

Parole Supervision and Re-offending: A propensity score matching analysis

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Introduction

In the 2010-2011 financial year, Australian courts sentenced 28,609 offenders to a term of imprisonment (Australian Bureau of Statistics 2012). The vast majority of these offenders will ultimately be released back into the community. Sadly, the majority of those released from prison will also eventually return. In 2011, 61 per cent of Australian prisoners had been in prison before (Australian Bureau of Statistics 2011a). Prison may be effective (Wan et al. 2012) but it is a very expensive form of crime control. In the last financial year, Australia spent \$2.4 billion annually on prisons. National expenditure per person increased in real terms over the last five years from \$131 in 2007-8 to \$139 in 2011-12 (SCRGSP 2013).

Past research (Weatherburn et al. 2009) has shown that one of the major drivers of high imprisonment rates is the high rate of return to custody. In NSW, for example, an estimated 58 per cent of prisoners (74% of Indigenous prisoners) released from custody eventually return to custody. Slight reductions in the rate of return to custody have the potential to produce significant savings in correctional outlays. Weatherburn et al. (2009) estimated that a 10 per cent reduction in the overall rate of return to prison in NSW, would reduce the NSW sentenced prisoner population by 800 inmates, saving \$28 million per annum. A 10 per cent reduction in the rate of return to prison by Indigenous offenders would reduce the number in prison by 365 inmates, resulting in savings of more than \$10 million per annum.

The primary means by which correctional authorities seek to limit the rate of re-offending and the rate of return to prison is to provide supervision and support to offenders following release (hereafter referred to simply as ‘supervised release’). Remarkably little is known about the overall effectiveness of supervised release in reducing re-offending. We know that intensive supervision without treatment is no more effective in reducing re-offending than non-intensive supervision (Aos et al. 2006). However the evidence is unclear as to whether those released into the community from prison with a supervision requirement are less likely to re-offend than those released without a supervision requirement.

This issue is important for most Australian States and Territories as most (e.g. NSW, Victoria, Queensland, South Australia, Tasmania, Northern Territory) permit both ‘fixed term’ and ‘non-parole period’ sentences (McKnight 2012). If supervision confers no benefit in terms of re-offending risk, it may be worth considering whether post-release supervision should be strengthened in some way to render it effective. On the other hand, a finding that

supervision does reduce the risk of re-offending would raise the question of whether fixed-term sentences or sentences that include no form of post-release supervision should be restricted or abandoned.

Past Research

Past research provides little guidance on which of these outcomes is more likely. As recently as 2005, the Urban Institute noted that, although 774,00 men and women in 2003 were under parole supervision in the United States, ‘remarkably little is known about whether parole supervision increases public safety or improves re-entry transitions’ (Solomon, Kachnowski & Bhati, 2005). Reviewing the situation in Britain, Shute (2004) remarked that after 35 years of research it was still unclear whether parole release has a beneficial effect on recidivism.

There are two reasons for the dismal state of research on parole effectiveness. One is that researchers have been more preoccupied with determining what sorts of *programs* reduce re-offending by parolees than with determining whether whole systems of conditional release are effective in reducing re-offending. There is, for example a very large literature on the effectiveness of intensive supervision compared with ‘normal’ supervision in reducing re-offending and on whether supervision needs to be combined with treatment in order to be effective (MacKenzie 2002). The second and more fundamental problem is one of selection bias. It is easy enough to compare re-offending rates amongst those released from custody without supervision and those released under supervision. The problem lies in interpreting the results. When one group of offenders performs better than another, it is hard to tell whether the better performance reflects the mode of release or pre-existing differences in the characteristics of offenders released with and without supervision. Ellis and Marshall (2000), for example, controlled for age, sentence length, principal offence type, age at first conviction, number of prior convictions and number of prior imprisonments but did not control for the types of prior convictions although research has since revealed that the type of prior conviction is a predictor of re-offending (Poynton & Weatherburn 2012).

The ideal defense against selection bias is a randomized controlled trial (RCT). For ethical reasons, very few studies have been able to use this methodology. One of the few is a study by Green & Winik (2010). They tracked 1,003 offenders convicted of drug-related offences who were randomly assigned to one of nine judicial calendars between June 2002 and May 2003. Judges on these calendars handed down sentences that varied substantially in terms of

prison and probation time. The offenders were followed up for four years, with re-arrest being used as a measure of re-offending. Green and Winik (2010) found no significant effect of probation length on the risk of re-arrest

Two other studies which have applied rigorous methodologies to assess the efficacy of parole are also worth mentioning here. Jackson (1983) analysed the re-offending rates of 314 young offenders on parole in California who were randomly assigned to discharge from parole or retention on regular parole supervision. He measured re-offending over a 26-month follow-up period using police arrest and conviction data and found no difference between the two groups in the extent of re-offending or in the time to new offence or conviction. Drake and Barnoski (2006) exploited the conditions of a natural experiment created by a legislative change in Washington State that eliminated parole supervision for all juveniles except the highest risk and those convicted of a sex offence. Parole was subsequently reinstated in this state 12 months later, however by this time a large number of juvenile offenders had been released into the community without parole supervision. Comparing the 36-month re-conviction rate of young offenders released after the new laws were passed with those who were released before the legislative changes and after parole was reinstated showed no significant differences between the Parole and No-Parole cohorts.

These two studies bring into question the effectiveness of standard parole supervision in reducing recidivism rates, but the extent to which their findings can be generalised to the Australian adult offender population is not clear. As far as we have been able to determine, only two studies have ever been published comparing re-offending rates among prisoners released with and without conditions in Australia (Broadhurst & Loh 2003; Smith & Jones 2008). One (Broadhurst & Loh 2003) found lower rates of re-offending amongst parolees than among offenders released without supervision. Smith and Jones (2008) found the opposite result. The only other Australian study of relevance is one conducted by Weatherburn and Trimboli (2008). They compared offenders placed on supervised bonds with offenders placed on unsupervised bonds and found no difference in rates of reconviction after controlling for a wide range of factors, including: age, gender, Indigenous status, principal offence, plea, number of concurrent convictions, number of prior convictions, bail status. One significant limitation in both the Smith and Jones (2008) and Weatherburn and Trimboli (2008) studies is that correctional authorities in NSW adjust the level of supervision

to the assessed risk of re-offending. It is quite possible many of those nominally on ‘supervised’ bonds were actually subjected to fairly minimal supervision.

Although correctional authorities are generally reluctant to test the effectiveness of correctional policies and programs using an RCT, some statistical methods offer a much more credible defence against selection bias than others. Propensity score matching (PSM), for example, is generally considered to be a more effective way of controlling on ‘observables’ (i.e. factors that can be measured) than conventional regression methods (e.g. logistic regression) which simply include these variables as controls. Conventional regression methods do not provide complete assurance that two groups being compared are identical (within the limits of chance) in terms of the factors included in the regression model. Properly implemented, propensity score matching does provide such assurance.

As far as we have been able to determine no study using PSM has ever been conducted to examine the effectiveness of parole in reducing re-offending. Most studies rely on standard regression methods to limit the risk of selection bias. Most also employ fairly limited controls. A further weakness in past research is that much of it has focused on only one outcome: the probability of reconviction. Post-release supervision may influence the time to the next conviction even if it has no effect on the probability of reconviction. An increase in the time to next conviction would signal a slow-down in the rate of offending—a finding that from a public safety perspective would be considered a highly desirable outcome. Post-release supervision may also reduce the seriousness of any further offending or the likelihood of another imprisonment penalty—both highly desirable outcomes.

The current study

Other things being equal, we would expect offenders granted unconditional release to be more likely to re-offend, to re-offend more quickly, to re-offend more often and to commit more serious offences than offenders released conditionally into the community. Further, if supervision is the mechanism by which conditional release affects re-offending risk then we would expect offenders who receive minimal supervision to be more likely to re-offend, to re-offend more quickly, to re-offend more often and to commit more serious offences than offenders who are more actively supervised. The current study, then, seeks to address four questions of importance:

1. Does unconditional release increase the risk, speed or seriousness of further offending compared with conditional release?
2. Does unconditional release increase the likelihood of re-imprisonment compared with conditional release?
3. Does less frequent supervision increase the risk, speed or seriousness of further offending compared with more frequent supervision?
4. Does less frequent supervision increase the likelihood of re-imprisonment compared with more frequent supervision?

The study improves on past research in five ways:

- We use PSM rather than conventional regression methods to control for selection bias
- We include a wider range of controls than past studies
- We measure a wider range of outcomes than past studies
- We restrict our attention to offenders who we know are being actively supervised
- We quantify the effects of level of supervision

Before we describe in detail how we answered the research questions, a threshold issue needs to be addressed. The study requires us to compare outcomes for two groups: offenders released without supervision and offenders released to parole. A question of obvious importance is whether these two groups are sufficiently alike in their extraneous particulars to permit inferences about the effect of supervision on re-offending. The short answer to this question, explained in more detail below, is that we will be conducting our analysis on offenders who have been matched in terms of extraneous factors that might influence re-offending (e.g. age, gender, offence type etc.). This possibility arises because judges confronting similar cases do not always respond similarly. The same offender, who one judge may give a fixed term sentence to, might be given a sentence with a non-parole period by another. In this study we also compare outcomes for two subgroups of parolees: offenders who have a high level of supervision post-release and offenders who have a low level of supervision post-release. Again, in order to make inferences about the effect of supervision intensity on re-offending, we need these two groups to be sufficiently alike. This is complicated by the fact that frequency of contact may be expected to be partly determined by risk level. Fortunately, past research suggests that supervision intensity depends on factors other than just risk of re-offending (e.g. the workload of the parole officer, the level of

experience of the parole officer and the geographical proximity of the client to the parole office (Byrne & Kelly 1989). We might therefore expect to see variation in the level of supervision contact even amongst offenders who have been assessed at the same level of re-offending risk. A key part of our analysis will involve testing how similar the groups being compared are to each other.

Method

Data source – Corrective Services NSW provided data on all offenders who were released from a NSW correctional centre between 1 January 2009 and 30 June 2010, after serving a full-time imprisonment sentence. Cases where the prisoner was released to bail were excluded. Data supplied by Corrective Services NSW included details regarding offender movements in and out of custody, parole length and discharge status, as well as the level of supervision provided by Community Corrections in the period post-release. These data were then linked to the NSW Bureau of Crime Statistics and Research’s Reoffending Database (ROD; see Hua & Fitzgerald, 2006) using the offender’s name, date of birth and OIMS offender identifier (the unique person identifier from the Corrective Services Offender Integrated Management System). ROD contains records of all persons appearing before the NSW Local and Higher Courts charged with a criminal offence since 1994. It includes both information about the charge (e.g. offence type) and demographic information pertaining to the offender (e.g. age, gender, last postcode, Indigenous status). ROD data were used in the current study to track individual offenders after they were released from custody in order to construct a comprehensive re-offending record and to obtain information on a large number of prior offending variables.

Sample definition – The sample comprised 7,494 offenders who were released from a NSW correctional centre between 1 January 2009 and 30 June 2010 after serving a full-time imprisonment sentence of 12 months or less.¹ For persons with more than one custodial episode within the defined period, the custodial episode with the earliest release date was selected as the ‘index’ custodial episode.

Independent variables – The study involved two independent variables: post-release supervision and supervision intensity. Supervision status post-release was identified from the

¹ The sample was restricted to offenders who had served 12 months or less during the index custodial episode to ensure that we could match the conditional and unconditional release groups on time spent in custody.

data supplied by Corrective Services NSW. These data distinguished between offenders who were released from prison to parole and those who were released unconditionally (either because they had a fixed sentence or because their sentence had expired). To measure supervision intensity, Corrective Services provided information on the number of contacts that each offender had with a Community Corrections Officer during their period of supervision and the length of time for which they were under supervision. Supervision intensity was measured according to whether the supervision was rehabilitation-focused or compliance-focused. Events were classified into one of these two groups on the basis of the case note category entered by the supervising officer for each event. Rehabilitation-focused supervision means supervision conducted by Community Offender Services (COS); where the purpose of the supervision is to address the offender's criminogenic needs and risk factors. Compliance-focused supervision refers to contacts where the aim is simply to ensure that the offender is complying with the conditions of their parole order. Parole officers traditionally performed both functions but during the course of this study compliance-focused supervision was largely carried out by a special unit of officers known as the Community Compliance and Monitoring Group (CCMG) which, among other things, carried out random checks on offenders. The functions of the CCMG have now been merged with those of COS.

Outcome variables – Two main outcomes were measured in this study: (1) Re-offending and (2) Re-imprisonment.

Re-offending was defined as any new proven offence which was finalised in a NSW Local or Higher Court before 30 September 2013. The offence was considered to be 'new' if the recorded offence date occurred after the 'index' custodial release date and before 30 June 2013.² Breaches of parole orders were not included in our definition of re-offending because this would have inflated the re-offending rate for prisoners who were released to supervision. Breaches of community-based orders also were not included as re-offences for two reasons: (1) these offences can be influenced by changes in policing practice and (2) the offence date recorded for breach offences in the court data does not accurately reflect the date on which the offence actually occurred.

Utilising this definition of re-offending, several outcomes were examined.

² The June 30 cut-off allowed a 3-month lag period for offences to be finalised in court.

- Time to re-offend: the number of days that elapsed between the offender being released from custody (i.e. index release date) and the date of the first new proven offence. For an offence to be included in this outcome it must have occurred prior to the earliest of the following dates, at which observations were censored:
 - start date of new custodial episode;
 - the end of the observation period (i.e. 30 June 2013);
 - date of death.
- Frequency of re-offending: the number of proven offences within 12, 24 or 36 months of release from custody
- Seriousness of re-offending: whether there was a further proven indictable offence after release from custody³

Time to re-imprisonment (measured as the number of days from index release date to date of first new proven offence for which a full-time imprisonment penalty was imposed) was the second major outcome examined in this study. Because offenders under parole supervision could potentially have a higher rate of censoring (due to breaches of parole conditions resulting in a new custodial episode), time to return to custody for any reason, including an old offence or breach of parole conditions (i.e. days from index release date to next new reception date) was also examined to see if any differences in time to re-offending or time to re-imprisonment was a consequence of one group being censored more often than the other and therefore not having the opportunity to re-offend.

Explanatory variables – The following covariates were considered for inclusion in the re-offending and propensity score models.

- **Age:** age in years at index release date
- **Gender:** male or female
- **Indigenous status:** whether the prisoner identified as being Indigenous (Aboriginal or Torres Strait Islander descent) or non-Indigenous at the index custodial episode
- **SEIFA of residence:** the Australian Bureau of Statistics' Socioeconomic Index for Area (SEIFA) was applied to prisoners' postcodes of residential address at the time of their index custodial episodes to assign prisoners to one of four SEIFA quartiles (Q1 to

³ Note that breaches of court orders (e.g. breach AVO, breach suspended sentence) were classified for the purpose of this analysis as indictable offences.

Q4), where a lower quartile indicates higher level of disadvantage (Australian Bureau of Statistics 2011b).

- **Remoteness of residence:** the Australian Bureau of Statistics' Accessibility Remoteness Index of Australia (ARIA+; Australian Bureau of Statistics 2001) was applied to prisoners' postcodes of residential address at the time of their index custodial episode. Geographic remoteness was grouped into five categories with the specified range: major cities (0-0.2), inner regional (>0.2-2.4), outer regional (>2.4-5.92), remote (>5.92-10.53) and very remote (>10.53).
- **Time in custody:** number of days from index episode start date until release date
- **Parole length:** number of days from index release date until expiry date of parole order
- **Prior court finalisations:** number of finalised court appearances (including youth justice conferences) during the index custodial episode or within 5 years prior to the index custodial start date where one or more offences were proven
- **Prior Children's Court finalisations or youth justice conferences:** number of finalised court appearances in the Children's court or at a youth justice conference during the index custodial episode or within 5 years prior to the index custodial start date where one or more offences were proven
- **Prior imprisonment:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date that resulted in a full-time prison sentence (including juvenile control orders)
- **Prior intensive correction order, periodic detention or home detention:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date that resulted in a penalty of periodic detention, intensive correction order or home detention
- **Prior suspended sentence:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date that resulted in a suspended sentence
- **Prior good behavior bond:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date that resulted in a s9 bond
- **Prior supervised order:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date that resulted in

a supervised s9 bond or supervised suspended sentence (including Children's Court supervised orders)

- **Prior serious violence offence:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date where one or more serious violent offences were proven (defined as any prior proven offence under ANZSOC divisions 01, 05 or 06 and groups 211 and 311)
- **Prior non-serious violence offence:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date where one or more non-serious violent offences were proven (defined as any prior proven offence under ANZSOC division 02 (except group 211), division 03 (except group 311) and division 04))
- **Prior property offence:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date where one or more property offences were proven (defined as any prior proven offence under ANZSOC divisions 07, 08, 09)
- **Prior break and enter offence:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date where one or more break and enter offences were proven (defined as any prior proven offence under ANZSOC division 07)
- **Prior drug offence:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date where one or more drug offences were proven (defined as any prior proven offence under ANZSOC division 10)
- **Prior drink driving offence:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date where one or more drink driving offences were proven (defined as any prior proven offence under ANZSOC groups 411, 412 and 1431)
- **Prior driving offence:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date where one or more driving offences were proven (excluding drinking driving offences) (defined as any prior proven offence under ANZSOC division 14, except group 1431)
- **Prior breach of a court order:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date where one or

more breaches of court orders were proven (defined as any prior proven offence under ANZSOC subdivisions 151, 152 or 153, except group 1511)

- **Prior indictable offence:** number of finalised court appearances during the index custodial episode or within 5 years prior to the index custodial start date where one or more indictable offences were proven

Statistical Methods – As discussed above, this study employed propensity score matching techniques to minimise the risk of selection bias when estimating treatment effects. In propensity score matching, individuals who receive a treatment (e.g. post-release supervision) are matched with untreated individuals (e.g. unconditional release) who are equally likely to receive the treatment, and outcomes (e.g. re-offending) are compared across these two groups.

This process involves several steps. Initially, a logistic regression model is built to predict the likelihood that each offender will receive the treatment (e.g. post-release supervision). The estimated probabilities derived from this model are known as propensity scores. Treated offenders (e.g. offenders who receive post-release supervision) are then matched with untreated offenders (e.g. offenders who are released unconditionally) based on their propensity score. One-to-one matching without replacement was used in this study with a caliper of 0.0005. In one-to-one matching, each offender from the treatment group is matched with the offender from the control group who has the closest propensity score, provided it is within 0.0005 units. Each offender is only matched once; resulting in two matched groups with equal sample size. Once matched, the matched treatment and control groups are compared to assess whether or not they differ significantly on any of the explanatory variables used to predict the propensity scores. Two measurements are used for this purpose. The first is known as the standardised bias (SB; see Rosenbaum & Rubin, 1985). The SB is the difference in means of a variable between the two groups divided by the square root of the average of the variances of the variable from the two groups. The SB is computed before and after matching for each explanatory variable. If the SBs are less than $|20|$ for all covariates after matching, the two groups are said to be balanced. The second measurement used to assess the adequacy of the matching process is based on the likelihood ratio test. This tests whether the explanatory variables jointly predict treatment allocation. If the p-value from the likelihood ratio test is greater than 0.05 after matching, the variables are said to be balanced as they no longer jointly predict group membership. If no significant differences are

found between the treated and untreated offenders on the observed covariates, then the groups can be compared on the outcome measure (e.g. reoffending) and treatment effects estimated.

Group Comparisons – Survival analysis, McNemar’s test and the paired-t test were used to test differences in re-offending outcomes between (1) offenders who received supervision post-release and those who were released unconditionally (2) offenders who received a low level of compliance-focused contacts whilst under supervision and those who received a high level of compliance-focused contacts whilst under supervision and (3) offenders who received a low level of rehabilitation-focused contacts whilst under supervision and those who received a high level of rehabilitation-focused contacts whilst under supervision.

To compare time to re-offend and time to re-imprisonment, the accelerated failure time (AFT) model⁴ was used with robust variance structure that controls for the matched nature of the data. The AFT model is a parametric survival model which assumes the survival time follows a distribution, such as exponential distribution, Weibull distribution, lognormal distribution and generalised gamma distribution. The primary independent variable included in the AFT model is the binary variable indicating whether the offenders received treatment (e.g. post-release supervision, high-level compliance-focused contacts and high-level rehabilitation-focused contacts). The observed covariates incorporated in the propensity score matching were also included as independent variables in the AFT model. The maximum likelihood method was used to estimate the parameters and the distribution that best describes the survival time was chosen based on the Akaike’s Information Criterion (AIC). AIC is a measure which rewards the goodness of fit and at the same time penalises the increasing number of parameters. The AFT model with the smallest AIC is chosen as the best model and is used to estimate the time ratio. The time ratio represents the ratio of the time to failure of the treatment group to the control group. A time ratio significantly greater than 1 indicates that the survival time is significantly longer for the treatment group. Two time ratios, the unadjusted and adjusted time ratios, are reported in the results section. The former is the estimated time ratio with only the treatment indicator incorporated into the AFT model, whereas the latter is the estimated time ratio from the model that includes the treatment indicator as well as any significant observed covariates used in propensity score matching.

⁴ Cox regression was not used because the proportional hazard assumption was violated.

To compare seriousness of re-offending, McNemar's test was used to determine whether there was a significant difference between the treatment and control groups in the proportion of offenders who recorded a new proven indictable offence after being released from custody. For frequency of re-offending, a one-tailed paired-t test was used to determine whether the mean number of new proven offences was higher for the control group compared with the treatment group. Frequency of re-offending within 12, 24 and 36 months post-release was compared.

Results

Characteristics of supervised and unsupervised groups

Table 1 presents the demographic, index custodial episode and prior offending characteristics for both the supervised and unsupervised (i.e. released unconditionally) groups. As shown in Table 1, most offenders who received post-release supervision were male (90.9%), non-Indigenous (67.9%), lived in major cities areas (49.1%) and lived in areas of greater socio-economic disadvantage (62.2%). Over sixty per cent of offenders in the supervised group (61.1%) were under 34 years of age. At their index custodial episode, nearly half of the supervised offenders (47.1%) had served between 6 and 12 months in custody and over half (51%) had been issued a parole order of between 6 and 12 months upon release. Most offenders in the supervised group also had extensive prior offending histories. Half of these offenders (49.6%) had five or more prior court appearances, just over half (51.8%) had two or more prior court appearances that resulted in a full-time prison sentence and half (50.5%) had at least one prior court appearance that resulted in a supervised s9 bond or supervised suspended sentence. Most offenders in the supervised group (72.7%) had at least one prior court appearance for a proven non-serious violent offence; 56.7 per cent for a proven property offence; 51.0 per cent for a proven driving offence; and 59.7 per cent for a proven breach offence. Over half of the supervised offenders (56.5%) had three or more prior court appearances where one or more indictable offences were proven.

Offenders in the unsupervised group differed significantly from the supervised group on a number of characteristics. Compared with the supervised group, the unsupervised offenders were younger (20.6% vs 23.4% aged 18 to 24 years), were more likely to be female (12.0% vs 9.1%), were more likely to be non-Indigenous (69.7% vs 67.9%), were more likely to live in areas of postcodes with lower levels of disadvantage (SEIFA Q3 and Q4: 41.2% vs 36.4%)

and live in major cities areas (58.1% vs 49.1%). With regard to the index custodial episode, the unsupervised group was more likely to have served less than 3 months in prison (41.9% vs 18.6%) and less likely to have served more than 9 months in prison (6.2% vs 21.0%). Offenders in the unsupervised group also had less extensive and less serious prior offending histories compared with the supervised group. Offenders who were released unconditionally were less likely to have one or more prior court appearances in the Children’s Court or at a youth justice conference (9.9% vs 12.5%); were less likely to have one or more prior court appearances that resulted in a full-time prison sentence (85.2% vs 94.2%); were less likely to have one or more prior court appearances that resulted in a supervised s9 bond or supervised suspended sentence (47.2% vs 50.5%); less likely to have at least one prior court appearance for a serious violent offence (12.6% vs 15.8%), a break and enter offence (19.6% vs 25.4%) or a drink driving offence (29.7% vs 34.8%); and were less likely to have at least one prior court appearance where three or more indictable offences (54.1% vs 56.5%) were proven

Table 1. Demographics, index offence and prior offending characteristics of supervised and unsupervised groups

Variable	Category	Unsupervised group (n1=2,772) (%)	Supervised group (n2=4,722) (%)	p-value
Demographic characteristics				
Age (years)	18-24	20.6	23.4	.024
	25-34	37.8	37.7	
	35-44	28.7	26.8	
	45+	12.9	12.1	
Gender	Female	12.0	9.1	<.001
	Male	87.9	90.9	
	Unknown	0.07	0.04	
Indigenous status	Non-indigenous	69.7	67.9	<.001
	Indigenous	28.0	31.0	
	Unknown	2.3	1.1	
SEIFA of residence	Quartile 1	31.0	34.0	<.001
	Quartile 2	25.2	28.2	
	Quartile 3	28.2	26.0	
	Quartile 4	13.0	10.4	
	Unknown	2.7	1.4	
Remoteness of residence	Major cities	58.1	49.1	<.001
	Inner regional	19.2	18.5	
	Outer regional/ remote/very remote	22.7	32.4	
Index custodial episode characteristics				
Time in custody	<=3 months	41.9	18.6	<.001
	3+ to 6 months	39.5	34.3	
	6+ to 9 months	12.4	26.1	
	9+ to 12 months	6.2	21.0	
Parole order length	No parole	100.0		
	<= 3 months		12.9	

	3+ to 6 months		36.1	
	6+ to 9 months		43.2	
	9+ to 12 months		7.8	
Prior offending characteristics				
5 or more court appearances*	yes	50.6	49.6	ns
Court appearances in Children's Court or at youth justice conference	yes	9.9	12.5	.001
Prison sentence^	0	14.8	5.8	<.001
	1	35.8	42.4	
	2 or more	49.4	51.8	
Periodic detention, intensive correction order or home detention	yes	12.1	6.2	<.001
Suspended sentence	yes	33.6	36.7	.007
s9 bond	yes	56.0	56.2	ns
Supervised s9 bond or suspended sentence	yes	47.2	50.5	.006
Serious violent offence	yes	12.6	15.8	<.001
Non-serious violent offence	yes	65.0	72.7	<.001
Property offence	yes	59.1	56.7	.044
Break and enter offence	yes	19.6	25.4	<.001
Drug offence	yes	36.9	33.1	.001
Drink driving offence	yes	29.7	34.8	<.001
Driving offence	yes	48.7	51.0	ns
Breach of court order	yes	59.7	59.7	ns
3 or more prior indictable offences	yes	54.1	56.5	.043

Note: ^ Some offenders had no prior prison sentence probably due to the following reasons: (1) they have breached a previous non-custodial penalty, (2) convicted of other offences not prosecuted in the Local/Higher Courts, (3) convicted of commonwealth offences, (4) given a prison penalty after a successful prosecution appeal, or (5) imprisoned for fine default.

Table 2 below shows the relationship between time spent in custody and parole order length for all offenders in the sample. As shown here, the unsupervised group generally served less time in custody during their index custodial episode compared with the supervised group and further, offenders who spent more time in custody were generally issued longer parole orders. The vast majority (81.4%) of the 2,772 offenders in the unsupervised group (i.e. no parole) served less than 6 months in custody before being unconditionally released. Of those offenders who had were issued a parole order of less than 3 months, nearly three-quarters (75.2%) had served between 3 and 9 months in jail. For those who were issued a parole order of longer than 1 year, more than forty per cent (42.1%) had served between 9 and 12 months in custody prior to being released to parole.

Table 2. Cross-tabulation on custody length and parole length

Custody length	Parole order length					Subtotal
	No parole	0+ to 3 months	3+ to 6 months	6+ to 12 months	12+ months	
0+ to 3 months	1,161	35	306	487	52	2,064
column %	41.9	5.8	17.9	23.9	14.2	27.3
3+ to 6 months	1,096	239	594	704	82	2,730
column %	39.5	39.2	34.8	34.5	22.4	36.2
6+ to 9 months	343	219	496	439	78	1,582

column %	12.4	36.0	29.1	21.5	21.3	21.0
9+ to 12 months	172	116	310	411	154	1,171
column %	6.2	19.1	18.2	20.1	42.1	15.5
Subtotal	2,772	609	1,706	2,041	366	7,494
column %	100	100	100	100	100	100

Table 3. Re-offending characteristics of supervised and unsupervised groups

Variable	Unsupervised group (n1=2,772)	Supervised group (n2=4,722)	p-value
New proven offence, %	64.1	59.7	<.001
New proven offence resulting in imprisonment penalty, %	31.1	31.4	ns
New proven indictable offence, %	49.1	46.4	.020
Return to custody, %	62.0	62.6	ns
Number of new proven offences within 12 months, mean (SD)	1.8 (3.3)	1.4 (2.5)	<.001
Number of new proven offences within 24 months, mean (SD)	3.1 (4.5)	2.6 (3.8)	<.001
Number of new proven offences within 36 months, mean (SD)	4.2 (5.7)	3.6 (4.8)	<.001

Table 3 shows the rate of re-offending for the supervised and unsupervised groups. As seen here, 60 per cent (59.7%) of offenders in the supervised group recorded at least one new proven offence after the index custodial episode release date, nearly one-third (31.4%) recorded at least one new proven offence which resulted in a full-time imprisonment penalty, nearly a half (46.4%) had at least one new proven indictable offence and almost two-thirds (62.6%) returned to custody. Compared with the supervised group, offenders who were released unconditionally were more likely to record one or more new proven offences (64.1% vs 59.7%) after being released from custody, were more likely to record one or more new proven indictable offences (49.1% vs 46.4%) after release, and had a higher mean number of new proven offences within 12 months, 24 months and 36 months post-release. There was, however, no significant difference between the supervised and unsupervised groups with regard to the proportion of offenders who were returned to custody (62.0% vs 62.6%) after their index custodial episode.

Supervision versus no supervision

Matching

As mentioned above, propensity scores were computed using the parameter estimates from a logistic regression model predicting whether or not an offender was supervised upon release from custody. The parameter estimates and the associated confidence intervals for the logistic regression model are reported in Table 4. The model predicts group membership well (pseudo

$R^2 = 0.119$; $p < .001$ for likelihood ratio test). Offenders living in outer regional, remote or very remote areas, offenders serving more time in custody, offenders who had one or more prior court appearances which resulted in a full-time prison sentence, offenders who had at least one or more prior non-serious violent or break and enter offences were more likely to be supervised upon release from custody. Older offenders (aged 35-44 years), Indigenous offenders, offenders who had at least one prior court appearance that resulted in a periodic detention, intensive correction order or home detention penalty, offenders who had at least one prior court appearance for a property offence or drug offence were less likely to be supervised post-release.

Propensity scores were computed for each offender and the offenders in each of the supervised and unsupervised groups were matched using one-to-one matching without replacement. Nearly three-quarters ($n=2,019$ offenders) of the 2,772 offenders in the unsupervised group were able to be matched with an offender from the supervised group. After matching, the logistic regression model predicting the likelihood of being released conditionally was not significant (pseudo $R^2 = 0.003$; $p = .988$ for likelihood ratio test). The SB for each of the variables included in the propensity score model is displayed in Figure 1. Thirty-nine variables were used to predict whether or not an offender received post-release supervision. Prior to matching, six variables had an absolute value of SB greater than 20. These variables were custody length (≤ 3 months, 6+ to 9 months and 9+ to 12 months), remoteness of area (outer regional/ remote/very remote), prior prison sentence and prior periodic detention, intensive correction order or home detention. After matching, SBs for all the variables had an absolute value of less than 10 and the largest absolute value of SB was 6.3 for the custody length variable (3+ to 6 months). Together, the diagnostics presented here suggest that the matched supervised and unsupervised groups can be considered equal (within the limits of chance) with respect to the set of observed covariates.

Table 4. Logistic regression on the likelihood of getting post-release supervision (n=7,494)

Variable	Category	Odds ratio	95% CI	p-value
Demographic characteristics				
Age (years)	≤ 24	1.000		
	25-34	0.884	(0.741, 1.053)	.168
	35-44	0.820	(0.682, 0.985)	.034
	≥ 45	0.813	(0.656, 1.009)	.060
Gender	Female	1.000		
	Male	1.109	(0.936, 1.313)	.232

	Missing	0.991	(0.102, 9.631)	.994
Indigenous status	Non-Indigenous	1.000		
	Indigenous	0.880	(0.779, 0.995)	.042
SEIFA of residence	Unknown	0.572	(0.384, 0.852)	.006
	Quartile 1	1.000		
	Quartile 2	1.008	(0.881, 1.154)	.909
	Quartile 3	0.989	(0.863, 1.132)	.868
	Quartile 4	0.911	(0.760, 1.092)	.313
Remoteness of residence	Missing postcode	0.462	(0.314, 0.680)	<.001
	Major cities	1.000		
	Inner regional	1.122	(0.974, 1.294)	.111
	Outer regional/ remote/very remote	1.727	(1.501, 1.986)	<.001
Index custodial episode characteristics				
Custody length	<=3 months	1.000		
	3+ to 6 months	1.942	(1.719, 2.193)	<.001
	6+ to 9 months	4.775	(4.089, 5.575)	<.001
	9+ to 12 months	8.038	(6.633, 9.741)	<.001
Prior offending characteristics				
5 or more court appearances	Yes	0.912	(0.789, 1.055)	.216
Court appearances in Children's Court or at youth justice conference	Yes	1.049	(0.836, 1.316)	.679
Prison sentence	0	1.000		
	1	2.409	(1.986, 2.923)	<.001
	2 or more	1.773	(1.430, 2.199)	<.001
Periodic detention, intensive correction order or home detention	Yes	0.578	(0.478, 0.698)	<.001
Suspended sentence	Yes	1.110	(0.980, 1.259)	.101
s9 bond	Yes	0.984	(0.858, 1.128)	.818
Supervised s9 bond or suspended sentence	Yes	1.131	(0.981, 1.303)	.090
Serious violent offence	Yes	1.076	(0.922, 1.255)	.351
Non-serious violent offence	Yes	1.143	(1.005, 1.299)	.041
Property offence	Yes	0.795	(0.698, 0.904)	<.001
Break and enter offence	Yes	1.312	(1.136, 1.516)	<.001
Drug offence	Yes	0.836	(0.747, 0.936)	.002
Drink driving offence	Yes	1.120	(0.987, 1.270)	.079
Driving offence	Yes	1.078	(0.957, 1.216)	.217
Breach of court order	Yes	0.951	(0.840, 1.077)	.432
3 or more indictable offences	Yes	1.020	(0.874, 1.190)	.803

Re-offending and Re-imprisonment

After matching, the supervised and unsupervised groups were compared on four outcomes: (1) time to re-offending, (2) time to re-imprisonment, (3) frequency of re-offending and (4) seriousness of re-offending. Tables 5 to 7 summarise the results of the survival analysis on the time to re-offending and time to re-imprisonment using the AFT model.

Table 5 presents the unadjusted and adjusted time ratios from the AFT model estimating time to re-offending, without and with adjustment for potential covariates. This table shows a significant difference between the supervised and unsupervised groups in the number of days to first new offence. Without adjusting for other potential covariates, the AFT model estimates that time to first new offence is 1.282 times longer for the supervised group compared with the unsupervised group. After adjusting for potential covariates in the AFT model, the time ratio remains statistically significant and is only slightly lower (1.212) than the unadjusted time ratio. Based on the unadjusted time ratio, the estimated re-offending rate of the unsupervised group is higher than the re-offending rate of the supervised group at 12, 24 and 36 months post-release. Twelve months after release, the AFT model estimates that 48.6 per cent of unsupervised offenders will re-offend while only 43.6 per cent of supervised offenders will re-offend. At 36 months after release, the estimated re-offending rate jumped up to 70.3 per cent for the unsupervised group and this was still significantly higher than the re-offending rate for the supervised group at 65.7 per cent.

Table 5. Time to any new proven offence, matched supervised and unsupervised groups

	Unsupervised group	Supervised group	95% CI	p-value
Number of offenders	2,019	2,019		
Unadjusted time ratio	1.000	1.282	(1.125, 1.461)	<.001
Adjusted time ratio	1.000	1.212	(1.080, 1.361)	.001
Unadjusted re-offending rate at 12 months	48.6%	43.6%		
Unadjusted re-offending rate at 24 months	62.6%	57.7%		
Unadjusted re-offending rate at 36 months	70.3%	65.7%		

With regard to time to re-imprisonment, both the unadjusted and adjusted time ratios are not significant (as shown in Table 6). In other words, there is no significant difference between the supervised and unsupervised groups in the time to first new offence which resulted in full-time imprisonment.

Table 6. Time to any new proven offence which resulted in full-time imprisonment, matched supervised and unsupervised groups

	Unsupervised group	Supervised group	95% CI	p-value
Number of offenders	2,019	2,019		
Unadjusted time ratio	1.000	1.098	(0.877, 1.373)	.415
Adjusted time ratio	1.000	1.022	(0.840, 1.243)	.827
Unadjusted re-imprisonment rate at 12 months	25.5%	24.6%		
Unadjusted re-imprisonment rate at 24 months	32.5%	31.6%		
Unadjusted re-imprisonment rate at 36 months	36.7%	35.8%		

Table 7 presents both the proportion of offenders who have one or more new proven indictable offences after the index custodial episode and the mean number of new proven offences within 12, 24 and 36 months for the matched supervised and unsupervised groups. As seen here, a significantly higher proportion (51.3%) of the unsupervised offender group recorded at least one new proven indictable offence after the index custodial episode compared with the supervised offender group (46.1%; $\chi^2=10.98$, $df=1$, $p=.001$). Moreover, the mean number of new proven offences within 12, 24 and 36 months post-release was significantly higher for offenders in the unsupervised group compared with offenders in the supervised group ($p<.001$). After adjusting for potential covariates, the difference in frequency and seriousness of re-offending remains significant.

Table 7. Frequency and seriousness of re-offending for matched supervised and unsupervised groups

Re-offending outcomes		Unsupervised group (n1=2,019)	Supervised group (n2=2,019)	Significance (McNemar's test/paired t test)
Any new proven indictable offence after index custodial episode release date	per cent	51.3	46.1	.001
	95% CI	(49.1, 50.9)	(43.9, 48.3)	
Number of new proven offences within 12 months	Mean	1.8	1.4	<.001
	95% CI	(1.7, 2.0)	(1.3, 1.5)	
Number of new proven offences within 24 months	Mean	3.1	2.6	<.001
	95% CI	(2.9, 3.3)	(2.5, 2.8)	
Number of new proven offences within 36 months	Mean	4.3	3.6	<.001
	95% CI	(4.1, 4.6)	(3.4, 3.8)	

High-level versus low-level compliance-focused contacts (excluding offenders with parole orders longer than 12 months)

Propensity score matching

Amongst the 4,722 offenders in the supervised group, only 4,131 had a parole order of up to 12 months issued. The following analysis was restricted to these 4,131 offenders because insufficient information was available on supervision contacts beyond the first 12 months post-release. In order to classify offenders into groups of low-level and high-level

compliance-focused contacts, the monthly rate of compliance-focused contacts was computed for each offender by summing the total number of contacts recorded within 12 months and dividing by the number of months under supervision (where the number of months under supervision is defined as the time between release date and the date that the parole order was discharged either because it was completed or revoked). The median monthly rate of compliance-focused contacts for the 4,131 offenders under supervision was one per month. Offenders were classified into the high-level group if their rate of compliance-focused contacts was greater than one contact per month and into the low-level group if their rate of compliance-focused contacts was equal to or less than one contact per month. This resulted in 2,338 offenders being allocated to the low-level group and 1,793 offenders to the high-level group.

Propensity scores were computed from a logistic regression model predicting whether or not an offender had a high level of compliance-focused contacts whilst under parole supervision. The parameter estimates from this logistic regression model and the associated confidence intervals are reported in Table 8. This model significantly predicted group membership (pseudo $R^2 = 0.020$; $p < .001$ for likelihood ratio test). Offenders living in areas of postcodes with lower levels of disadvantage, offenders having longer parole orders and offenders who had three or more prior court appearances for indictable offences were more likely to have a high level of compliance-focused contacts. Offenders aged 45 years or above, male offenders, offenders serving 6 to 9 months in prison and offenders who had one or more prior court appearances that resulted in a s9 bond were less likely to have a high level of compliance-focused contacts.

Using one-to-one matching without replacement and a caliper of 0.0005, 1,494 offenders (out of 2,338 offenders) from the low-level group were matched with 1,494 offenders (out of 1,793 offenders) from the high-level group. After matching, the logistic regression model predicting the likelihood of being given a high level of compliance-focused contacts was not significant (pseudo $R^2 = 0.002$; $p = 1.000$ for likelihood ratio test). Forty variables were used to predict group membership in the propensity score model. Prior to matching, six variables had an absolute value of SB greater than 10 (none had an absolute value greater than 20). These variables were length of parole order (≤ 3 months and 6+ to 12 months), age group (age 25-34 and age ≥ 45) and gender (male and female). After matching, SBs for all the variables

had an absolute value of less than 10 and the largest absolute value of SB was 5.3 for the one or more prior proven drink driving offence variable. The small absolute value for all SBs and the large p-value from the likelihood ratio test confirm that the matched low-level and high-level groups are balanced with respect to the set of observed covariates.

Table 8. Logistic regression predicting the likelihood of having a high level of compliance-focused contacts whilst under parole supervision (n=4,129)

Variable	Category	Odds ratio	95% CI	p-value
Demographic characteristics				
Age (years)	<=24	1.000		
	25-34	1.132	(0.912, 1.405)	.260
	35-44	0.945	(0.753, 1.187)	.628
	>=45	0.689	(0.525, 0.904)	.007
Gender	Female	1.000		
	Male	0.716	(0.574, 0.894)	.003
Indigenous status	Non-Indigenous	1.000		
	Indigenous	0.925	(0.798, 1.072)	.303
	Unknown	0.639	(0.346, 1.183)	.154
SEIFA of residence	Quartile 1	1.000		
	Quartile 2	1.155	(0.983, 1.357)	.080
	Quartile 3	1.184	(1.001, 1.400)	.049
	Quartile 4	1.345	(1.066, 1.697)	.013
	Missing postcode	1.141	(0.647, 2.010)	.649
Remoteness of residence	Major cities	1.000		
	Inner regional	0.905	(0.757, 1.082)	.273
	Outer regional/ remote/very remote	0.848	(0.718, 1.001)	.051
Index custodial episode characteristics				
Custody length	<=3 months	1.000		
	3+ to 6 months	0.905	(0.756, 1.082)	.273
	6+ to 9 months	0.810	(0.668, 0.983)	.033
	9+ to 12 months	0.839	(0.678, 1.037)	.105
Parole length	<=3 months	1.000		
	3+ to 6 months	1.300	(1.069, 1.582)	.009
	6+ to 12 months	1.548	(1.273, 1.883)	<.001
Prior offending characteristics				
5 or more court appearances	Yes	0.907	(0.761, 1.082)	.279
Court appearances in Children's Court or at youth justice conference	Yes	0.935	(0.713, 1.226)	.625
2 or more prior prison sentences	Yes	0.878	(0.750, 1.028)	.106
Periodic detention, intensive correction order or home detention	Yes	0.976	(0.753, 1.265)	.856
Suspended sentence	Yes	0.926	(0.794, 1.078)	.321
s9 bond	Yes	0.782	(0.663, 0.922)	.003
Supervised s9 bond or suspended sentence	Yes	1.156	(0.970, 1.378)	.105
Serious violent offence	Yes	1.102	(0.918, 1.324)	.298
Non-serious violent offence	Yes	1.041	(0.884, 1.227)	.627
Property offence	Yes	1.161	(0.987, 1.366)	.071
Break and enter offence	Yes	0.897	(0.754, 1.067)	.219
Drug offence	Yes	1.026	(0.892, 1.180)	.722
Drink driving offence	Yes	1.043	(0.897, 1.213)	.584
Driving offence	Yes	1.155	(0.997, 1.338)	.055
Breach of court order	Yes	1.131	(0.971, 1.316)	.113
3 or more indictable offences	Yes	1.217	(1.009, 1.468)	.040

Re-offending and Re-imprisonment

After matching, the high-level compliance-focused supervision group was compared with the low-level compliance-focused supervision group on the four outcomes previously described. Table 9 presents the unadjusted and adjusted time ratios from the AFT model estimating time to first new proven offence, without and with adjustment for potential covariates. This table shows that the time to re-offending for the high-level supervision group is not significantly different from the low-level group, regardless of whether or not the model is adjusted for other covariates.

Table 9. Time to any new proven offence, matched high-level and low-level compliance-focused contacts groups

	low-level group	high-level group	95% CI	p-value
Number of offenders	1,494	1,494		
Unadjusted time ratio	1.000	1.078	(0.930, 1.249)	.322
Adjusted time ratio	1.000	1.037	(0.912, 1.181)	.577
Unadjusted re-offending rate at 12 months	45.4%	43.9%		
Unadjusted re-offending rate at 24 months	60.0%	58.5%		
Unadjusted re-offending rate at 36 months	68.1%	66.7%		

Table 10 shows both the unadjusted and adjusted time ratios from the AFT models estimating time to first new full-time prison penalty. As seen here, the time to first new offence which resulted in full-time prison penalty for the high-level supervision group is 1.687 times longer than the low-level supervision group, without adjusting for potential covariates in the AFT model. After adjusting for potential covariates, the time ratio reduces to 1.323 but remains statistically significant. At 12 months after release, the unadjusted AFT model estimated that 28.8 per cent of offenders with a low level of compliance-focused supervision contacts will commit a re-offence which will receive a new full-time imprisonment penalty compared with only 23.5 per cent of the high-level supervision group. At 36 months after release, the estimated re-imprisonment rate for the low-level supervision group jumped up to 40.3 per cent compared with 34.8 per cent for the high-level supervision group.

Table 10. Time to any new proven offence which resulted in a full-time prison penalty, matched high-level and low-level compliance-focused contacts groups

	low-level group	high-level group	95% CI	p-value
Number of offenders	1,494	1,494		
Unadjusted time ratio	1.000	1.687	(1.288, 2.209)	<.001
Adjusted time ratio	1.000	1.323	(1.056, 1.657)	.015
Unadjusted re-imprisonment rate at 12 months	28.8%	23.5%		
Unadjusted re-imprisonment rate at 24 months	36.1%	30.6%		
Unadjusted re-imprisonment rate at 36 months	40.3%	34.8%		

Table 11 shows the proportion of offenders who have one or more new proven indictable offences after the index custodial episode and the mean number of new proven offences within 12, 24 and 36 months post-release for the two matched groups. No significant differences were found between the low-level and high-level supervision groups in the proportion who committed a new indictable offence after being released from custody. Moreover, there were no significant differences between the low-level and high-level supervision groups in the mean number of new proven offences within 12, 24 and 36 months post-release.

Table 11. Frequency and seriousness of re-offending, matched high-level and low-level compliance-focused contacts groups

Re-offending outcomes	low-level group (n1=1,494)		high-level group (n2=1,494)	Significance (McNemar's test/paired t test)
	per cent			
Any new proven indictable offence occurred after index custodial episode release date	per cent	48.3	47.8	ns
	95% CI	(45.7, 50.8)	(45.3, 50.3)	
Number of new proven offences within 12 months	Mean	1.4	1.6	ns
	95% CI	(1.3, 1.5)	(1.5, 1.8)	
Number of new proven offences within 24 months	Mean	2.6	3.0	ns
	95% CI	(2.4, 2.8)	(2.8, 3.2)	
Number of new proven offences within 36 months	Mean	3.5	4.1	ns
	95% CI	(3.3,3.8)	(3.8, 4.3)	

High-level versus low-level rehabilitation-focused contacts (excluding offenders with parole orders longer than 12months)

Propensity score matching

As was done for compliance-focused contacts, we calculated the monthly rate of rehabilitation-focused contacts by summing the total number of contacts an offender received within 12 months post-release and dividing by the length of time under supervision (in months). Again the analysis was restricted to offenders who were serving parole orders of 12 months or less due to insufficient information being available on supervision contact beyond 12 months post-release. Amongst the 4,131 offenders who received post-release supervision with a parole order equal to or less than 12 months, the median monthly rate of rehabilitation-focused contacts was two per month. This, it should be noted, is higher than that observed in connection with compliance-focused supervision. Offenders were classified into the high-level group if their rate of rehabilitation-focused contacts was greater than two contacts per month and into the low-level group if their rate of rehabilitation-focused contacts was equal to or less than two contacts per month. This resulted in 1,632 offenders being allocated to the low-level group and 2,499 offenders being allocated to the high-level group.

Propensity scores were computed from a logistic regression model predicting whether or not an offender had a high level of rehabilitation-focused contacts whilst under parole supervision. The parameter estimates from this logistic regression model and the associated confidence intervals are reported in Table 12. The variables listed in Table 12 significantly predict group membership (pseudo $R^2 = 0.022$; $p < .001$ from likelihood ratio test). Offenders serving more than 6 months in custody, offenders who had one or more prior court appearances for non-serious violent offences and offenders who had three or more prior court appearances for indictable offences were more likely to have a high level of rehabilitation-focused contacts. Offenders who lived in outer regional/remote/very remote areas, offenders with a parole order of longer than 6 months and offenders who had one or more prior court appearances for drink driving offences were less likely to have a high level of rehabilitation-focused contacts.

Using one-to-one matching without replacement and a caliper of 0.0005, 1,409 offenders (out of 1,632 offenders) in the low-level group were matched with 1,409 offenders (out of 2,499 offenders) in the high-level group. After matching, the logistic regression model predicting the likelihood of being given a high level of rehabilitation-focused contacts was not significant (pseudo $R^2 = 0.002$; $p = 1.000$ from likelihood ratio test). Forty variables were used to predict group membership in the propensity score model. Prior to matching, seven variables had an absolute value of SB greater than 10 (none had an absolute value greater than 20). These variables were custody length (≤ 3 months, 6+ to 9 months), length of parole order (6+ to 12 months), ARIA range (Outer regional/ remote/very remote), two or more prior prison sentences, one or more prior non-serious violent offences and three or more prior indictable offences. After matching, SBs for all the variables had an absolute value of less than five and the largest absolute value of SB was 4.9 for the variable parole length (≤ 3 months). The small absolute value of all SBs and the large p-value in the likelihood ratio test confirm that the matched low-level and high-level rehabilitation-focused groups are balanced with respect to the set of observed covariates.

Table 12. Logistic regression model predicting the likelihood of having a high level of rehabilitation-focused contacts whilst under parole supervision (n=4,129)

Variable	Category	Odds ratio	95% CI	p-value
Demographic characteristics				
Age (years)	<=24	1.000		
	25-34	0.938	(0.753, 1.169)	.570
	35-44	1.034	(0.820, 1.304)	.777
	>=45	0.855	(0.653, 1.120)	.255
Gender	Female	1.000		
	Male	1.182	(0.945, 1.480)	.143
Indigenous status	Non-indigenous	1.000		
	Indigenous	1.030	(0.887, 1.197)	.698
	Unknown	1.008	(0.562, 1.810)	.978
SEIFA of residence	Quartile 1	1.000		
	Quartile 2	1.160	(0.985, 1.365)	.075
	Quartile 3	1.089	(0.918, 1.291)	.327
	Quartile 4	0.931	(0.735, 1.179)	.554
	Missing postcode	0.958	(0.550, 1.667)	.879
Remoteness of residence	Major cities	1.000		
	Inner regional	1.118	(0.930, 1.345)	.235
	Outer regional/ remote/very remote	0.774	(0.655, 0.914)	.003
Index custodial episode characteristics				
Custody length	<=3 months	1.000		
	3+ to 6 months	1.057	(0.883, 1.265)	.547
	6+ to 9 months	1.394	(1.146, 1.696)	.001
	9+ to 12 months	1.294	(1.044, 1.604)	.019
Parole length	<=3 months	1.000		
	3+ to 6 months	0.974	(0.799, 1.188)	.798
	6+ to 12 months	0.761	(0.625, 0.927)	.007
Prior offending characteristics				
5 or more court appearances	Yes	0.885	(0.740, 1.060)	.184
Court appearances in Children's Court or at youth justice conference	Yes	0.858	(0.651, 1.131)	.278
2 or more prison sentences	Yes	1.064	(0.907, 1.248)	.444
Periodic detention, intensive correction order or home detention	Yes	0.824	(0.635, 1.070)	.146
Suspended sentence	Yes	1.011	(0.865, 1.181)	.889
s9 bond	Yes	1.053	(0.890, 1.245)	.549
Supervised s9 bond or suspended sentence	Yes	1.020	(0.853, 1.219)	.827
Serious violent offence	Yes	0.851	(0.706, 1.025)	.089
Non-serious violent offence	Yes	1.272	(1.079, 1.498)	.004
Property offence	Yes	1.025	(0.869, 1.209)	.769
Break and enter offence	Yes	1.034	(0.865, 1.236)	.715
Drug offence	Yes	1.001	(0.868, 1.154)	.990
Drink driving offence	Yes	0.843	(0.724, 0.982)	.028
Driving offence	Yes	0.967	(0.833, 1.123)	.658
Breach of court order	Yes	1.025	(0.879, 1.196)	.751
3 or more indictable offences	Yes	1.254	(1.037, 1.517)	.019

Re-offending and Re-imprisonment

Again, the low-level and high-level rehabilitation-focused supervision groups were compared across the four outcome variables described earlier. Tables 13 through 15 present the results of the AFT model, without and with adjustment of potential covariates, for time to re-

offending and time to re-imprisonment, respectively. These tables show that time to re-offending and time to re-imprisonment were significantly longer for the high-level supervision group compared with the low-level supervision group, regardless of whether or not other potential covariates were included in the AFT model. As shown in Table 13, the time to first new proven offence for the high-level group is 1.431 times longer than that of the low-level group, without adjustment for potential covariates. The adjusted time ratio is slightly smaller (1.349) but still remains statistically significant. The estimated re-offending rates at 12, 24 and 36 months (from the unadjusted model) for the high-level group are 41.7 per cent, 55.4 per cent and 63.2 per cent respectively. These estimated re-offending rates are significantly lower than the estimated re-offending rates for the low-level supervision group (48.8%, 62.3% and 69.7%).

Table 13. Time to any new proven offence, matched high-level and low-level rehabilitation-focused contacts groups

	low-level group	high-level group	95% CI	p-value
Number of offenders	1,409	1,409		
Unadjusted time ratio	1.000	1.431	(1.205, 1.700)	<.001
Adjusted time ratio	1.000	1.349	(1.170, 1.556)	<.001
Unadjusted re-offending rate at 12 months	48.8%	41.7%		
Unadjusted re-offending rate at 24 months	62.3%	55.4%		
Unadjusted re-offending rate at 36 months	69.7%	63.2%		

The effect was stronger for time to re-imprisonment. As shown in Table 14, the unadjusted time ratio is 2.645 and the adjusted time ratio is 1.733. In other words, the time to first new full-time prison penalty for the high-level supervision group is 2.645 times longer than that of the low-level supervision group. The estimated rate of re-imprisonment at 12, 24 and 36 months are therefore much lower for the high-level group. At 12 months after release from custody, the estimated re-imprisonment rate of offenders in the high-level supervision group was 22.6 per cent compared with 32.0 per cent for the low-level group. At 24 months, the estimated re-imprisonment rate of offenders in the high-level supervision group was 29.3 per cent compared with 38.7 per cent for the low-level group. At 36 months the estimated re-imprisonment rate of offender in the high-level supervision group was 33.2 per cent compared with 42.5 per cent for the low-level group.

Table 14. Time to any new proven offence which resulted in a full-time prison penalty, matched high-level and low-level rehabilitation-focused contacts groups

	low-level group	high-level group	95% CI	p-value
Number of offenders	1,409	1,409		
Unadjusted time ratio	1.000	2.645	(1.988, 3.518)	<.001
Adjusted time ratio	1.000	1.733	(1.409, 2.231)	<.001
Unadjusted re-imprisonment rate at 12 months	32.0%	22.6%		
Unadjusted re-imprisonment rate at 24 months	38.7%	29.3%		
Unadjusted re-imprisonment rate at 36 months	42.5%	33.2%		

Table 15 reports the proportion of offenders who have one or more new proven indictable offences after their index custodial episode and the mean number of new proven offences within 12, 24 and 36 months for both the low-level and high-level supervision groups. As seen here, there is no significant difference across the two groups with regard to the proportion of offenders recording a new proven indictable offence. However, the mean number of new proven offences within 12 and 36 months are significantly lower in the high-level supervision group relative to the low-level supervision group ($p=.026$ for 12 months and $p=.002$ for 36 months). After adjusting for potential covariate, the difference in the mean number of new proven offences within 12 months becomes insignificant while that for 36 months remains significant.

Table 15. Frequency and seriousness of re-offending, matched high-level and low-level rehabilitation-focused contacts groups

Re-offending outcomes		low-level group (n1=1,409)	high-level group (n2=1,409)	Significance (McNemar's test/paired t test)
Any new proven indictable offence occurred after index custodial episode release date	per cent	47.7	47.2	ns
	95% CI	(45.1, 50.3)	(44.6, 49.8)	
Number of new proven offences within 12 months	Mean	1.6	1.4	.026
	95% CI	(1.4, 1.7)	(1.2, 1.5)	
Number of new proven offences within 24 months	Mean	2.7	2.5	ns
	95% CI	(2.5, 2.9)	(2.4, 2.7)	
Number of new proven offences within 36 months	Mean	4.0	3.5	.002
	95% CI	(3.7,4.3)	(3.2, 3.7)	

Discussion

The current study sought to address four questions of importance to correctional policy:

1. Does unconditional release increase the risk, speed or seriousness of further offending compared with conditional release?

2. Does unconditional release increase the likelihood of re-imprisonment compared with conditional release?
3. Does less frequent supervision increase the risk, speed or seriousness of further offending compared with more frequent supervision?
4. Does less frequent supervision increase the likelihood of re-imprisonment compared with more frequent supervision?

To answer questions (1) and (2) we compared re-offending rates among two matched cohorts of prisoners released from NSW correctional centres in 2009/10; one of which was released without any requirement for parole supervision and the other of which was released under parole supervision. The offenders in both groups were matched on a wide range of factors that influence the rate of re-offending and/or the rate of re-imprisonment. The results of this part of the study revealed that offenders who received parole supervision upon release from custody took longer to commit a new offence, were less likely to commit a new indictable offence and committed fewer offences than offenders who were released unconditionally into the community. No significant differences were found between the two groups in the average time to commit a new offence that resulted in a prison penalty.

To answer questions (3) and (4) two comparisons were made. Firstly, the re-offending rate of parolees who received more frequent compliance-focused contacts whilst on parole was compared with the re-offending rate of a matched group of parolees who received less frequent compliance-focused contacts. Secondly, the re-offending rate of parolees who received more frequent rehabilitation-focused contacts whilst on parole was compared with the re-offending rate of a matched group of parolees who received less frequent rehabilitation-focused contacts. A similar comparison was made with re-imprisonment as the outcome variable, rather than re-offending. The results of these comparisons suggest that more active supervision can reduce parolee recidivism but only if it is rehabilitation-focused. Specifically, we found that, after matching on all observed covariates, parolees with a higher than average level of rehabilitation-focused contacts take longer to commit any new offence and record fewer offences within 36 months of being released compared with their counterparts who received less frequent rehabilitation-focused contacts. No similar effect was observed for the compliance-focused supervision. It should be noted, however, that, regardless of the type of supervision, higher levels of supervision were associated with a lower risk of return to prison.

Our findings are inconsistent with a number of overseas studies examining the effectiveness of parole in reducing re-offending but consistent with those of studies which have examined the specific effect of supervision on re-offending. In her review of the relevant literature, MacKenzie (2002, p. 386) found no evidence that intensive supervision on its own reduced re-offending. Programs that combine treatment or rehabilitation with supervision, however, have been found to be effective (Aos, Miller & Drake, 2006). It is not clear why the present study found beneficial effects from parole supervision whereas studies in other jurisdictions (e.g. Jackson 1983; Drake & Barnoski 2006) found no effect but there are several possibilities. First, as Osterman (2013) points out, traditional analyses of the effectiveness of parole typically assume that offenders released to parole are under supervision. In practice, active supervision often ends prior to the expiry of the parole order. In the present study, offenders on parole were only treated as supervised if they were actually under supervision.

A second possibility is that, since offenders at higher risk of re-offending are likely to be assigned to higher levels of supervision, the benefits of supervision may be hidden in studies that do not control adequately for selection bias. The present study used propensity score matching to ensure that those released without supervision and those released with supervision were identical (within the limits of chance) on a large range of factors relevant to re-offending. As Apel and Sweeten (2010, p. 557) show, propensity score matching offers more assurance than conventional regression methods (such as those often used in earlier parole evaluation studies) that the two groups being compared are alike in all relevant particulars. A third possibility is that jurisdictions differ in the quality and intensity of their parole supervision and support. It may be that the treatment and/or supervision of parolees in NSW is more intensive or of higher quality than in jurisdictions where parole caseloads are high, treatment resources are scarce and there are substantial barriers to successful re-entry into community life (e.g. prohibitions against the employment of ex-offenders in a large number of areas).

There are, as always, a number of important caveats surrounding our findings. Firstly, even if our results are accepted as evidence of the effectiveness of parole in NSW, it is important to bear in mind that the supervision versus no supervision comparison was necessarily restricted to offenders who had served 12 months or less in custody. This was to ensure that there was sufficient overlap between the supervised and unsupervised groups in regard to the number of

days spent in custody during the index custodial episode. The comparison between high- versus low-level supervision was also based on a restricted sample. In this analysis, offenders who were serving parole orders of 12 months or more were excluded because data on supervision levels after the first year were not recorded in sufficient detail. It is therefore unclear the extent to which the current results are applicable to prisoners who have served lengthy custodial sentences or parole orders (although, having said this, it is worth noting that this latter group of 366 offenders represents a minority of the 7,494 offenders in the sample (4.8%).

A second concern to bear in mind is that, as our measure of supervision intensity is the actual contact rate with parole officers, it might be argued that those who were more likely to re-offend were also less likely to comply with their supervision obligations. It is possible, in other words, that low frequency of supervised contact and high risk of re-offending, rather than being cause and effect, are both effects of some third factor (e.g. a general disposition toward non-compliance). Without dismissing this interpretation of our findings out of hand, there are two considerations that militate against it. To begin with, non-compliance with parole supervision requirements leads fairly quickly to parole revocation. There is not much scope, in other words, for low levels of supervision intensity to emerge as a by-product of deliberate non-compliance with parole conditions. Furthermore, if the inverse relationship between supervision intensity and risk of re-offending were an artefact of non-compliance with parole reporting requirements, one would expect to find an inverse relationship between level of supervision and risk of re-offending for both rehabilitation-focused contact and compliance-focused contact. In the latter case, no such relationship was found.

This said, there is always a possibility that an important covariate has been excluded from the analysis and it is this omitted variable which accounts for the difference observed between the treatment and control groups. To deal with the problem of omitted variable bias a large range of covariates from the Bureau's Reoffending Database were included in our models. We were, however, unable to use information from the LSI-R because these data were missing for a large proportion of the cohort (17.2%); in particular for prisoners released unconditionally (37.2%). This is unfortunate because previous research has shown that recidivism models including the LSI-R subscales along with routinely collected data have greater predictive accuracy than recidivism models based on routinely collected data alone (Ringland 2011). LSI-R scores were available for a larger proportion of offenders released to

parole supervision and were used in supplementary analyses as a covariate to match parolees given high- versus low-levels of supervision. The results of these additional analyses were generally consistent in demonstrating a significant effect of more active supervision in reducing parolee recidivism. Routine administration of the LSI-R to all prisoners prior to release would enable future research to undertake similar confirmatory analyses for the conditional versus unconditional release comparison.

Note

The Level of Service Inventory-Revised (LSI-R) is routinely used by Corrective Services NSW to guide supervision and treatment decisions. The LSI-R is a 54-item measure that has 10 subscales: criminal history, education/employment, financial, family/marital, accommodation, leisure/recreation, companions, alcohol/drug problem, emotional/personal, attitudes/orientation. An overall summary risk score is produced that can be categorised into 5 risk levels of recidivism: low, low-medium, medium, medium-high, high.

The analyses presented in the main report did not include information from the LSI-R in the propensity score models because, in the current dataset, LSI-R scores were missing for a large number of offenders (in particular, 1,030 out of 2,772 offenders (37.2%) who were released unconditionally have a missing LSI-R score). To test our conclusions regarding the efficacy of high levels of rehabilitation- and compliance-focused contacts we therefore repeated the analyses presented above but included LSI-R as an additional variable on which to match offenders. The results from these supplementary analyses (presented in the Appendix) are generally consistent with those reported above. For compliance-focused contacts, a significant difference between the matched high- and low-level supervision groups was evident for time to re-imprisonment. However, for the rehabilitation-focused contacts, significant differences between the matched high- and low-level supervision groups were apparent for time to re-offending, time to re-imprisonment and time to return to custody.

Appendix

Sensitivity analysis

In the analyses comparing outcomes for offenders receiving high levels of post-release supervision with those receiving low levels of supervision, information from the Level of Service Inventory-Revised (LSI-R) was not included in the propensity score models and offenders were therefore not matched on this variable. This variable was excluded from the model because 16 per cent of the 4,131 offenders conditionally released had a missing LSI-R score and/or had a valid LSI-R score but the LSI-R had been administered more than 18 months prior to or 6 months after the index episode release date. This is unfortunate because scores on the LSI-R are not only used by community corrections officers to assess risk and guide case management plans but have also been shown to independently predict re-offending likelihood (Ringland 2011). Further sensitivity analyses were therefore undertaken

to examine whether inclusion of the LSI-R scores in the propensity score models would affect our conclusions regarding the efficacy of high levels of rehabilitation- and compliance-focused contacts.

Table A1 below presents the results from a logistic regression model predicting the likelihood of receiving a high level of compliance-focused contacts post-release, where LSI-R scores have been included as an independent variable in the model. The results show that offenders with medium-high (i.e. a score of 34 to 40) and high (i.e. a score of 41 to 54) LSI-R scores were more likely to have more frequent compliance-focused contacts compared with offenders with low (i.e. scores of 0 to 13) or medium-low (i.e. scores of 14 to 23) LSI-R scores. Using one-to-one matching with no replacement and a caliper of 0.0005, 1,171 offenders (of a total 1,494 offenders) who received a high level of compliance-focused contact whilst under parole supervision were matched with 1,171 offenders who received a low level of compliance-focused contact.

Table A1. Logistic regression on the likelihood of getting high-level compliance focused contacts excluding offenders with parole order of greater than 12 months (n=3,457)

Variable	Category	Odds ratio	95% CI	p-value
Demographic characteristics				
Age (years)	<=24	1.000		
	25-34	1.140	(0.899, 1.445)	.279
	35-44	0.903	(0.703, 1.160)	.426
	>=45	0.697	(0.517, 0.940)	.018
Gender	Female	1.000		
	Male	0.799	(0.621, 1.029)	.082
Indigenous status	Non-indigenous	1.000		
	Indigenous	0.854	(0.725, 1.005)	.057
	Unknown	0.836	(0.427, 1.634)	.599
SEIFA of residence	Quartile 1	1.000		
	Quartile 2	1.236	(1.037, 1.474)	.018
	Quartile 3	1.228	(1.022, 1.476)	.028
	Quartile 4	1.392	(1.075, 1.802)	.012
	Missing postcode	1.235	(0.626, 2.433)	.543
Remoteness of residence	Major cities	1.000		
	Inner regional	0.877	(0.722, 1.065)	.185
	Outer regional/ remote/very remote	0.821	(0.684, 0.985)	.034
Index custodial episode characteristics				
Custody length	<=3 months	1.000		
	3+ to 6 months	0.833	(0.679, 1.021)	.078
	6+ to 9 months	0.713	(0.574, 0.886)	.002
	9+ to 12 months	0.716	(0.566, 0.906)	.005
Parole length	<=3 months	1.000		
	3+ to 6 months	1.257	(1.011, 1.563)	.039
	6+ to 12 months	1.463	(1.177, 1.819)	.001
LSI-R score risk category	Low (0-13)	1.000		
	Medium-low (14-23)	1.173	(0.779, 1.767)	.444

	Medium (24-33)	1.456	(0.977, 2.169)	.065
	Medium-high (34-40)	1.984	(1.312, 3.000)	.001
	High (41-54)	1.887	(1.173, 3.036)	.009
Prior offending characteristics				
5 or more court appearances	Yes	0.926	(0.764, 1.122)	.430
Court appearances in Children's Court or at youth justice conference	Yes	0.946	(0.701, 1.274)	.713
2 or more prison sentences	Yes	0.824	(0.692, 0.981)	.030
Periodic detention, intensive correction order or home detention	Yes	0.999	(0.749, 1.333)	.995
Suspended sentence	Yes	0.891	(0.753, 1.054)	.178
s9 bond	Yes	0.764	(0.639, 0.914)	.003
Supervised s9 bond or suspended sentence	Yes	1.177	(0.973, 1.424)	.094
Serious violent offence	Yes	1.076	(0.877, 1.320)	.482
Non-serious violent offence	Yes	1.007	(0.841, 1.206)	.941
Property offence	Yes	1.152	(0.964, 1.376)	.119
Break and enter offence	Yes	0.860	(0.711, 1.040)	.120
Drug offence	Yes	1.025	(0.879, 1.195)	.751
Drink driving offence	Yes	1.026	(0.870, 1.210)	.759
Driving offence	Yes	1.177	(1.001, 1.383)	.049
Breach of court order	Yes	1.052	(0.891, 1.241)	.550
3 or more indictable offences	Yes	1.213	(0.988, 1.489)	.066

Tables A2 through A4 compare these two matched groups across the four outcomes used in this study. Only time to re-imprisonment is significantly different across the two groups, with offenders who received high-level compliance-focused contacts taking longer to receive a new full-time prison penalty than offenders who received low-level compliance-focused contact. There were no significant differences between the two matched groups in the time to re-offending, frequency of re-offending or seriousness of re-offending. These results are generally consistent with those from the earlier analysis which excluded the LSI-R scores from the propensity score models.

Table A2. Time to any new proven offence, matched high-level and low-level compliance-focused contacts groups

	low-level group	high-level group	95% CI	p-value
Number of matched pairs	1,171	1,171		
Unadjusted time ratio	1.000	1.141	(0.976, 1.334)	.099
Adjusted time ratio	1.000	1.125	(0.981, 1.289)	.091
Unadjusted re-offending rate at 12 months	45.6%	42.6%		
Unadjusted re-offending rate at 24 months	61.2%	58.2%		
Unadjusted re-offending rate at 36 months	69.8%	67.1%		

Table A3. Time to any new proven offence which resulted in a full-time prison penalty, matched high-level and low-level compliance-focused contacts groups

	low-level group	high-level group	95% CI	p-value
Number of matched pairs	1,171	1,171		
Unadjusted time ratio	1.000	1.924	(1.459, 2.537)	<.001
Adjusted time ratio	1.000	1.579	(1.264, 1.972)	<.001
Unadjusted re-offending rate at 12 months	29.5%	22.2%		
Unadjusted re-offending rate at 24 months	37.6%	29.9%		
Unadjusted re-offending rate at 36 months	42.3%	34.6%		

Table A4. Frequency and seriousness of re-offending, matched high-level and low-level compliance-focused contacts groups

Re-offending outcomes	low-level group (n1=1,171)		high-level group (n2=1,171)		Significance (McNemar's test/paired t test)
	per cent				
Any new proven indictable offence occurred after index custodial episode release date	per cent	51.8	48.1		ns
	95% CI	(49.0, 54.7)	(45.2, 50.9)		
Number of new proven offences within 12 months	Mean	1.5	1.6		ns
	95% CI	(1.3, 1.6)	(1.4, 1.7)		
Number of new proven offences within 24 months	Mean	2.7	2.9		ns
	95% CI	(2.5, 2.9)	(2.7, 3.2)		
Number of new proven offences within 36 months	Mean	3.7	3.9		ns
	95% CI	(3.5,4.0)	(3.7, 4.2)		

Table A5 presents the results from a logistic regression model predicting the likelihood of receiving a high level of rehabilitation-focused contacts post-release, where LSI-R scores have been included as an independent variable in the model. This model indicates that offenders with higher LSI-R scores are more likely to receive a high level of rehabilitation-focused contacts post-release. When we include the LSI-R variable as one of the matching variables, the number of offenders in each matched group drops from 1,409 to 956. Despite this decrease in sample size, the time ratios estimated from the AFT model remain significant and are also larger than previous estimates (see Tables A6 to A8). Time to re-offending and time to re-imprisonment are all significantly longer for the high-level group compared with the low-level group. These results are also consistent with earlier analyses which excluded the LSI-R variable from the matching process (refer to Tables 13 to 14). However, in contrast to earlier analyses, neither the frequency of re-offending nor the seriousness of re-offending was found to be significantly different across the two groups (see Table A8).

Table A5. Logistic regression on the likelihood of getting high level of rehabilitation-focused contacts excluding offenders with parole order of greater than 12 months (n=3,457)

Variable	Category	Odds ratio	95% CI	p-value
Demographic characteristics				
Age (years)	<=24	1.000		
	25-34	0.965	(0.752, 1.239)	0.781
	35-44	1.110	(0.852, 1.446)	0.440
	>=45	0.956	(0.702, 1.301)	0.773
Gender	Female	1.000		
	Male	1.236	(0.949, 1.608)	0.116
Indigenous status	Non-indigenous	1.000		
	Indigenous	0.877	(0.738, 1.042)	0.137
	Unknown	1.132	(0.569, 2.252)	0.724
SEIFA of residence	Quartile 1	1.000		
	Quartile 2	1.223	(1.017, 1.472)	0.032
	Quartile 3	1.058	(0.872, 1.284)	0.565
	Quartile 4	1.085	(0.823, 1.429)	0.565
	Missing postcode	1.433	(0.712, 2.887)	0.314

Remoteness of residence	Major cities	1.000		
	Inner regional	1.091	(0.885, 1.345)	0.414
	Outer regional/ remote/very remote	0.759	(0.627, 0.917)	0.004
Index custodial episode characteristics				
Custody length	<=3 months	1.000		
	3+ to 6 months	1.070	(0.866, 1.321)	0.532
	6+ to 9 months	1.472	(1.171, 1.850)	0.001
	9+ to 12 months	1.219	(0.954, 1.556)	0.113
Parole length	<=3 months	1.000		
	3+ to 6 months	0.970	(0.768, 1.227)	0.802
	6+ to 12 months	0.659	(0.523, 0.831)	0.000
LSI-R score risk category	Low (0-13)	1.000		
	Med-low (14-23)	1.868	(1.230, 2.836)	0.003
	Medium (24-33)	4.378	(2.901, 6.608)	0.000
	Med-high (34-40)	6.650	(4.321, 10.234)	0.000
	High (41-54)	6.279	(3.798, 10.383)	0.000
Prior offending characteristics				
5 or more court appearances	Yes	0.894	(0.729, 1.095)	0.279
Court appearances in Children's Court or at youth justice conference	Yes	0.915	(0.670, 1.251)	0.578
2 or more prison sentences	Yes	0.892	(0.742, 1.072)	0.224
Periodic detention, intensive correction order or home detention	Yes	0.809	(0.599, 1.093)	0.168
Suspended sentence	Yes	0.973	(0.815, 1.161)	0.759
s9 bond	Yes	1.054	(0.873, 1.273)	0.585
Supervised s9 bond or suspended sentence	Yes	0.989	(0.809, 1.209)	0.911
Serious violent offence	Yes	0.761	(0.614, 0.942)	0.012
Non-serious violent offence	Yes	1.215	(1.007, 1.467)	0.042
Property offence	Yes	0.931	(0.772, 1.124)	0.459
Break and enter offence	Yes	0.933	(0.762, 1.142)	0.501
Drug offence	Yes	0.983	(0.836, 1.156)	0.836
Drink driving offence	Yes	0.886	(0.745, 1.054)	0.172
Driving offence	Yes	0.928	(0.782, 1.101)	0.390
Breach of court order	Yes	0.965	(0.810, 1.149)	0.688
3 or more indictable offences	Yes	1.115	(0.898, 1.385)	0.323

Table A6. Time to any new proven offence, matched high-level and low-level rehabilitation-focused contacts groups

	low-level group	high-level group	95% CI	p-value
Number of matched pairs	956	956		
Unadjusted time ratio	1.000	1.653	(1.369, 1.996)	<.001
Adjusted time ratio	1.000	1.580	(1.355, 1.843)	<.001
Unadjusted re-offending rate at 12 months	51.0%	40.2%		
Unadjusted re-offending rate at 24 months	65.7%	55.2%		
Unadjusted re-offending rate at 36 months	73.5%	63.7%		

Table A7. Time to any new proven offence which resulted in a full-time prison penalty, matched high-level and low-level rehabilitation-focused contacts groups

	low-level group	high-level group	95% CI	p-value
Number of matched pairs	956	956		
Unadjusted time ratio	1.000	3.746	(2.737, 5.126)	<.001
Adjusted time ratio	1.000	2.322	(1.820, 2.962)	<.001
Unadjusted re-offending rate at 12 months	31.7%	20.9%		
Unadjusted re-offending rate at 24 months	41.8%	28.1%		
Unadjusted re-offending rate at 36 months	45.8%	32.4%		

Table A8. Frequency and seriousness of re-offending, matched high-level and low-level rehabilitation-focused contacts groups

Re-offending outcomes	low-level group (n1=956)		high-level group (n2=956)	Significance (McNemar's test/paired t test)
Any new proven indictable offence occurred after index custodial episode release date	per cent	50.6	47.3	ns
	95% CI	(47.5, 53.8)	(44.1, 50.5)	
Number of new proven offences within 12 months	Mean	1.5	1.5	ns
	95% CI	(1.4, 1.7)	(1.4, 1.7)	
Number of new proven offences within 24 months	Mean	2.7	2.9	ns
	95% CI	(2.5, 3.0)	(2.7, 3.2)	
Number of new proven offences within 36 months	Mean	3.8	3.9	ns
	95% CI	(3.5,4.2)	(3.6, 4.2)	

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