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The impact of the Practice Guide for Intervention (PGI) on recidivism among parolees

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AIM

We investigate the impact of the Practice Guide for Intervention (PGI) on re-offending among high-risk parolees in New South Wales (NSW).

METHOD

Introduced in June 2016, PGI was a major component of the 'Enhanced Community Supervision' reform and led to a dramatic overhaul in the delivery of supervision services. Using a difference-in-differences (DiD) strategy, we compare re-offending behaviour between offenders released from prison on parole and those released unconditionally before and after the introduction of PGI. PGI is compulsory for offenders released on parole with a Level of Service Inventory-Revised (LSI-R) score of medium or above, and consequently, the sample is limited to offenders with these LSI-R scores. Re-offending is measured as the probability of committing a new and proven offence within 12 months of release from prison. The pre-PGI period includes offenders released from prison between June and December 2014. There are two post-PGI periods. The first post-PGI period includes offenders released between June and December 2016, which coincides with the first six months after PGI was introduced in NSW. The second post-PGI period includes offenders released between June and December 2017, when the use of PGI across NSW was approaching its historical peak.

RESULTS

A comparison of the trends in the re-offending rate before the introduction of PGI confirms that prisoners released unconditionally form a natural comparison group for parolees. The DiD estimates reveal a 2 to 3 percentage point reduction in the likelihood of re-offending among parolees compared with those released unconditionally after the introduction of PGI. However, the estimates are not statistically significant.

CONCLUSION

The results suggest that the introduction of PGI did not have a statistically significant impact on re-offending rates of high-risk parolees.

KEYWORDS

Practice Guide for Intervention (PGI) | risk-need-responsivity (RNR) | cognitive behavioural therapy (CBT) | recidivism | parole

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INTRODUCTION

Beginning in 2016, the New South Wales (NSW) government introduced a wide range of criminal justice reforms with the aim to reduce re-offending by 5 percentage points by 2019. To help achieve this target, Community Corrections NSW introduced the 'Enhanced Community Supervision' strategy. In practice, this led to the implementation of the Practice Guide for Intervention (PGI); a new supervision tool for Community Corrections Officers (CCOs) to use with high-risk offenders serving community supervision orders, including parole.

The Practice Guide for Intervention (PGI)

PGI is designed to be used by CCOs who supervise offenders in the community and is fundamentally a cognitive behavioural therapy (CBT) based approach to offender rehabilitation.[1] It can be undertaken with the offender during any community supervision interview ('contact'), including any contact prior to release from custody.

PGI is a supervision tool that builds upon the three core principles of the Risk-Need-Responsivity (RNR) model (Bonta & Andrews, 2007):

1. 'Risk' principle: the level of program intensity should be matched to the offender's risk of re-offending. In other words, higher (lower) levels of service should be reserved for high (low)-risk offenders,
2. 'Need' principle: target specific offender needs that are related to criminality, and;
3. 'Responsivity' principle: provide CBT-based treatment that is tailored to complement the offender's learning style and abilities.

In practice, PGI provides the CCO with a series of CBT-based written exercises to undertake with offenders as part of their overall supervision case plan.[2] The exercises are intended to provide focus and structure during each supervision contact, and are broadly grouped into 13 modules (or 'topics') that target different criminogenic needs. Accordingly, the focus of each module varies significantly, from 'Managing Stress and Anger', 'Managing Cravings', to 'Conflict Resolution'.[3] Within each module, there are between three and six exercises available for the CCO to use during supervision interviews. Module 1 'Assessment and Planning' and Module 2 'Achieving Goals' are intended to be used with all supervised offenders. Moreover, exercises '1.1 Supervision Expectations' and '1.2 Offence Mapping and Intervention Planning' within module 1 are compulsory for all eligible offenders to undertake and form the basis of supervision expectations between the CCO and offender. PGI can also be used in conjunction with other therapeutic programs that address criminogenic factors.

Consistent with RNR principles, PGI is primarily intended for use with high-risk offenders serving a community supervision order; that is, all supervised offenders with a Level of Service Inventory-Revised (LSI-R) score of medium or above.[4] PGI can also be used with offenders with an LSI-R score below medium; however, where used, only a minimum level of intervention is recommended. A community supervision order includes serving bail supervision, supervised suspended sentences, good behaviour bonds, intensive correction orders (ICOs), home detention orders, parole orders, and extended supervision orders. In addition to community supervision, PGI can also be used with prisoners at pre-release.

1 Put simply, CBT techniques are designed to focus on modifying the thought processes that can lead an offender to commit a crime. CBT is intended to encourage offenders to understand their thinking, attitudes, and beliefs that led to past criminal activity, and ultimately, produce behavioural change.
2 While PGI provides a total of 56 written exercises, and the primary mode of intended delivery is face-to-face, it is also possible for the exercises to be delivered verbally or via phone with an offender.
3 The complete list of PGI modules are: 1) Assessment and planning, 2) Achieving goals, 3) Dealing with setbacks, 4) Managing stress and anger, 5) Managing impulsivity, 6) Managing environment, 7) Managing cravings, 8) Interpersonal relationships, 9) Communication, 10) Conflict resolution, 11) Self-awareness, 12) Prosocial lifestyle, and 13) General skills.
4 A noteworthy caveat is sex offenders. It is recommended that CCOs consult with a Corrective Services NSW (CSNSW) psychologist for advice on which modules are relevant before using PGI with sex offenders.

Overall, the introduction of PGI amounted to a substantial departure from how community supervision was conducted historically. Previously, the emphasis of supervision was typically on monitoring an offender's compliance with the conditions of their order(s). However, PGI shifts the focus of supervision toward a rehabilitative approach where CCOs proactively assist offenders to address the factors that contribute to their offending behaviour (that is, their 'criminogenic needs'). It was expected that the PGI exercises would translate into greater consistency in the delivery of supervision across NSW, and more broadly, how CCOs interact with offenders (Tran, Thaler, Chong, & Howard, 2019).

The implementation of PGI

The implementation of PGI state-wide was staggered over time to allow CCOs to engage in training and to familiarise themselves with the new material before using it with offenders. According to Thaler, Chong, Raudino, and Howard (2019), Community Corrections NSW intentionally introduced PGI in three distinct stages spanning June 2016 to June 2017.

Table 1. The three stages of PGI implementation

Stage 1	June 2016 to December 2016	PGI introduced across NSW Use of PGI during supervision not compulsory No KPIs
Stage 2	January 2017 to May 2017	Exercises 1.1 and 1.2 became compulsory KPIs introduced to measure use of exercises 1.1 and 1.2
Stage 3	June 2017 onwards	70 per cent of contacts with offenders must involve PGI Full KPIs introduced

Note. The compulsory exercises in stage 2 are '1.1 Supervision Expectations', and '1.2 Offence Mapping and Intervention Planning'.

Table 1 presents the three stages of PGI implementation and summarises the key characteristics of each stage. The first stage of implementation, which occurred between June to December 2016, involved training of CCOs in the use of the materials and communication encouraging CCOs to progressively incorporate the exercises into all offender contacts. As the use of PGI during supervision was not mandatory in stage 1, the uptake of PGI varied substantially across CCOs. As a result, a relatively small proportion of offenders serving a supervision order received one or more sessions of PGI during this period (Howard & Chong, 2019).

The second stage, which took place between January and May 2017, mandated the use of PGI with all offenders serving a community supervision order who were assessed medium or above on the LSI-R. PGI could also be used with supervised offenders who have an LSI-R score below medium; however, it was not compulsory for these offenders. During this period, Community Corrections NSW also introduced key performance indicator (KPI) benchmarks, which mandated the use of two activities ('1.1 Supervision Expectations' and '1.2 Offence Mapping and Intervention Planning') from the first 'Assessment and Planning' module.

The third and final stage of the implementation of PGI began in June 2017. The final phase was most notably characterised by the establishment of a minimum delivery standard of PGI across NSW that was intended to increase the use of PGI modules (or, 'PGI activity') with supervised offenders. In practice, this meant that CCOs were required to involve PGI in at least 70 per cent of contacts with each supervised offender, and their performance was measured in the form of KPIs.

In addition to an increase in PGI activity, the proportion of supervised offenders that received PGI also increased substantially during the third stage. The number of offenders who received PGI earlier in their supervision order also increased in stage 3. The significant increase in the delivery of PGI among supervised offenders occurred from June 2017 onward, with Howard and Chong (2019) reporting that "...growth in the number of PGI sessions delivered and reach to the target population was observed to

accelerate following transition from an introductory phase of discretionary use to operational phases of mandatory use and associated KPIs."

Between October and December 2017, Tran et al. (2019) interviewed 43 CCOs to gauge how the changes to community supervision resulting from the introduction of PGI have been received. In general, the authors find that the shift toward promoting behavioural change was positively received by CCOs. For instance, CCO's awareness of the importance of behavioural change to successfully rehabilitate offenders and reduce recidivism increased following the introduction of PGI. Interestingly, they also found that CCOs who have been using PGI during supervision contacts for a longer period held a more positive perception of their role in offender rehabilitation. And, in practice, the CCOs reported that the PGI exercises provided structure and focus during supervision contacts.

Previous research

This study is related to the broader literature on the efficacy of the RNR approach to offender rehabilitation. The RNR principles originally proposed by Andrews, Bonta, and Hoge (1990), have been adopted into offender supervision and rehabilitation programs in many correctional settings worldwide (for instance, Canada, New Zealand, and the United Kingdom).

Broadly, there is empirical support for the effectiveness of RNR-based programs in reducing re-offending, at least for those programs where there is a high level of adherence to the RNR principles. In one of the earliest reviews, Andrews et al. (1990) set out to compare the efficacy of RNR-based rehabilitative programs with punitive approaches for adult and juvenile offenders. They conducted a meta-analysis of 80 studies evaluating the effectiveness of treatment delivered in community or correctional settings on recidivism.

The authors were interested in testing two predictions. The first was that rehabilitative programs based on the RNR framework would lead to larger reductions in re-offending compared with programs that focus on criminal punishments only. Second, the authors predicted that programs with greater consistency with the RNR model would be associated with larger reductions in recidivism than programs with a lower level of adherence.

To test these predictions, programs were classified by the authors according to three principles. The first was whether the program matched the intensity of treatment to an offender's risk level, where high-risk offenders would receive a greater level of treatment. Second, whether the program targeted each offender's unique criminogenic needs, or 'dynamic risk factors'. Third, whether services were appropriately matched to the offender's learning ability. A program that satisfied all three principles was classified as 'appropriate'. This resulted in four different categories: 1) 'criminal sanctions', the offender receives a punishment only without any rehabilitative services, 2) 'inappropriate correctional service', offender risk was not matched with the level of service provided, 3) 'appropriate correctional service', CBT programs that were appropriately targeted to offender risk, and, 4) 'unspecified correctional service', programs the authors could not classify.

Andrews et al. (1990) found that offender rehabilitation programs which successfully applied the principles of RNR led to substantial reductions in recidivism when compared with criminal sanctions only. Furthermore, programs that the authors classified as 'appropriate correctional service' had comparatively larger reductions in re-offending than programs the authors classified as 'inappropriate'.

Later research investigated the effectiveness of the RNR-based interventions among specific groups of offenders. For example, Dowden and Andrews (2000) reviewed 35 studies evaluating the effectiveness of violent offender treatment programs delivered in correctional facilities in reducing recidivism. Similar to the approach adopted by Andrews et al. (1990), rehabilitation programs were classified according to their adherence to the RNR principles, as well as whether a program targeted an offender's criminogenic needs. Higher scores were allocated to programs with greater adherence, while programs that focused on sanctions only were given the lowest score.

The programs with the greatest adherence to the RNR principles were again the most effective in reducing re-offending. In contrast, programs that targeted non-criminogenic needs had comparatively small effects on violent recidivism. These findings, the authors argue, indicate that the RNR model can be effective in rehabilitating offenders with very specific needs.

Reductions in recidivism have also been documented for sex offenders. Hanson, Bourgon, Helmus, and Hodgson (2009) conducted a meta-analysis of 23 RNR-based treatment programs for sex offenders, and found that, "For studies that adhered to none of the principles, the effects were consistently low; for studies adhering to all three, the effects were consistently large" (p. 884).

Furthermore, the evidence base for the effectiveness of RNR based treatment programs extends to female offending. Dowden and Andrews (1999) reviewed 26 studies where each sample consisted mostly of female offenders. In comparison with criminal sanctions alone, the authors found that the delivery of treatment programs most consistent with RNR were effective in reducing recidivism. In contrast, programs that the authors classified as inappropriate had the smallest effects.

A well-known offender rehabilitation model based on the RNR principles is the 'Strategic Training Initiative in Community Supervision' (STICS) program. In the STICS program, parole officers are trained in the application of RNR principles during supervision and receive clinical support to ensure a high level of adherence to the model. A small trial of STICS was initially conducted in Canada where probation officers were randomly selected to receive STICS training (Bonta et al., 2010). The authors report that offenders who were supervised by probation officers that received STICS training had a 15 per cent reduction in reconvictions relative to offenders supervised by probation officers in the comparison group who did not receive STICS training. However, the difference was not statistically significant, which the authors partly attribute to the small sample size. It is important to bear in mind that, although STICS training was randomly assigned to probation officers, those who participated were volunteers. It is possible that the probation officers participating in the trial were also more motivated, thereby reducing the generalisability of the results. Despite these limitations, the authors argue that the results from the STICS trial are promising.[5]

In NSW, there is some evidence that RNR-based community supervision can reduce the likelihood to re-offend. Wan, Poynton, van Doorn, and Weatherburn (2014) studied the impact of parole supervision on recidivism among adult offenders. Compared to prisoners released unconditionally between 2009 and 2010, the authors found that 'rehabilitation-focused' supervision contacts (where the purpose of the contact was to address criminogenic needs) had a beneficial impact on recidivism. In contrast, contacts where the focus was to ensure the offender complied with their parole conditions ('compliance-focused' contacts) had no impact. However, it should be noted that a supervision contact was classified as 'rehabilitation' or 'compliance' focused indirectly from case notes. Nevertheless, this result is significant for our study given the focus of PGI on offender rehabilitation.

While the studies reviewed above provide promising evidence for RNR-based offender treatment programs, there are notable criticisms of the RNR approach in the criminal psychology literature. In particular, the RNR approach has been criticised for its exclusive focus on addressing criminogenic factors. The Good Lives Model (GLM) is a prominent alternative to the RNR-based approach to offender rehabilitation (Ward & Laws, 2010), which identifies 9 aspects that are critical to offender rehabilitation. These are personality identity, agency, risk conception, criminogenic needs, non-criminogenic needs, etiology (or, the variety of causes of offending), motivation, intervention focus, and intervention modality (Whitehead, Ward, & Collie, 2007).

Unlike RNR models, GLM highlights the importance of focusing on non-criminogenic needs when addressing recidivism risk, including physical health, stable housing and employment, educational attainment, and the development of strong personal relationships.

5 The STICS trial spawned several similar RNR-based rehabilitation programs, which are the Staff Training Aimed at Reducing Rearrest (STARR), Effective Practices in Community Supervision (EPICS), and Skills for Effective Engagement, Development and Supervision (SEEDS) programs. However, these programs are in their infancy and the impact of them on offender recidivism has yet to be studied (Bonta, Bourgon, & Rugge, 2018).

When developing a treatment plan within the GLM, offenders' strengths and weaknesses, values, and identity, as well as their competencies and decision-making ability are also considered (Ward, Mann, & Gannon, 2007). Overall, the GLM takes a wide-ranging approach toward offender rehabilitation when compared with the mainstream RNR framework. It suggests that the offender's general psychological well-being, referred to as 'obtaining a good life' (Ward et al., 2007), is critical and should be considered alongside risk-management during rehabilitation.

However, despite these criticisms and the development of alternative models, the RNR framework is broadly considered to be the mainstream approach to offender rehabilitation, in part due to the empirical evidence for RNR interventions successfully reducing the likelihood of recidivism (Looman & Abracen, 2013). Also, proponents of the RNR principles retort that many of the program elements featured in the GLM have since been incorporated into the RNR framework (Andrews, Bonta, & Wormith, 2011).

Current study

The introduction of PGI across NSW signified a dramatic change in the approach towards supervising offenders in the community. The aim of the current study is to investigate whether these reforms were successful in achieving their objective of reducing re-offending.

To achieve this, we compare the re-offending behaviour of parolees and offenders released from prison unconditionally before-and-after the implementation of PGI. While most inmates are released from prison to parole, many can be released unconditionally either because they were sentenced to a fixed term of imprisonment or their sentence expired. If released unconditionally, the offender is not subject to supervision, and hence, would not have received PGI at the time of release from prison.

While other offenders who are supervised in the community can receive PGI, this study focuses on the impact of PGI on parolees. Typically, offenders released from prison are at relatively higher risk of re-offending and re-imprisonment. Reducing recidivism amongst parolees is especially important given the high cost of re-imprisonment (Report on Government Services, 2019). For readers interested in the impact of PGI on recidivism among offenders serving a community-based order, namely a good behaviour bond or a suspended sentence, please see the related BOCSAR study (Ooi, 2020).

METHOD

Data

The main dataset is sourced from the NSW Bureau of Crime Statistics and Research (BOCSAR) Re-offending Database (ROD), and contains records for every offender released from a NSW prison between 2014 and 2018.

The ROD offender-level data used in this study includes a detailed record of each prisoner's criminal history, including criminal court appearances (both as a juvenile and an adult), and all prior custodial episodes. The data also includes a variety of demographic information (Aboriginality, date of birth, and gender), reception and release date from custody, most recent LSI-R score prior to release from prison, and whether the offender was released from prison to community supervision.

To compare recidivism outcomes between supervised and unsupervised offenders, we also obtained data on new offences committed after each offender was released from prison into the community, including the type of re-offence(s), re-offence date, whether or not the offence was proven, and the sentence imposed by the Court. The dataset includes all new offences finalised in Court until June 2019.

We also obtained offender-level data from NSW Corrections Research Evaluation and Statistics (CRES). The data from CRES includes a record for every offender who served a supervision order between

December 2013 and August 2018 in NSW, and the monthly number of PGI sessions completed by each supervised offender.

Empirical approach: Difference-in-Differences

To measure the impact of the PGI supervision reforms on recidivism behaviour, we estimate the following difference-in-differences (DiD) model pre and post the implementation of PGI $(t=1,2)$:

$$R_{it} = \alpha_0 + \alpha_1 S_i + \alpha_2 P_t + \alpha_3 (S_i \times P_t) + \alpha_4 X_i' + \tau_t + \varepsilon_{it} \quad (1)$$

where R_{it} is the re-offending behaviour of offender i in period t. In the study, we measure the probability that offender i commits a new and proven offence within 12 months of release from prison into the community in period t.[6]

S_i is a binary variable equal to one for prisoners who receive community supervision when released (i.e.: those released on parole), and zero for prisoners released unconditionally (i.e.: those released without supervision). In the current study, we compare recidivism for parolees against offenders released from prison unconditionally. Offenders released from prison on parole with an LSI-R score of medium and above must receive PGI during supervision contacts, and hence, are the treatment group. Prisoners released unconditionally with an LSI-R of medium and above form the comparison group.[7]

P_t is a binary variable equal to 1 for the post-PGI period, and 0 for the pre-PGI period. The pre-PGI period includes prisoners released into the community between June and December 2014. The pre-PGI includes prisoners released in the second half of 2014 to include a 12-month follow up in the community to measure recidivism before the implementation of PGI in June 2016.

We include two distinct 'post' periods in the study. The first 'post' period (hereafter, referred to as 'post-PGI period 1') includes prisoners released into the community between June and December 2016. This period coincides with stage 1 of the implementation of PGI. Although PGI was first introduced state-wide in stage 1, the use of PGI during supervision contacts was comparatively minimal.

The second 'post' period (hereafter, 'post-PGI period 2') includes prisoners released into the community between June and December 2017. This period comprises stage 3 of the PGI rollout, where full KPIs were introduced state-wide and PGI activity was at its historical peak. In this study, the main pre-and-post comparison of interest is between post-PGI period 2 and the pre-PGI period.

The coefficient of interest in equation (1) is α_3, which measures the change in the likelihood of re-offending before-and-after the introduction of PGI between the treatment and comparison prisoners. The coefficient α_3 can be interpreted as a causal impact of PGI if the trend in re-offending of prisoners released unconditionally approximates the trend in re-offending of parolees before the implementation of PGI. This would indicate that prisoners released unconditionally provide a valid counterfactual for the re-offending of parolees had PGI not been implemented, and consequently, α_3 provides an unbiased estimate of the impact of PGI on re-offending.[8]

Equation (1) also includes a vector of offender characteristics (X_i'), including the number of prior prison sentences, prior finalised criminal court appearances, and any criminal justice contacts as a juvenile. Also included in X_i' are offender demographics (age at release into the community, gender, and Aboriginality), and the time spent in prison prior to release. We also include an interaction effect for month and year of release into the community (τ_t).

6 We exclude breach of order offences in the recidivism outcomes.
7 Among offenders released from prison without a requirement to serve a parole supervision order, it is possible the offender may still receive community supervision in the form of a non-custodial supervision order. For example, an offender may be sentenced to a fixed prison sentence and a good behaviour bond that is scheduled to start after release from prison. These offenders were excluded from the dataset.
8 In the empirical literature, this is commonly referred to as the 'parallel' or 'common' trend assumption.

PGI activity

Our empirical strategy estimates the recidivism of offenders released to parole supervision between June and December in 2016 and 2017 (i.e. post-PGI periods 1 and 2). In this section, we briefly describe the level of PGI activity during these two time periods, as well as the different types of PGI modules being completed by parolees.

Completed PGI modules over time

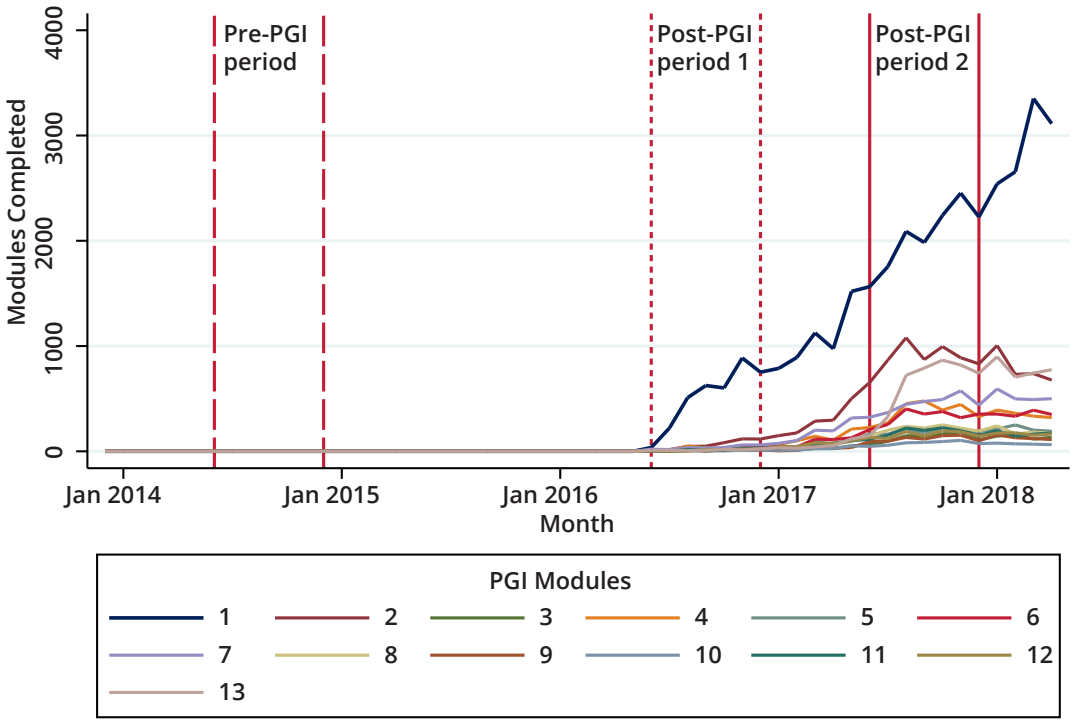
Figure 1 displays the number of PGI modules completed among all offenders serving a supervision order between January 2014 and July 2018 across NSW. In the figure, the pre-PGI period is represented by the long-dash vertical lines. The first post-PGI period (stage 1) is represented by the short-dash vertical lines, while the second post-PGI period (stage 3) is represented by the solid vertical lines.

As expected, the monthly number of PGI modules completed is zero prior to its introduction in June 2016. After its introduction, it is clear that the number of completed modules increases steadily with time, particularly for module 1. During stage 1 (post-PGI period 1), there is a comparatively low number of PGI modules completed, and nearly all of the PGI modules completed were activities from module 1 'Assessment and Planning'.

However, as seen in Figure 1, the use of PGI increased considerably in stage 3 (post-PGI period 2), when full KPIs were introduced. During this stage, there is a demonstrable rise in the use of some of the non-compulsory PGI modules. This suggests that CCOs were increasingly incorporating modules that address offender's criminogenic factors into supervision during this period, albeit the majority of PGI activity continued to be from module 1.

To capture the relationship between PGI activity and recidivism, the main post-PGI period in the DiD specification (i.e.: post-PGI period 2) occurs during a period when the number of PGI modules completed is relatively high, as is clearly demonstrated in Figure 1. We take this approach instead of comparing the recidivism of offenders who have completed different levels of PGI activity. This is because of the endogeneity between the number of completed PGI modules and offender characteristics related to recidivism. Further, the impact of the endogeneity bias on recidivism is ambiguous. For instance, an offender with a wider range of criminogenic factors who may be more likely to re-offend may complete more modules. Conversely, a high-risk offender may not complete a high number of modules due to being uncooperative during supervision contacts. Irrespective of the direction, this endogeneity would introduce selection bias into the DiD specification. Instead, we focus on a post-PGI period with a comparatively high number of completed modules.

Figure 1. The monthly number of PGI modules completed between 2014 and 2018



Note. Each trend line in the figure represents the usage of each of the various PGI modules, respectively. The pre-PGI period is represented by the long-dash vertical lines. Post-PGI period 1 (post-PGI period 2) is represented by the short-dash (solid) vertical lines. PGI was first introduced across NSW in June 2016, which is represented by the first short-dash vertical line.
The PGI modules are: 1) Assessment and planning, 2) Achieving goals, 3) Dealing with setbacks, 4) Managing stress and anger, 5) Managing impulsivity, 6) Managing environment, 7) Managing cravings, 8) Interpersonal relationships, 9) Communication, 10) Conflict resolution, 11) Self-awareness, 12) Prosocial lifestyle, and 13) General skills.

Compulsory and non-compulsory PGI modules among parolees

Here, we briefly summarise the use of PGI modules with parolees. Table 2 displays the percentage of parolees with an LSI-R of medium or above who completed compulsory or non-compulsory PGI modules during supervision. Column 1 includes the percentage of supervised offenders and parolees who completed the compulsory module, and Column 2 includes the percentage who completed the non-compulsory modules

Table 2. Percentage of offenders who completed compulsory or non-compulsory modules during supervision

	Compulsory module (1)	Non-compulsory modules (2)
Panel A. Post-PGI period 1		
All supervised offenders	66.40	53.47
Parole	67.53	54.21
Panel B. Post-PGI period 2		
All supervised offenders	94.38	87.92
Parole	95.68	89.09

Note. Post-PGI period 1 (post-PGI period 2) includes offenders who began their supervision between June and December 2016 (2017). The Table includes offenders with an LSI-R score of medium, medium-high, and high.

Panel A contains offenders who began supervision during post-PGI period 1 (June to December 2016), and Panel B includes parolees who began supervision during post-PGI period 2 (June to December 2017). Beginning with post-PGI period 1, just over two-thirds (67.53 per cent) of parolees completed the compulsory module, which is slightly higher than all supervised offenders (66.40 per cent). In the same period, just over half of parolees completed non-compulsory modules.

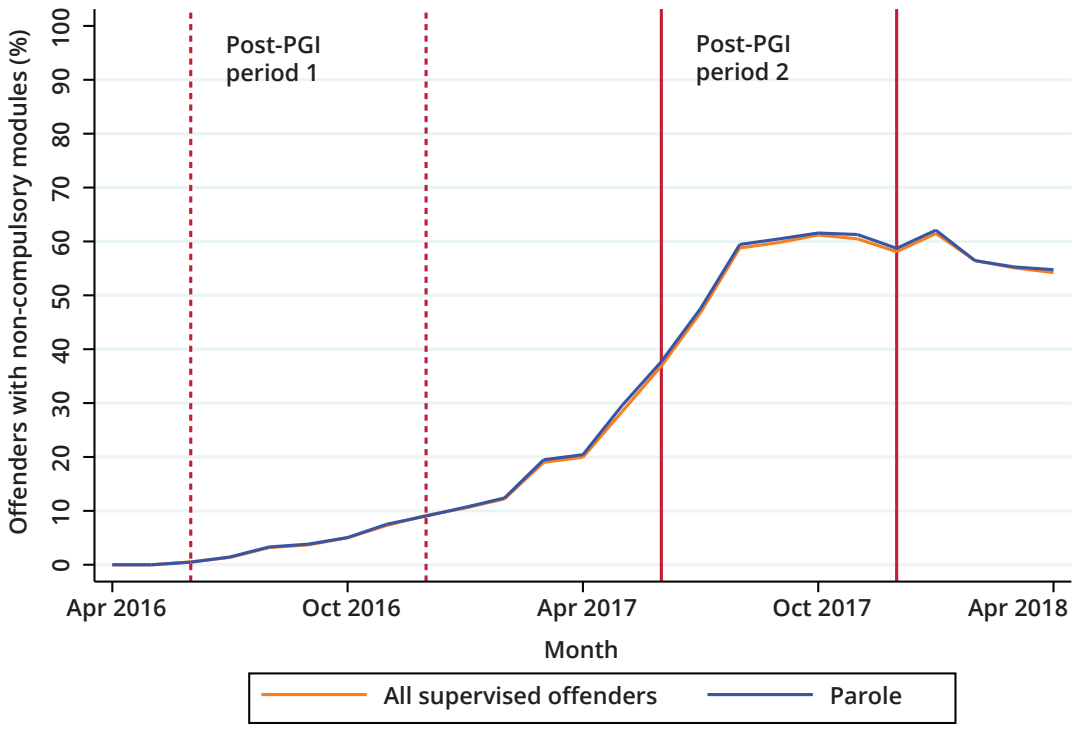
However, PGI engagement increases substantially over time. As Panel B demonstrates, among parolees (all supervised offenders) who began supervision in post-PGI period 2, roughly 96 (94) per cent completed the compulsory module and 89 (88) per cent completed at least one of the non-compulsory modules. This indicates that, in the main post-PGI period of interest, a substantial proportion of parolees undertook PGI modules during supervision that are designed to address criminogenic needs.

Next, we illustrate how frequently the non-compulsory modules are used during supervision over time among parolees with an LSI-R score of medium and above. Figure 2 displays the percentage of supervised offenders and parolees who complete the non-compulsory PGI modules in each month. As previously discussed, PGI was implemented across three distinct stages. In the figure, post-PGI period 1 is indicated by the two dashed vertical lines, while post-PGI period 2 is captured by the solid vertical lines.

Initially, the non-compulsory modules are used relatively infrequently; the percentage of supervised offenders (and parolees) who complete non-compulsory modules is low in post-PGI period 1, but the proportion soon grows steadily over time. In post-PGI period 2, the proportion of supervised offenders who complete non-compulsory modules rises steadily and remains stable for the remainder of the period. Thus, it appears that, for most of post-PGI period 2, the non-compulsory modules are used relatively frequently during supervision with roughly 60 per cent of offenders each month completing at least one of the non-compulsory modules.

Viewed together, the descriptive evidence presented in Table 2 and Figures 1 and 2 indicate that there was a relatively high level of PGI activity in post-PGI period 2. Almost every parolee completed the compulsory modules during this period, and importantly, a large proportion also completed non-compulsory modules during supervision.

Figure 2. The monthly percentage of offenders who completed non-compulsory PGI modules



Note. The Figure includes offenders with an LSI-R score of medium, medium-high, and high.

RESULTS

In this section, we present the findings for the impact of PGI on parolee re-offending. We start by discussing the descriptive statistics of the sample and then discuss the DiD estimates.

Descriptive statistics

Table 3 displays the total sample size of prisoners released into the community with an LSI-R score of medium and above, and the proportion released on parole during each pre and post PGI period, respectively. Column 1 includes the pre-PGI period, while columns 2 and 3 include the post-PGI periods, respectively. The sample included a total of 3,734 offenders released from prison in the pre-PGI period, 4,603 prisoners released in post-PGI period 1, and 4,873 prisoners released in post-PGI period 2. Thus, the number of offenders being released from prison with an LSI-R score of medium and above increased during the study period.

Within each time period in the study, the majority of offenders released from prison were parolees (between approximately 74 and 81 per cent). The proportion of prisoners with an LSI-R score of medium or above being released to parole has also been increasing with time. However, despite an increase in the proportion of offenders being released from prison on parole the study period, as discussed further below and in the appendix, there does not appear to be a change of the underlying characteristics of offenders being released on parole after the implementation of PGI in comparison with the pre-PGI period.

The characteristics of parolees and prisoners released unconditionally for the pre- and post-PGI periods are summarised in Table 4. Column 1 includes the full sample, while columns 2 and 3 separate parolees and prisoners released unconditionally, respectively. Column 4 calculates the difference between parolees and those released unconditionally for each panel. The offenders in the full sample have an extensive criminal history, which is expected given our sample consists of only medium to high risk prisoners who have served a full-time prison sentence.

Table 3. Number of prisoners released with LSI-R medium and above in the pre-and-post PGI periods

	Pre-PGI period (1)	Post-PGI period 1 (2)	Post-PGI period 2 (3)
Parolees	0.738	0.783	0.806
Total	3,734	4,603	4,873

PGI was introduced across NSW in June 2016. The pre-period includes prisoners released between June and December 2014. Post-PGI period 1 is from June to December 2016, and post-PGI period 2 includes June and December 2017.

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Table 4. Descriptive statistics: Prisoners released with LSI-R medium and above in the pre-and-post PGI periods

	Full sample (1)	Parolees (2)	Released unconditionally (3)	Difference (4)
Panel A. Pre-PGI period				
Aboriginal	0.483	0.465	0.536	-0.071**
	(0.008)	(0.009)	(0.016)	
Female	0.106	0.097	0.131	-0.034**
	(0.005)	(0.005)	(0.011)	
Age at release	33.628	33.377	34.334	-0.957**
	(0.154)	(0.180)	(0.299)	
Custodial episode 2 or more years	0.089	0.111	0.029	0.081**
	(0.005)	(0.006)	(0.005)	
Number of prior court appearances	13.370	12.781	15.027	-2.246**
	(0.133)	(0.147)	(0.284)	
Number of prior prison sentences	5.086	4.823	5.826	-1.003**
	(0.075)	(0.083)	(0.161)	
High LSI-R	0.124	0.116	0.147	-0.031*
	(0.005)	(0.006)	(0.011)	
Medium-High LSI-R	0.408	0.398	0.439	-0.041*
	(0.008)	(0.009)	(0.016)	
Prior juvenile court appearance	0.280	0.273	0.297	-0.024
	(0.007)	(0.008)	(0.014)	
Prior violent offence past 5 years	0.706	0.717	0.676	0.041
	(0.007)	(0.009)	(0.015)	
Prior property offence past 5 years	0.639	0.613	0.713	-0.100**
	(0.008)	(0.009)	(0.014)	
Prior domestic violence offence past 5 years	0.449	0.453	0.436	0.017
	(0.008)	(0.009)	(0.016)	
Re-offend within 12 months	0.392	0.358	0.489	0.131**
	(0.008)	(0.009)	(0.016)	
N	3,734	2,756	978	
Panel B. Post-PGI period 1				
Aboriginal	0.488	0.478	0.529	-0.051**
	(0.007)	(0.008)	(0.015)	
Female	0.107	0.103	0.120	-0.017
	(0.004)	(0.005)	(0.010)	
Age at release	33.971	33.901	34.228	-0.327
	(0.138)	(0.157)	(0.286)	
Custodial episode 2 or more years	0.101	0.123	0.018	0.105**
	(0.004)	(0.005)	(0.004)	
Number of prior court appearances	13.639	13.198	15.233	-2.035**
	(0.122)	(0.133)	(0.283)	
Number of prior prison sentences	4.960	4.773	5.636	-0.863**
	(0.066)	(0.073)	(0.152)	
High LSI-R	0.128	0.121	0.157	-0.036**
	(0.005)	(0.005)	(0.011)	

Table 4. Descriptive statistics: Prisoners released with LSI-R medium and above in the pre-and-post PGI periods - continued

	Full sample	Parolees	Released unconditionally	Difference
	(1)	(2)	(3)	(4)
Medium-High LSI-R	0.413	0.407	0.436	-0.029
	(0.007)	(0.007)	(0.016)	
Prior juvenile court appearance	0.285	0.282	0.300	-0.018
	(0.006)	(0.007)	(0.012)	
Prior violent offence past 5 years	0.708	0.710	0.702	0.008
	(0.006)	(0.008)	(0.014)	
Prior property offence past 5 years	0.642	0.625	0.702	-0.077**
	(0.007)	(0.008)	(0.014)	
Prior domestic violence offence past 5 years	0.503	0.499	0.520	-0.021
	(0.007)	(0.008)	(0.015)	
Re-offend within 12 months	0.409	0.375	0.531	0.156**
	(0.007)	(0.008)	(0.015)	
N	4,603	3,605	998	
Panel C. Post-PGI period 2				
Aboriginal	0.479	0.469	0.519	-0.050**
	(0.007)	(0.008)	(0.016)	
Female	0.114	0.111	0.125	-0.014
	(0.004)	(0.005)	(0.010)	
Age at release	34.252	33.988	35.352	-1.364**
	(0.136)	(0.152)	(0.300)	
Custodial episode 2 or more years	0.095	0.115	0.014	0.101**
	(0.004)	(0.005)	(0.003)	
Number of prior court appearances	13.945	13.482	15.873	-2.391**
	(0.125)	(0.133)	(0.320)	
Number of prior prison sentences	5.064	4.870	5.870	-1.000**
	(0.068)	(0.073)	(0.171)	
High LSI-R	0.114	0.107	0.138	-0.031**
	(0.005)	(0.005)	(0.010)	
Medium-High LSI-R	0.418	0.410	0.446	-0.036*
	(0.007)	(0.008)	(0.015)	
Prior juvenile court appearance	0.276	0.282	0.252	0.030
	(0.006)	(0.007)	(0.014)	
Prior violent offence past 5 years	0.704	0.707	0.693	0.014
	(0.006)	(0.007)	(0.015)	
Prior property offence past 5 years	0.651	0.646	0.670	-0.024
	(0.006)	(0.007)	(0.014)	
Prior domestic violence offence past 5 years	0.499	0.495	0.517	-0.022
	(0.007)	(0.008)	(0.016)	
Re-offend within 12 months	0.429	0.398	0.559	0.161**
	(0.007)	(0.007)	(0.016)	
N	4,873	3,930	943	

Standard errors presented in parentheses.
** $p < .01$, * $p < .05$

Compared with parolees, offenders released from prison unconditionally are more likely to be Aboriginal, female, and slightly younger when released from gaol. Those released unconditionally have a greater number of prior court appearances and prior prison sentences, and they were also more (less) likely to have committed a property (violent) offence in the 5 years prior to release.[9] Parolees were also more likely to have spent two or more years in prison prior to release. In the pre-PGI period, approximately 49 (36) per cent of offenders released from prison unconditionally (on parole) re-offended within 12 months of release.

Panels B and C of Table 4 present the same set of calculations for prisoners released in each of the post-PGI periods. In general, the differences between parolees and offenders released from prison unconditionally remain consistent across the pre and post periods. That is, in both of the post-PGI periods, those released from prison unconditionally are more likely to be Aboriginal, female, younger, and possess a more extensive criminal history than parolees. This suggests that the characteristics of parolees and offenders released unconditionally did not change, on average, following the introduction of PGI.[10] In post-PGI period 1, the recidivism rate for offenders released from prison unconditionally (on parole) was roughly 53 (37) per cent. And, in post-PGI period 2, the 12-month recidivism rate for offenders released from prison unconditionally (on parole) was approximately 56 (40) per cent.

Descriptive statistics: Recidivism before and after the introduction of PGI among parolees

Before we report the results from the DiD analysis, we describe the change in the probability of committing a new and proven offence within 12 months of release from prison before and after the introduction of PGI among our sample of parolees only. We estimate the following linear probability model (LPM):

$$Pr(R_{it}) = c + \delta P_{it} + \beta X_i' + \tau_t + \varepsilon_{it} \qquad (2)$$

where P_{it} is a binary variable equal to one for parolee i released in post-PGI period 2 (between June and December 2017), and zero for parolee i released in the pre-PGI period (between June and December 2014). We also calculate estimates where P_{it} is equal to one for post-PGI period 1 (between June and December 2016), and zero for the pre-PGI period. Consequently, δ estimates the change in the probability of re-offending among parolees before-and-after the introduction of PGI, after controlling for offender characteristics (X_i'). The outcome variable, R_{it}, is a binary variable equal to one for offenders who commit a new and proven offence (not including breaches) within 12 months of being released from prison.

The estimates from equation (2) are presented in Table 5. We include the results from two comparisons: 1) the change in recidivism among parolees between the post-PGI period 2 and the pre-PGI period, and 2) the change in recidivism among parolees between the post-PGI period 1 and the pre-PGI period.

Column 1 displays the naïve estimate without including any controls. When comparing post-PGI period 2 and pre-PGI, the naïve estimate indicates that, among parolees, the probability of re-offending increased by 4 percentage points, which is statistically significant. This suggests that parolees released in post-PGI period 2 were more likely to re-offend. However, after adding the full set of control variables (see Column 2) the direction of the estimate changes and is no longer statistically significant.

In the bottom half of Table 5, we also compare recidivism between post-PGI period 1 and pre-PGI. As indicated in the table, the coefficient estimates are small and not statistically significant.

9 A 'violent' offence includes the following offences based on the Australian and New Zealand Standard Offence Classification (ANZSOC) 2011: Homicide and related offences (ANZSOC 01), Acts intended to cause injury (ANZSOC 02), Sexual assault and related offences (ANZSOC 03), and Robbery, extortion, and related offences (ANZSOC 06). A 'property' offence includes: Unlawful entry with intent/burglary, break and enter (ANZSOC 07), Theft and related offences (ANZSOC 08), and Fraud, deception and related offences (ANZSOC 09).

10 In the appendix, we present additional descriptive statistics in Table A1 that compare parolees or offenders released unconditionally across the pre and post PGI periods. In general, we find that the characteristics of parolees remained relatively stable throughout the study period. While there are some notable exceptions, such as parolees in the post periods are older at release, these differences are negligible. We also find a similar pattern when comparing offenders released from prison unconditionally across the time periods. That is, overall, the characteristics of offenders released from prison unconditionally are relatively steady.

Table 5. Descriptive statistics: Recidivism among parolees with an LSI-R of medium and above before and after PGI

	Without controls (1)	With controls (2)
Post-PGI period 2 vs Pre-PGI	0.040**	-0.021
	(0.012)	(0.030)
N	6,686	6,686
Post-PGI period 1 vs Pre-PGI	0.017	-0.018
	(0.012)	(0.030)
N	6,361	6,361
Controls		
Demographics	No	Yes
Prior offending history	No	Yes

Robust standard errors presented in parentheses.
** $p < .01$, * $p < .05$

Together, these findings suggest that there was no meaningful change in the likelihood of re-offending after the introduction of PGI among parolees only. However, the findings presented in Table 5 are descriptive as it is possible that parolees before and after the introduction of PGI may not be comparable, or that other factors are influencing re-offending in the post-PGI period. In the next section, we present the main results from the DiD model.

Difference-in-differences results

To consistently measure the causal impact of PGI on recidivism of parolees, it is important that the comparative trends in re-offending over time between parolees and prisoners released unconditionally are similar prior to the introduction of PGI. In practice, this means that the time series trends in re-offending over time for parolees and prisoners released unconditionally closely follow one another. If so, this indicates that the recidivism behaviour of prisoners released unconditionally is a valid counterfactual for parolees had PGI not been introduced. And, we can more confidently attribute any observed change in re-offending among parolees to the implementation of PGI.

Recidivism trends between 2014 and 2018

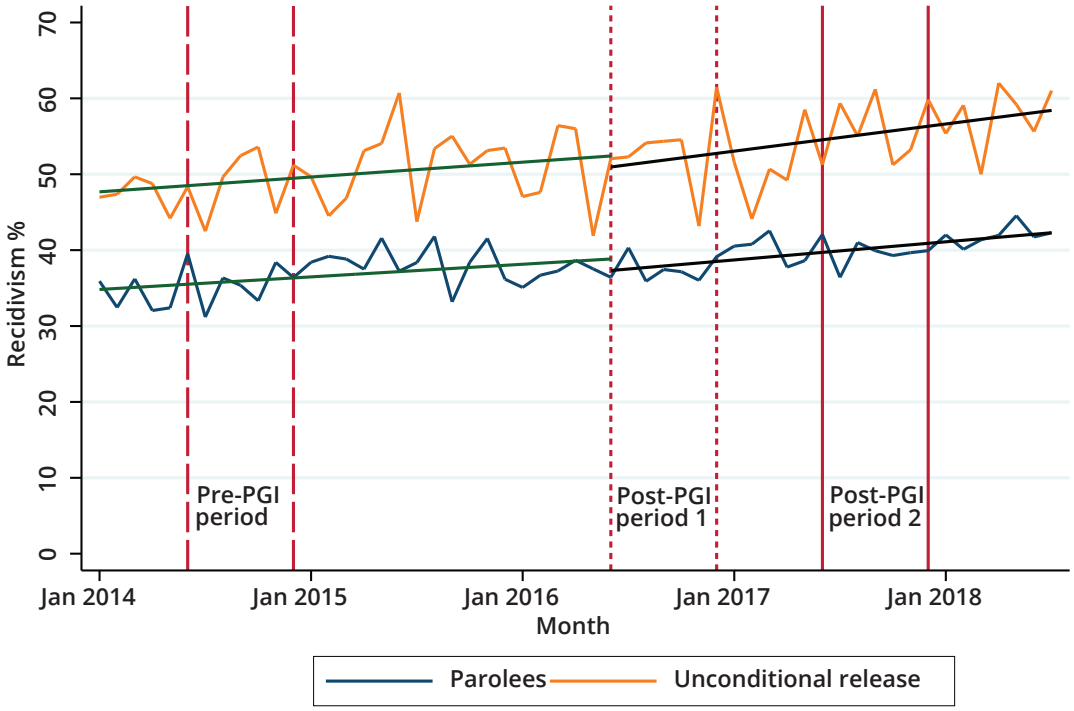
Figure 3 displays the 12-month re-offending rates, by month of release, for parolees and offenders released from prison unconditionally between January 2014 and July 2018. The first short-dash vertical line represents the initial introduction of PGI across NSW in June 2016. For each trend, we overlay a separate trend line for the period before the introduction of PGI, and the period after the introduction of PGI.

Overall, it is apparent from Figure 3 that offenders released from prison unconditionally have higher recidivism rates than those released on parole. Prior to the introduction of PGI, the comparative trend in re-offending between parolees and those released unconditionally is remarkably similar, including the pre-PGI period. This suggests that the 'common' trend assumption required to measure a causal impact is satisfied; that is, the change in the average parolee re-offending rate in the absence of PGI is approximated by the change in the average re-offending rate of offenders released unconditionally in the pre-PGI period. Consequently, the use of a DiD approach to capture the causal impact of PGI on the change in parolee re-offending is appropriate.

Also, Figure 3 shows no evidence of a large drop in re-offending in either of the two post-PGI periods. On the contrary, there appears to be a slight increase in re-offending after the introduction of PGI, although this upward trend is apparent for both parolees and those released unconditionally.[11]

11 We also considered the comparative trends in the likelihood of returning to custody within 12 months of release from prison among parolees and offenders released from prison unconditionally between 2014 and 2018. We do not find evidence that the return to custody trends exhibit a similar pattern in the period prior to the introduction of PGI. As such, we do not estimate the impact of PGI on the likelihood of return to custody among our sample. If the reader is interested, the comparative trends for return to custody are presented in Figure A1 in the appendix.

Figure 3. 12-month recidivism trends of parolees and offenders released from prison unconditionally with LSI-R medium and above between 2014 and 2018



Note. The pre-PGI period is represented by the long-dash vertical lines. Post-PGI period 1 (post-PGI period 2) is represented by the short-dash (solid) vertical lines.

DiD estimates: Recidivism within 12 months of release from prison

In Table 6, we present the findings from the DiD specification outlined in equation (1) for offenders released from prison with an LSI-R of medium and above. The estimates displayed in Column 1 do not include any control variables (demographics and prior offending history). These controls are subsequently added to the DiD specification in Column 2. If PGI reduces recidivism, we would expect to observe a reduction in re-offending after the introduction of PGI. Given PGI activity was higher during post-PGI period 2, an even larger reduction in recidivism would be expected for this period.

Table 6. DiD estimates: Recidivism between parolees and offenders released from prison unconditionally with LSI-R medium and above

	Without controls	With controls
	(1)	(2)
Post-PGI period 2 vs Pre-PGI	-0.030	-0.034
	(0.026)	(0.026)
N	8,607	8,607
Post-PGI period 1 vs Pre-PGI	-0.025	-0.015
	(0.026)	(0.026)
N	8,337	8,337
Controls		
Demographics	No	Yes
Prior offending history	No	Yes

Robust standard errors presented in parentheses.
** $p < .01$, * $p < .05$

The outcome of interest is the change in the likelihood of committing a new and proven offence within 12 months of release from prison. The first set of results compares post-PGI period 2 (or stage 3) with the pre-PGI period. In the absence of controls, there was a 3 percentage point decrease in the probability of a parolee committing a new and proven offence after PGI was introduced. However, this reduction is not statistically significant. After adding controls to the specification, the estimate changes slightly to a 3.4 percentage point reduction in recidivism. But again, the coefficient is not statistically significant.

The estimates reported in the bottom half of Table 6 compare post-PGI period 1 with the pre-PGI period. The treatment coefficient estimates, with and without controls, are negative, which indicates a reduced rate of recidivism for parolees post PGI. Further, the magnitude of the coefficients presented in Column 2 of Table 6 are smaller than those shown in the top half of Table 6, which is consistent with the a priori expectation that a greater 'dose' of PGI (in post-PGI period 2) leads to a larger reduction in recidivism. However, again, none of the DiD estimates are statistically significant. Overall, the findings presented throughout Table 6 are small and indicate that we did not find a statistically significant reduction in the re-offending rate among high-risk parolees after the introduction of PGI.[12]

DISCUSSION

This study investigates the impact of the introduction of PGI, a CBT-based intervention delivered by CCOs, on parolee recidivism rates in NSW. We compare all medium to high-risk offenders released from prison on parole with those released unconditionally before and after the introduction of PGI. Offenders released from prison unconditionally do not receive supervision in the community, and hence, form a natural comparison group. Recidivism is measured as the probability of committing a new and proven offence within 12 months of release from prison. The pre-PGI period examined in this study includes offenders released from prison between June and December 2014, before PGI was introduced, and the two post-PGI periods comprise offenders released from prison between June and December 2016 (period 1), when PGI was initially introduced, and June and December 2017 (period 2), when PGI supervision was approaching its peak.

We do not find evidence for an impact of PGI on recidivism. We report a 3 to 3.4 percentage point reduction in the probability of committing a new and proven offence for those released during the post-PGI period where PGI activity was at its peak, including the use of non-compulsory modules. However, none of the estimates were statistically significant. Furthermore, we find similar results for a range of different re-offending outcomes, including committing a new and proven personal, property, or serious drug offence, the percentage change in re-offending days, and re-offending within 12 months of free time (please see Table A2 in the appendix for further details on these additional analyses).

The results presented here are similar to a related BOCSAR study by Ooi (2020), which investigates the impact of PGI on recidivism among supervised offenders serving a community-based order (that is, a good behaviour bond or a suspended sentence). In both studies, the estimated treatment effect was small and not statistically significant.

While the sample size in this study was large, imprecision in the standard errors of the estimates prevents us from outright rejecting the null hypothesis of no treatment effect. A 3 percentage point reduction in recidivism would, however, represent a relatively small reduction in the number of parolees re-offending – even if the reduction was statistically significant. Based on the counterfactual re-offending trend, we

12 In further results presented in the appendix (Table A2), we re-estimate the DiD model with three different measures of recidivism behaviour among parolees. Namely, within 12 months of release from prison, we consider the change in the likelihood of committing a new and proven personal, property, or serious drug offence. The NSW government has set a target to reduce re-offending in these offence types by five per cent by 2023 among adult ex-prisoners. We also consider the change in offending days, which is the number of days where one or more proven offences occurred within 12 months of release from prison. We also consider the probability of committing a new and proven offence within 12 months of 'free-time' post-release. Measuring 'free time' accounts for time spent in custody following release from prison and only includes offenders who have effectively spent 12 months in the community post-release. The supplementary results presented in the appendix are consistent with the main findings. Overall, across three different measures of recidivism, we do not find a meaningful change in parolee re-offending behaviour; none of the estimates are statistically significant.

calculate that a 3 percentage point decrease equates to 133 fewer high-risk parolees committing a new offence. This represents less than 3 per cent of all high-risk parolees released from prison between June and December 2017 (i.e. post-PGI period 2). The cost of implementing PGI would have to be weighed against these anticipated benefits to assess whether such a reduction could be considered meaningful.

These findings would appear to contradict the results of other international research in this field. The reduction in recidivism reported in this study is relatively small when compared to the effect sizes from other RNR-based offender rehabilitation supervision programs. For example, WSIPP (2019) conducted a meta-analysis of 14 studies and report a 10.9 percentage point reduction in crime rates among moderate to high risk offenders, which is a substantially larger reduction than what was reported here. Similarly, as previously discussed, Bonta et al. (2010) found that the STICS program, which trains parole officers in the application of RNR principles during supervision (combined with clinical support), decreases recidivism of parolees by up to 15 per cent (albeit, the reduction was not statistically significant). However, it is important to remember that the counterfactual in our study is the model of supervision that existed prior to implementation of PGI (i.e.: June to December 2014). As such, our results indicate that PGI does not produce any additional benefit over what was previously delivered by CCOs, rather than demonstrating that PGI is ineffective in addressing recidivism. It is quite possible that many CCOs were already successfully applying the RNR model before PGI was introduced. Indeed, CSNSW has been using the LSI-R to assess the risk and criminogenic needs of offenders since 2002 and this assessment has formed the basis for all supervision case planning by CSNSW over the last 10 years (Watkins, 2011), suggesting that CCOs were already well versed in RNR principles prior the launch of PGI.

Furthermore, prior research undertaken in NSW shows that while reoffending rates of parolees are affected by their supervision parole officer, parole officers account for a surprisingly small amount of the variation in parolee reoffending rates (between 1-2 percentage points), once other offender and parolee office effects are taken into account. This finding is consistent across age, gender, and years of experience of the supervising officer (Thorburn, 2018). Therefore, even if PGI achieved its objective of standardising supervision practices across all CCOs in NSW then we would only ever anticipate a relatively small marginal effect.

It is also possible that PGI supervision alone is not sufficient to change parolee recidivism behaviour but may be effective when coupled with more intensive therapeutic interventions targeting specific needs. As previously discussed, an offender can receive PGI and participate in other behaviour change programs delivered by Corrective Services NSW (CSNSW) that address criminogenic needs, such as the EQUIPS suite of programs (Howard & Chong, 2019). Future research should investigate whether PGI in conjunction with other cognitive behaviour programs has an impact of re-offending. Alternatively, addressing offenders' needs beyond those related to criminogenic factors, such as housing needs or homelessness, may be essential for achieving enduring behavioural change amongst this group of high-risk offenders. This is a common criticism of offender rehabilitation models that rely heavily on RNR principles and may account for the null findings presented here.

One important outcome that could not be examined in the current study is the likelihood of returning to custody (either as a remandee or sentenced prisoner). It is conceivable that PGI may have little impact on reoffending but could result in fewer violations of parole conditions through improved offender and CCO interactions, and thereby lower the rate of return to custody. A DiD approach could not be used here to test the impact of PGI on return to custody because the comparative trends for parolees and offenders released unconditionally were not parallel before PGI was introduced (i.e.: there was no common trend). However, this outcome should be prioritised in future evaluations of the PGI model given the substantial cost of incarceration to both the NSW criminal justice system and the accused.

It would also be valuable for future research to consider longer follow-up periods (such as re-offending after 24 months), as the benefits of PGI may only manifest once supervision is complete (for instance, Stavrou, Poynton, and Weatherburn (2016) report larger reductions in parolee recidivism after the supervision period has expired). In addition to re-offending, future research could also consider other

post-release outcome measures, such as labour market and health outcomes. Although the main objective of PGI is to reduce recidivism among supervised offenders, studying a variety of outcomes will provide a broader understanding of the impact of PGI on parolee behaviour.

While we find no evidence that the introduction of PGI led to a statistically significant reduction in recidivism, there are two important caveats. Firstly, the analyses presented here include every parolee with an LSI-R of medium and above in the post-PGI periods, irrespective of whether or not they actually received PGI. This approach was adopted to minimise any bias arising from unobservable differences between supervised offenders who engaged in PGI and those who did not. However, it is possible that the inclusion of 'untreated' parolees is obscuring, or 'diluting', any treatment effect associated with PGI. While acknowledging this as a limitation, nearly 90 per cent of offenders who began parole supervision in post-PGI period 2 completed non-compulsory PGI modules that address criminogenic factors. This indicates that the level of treatment dilution in the post-PGI period 2, the period of most interest, is likely to be small.

Secondly, there is no available measure of the overall 'quality' of the delivery of PGI since its implementation in June 2016. While we focused on post-PGI period 2, when the use of PGI with supervised offenders was at its highest across NSW, we were unable to assess whether CCO application of the CBT techniques when using PGI exercises was at a sufficient level to impact re-offending. Community Corrections NSW has since established a range of measures to promote the delivery of high-quality PGI supervision and future research should assess whether these initiatives are associated with any significant change in re-offending. Related to the issue of 'quality' is the impact of treatment intensity on recidivism. Greater PGI activity (measured by the larger number of PGI sessions completed) may lead to larger reductions in recidivism. However, we do not investigate this possibility here because of the endogeneity between PGI activity and other offender characteristics related to recidivism. Nevertheless, as previously mentioned, the number of completed PGI sessions peaked during the main post-PGI period used in this study, which partly addresses these concerns.

A possible consideration for future policy reform is the manner in which large-scale programs are implemented. From an evaluation perspective, it would have been preferable for PGI to have been initially introduced on a smaller scale with randomly selected treated individuals (for example, by randomly allocating PGI to offenders or parole offices). Offenders assigned to receive PGI could then be directly compared with an otherwise equivalent control group who did not receive PGI. Acknowledging the difficulties in implementing a large-scale randomised trial, an alternative would be to stagger the roll out of the program across NSW parole offices or regions. This would significantly improve our ability to effectively measure program outcomes and our chances of detecting a significant effect (if one exists). The additional benefit of a trial or staggered approach to program implementation is that practical issues can be identified early in the process and resolved prior to the program being scaled up, thus increasing the likelihood that the new program is delivered as intended and that policy objectives will be achieved.

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APPENDIX

Descriptive statistics

Comparing prisoners between pre and post PGI periods

Table A1 provides descriptive statistics that compare prisoners between the pre and post PGI periods. Panel A (Panel B) compares offenders released on parole (released unconditionally) between the time periods of interest. Column 1 includes offenders released from prison in the pre-PGI period, while columns 2 and 3 include offenders released from prison in the post-PGI periods, respectively. Column 4 calculates the difference between post-PGI period 1 and the pre-PGI period (i.e.: the difference between columns 2 and 1), and Column 5 calculates the difference between post-PGI period 2 and the pre-PGI period (i.e.: the difference between columns 3 and 1).

Beginning with parolees in Panel A, overall, we find that the characteristics of offenders released on parole has remained relatively stable across time. However, there are some exceptions. While offenders released on parole in the post-PGI periods are, on average, older at release and have more prior court appearances, these differences are very small.

Offenders released on parole in post-PGI period 2 are slightly more likely to have a prior property offence in the past 5 years, compared to the pre-PGI period. And, parolees in both post-PGI periods are also more likely to have had a prior domestic violence offence in the past 5 years. Despite these exceptions, we find that the characteristics of offenders released on parole have remained relatively stable during the study period.

Panel B compares offenders released unconditionally between the pre and post PGI periods. Similarly, we also find that the characteristics of offenders released from prison unconditionally have remained relatively stable in the pre and post periods. However, we do find that offenders released from prison unconditionally in the post-PGI periods are roughly 8 percentage points more likely to have had a prior domestic violence offence in the past 5 years. Nevertheless, while there are some exceptions, most of these differences are negligible.

Table A1. Descriptive Statistics: Prisoners released with LSI-R medium and above across the pre and post PGI periods

	Pre-PGI period (1)	Post-PGI period 1 (2)	Post-PGI period 2 (3)	Difference (2) – (1) (4)	Difference (3) - (1) (5)
Panel A. Offenders released on parole					
Aboriginal	0.465	0.478	0.469	0.013	0.004
	(0.009)	(0.008)	(0.008)		
Female	0.097	0.103	0.111	0.006	0.014
	(0.006)	(0.005)	(0.005)		
Age at release	33.377	33.901	33.988	0.524*	0.611**
	(0.180)	(0.157)	(0.152)		
Custodial episode 2 or more years	0.111	0.123	0.115	0.012	0.004
	(0.006)	(0.005)	(0.005)		
Number of prior court appearances	12.781	13.198	13.482	0.417*	0.701**
	(0.147)	(0.133)	(0.133)		
Number of prior prison sentences	4.823	4.773	4.870	-0.050	0.047
	(0.083)	(0.073)	(0.073)		
High LSI-R	0.116	0.107	0.121	-0.009	0.005
	(0.006)	(0.005)	(0.005)		
Medium-High LSI-R	0.398	0.410	0.407	0.012	0.009
	(0.009)	(0.008)	(0.007)		
Prior juvenile court appearance	0.273	0.282	0.282	0.009	0.009
	(0.008)	(0.007)	(0.007)		
Prior violent offence past 5 years	0.717	0.710	0.707	-0.007	-0.010
	(0.009)	(0.008)	(0.007)		
Prior property offence past 5 years	0.613	0.625	0.646	0.012	0.033**
	(0.009)	(0.008)	(0.007)		
Prior domestic violence offence past 5 years	0.453	0.499	0.495	0.046**	0.042**
	(0.009)	(0.008)	(0.008)		
N	2,756	3,605	3,930		
Panel B. Offenders released unconditionally					
Aboriginal	0.536	0.529	0.520	-0.007	-0.016
	(0.016)	(0.015)	(0.016)		
Female	0.131	0.120	0.125	-0.011	-0.006
	(0.010)	(0.010)	(0.010)		
Age at release	34.334	34.228	35.352	-0.106	1.018*
	(0.299)	(0.286)	(0.300)		
Custodial episode 2 or more years	0.028	0.018	0.014	-0.010	-0.014*
	(0.005)	(0.004)	(0.003)		
Number of prior court appearances	15.027	15.233	15.873	0.206	0.846*
	(0.284)	(0.283)	(0.320)		
Number of prior prison sentences	5.826	5.636	5.870	-0.190	0.044
	(0.161)	(0.152)	(0.171)		
High LSI-R	0.147	0.138	0.156	-0.009	0.009
	(0.011)	(0.010)	(0.011)		
Medium-High LSI-R	0.438	0.446	0.435	0.008	-0.003
	(0.016)	(0.015)	(0.016)		
Prior juvenile court appearance	0.297	0.300	0.252	0.003	-0.045*
	(0.014)	(0.014)	(0.014)		
Prior violent offence past 5 years	0.676	0.702	0.693	0.026	0.017
	(0.015)	(0.014)	(0.015)		
Prior property offence past 5 years	0.713	0.702	0.670	-0.011	-0.043*
	(0.014)	(0.014)	(0.015)		
Prior domestic violence offence past 5 years	0.436	0.520	0.517	0.084**	0.081**
	(0.016)	(0.015)	(0.016)		
N	978	998	943		

Standard errors presented in parentheses.
** $p < .01$, * $p < .05$

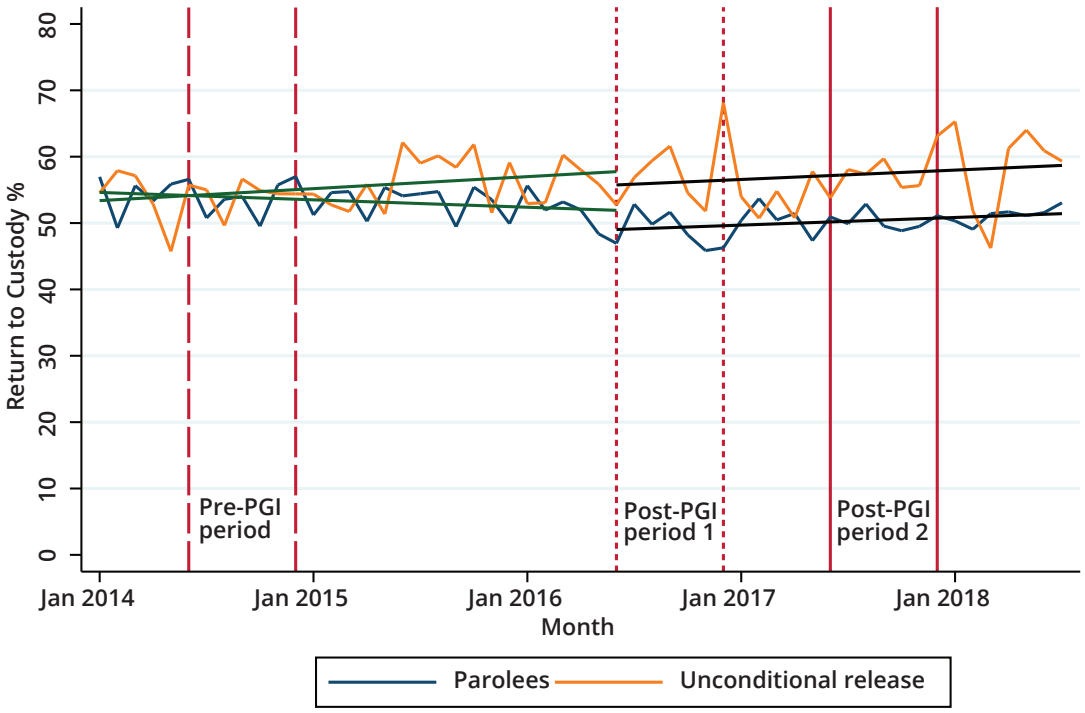
Return to custody trends between 2014 and 2018

Return to custody is an important outcome of interest given the substantial financial and social costs that result from incarceration, particularly among high-risk parolees who are relatively more likely to re-offend. In this section, we present the trends in return to custody within 12 months of release from prison among parolees and prisoners released unconditionally with an LSI-R score of medium and above and were released between January 2014 and July 2018. Return to custody is measured according to whether an offender returns to custody for any offence, including breach offences, within 12 months of release from prison.[13] Figure A1 displays the comparative trends in return to custody between parolees and offenders released unconditionally.

As illustrated in Figure A1, the trends in return to custody between parolees and offenders released unconditionally before the implementation of PGI at June 2016 often diverge, and do not appear to share a common trend. This appears to suggest that parolees and those released unconditionally do not share a common trend in return to custody over time prior to the introduction of PGI in June 2016.

Without a common trend in return to custody, offenders released unconditionally are not a valid comparison for parolees. In other words, we would not be able to confidently attribute any change in the likelihood of returning to custody to the implementation of PGI.

Figure A1. 12 month return to custody trends for parolees and prisoners released unconditionally with an LSI-R of medium and above between 2014 and 2018



Note. The pre-PGI period is represented by the long-dash vertical lines. Post-PGI period 1 (post-PGI period 2) is represented by the short-dash (solid) vertical lines.

13 The data does not include custodial episodes that are less than one day in duration.

DiD estimates: Other recidivism outcomes

In the main results, we do not find a statistically significant reduction in the probability of committing a new and proven offence within 12 months of release from prison. In this section, we present DiD estimates from equation (1) with three slightly different recidivism outcomes.[14] The results are displayed in Table A2. Each panel includes the results for each outcome, respectively. We consider each outcome in turn. Panel A includes estimates for the probability of committing a new and proven personal, property, or serious drug offence.[15]

In Panel A, when comparing post-PGI period 2 with the pre-PGI period, there is a slight increase in the likelihood of committing a new and proven PP offence, but the coefficients are not statistically significant. Similarly, we do not find a statistically significant change when comparing post-PGI period 1 with the pre-PGI period.

Table A2. DiD estimates: Recidivism between parolees and prisoners released unconditionally with LSI-R medium or above

	Without controls	With controls
	(1)	(2)
Panel A. New and proven personal, property, or serious drug offence		
Post-PGI period 2 vs Pre-PGI	0.014	0.001
	(0.026)	(0.025)
N	8,607	8,607
Post-PGI period 1 vs Pre-PGI	0.007	0.007
	(0.026)	(0.025)
N	8,337	8,337
Panel B. Log (Number of re-offending days)		
Post-PGI period 2 vs Pre-PGI	0.013	-0.036
	(0.081)	(0.077)
N	8,607	8,607
Post-PGI period 1 vs Pre-PGI	-0.041	-0.028
	(0.081)	(0.078)
N	8,337	8,337
Panel C. New and proven offence (free time)		
Post-PGI period 2 vs Pre-PGI	-0.029	-0.039
	(0.024)	(0.023)
N	8,418	8,418
Post-PGI period 1 vs Pre-PGI	-0.031	-0.023
	(0.024)	(0.024)
N	8,229	8,229
Controls		
Demographics	No	Yes
Prior offending history	No	Yes

Robust standard errors presented in parentheses.
** $p < .01$, * $p < .05$

14 Once again, we exclude breach of order offences in each of the recidivism outcomes.
15 These offences are based on the Australian and New Zealand Standard Offence Classification (ANZSOC) 2011 and include 01 Homicide and related offences, 02 Acts Intended to Cause Injury, 03 Sexual Assault and Related Offences, 051 Abduction and Kidnapping, 06 Robbery, Extortion, and Related Offences, 07 Unlawful Entry with Intent/Burglary, Break and Enter, 08 Theft and Related Offences, 09 Fraud, Deception and Related Offences, 101 Import or Export Illicit Drugs, 102 Deal or Traffic in Illicit Drugs, and 103 Manufacture or Cultivate Illicit Drugs.

Panel B of Table A2 displays the DiD coefficients for the log of the number of re-offending days, which measures the percentage change in the number of days where one or more proven offences occurred within 12 months of release from prison.[16] After adding the full set of controls to the specification, we find a 3.54 per cent reduction in re-offending days in post-PGI period 2.[17] However, the reduction is not statistically significant.

For post-PGI period 1 and the pre-PGI period, we find a 2.76 per cent reduction in re-offending days, but again, the estimate is not statistically significant.[18]

In Panel C, we consider the probability of committing a new and proven offence within 12 months of 'free time' following release from prison. The 'free time' outcome measure accounts for time spent in custody following release from prison and includes only offenders who have spent 12 months in the community post-release.

The estimates in Panel C of Table A2 are similar to those reported in the main analysis. That is, we find slight reductions in the likelihood of committing a new and proven offence based on 12 months free time; but again, the difference is not statistically significant.

Overall, the DiD findings presented in Table A2 indicate that, across three slightly different measures of recidivism, we do not find a statistically significant reduction in re-offending behaviour after the introduction of PGI. And importantly, the results in Table A2 are consistent with the main findings presented in the study.

16 As some offenders will have zero offending days in the dataset, we add a small positive amount in order to calculate the log.

17 $100 \times (e^{-0.036} - 1) = -3.535$

18 $100 \times (e^{-0.028} - 1) = -2.761$

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