CRIME AND JUSTICE BULLETIN

Estimating the effectiveness of the High Intensity Program Units on reoffending

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AIM

The aim of this study was to assess the impact of participating in a program through a High Intensity Program Unit (HIPU) on reoffending, violent reoffending and reimprisonment within 3, 6 and 12 months of leaving custody.

METHOD

We estimate the impact of the HIPUs on reoffending, violent reoffending and reimprisonment within 3, 6 and 12 months of leaving custody by conducting three different comparisons between people who were identified as eligible for the program:

1. Comparing individuals by program status (Did not start, Started but did not complete, Finished);
2. Comparing individuals by the number of therapeutic hours received at a HIPU, regardless of program status;
3. Comparing individuals using variation in therapeutic hours recieved, restricted to just those who exited due to "insufficient time".

We use regression models across all analyses to adjust for observable differences between individuals. The key threat to our estimates is selection bias, which could be caused by unobserved differences between those starting and/or completing a program through the HIPUs and those who do not. The first two comparisons are (possibly) biased towards a higher estimate, while the third comparison attempts to avoid this bias by leveraging variation in time left to serve.

RESULTS

We find small differences in reoffending outcomes for those who did not start a program when compared with those who commenced and did not complete a program, or those who completed a program through the HIPUs. We (generally) observe lower reoffending rates for those who finished a program at the HIPU and those who never started, but these differences are small in magnitude (generally less than compared with 4 percentage points) and are not statistically significant at conventional thresholds. Similarly, there is no systematic relationship between the number of hours spent in a behaviour change program and our reoffending outcomes across all individuals, or for the subset of inmates who left the HIPU before completion due to "insufficient time".

CONCLUSION

Our analysis provides no evidence that receiving a program at a HIPU reduces the likelihood of any reoffending, violent reoffending or reimprisonment iin the first year after release from custody. Any differences estimated in these outcomes are small and are confounded by the possibility that less risky individuals are more likely to receive a program.

KEYWORDS

Domestic violence · Prison · Program evaluation · Rehabilitation · Recividism / Re-offending · cognitive behavioural therapy

INTRODUCTION

In New South Wales (NSW), approximately 80% of prison sentences imposed by the courts between June 2016 and June 2021 were 12 months or less in duration (NSW Bureau of Crime Statistics and Research, 2022). Around 44% of these offenders will be re-imprisoned within two years of release, compared with just 32% of those sentenced to prison for 3 years or more (Xie et al., 2018). High rates of recidivism among inmates serving short prison sentences have also been found in the United Kingdom and the Netherlands (UK Ministry of Justice 2013; Wermink et al, 2010). Reducing reoffending among people who have recently left custody is an area of focus for the NSW Government, with a current Premier's Priority target to reduce adult reoffending following release from prison by 5% by 2023 (NSW Department of Premier and Cabinet, 2019).

Corrective Services NSW delivers a range of behaviour change programs in correctional centres that aim to reduce reoffending. These programs involve multiple modules on different topics and skills, delivered on a weekly or biweekly basis. Many of these are delivered in group settings, with facilitators guiding participants through structured sessions that progressively move through the themes or modules. Inmates are expected to commit to a behaviour change program and complete many sessions before "graduating". Some existing programs, such as the Violent Offender Therapeutic Program (VOTP), can take up to 12 months to complete.

Delivering programs to individuals who are incarcerated for a short period of time can be difficult. There is a lengthy delay between an individual being taken into custody and being identified, assessed, enrolled and ready to commence a program. This delay limits the time available to participate in and complete a program. The Audit Office of NSW (2017) reported that, in 2015-16, 75% of NSW prisoners with an identified program need did not participate in a program before their earliest parole release date.

To fill this gap, in NSW, 10 High Intensity Program Units (HIPUs) were established in purpose-built structures across seven correctional centres in 2017-2018, with the purpose of primarily delivering behaviour change programs to prisoners serving shorter sentences (e.g. less than 12 months). Many of these offenders would have been released without assessment or treatment by a behaviour change program had the HIPUs not been established. This bulletin seeks to examine the impact of these HIPUs on rates of reoffending and reimprisonment.

The High Intensity Program Units

The HIPUs aim to deliver intensive behaviour change programs, reintegration services and enhanced release planning for people serving short prison sentences. Participants go through the program in three phases which are describe in detail below.

1. Assessment Phase (Week 1 - 2)

To be eligible for a HIPU, participants must meet the following criteria:

- 5 – 36 months remaining on their sentence;
- Not in custody for a sexual offence as the index offence.[1]

Eligible offenders are identified from reception centres across NSW and transferred to the HIPU sites. Priority is given to those who are identified as having the highest risk of offending (using the Custody Triage Risk Assessment Score (Raudino et al., 2019)), as well as Aboriginal offenders and those serving less than 12 months on their sentence. The security classification level and Criminal Reimprisonment Estimate Scales (CRES) are also used to determine which of the HIPU pathways an individual should be placed in (Minimum security, Violent Offender Therapeutic Program or Female Offenders).

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1   Individuals with a sexual offence were excluded for both logistical and therapeutic reasons. Logistically, it was challenging for the HIPUs to run the programs designed for sexual offences along with the other programs. Including both sexual and non-sexual offenders in the same HIPU group also presented therapeutic challenges.

Once found eligible, participants are assessed for their suitability for the HIPUs. This includes:

- **Logistical issues:** prior participation in vocational traineeships, security issues, protection status, non-association alerts.

- **Motivation issues:** unwillingness to participate, hostility towards staff, disruptive behaviours for other participants (which would then generate a referral for program support).

- **Health issues:** any serious physical or mental health issues that would make it difficult for the individual to participate in or make them unsuitable for the program (which would then generate a referral for an appropriate service).

- **Cognitive or comprehension impairment:** individuals with an intellectual disability and/or cognitive impairment may not be suitable. Suitability for each applicant is discussed with the State-wide Disability Services.

Once an individual has been found to be eligible and suitable, they undertake an orientation at the local centre, are assigned a custodial case officer and complete a comprehensive individualised assessment to determine their criminogenic needs.[2] An individualised case plan is then developed to match the treatment and reintegration programs to the individuals level of risk and needs. This plan is then discussed with the individual and signed by the offender. A treatment and reintegration program is also developed during this phase, in order to help participants connect the programs delivered within the HIPUs with their future cultural and community context (Corrective Services NSW, 2020).

2. Intervention phase (Week 3-16)

Participants are required to attend two-hour treatment sessions six to eight times per week, over 3-4 months, as part of a behaviour change program. These sessions are delivered in a group setting with each session involving between six and 16 participants[3] and are based on existing behaviour change programs, which in turn are based on cognitive behavioural therapy principles.[4] The total number of sessions that an individual receives is tailored to the needs of each individual, which is assessed on an ongoing basis by HIPU staff. The aim is for everyone to complete a minimum of 120 hours of treatment, with the expectation being 120-160 hours for each participant, although this could be as high as 200 hours for some individuals.

The behaviour change programs offered at the HIPUs have been adapted from existing programs delivered by Corrective Services NSW and involve a similar number of hours of treatment over a shorter period of time. The programs that have been adapted for HIPUs include EQUIPS (Explore, Question, Understand, Investigate, Practice, Succeed), Real Understanding of Self-Help (RUSH),[5] CONNECT,[6] and the Aboriginal Cultural Strengthening program.[7] Other specialised programs such as TRIP (safe driving), Dads and Family, and Mothering at a Distance (MAAD) are delivered in accordance with Risk-Need-Responsivity principles (Corrective Services NSW, 2020). An adapted version of the Violent Offender Treatment Program (VOTP) is also delivered to violent offenders with short sentences at Shortland Correctional Centre.

3. Completion and exit

Finally, when participants complete the program they are referred to services by their allocated HIPU staff member. The services they receive will depend on whether they are released to the community on exit

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2   These assessments are completed by the HIPU staff, and include the Planning for Adjustment Responsivity Reintegration Criminogenic needs and Communication (PARRCC), Most Appropriate Program Pathway (MAPP) and Barratt Impulsivity Scale (BIS-11).
3   This has since been changed to a maximum of 12 participants after the period that is covered by the data for this study.
4   Further information on these behaviour change programs is provided at the Tap Therapeutic Portal at https://tap.nsw.gov.au/
5   For women only, the first nine sessions were delivered to men until 2020.
6   For men only.
7   For further details, please refer to the Corrective Services NSW Compendium of Offender Behaviour Change Programs https://correctiveservices.dcj.nsw.gov.au/content/dam/dcj/corrective-services-nsw/documents/programs/CSNSW_Compendium_of_Offender-Behaviour_Change_Programs.pdf

or have time on their sentence remaining at completion. For participants who have a remaining sentence after completion at the HIPU, recommendations are made for changes in classification and any continuing treatment needs that need to be addressed.

For those who are released to the community, the HIPU model aims to connect individuals with reintegration services. The treatment model aims to combine participation in behaviour change programs with reintegration services and community engagement throughout the program, not just on exit. The reintegration services are focused on helping participants find stable housing, employment and legal support on release from prison. When participants are released without parole, reintegration services are coordinated by HIPU staff but delivered by external service providers.

Differences in implementation

Mahajan, Lobo, and Howard (2021) evaluated the implementation of the HIPUs, presenting survey results from 33 Service and Program Officers and all eight Senior Service and Program Officers working within the HIPUs. The behaviour change programs were identified as the central benefit of the HIPUs, effectively tailoring individual programs to fit criminogenic needs and sequencing modules in such a way as to maximise program benefits. However, corrections staff reported difficulties in identifying and placing offenders into HIPUs because they had to compete for eligible participants with other programs, unexpected changes to offenders' eligibility / availability and a shortage of spaces.

There are two key differences in the HIPUs as implemented from the treatment model described above:

- **The HIPU eligibility criteria were expanded to inmates who had between 5 and 36 months remaining on their sentence at the time of referral, rather than just those serving sentences of 12 months or less**. This is a significant change made in the implementation of the program, as the HIPUs were originally designed to serve prisoners with sentences of 12 months or less, who were unable to access other behaviour change programs due to their short length of stay in custody.

- **The reintegration services (or lack thereof) were also identified as an issue for implementation of the model**, with Service and Program officers reporting that the reintegration services on offer too limited to meet individual needs in key areas such as housing and employment, and that individuals had limited access to community-based resources for pre-release planning or activity.

The expansion of the eligibility criteria had a significant impact on the characteristics of offenders treated at the HIPUs and the other type(s) of interventions/services they received. Over one-third of inmates who started at the HIPUs were serving a sentence of 12 months or more and 77% received other behavioural change programs outside of the HIPUs. Perhaps more importantly for our study, 54% of those who did not start at the HIPUs (but were selected) also attended other behaviour change programs whilst they were in custody. We also observe in our data substantially fewer hours of treatment for those who are marked as "completed" with the average being 74 hours. This is substantially lower than the minimum of 120 hours targeted by the treatment model.

RELATED LITERATURE

Behaviour change programs to reduce reoffending

All behaviour change programs delivered by Corrective Services NSW, including those delivered through the HIPUs, are based on Cognitive Behavioural Therapy (CBT) and/or Dialectical Behaviour Therapy (DBT). In CBT-based programs, individuals are taught to identify and challenge distortions in their thinking, and then reform these internal beliefs using newly learnt coping skills and practical strategies to help modify their behaviour (Milkman & Wanberg, 2007, Little et al., 1991). This approach is widely used to treat depression and anxiety and is perhaps the most studied therapeutic approach in the broader clinical psychology literature (Dobson & Khatri, 2000).

Dialectical Behaviour Therapy (DBT) is one of several "third-wave" CBT approaches and focuses on increasing the capacity of participants to regulate themselves, incorporating many components of existing CBT approaches (Tomlinson, 2018). DBT is theoretically well aligned with the Risk-Needs-Responsivity (RNR) model, which has led to the model rapidly being implemented in correctional settings (Tomlinson, 2018). There is little direct evidence for DBT-based programs,[8] but since DBT integrates and builds on existing CBT approaches, it is supported by the wider CBT evidence base (Jones, 2019).

Meta-analyses and systematic reviews of the literature suggest that CBT-based approaches are effective in reducing reoffending, but the estimated impact differs significantly based on their inclusion criteria. Wilson, Bouffard, and Mackenzie (2005) assessed 20 studies published between 1985 and 1999, 11 of which were judged as having a high-quality design.[9] For all of these "high quality design" studies, reductions in reoffending were observed, with an average causal effect of approximately 16 percentage points (p.p.). A later review by Lipsey, Landenberger, and Wilson (2007) reviewed 58 studies of CBT-based perpetrator interventions, 19 of which were randomised controlled trials. They found an average decrease in reoffending of approximately 10 p.p. across all studies.

These meta-analyses are likely inflated by publication bias, given the large number of small sample studies and observational studies that were included. A more recent meta-analysis by Beaudry et al. (2021) focuses specifically on just randomised controlled trials of interventions that were delivered in a custodial setting, narrowing down the number of studies that fit the criteria to 29 RCTs, six of which are based on CBT. They estimate an odds ratio of 1.00 (i.e., no impact on reoffending) for the pooled effect of these CBT-based interventions (from their random effects model). These results are in stark contrast to the large impacts estimated by previous meta-analyses. This suggests that conclusions regarding the effectiveness of CBT-based interventions in custodial settings hinges critically on how much you weight the positive effects found in observational studies and studies of interventions delivered outside custody.

Behaviour change programs offered by Corrective Services NSW

The EQUIPS suite of programs are a central component of the behaviour change interventions delivered in all HIPUs (Mahajan, Lobo, & Howard, 2021) and a modified version of the VOTP is offered at one HIPU location for high-risk violent offenders serving short prison sentences. Previous evaluations of these programs provide mixed evidence for their effectiveness in reducing reoffending.

Explore, Question, Understand, Investigate, Practice, Succeed (EQUIPS)

The EQUIPS program commenced in 2015 and is offered by Corrective Services NSW to offenders serving custodial and community-based orders. It is a CBT-based behaviour change program, which is available to all offenders assessed at medium or higher risk of reoffending. The standard EQUIPS program (Foundation) runs for 20 sessions of 2 hours each, with one or two sessions completed each week for approximately 12 months. It can be undertaken as a stand-alone program or as part of an offence-targeted pathway to address more specific criminogenic needs (e.g., the EQUIPS Addiction, EQUIPS Domestic Violence and EQUIPS Aggression programs).

Although there is no single evaluation that considers the suite of EQUIPS programs as a whole, the domestic violence module known as DV EQUIPS was evaluated by BOCSAR using both an instrumental variable approach and a comparison of starters and non-starters of the program. Thirty-eight per cent of offenders who were referred to the program actually commenced treatment (487 individuals, out of the total sample of 1,273 analysed) and just one in five (21.7%) who started the program completed all sessions. Rahman and Poynton (2018) observed a decrease for general reoffending and a small increase in domestic violence related reoffending but neither of these differences was statistically significant.

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8   Evershed et al. (2003) report on the effectiveness of DBT in a correctional setting for individuals with borderline personality disorder, but are limited by the number (n = 17) in their study. Morrissey and Ingamells (2011) also report on a DBT programme in a correctional setting, but do not conduct an outcome evaluation.
9   Four with explicit randomisation and seven assessed as 'high-quality' quasi-experimental studies.

Violent Offender Therapeutic Program (VOTP)

The standard VOTP is a therapeutic program for male offenders with a history of violent behaviour and commenced operation in 2003 at Parklea correctional facility. VOTP is also a CBT-based program where participants are encouraged to challenge the thinking, attitudes and feelings that led to their offending, and to understand the factors that contributed to their offending behaviour. The VOTP is considerably more intensive than EQUIPS, consisting of over 300 hours of sessions, delivered in 2-hour sessions three to four times per week, for approximately 12 months.

The VOTP program was evaluated by Rahman, Poynton, and Wan (2018). The authors observed a lower rate of general reoffending, violent reoffending and returning to custody of between 4 and 9 p.p. for those who started the program compared with those who were referred but never commenced treatment, but these estimates are potentially confounded by the voluntary nature of the program (conditional on referral). The analogous estimates using an instrumental variable approach (which more adequately deals with problems of selection bias but introduces a significant loss in precision) also observed reductions in reoffending of between 1 and 20 p.p., but these estimates were not statistically significant at conventional thresholds. Similar to the EQUIPS evaluation, the VOTP study was constrained by a relatively small sample of participants (587 in total, 216 who completed the program and 50 who started but did not complete), making it difficult to estimate the treatment effect with precision.

Intensive custody-based interventions for offenders with short custodial sentences

There are few studies of intensive programs designed for individuals with short custodial sentences, but those that exist are promising.[10] Barnes, Hyatt, and Sherman (2017) report on a randomised controlled trial evaluating the impact of a 14-week CBT program delivered in a correctional facility with 894 participants. Similar to the programs delivered through the HIPUs, this was a short CBT-based intervention, but the treatment was significantly less intensive than the HIPU program, with only one session undertaken each week for two hours (i.e., 28 hours in total, compared with 140-160 hours for the HIPU program). This program also targeted a higher-risk cohort, with any high-risk offender with more than 9 months left to serve on their sentence being eligible for the program. They found a large impact of the program on reoffending, with 40.5% of individuals in the control group charged with a new offence within 12 months compared with 33.7% in the CBT group; a reduction of approximately 7 p.p.. This reduction in reoffending was largely driven by fewer non-violent offences (a 6 p.p. reduction observed for offenders in the treatment group).

Bourgon and Armstrong (2005) studied a set of intensive programs based on CBT principles delivered at the Rideau Correctional and Treatment Centre in Ontario between September 1997 and December 1999. There were three programs of 5, 10 and 15 weeks in duration, with each delivering approximately 20 hours of therapy each week. All offenders (n = 620) who were identified as potential recipients and were released in time for a year of recidivism data to be available, were included in the sample. Of these, 482 received treatment and 138 did not. This was not a randomised trial; the most common reason for not receiving treatment was due to insufficient time left in custody. The authors found significant reductions in the proportion that returned to custody within a year of release (between 13.9 p.p. and 22.8 p.p.), and showed that the proportion that returned to custody was correlated with the hours of therapy received by each participant. As this study is significantly confounded by selection into the program, this estimate is likely larger than the "true" causal effect, (if any), of the program.

The current study

The aim of this study is to estimate the causal impact of completing a program at a HIPU on the likelihood of reoffending, violent reoffending and/or reimprisonment within 3, 6 and 12 months of release from custody. The HIPU program may be particularly effective (or ineffective) at reducing more serious

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10   Perkins (2019) report on a small pilot (n = 17) of an intensive violence prevention program delivered at Otago Corrections Facility in NZ, which involved 25 three hour sessions, delivered up to three days a week. They find improvements in attitudes and beliefs regarding offending, but are limited by a pre-post design, lack of outcome data and small sample size.

reoffending and/or reincarceration. Therefore, in this study, we consider three different measures of reoffending: any reoffending; any violent reoffending; and; any reoffending resulting in a prison sentence.

We estimate the impact of HIPUs on reoffending using three different approaches:

1. Comparing individuals by program status (Did not start, Started but did not complete, Finished), using a regression model to control for observed differences;

2. Comparing individuals by the number of therapeutic hours received at a HIPU, regardless of program status, using a regression model to control for observed differences;

3. Comparing individuals using variation in therapeutic hours recieved, restricted to just those who exited due to "insufficient time", using a "front-door criterion" approach (Pearl, 1995).

METHOD

Data source

There are two sources of data used in this evaluation.

1. **Corrective Services NSW Offender Information Management System (OIMS)**: We used data from OIMS to identify individuals selected to receive a program at a High Intensity Program Unit (HIPU). In this data, we can observe whether an individual was found suitable, consented and ultimately received the program. OIMS is the source of all program information for this evaluation, including information on the number of sessions that an individual received, the duration of their program, the facility where they received treatment and their security classification. All data were provided by Corrections Research, Evaluation and Statistics (CRES), an agency within Corrective Services NSW.

2. **NSW Bureau of Crime Statistics and Research (BOCSAR) Reoffending Database (ROD)**: Data on offending history, demographic variables and all of the outcome measures specified above for all individuals selected to receive a program at a HIPU were extracted from BOCSAR's Reoffending Database. ROD links all finalised NSW criminal court appearances from January 1994 to the present and all movements in and out of NSW correctional facilities for a given individual from January 2000.

These two datasets were linked using the Master Index Number (MIN) which is a unique person identifier assigned by Corrective Services NSW. The combination of the CRES and ROD data allowed us to construct a dataset where each row is a unique individual, linked to a specific custodial episode. We can thus measure post-release outcomes during a specified follow-up period.

Sample

The treatment group for this study includes all individuals who were identified for a program at a HIPU between August 2017 and October 2019[11], and who were released from custody before 1 January 2020.[12] The cut-off date of 1 January 2020 has been chosen to allow all individuals in the dataset a minimum of three months to reoffend in the pre-COVID period, defined here as 90 days before 31 March, before a large range of changes were introduced, including mobility restrictions and police powers to charge anyone found failing to comply with public health orders restrictions.

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11 On September 2018, right in the middle of this period, the 2018 sentencing reforms introduced more flexible sentencing options. Donnelly (2020) finds a small decrease (0.6 p.p.) in the proportion who are sentenced to prison with larger decreases for DV offenders and Aboriginal offenders. As these changes are small in absolute magnitude, we do not believe these changes in composition are meaningful for our study.
12 For the outcome measure, reoffences must have been finalised in court by April 2021.

The key reason for an individual being excluded from the sample used in this analysis was insufficient time after release for reoffending to be observed. 2,491 individuals were identified for a program at the HIPUs, of which 845 individuals were dropped as they were still in custody after 1 January 2020 (i.e. observed for less than 3 months), leaving 1,606 individuals[13] in our sample for the 3-month outcomes. For analyses using a 6-month cut off for reoffending, we exclude an additional 291 people because we could not observe them for the full six months, leaving us with 1,315 people in the sample. For analyses using a 12-month cut-off for reoffending, we exclude a further 588 people because we could not observe them for the full 12 months, leaving us with 716 people in the sample.

We then construct three mutually exclusive groups for analysis: those who never started a program (721 people); those who started a program but did not complete (534 people) and; those who completed (351 people).[14] For each individual, we also use the number of therapeutic hours received as another measure of treatment. Of the 552 individuals who were referred but did not start a HIPU program and who had information recorded regarding their reasons for exit, 219 (39.6%) did not start either because they refused or for therapeutic reasons, and 207 (37.4%) did not start the program due to insufficient time left in custody.[15] For the 352 individuals who started a HIPU program but did not complete and who we had a reason for exit, 186 (52.8%) did not complete because of insufficient time left to serve and 82 (23.3%) because they refused or for therapeutic reasons. Each observation in our data then corresponds to a unique custodial episode for a unique individual, which was linked to the court finalisation that led to the custodial episode.[16]

Theoretical framework

This report aims to estimate the causal impact of the intensive behaviour change programs, reintegration services and enhanced release planning delivered through the HIPUs on the likelihood of reoffending. The key threat to our estimates is selection bias, which could be caused by unobserved differences between those starting and/or completing a program through the HIPUs and those that do not. This occurs if the association between starting and/or completing a program through the HIPUs and rates of reoffending is confounded by a third factor (e.g., underlying risk) which is a significant determinant of both variables. If individuals who are less likely to reoffend in the future (due to underlying but unmeasured characteristics at entry) are more likely to start and/or participate in HIPU programs, any comparison between people who did not receive the program and those who did will lead us to overestimate the impact of the HIPUs (i.e., any reduction in reoffending will simply reflect the lower underlying risk of the cohort).

Two plausible sources of this selection bias are described below.

1. HIPU staff may systematically select less risky individuals to participate in a program in the HIPUs.

   If, in the initial screening phase, the HIPUs systematically selected individuals for programs who are at higher (or lower) risk of reoffending, comparing those who started the program with those who did not start (but were selected for the program) may overestimate the impact of the program. There is some evidence for this in our data, with 18% of the individuals selected for a therapeutic program at the HIPUs being screened out because of security concerns. If this selection mechanism is correlated with our reoffending outcomes, this will bias our estimates in favour of a treatment effect of the HIPU program.

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13   40 additional individuals could not be matched to the BOCSAR reoffending database.

14   This was determined by combining two sources of data – first we used the logs of program status that we have for all individuals in the data to detect whether they were ever logged as 'commenced treatment'. We then used the data we have on the number of hours spent in the program for 79% of participants to look for any contradictions – e.g. individuals logged as started who have zero hours of a program, or those who were not logged as started who have more than zero hours of a program – and changed the status to match the hours when there was a conflict. This changes the status for 246 people (15%) in the sample, 153 people from being recorded as started to not started, and 93 people being recorded as not started to started.

15   Insufficient time left to serve was driven by three types of issues – the individual experienced unforeseen delays in arrival, they had their parole or intensive correctional order reinstated or there were (rarely) capacity issues at the HIPU that caused a delay before the individual could start.

16   For individuals who have multiple custodial episodes during this period, we have identified the relevant custodial episode by using the dates that they were in the HIPU program, with the first episode used for those who have multiple appearances in the data set.

2. Participants who agree to start and/or complete a program at a HIPU are less risky than those that do not.

Of those individuals selected for a HIPU, only 58% started a program at a HIPU and 26% of those who were selected for a HIPU completed the required number of therapeutic sessions. For example, if those who complete a program are more likely to complete due to unobserved characteristics that also reduce the risk of reoffending (e.g., a change in dynamic risk factors unrelated to the program) then this will cause us to overestimate the impact of the HIPUs.

To reduce the risk that our estimates are not being driven by selection bias, we need to understand the way in which individuals are selected to join the program. To do this, we control for as many of the relevant observed characteristics as possible, and supplement this with an analysis of a subset of individuals where the selection was "plausibly random" (i.e., those who did not complete because of insufficient time left to serve). In Figure 1 we present our underlying causal model using a directed acyclic graph. A directed acyclic graph provides a visual depiction of what we believe to be the relevant variables in a causal model and how they are expected to impact each other.

Figure 1. Directed Acyclic Graph of relevant causal relationships
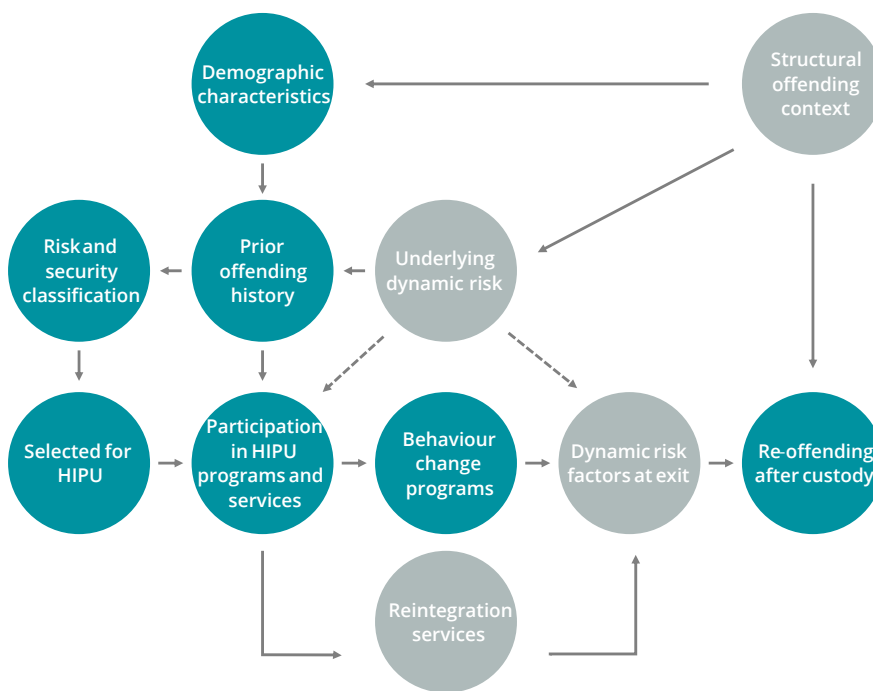
Note: Grey circles denote unobserved factors

The HIPUs aim to target a number of dynamic risk factors for reoffending such as anti-social attitudes, anti-social peers, instability of relationships, education and/or employment, leisure activities, substance abuse and general self-regulation. The HIPUs follow a Risk-Needs-Responsivity approach, tailoring the treatment to the risk factors most relevant for each individual and their abilities or strengths. Our causal relationship is therefore entirely mediated through how successful the HIPU program is at identifying and addressing an individual's dynamic risk factors for reoffending, and how relevant those risk factors are to reoffending after being released from custody.

Empirical strategy

For this report, we estimate the impact of the HIPUs on reoffending using three approaches. For each of these approaches, we describe below how the treatment effect is estimated.[17] Due to the size of our sample we have not presented treatment effects for specific subsamples of the data (e.g. by Aboriginality, gender, those with a history of domestic violence, or other groups of interest).[18]

1. **Comparing individuals by program status (Did not start, Started but did not complete, Finished)**

First, we examine reoffending rates for only those who were selected to receive a behaviour change program at the HIPUs and compare outcomes between three mutually exclusive groups: 1) those who did not start a program; 2) those who started but did not complete a program[19], and; 3) those who completed a program.

We estimate differences in reoffending between these groups using a logistic regression model, which allows us to estimate the impact of starting or completing a program at a HIPU after adjusting for demographics, offending history and the characteristics of the index custodial episode. We report the average marginal effect from this regression, which can be directly interpreted as the average predicted difference in the proportion of individuals who commit the reoffending outcome. As discussed above, this estimate is (potentially) confounded by a less risky cohort choosing to start and/or continue in a behaviour change program, which would result in an overestimate of the impact of the HIPUs on reoffending.

2. **Comparing individuals by the number of therapeutic hours received at a HIPU**

Second, we compare reoffending rates by the number of hours inmates participated in behavioural change programs at the HIPU (regardless of their end program status). This analysis uses the same sample as the analysis above, but uses a different measure of HIPU program "treatment". There is substantial variation in treatment hours amongst those who started at a HIPU and those who completed their plan through the HIPUs. Therefore, we group individuals into 10-hourly intervals (i.e., 1-10 hours, 11-20 hours etc), reflecting the total number of hours spent in any program, and compare outcomes across these groups. Intuitively, we would expect that the benefits from a HIPU (and subsequently any reduction in reoffending) would be greater for individuals who received more therapeutic hours compared with those who spent less time in the program holding constant characteristics such as underlying risk.

We again estimate the average reoffending rate for each group using logistic regression, where a group indicator[20] is included and demographics, offending history and the characteristics of the custodial episode are adjusted for. This provides an estimate of the change in the reoffending rate for inmates who received therapeutic intervention relative to those who did not receive a single hour of treatment.

Figure 2 below shows the distribution of hours for those who started a program (but did not finish) and those who finished a program through the HIPUs. Only data for the 682 people who received a behavioural change program at a HIPU and had non-missing data on the number of participation hours, are reported here.[21]

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17   We also considered a matching approach for this evaluation, using either individuals who were not selected for a HIPU who were in custody during the same period, or who were in custody in the two years before the HIPUs were implemented. Ultimately, we were unsatisfied with the quality of matches for a sizable proportion of the sample, so this approach has not been reported.

18   Where estimates were calculated for a subgroup, we did not observe any qualitative differences in the estimates to those presented below for the whole sample..

19   As described in the Sample section, this is made up of individuals who had insufficient time left to serve, those that refused to continue and/or therapeutic reasons, and those where we do not have data on the reason for non-completion. We have aggregated this group for two reasons – Firstly, the sample sizes from the groups become small when disaggregated. Secondly, removing the two groups that have higher reoffending rates when disaggregated ('misconduct' and 'security') does not meaningfully change the results.

20   This model was also estimated as a continuous variable, using more/less granular brackets, but these approaches did not yield qualitatively different estimates. Estimates from a multi-level model were also considered.

21   Data was extracted by CRES on the number of program treatment hours for each individual, but may not reflect total hours as counted by HIPU. We calculate all hours from Aboriginal Cultural Strengthening, Addictions support group, CONNECT, Dads and family, EQUIPS Addiction, EQUIPS Aggression, EQUIPS Domestic Abuse, EQUIPS Domestic and Family Violence, EQUIPS Foundation, EQUIPS Maintenance, Mini Mothering at a Distance, Mothering At a Distance v2015, Out of the dark v2015, Remand DV intervention, TRIP, RUSH, RUSH v2020 and VOTP High Intensity v16. This data therefore does not imply that the HIPU was not meeting its target therapeutic hours per person. Unfortunately, we do not have any other measures of adherence or engagement with the program.

Figure 2. Hours attending a behavioural change program, by HIPU program completion status
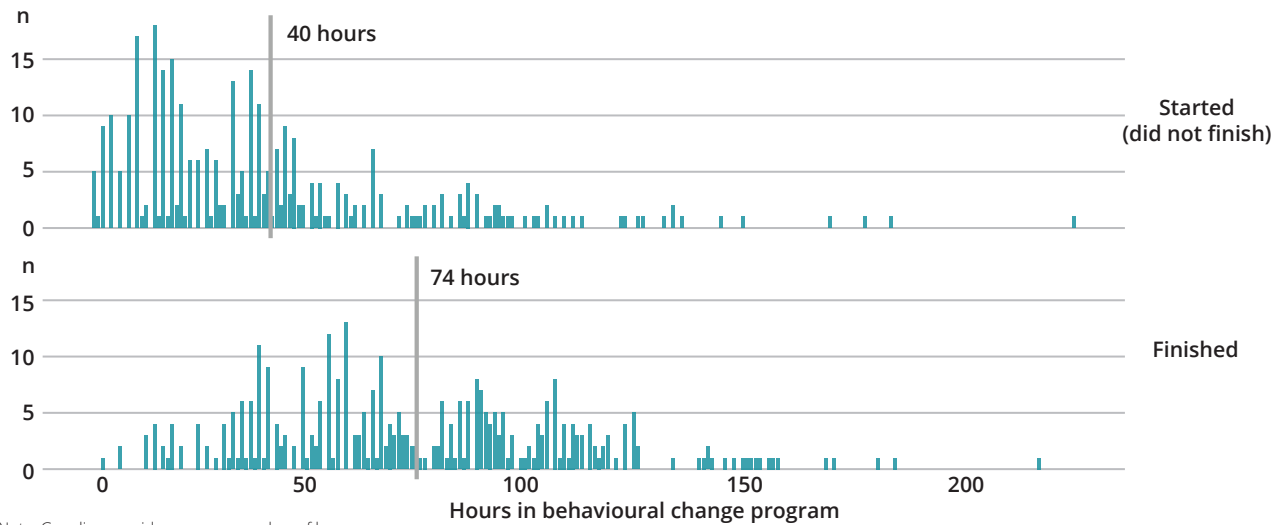
Note: Grey line provides average number of hours

This approach is again confounded by any unobserved factors that cause both changes in the number of session hours completed and our reoffending outcomes. As discussed above, we expect that higher risk individuals are likely to drop out of their plan earlier, but conditional on staying in the program would likely receive a greater number of hours of treatment. Therefore, we would expect the estimated difference in reoffending rates between those who receive more versus less hours of treatment to reflect more than just the causal impact (if any) of the behavioural change programs, but the direction of the impact is ambiguous.

3. **Comparing individuals by the number of therapeutic hours received, only among those who exited due to "insufficient time"**

Finally, we use a "front-door criterion" approach to estimate the impact of starting a program at a HIPU. This approach first estimates the impact of starting a program on the number of hours in a behavioural change program, then estimates the impact of the number of hours in a behavioural change program on reoffending. These estimates are then multiplied to give an estimate of the impact of starting a program at a HIPU. This approach requires three things to be true for our estimate to identify the causal effect of the program: 1) there is a mediator / mechanism that lies on the causal path between the program and the outcome; 2) it is the only such mechanism and; 3) it is not impacted by the confounder.

For this study, the mediator / mechanism for the HIPUs is the number of hours spent in the program. Intuitively, if we can identify the effect of the program on the number of hours spent in the program, and the effect of the number of hours spent in the program on our reoffending outcomes, then we are able to estimate the impact of the program on the outcome. This means that the estimate is unconfounded if the program works entirely through the number of hours inmates participate in the program, and the number of hours completed is unrelated to factors that influence reoffending. Figure 3 shows the causal relationships required for this estimate to be identified.

Figure 3. Directed Acyclic Graph showing requirements for front-door criterion
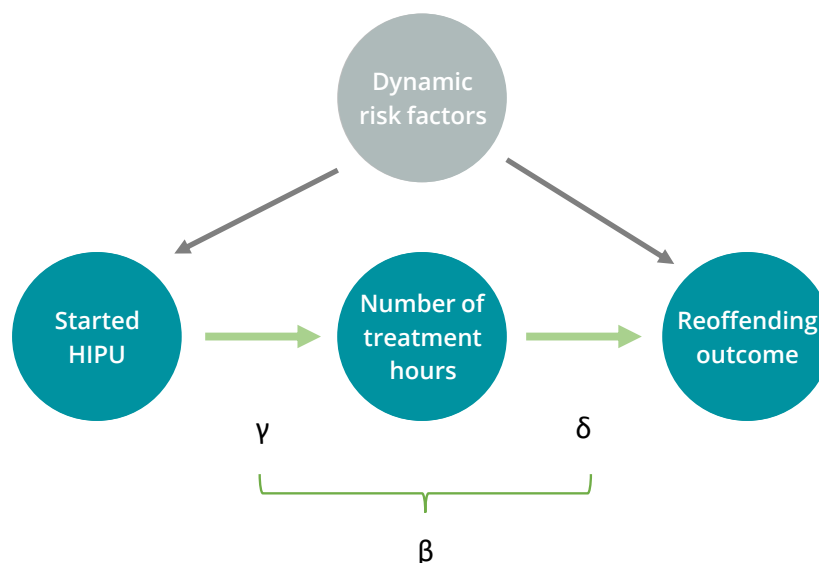
As dynamic risk factors likely influence how long people remain in a HIPU behavioural program and/or program completion, we have selected a subset of individuals where the number of treatment hours they received were likely unrelated to their underlying risk - those who exited the HIPUs because of "insufficient time". These individuals were assessed as having sufficient time when they started, but circumstances were changed unexpectedly to prevent completion of the program reoffending (e.g., variation in meeting requirements for parole, availability of accommodation after release). This means that their treatment hours vary in a way that creates a "natural experiment" if these changes in circumstances were unrelated to reoffending in the future.

We estimate the average impact of starting the HIPU on the number of treatment hours received (γ), then estimate the average impact of treatment hours on our reoffending outcome (δ), adjusting for all predictors at both stages of the regression. We estimate these two relationships simultaneously using a seemingly unrelated regression (Feibig, 2001) approach, and estimate the standard error of our final estimate (β) using the delta method, following Bellemare, Bloem, and Wexler (2019).

Variables

Treatment variables

Two indicators of treatment were used in this study.

- **Program status:** A categorical variable that is either "Did not start", "Started (but did not finish)" or "Finished" for all individuals in the sample. This is then converted to two indicator variables for "Started (but did not finish)" and "Finished" which are TRUE if that is the individual's status and FALSE if not, making "Did not start" the omitted category.

- **Number of hours received:** A variable indicating the number of hours an individual spent in a behaviour change program at the HIPUs. For this dosage analysis, hours are categorised into 10-hourly intervals (i.e., 1-10 hours, 11-20 hours etc). Again, we convert this to a series of indicator variables which is TRUE if it corresponds to the interval that the individual is in, with the 0 hours being our omitted category. For the front-door criterion estimate, we use the number of hours received as a numeric variable in the first stage of the estimation.

Outcome variables

Three outcome variables were used in this study,[22] measured within 3, 6 and 12 months of leaving custody.[23]

- **Any new offence**: This variable is TRUE if the individual was found guilty of any offence with an offence date within 3, 6, and 12 months of their discharge date.

- **Any new violent offence**: This variable is TRUE if the defendant was found guilty of any violent offence with an offence date within 3, 6, and 12 months of their discharge date. A violent offence is defined as any offence within ANZSOC Division 1, 2, 3, 5, or 6, excluding subdivision 013 (manslaughter) (see Australian Bureau of Statistics, 2011).

- **Reimprisonment**: This variable is TRUE if the defendant was sentenced to imprisonment for any offence with an offence date within 3, 6, and 12 months of their discharge date.

Predictors

A large set of predictors was used in the analysis and are detailed below. Where possible similar sets of variables were included in each of the models to ensure comparability. Where certain predictors have not been included in specific models these are identified below.

Demographic variables

- *Gender*: This variable is recorded as a binary variable ("Male" or "Female").

- *Age category*: This variable is recorded as a numeric variable, and is the individual's age in years at the time of the index court finalisation. This is converted into a categorical variable with seven possible values ("18-24", "25-34", "35-44", "45-54", "55+").

- *Aboriginality ever recorded*: This variable is a categorical value with three possible values: Aboriginal; Non-Aboriginal; or Unknown. An individual is recorded as an Aboriginal person if the police identified them as such at any incident.

- *Socio-economic disadvantage*: A categorical variable indicating the level of disadvantage of the individual's postcode of residence. It consists of five values; one for each quartile of the SEIFA distribution and one for missing values (see Australian Bureau of Statistics, 2018).

Offending history

- *All offences*: Total number of proven offences in the two years prior to the index finalisation date, converted into a categorical variable with seven possible values ("0-5", "6-10", "11-15", "16-20", "21-25", "26-30", "31+")

- *Violent offences*: An indicator which is TRUE if the individual had a proven violent offence in the two years prior to the index finalisation date and FALSE if not, defined identically to the analogous outcome variable above.

- *Prison episodes*: An indicator which is TRUE if the individual was sentenced to imprisonment for any offence in the two years prior to the index finalisation date and FALSE if not.

Characteristics of index custodial episode[24]

- *Days spent in custody*: The total duration of the index custodial episode measured in days.

- *Discharge type*: A categorical variable that captures how the individual was discharged from custody. This variable has four possible values: Bail; Parole; Sentence expired; and Other.

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22 We also considered restricting our outcome measure to domestic violence offences, using the same definitions and observation periods as above, and found no qualitative differences in our estimates.

23 Here, we define a month as 30 days for 3 and 6 months, meaning that this is 90, 180 and 365 days after leaving custody in our code.

24 One predictor that is conspicuously missing is a measure of the number of behavioural change programs received in custody outside of the HIPUs for each individual. This variable has not been included as a predictor, as it is likely confounded by the same dynamic risk factors that influence both HIPU program status and reoffending outcomes.

Descriptive statistics

Table 1 below presents descriptive statistics for all covariates included in our analysis. These statistics are shown for all individuals included in the dataset and are also broken down by program status. For our sample as a whole, approximately half (51%) were identified by police as Aboriginal, 78% were male, the age at index court finalisation was 36 years and most resided in major cities (66%).[25] Forty per cent of inmates in the sample had committed a violent offence in the two years preceding the index custodial episode. On average inmates spent 241 days in custody during the index episode and the vast majority were released to parole (82%).

Table 1.   **Descriptive statistics: counts and proportions of observable characteristics by whether the individual started and/or competed a program through the HIPUs.**

Characteristic	Total n = 1,606[1]	Did not start n = 721[1]	Started (did not finish) n = 534[1]	Finished n = 351[1]	p-value[2]
Aboriginality (ever recorded)	825 (51%)	365 (51%)	285 (53%)	175 (50%)	.500
Age					.002
18-24	100 (6%)	42 (6%)	44 (8%)	14 (4%)	
25-34	591 (37%)	272 (38%)	216 (40%)	103 (29%)	
35-44	566 (35%)	247 (34%)	173 (32%)	146 (42%)	
45-54	295 (18%)	132 (18%)	88 (16%)	75 (21%)	
55+	54 (3%)	28 (4%)	13 (2%)	13 (4%)	
SEIFA quartile					.400
Most disadvantaged	458 (29%)	218 (30%)	152 (28%)	88 (25%)	
Disadvantaged	703 (44%)	300 (42%)	230 (43%)	173 (49%)	
Advantaged	373 (23%)	174 (24%)	125 (23%)	74 (21%)	
Least disadvantaged	64 (4%)	25 (4%)	25 (5%)	14 (4%)	
Unknown	8 (1%)	4 (1%)	2 (0%)	2 (1%)	
Gender					.037
Female	352 (22%)	140 (19%)	136 (25%)	76 (22%)	
Male	1,254 (78%)	581 (81%)	398 (75%)	275 (78%)	
Remoteness					.500
Major cities	1,024 (66%)	459 (67%)	330 (64%)	235 (69%)	
Regional	475 (31%)	207 (30%)	170 (33%)	98 (29%)	
Remote	47 (3%)	23 (3%)	17 (3%)	7 (2%)	
Unknown	60	32	17	11	
Court appearances before prison episode (two years before index offence)	1,407 (89%)	628 (89%)	466 (88%)	313 (90%)	.800
Unknown	22	13	7	2	
Court appearance for violent offence before prison episode (two years before index offence)	628 (40%)	277 (39%)	221 (42%)	130 (37%)	.400
Unknown	22	13	7	2	
Sentenced to prison for offence before prison episode (two years before index offence)	991 (63%)	439 (62%)	330 (63%)	222 (64%)	.900
Unknown	22	13	7	2	
Number of days spent in custody (index episode)	241 (178, 362)	213 (152, 362)	221 (179, 322)	272 (202, 364)	<.001
Discharge type					<.001
Bail	31 (2%)	20 (3%)	10 (2%)	1 (0%)	
Parole	1,311 (82%)	564 (78%)	441 (83%)	306 (87%)	
Sentence expired	117 (7%)	50 (7%)	37 (7%)	30 (9%)	
Other	147 (9%)	87 (12%)	46 (9%)	14 (4%)	

[1] n (%); Median (Interquartile range)

[2] Pearson's Chi-squared test; Fisher's Exact Test for Count Data with simulated p-value (based on 2000 replicates); Kruskal-Wallis rank sum test

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25   This was calculated at the date of data extraction (i.e. 1/4/2021).

Individuals who completed a program were more likely to be older, female and be discharged to parole compared with those that did not complete a program. These differences are statistically significant, but relatively small. In general, there were only small differences between individuals by program status, suggesting that these observable demographic characteristics and/or offending history were largely unrelated to whether individuals completed the program. The largest meaningful difference is that individuals who finish a program spent approximately two more months (59 days) in custody than those who were referred but did not start a program. This is likely because exiting custody earlier can cause people to not start or not finish their HIPU programs, thus lowering the average number of days spent in custody.

Table 2 presents rates of reoffending by program status before adjusting for any of the group differences described in Table 1. Within 3 months of leaving custody, a lower proportion of those who finished the program had committed a new offence (23% vs 28%), a violent offence (5.4% vs 7.1%), or been reimprisoned (15% vs 18%) compared with individuals who never started a program at the HIPUs. These patterns are consistent across outcomes measured at 6 and 12 months.

Table 2. **Descriptive statistics: counts and proportions of outcome variables by whether the individual started and/or competed a program through the HIPUs**

	Did not start n = 721[1]	Started (did not finish) n = 534[1]	Finished n = 351[1]
Any new offence			
Within 3 months of leaving custody	200 (28%)	137 (26%)	79 (23%)
Within 6 months of leaving custody	270 (45%)	173 (48%)	150 (43%)
Unknown	117	174	0
Within 12 months of leaving custody	217 (63%)	120 (65%)	110 (59%)
Unknown	377	350	163
New violent offence			
Within 3 months of leaving custody	51 (7.1%)	32 (6.0%)	19 (5.4%)
Within 6 months of leaving custody	76 (13%)	47 (13%)	40 (11%)
Unknown	117	174	0
Within 12 months of leaving custody	84 (24%)	42 (23%)	35 (19%)
Unknown	377	350	163
Reimprisonment			
Within 3 months of leaving custody	127 (18%)	89 (17%)	51 (15%)
Within 6 months of leaving custody	169 (28%)	110 (31%)	87 (25%)
Unknown	117	174	0
Within 12 months of leaving custody	137 (40%)	79 (43%)	75 (40%)
Unknown	377	350	163

[1] n (%)

Unknown is for those individuals where we do not observe the outcome before the start of the COVID period, due to being discharged towards the end of our sample.

RESULTS

The following section presents three different analyses estimating the impact of the HIPUs on our reoffending outcomes.

1. Reoffending by program status.

2. Reoffending by program hours received.

3. Reoffending estimate using "insufficient time" as a natural experiment

Each of the outcomes is measured at 3, 6 and 12 months after release from custody. Full regression tables for all results below are provided in the Appendix.
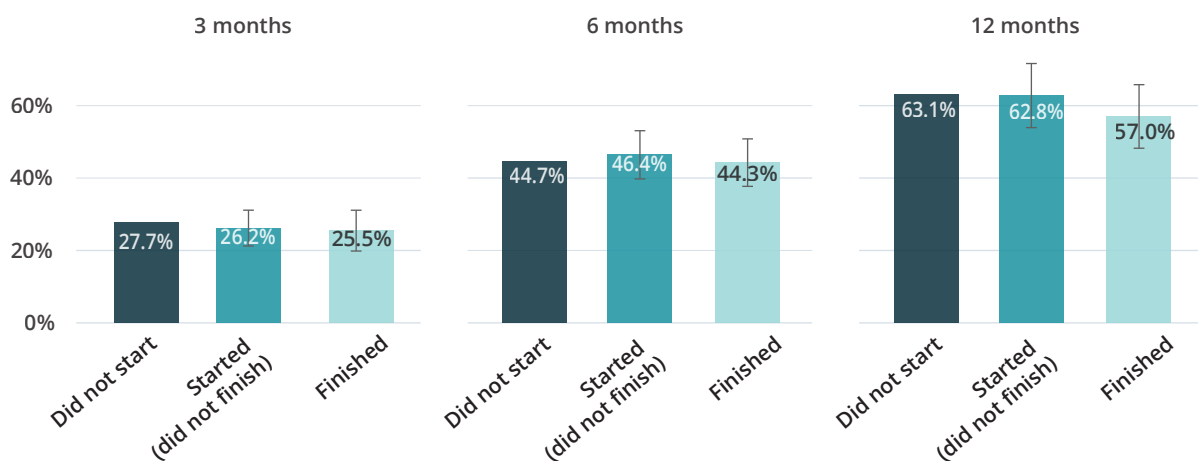
Reoffending by program status

For this analysis, all individuals who were referred to the HIPU are categorised into one of three groups: (1) did not start a program through the HIPUs (the referent group); (2) started but did not complete, and; (3) finished the HIPU program. For each outcome examined, we present the estimate from our full regression model, which adjusts for demographic variables, offending history and characteristics of the custodial episode. As discussed above in the Sample and Theoretical Framework sections, the reasons for not starting and starting but not finishing may be correlated with reoffending, biasing our estimates towards finding a reduction in reoffending as a result of participation in the program.

The estimates below can be interpreted as the estimated proportion in each group reoffending with the specified offence type, after adjusting for all covariates.[26] The estimate for those who did not start at a HIPU (i.e., the referent group) is simply the unadjusted average of the reoffending outcome. For the other two groups, the estimate is the average marginal effect computed from the full logistic regression model and added to the average of the outcome for those who did not start.

Any reoffending

First, we examine the proportion recording any new proven offence within 3, 6 and 12 months of leaving custody. Figure 4 presents the estimates from our full logistic regression model, with each bar showing the estimated proportion who reoffend in each group after adjusting for observed covariates, and the error-bars showing the 95% confidence interval associated with each estimate.

Figure 4. Estimated proportion who reoffend (with any offence) after adjustments for observed characteristics, by program status

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26   These estimates can further be interpreted as the causal effect if the allocation to program status is unrelated to the reoffending outcome, something that is not likely to be true in this study.

Over one-quarter (27.7%) of those selected for the HIPU program (but who never start) are estimated to reoffend within 3 months of leaving custody, compared with 26.2% of those who start but do not finish their program and 25.5% of those who complete the program. Similarly for reoffending with any offence within 12 months, we estimate that 63.1% of those who do not start a program at the HIPUs reoffend compared with 62.8% of those who start but do not finish, and 57% of those who finish their program at the HIPU.

Measured at 3, 6 and 12 months, the estimated proportion reoffending is slightly lower for individuals who complete the HIPU program compared with those who are selected but never start. At 6 months, we observe slightly *higher* reoffending rates for starters who did not finish compared with those who do not start, which is likely driven by confounding factors (e.g., higher risk factors causing both non-completion and reoffending). None of these differences are statistically significant at conventional thresholds.

Violent reoffending

Second, we estimate the proportion recording any new proven violent offence by program status. Figure 5 presents the estimates from our full logistic regression model for this outcome measured at 3, 6 and 12 months after discharge.

Figure 5. Estimated proportion who reoffend with a violent offence after adjustments for observed characteristics, by program status
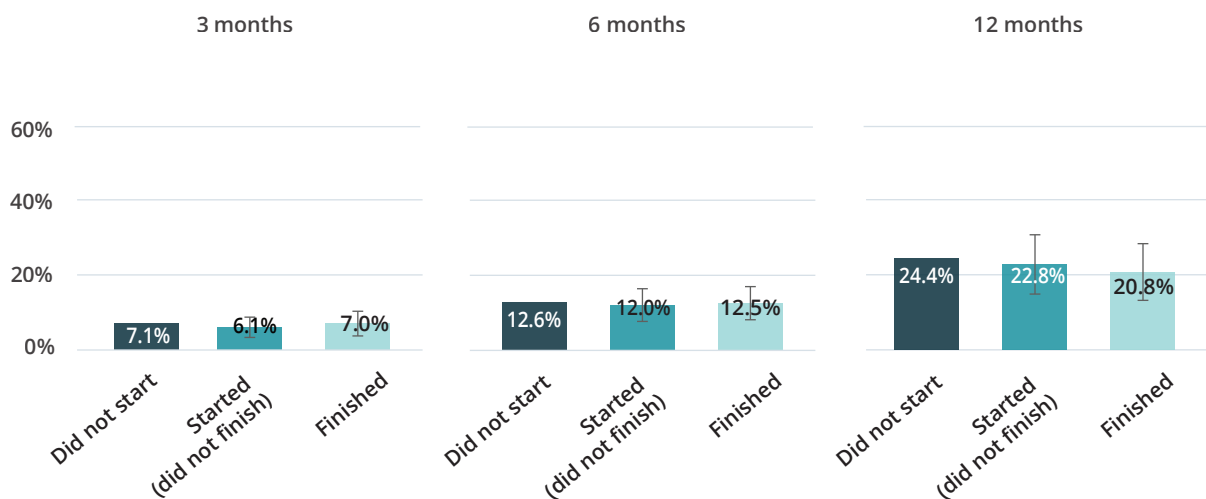
Measuring violent reoffending at 3 and 6 months, we see little to no difference in reoffending rates between those who do not start a program at the HIPUs and those who start or finish a program. We estimate that only 7.1% of those who do not start a program reoffend with a new violent offence within 3 months of release from custody, compared with 6.1% who start but do not finish and 7% who complete the HIPU program. All these differences are less than 1 p.p.. Differences between the three groups are even smaller when measured at six months (0.6 p.p. and 0.1 p.p. respectively). We estimate slightly larger differences at 12 months follow-up, with 24.4% of those who do not start a program at the HIPUs estimated to reoffend with a new violent offence compared with 22.8% of those who start but do not finish and 20.8% of those who finish the program. However, none of these differences are statistically significant at conventional thresholds.

Reimprisonment

Finally, we examine the proportion receiving a new full-time prison sentence for each of the three groups. Figure 6 presents the estimates from our full logistic regression model for this outcome, measured at 3, 6 and 12 months post-release.

Figure 6.   Estimated proportion who are reimprisoned after adjustments for observed characteristics, by program status
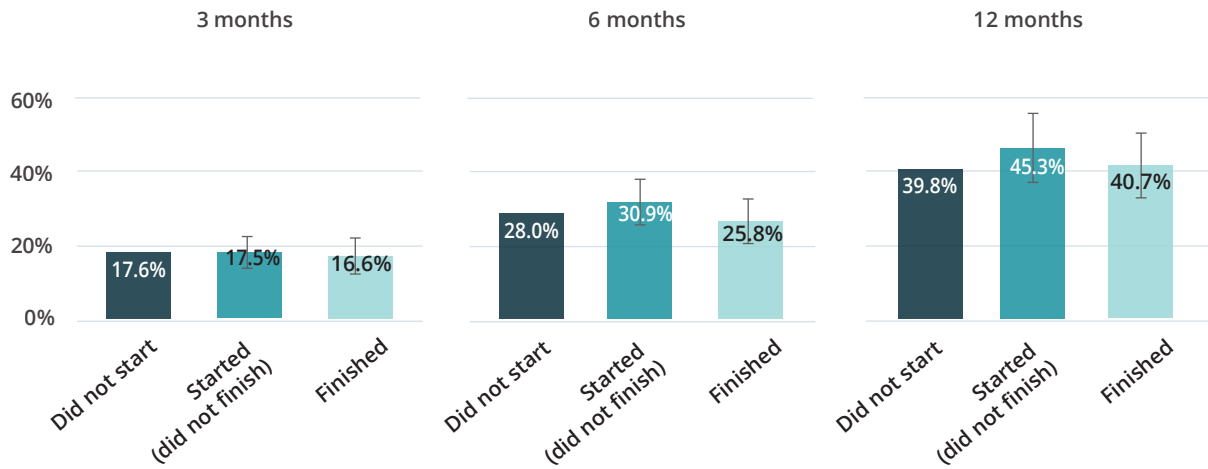
At three months, we see very small differences in reimprisonment rates between those who do not start a program at the HIPUs and both those who start but do not finish (0.1 p.p.) and those who complete a program (1 p.p.). Looking at reimprisonment within six and twelve months, we estimate a bigger reduction in reimprisonment for those who complete a program at the HIPUs (2.2 p.p) at six months but very little difference at twelve months (0.9 p.p), and slightly higher imprisonment rates for those who start but do not finish (2.9 p.p. and 5.5 p.p., respectively). These increases in reimprisonment rates likely reflect selection effects, with the cohort that do not complete the program having a higher underlying risk of reoffending and/or reimprisonment than those who do not start or complete a program through the HIPUs. Again, none of these differences are statistically significant.

Reoffending by program hours received

In this section we examine the relationship between the number of program hours a HIPU participant completed and the likelihood of reoffending after release from custody. For this analysis, we only consider those who had data recorded on the number of treatment hours received (including where zero was recorded). These data were available for 1,274 people in our full sample (79.3%), of whom 684 started a program through one of the HIPUs.

For all these individuals, we categorised the number of treatment hours into 10-hourly intervals (i.e., 0 hours, less than 10 hours, 11-20, 21-30 hours etc[27]), reflecting the dosage level. Total treatment hours varied significantly within the group of inmates who started but did not finish at a HIPU (e.g., an average of 40 hours for this group, but some individuals received more than 150 hours in total). There was also significant variation in the number of treatment hours received between those who completed a HIPU program (an average of 74 hours completed) and those who exited the program early. The distribution of treatment hours received is presented in the Empirical Strategy section of this report (see Figure 2).

Each coefficient below can be interpreted as the estimated difference in the outcome between the dosage group and the group of inmates selected for a HIPU who received no hours of treatment (i.e., both those who did not start a program through the HIPUs, and those who were identified as starting but had zero hours recorded).[28] For each dosage level, we report the coefficient from our full logistic model after adjusting for demographic variables, prior offending and characteristics of the custodial episode. Again, each outcome was measured at 3, 6 and 12 months after the date of discharge from custody.

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27   Those with 130 hours or more have been grouped into one interval due to the small number of people who received this amount of hours.

28   As we are estimating a large number of parameters here, we would expect that some of these will turn out to be statistically significant spuriously as we have not further adjusted for the large number of estimates (that is, adjusted for a familywise error rate).

Any reoffending

First, we estimate the difference in the proportion reoffending with any offence type by the number of program hours received. Figure 7 presents the estimates from our full logistic regression, with the error-bars showing the 95% confidence interval associated with each estimate.

Figure 7. Estimated difference in proportion who reoffend (any offence), by program hours received
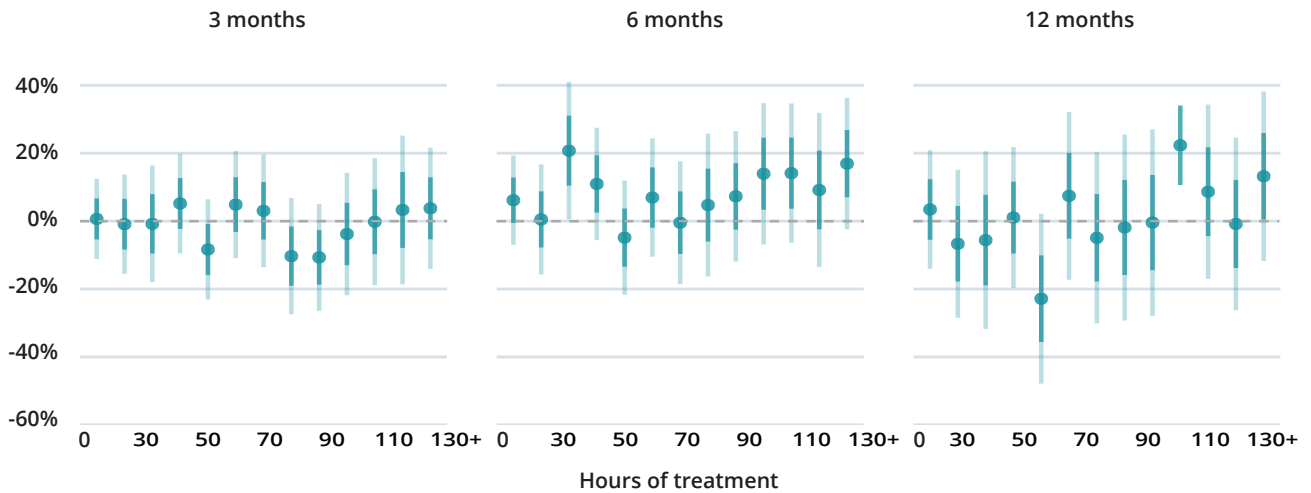

Looking across the estimates, we see that the majority are clustered around zero, with only two of the estimates being statistically significant (21-30 hours after 6 months, 101-110 after 12 months). The remaining estimates are not consistently lower across dosage groups regardless of whether the outcome is measured at 3, 6 or 12 months. This analysis does not provide evidence that the likelihood of reoffending decreases as the number of hours spent in a HIPU program increases.

Violent reoffending

We then estimate the difference in the proportion reoffending with a violent offence by the number of program hours received. Figure 8 presents the reoffending estimates from the full logistic model for this outcome, measured at 3, 6 and 12 months post-release.

Figure 8. Estimated difference in proportion who reoffend with a violent reoffence, by program hours received
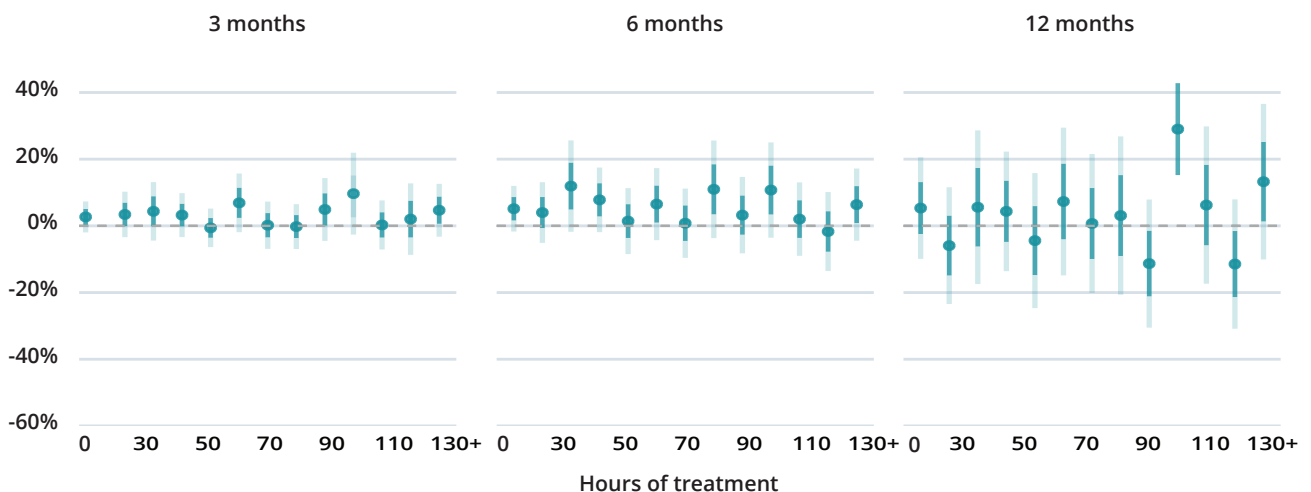
Similar to reoffending with any offence, the estimates for violent reoffending are clustered around zero and there is no consistent pattern across the different levels of treatment. Only one estimate is statistically significant (101-110, 12 months reoffending), with large estimated increases in violent offending. However, again, given that there is no systematic pattern across the different dosage measurements there is no evidence to suggest that rates of violent reoffending are significantly lower for inmates who receive more hours of treatment through the HIPUs.

Reimprisonment

Finally, we estimate the difference in the proportion reimprisoned for a new offence by program duration. Figure 9 presents the reoffending estimates from the full logistic model for this outcome, measured at 3, 6 and 12 months post-release.

Figure 9. Estimated difference in proportion who are reimprisoned, by program hours received
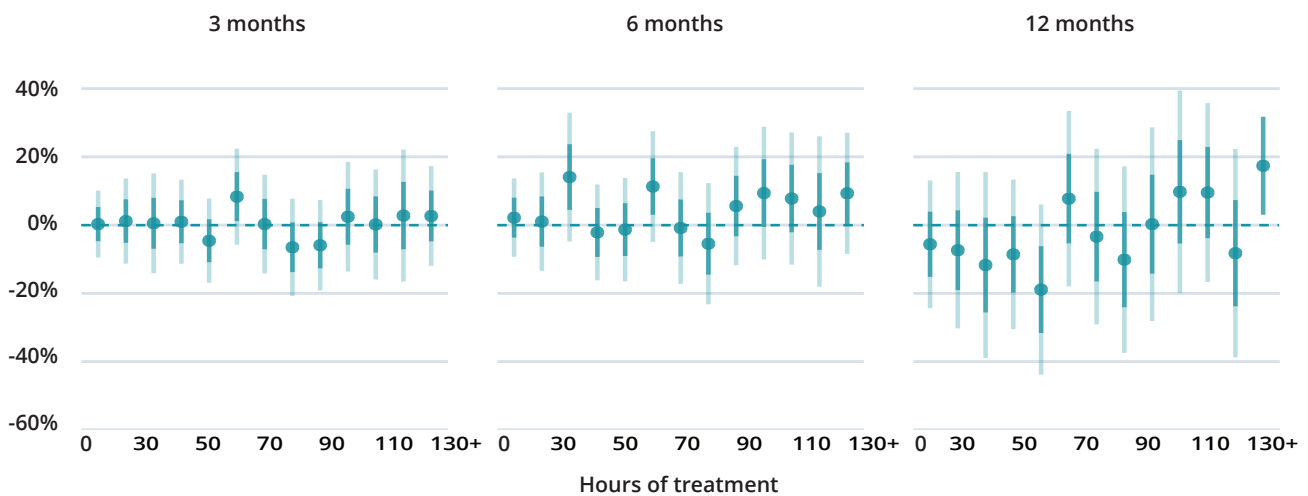
Using reimprisonment as our outcome variable, all of the estimates are again clustered around zero and again one is statistically significant at conventional thresholds (130+ at 12 months). Thus, there is no evidence that the rate of reimprisonment decreases as treatment hours increase.

Reoffending estimate using "insufficient time" as a natural experiment

In this section we estimate the impact of receiving a behaviour change program through the HIPUs on reoffending outcomes by exploiting "plausibly random" variation in the number of treatment hours received, caused by release from prison sooner than expected. A total of 389 individuals were recorded as exiting the HIPU due to insufficient time, with 203 not starting a program due to insufficient time and 186 starting but not completing their program because they had insufficient time left to serve. These 389 inmates constitute the sample for this analysis. Those that started the program received on average 45 hours of a behavioural change program, approximately 60% of the 74 hours received (on average) by those that finished their program through the HIPUs.

The estimate from the front-door estimate can be interpreted as the impact of starting a behavioural change program on reoffending, after adjusting for all relevant covariates. Since those that started a program received 45 hours of a behaviour change program, it can equivalently be thought of the average impact of these 45 hours on reoffending. This can be further interpreted as the causal effect of starting the HIPU program if two things are true: 1) the number of hours received is the only way in which the program impacts reoffending and; 2) the number of hours received are not determined by factors related to reoffending for those who exit due to insufficient time left to serve on their sentence.[29]

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29   One plausible violation of this condition would be through parole – lower risk offenders may be more likely to be granted parole, and thus receive systematically less treatment than those who are higher risk.

Any reoffending

First, we estimate the proportion reoffending with any new offence type in each group, at 3, 6 and 12 months after leaving custody. Figure 10 presents the estimates from the front-door criterion approach, with each bar showing the estimated proportion of starters and non-starters who reoffend after adjusting for observed characteristics. The error-bars show the 95% confidence interval associated with each estimate.

Figure 10. Estimated proportion who reoffend (with any offence), front-door estimate using those who exited due to insufficient time
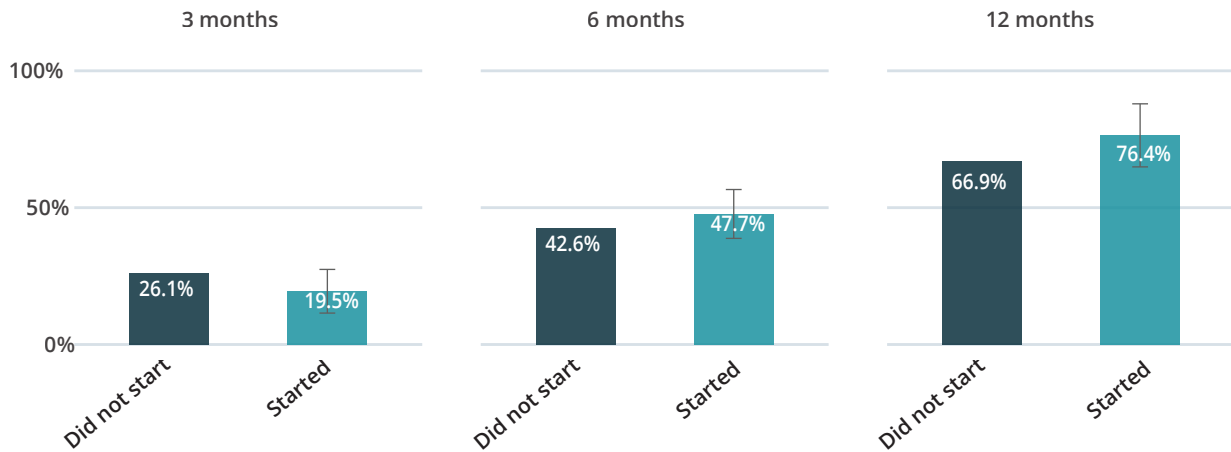
At three months post-release, we estimate that reoffending is 6.6 p.p. lower for those who start a program at the HIPUs, but this difference is not statistically significant. However, at 6 and 12 months, we estimate the reoffending rate to be higher for those who start a program through the HIPUs compared with those who do not start (a differences of 5.1 p.p. and 9.5 p.p. respectively). These differences are again not statistically significant at conventional thresholds.

Violent reoffending

Next, we estimate the difference in violent reoffending, within 3, 6 and 12 months of leaving custody. Figure 11 presents the estimates using the front-door criterion, with each bar showing the estimated proportion of each group who reoffend with a violent offence after adjusting for observed characteristics. The error-bars show the 95% confidence interval associated with each estimate.

Figure 11. Estimated proportion who reoffend with a violent offence, front-door estimate using those who exited due to insufficient time
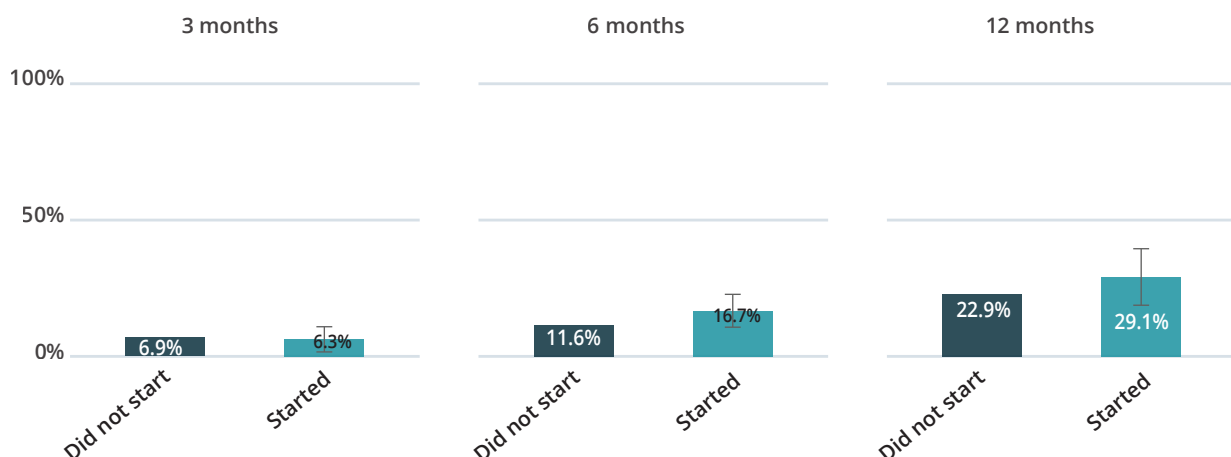
Regardless of when the outcome is measured, we do not estimate a significant reduction in violent offending after starting a behaviour change program at a HIPU. The estimated difference in violent reoffending after three months is negligible. We estimate an increase in violent reoffending within 6 and 12 months (5.1 p.p. and 6.2 p.p., respectively) but these differences are not statistically significant.

Reimprisonment

Finally, we estimate the difference in the proportion who are reimprisoned for a new offence within 3, 6 and 12 months of leaving custody. Figure 12 presents the estimates using the front-door criterion, with each bar showing the estimated proportion of each group who are reimprisoned after release from custody, adjusting for observed differences.

Figure 12. Estimated proportion who are reimprisoned, front-door estimate using those who exited due to insufficient time
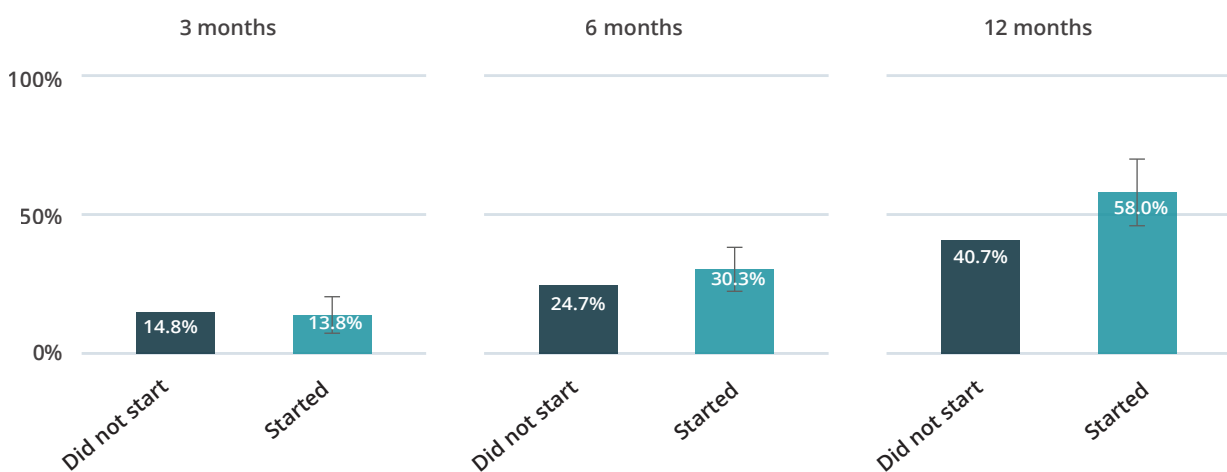
For reimprisonment, we see a similar pattern of results to those previously reported for any reoffending and violent reoffending. That is, we estimate a small reduction in the proportion that are reimprisoned within 3 months (1 p.p.), and an increase within 6 and 12 months (5.6 p.p. and 17.3 p.p. respectively), with the difference at 12 months large enough to be statistically significant.

We consistently observe higher reoffending and reimprisonment rates within 6 and 12 months among those who start the program compared with those who do not start. Although these differences are not statistically significant, these differences are concerning as it suggests that those who exit due to insufficient time may be a riskier group.[30]

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30   This result is also consistent with a small 'backfire effect' of the HIPU program, but given the previous literature on behaviour change programs and CBT based interventions this is less likely.

DISCUSSION

The aim of this study was to assess the impact of participating in a program through a HIPU on reoffending and reimprisonment within 3, 6 and 12 months of leaving custody. We estimated program impact using three different approaches: (1) comparing outcomes by program status (did not start, started but did not finish, finished); (2) comparing outcomes by hours of behavioural change program received, and; (3) considering outcomes only for those who exited the program early due to insufficient time left to serve on their sentence ("front-door approach"). This study is one of only a few that have attempted to estimate the benefits associated with intensive custody-based interventions for offenders serving short custodial sentences, and contributes to the broader literature on the effectiveness of custodial-based behaviour change programs in reducing reoffending.

Across the three approaches, we do not find any persuasive evidence for a reduction in reoffending caused by participation in a program at a HIPU. We (generally) observe small reductions in our reoffending outcomes between those who finished a program at the HIPU and those who never started, but these differences are very small (generally less than 4 p.p.) and are not statistically significant at conventional thresholds. Similarly, the overall pattern observed in the dosage analysis does not provide evidence for reduced reoffending after leaving custody for those who spend longer in HIPU programs. Using a "front-door" approach, we estimate small reductions in reoffending when the outcomes are measured at three months, but the estimates suggest an *increase* in reoffending and reimprisonment within 6 and 12 months. Again, none of these estimates are statistically significant at conventional thresholds. Our estimates are limited by the small (absolute) size of the sample and a shortened follow-up period of a maximum of 12 months due to the COVID-19 pandemic (and its impact on the offending environment).

The possibility that reductions in post-release rates of reoffending could be due to a less risky cohort opting into HIPU programs ("selection bias") was our key consideration for the analysis. The first two analyses rely on adjustments based on observable characteristics to account for this selection, while the "front-door" approach exploited variation in therapeutic hours at a HIPU caused by insufficient time left to serve. We would expect this selection bias to cause us to *overstate* the impact of the HIPU program across our estimates, so the small reductions (and small *increases* estimated using the "front-door" approach) suggest that the HIPUs (as currently implemented) are not effective in reducing reoffending rates for this cohort. Our results are discouraging, but are in line with the more stringent meta-analysis by Beaudry et al. (2021) of the (lack of) impact that CBT delivered in custodial settings has on re-offending outcomes.

Evaluating why participation in programs at the HIPUs is not resulting in significant impacts on reoffending and reimprisonment requires us to understand how each of the components have been implemented and if/how they are impacting participants. Without data on intermediate outcomes targeted by the programs it is impossible to assess the effectiveness of each component in isolation. For example, if data was collected on the "core skills" that the behaviour change programs are intended to improve, along with qualitative research assessing how relevant these "core skills" are to reoffending once inmates are discharged from custody, this may help to identify any deficiencies in the programs being delivered. Similarly, if data were available on the number and quality of supports provided to participants after release from custody this would help assess the extent to which reintegration services are being utilised. Links (including data linkage) between services inside and outside custodial settings would help us to understand the intermediate outcomes (e.g. housing, health, employment) post-release that may be critical for reducing reoffending.

There were two important differences between the original treatment design and the HIPU model as it was implemented which may have influenced the effectiveness of the program. First, the HIPUs were originally developed for those serving sentences of between 6 and 12 months who had limited time to access treatment but, due to low accrual rates, eligibility was expanded to include inmates with sentences of up to 36 months in length. The longer length of stay meant that many (54%) of those who did not start the HIPU program had the opportunity to engage with other custodial behaviour change programs.

Therefore our comparison group is not a group that had no access to a behavioural change program, as originally intended, but a mix of eligible inmates many of whom received other interventions/services from corrective staff during the index custodial episode. Second, reintegration services for participants were reportedly unable to meet the needs of many participants, particularly in the early stages of the HIPUs shortly after they had been implemented (Mahajan, Lobo, & Howard, 2021).[31] One reason for this was that participants referred early in their sentence experienced a long delay between completing a program through the HIPUs and release from custody, which limited the ability of reintegration services to assist with post-release housing and employment needs.[32] This issue could be addressed by ensuring inmates enter the HIPU program closer to when they are due to leave custody, or providing additional services closer to the anticipated discharge date.

Despite our best efforts, the challenges presented by retrospective evaluation mean that we cannot rule out that the results of this evaluation are driven by critical issues with the analysis. For example, it is possible that inmates exited early from HIPUs because they were granted parole after demonstrating good behaviour whilst in custody. If this were true, the assumption that we make for our "front-door" approach estimate (i.e., that the number of therapeutic hours received was determined by factors unrelated to reoffending) would be violated, biasing estimates towards a smaller (or negative) impact of the HIPUs. Credibly identifying causal effects is a recurrent challenge for retrospective evaluations and underscores the need for evaluation experts to be involved early in the planning of large-scale interventions, programs and policies. If stronger consideration had been given to a robust evaluation strategy during implementation (e.g., if the eligibility criteria were more strictly defined or if roll-out was purposefully staggered), this would have allowed us to remove much of the doubt and qualifications given to the analysis in this report and provide clearer guidance for policy and practice.

The HIPUs were originally intended to deliver behaviour change programs to a large cohort of individuals who would otherwise not have had access to any programs whilst in custody. Given the results of this evaluation, we would suggest that future work consider whether the treatment model has been implemented as intended, including whether the expanded eligibility criteria is appropriate, and whether all components are delivering their intermediate outcomes. A further outcome evaluation should be developed as part of that process, focusing on how selection into the program can be eliminated as a potential confound and how more granular data can be collected on what individuals did (or did not) receive. Continued development of the HIPUs, and ongoing evaluation, is imperative given the gap in service delivery for prisoners serving short sentences and the potential impact of intensive CBT-based programs in curtailing offending amongst this high volume, high risk cohort.

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31 However, given the discouraging evidence on reintegration programs from trials in the USA (Doleac, 2019), coupled with the strong evidence suggesting that CBT based behaviour change programs can reduce reoffending in the absence of other services (Lipsey, Landenberger, & Wilson, 2007), this may not explain our results.

32 It may be the case that the programs lose effectiveness due to this delay before release, as the skills that have been developed go unused whilst serving the rest of their sentence.

REFERENCES

Australian Bureau of Statistics (2011). *Australian and New Zealand Standard Offence Classification.* Retrieved 19 Oct 2021 from https://www.ausstats.abs.gov.au/ausstats/subscriber. nsf/0/5CE97E870F7A29EDCA2578A200143125/$File/12340_2011.pdf

Australian Bureau of Statistics (2018). *Socio-Economic Indexes for Areas.* Retrieved 19 Oct 2021 from https:// www.abs.gov.au/websitedbs/censushome.nsf/home/seifa

Barnes, G. C., Hyatt, J. M., & Sherman, L. W. (2017). Even a little bit helps: an implementation and experimental evaluation of cognitive-behavioral therapy for high-risk probationers. *Criminal Justice and Behavior, 44*(4), 611-630.

Beaudry, G., Yu, R., Perry, A. E., & Fazel, S. (2021). Effectiveness of psychological interventions in prison to reduce recidivism: a systematic review and meta-analysis of randomised controlled trials. *The Lancet Psychiatry, 8*(9), 759-773.

Bellemare, M. F., Bloem, J. R., & Wexler, N. (2019). *The paper of how: Estimating treatment effects using the front-door criterion*. Working paper. Retrieved 19 Oct. from http://marcfbellemare.com/wordpress/wp-content/uploads/2019/08/BellemareBloemFDCAugust2019.pdf

Bourgon, G., & Armstrong, B. (2005). Transferring the principles of effective treatment into a "real world" prison setting. *Criminal Justice and Behavior, 32*(1), 3-25.

Corrective Services NSW. (2020). *Compendium of Offender Behaviour Change Programs.* Retrieved 19 Oct. 2021 from https://correctiveservices.dcj.nsw.gov.au/content/dam/dcj/corrective-services-nsw/documents/ programs/CSNSW_Compendium_of_Offender-Behaviour_Change_Programs.pdf

Dobson, K. S., & Khatri, N. (2000). Cognitive therapy: Looking backward, looking forward. *Journal of Clinical Psychology, 56*(7), 907-923.

Doleac, J. L. (2019). Wrap-around services don't improve prisoner reentry outcomes. *Journal of Policy Analysis and Management, 38*(2), 508-514.

Donnelly, N (2020). *The impact of the 2018 NSW sentencing reforms on supervised community orders and short-term prison sentences.* (Bureau Brief No. 148). Retrieved 31 May 2022 from NSW Bureau of Crime Statistics and Research website: https://www.bocsar.nsw.gov.au/Pages/bocsar_publication/Pub_Summary/ BB/BB148-The-impact-of-the-2018-NSW-sentencing-reforms-on-supervised-community-orders.aspx

Evershed, S., Tennant, A., Boomer, D., Rees, A., Barkham, M., & Watson, A. (2003). Practice-based outcomes of dialectical behaviour therapy (DBT) targeting anger and violence, with male forensic patients: A pragmatic and non-contemporaneous comparison. *Criminal Behaviour and Mental Health, 13*(3), 198-213.

Feigenbaum, J. (2007). Dialectical behaviour therapy: An increasing evidence base. *Journal of Mental Health, 16*(1), 51-68.

Fiebig, D. G. (2001). Seemingly unrelated regression. *A companion to theoretical econometrics*, 101-121.

Jones, L. (2019). New developments in interventions for working with offending behavior. *The Wiley international handbook of correctional psychology,* 669-685.

Lipsey, M. W., Landenberger, N. A., & Wilson, S. J. (2007). Effects of cognitive-behavioral programs for criminal offenders. *Campbell Systematic Reviews, 6.*

Little, G. L., Robinson, K. D., & Burnette, K. D. (1991). Treating drug offenders with moral reconation therapy: A three-year recidivism report. *Psychological Reports, 69*(3_suppl), 1151-1154.

Mahajan, Y., Lobo, J., & Howard, M. (2021). *Evaluation of High Intensity Programs Units (HIPUs): Implementation of an innovative intervention model for offenders with short custodial sentences* (NSW Corrections Research Evaluation and Statistics Research Publication No.62). Retrieved 19 Oct. 2021 from NSW Corrections Research Evaluation and Statistics website: https://correctiveservices.dcj.nsw.gov.au/csnsw-home/resources/research-and-reports/corrections-research-evaluation-and-statistics/research-publications.html

Milkman, H. B., & Wanberg, K. W. (2007). *Cognitive-behavioral treatment: A review and discussion for corrections professionals.,* National Institute of Corrections. Retrieved 19 Oct. 2021 from USA National Institute of Corrections website: https://nicic.gov/cognitive-behavioral-treatment-review-and-discussion-corrections-professionals

Morrissey, C., & Ingamells, B. (2011). Adapted dialectical behaviour therapy for male offenders with learning disabilities in a high secure environment: six years on. *Journal of Learning Disabilities and Offending Behaviour, 2*(1):8-15

NSW Bureau of Crime Statistics and Research. (2022). *Sentencing Tool.* Retrieved 15 February 2022 from NSW BOCSAR website: https://sentencingtool.bocsar.nsw.gov.au/

NSW Department of Premier and Cabinet (2019). *Premiers Priorities.* Retrieved 19 October 2021 from NSW Department of Premier and Cabinet website: https://www.nsw.gov.au/premiers-priorities/reducing-recidivism-prison-population

Ooi, E. J. (2019). *Evaluating the impact of the Intensive Drug and Alcohol Treatment Program (IDATP) on prisoner misconduct* (Crime and Justice Bulletin No. 222). Retrieved 19 Oct. 2021 from NSW Bureau of Crime Statistics and Research website: https://www.bocsar.nsw.gov.au/Pages/bocsar_publication/Pub_Summary/CJB/cjb222-Evaluating-the-Impact-of-the-Intensive-Drug-and-Alcohol-Treatment-Program-IDATP-on-Prisoner-Misconduct.aspx

Pearl, J. (1995). Causal diagrams for empirical research. *Biometrika, 82*(4), 669-688.

Perkins, R. (2019). The Short Violence Prevention Programme: An offence-focused intervention for short-serving incarcerated men with a history of violence who are at high risk of reoffending. *Practice: The New Zealand Corrections Journal, 7*(1).

Rahman, S., Poynton, S., & Wan, W. Y. (2018). *The effect of the Violent Offender Treatment Program (VOTP) on offender outcomes* (Crime and Justice Bulletin No. 216). Retrieved 19 Oct. 2021 from NSW Bureau of Crime Statistics and Research website: https://www.bocsar.nsw.gov.au/Pages/bocsar_publication/Pub_Summary/CJB/cjb216-The-effect-of-the-Violent-Offender-Treatment-Program-on-offender-outcomes.aspx

Rahman, S., & Poynton, S. (2018). *Evaluation of the EQUIPS domestic abuse program* (Crime and Justice Bulletin No. 211). Retrieved 19 Oct. 2021 from NSW Bureau of Crime Statistics and Research website: https://www.bocsar.nsw.gov.au/Pages/bocsar_publication/Pub_Summary/CJB/cjb211-Evaluation-of-the-EQUIPS-domestic-abuse.aspx

Raudino, A., Corben, S., Galouzis, J., Mahajan, Y., & Howard, M. (2019). *The Custody Triage Risk Assessment Scale (Custody TRAS): An updated statistical model for predicting risk of return to custody* (NSW Corrections Research Evaluation and Statistics Research Bulletin No.41). Retrieved 19 Oct. 2021 from NSW Corrections Research Evaluation and Statistics website: https://correctiveservices.dcj.nsw.gov.au/content/dam/dcj/corrective-services-nsw/documents/research-and-statistics/RB41-Custody-TRAS.pdf

The Audit Office of NSW (2017). *Therapeutic programs in prisons.* Retrieved 31 May 2022 from https://www.audit.nsw.gov.au/our-work/reports/therapeutic-programs-in-prisons

Tomlinson, M. F. (2018). A theoretical and empirical review of dialectical behavior therapy within forensic psychiatric and correctional settings worldwide. *International Journal of Forensic Mental Health, 17*(1), 72-95.

UK Ministry of Justice. (2013). *Transforming rehabilitation: A revolution in the way we manage offenders* (Vol. 8517). The Stationery Office. Retrieved 19 Oct. 2021 from gov.uk: https://www.gov.uk/government/publications/transforming-rehabilitation-a-revolution-in-the-way-we-manage-offenders

Van Voorhis, P., Spruance, L. M., Ritchey, P. N., Listwan, S. J., & Seabrook, R. (2004). The Georgia cognitive skills experiment: A replication of reasoning and rehabilitation. *Criminal Justice and Behavior, 31*(3), 282-305.

Wermink, H., Blokland, A., Nieuwbeerta, P., Nagin, D., & Tollenaar, N. (2010). Comparing the effects of community service and short-term imprisonment on recidivism: a matched samples approach. *Journal of Experimental Criminology, 6*(3), 325-349.

Wilson, D. B., Bouffard, L. A., & Mackenzie, D. L. (2005). A quantitative review of structured, group-oriented, cognitive-behavioral programs for offenders. *Criminal Justice and Behavior, 32*(2), 172-204.

Xie, Z., Neto, A., Corben, S., Galouzis, J., Kevin, M., & Eyland, S. (2018). *The Criminal Reimprisonment Estimate Scale (CRES): A statistical model for predicting risk of reimprisonment* (NSW Corrections Research Evaluation and Statistics Research Bulletin No.35). Retrieved 19 Oct. 2021 from NSW Corrections Research Evaluation and Statistics website: https://correctiveservices.dcj.nsw.gov.au/content/dam/dcj/corrective-services-nsw/documents/research-and-statistics/RB35-criminal-reimprisonment-estimate-scale.pdf