.24	0.03	> 0.01	0.23	0.03	> 0.01
Custody two years prior	Yes *No							0.02	0.04	0.56	0.03	0.04	0.39
Prior theft offences	*0												
	1-3							0.24	0.04	> 0.01	0.24	0.04	> 0.01
	3+							0.44	0.05	> 0.01	0.45	0.05	> 0.01
Prior drug offence	Yes *No							0.37	0.03	> 0.01	0.36	0.03	> 0.01
Offence seriousness	High *Low										-0.12	0.04	> 0.01
Disadvantage	Less *More										-0.04	0.03	0.11
Remoteness	Less *More										-0.14	0.03	> 0.01
Constant		-2.27	0.05	> 0.01	-2.64	0.05	> 0.01	-2.83	0.06	> 0.01	-2.69	0.06	> 0.01
RHO		0.04	0.12		0.10	0.14		0.55	0.10		0.47	0.11	
LR test of rho (Chi ²)		Chi ² (1) =0.130, p= 0.71			Chi ² (1) =0.50, p= 0.48			Chi ² (1) =17.8 0, p > 0.01			Chi ² (1) =12.10, p > 0.01		
Log Likelihood		-12636.51			-11398.70			-10761.96			-10725.60		

* reference category

Note: Theft index offence variable is included in the model

Technical Appendix 6: Treatment effects models for the impact of the MERIT program on the any drug offence outcome for the intention-to-treat sample

Outcome Model		Model 1			Model 2			Model 3			Model 4		
Variable	Categories	Coef.	Std. Err	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err	P-value	Coef.	Std. Err	P-value
Treatment	MERIT *Control	0.51	0.21	0.01	-0.20	0.18	0.27	-0.34	0.16	0.03	-0.30	0.16	0.06
Gender	Male *Female	0.18	0.04	> 0.01	0.07	0.04	0.06	0.07	0.04	0.08	0.08	0.04	0.04
Indigenous status	Yes *No	0.24	0.03	> 0.01	-0.01	0.04	0.70	0.02	0.04	0.54	0.03	0.04	0.41
Age (years)	18-22	0.03	0.04	0.38	0.14	0.04	> 0.01	0.13	0.04	> 0.01	0.11	0.04	> 0.01
	23-27	0.12	0.04	> 0.01	0.08	0.04	0.04	0.08	0.04	0.05	0.07	0.04	0.08
	28-33	0.09	0.04	0.03	0.04	0.04	0.25	0.05	0.04	0.22	0.04	0.04	0.28
	*34+												
Concurrent offences	*0												
	1				0.13	0.04	> 0.01	0.15	0.04	> 0.01	0.15	0.04	> 0.01
	2+				0.34	0.06	> 0.01	0.32	0.06	> 0.01	0.32	0.06	> 0.01
Prior offences	*0-1												
	2-4				0.42	0.04	> 0.01	0.13	0.04	> 0.01	0.13	0.04	> 0.01
	5-7				0.72	0.05	> 0.01	0.23	0.05	> 0.01	0.23	0.06	> 0.01
	8+				0.95	0.06	> 0.01	0.29	0.06	> 0.01	0.30	0.06	> 0.01
Index drug offence	Yes							0.54	0.04	> 0.01	0.53	0.04	> 0.01
	No												
Offence two years prior	Yes							0.20	0.03	> 0.01	0.20	0.03	> 0.01
	*No												
Custody two years prior	Yes							0.21	0.04	> 0.01	0.21	0.04	> 0.01
	*No												
Prior theft offences	*0												
	1-3							0.23	0.04	> 0.01	0.21	0.04	> 0.01
	3+							0.29	0.06	> 0.01	0.27	0.06	> 0.01
Prior drug offence	Yes							0.31	0.03	> 0.01	0.31	0.03	> 0.01
	*No												
Offence seriousness	High										-0.09	0.03	0.01
	*Low												
Disadvantage	Less										-0.01	0.03	0.63
	*More												
Remoteness	Less										0.01	0.03	0.84
	*More												
Constant		-1.96	0.04	> 0.01	-2.14	0.04	> 0.01	-2.30	0.05	> 0.01	-2.27	0.05	> 0.01
Treatment Model		Coef.	Std. Err	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err	P-value	Coef.	Std. Err	P-value
Legal Representation	Yes	0.73	0.03	> 0.01	0.55	0.03	> 0.01	0.57	0.04	> 0.01	0.59	0.04	> 0.01
	*No												
Gender	Male	-0.06	0.03	0.02	-0.21	0.03	> 0.01	-0.20	0.03	> 0.01	-0.18	0.03	> 0.01
	*Female												
Indigenous status	Yes	0.14	0.03	> 0.01	-0.21	0.03	> 0.01	-0.15	0.03	> 0.01	-0.18	0.03	> 0.01
	*No												
Age (years)	18-22	0.23	0.03	> 0.01	0.34	0.03	> 0.01	0.30	0.04	> 0.01	0.27	0.04	> 0.01
	23-27	0.41	0.03	> 0.01	0.29	0.03	> 0.01	0.27	0.04	> 0.01	0.26	0.04	> 0.01
	28-33	0.33	0.03	> 0.01	0.23	0.03	> 0.01	0.23	0.04	> 0.01	0.23	0.04	> 0.01
	*34+												
Concurrent offences	*0												
	1				0.35	0.03	> 0.01	0.38	0.03	> 0.01	0.40	0.03	> 0.01
	2+				0.83	0.03	> 0.01	0.80	0.04	> 0.01	0.82	0.04	> 0.01
Prior offences	*0-1												
	2-4				0.62	0.03	> 0.01	0.25	0.04	> 0.01	0.25	0.04	> 0.01
	5-7				0.93	0.04	> 0.01	0.26	0.05	> 0.01	0.27	0.05	> 0.01
	8+				1.13	0.04	> 0.01	0.21	0.06	> 0.01	0.23	0.06	> 0.01
Index drug offence	Yes							0.77	0.03	> 0.01	0.78	0.03	> 0.01
	*No												
Offence two years prior	Yes							0.29	0.03	> 0.01	0.27	0.03	> 0.01
	*No												
Custody two years prior	Yes							0.25	0.03	> 0.01	0.26	0.03	> 0.01
	*No												
Prior theft offences	*0												
	1-3							0.33	0.03	> 0.01	0.31	0.04	> 0.01
	3+							0.62	0.05	> 0.01	0.59	0.05	> 0.01
Prior drug offence	Yes							0.25	0.03	> 0.01	0.24	0.03	> 0.01
	*No												
Offence seriousness	High										-0.28	0.03	> 0.01
	*Low												
Disadvantage	Less										-0.06	0.03	0.01
	*More												
Remoteness	Less										-0.20	0.03	> 0.01
	*More												
Constant		-2.10	0.04	> 0.01	-2.49	0.05	> 0.01	-2.79	0.05	> 0.01	-2.60	0.06	> 0.01
RHO		0.09	0.11		0.36	0.10		0.37	0.09		0.35	0.09	
LR test of rho (Chi ²)		Chi ² (1)=0.68, p= .41			Chi ² (1)=12.10, p= .16			Chi ² (1)=15.88, p > 0.01			Chi ² (1)=14.22, p > 0.01		
Log Likelihood		-12702.01			-11424.32			-10739.43			-10664.44		

* reference category

Note: Drug index offence variable is included in the model

Technical Appendix 7: Treatment effects models for the impact of the MERIT program on the any drug offence outcome for the treated sample

Outcome Model		Model 1			Model 2			Model 3			Model 4		
Variable	Categories	Coef.	Std. Err	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err	P-value	Coef.	Std. Err	P-value
Treatment	MERIT *Control	0.51	0.29	0.08	-0.12	0.23	0.62	-0.37	0.18	0.04	-0.31	0.18	0.08
Gender	Male *Female	0.20	0.04	> 0.01	0.10	0.04	0.01	0.10	0.04	0.01	0.11	0.04	0.01
Indigenous status	Yes *No	0.25	0.04	> 0.01	-0.01	0.04	0.83	0.02	0.04	0.58	0.03	0.04	0.41
Age (years)	18-22	0.04	0.04	0.24	0.13	0.04	> 0.01	0.12	0.04	> 0.01	0.11	0.04	0.01
	23-27	0.11	0.04	0.01	0.05	0.04	0.22	0.05	0.04	0.23	0.04	0.04	0.29
	28-33	0.07	0.04	0.09	0.01	0.04	0.76	0.02	0.04	0.64	0.01	0.04	0.75
	*34+												
Concurrent offences	*0												
	1				0.11	0.04	> 0.01	0.13	0.04	> 0.01	0.13	0.04	> 0.01
	2+				0.28	0.06	> 0.01	0.29	0.06	> 0.01	0.28	0.06	> 0.01
Prior offences	*0-1												
	2-4				0.40	0.04	> 0.01	0.14	0.04	> 0.01	0.14	0.04	> 0.01
	5-7				0.69	0.05	> 0.01	0.24	0.06	> 0.01	0.25	0.06	> 0.01
	8+				0.93	0.06	> 0.01	0.32	0.07	> 0.01	0.33	0.07	> 0.01
Index drug offence	Yes							0.53	0.04	> 0.01	0.51	0.04	> 0.01
	No												
Offence two years prior	Yes *No							0.19	0.04	> 0.01	0.19	0.04	> 0.01
Custody two years prior	Yes *No							0.19	0.04	> 0.01	0.18	0.04	> 0.01
Prior theft offences	*0												
	1-3							0.22	0.04	> 0.01	0.21	0.04	> 0.01
	3+							0.30	0.06	> 0.01	0.27	0.06	> 0.01
Prior drug offence	Yes *No							0.30	0.04	> 0.01	0.29	0.04	> 0.01
Offence seriousness	High *Low										-0.07	0.03	0.03
Disadvantage	Less *More										-0.01	0.03	0.70
Remoteness	Less *More										0.02	0.03	0.57
Constant		-1.98	0.04	> 0.01	-2.17	0.05	> 0.01	-2.33	0.05	> 0.01	-2.31	0.05	> 0.01
Treatment Model		Coef.	Std. Err	P-value	Coef.	Std. Err.	P-value	Coef.	Std. Err	P-value	Coef.	Std. Err	P-value
Legal Representation	Yes *No	0.77	0.04	> 0.01	0.64	0.04	> 0.01	0.68	0.04	> 0.01	0.71	0.04	> 0.01
Gender	Male *Female	-0.05	0.03	0.10	-0.19	0.03	> 0.01	-0.16	0.04	> 0.01	-0.14	0.04	> 0.01
Indigenous status	Yes *No	0.05	0.03	0.14	-0.26	0.04	> 0.01	-0.19	0.04	> 0.01	-0.21	0.04	> 0.01
Age (years)	18-22	0.15	0.03	> 0.01	0.25	0.04	> 0.01	0.21	0.04	> 0.01	0.18	0.04	> 0.01
	23-27	0.35	0.03	> 0.01	0.24	0.04	> 0.01	0.22	0.04	> 0.01	0.21	0.04	> 0.01
	28-33	0.27	0.04	> 0.01	0.19	0.04	> 0.01	0.19	0.04	> 0.01	0.19	0.04	> 0.01
	*34+												
Concurrent offences	*0												
	1				0.34	0.03	> 0.01	0.37	0.03	> 0.01	0.39	0.03	> 0.01
	2+				0.70	0.04	> 0.01	0.72	0.04	> 0.01	0.73	0.04	> 0.01
Prior offences	*0-1												
	2-4				0.58	0.03	> 0.01	0.26	0.04	> 0.01	0.27	0.04	> 0.01
	5-7				0.85	0.04	> 0.01	0.27	0.06	> 0.01	0.29	0.06	> 0.01
	8+				1.01	0.04	> 0.01	0.21	0.07	> 0.01	0.24	0.07	> 0.01
Index drug offence	Yes							0.79	0.04	> 0.01	0.81	0.04	> 0.01
	No												
Offence two years prior	Yes *No							0.27	0.03	> 0.01	0.25	0.03	> 0.01
Custody two years prior	Yes *No							0.07	0.04	0.04	0.08	0.04	0.03
Prior theft offences	*0												
	1-3							0.31	0.04	> 0.01	0.30	0.04	> 0.01
	3+							0.61	0.05	> 0.01	0.58	0.05	> 0.01
Prior drug offence	Yes *No							0.25	0.03	> 0.01	0.24	0.04	> 0.01
Offence seriousness	High *Low										-0.28	0.03	> 0.01
Disadvantage	Less *More										-0.06	0.03	0.05
Remoteness	Less *More										-0.14	0.03	> 0.01
Constant		-2.27	0.05	> 0.01	-2.64	0.05	> 0.01	-2.98	0.06	> 0.01	-2.82	0.06	> 0.01
RHO		0.05	0.14		0.26	0.13		0.34	0.10		0.31	0.10	
LR test of rho (Chi ²)		Chi ² (1) = 0.12, p = .73			Chi ² (1) = 3.93, p = .05			Chi ² (1) = 10.23, p > 0.01			Chi ² (1) = 8.42, p > 0.01		
Log Likelihood		-104499.79			-9619.00			-9065.81			-9016.52		

* reference category

Note: Drug index offence variable is included in the model

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