Research Bulletin

Offender participation outcomes and predictors of treatment completion in the High Intensity Program Units (HIPUs)

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Aims

To examine the participation outcomes of short-sentenced offenders who participated in the HIPUs as they progressed through the program, how these participation outcomes have changed since the commencement of HIPUs, and factors that are associated with treatment completion.

Methods

The sample included 3341 participants with a treatment completion or non-completion HIPU participation outcome recorded in OIMS between October 2017 and October 2020. A subset of this sample was also used to focus on outcomes since the HIPUs became fully operational, consisting of 2150 participants with a treatment completion or non-completion status recorded after February 2019. A combination of descriptive statistics, trend analysis and logistic regression were employed to achieve the aims of this study.

Results

Trend analysis showed that the number of treatment completions gradually increased before plateauing by February 2019, and non-completions overall showed a declining pattern. Over a third of participants who were identified for the HIPUs completed treatment, and of those who commenced treatment, more than half completed treatment. Administrative exits accounted for two-thirds of all treatment non-completion exits in the HIPUs. Female participants and participants with an Indigenous background had a higher proportion of non-completion exits than male and non-Indigenous HIPU participants. Participants' age, Indigenous background, time to serve post-treatment commencement, reporting of a disability, security classification and history of violent offences were significant predictors of treatment completion in the HIPUs.

Conclusion

Despite a high proportion of treatment non-completions in the HIPUs, the trend analysis showed declining non-completions as HIPU operations developed over time. The results of the current study contribute to our understanding of factors associated with treatment completion among short-sentenced offenders.

INTRODUCTION

New South Wales (NSW) accounted for 31% of the total Australian adult prison population in 2018–2019 (Australian Bureau of Statistics, 2019). Although a significant proportion of all adult prisoners serve less than two years in custody in NSW (35%; Corben & Tang, 2019), they historically have had limited intervention opportunities due to a lack of tailored interventions for short-sentenced offenders (Wang & Poynton, 2017). Limited rehabilitative opportunities for short-sentenced offenders may contribute to observed increased risk of reoffending among this cohort compared to offenders serving longer sentences and who have access to an increased range of available interventions (Wermink et al., 2010; Xie et al., 2018). Furthermore, a significant proportion are female offenders who commit less serious crimes and therefore receive shorter custodial sentences (Lobo & Howard, 2021). Female offenders, as well as Indigenous offenders, tend to have specific risk factors and needs that may not be well addressed by many traditional behaviour change interventions (Bartels, 2011; Olver et al., 2011; Wormith & Olver, 2002). Therefore, a need was identified to develop suitable interventions that specifically targeted short-sentenced offender cohorts.

Corrective Services New South Wales (CSNSW) established 10 High Intensity Program Units (HIPUs) in late 2017 to provide tailored interventions and reintegration services to male and female offenders with shorter sentences. The HIPU policy defines short-sentenced inmates eligible for intervention as those with a minimum of 5 months to earliest release date or an aggregate custodial sentence of less than 2 years. Offenders with sex offences or offenders serving balance of parole for an index sex offence are not considered for participation in the HIPUs.

The HIPUs comprise purpose-built group rooms and standalone facilities within correctional centres. Core principles underlying the HIPUs include intensive assessment and delivery of intervention dosage to eligible offenders. Offenders are identified for participation in the HIPUs via an eligibility assessment conducted by the classification and placement team. The eligible offender is placed in a HIPU based on vacancy at the host centre, Indigenous status, criminogenic needs, location of family, security risks and other considerations. A classification and placement officer then liaises with transport and HIPU staff to ensure the relocation of an eligible offender to the host correctional centre. The eligible offender identified for participation is then received at a suitable HIPU location. After entering a HIPU, participants undergo a suitability assessment. This phase also identifies treatment targets based on the severity of their dynamic risk factors and criminogenic needs.

The treatment stage in the HIPUs involves intensive delivery of core interventions centred on principles of the risk-need-responsivity (RNR) model of correctional treatment (Andrews & Bonta, 2010). Following the RNR model, the intensity of the HIPU intervention and services is tailored to the risk level of participants, addressing the dynamic factors associated with the development and continuation of criminal behaviour (need) and delivered in a manner that promote change (responsivity). For example, a high risk HIPU participant is provided high intensity (up to 200 hours) interventions that addresses risk factors including aggression and addiction and needs such as accommodation and employment in preparation for their release from custody.

Reducing the risk of recidivism in offenders serving shorter sentences is the primary outcome expected from the HIPUs. The HIPU interventions aim to reach this outcome by reducing the severity of identified

dynamic risk factors and achieving positive behavioural change in participants.

Predictors of participation outcomes

Program participation outcomes (referred to in this study as treatment completion and non-completions) are also considered critical indices of program effectiveness (Day et al., 2006; Polaschek, 2010). Among other reasons, success of the HIPU intervention model is ultimately contingent on regular participation and successful completion of intervention programs, and the uptake of reintegration services available in the HIPUs. An identified challenge is that offender non-participation and non-completion are common across various offender treatment programs (Bosma et al., 2014; Brunner et al., 2019). Some studies have reported treatment non-completion rates across offender cohorts as high as 58% (Bosma et al., 2014; Jewell & Wormith, 2010; McMurran & Theodosi, 2007; Olver et al., 2011).

Considerable research has examined predictors of treatment participation outcomes across various offender programs at the post-assessment and post-commencement of treatment stages (Jewell & Wormith, 2010; Olver et al., 2011). Predictors that influence treatment participation outcomes include demographic characteristics, sentencing factors, recidivism risk, various dynamic risk factors and offender engagement (Bosma et al., 2014; Brunner et al., 2019; Jewell & Wormith, 2010; Olver et al., 2011).

More specifically, the results from these studies identified that treatment non-completion was more likely to occur among younger male offenders, offenders who identified as Indigenous, those who were unemployed at the time of incarceration, and offenders with poor literacy skills (Gover et al., 2011; Jewell & Wormith, 2010; Olver et al., 2011). It has also been found that offenders who do not complete treatment are more likely to have committed prior violent offences and generally have a short time remaining on their sentences (less than six months to serve on average from assessment or treatment commencement) (Chamberlain, 2012; Jackson & Innes, 2000; Olver et al., 2011). As mentioned previously, this is partly because these offenders often do not have adequate time to serve after commencing participation in a treatment program. Actuarial recidivism risk measures, such as the Level of Service Inventory-Revised (LSI-R; Andrews & Bonta, 2000) also significantly predict treatment non-completion, indicating that higher-risk offenders are less likely to complete treatment (Nunes & Cortoni, 2006a; Olver et al., 2011; Rooney & Hanson, 2001).

Research examining the relationship between dynamic risk factors and treatment completion has revealed mixed results. Some report that offenders with more (severe) dynamic risk factors are less likely to complete correctional treatment programs than offenders with fewer (or less severe) risk factors (Bosma et al., 2014). Pre-treatment risk assessment scores on anger, impulsivity and antisocial attitudes have a modest, albeit significant relationship to treatment completion such that impulsive offenders and offenders with significant anger-related risks tend to drop out of correctional treatment programs prematurely (Bosma et al., 2014; McMurran et al., 2008; Olver et al., 2011). In contrast, some studies have found that self-reported impulsivity, criminal thinking style, anger, attitude supportive of domestic violence, and psychopathic traits were not predictive of treatment completion in custody (Bowen & Gilchrist, 2006; Polaschek, 2010).

Cognitive and learning disabilities have also been associated with significant treatment non-completion rates (Olver et al., 2011). Other studies have strongly associated substance abuse problems with higher treatment non-completion rates, especially for violent offenders (Brunner et al., 2019; Daly & Pelowski, 2000; Jewell & Wormith, 2010). Among treatment engagement factors,

offenders with poor treatment readiness are also less likely to engage with and complete correctional treatment programs (Ogloff et al., 1990; Pelissier, 2007; Wormith & Olver, 2002).

Treatment non-completion can have several consequences. For example, offenders who do not complete treatment are at increased risk of recidivism compared to offenders who complete treatment (Day et al., 2010; Jewell & Wormith, 2010; McMurran & Theodosi, 2007). Treatment non-completion may also lead to selective treatment delivery for specific cohorts of offenders who are deemed most likely to complete treatment, while the needs of offenders who could most benefit from treatment are left unaddressed (Beyko & Wong, 2005; Brunner et al., 2019), with implications for the program's capacity to adhere to the risk principle. Further, treatment non-completion results in wastage of finite resources and operational funding of offender programs (Bosma et al., 2014; Brunner et al., 2019; Durcan et al., 2011). As such, consideration of completion and non-completion outcomes, and associated factors, is vital for an accurate assessment of treatment program effectiveness and developing strategies to promote participant retention in the programs (Polaschek, 2010; Wormith & Olver, 2002).

The current study

The HIPUs are a novel holistic intervention model designed to address the needs of offenders serving short sentences. The HIPUs aim to achieve this by intensive delivery of a range of behaviour change interventions (criminogenic and non-criminogenic programs) and reintegration services over 16 weeks. The process of offender identification, referral, relocation, and engagement in treatment, coupled with HIPU participants' shorter sentences (less than 12 months), presents a unique challenge to the HIPU operational model (Mahajan et al., 2021). The extent to which HIPUs meet this challenge is likely to be closely related to performance in program participation and completion outcomes.

As an innovative and novel initiative, the HIPU operations continued to develop and evolve during the initial two years after its establishment (Mahajan et al., 2021). Although the HIPUs were initially implemented in late 2017 they did not become fully operational until early 2019, after finalising external reintegration service providers' contracts. Thus, the first aim of the current study was to examine trends in treatment completion and non-completion in the HIPUs across both the complete operational period and following the full implementation of HIPU operations. Given the staged establishment of HIPU operations it was expected that rates of treatment completion would increase, across the operational lifespan of the HIPUs.

The second aim of this study was to map participation outcomes for eligible offenders across stages of the HIPU throughput process, including reasons for non-completion. Research has found high program participation attrition rates among female and Indigenous offenders (Olver et al., 2011). Given the HIPUs prioritise the participation of female and Indigenous offenders through tailored programs and services, we also examined the impact of gender and Indigenous status on treatment completion and non-completion rates, as well as the primary reasons for treatment non-completions.

Previous research has identified predictors of treatment completion among offenders participating in custodial intervention programs serving longer sentences (i.e., more than 12 months) or offenders participating in treatment at the end of their long sentences (Bosma et al., 2014; Brunner et al., 2019). No study has identified predictors of treatment completion among offenders with shorter sentences. Identifying the predictors of successful treatment completion is not only crucial to reducing participation attrition rates,

but it also has implications for programming individualised tailored treatment (Gover et al., 2011). Therefore, the final aim of this study is to explore factors that are associated with successful treatment completion for short-sentenced offenders in the HIPUs. Variables considered to have a relationship with program completion included demographic and sentence characteristics, recidivism risk, treatment readiness and dynamic risk factors assessed before the commencement of treatment.

The current study aimed to address three key research questions:

1) What are the trends in treatment completion and non-completion since the commencement of HIPU operations, and since implementation of the full HIPU operational model?

2) What are HIPU participants' treatment completion rates since the implementation of the full HIPU operational model? What are the primary reasons for treatment non-completion?

3) What factors are associated with treatment completion in the HIPUs?

METHODS

Participants

The total sample comprised 3761 participants identified for the HIPUs between October 2017 and October 2020. However, as previously noted, the HIPU model did not become fully operational until February 2019 after finalising contracts for external reintegration service providers. To gain a better understanding of HIPU participation outcomes under full operational conditions, a subset sample of 2533 participants identified for the HIPUs between February 2019 and October 2020 was also examined. A total of 420 participants within the full sample and 383 participants within the subset sample were either still actively progressing through the HIPUs by the data censoring date or did not have a HIPU completion or non-completion exit status. These participants were excluded from the analyses. The final number of HIPU participants included in the full sample was 3341, and the final subset sample was 2150.

Some HIPU participants were found to have multiple pathway records. These participants either had both a completion status and non-completion status, or multiple completion statuses. The inclusion of these multiple records posed a risk of over-reporting the number of treatment completion and non-completion throughputs overall, incorrectly reporting trends and misidentifying the effect of factors associated with successful treatment completion. Therefore, two counting rules were implemented to address multiple reporting. Participants with both a HIPU completion and a non-completion status had only their completion status counted, while those with multiple non-completion statuses had only their earliest non-completion status counted.

Table 1 provides the characteristics of HIPU participants in both the full and subset samples. Inmate characteristics remained consistent across both samples.

Table 1. Full and subset sample breakdown by inmate characteristics

	Full Sample (n = 3341)		Subset Sample (n = 2150)	
Characteristic	Mean (SD)	%	Mean (SD)	%
Age (yrs.)	37.0 (8.9)	-	36.5 (8.9)	-
Gender				
Male	-	78.0 %	-	79.8 %
Female	-	22.0 %	-	20.2 %
Indigenous status				
Indigenous	-	36.8 %	-	35.5 %
Non-Indigenous	-	63.2 %	-	64.5 %
Self-reported disability				
Yes	-	36.9 %	-	37.1 %
No	-	63.1%	-	62.9%
Security classification				
Minimum	-	66.6 %	-	67.6 %
Medium	-	25.0 %	-	25.4 %
Maximum	-	8.4 %	-	7.0 %
History of violent offence				
Yes	-	19.1 %	-	22.0 %
No	-	80.9 %	-	78.0 %
Time to serve (months)	11.5 (8.5)	-	9.36 (6.6)	-

Data sources

The data for the current study were primarily extracted from the Offender Integrated Management System (OIMS). OIMS is the central operational database maintained by CSNSW to manage people under supervision in custody and in the community. The variables extracted from OIMS were the HIPU participants' demographic characteristics, sentence-related variables, risk assessment scores, criminal history, and treatment readiness scores. The HIPU stages and dates of participation across the HIPU pathway from identification to treatment completion or non-completion were also extracted from OIMS. Finally, a combination of OIMS and spreadsheets maintained by HIPU operational staff were used to extract psychometric measurement scores, which assessed various dynamic risk factors presented by participants prior to the commencement of HIPU programs.

Analytical Plan

Analysis of trends

The full and subset samples of participants were used to analyse trends in monthly treatment completion and non-completion counts. The total sample provides the overall trends in treatment completion and non-completion since the commencement of HIPU operations. Meanwhile, the analysis of trends using the subset sample was intended to examine patterns of participation outcomes under full HIPU operational conditions. While these trends were primarily assessed at a descriptive level, a non-parametric Mann-Kendall Trend test was also employed to assess the significance and direction of the trends in the HIPUs. Non-parametric polynomial regression (quadratic) lines were also fitted across the completion and non-completion trends.

HIPU throughput analysis

The throughput analyses were conducted using the subset sample to give a contemporary indication of HIPU implementation since the program became fully operational. The analysis involved tracking the progression of participants through different stages in the HIPUs, followed by using frequency tables to examine the characteristics of HIPU participants who either completed treatment or exited the program before completion.

A complete list of reasons for treatment non-completion were categorised into administrative, behavioural, and therapeutic reasons to provide additional context to understanding overall treatment non-completion. Administrative HIPU non-completion refers to an exit that occurred because of any factor outside of the normal HIPU procedures (e.g., insufficient time remaining to complete treatment, parole reinstated during participation, security concerns, criminal associations). Behavioural non-completion includes instances where a participant refused to participate or was prevented from commencing or continuing participation in a HIPU due to misconduct. Finally, therapeutic non-completion is recorded when a participant is found unsuitable after the assessment stage or refuses to continue participation after commencing treatment[1]. Participation outcomes were examined for the subset sample in total and were also compared between male and female participants and between Indigenous and non-Indigenous participants.

Factors predicting treatment completion in the HIPUs

Univariate tests followed by logistic regression modelling were used to determine the relationship between predictor variables and likelihood of treatment completion in the HIPUs. The sample for this analysis consisted of participants who completed (n = 1219) treatment and participants who commenced but did not complete treatment (n = 826) between October 2017 and October 2020. We used the full sample for this analysis to ensure a sufficient sample size for inferential analyses and to account for predictive factors over the complete HIPU timeframe. A substantial number of predictors were non-normally distributed, hence we used non-parametric tests for univariate analyses, including Mann-Whitney U tests for continuous variables and chi-square tests for categorical variables. To account for potential inflation of Type I error resulting from multiple univariate comparisons, we applied a conservative alpha of $p = .01$ to interpret univariate comparison results.

For logistic regression modelling, a range of HIPU participant-related variables were entered into the model as predictors (see Table 2), with treatment completion status as the binary outcome variable. The variables were selected based on existing research literature on predictors of offender treatment completion and attrition (Jewell & Wormith, 2010; Olver et al., 2011) and characteristics unique to HIPU participants (e.g., a battery of psychometric tests).

There were missing values in the data, predominantly across the measures of dynamic risk factors. Missing values can adversely impact the power of logistic regression models and result in overestimating the model's outcomes (Nemes et al., 2009). Therefore, missing values across measures of dynamic risk factors were replaced for completers and non-completers using linear interpolation.

[1] The definition of administrative, behavioural and therapeutic HIPU non-completion was guided by 'Annexure 5 – OIMS business rules for HIPU process line' in the 'Procedures for High Intensity Program Units (2017), developed by Offender Services and Programs.

Table 2. List of variables used for binary logistic modelling

Category	Variable	Description
Demographics	Age	Age (in years) of a participant at HIPU entry.
	Gender	Gender (male or female) of a HIPU participant.
	Indigenous status	Whether the participant identified as being of Indigenous cultural background.
Disability	Disability	Whether the HIPU participant reported having a disability on the CSNSW Intake Screening Questionnaire (ISQ).
Sentence Variables	Time to serve	Time (in days) remaining on the sentence of a participant from HIPU treatment commencement.
	Security classification	Initial security classification of a HIPU participant entering custody (minimum, medium, or maximum).
Criminal history	Violent offence	Whether the participant has a history of committing any violent offence.
Recidivism Risk	LSI-R	The risk of reoffending as assessed by the total score on the Level of Service Inventory-Revised (Andrews & Bonta, 2000).
Dynamic Risk Factors (at pre-treatment)	Antisocial attitudes	Total score derived from the Measures of Criminal Attitudes and Associates (MCAA; Mills et al., 2002) Part B, which assesses self-reported antisocial attitudes relating to endorsement of violence, entitlement, antisocial intent, and association with others involved in criminal activities. Higher MCAA scores indicate more antisocial attitudes.
	Anger manifestation	Total score derived from the Novaco Anger Scale (NAS; Moeller et al., 2016), which assesses self-reported anger disposition relating to anger justification, hostile attitudes, irritability, impulsive reactions, and verbal aggression. Higher NAS scores indicate more severe difficulties with disposition towards anger.
	Anger regulation	Total score derived from the Regulation subscale of NAS, which assesses self-reported ability to regulate anger and anger-engendering thoughts across provocative scenarios. Higher scores indicate better ability to regulate anger.
	Impulsivity	Total score derived from the Barratt Impulsivity Scale-11 (BIS-11; Patton, Stanford, & Barratt, 1995), which assesses the self-reported behavioural construct of impulsiveness expressed through quick decision making, acting without thinking and lack of forethought. Higher BIS-11 scores indicate elevated impulsiveness.
	Substance dependence	Total score derived from the Severity of Dependence Scale (SDS; Gossop et al., 1992, 1995), which assesses self-reported psychological dependence on a list of substances including, alcohol, methamphetamines, cannabis, opioids, cocaine, and benzodiazepines. Higher SDS scores indicate increased dependence on a nominated substance.
Treatment readiness	Treatment readiness	Total score derived from the Treatment Readiness Questionnaire (TRQ; Casey et al., 2007), which assesses self-reported preparedness for criminogenic programs and estimates of whether an offender will respond positively to treatment. Higher TRQ scores indicate better readiness for treatment.

RESULTS

Trends in HIPU treatment completion and non-completion

An analysis of trends examined treatment outcomes for participants since the commencement of HIPUs in 2017, and again since the HIPUs became fully operational in 2019. The left panel of Figure 1 depicts the number of HIPU participants who had finalised treatment completion or non-completion exit statuses between November 2017 and October 2020 (the full participant sample). The total number of participants with a treatment completion exit status steadily increased before plateauing out by December 2019. The average monthly rate of change in treatment completions over this period was 23%, with a significant growth trend in treatment completions ($M = 37.0$, $SD = 20.2$; $\tau = .50$, $p < .001$). On the other hand, the total number of participants with a treatment non-completion exit status fluctuated across this period with an initial sharp increase until about mid-2019, followed by a short plateau and then a decrease in the remaining period. The average monthly rate of change in treatment non-completions in the HIPUs was 34%. As a result of this fluctuation, the trend in non-completions across this period was not significant ($M = 59.1$, $SD = 31.5$; $\tau = .21$, $p = .07$).

Once the HIPU model was fully operational across the correctional centres (after February 2019), treatment completions in the HIPUs remained largely steady with an 11% average rate of change per month (see the right panel of Figure 1). There was no indication of any significant growth trend ($M = 47.3$, $SD = 17.0$; $\tau = .08$, $p = .60$). In contrast, there was a significant decline in the number of HIPU participants who did not complete treatment once the HIPU model became fully operational ($M = 72.2$, $SD = 23.5$; $\tau = -0.42$, $p = .009$). There was a negative average rate of change of -1% per month in non-completions between February 2019 until the censoring date.

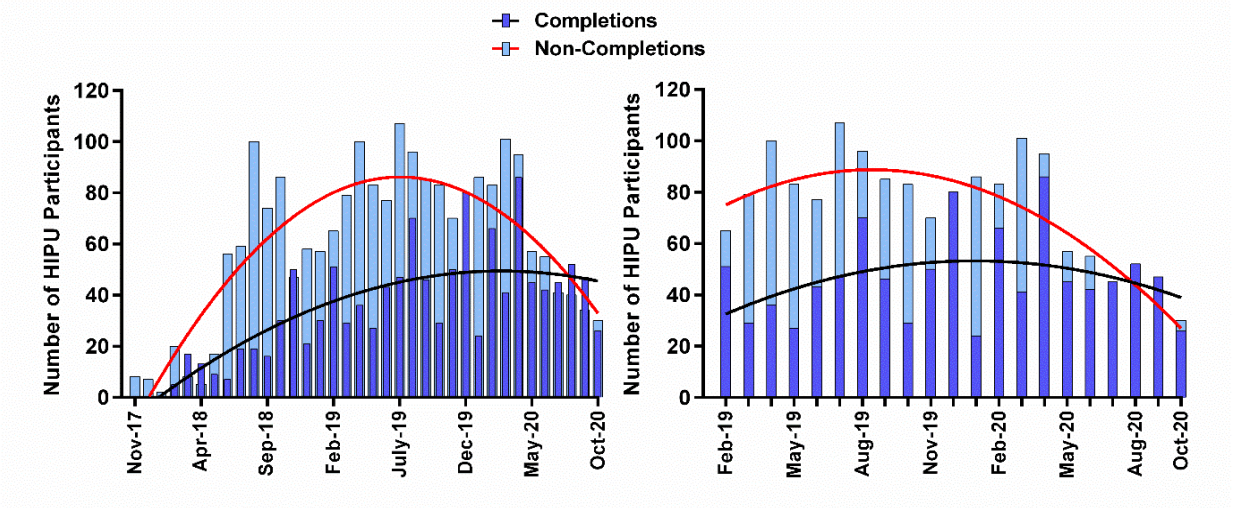

Figure 1. Trends in the number of completion and non-completion participant outcomes in the HIPUs for the full sample (left) and the subset sample (right).

Overall throughput analysis

As shown in Figure 2, 93% (n = 2010) of participants initially identified for the HIPUs were subsequently received at one of the seven HIPU locations. The remaining 7% of HIPU participants (n = 140) exited following identification. Following their reception at a HIPU location, the majority (n = 1804; 90%) commenced assessment. The remaining 10% of participants (n = 206) exited following reception at a HIPU location. The majority of HIPU participants who commenced assessment went on to commence treatment (n = 1342; 74%). Meanwhile, the remaining 26% (n = 462) of participants exited the HIPUs before commencing treatment.

Among the 1342 participants who commenced treatment, more than half (n = 797, 59%) were recorded as having completed treatment and 41% (n = 545) were recorded as having exited the HIPUs prior to completion. Therefore, among the total 2150 participants identified for the HIPUs, just over a third (37%) completed treatment. Meanwhile, just under two thirds (63%) exited at some stage prior to HIPU completion.

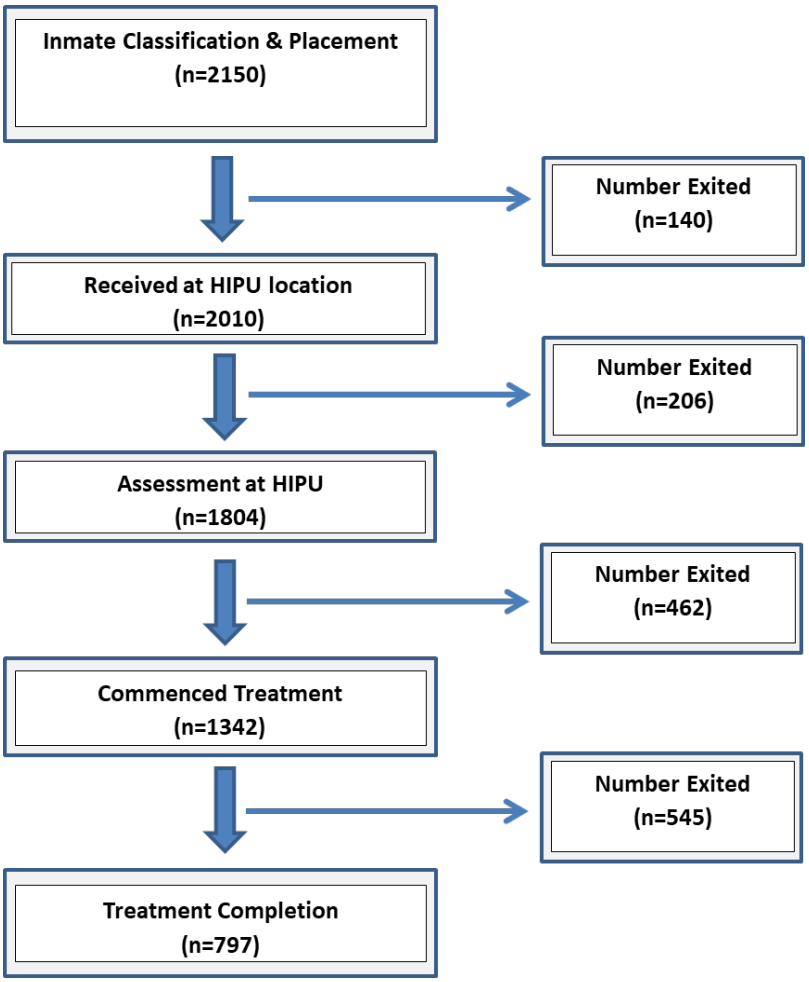

Figure 2. Number of participants at each stage of the HIPU program, including the number that exited the program at each stage between February 2019 and October 2020.

HIPU treatment completion and non-completion

Participants exited a HIPU either by completing treatment (n = 797) or at any stage of the program prior to completing treatment (n = 1353).

Table 3 provides an overview of exits by gender and Indigenous status. A chi square test revealed a significant association between HIPU participation outcomes and gender [$\chi^2(1, N = 2150) = 14.5$, $p < .001$], such that a significantly greater proportion of female HIPU participants (71%) had a non-completion exit than male participants (61%).

A significant association between HIPU participation outcomes and Indigenous status was also revealed [$\chi^2(1, N = 2150) = 22.8$, $p < .001$]. The finding indicates a significantly greater proportion of Indigenous HIPU participants (70%) had a non-completion exit than non-Indigenous participants (59%).

Overall non-completion exits

Table 4 presents data on the reasons for non-completion exits overall grouped within each non-completion exit category. The administrative exit category accounted for two-thirds of all reasons that participants exited the HIPU. The primary reason within this category was insufficient time remaining to continue HIPU participation (31%), which accounted for a much larger proportion than all other administrative exit reasons. This is likely due to the change in how insufficient time was defined. Prior to 30th September 2019 insufficient time included non-completion exit reasons such as the release of an inmate onto parole, the reduction of a sentence following an appeal and the reinstatement of an Intensive Corrections Order (ICO). After 30 September 2019 these three reasons were assigned their own codes in OIMS. However, it was not possible to retrospectively determine the number of times these three codes were used under the insufficient time category prior to 30 September 2019.

One in six participants had a non-completion exit status within the behavioural category, with the primary reason being a refusal to commence treatment in a HIPU (16%). Therapeutic reasons accounted for the smallest group of participants with a non-completion exit status (13%). Twice as many HIPU participants within this category did not complete after commencing treatment (9%) than being found unsuitable at the assessment stage (4%).

Non-completion exits by gender and Indigenous status

Table 5 shows comparisons by gender and Indigenous status for the type of non-completion exit reasons. Administrative reasons were the primary category of HIPU non-completion exits among both male and female participants; however, such reasons were more common among female (72%) than male (65%) HIPU participants. Insufficient time was the most frequently reported type of administrative reason for female HIPU participants (41%) and occurred more often than for males (31%). The next most common administrative non-completion exit reason was security-related, which accounted for twice as many male administrative non-completion exit statuses (12%) than female exit statuses (6%).

Of the two remaining categories of HIPU non-completion exits, a greater proportion of males (22%) than females (12%) exited for behavioural reasons. In contrast, more female participants (17%) than male participants (12%) exited for therapeutic reasons. Despite these differences, the primary reasons within each non-completion exit category remained consistent among men and women. For instance, refusal to start in the HIPU was the primary behavioural reason among both men (18%) and women (9%), while unsuitability to commence

treatment was the primary therapeutic reason among both women (13%) and men (8%).

Differences in the categories of non-completion exits were less pronounced when examining the Indigenous status of the HIPU participants. Two-thirds of both Indigenous (65%) and non-Indigenous (68%) participants had an administrative reason recorded for not completing treatment in the HIPUs. Insufficient time was again the primary reason, and a similar proportion of Indigenous (30%) and non-Indigenous (32%) participants exited the HIPUs before completion for this reason. The proportion of non-completion exits for behavioural reasons was also similar among Indigenous (22%) and non-Indigenous (19%) HIPU participants. Meanwhile, the same proportion of Indigenous and non-Indigenous participants did not complete treatment in the HIPUs for therapeutic reasons (13%).

Table 3. Exits by gender and Indigenous status of participants

	Total exits		Completion exits		Non-completion exits	
	(n)	%	(n)	%	(n)	%
Gender						
Male	1715	80	670	39	1045	61
Female	435	20	127	29	308	71
Indigenous Status						
Indigenous	764	36	232	30	532	70
Non-Indigenous	1386	64	565	41	821	59

Table 4. Categories and reasons of non-completion exits in the HIPUs

Non-completion exit category	Non-completion exit reason	(n)	%
Administrative	Exit HIPU - Insufficient time	416	31
	Exit HIPU - Security	145	11
	Exit HIPU - Associations	97	7
	Exit HIPU - Intensive Correction Order*	78	6
	Exit HIPU - Parole re-instated*	68	5
	Exit HIPU - Appeal*	47	3
	Exit HIPU - Supported/compassionate	45	3
	Exit HIPU - COP/Review initiated	7	1
	Exit HIPU - Refused transport	2	< 1
	Total Administrative	*905*	*67*
Behavioural	Non-starter - refuse/decline to start	217	16
	Non-starter - behaviour/misconduct	33	2
	Non-completion - behaviour/misconduct	17	1
	Temporary absence - allegation of misconduct	1	< 1
	Total Behavioural	*268*	*20*
Therapeutic	Non-starter - therapeutic decision	120	9
	Non-completion - refused participation/therapeutic decision	60	4
	Total Therapeutic	*180*	*13*

*Prior to 30 September 2019, these reasons for treatment non-completion were recorded within the Insufficient time reason for non-completion.

Table 5. Categories and reasons of non-completion exits by gender and Indigenous status

Non-completion exit category	Non-completion exit reason	Male		Female		Indigenous		Non-Indigenous	
		(n)	%	(n)	%	(n)	%	(n)	%
Administrative	Exit HIPU – Insufficient time	291	31	125	41	157	30	259	32
	Exit HIPU – Security	126	12	19	6	55	10	90	11
	Exit HIPU – Associations	87	8	10	3	31	6	66	8
	Exit HIPU – Intensive Correction Order*	53	5	25	8	34	6	44	5
	Exit HIPU – Parole re-instated*	52	5	16	5	29	5	39	5
	Exit HIPU – Appeal*	28	3	19	6	18	3	29	4
	Exit HIPU – Supported/compassionate	41	4	4	1	17	3	28	3
	Exit HIPU – COP/Review initiated	4	<1	3	<1	3	1	4	<1
	Exit HIPU – Refused transport	2	<1	0	0	1	<1	1	<1
	Total Administrative	*684*	*65*	*221*	*72*	*345*	*65*	*560*	*68*
Behavioural	Non-starter – refuse/decline to start	188	18	29	9	90	17	127	15
	Non-starter – behaviour/misconduct	28	3	5	2	16	3	17	2
	Non-completion – behaviour/misconduct	15	1	2	1	9	2	8	1
	Temporary absence – allegation of misconduct	1	<1	0	0	1	<1	0	0
	Total Behavioural	*232*	*22*	*36*	*12*	*116*	*22*	*152*	*19*
Therapeutic	Non-starter – therapeutic decision	81	8	39	13	42	8	78	10
	Non-completion – refused participation/therapeutic decision	48	5	12	4	29	5	31	4
	Total Therapeutic	*129*	*12*	*51*	*17*	*71*	*13*	*109*	*13*

*Prior to 30 September 2019, reasons for treatment non-completion were recorded within the Insufficient time reason for non-completion.

Predictors of treatment completion

Table 6 shows the descriptive statistics and univariate comparisons of program completers and non-completers. Results of univariate comparisons indicated that HIPU treatment completers were significantly older, were more likely to be male, were more likely to report being of non-Indigenous cultural background; and were more likely to report no disability when compared to those who did not complete treatment. HIPU treatment completers also had significantly more time to serve after commencement of treatment, had a history of violent offences and were more likely to be classified with minimum or medium-security classification. Univariate results further indicated that HIPU treatment completers reported less antisocial attitudes and fewer difficulties with disposition towards anger. Treatment completers tended to have higher LSI-R scores on average than non-completers; however, this difference was not significant at $p = .01$. Treatment completers and non-completers did not differ significantly by treatment readiness, self-reported ability to regulate anger, impulsiveness, or dependence on a substance.

Table 6 also shows the results of a binary logistic regression model assessing participant-related variables as predictors of treatment completion in the HIPUs. Several variables emerged as significant predictors of treatment completion. The age of participants was a significant predictor of treatment completion, such that the odds of treatment completion increased as the age of HIPU participants increased. With each one-point increase in participants' age, the odds of treatment completion increased by 2%. Indigenous HIPU participants had 18% lower odds of treatment completion than non-Indigenous HIPU participants, while HIPU participants who reported having a disability had 28% lower odds of treatment completion than participants who did not report having a disability. The results also indicated that

the more time HIPU participants had on their sentences after commencing treatment, the greater were the odds of completing treatment. A one-point increase in months remaining to serve in custody after commencing treatment corresponded with a 1% increase in the odds of treatment completion in the HIPUs. HIPU participants with a minimum-security classification were almost twice as likely to complete treatment than participants with a maximum-security classification. Meanwhile, participants with a medium-security classification were 1.5 times more likely than maximum security classified participants to complete treatment in the HIPUs. Interestingly, HIPU participants with a history of violent offences were 1.5 times more likely to complete treatment than participants with no history of committing violent offences.

Though male HIPU participants had higher odds of treatment completion than female participants, this difference was not statistically significant. None of the dynamic risk factors, treatment readiness, or the total LSI-R score significantly predicted the odds of treatment completion in the HIPUs.

Table 6. Univariate comparisons between variables and Logistic regression modelling of predictors of treatment completion

Variable	Univariate Analysis					Multivariate Analysis	
	Completers		Non-completers		Difference	Logistic Regression Model	
	n	Mean (SD)/%	n	Mean (SD)/%	W/χ^2	OR	95% CI
Age	1219	36.8 (8.7)	826	35.0 (9.0)	-4.87 ***	1.02 ***	[0.01 0.03]
Gender							
Males (1)	1009	82.8 %	640	77.5 %	82.57 ***	1.18	[-0.07 0.4]
Females	210	17.2 %	186	22.5 %	1.45		
Indigenous status							
Indigenous (1)	391	32.0 %	329	39.9 %	5.33	0.82 *	[-0.04 0.0]
Non-Indigenous	828	68.0 %	497	60.1 %	82.68 ***		
Self-reported disability							
Yes (1)	358	29.3 %	316	61.8 %	2.61	0.72 ***	[-0.53 -0.13]
No	861	70.7 %	510	38.2 %	89.86 ***		
Security Classification							
Minimum (1)	865	71.0 %	514	62.4 %	89.34 ***	1.79 ***	[0.21 0.95]
Medium (2)	289	23.8 %	229	27.8 %	6.95 **	1.55 **	[0.05 0.82]
Maximum	63	5.2 %	80	9.8 %	2.02		
History of Violence Offence							
Yes (1)	276	22.7 %	139	16.8 %	45.22 ***	1.52 ***	[0.18 0.66]
No	943	77.3 %	687	83.2 %	40.20 ***		
Time to serve (months)	1201	9.5 (8.0)	806	8.8 (8.2)	-3.65 ***	1.01 *	[0.0 0.02]
LSI-R total score	1218	33.0 (6.9)	824	33.9 (6.4)	-2.55 *	0.99	[-.02 0.01]
Treatment readiness	1219	74.9 (12.3)	826	75.6 (8.6)	-0.19	0.99	[-0.02 0.0]
Antisocial attitudes	1219	23.5 (9.0)	826	25.0 (8.7)	-3.28 **	0.99	[-0.02 0.0]
Manifestation of anger	1219	86.5 (17.0)	826	89.0 (16.4)	-3.23 **	0.99	[-0.01 0.0]
Anger regulation	1219	25.5 (4.0)	826	25.4 (3.6)	-0.28	1.00	[-.03 0.02]
Impulsivity	1219	72.1 (11.0)	826	73.0 (10.7)	-1.37	1.00	[-.01 0.01]
Substance dependence	1218	7.1 (3.5)	826	7.2 (3.4)	-1.27	1.00	[-.02 0.03]

*** $p < .001$, ** $p < .01$, * $p < .05$. (1) (2) = Reference group. Treatment completion status coded as 1.

DISCUSSION

The HIPU model represents an innovation in correctional practice by tailoring behaviour change interventions to address the needs of custody-based offenders with shorter sentences. The current study addressed three research questions that sought insights into HIPU participation outcomes. The first question examined the overall trends in treatment participation outcomes since the commencement of HIPU operations and following commencement of the full HIPU operational model. The second question provided a snapshot of the pathway of offender participation in the HIPUs since it became fully operational, as well as outcomes as a function of gender and Indigenous status. The final question examined factors contributing to treatment completion in the HIPUs.

Trends in participation outcomes in HIPUs

The participation outcomes trend provided insights into the development and refinement of HIPU operations. Analysis of trends indicated that in the three years since the implementation of the HIPUs, the number of treatment completions steadily increased while non-completions decreased. This trend was further supported by the participation outcome trends post-February 2019 when the HIPUs became fully operational. The trends in participation since 2019 showed steady completions and a steep decline in non-completions.

In a previous study (Mahajan et al., 2021), key HIPU staff revealed that HIPU operations had been continually evolving since the initial implementation. Staff also reported on various opportunities for continuous improvement in best practices for HIPU operations. For example, key HIPU staff suggested adaptations to some elements of assessment procedures, managing staff workload, promoting offender engagement and rapport building strategies, and organising timely transport and placements in the HIPUs to prevent participant attrition (Mahajan et al., 2021). It is possible that the systematic implementation of these changes over time is reflected in the trends of HIPU program completion.

Additionally, program facilitators view treatment completion as therapeutic success and positive feedback on their endeavours, increasing their morale (Howells & Day, 2007). Facilitators may then promote engagement, motivate future participant cohorts, and improve the therapeutic alliance. A robust therapeutic alliance and its growth might then contribute to the retention of participants over the course of custodial treatments, such as in the HIPUs (DeSorcy et al., 2016; Mahajan & Howard, 2022).

Participant throughput in HIPUs

Administrative data collected during the full operation of the HIPUs indicated that 63% of offenders identified for participation exited the HIPUs prior to completion. However, the likelihood of non-completion fell considerably to 41% among participants that progressed to the treatment commencement stage of the program. These attrition rates in the HIPUs are comparable to the rates across other treatment programs in custody, which have reported attrition rates between 27% and 58% (e.g., Bosma et al., 2014; Jewell & Wormith, 2010; McMurran & Theodosi, 2007; Olver et al., 2011).

Administrative factors were identified as the primary cause of non-completion exits. This finding is consistent across the treatment program evaluation literature which found administrative exits to be the main reason for treatment non-completion (Abel et al., 1988; Marques et al., 1994; Wormith & Olver, 2002). More specifically, HIPU participants in this category often lacked time to

complete the program. Prior to September 2019, insufficient time included, but was not limited to, HIPU participants who were released on parole, had a sentence reduced on appeal or had an ICO reinstated, among other criteria. These three specific reasons were recorded as separate non-completion codes in OIMS from 19 September 2019 and were within the top six administrative reasons for HIPU non-completion exits reported in this study. The prevalence of such administrative exits is unsurprising, given that time constraints are implicit for short-sentenced offenders and have been identified as a central challenge to delivering behaviour change interventions to this cohort (Mahajan et al., 2021).

On the other hand, behavioural and therapeutic reasons accounted for a small proportion of non-completion exits in the HIPUs. Unlike administrative exits, these exits involved specific actions and decisions made by both staff and participants during the operation of the HIPUs. For example, behavioural exits were recorded when a HIPU participant refused to participate prior to treatment commencement or had to be exited due to misconduct. Meanwhile, therapeutic exits were recorded if a participant was assessed as unsuitable by the staff prior to treatment or if they refused to continue HIPU treatment. Previous research has reported on the importance of the therapeutic alliance between HIPU participants and facilitators in buffering against behavioural and therapeutic exits (Mahajan et al., 2022). The relatively small proportion of therapeutic non-completion exits may be indicative of positive therapeutic engagement between HIPU staff and participants once they have entered the program.

Further examination of the characteristics of treatment non-completion exits revealed that female HIPU participants and participants with an Indigenous background had a greater proportion of non-completion exits than male and non-Indigenous participants. Results on the categories of non-completion exits by gender and Indigenous status mirrored the results for the overall cohort of the HIPU participants. Administrative exits were again the primary reported category of treatment non-completions, followed by behavioural and therapeutic categories, regardless of gender or Indigenous status.

Between group differences further revealed that a greater proportion of female HIPU participants had insufficient time recorded as the reason for treatment non-completion compared to male participants. Female participants also made up a greater proportion of non-completion exits due to their sentence being reduced on appeal or having an ICO reinstated. Research examining gendered pathways to involvement with the criminal justice system has found that women commit less serious crimes and receive shorter sentences than males (Stathopoulos & Quadara, 2014; Flynn, 2013; Bartels, 2012). As such, women may be more likely to receive an alternative sanction such as an ICO or be paroled early compared to males. It is also noted that women have separate housing and intervention resources to men, which could impact on HIPU participation pathways in different ways. For example, previous research has identified a greater demand for female participants across a range of rehabilitative programs than for male participants at the program identification stage or even post-treatment commencement (Mahajan et al., 2021). As a result, female participants are often redirected to alternative programs. The associated constraints to women's windows of opportunity to participate in the HIPUs could explain their higher likelihood of insufficient time related exits compared to males.

Predictors of treatment completion in HIPUs

Results of logistic regression modelling indicated that age and Indigenous status of HIPU participants were significantly associated with likelihood of treatment completion, whereas gender did not

predict treatment completion. As the age of HIPU participants increased, the likelihood of treatment completion also increased. Non-Indigenous HIPU participants were also more likely to complete treatment than Indigenous participants. These results in short-sentenced offenders are consistent with previous research on demographic predictors of treatment completion among other treatment programs (e.g., Daly & Pelowski, 2000; Jewell & Wormith, 2010; Olver et al., 2011; Stalans & Seng, 2007). For example, in custodial programs for domestic violence, older offenders and those of non-Indigenous backgrounds were more likely to complete treatment than younger offenders and offenders with an Indigenous background (Daly & Pelowski, 2000; Jewell & Wormith, 2010). Older offenders are generally considered more mature and may take their sentences and treatment programs more seriously, and hence may be more likely to complete programs than younger offenders (Cadsky et al., 1996; Dedopoulos, 2011).

Studies have found that employment difficulties, poor education, low socioeconomic status, and significant criminal history among Indigenous offenders often contribute to the negative relationship between Indigenous background and treatment completion (Daly & Pelowski, 2000; Hamberger & Hastings, 1989). The cultural incongruence between Indigenous participants and custodial programs across jurisdictions has also been attributed with significant treatment attrition in Indigenous participants (Daly & Pelowski, 2000; Olver et al., 2011). To address these concerns in the HIPUs, Aboriginal cultural strengthening programs and cultural support from the local community have recently been made available for male and female Indigenous participants. Previous research has indicated that the inclusion of cultural heritage in models of correctional treatment are an essential responsivity consideration (Olver et al., 2011) and could therefore mitigate the risk of treatment non-completion among Indigenous participants in future.

All sentencing factors were significant predictors of treatment completion in the HIPUs. Not surprisingly, HIPU participants with more time remaining on a sentence after commencing treatment were more likely to complete, as they had greater opportunities to participate in the HIPU's therapeutic programs and reintegration services. This finding was consistent with previous research (e.g., Chamberlain, 2012; Jewell & Wormith, 2010; Olver et al., 2011). It emphasises the importance of HIPU operations for accommodating the intensity of interventions within the constraints of participants' short sentences. However, it should be noted that the statistical relationship between time to serve and treatment was small and made only a minor contribution to the model.

HIPU participants with minimum or medium-security classifications were more likely to complete treatment in the HIPUs than participants with maximum-security classifications. These results align with previous research on the association between sentencing factors and custodial treatment completion (Jewell & Wormith, 2010; Olver et al., 2011). It has been suggested that offenders with severe offences are more likely to drop out of treatment as they demonstrate a significant propensity to violate rules and regulations, increasing the likelihood of attrition (Bosma et al., 2014; Dedopoulos, 2011; Jewell & Wormith, 2010). As such, this finding was expected as the majority of HIPU participants were minimum or medium-security classified.

In contrast with previous research on violent offenders (Brunner et al., 2019; Olver et al., 2011), our modelling revealed that HIPU participants with a history of committing violent offences were more likely to complete treatment. The presence of affective deficits, antisocial behaviour, lack of motivation and disruptive behaviours explained

attrition among violent offenders (Brunner et al., 2019; O'Brien & Daffern, 2016). Our counterintuitive finding has positive implications for the goals of HIPUs of addressing the needs of high-risk offenders and may be attributed to the unique intervention model available for violent offenders in the HIPUs. The HIPUs deliver intensive interventions to short-sentenced high-risk offenders with violent offences through the EQUIPS-Domestic Violence (Explore-Question-Understand-Investigate-Practice & Plan-Succeed), EQUIPS-Aggression programs or the purpose-built Violent Offenders Therapeutic Program (VOTP) HIPU which specifically targets those with persistent general violence offences. These specialised interventions for violent offenders could potentially address traditional reasons for non-completion among this cohort and explain their improved likelihood of completing the HIPU after treatment commencement.

Results also identified that participants with a self-reported disability were less likely to complete the HIPUs than participants without a self-reported disability. This finding was consistent with previous research (Olver et al., 2011), which found a significant association between low cognitive-academic ability and treatment non-completion, especially with cognitive interventions. Participants with cognitive deficits and literacy problems may find it hard to deal with the demands of interventions centred on cognitive behavioural therapy principles and literacy laden assessment and treatment worksheets, hindering their progression through the treatment pathway (Langevin & Curnoe, 2007). As part of continuous improvement in HIPU operations, the assessment procedures were streamlined so that most literacy-laden assessments are no longer administered in the HIPUs. Additionally, referrals to appropriate services on behalf of participants with severe cognitive and comprehension impairments have recently been instituted. These factors may contribute to improvements in the retention of participants with disability among future HIPU cohorts.

Results also indicated that, contrary to our prediction, treatment readiness, total LSI-R score, and dynamic risk factors did not predict treatment completion. While consistent with some previous research (e.g., Bowen & Gilchrist, 2006; Polaschek, 2010), these results were not in line with a majority of existing research evidence (e.g., Bosma et al., 2014; McMurran et al., 2008; Olver et al., 2011). One possible reason that could explain these non-significant relationships are the category of non-completion exits in the HIPUs. A higher proportion of administrative non-completion exits (67%), which are not related to individual risk factors (as is the case with behavioural exits) may have moderated the relationship between risk and treatment outcomes. Another possibility that might explain these non-significant findings are response bias or measurement errors commonly associated with self-reported psychometric measures of risk (Edens et al., 2000; Howard & van Doorn; 2018). For example, participants may not provide an accurate indication of the extent of their substance abuse or anger issues during the assessment phase. However, the extent of the effect of bias on the relationship between risks and treatment outcomes is not yet clear (Polaschek, 2010). Notwithstanding these considerations, the absence of significant associations between risk factors and treatment completion could also be interpreted as a positive indication that the HIPUs are well placed to accommodate the particular needs and responsivity factors of higher risk offenders who are the targets of intervention.

Limitations

Some limitations of the study are noted. The current study focused exclusively on predictors of treatment completion once participants commenced treatment and did not consider outcomes at different points along the HIPU treatment pathway,

such as after reception and before assessment, or after assessment but before commencing treatment. We focused on in-program treatment outcomes to allow for a more targeted understanding of potential contributors to attrition within the therapeutic context specifically rather than across the broader participation process, which is aligned with the majority of other prior research in this area.

We included only the total scores and not the subscale scores of psychometric measures of dynamic risk factors and LSI-R in the logistic regression modelling. It is possible that some of these sub-scale measures would have predicted treatment completion. We included only the total scores to prevent potential over-fitting of variables used in the regression modelling. Also, there remains a possibility that HIPU participants experience other risk factors unique to short-sentenced offenders that were not assessed with available measures. These factors may include interpersonal reactivity, empathy, anxiety, attitude towards women, intellectual functioning, motivation, and others.

Conclusions

This study provides insights into the participation outcomes of short-sentenced offenders who participated in the HIPUs. The results indicated relatively high rates of non-completion that are nonetheless comparable with other treatment programs identified in the literature. There was a high proportion of administrative exits unrelated to HIPU-specific operations, participants' response to treatment, or HIPU staff management. Low proportions of behavioural and therapeutic exits and the increasing trend of completions suggest that short-sentenced offenders' needs and responsivity factors are being accommodated with increasing success by the HIPUs.

The study also gives initial insights into the predictors of treatment completion in the HIPUs among short-sentenced offenders. The results underscore the importance of factors such as age, gender, Indigenous cultural background, self-reported disability, history of violent offences, time to serve and security classification of short-sentenced offenders as potential moderators of their propensity to complete treatment in the HIPUs. Awareness of these factors may facilitate allocation of therapeutic or administrative resources towards retention of participants who are most likely to drop out from the treatment program but stand to benefit from it. In particular, there continues to be opportunities to support HIPU participation and completion among identified priority cohorts such as women and people with Indigenous backgrounds.

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Oct 2021	Five Minute Interventions (FMI): Short-term effects of training on staff attitudes towards prisoners, motivation and ability to support rehabilitation, and job stress and satisfaction
Sept 2021	Process evaluation of the Custody Based Intensive Treatment (CUBIT) program for sex offender: Within-treatment change
Sept 2021	Impact Evaluation of the Gurnang Life Challenge Specialised Program for Young Adult Male Offenders in NSW
March 2021	Evaluation of High Intensity Program Units (HIPUs): Implementation of an innovative intervention model for offenders with short custodial sentences
March 2021	Women in prison: An examination of the support needs of women in custody with children
Feb 2021	The Initial Transitional Support (ITS) program: A profile of offender participation and service delivery
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Oct 2020	Access to programs and services among Culturally and Linguistically Diverse (CALD) offenders: The case of EQUIPS
Oct 2020	Process evaluation of Custodial Case Management: Case plans
Aug 2020	Understanding the spectrum of domestic violence: Risk factors, treatment pathways and recidivism among offenders who commit intimate partner or non-intimate partner violence
Aug 2020	Process evaluation of the High Intensity Program Units (HIPUs): Within-treatment change
Aug 2020	Evaluation of the Practice Guide for Intervention (PGI): Relationship between offender needs and PGI use in case planning and supervision practice
Dec 2019	Effectiveness of the Initial Transitional Support (ITS) Service 2014-2017
Sept 2019	Evaluation of EQUIPS treatment pathways for domestic violence offenders in New South Wales
Sept 2019	Process evaluation of the Practice Guide for Intervention (PGI): Staff experiences of implementation and continuing service delivery
Sept 2019	Desistance in an ageing inmate population: An examination of trends in age, assessed risk of recidivism and criminogenic needs
Aug 2019	The Custody Triage Risk Assessment Scale (Custody TRAS): An updated statistical model for predicting risk of return to custody

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