Evaluation of Home Detention in South Australia: Report 1

Prepared for: Department for Correctional Services, South Australia

November 2021

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Acknowledgements

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Glossary

ABS	Australian Bureau of Statistics
AHCSA	Aboriginal Health Council of South Australia
AHREC	Aboriginal Health Research and Evaluation Committee
AIC	Akaike Information Criterion
CBC	Community Based Corrections
CEA	Cost effectiveness analysis
COHD	Court Ordered Home Detention
DCS	Department for Correctional Services
EM	Electronic Monitoring
HD	Home Detention
HISSP	Home Detention Integrated Support Services Program
ICU	Intensive Compliance Unit
ORNI-R	Offender Risk Needs Inventory - Revised
PD	Discharged from Prison
PSM	Propensity Score Matching
PSA	Probabilistic Sensitivity Analysis
ROHD	Release Ordered Home Detention
RoGS	Report on Government Services
ROC	Receiver Operating Characteristics
ROR	Risk of re-offending
RTC	Return to custody
SA	South Australia
SAPOL	South Australia Police
SPRC	Social Policy Research Centre
UNSW	The University of New South Wales

Executive Summary

Introduction

In May 2020, the South Australian Department for Correctional Services (DCS) commissioned a team of researchers from the Social Policy Research Centre, University of New South Wales (UNSW) Sydney; Griffith University; and Époque Consulting to conduct an independent evaluation of Home Detention (HD) in South Australia (SA). The evaluation project commenced in 2020 and is scheduled to end in December 2022. The evaluation aims to provide a longitudinal assessment of the impact of legislative and program changes to HD in SA.

This report presents findings related to the profile and outcomes of two distinct group of offenders subject to HD: those on court-ordered HD (COHD) and those on release-ordered HD (ROHD). In addition, the report presents preliminary findings related to the economic evaluation of home detention in South Australia.

Evaluation progress to date

This second evaluation project commenced in May 2020 and will continue until the end of 2022. The tasks undertaken between project commencement and November 2021 have included:

- Executing the Official Order;

- Developing an agreed Evaluation Framework (Cale, Zmudzki & Hilferty, 2020);

- Applying for and receiving ethics approval from UNSW HREC;

- Establishing a Data Sharing Agreement between UNSW and DCS to ensure secure transfer of de-identified administrative data;

- Liaising with Aboriginal organisations and DCS to ensure reporting on outcomes for Aboriginal offenders meets ethical requirements; and

- Conducting analysis of DCS administrative data (12 November 2018 to 30 June 2020) and presenting high level analysis in Interim Report submitted to DCS in January 2021.

Outcomes analysis

The analysis of data focused on two distinct cohorts of offenders: those serving ROHD and those sentenced to COHD. The finding presented in this report relates to the period from November 2018 (when the first evaluation project concluded) to 27 August 2021 (date of data extraction).

Key findings from the analysis are summarised below:

- The majority of individuals serving HD orders were males (approximately 80%) with an average age around the mid-to-late 30s, and fewer than one in ten were Aboriginal.

- The most common index offences[1] for individuals serving ROHD were drug related (35.0%), compared to COHD where they were overwhelmingly administrative/driving related offences (78.1%). In terms of ROHD, in the two-year and eight-month follow-up period characterising the current data, 19.4% of prisoners breached the conditions of ROHD compared to 15.9% of individuals serving COHD who breached the conditions of an order.

- However, in terms of returns to corrective services post completion of HD orders (up to 27 August 2021) only 8.5% of those serving ROHD returned to custody within the two-year follow-up period, and 17.4% of those serving COHD returned in the same time frame.

- In the current analysis, the key variables associated with whether a prisoner would breach conditions of ROHD were a higher risk assessment score (i.e. Risk of Reoffending score or ROR) and not having engaged in employment training programs while in custody. It was not possible to estimate predictors of returns to custody in the current analysis because of the low base-rate of this outcome over the specified time under observation.

- The key variables associated with whether a prisoner would breach conditions of COHD were having prior multiple sentences and higher risk assessment score.

- The key variables associated with returning to custody following the completion of COHD were younger age at release to COHD and having multiple prior sentences.

- Propensity scores matched proportions of prisoners released to ROHD with those released directly from prison show that the likelihood of returning to custody following ROHD is far lower than compared to being released directly from prison (i.e., 11.2% versus 25.8%). These results provide some evidence to suggest that all else being equal, if a prisoner is released to ROHD they will be less likely to return to custody than if they remain in prison for the duration of their sentence.

- Similarly, propensity score matched proportions of prisoners serving COHD with those released directly from prison show that the likelihood of returning to custody following COHD is far lower than compared to being released directly from prison (i.e., 17.2% versus 27.0%), again, providing some evidence to suggest that all else being equal, if a prisoner serves COHD rather than a prison sentence, they will be less likely to return to custody following the completion of their sentence.

- Analysis taking into consideration the potential impact of the COVID-19 pandemic showed that it has potentially had an impact on the likelihood of breaching conditions/returning to custody, but the exact nature of this impact is somewhat unclear. Our preliminary analysis

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[1] An index offence is the principle proven offence (that is, the most severe offence) for which an individual is sentenced.

suggests that the COVID-19 pandemic may have operated to reduce the likelihood of breaching conditions of some orders, and the likelihood of returning to custody, but more data would be necessary to come up with more conclusive results. What the current analysis does show, however, is that despite the impact COVID-19 potentially may have had on these outcomes, the key predictors of breaches of ROHD (i.e., higher risk assessment score and engaging in employment training while in custody) remained stable. Similarly, when controlling for the potential impact of COVID-19 on COHD, the key factors predicting breaches of these orders (i.e., multiple prior sentences and a higher risk assessment score) and returns to custody (younger age at release and multiple prior sentences) remained stable.

Economic evaluation

Since the earlier evaluation of HD conducted by the researchers (2016-2018), the pressure and high costs of incarceration has continued to grow at over 5 per cent per annum emphasising the value of diversionary programs such as SA HD. Key findings of the economic evaluation include:

- The current Phase 2 evaluation now extends data for detainees placed on HD orders since June 2014 to June 2021 with 2,742 in total, around 1,800 ROHD and 1,000 COHD.

- HD program utilisation (concurrent detainees per month) has increased and been sustained since the Phase 1 evaluation to around 175 for ROHD and around 215 for COHD during 2020-21 indicating established high demand for the HD programs. Following the commencement of COHD in 2016 concurrent COHD detainees now exceed ROHD.

- The HD program budget allocation for the three-year study period was $7.9 million in 2018-19, $8.1 million in 2019-20 and $8.2 million in 2020-21, a total of $24.1 million over the 3 years.

- The total HD program cost including Home Detention Integrated Support Services Program (HISSP) was $6.1 million in 2018/19, $5.5 million in 2019/20 and $5.1 million in 2020-21, a total of $16.7 million over the 3 years.

- The program supported a total of 1,025 HD detainees during the study period (533 ROHD and 492 COHD) providing an estimated average cost per detainee of $16,540 across average HD sentences of 6.1 months.

- Based on the total number of HD months during the study period from 2018-19 to 2020-21 of 6,226 this represents an average HD cost of $2,723 per month

  - On average ROHD orders were 5.4 months with estimated average cost per detainee of $14,740.

  - Detainees serving COHD orders spent their full sentence in HD with a slightly higher average 6.8 months and an estimated average cost of $18,491.

- The total program cost of $17.0 million is within the total budget for the 3-year study period of $24.5 million over 2018-19 to 2020-21.

- Although HD sentences are generally around six months this annualises to $32,676 in the case of a full year in HD, which represents around 28% of the annual cost of prison in South Australia.

Home detention custodial cost offsets

- Based on prior custodial sentences over several years before their HD order the study group served total prison time estimated at $115.5 million.

- The program generated substantial custodial cost offsets during the 3-year study period of $59.2 million (ROHD $27.4 million and COHD $31.8 million). This provides a base case directly on measurable costs and prison days avoided during the study period.

- In addition to the base case, prison time avoided within the study period the program is also generating further cost offsets following completion of HD orders through reduced returns to custody estimated at $16.3 million based on reduced recidivism rates compared to a matched prison discharge group.

- Combined, the program cost of $17.0 million is generating $59.2 million of direct prison offsets with high confidence, plus a further estimated future offset beyond the study timeframe of $16.3 million, a total estimated cost offset of $75.5 million.

  - The cost effectiveness modelling indicates that the average HD cost of $16,436 is resulting in cost savings of $41,287 per detainee through direct HD prison time avoided and $55,427 when including subsequent reduced returns to custody.

Program outcomes and benefits

- Consistent with the Phase 1 evaluation custodial cost offsets as outlined above represent a subset of quantifiable outcomes for HD detainees but the program is also potentially producing a range of implicit positive outcomes that are difficult to measure, particularly in monetary terms. These benefits may include increased ability to obtain and sustain appropriate housing and a reduced risk of homelessness, management of drug and alcohol abuse, improved community and workforce participation, improved education and job skill training, improved and sustained physical and mental health, as well as improved outcomes for families, partners and children of offenders.

Program cost effectiveness

- This longitudinal follow up evaluation confirms initial positive outcomes for HD detainees and develops enhanced modelling of the substantial cost offsets reported in the Phase 1 study period.

- It is exceptional that government programs deliver this level of cost effectiveness where the total program cost is generating multiples in offsets of around 3.5 times within the study timeframe and nearly 4.5 times if the future reductions in RTC are considered.

- HD is potentially supporting additional benefits such as increased participation in education, employment and other measures of quality of life for offenders, their families, partners and children. There are also potential further indirect prison cost offsets including lost productivity across paid and unpaid work, workplace disruption and replacement, injury through prison assaults.

- This first report of the Phase 2 economic evaluation confirms that even under conservative assumptions, the South Australian HD program is resulting in significant positive benefits and system cost offsets. These benefits can extend well beyond the HD episode, potentially offsetting the cost of HD investment many times over.

1 Introduction

In May 2020, DC commissioned a team of researchers from the Social Policy Research Centre, UNSW Sydney; Griffith University; and Époque Consulting to conduct an independent evaluation of Home Detention (HD) in South Australia (SA). The evaluation project commenced in 2020 and is scheduled to end in December 2022. The evaluation aims to provide a longitudinal assessment of the impact of legislative and program changes to HD in SA and as detailed below, builds on an earlier evaluation project (hereafter referred to as the first evaluation of HD in SA) conducted by the same team of researchers.

This report presents findings related to the outcomes of two distinct group of offenders subject to HD: COHD and those on ROHD. Findings for the program outcomes relate to a two-and-a-half-year period from November 2018 (when the first evaluation project concluded) to June 2021. In addition, the report presents findings for the economic evaluation that examines the cost benefit of the program for the government. The report concludes with a section that looks ahead to the final project report.

Project background: the first evaluation

In February 2017, following the completion of a competitive tender process, DCS commissioned the same team of researchers undertaking this project, to evaluate the impact of newly implemented changes to HD in SA. The first evaluation project continued for two years and concluded in March 2019. The findings show that the HD reforms (expanded use of ROHD, introduction of COHD, and implementation of the HD support program HISSP) had a demonstrable positive impact across multiple domains. The return to custody rate, for example, was found to be significantly lower for prisoners who completed their sentence on ROHD than a matched group of prisoners who served their sentence in prison. Further, the economic analysis indicated that the changes to HD provided substantial quantifiable cost offsets for the government. The project findings are accessible via the DCS website (see https://www.corrections.sa.gov.au/about/our-research/hd-research-evaluation).

The two-year time period of the first evaluation project was appropriate for assessment of program effectiveness however an examination of post HD outcomes is enhanced by a longer analysis period. This is because there can be a lengthy time between prison or HD release and reoffending. This second evaluation project will build on findings from the first evaluation and will enable analysis of outcomes for those on HD over a longer period of time.

Policy and program context

HD is a criminal justice sanction that allows offenders to live in the community in an approved residence and complying with imposed conditions. Offenders approved for HD are often subject to Electronic Monitoring (EM) and strict supervision by corrective services officers. In 2015 and 2016, the SA government introduced a number of legislative and program changes that aimed to expand the use and effectiveness of HD throughout the state. The *Statutes Amendment (Home Detention) Bill 2015* expanded the use of ROHD and established COHD as a new front end sentencing option.

In addition, the government funded the development and implementation of the HISSP to support offenders to successfully complete their sentence and reintegrate into the community. These changes to HD were part of a larger reform strategy to reduce reoffending by 10% by 2020 (Government of South Australia, 2016).

This policy and program context has been impacted by the COVID-19 pandemic. Much of the emerging literature on the criminal justice system's response to the pandemic has focused on actions within prisons and gaols (see for example Madhumita, 2021; Novisky et al, 2020), however, the impact on HD should also be considered. Research from the US indicates that many states responded to the high risk and rate of transmission within prisons by reducing arrests, suspending court appearances, transferring low risk and vulnerable offenders from prison to HD, and employing remote and virtual supervision strategies, including for those on HD (see for example Schwalbe & Koetzle, 2021). Similarly, corrective services across Australia have implemented a number of changes to their HD programs. Changes to programs have included using remote supervision of offenders where possible, and offering support and rehabilitation programs via digital technologies, rather than through face-to-face contact (Payne & Hanley, 2020).

Prior to the global pandemic, Australia had seen a sustained trend of upward growth in imprisonment rates (Payne & Hanley, 2020). This pattern is evident in the South Australian prisoner population averages that show an increase every year from 2009/10 to 2017/18, with a small decrease in the average number of prisoners in the 2018/19 financial year (Productivity Commission, 2020). However, the available data indicate that since the onset of the pandemic in Australia, the number of persons in custody as well as those serving community-based corrections such as HD have decreased. The Australian Bureau of Statistics, Corrective Services data shows that the average daily prisoner number was 42,633 in the March 2021 quarter, in comparison to an average of 43,069 prisoners in the December 2019 quarter. Further, an average of 77,527 people were serving community-based corrections (CBC) orders in the March 2021 quarter – a significant decrease to the 83,648 people subject to CBC orders in the December 2019 quarter (ABS, 2021; 2020).

Further longitudinal analysis on the reductions of people in custody and those serving community orders is required, however, crime statistics also show a reduction in most crime categories during the pandemic period. Indeed, rolling crime statistics from the South Australian Police show that between May 2021 and May 2020 there was a reduction in all offences against property including criminal trespass (-27%) property damage (-9%); and theft (-25%) (SAPOL, 2021). The trend is mixed in relation to offences against people with a reduction in homicides (-15%), robbery (-22%) and threatening behaviour (-13%), however, there was an increase in sexual assault and related offences (+11%) and assaults (+8%) (SAPOL, 2021).

This context of ongoing policy reform and COVID-19 is the background to the evaluation of HD in SA. The analysis presented in this report considers the effect that COVID-19 has had on HD outcomes. There is currently minimal literature on the impact of COVID-19 on correctional practices and outcomes, however there is some research that has been published on its impact on offending in the community. In the current analysis, it was possible to model potential impacts of the COVID-19 on breaches of ROHD/COHD, as well as returns to custody.

Report structure

This report comprises of five chapters. Chapter one provides some introductory and background information to the project. Chapter two outlines the mixed methodology adopted by the research team to complete the project. Chapter three presents the analysis of outcomes data for those on HD. Chapter four presents preliminary findings of the economic evaluation. Finally, chapter 5 concludes with some general commentary on program effectiveness and considers the final steps for the evaluation project.

2 Evaluation methodology

The evaluation methodology is detailed in the Evaluation Plan (Cale, Zmudzki & Hilferty, 2020) with key details described below.

Aims of the evaluation

As specified in the Evaluation Plan, the project aims to conduct a longitudinal assessment of the impact that legislative and operational changes to HD have had on client outcomes and costs to government. To facilitate longitudinal analysis and comparison with findings from the first evaluation (2016-2018), our assessment will focus on three key domains from the first evaluation:

- Re-offending rates;

- Forecast prisoner growth; and

- HD program expenditure and cost effectiveness.

To assess the impact of changes across these key domains, the evaluation team will implement two interlinked components:

- An *Outcomes Evaluation* that measures the effect that changes to HD had on key indicators such as breaches and returns to custody. This component will report outcomes for specific offender groups including women and Aboriginal people.

- An *Economic Evaluation* that provides an analysis of HD program costs and associated outcomes in context of alternative custodial pathways.

This report presents findings from the first round of analysis for the outcomes evaluation and the economic evaluation.

Evaluation data sources

The evaluation draws upon three data sources:

- DCS administrative data for the period November 2018 (end of first evaluation project) to June 2021. DCS data was provided for three distinct cohorts: those on ROHD; those on COHD; and a comparative group of prisoners who were released from prison during the specified time period. Data items contained in the dataset include: demographic information; prior offending history; information about index sentencing; offending related program undertaken; information about index community order; return to corrective services information (e.g. return to prison and/or breach details). Data on the HISSP was not made available for this report.

- DCS financial data for the period 1 July 2018 to 30 June 2021. The data items contained in the dataset include: HD program operating expenditure; electronic monitoring costs;

intensive compliance unit cost allocations; and HISSP cost data based on monthly payments to service providers.

- A review of literature related to the implementation and evaluation of HD programs in all jurisdictions of Australia as well as countries with similar policy contexts. In addition, the literature review sought sources examining the impact of COVID-19 on HD programs and outcome measures (such as recidivism rates and program breaches). The literature sourced dates from 2016 to 2021.

Evaluation methods

The research team employed a mixed-method approach for the evaluation. Each method is described separately below.

Quantitative analysis of DCS data

The outcomes evaluation is based upon analysis of administrative data obtained from DCS. The data was de-identified by DCS and included: demographic characteristics, current and historical offence information, risk assessment information, information about involvement in different programs while in custody, sentence details, and information about breaches and returns to custody. The data covered HD orders from 1 November 2018 to 1 July 2021, and HD order breaches and returns to custody up until 27 August 2021.

To investigate which key demographic, sentencing and correctional history characteristics were associated with positive outcomes on HD, four separate sets of analyses were conducted based on samples derived from administrative correctional data provided by DCS SA of prisoners released to HD since November 2018. Descriptions of each sample are provided below and as shown, they relate to different forms of HD and different follow-up times.

The first sample involved all prisoners who received, and either completed or breached ROHD between November 2018 to August 2021 (the end of the observational period at the time of data collection). The original data set contained 566 observations corresponding to 533 unique individuals. Thirty-three individuals had a second admission to HD during the observation period. Data on subsequent instances of HD were removed so that each case corresponded to a unique individual first observed admission. Prisoners in the data who were still serving ROHD sentences at the time the data were requested from DCS were excluded from the analyses (n = 99). The final sample includes 434 prisoners released to ROHD.

Figure 1: Sample and cohort description, ROHD
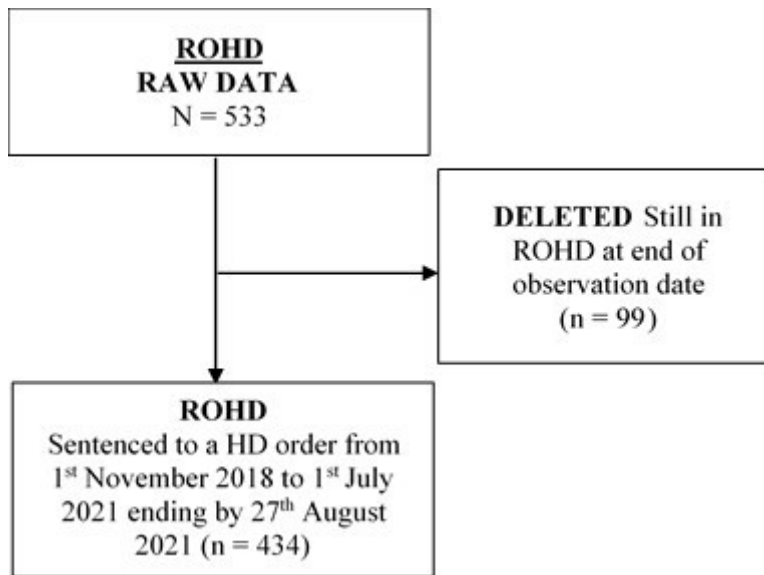
The second set of analyses investigated a subgroup of prisoners sentenced to COHD from 1 November 2018 to 1 July 2021, and discharges and/or breaches up to 27 August 2021. The data set contained 1427 observations corresponding to 492 unique individuals. Of the 492 prisoners who received COHD in SA during this period, 83 were still in COHD by the end of the observation period. These were removed, resulting in a final COHD sample of n = 409 (see Figure 2).

Figure 2: Sample and cohort description, COHD
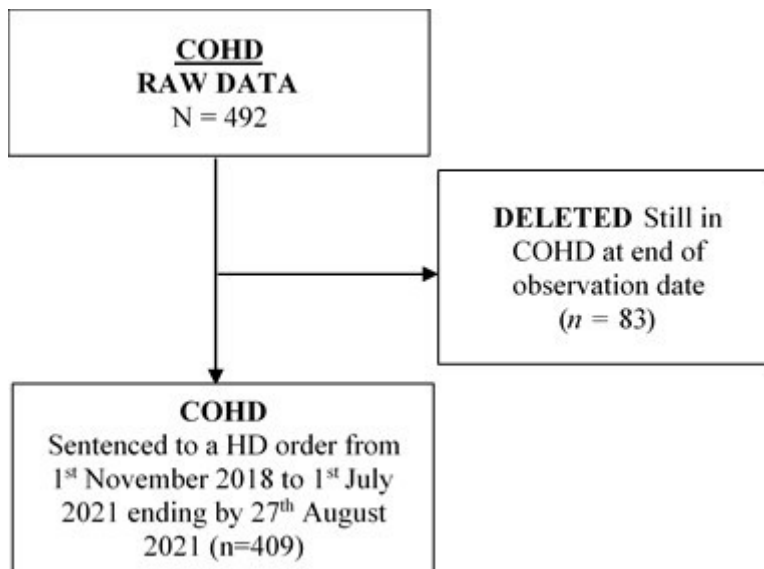
The third and fourth set of analyses involved all prisoners in SA who were released from custody between 1 November 2018 and 1 July 2021. First, prisoners who completed ROHD in the same

period were matched to prisoners discharged from custody (Prisoner discharged; PD) who were not sentenced to ROHD (Figure 3). The groups were matched on key demographic and sentence characteristics and then compared in terms of the proportions of prisoners who returned to custody by 27 August 2021. Second, the same matching procedures were replicated for prisoners who completed COHD in the same period (Figure 4).

Figure 3: Sample descriptions, prison discharged and matched ROHD
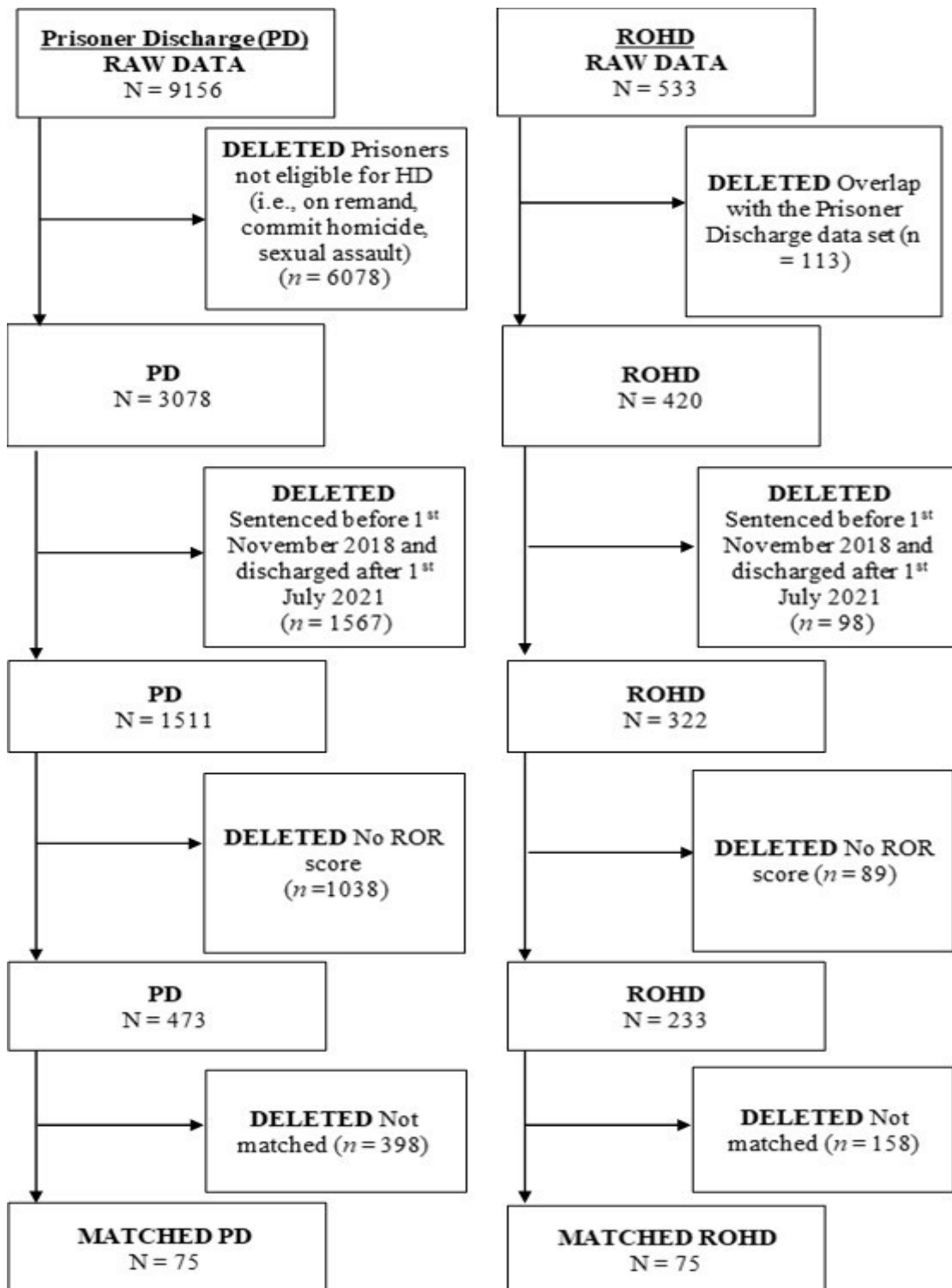
Figure 4: Sample descriptions, prison discharged and matched COHD
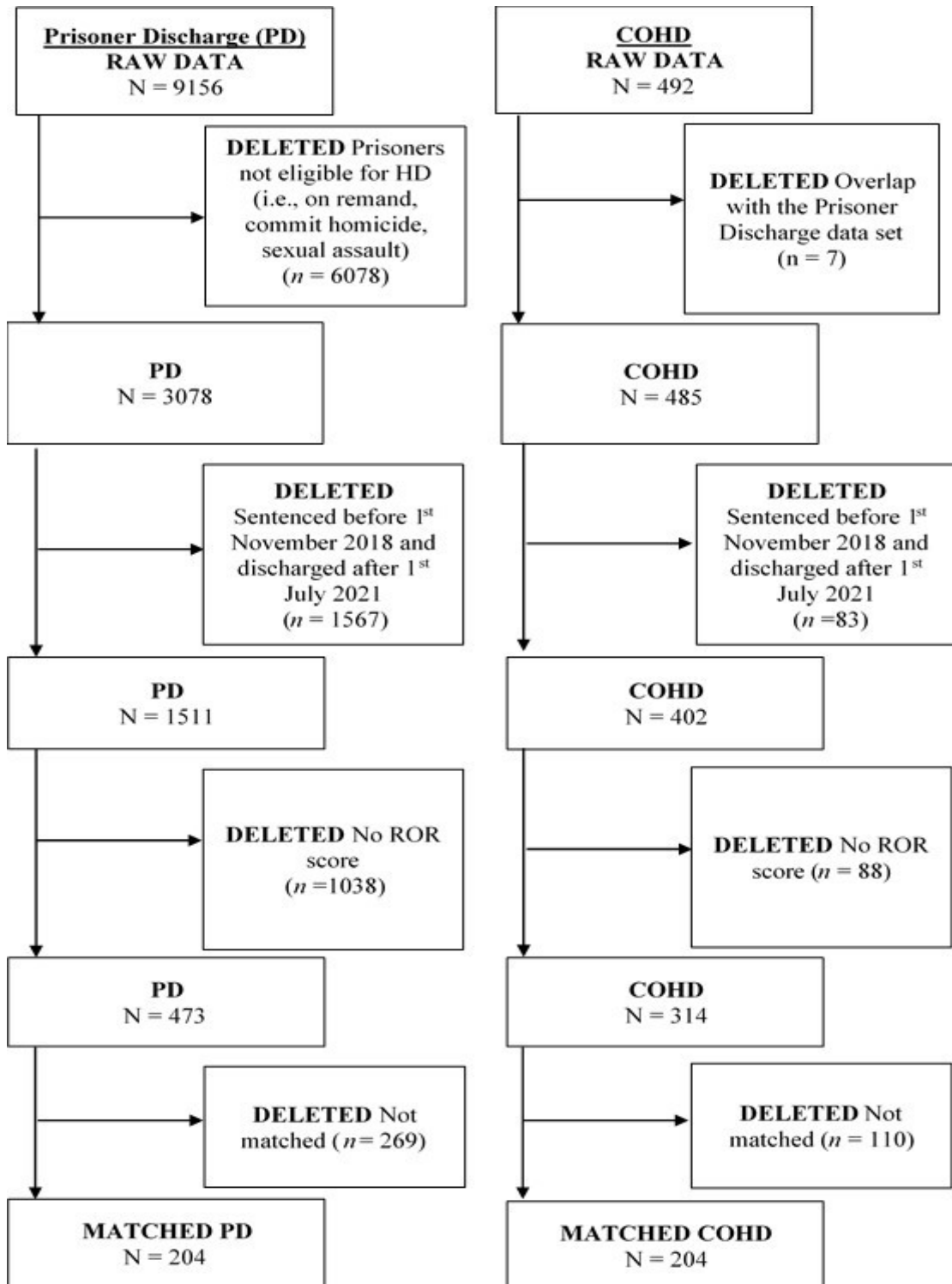
The statistical analysis focused on the key measures described below.

Measures

Covariates. In the current study, demographic covariates included: (1) age; (2) sex (0=female, 1=male); (3) Aboriginal (0=no, 1=yes); (4) level of education (0=less than high school, 1=high school or greater); and (5) employment status prior to incarceration (0=unemployed, 1=employed). The offence history variables included the type of index offence for which they were serving the current sentence and were coded as a: violent (0=no, 1=yes); theft (0=no, 1=yes); drug related (0=no, 1=yes); administrative/driving (0=no, 1=yes); public order/property (0=no, 1=yes); or fraud (0=no, 1=yes). The number of prior sentences was also included as well as the number of non-parole period days that were part of the initial sentence (i.e., ROHD), and the number of days sentenced to HD orders (i.e., ROHD/COHD). Risk assessment information (Risk of Reoffending (RoR) and Prisoner Risk Needs Inventory-Revised ('ORNI-R') scores were also included. Finally, participation in programs in custody was coded as whether the individual had ever participated in a: prison employment program (0=no, 1=yes); prison education program (0=no, 1=yes); behavioural change program (0=no, 1=yes); literacy and numeracy program (0=no, 1=yes); and/or, domestic violence program (0=no, 1=yes).

Recidivism & Follow-up periods. Two different outcome variables were measured across all the analyses. The first was whether prisoners' records indicated they had breached their HD conditions (0=discharged from HD, 1=breached HD). The respective follow-up period was also computed by determining: a) the time in days between release to HD and breach of HD or discharge from an HD order. The second outcome variable was whether prisoners returned to custody for a new offence (i.e., returned to prison for a new sentence) at some point following the actual discharge date associated with their sentence that included an HD order (0=did not return to custody, 1=returned to custody). Similarly, the follow-up period here was determined by computing the number of days between the end of an individual's last sentence that included an HD order and their return to custody.

Analytic strategy

Cox Regression. First, bivariate analyses were used to provide a description of the different samples according to demographic characteristics, covariates and outcome variables. All of these analyses were conducted comparing males and females, as well as individuals of Aboriginal background to those who were not Aboriginal. Next, Cox regression models were estimated for the ROHD sample, the first predicting breaches of ROHD, the second predicting returns to custody following ROHD. Cox regression (or Cox proportional hazards) was employed to determine the relative association between covariates that were associated with survival time (i.e., not breaching/reoffending). Prisoners were followed from the start of their ROHD sentence to the time of their breach or successful completion of the sentence. Prisoners were also followed from the end of ROHD to the time they returned to custody (RTC) or the end of the follow-up period, whichever came first. Prisoners who did not breach ROHD conditions or failed to return to custody were right censored and comprised the comparison group for the respective analyses. Multivariate Cox Proportional Hazards regression analyses were conducted to test the relationship between prisoners' rates of breaches/RTC, and demographic, criminal justice, and sentence, related characteristics when sample sizes permitted. Hazard Ratio's (HR) and the 95% Confidence Intervals (95% CI) were computed as measures of effect size and precision of any association between covariates, HD breaches, and RTCs. Covariates for prediction models were selected

based on their bivariate association with the respective outcomes (that is, if they were significantly associated with breaches of HD or RTC) to determine the value of adjusted odds ratios identifying which variables predicted breaches of HD and RTC.

Risk prediction modelling. Backwards stepwise logistic regression analyses were conducted to identify the optimal predictors for inclusion in a model predicting the risk of HD breach[2]. Model selection was determined using the Akaike Information Criterion (AIC), which balances model fit and complexity, with lower AIC scores corresponding to a better model. The optimal model was then subject to bootstrapping, which assess the sampling distribution of the model's regression coefficients to estimate its consistency. This involves resampling from the original dataset a prescribed number of times (i.e., 1000) and applying the model each time to estimate its average performance. Receiver Operating Characteristics (ROC) curves were then calculated to test model accuracy. The area under the ROC curve is plotted against model sensitivity (true positive rate) and 1- specificity (false positive rate) and represents the probability that the model correctly discriminates between a positive case and a negative case. Finally, nomograms were created to estimate the multivariate probability of HD breach derived from the risk prediction model.

Propensity score matching. Propensity Score Matching (PSM) matches participants from different groups based on theoretically and empirically relevant covariates (Lane, To, Shelley, & Henson, 2012), and was used to create matched experimental (1. ROHD and 2. COHD; Home detention) and control (PD; Prison discharges) groups to determine the effect of ROHD and COHD on returns to custody by 27th August 2021. Samples were limited to prisoners not on remand or sentenced for an offence deemed ineligible for a ROHD/COHD order, had an ROR score, and were discharged to HD, or admitted to prison, from 1st November 2018, and discharged before 27th August 2021. Prisoners were matched on factors associated with group membership and returns to custody. A total sample of 473 prisoners in the PD group were retained before matching.

Economic evaluation

This second Phase of the economic evaluation builds on the first project (2016-2018) to validate and extend the costs and benefits of home detention to the South Australian justice system. The methodology developed during the completed first evaluation (Phase 1) established the economic framework across cost components and program outcomes. The initial project developed costing calculation methods and cross validated DCS operating unit costs with the published Report on Government Services (RoGS) expenditure across the ROHD and COHD offender populations (Cale et al., 2018).

The current Phase 2 evaluation uses the same sources of program funding and cost data and the same methodology for the extended longitudinal study period now including four complete financial years from 2018-19 to 2021-22, (see Figure 5). This report is the first of two reports during the Phase 2 evaluation covering the 3-year period from 2018-19 to 2020-21. The second and final

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[2] Risk prediction modelling was only conducted for breaches of ROHD/COHD. Risk prediction modelling was not conducted for returns to custody following orders. The rationale behind this is that those individuals who breached an HD order were under supervision at the time compared to those who returned to custody.

evaluation report will be delivered in November 2022 when further cost and custodial data are available.

Further details of economic data sources and program costs are provided in the Phase 2 Evaluation Framework including Home Detention Integrated Support Services Program (HISSP) costs and program related custodial cost offsets (Cale, Zmudzki, & Hilferty, 2020). The Phase 1 evaluation work established economic modelling scope and methods to incorporate extended study period outcomes when follow up data were available.

Figure 5: Phase 2 program cost data components 2018-19 to 2021-22
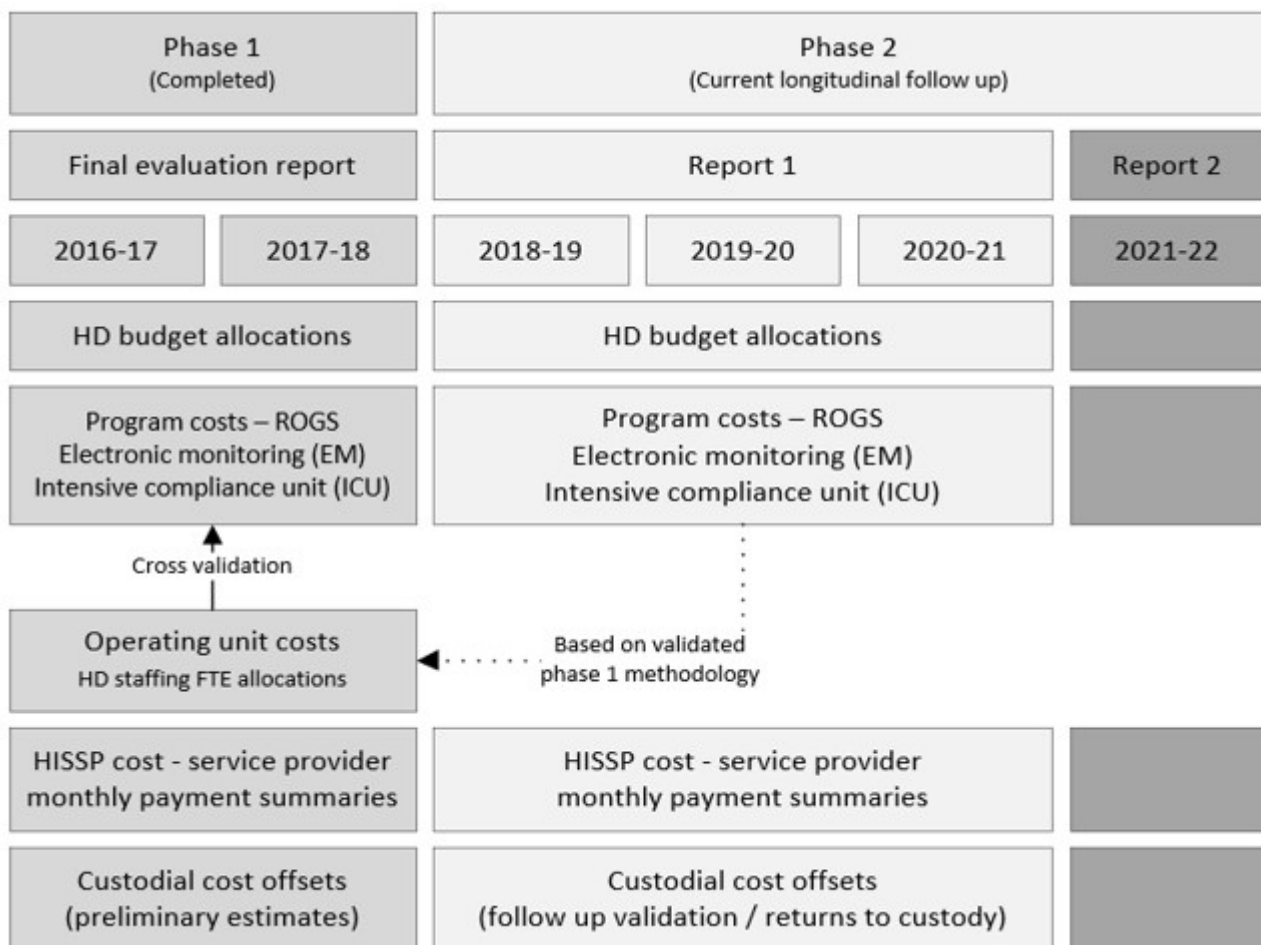
Notes: ROGS = Report on Government Services, HISSP = Home Detention Integrated Support Services Program, EM = Electronic Monitoring, ICU = Intensive Compliance Unit, FTE = Full time equivalent
This document provides Report 1 of the Phase 2 evaluation, report 2 will be delivered in 2022 when data are available.

Program funding and cost data

The economic component data sources incorporate annual HD budget allocations aligned with State-wide program costs calculated from RoGS operating expenditure, HISSP program support service costs as well as estimated program related custodial cost offsets. Home detention program costs are calculated from RoGS operating expenditures, and DCS Finance Directorate cost allocations of electronic monitoring (EM) and Intensive Compliance Unit (ICU) based on the

number of offender days, Table 1. This cost calculation was separately cross validated during Phase 1 with a comprehensive bottom-up program cost base using HD related operating units across Community Corrections based on HD staffing and FTE positions. This combined approach ensured consistency and comparability with published RoGS custodial cost data as well as validation of cost allocation calculations.

All program costs have been reviewed and updated to reflect current procurement and contracting including electronic monitoring services. The current Phase 2 again includes service provider payments for HISSP integrated support services reported through DCS Finance systems. The cost of HISSP has been examined to confirm support services provided for HD detainees as HISSP services are also now available for offenders on other (non-HD) orders.

Table 1: State-wide home detention program cost calculation method

Cost item	Source / calculation
Net total operating expenditure (a)	ROGS
EM costs* (b)	Finance
ICU costs (c)	Finance
Net operating expenditure less EM and ICU (d)	a-(b+c)
Number of offender days (e)	ROGS
Cost per day excluding EM and ICU (f)	(d divided by e)
Avg daily CC population with EM and ICU input (g)	ROGS
Annualised cost of EM** (h)	Finance
Annualised cost of ICU (i)	b+c
Total Annualised cost of EM & ICU (j)	
Daily cost of EM and ICU (k)	(j / 365.25)/g
Cost of supervision, EM and ICU (l)	(f+k)
Number of offender days	(g x 365.25)
Proportion of population in-cope (ROHD and COHD)	Data run by GES
Number of offender days for in-scope population	
Annualised cost of ROHD and COHD	
HISSP service provider costs	Finance
Total for period of study	

Source: Phase 1 Evaluation Report
Notes: * Includes the portion of the EM contract and lost and damaged goods which was allocated to the Community Corrections population in the ROGS calculation, ** Includes the full annual cost of the EM contract and lost and damaged goods, EM = Electronic Monitoring, ICU = Intensive Compliance Unit, CC = Community Corrections, HISSP = Home Detention Integrated Support Services Program

The final component of HD program costs relates to cost offsets based on custodial data as described in the previous section. Custodial days avoided because of COHD as well as through ROHD early release are again developed into the economic evaluation modelling. This second

Phase extends the completed preliminary work to examine longitudinal follow up of detainee returns to custody (RTC). All sources of cost data have been developed into a time series framework to establish before and after HD entry points as the basis of average costs per detainee. These sources of program cost have been incorporated into the Cost Effectiveness Analysis (CEA) modelling, described further below.

Program costs and benefits

Program costs for Phase 2 are again integrated with the quantitative offender data analyses developed into the economic modelling through HD detainee outcomes. Custodial days avoided because of COHD as well as through ROHD early release again provide the core cost offsets for the economic evaluation. Additionally, this second Phase extends the completed preliminary work to examine longitudinal follow up of detainee returns to custody compared with the non-HD matched control group. In this context the HD program, economic evaluation has been developed based on available program and offender data from the perspective of DCS as the lead agency.

As referred to in the first evaluation report additional potential cost offsets may result from HD program support in a broader whole of government or societal perspective. These include a range of potential outcomes including physical and mental health, drug and alcohol dependency, community re-engagement, employment, accommodation stability, court and policing or through reduced victim costs. Although these aspects are not an explicit component of the cost effectiveness modelling, a supplementary scenario has been developed based on published research to assess potential extended HD program cost effectiveness for potential indirect costs.

The costing components re-examine and incorporate scenarios in context of DCS's strategic policy through the '10 by 20' initiative (Government of SA, 2016), which established a target of reducing SA re-offending 10% by 2020.

Cost effectiveness modelling

The economic component of the evaluation developed a Markov model framework to assess corrective services use, program costs and outcomes and to estimate cost effectiveness, (see Figure 6 below)**Error! Reference source not found.** The model defines transition probabilities of being placed on COHD or ROHD orders, successful completion of HD as well as cases of reoffending and return to custody. The structure uses corresponding pathways to define comparative events and incremental costs and outcomes between the matched evaluation control group. The Markov model provides the framework to undertake a Cost Effectiveness Analysis (CEA) of HD compared to time in prison.

Results are estimated as cost per prison year avoided due to the alternative sentencing option of home detention. The economic modelling approach applies methods commonly used in program evaluation in healthcare settings. Health economic modelling of cost effectiveness often reflects high levels of uncertainty in outcomes related to risk of illness relapse and readmissions to hospital. The variation in these ongoing outcomes has natural implications for estimated program cost effectiveness similar to the uncertainty in custodial outcomes with rates of returns to community corrections or prison.

The Markov modelling framework provides rigorous methods to evaluate this uncertainty in estimated model parameters through sensitivity analyses and bootstrapping resampling techniques including probabilistic sensitivity analysis (PSA). This provides the basis to integrate the extended RTC outcomes as a supplementary component of calculated incremental cost effectiveness ratio(s) with associated 95 percent confidence intervals. This supports inclusion of extended Phase 2 endpoints while sustaining the direct HD custodial cost offsets reported in Phase 1 which underpins core program cost effectiveness. The Phase 2 economic Markov modelling has been undertaken using TreeAge Pro version 2021 R2.1. The base case cost effectiveness analysis modelling has been developed from the perspective of DCS as the program funding agency.

Figure 6: HD Markov model pathways and comparison
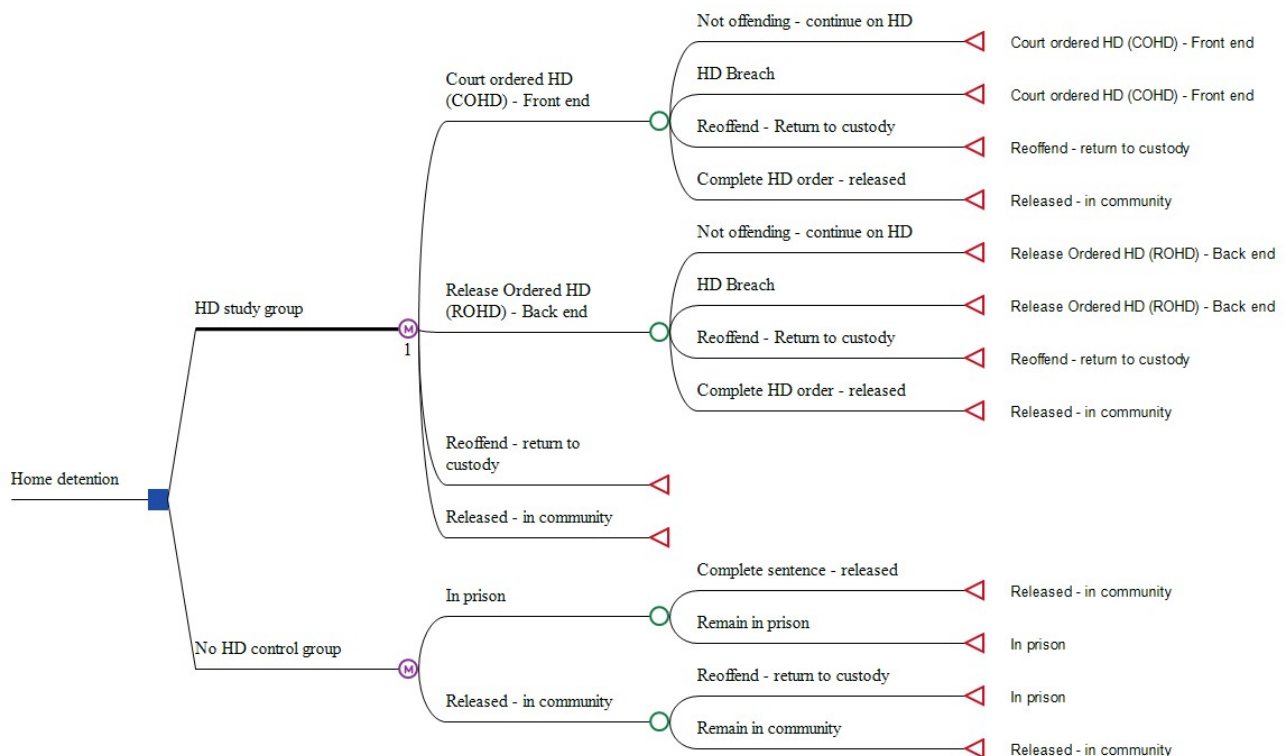
Source: Phase 2 Evaluation Framework (Cale et al., 2020)

The program costs and outcomes are based on evaluation of financial and offender data and published program valuation sources, Table 2. The modelling parameters include estimated outcome distributions and variation to establish the framework for assessing joint model uncertainty in all parameters. All cost figures are reported in 2020-21 Australian dollars indexed at 1.5 percent per annum in line with DCS guidance.

The economic modelling develops a base case establishing direct prison years avoided offsets for the study group ROHD and COHD orders. The base case is then extended to incorporate returns to custody for the HD study group compared to the matched control group. A further scenario examines estimated indirect costs of imprisonment and the related implications for HD cost effectiveness.

Program costs are calculated in aggregate and combined with ROHD and COHD days to estimate average cost per order type based on average days detainees spend on each order. The variation

in cost of each order type is similarly estimated from standard deviation or the number of days on each order type.

The Phase 2 economic evaluation is associated with methodological enhancements that extend the analysis and robustness of results. This includes the new Phase 2 longitudinal follow up data providing validation of initial findings through additional data for the increased study and control group sample sizes. The current Phase 2 study group for the economic evaluation was 1,025 detainees compared to 882 in the previous 2018 evaluation.[3]

Table 2 Model parameters used in economic modelling

Parameter	Unit	Value	Distribution	Range	Source
Costs					
ROHD cost including EM and ICU	Per detainee	$14,740	Gamma	± $15,720	1: SADCS
COHD cost including EM and ICU	Per detainee	$18,491	Gamma	± $18,040	1: SADCS
Prison	Per year	$114,077	n/a	n/a	2: RoGS
HD orders					
ROHD	Months	5.4	Gamma	± 5.8	3: SADCS
COHD	Months	6.8	Gamma	± 6.6	3: SADCS

Notes: ROHD = release-ordered HD, COHD= court-ordered HD, EM = Electronic Monitoring, ICU = Intensive Compliance Unit, ± = standard deviation
Sources:
1. South Australian Department of Corrective Services, Finance Directorate.
2. Australian Government, Productivity Commission, Report on Government Services (RoGS) 2019-20. Table 8A.19 Recurrent expenditure per prisoner and per offender per day. Net operating expenditure. Annualised total figure for South Australia including operating expenditure and capital costs
3. South Australian Department of Corrective Services, offender data.

The current project extends the economic component of the evaluation through development of enhanced economic Markov modelling which validates and builds on the preliminary program cost effectiveness reported in the completed initial Phase 1 project. This includes enhanced cost effectiveness estimates using data of the proportion of HD detainees returning to custody.

Methodological limitations

The methodology outlined is best practice in evaluation of HD programs and was also designed to make best use of existing datasets. The researchers are confident that the design and findings presented in this report are robust, however there are some limitations associated with the design and it is important that these be considered when interpreting results. Importantly, in order to examine any changes between offenders receiving different forms of HD and those on other forms of sanctions, our analysis included comparison groups. A quasi-experimental design was applied in

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[3] Minor differences result from quantitative sample sizes due to exclusion of incomplete HD sentences.

the current analyses because it was not possible to randomly select those who received HD orders/sentences and those who did not. Therefore, propensity score matching was utilised to match prisoners who completed HD orders/sentences between November 2018 and August 2021, with prisoners released from custody over the same time. Given that these data come from two distinct sources, the number of variables available for matching was limited to those available in each source, and only certain proportions of individuals serving HD orders were successfully matched. Key demographic and sentence characteristics and risk assessment information were available to conduct the matching.

The economic modelling is integrated with and shares the limitations associated with quantitative analyses of the offender data. This may have minor implications for outcomes such as reoffending rates during the COVID19 pandemic. These aspects are not considered to have material implications for the estimated program cost effectiveness.

Evaluation ethics

The researchers sought and received approval to conduct evaluation activities from UNSW's Human Research Ethics Committee (HC 200634). To meet ethical requirements for reporting outcomes for Aboriginal prisoners' subject to HD, the researchers also intended to seek approval from the Aboriginal Health Council of South Australia's (AHCSA). Unfortunately, the researchers were unable to gain ethics approval from the Aboriginal Health Research and Evaluation Committee (AHREC) of AHCSA, as in the first evaluation, as the scope of the committee had changed (they no longer review commissioned evaluations) and the scope of the evaluation program had narrowed to exclude health indicators.

In liaising with DCS, the researchers have agreed to re-implement strategies adopted in the first evaluation to report outcomes for Aboriginal offenders[4]. The researchers further propose meeting with DCS early in 2022 to discuss additional strategies that may be implemented prior to submission of the final evaluation report.

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[4] Strategies include inviting an Aboriginal researcher/expert in criminal justice to review the final evaluation report to ensure outcomes are reported in an appropriate manner; agree not to publish any article solely reporting outcomes of Aboriginal offenders on HD; and clearly state in the final report the limitations of the study including that it was designed without the input of Aboriginal expertise on HD.

3 Outcomes evaluation

This section presents the analysis and findings of the DCS administrative data.

Profiles and outcomes of prisoners subject to HD

Release Ordered Home Detention

Sample characteristics

Table 3 below provides a bivariate description of all prisoners who received ROHD between 1st November 2018 and 1st July 2021 stratified by gender. Most of the sample were male (83.6% male, 16.4% female). The average age of the sample at the time they were released to HD was 39.7 (sd=10.5) years, and there were no differences in age between males and females. Approximately nine per cent of the sample was Aboriginal, with significantly more females (15.9%) than males (7.5%) identifying as Aboriginal. Around one-quarter of the sample (24.8%) had high school education or above, with no differences between the proportion of males and females. One-third of the sample were employed prior to ROHD, with a significantly greater proportion of those employed being male (43.3% vs. 15.0%).

Table 3: Demographic, criminal justice and sentence characteristics of prisoners sentenced to ROHD between 1st November 2018 and 1st July 2021 by gender (n=434)

	Total sample (n=434) n (%) / x̄(sd)	Males (n=363) n (%) / x̄(sd)	Females (n=71) n (%) / x̄(sd)	$x^2(df)$, φ / $t(df)$, Cohen's d
Demographics				
Age at release to ROHD	39.66 (10.53)	39.62 (10.60)	39.87 (10.23)	n.s
Aboriginal/Torres Strait Islander[a]	33 (8.9%)	23 (7.5%)	10 (15.9%)	$x^2(1)=4.48^*$, .11
Completed high school[b]	76 (24.8%)	62 (25.2%)	14 (23.3%)	n.s
Employed[c]	116 (37.8%)	107 (43.3%)	9 (15.0%)	$x^2(1)=16.47^{***}$, .23
Offence history				
Has multiple sentences	153 (35.3%)	136 (37.5%)	17 (23.9%)	$x^2(1)=4.76^*$, .11
Avg. # of prior sentence	1.80 (1.54)	1.88 (1.62)	1.37 (0.91)	$t(169.71)=3.76^{***}$, 0.39
Index offence (ROHD sentence)				
Drug	152 (35.0%)	126 (34.7%)	26 (36.6%)	n.s
Administrative/driving	97 (22.4%)	78 (21.5%)	19 (26.8%)	n.s
Theft	22 (5.1%)	18 (5.0%)	4 (5.6%)	n.s
Fraud	31 (7.1%)	24 (6.6%)	7 (9.9%)	n.s
Violent	47 (10.8%)	42 (11.6%)	5 (7.0%)	n.s
Public order/property	82 (18.9%)	72 (19.8%)	10 (14.1%)	n.s
Risk ratings				
Risk of Reoffending (ROR)[d]	11.31 (5.26)	11.24 (5.42)	11.70 (4.40)	n.s

	Total sample (n=434) n (%) / x̄(sd)	Males (n=363) n (%) / x̄(sd)	Females (n=71) n (%) / x̄(sd)	x^2(df), φ / t(df), Cohen's d
Offender Risk Needs Inventory (ORNI-R)[e]	25.59 (4.26)	25.27 (4.29)	27.07 (3.92)	n.s
Prison programs				
Employment	392 (90.3%)	328 (90.4%)	64 (90.1%)	n.s
Education	118 (27.2%)	72 (19.8%)	46 (64.8%)	x^2(1)=60.62***, .37
Domestic violence	41 (9.4%)	41 (11.3%)	0	x^2(1)=8.86**, .14
Literacy and numeracy	76 (17.5%)	56 (15.4%)	20 (28.2%)	x^2(1)=6.68**, .12
Making changes	63 (14.5%)	41 (11.3%)	22 (31.0%)	x^2(1)=18.56***, .21
Sentence characteristics				
Non-parole period (days)[sqrt]	549.40 (516.77)	553.01 (517.62)	530.92 (515.65)	n.s
Length of ROHD (sentenced days)[sqrt]	177.71 (174.23)	177.32 (176.85)	179.68 (161.34)	n.s
Length of ROHD (actual days)[sqrt]	169.05 (179.66)	169.40 (181.62)	167.23 (170.49)	n.s
ROHD breaches				
Breached ROHD conditions	85 (19.4%)	68 (18.5%)	17 (23.9%)	n.s
Days to breach	111.49 (108.39)	117.13 (116.34)	89.24 (66.74)	n.s
Return to custody (RTC) post-ROHD				
RTC by 27th August 2021	37 (8.5%)	35 (9.6%)	2 (2.8%)	x^2(1)=3.55+, .09
Days RTC	271.89 (162.54)	272.17 (162.14)	267.00 (239.00)	n.s

p<.10+, p<.05*, p<.01**, p<.001***
Note: Percentages exclude missing cases
a. n=369
b. n=306
c. n=307
d. n=334
e. n=85

Regarding offence histories, just over one-third (35.3%) of the sample had more than one prior sentence, and the average number of prior sentences was 1.8 (sd=1.5). Males were significantly more likely than females to have more than one prior sentence, and a greater number of prior sentences. In terms of the index offence for which individuals received ROHD, around one-third (35.0%) were for drug offences, nearly one-quarter (22.4%) for administrative/driving offences, almost one-in-five (18.9%) for public order/property offences, one-in-ten (10.8%) for a violent offence, 7.1% for fraud, and 5.1% for a theft related offence. There were no significant differences between genders regarding the proportion of types of index offences for which they were released to ROHD.

Table 3 above also displays risk assessment information and involvement in prison programs while serving time in custody prior to release to ROHD. The average risk assessment score (based on

the Risk of Re-offending screening assessment) for those with available data was 11.3 (sd=5.3)[5]. For those assessed with the ORNI-R[6] (n=85), the average score was 25.6 (sd=4.3). There were no significant differences in ROR or ORNI-R scores between genders. Most of the sample (90.3%) were involved in employment programs in their custodial histories, with no difference between the genders regarding the proportion who participated in employment programs while in custody. Far fewer prisoners had prior involvement in education programs (27.2%), literacy and numeracy programs (17.5%), behavioural change programs (14.5%), and domestic violence programs (9.4%) while in custody. With the exception of participation in domestic violence and employment programs, a significantly greater proportion of females compared to males participated in all of the remaining program types while in custody.

In terms of sentence characteristics, there were no significant differences between males and females regarding length of non-parole periods, days sentenced to ROHD, and days spent on ROHD. Almost one-in-five (19.4%) prisoners breached their HD order and there were no significant differences in the proportion of males or females who breached ROHD, or the average time to breach. Just under one-in-ten (8.5%) prisoners returned to custody by 27 August 2021, with a greater proportion being male (9.6% compared to 2.8%), although there were no gender differences regarding the average days to return to custody post-ROHD.

Variables associated with breaches of ROHD and returns to custody post-ROHD

Table 4 below shows bivariate comparisons of demographic, criminal justice and sentence characteristics of prisoners serving ROHD across those who breached conditions and those who did not. Eighty-five prisoners (19.4%) breached conditions of ROHD. Prisoners who breached ROHD did not significantly differ from those who did not regarding demographic characteristics and offence histories. However, prisoners sentenced to ROHD for administrative/driving offences were less likely to breach their conditions compared to those sentenced to ROHD for any of the other offences (12.9% compared to 24.6%), and those who participated in employment programs while in custody were also less likely to have breached ROHD compared to those who did not (76.5% compared to 93.7%). Prisoners who breached ROHD also had significantly higher ROR scores (x=12.6 sd=3.7 compared to x=10.9 sd=5.6), longer non-parole periods (x=637.1 days sd=494.8 compared to x=528.0 days sd=520.4), more ROHD sentence days (x=234.9 days sd=165.5 compared to x=163.9 days sd=173.9), and therefore as expected, fewer days actually spent on ROHD (x=111.8 days sd=107.8 compared to x=183.0 days sd=190.7). There were no significant differences between the two groups regarding returns to custody.

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[5] RoR risk categories = 0 - 11 (low), 12-15 (medium), 16-22 (high).
[6] The ORNI-R instrument is utilised for prisoners who meet a specific threshold based on assessment with the RoR instrument. For these reasons, RoR score was used to measure risk level in all of the multivariate analyses. ORNI-R risk categories = 0-12 (low), 13-28 (medium), 29-39 (high), 40-41 (extreme).

Table 4: Demographic, criminal justice, and sentence characteristics of prisoners sentenced to ROHD from 1st November 2018 to 1st July 2021, and ending before 27th August 2021, by breach status (n=434)

	Total sample (n=434) n (%) / x̄(sd)	No Breach (n=349) n (%) / x̄(sd)	Breach (n=85) n (%) / x̄(sd)	$x^2(df)$, φ / $t(df)$, Cohen's d
Demographics				
Age at release to ROHD	39.66 (10.53)	39.68 (10.81)	39.60 (9.35)	n.s
Male	363 (83.6%)	295 (84.5%)	68 (80.0%)	n.s
Aboriginal[a]	33 (8.9%)	23 (8.0%)	10 (12.3%)	n.s
Completed high school[b]	76 (24.8%)	60 (25.9%)	16 (21.6%)	n.s
Employed[c]	116 (37.8%)	93 (40.3%)	23 (30.3%)	n.s
Offence history				
Has multiple sentences	153 (35.3%)	120 (34.4%)	33 (38.8%)	n.s
Avg. # of prior sentence	1.80 (1.54)	1.77 (1.50)	1.91 (1.67)	n.s
Index offence (ROHD sentence)				
Drug	152 (35.0%)	117 (33.5%)	35 (41.2%)	n.s
Administrative/driving	97 (22.4%)	86 (24.6%)	11 (12.9%)	$x^2(1)$=5.39*, .11
Theft	22 (5.1%)	16 (4.6%)	6 (7.1%)	n.s
Fraud	31 (7.1%)	22 (6.3%)	9 (10.6%)	n.s
Violent	47 (10.8%)	41 (11.7%)	6 (7.1%)	n.s
Public order/property	82 (18.9%)	65 (18.6%)	17 (20.0%)	n.s
Risk ratings				
Risk of Reoffending (ROR)[d]	11.31 (5.26)	10.94 (5.57)	12.64 (3.68)	$t(177.95)$=3.09**, .33
Offender Risk Needs Inventory (ORNI-R)[e]	25.59 (4.26)	25.39 (4.25)	26.69 (4.27)	n.s
Prison programs				
Employment	392 (90.3%)	327 (93.7%)	65 (76.5%)	$x^2(1)$=23.20***, .23
Education	118 (27.2%)	98 (28.1%)	20 (23.5%)	n.s
Domestic violence	41 (9.4%	30 (8.6%)	11 (12.9%)	n.s
Literacy and numeracy	76 (17.5%)	62 (17.8%)	14 (16.5%)	n.s
Making changes	63 (14.5%)	51 (14.6%)	12 (14.1%)	n.s
Sentence characteristics				
Non-parole period (days)[sqrt]	549.40 (516.77)	528.03 (520.42)	637.14 (494.84)	$t(431)$=2.47*, 0.30
Length of ROHD (sentenced days)[sqrt]	177.71 (174.23)	163.86 (173.95)	234.94 (165.46)	$t(140.27)$=4.59***, 0.60
Length of ROHD (actual days)[sqrt]	169.05 (179.66)	183.00 (190.68)	111.75 (107.78)	$t(172.97)$=3.66***, 0.36
Return to custody (RTC) post-ROHD				
RTC by 27th August 2021	37 (8.5%)	29 (8.3%)	8 (9.4%)	n.s
Days RTC	271.89 (162.54)	261.83 (165.60)	308.38 (155.67)	n.s

p<.10+, p<.05*, p<.01**, p<.001***

	Total sample (n=434) n (%) / x̄(sd)	No Breach (n=349) n (%) / x̄(sd)	Breach (n=85) n (%) / x̄(sd)	x^2(df), φ / t(df), Cohen's d

Note: Percentages exclude missing cases
a. n=369
b. n=306
c. n=307
d. n=334
e. n=85

Table 5 below shows the bivariate comparisons of demographic, criminal justice and sentence characteristics of prisoners serving ROHD across those who returned to custody at some point in the follow-up period and those who did not. Approximately one-in-ten (12.6%) prisoners who were sentenced to ROHD returned to custody at some point following ROHD during the follow-up period. Roughly similar proportions of males and females returned to custody, but significantly more Aboriginal people returned to custody (18.5% compared to 7.3%). Individuals who returned to custody were also more likely to have had multiple prior sentences (49.1% compared to 33.2%) and a greater number of prior sentences (x=2.15 sd=2.07 compared to x=1.75 sd=1.44) in their offence histories. At the time of the initial ROHD order, those who returned to custody were more likely to have been sentenced for an administrative/driving offence (32.7% compared to 20.8%) or a public order/property offence (27.3% compared to 17.7%). Those who returned to custody also had significantly higher ROR scores (x=13.89 sd=2.95 compared to x=11.00 sd=5.39). They also had significantly fewer ROHD sentenced days (x=100.2 days sd=79.6 compared to x=191.80 days sd=180.04). The two groups did not significantly differ regarding participation in prison programs or breaches of their ROHD order.

Table 5: Demographic, criminal justice, and sentence characteristics of prisoners sentenced to ROHD from 1st November 2018 to 1st July 2021, and ending before 27th August 2021, by return to custody status (n=434)

	Total sample (n=434) n (%) / x̄(sd)	No return to custody (n=379) n (%) / x̄(sd)	Return to custody (n=55) n (%) / x̄(sd)	x^2(df), φ / t(df), Cohen's d
Demographics				
Age at release to ROHD	39.66 (10.53)	39.95 (10.83)	37.69 (7.99)	t(85.76)=1.86[+], 0.22
Male	363 (83.6%)	314 (82.8%)	49 (89.1%)	n.s
Aboriginal[a]	33 (8.9%)	23 (7.3%)	10 (18.5%)	x^2(1)=7.12[**], .14
Completed high school[b]	76 (24.8%)	66 (24.5%)	10 (27.0%)	n.s
Employed[c]	116 (37.8%)	105 (38.9%)	11 (29.7%)	n.s
Offence history				
Has multiple sentences	153 (35.3%)	126 (33.2%)	27 (49.1%)	x^2(1)=5.28[*], .11
Avg. # of prior sentence	1.80 (1.54)	1.75 (1.44)	2.15 (2.07)	t(432)=1.79[+], 0.26
Index offence (ROHD sentence)				
Drug	152 (35.0%)	139 (36.7%)	13 (23.6%)	x^2(1)=3.59[+], .09
Administrative/driving	97 (22.4%)	79 (20.8%)	18 (32.7%)	x^2(1)=3.91[*], .10
Public order/property	82 (18.9%)	67 (17.7%)	15 (27.3%)	x^2(1)=2.89[+], .08
Violent	47 (10.8%)	46 (12.1%)	1 (1.8%)	x^2(1)=5.30[*], .11

	Total sample (n=434) n (%) / x̄(sd)	No return to custody (n=379) n (%) / x̄(sd)	Return to custody (n=55) n (%) / x̄(sd)	x^2(df), φ / t(df), Cohen's d
Fraud	31 (7.1%)	26 (6.9%)	5 (9.1%)	n.s
Theft	22 (5.1%)	20 (5.3%)	2 (3.6%)	n.s
Risk ratings				
Risk of Reoffending (ROR)[d]	11.31 (5.26)	11.00 (5.39)	13.89 (2.95)	t(67.74)=4.96***, 0.56
Offender Risk Needs Inventory (ORNI-R)[e]	25.59 (4.26)	25.99 (4.30)	23.38 (3.33)	t(83)=2.07*, 0.62
Prison programs				
Employment	392 (90.3%)	340 (89.7%)	52 (94.5%)	n.s
Education	118 (27.2%)	101 (26.6%)	17 (30.9%)	n.s
Domestic violence	41 (9.4%	37 (9.8%)	4 (7.3%)	n.s
Literacy and numeracy	76 (17.5%)	69 (18.2%)	7 (12.7%)	n.s
Making changes	63 (14.5%)	53 (14.0%)	10 (18.2%)	n.s
Sentence characteristics				
Non-parole period (days)[sqrt]	549.40 (516.77)	574.41 (512.14)	377.05 (520.32)	t(432)=3.24***, 0.47
Length of ROHD (sentenced days)[sqrt]	177.71 (174.23)	191.80 (180.04)	80.55 (74.18)	t(100.80)=6.73***, 0.69
Length of ROHD (actual days)[sqrt]	169.05 (179.66)	181.85 (186.60)	80.80 (77.44)	t(106.95)=5.81***, 0.57
ROHD breaches				
Breached ROHD conditions	85 (19.6%)	76 (20.1%)	9 (16.4%)	n.s
Days to breach	111.75 (107.77)	113.65 (111.85)	95.78 (65.99)	n.s

$p<.10^+$, $p<.05^*$, $p<.01^{**}$, $p<.001^{***}$
Note: Percentages exclude missing cases
a. n=369
b. n=306
c. n=307
d. n=334
e. n=85

Table 6 below presents the adjusted cox regression models predicting ROHD breaches (Model 1). Due to the relatively small proportion of individuals returning to custody during the follow-up period, it was not possible to accurately estimate adjusted cox regression models based on those factors that differentiated the group of individuals who returned to custody in the bivariate analysis (table 5). For the model examining breaches, the variables included in the models are based on those that had statistically significant bivariate associations. Model 1 indicates that net of other factors considered in the model, higher ROR score (HR=1.60 [95% CI = 1.15-2.21]), not participating in a prison employment program (HR=0.18 [95% CI = 0.10-0.30]), and a shorter ROHD sentence (HR=0.94 [95% CI = 0.89-0.99]), was associated with a faster rate of ROHD breach. An administrative/driving offence did not significantly influence the rate of ROHD breach, suggesting that the effect of this factor is explained by the other variables included in the model. Overall, this indicates that prisoners with higher ROR scores, not participating in a prison employment program, and shorter ROHD sentences, are associated with the likelihood of ROHD breach.

Table 6: Adjusted Cox regression models predicting breaches/RTC among prisoners sentenced to ROHD between 1 November 2018 and 1 July 2021, ending by 27 August 2021

VARIABLES	MODEL 1 ROHD BREACH HR (95% CI)
Index offence (ROHD sentence)	
Drug	
Administrative/driving	0.90 (0.42-1.92)
Violent	
Public order/property	
Risk ratings	
Risk of Reoffending (ROR)^{sqrt}	1.60 (1.15-2.21)[*]
Prison programs	0.18 (0.10-0.30)[***]
Employment	
Sentence characteristics	0.94 (0.89-0.99)[*]
Length of ROHD (sentenced days)^{sqrt}	

p<.10[+], *p*<.05[*], *p*<.01[**], *p*<.001[***]

Predicting those at risk of breaching ROHD order

Backwards stepwise logistic regression analysis was conducted to identify the optimal predictors for inclusion in a model predicting the risk of ROHD breach. Variable entry and removal probability were set to 0.1. The sample was limited to the 434 individuals who completed their ROHD placement, by either discharge or breach, by the end of the observation period. The original model (step 0) included the following variables: did not complete year 12; unemployed prior to admission; did not participate in prison employment, education, domestic violence, literacy and numeracy, or making changes program; age at admission; Aboriginal identity; sex; multiple prior sentences; ROR score; non parole days; and offence type for current sentence. Model selection was determined using the Akaike Information Criterion (AIC), which balances model fit and complexity, with lower AIC scores corresponding to a better model.

Inclusion of all variables in the step 0 model resulted in an AIC score of 257.15. Sequential backwards removal of variables gradually improved model fit. The step 10 model had the lowest AIC score (239.14), and included unemployment prior to imprisonment (OR=12.85 [95% CI=4.88-33.83]), did not participate in the making changes program (OR=2.022 [95% CI=0.90-4.56]), did not participate in the prison employment program (OR = 2.41 [95% CI = 1.32-4.39]) ROR score (OR=1.09 [95% CI=1.02-1.17]), and offence type for ROHD sentence (violent offence OR = 1.00 (reference); theft/fraud offence OR = 5.71 [95% CI = 1.44-22.69]; drug offence OR = 4.04 [95% CI = 1.17-14.02]; public order/property offence OR = 2.99 [95% CI = 0.78-11.53]; administrative/driving offence OR = 2.30 [95% CI = 0.56-9.45]). The model had acceptable fit (x^2(8) = 11.82, *p*=.16), and explained 25.7% of the variance.

Bootstrapping was conducted to assess the sampling distribution of the model's regression coefficients. This involves resampling from the original data set a prescribed number of times and applying the model each time to estimate its average performance. In this instance, 1000 bootstrap

samples were simulated. The average regression coefficients produced from the bootstrapped samples were consistent with the original model. The 95% confidence interval for the bootstrapped samples were 5.31 to 60.58 for unemployed prior to imprisonment, 0.96 to 5.37 for did not participate in the making changes program, 1.33 to 4.91 for did not participate in the prison employment program, 1.02 to 1.17 for ROR score, 1.38 to 70.88 for theft/fraud offence, 1.32 to 38.63 for drug offence, 0.72 to 30.60 for public order/property offence, and 0.45 to 22.85 for administrative/driving offence.

Receiver Operating Characteristics (ROC) curves were calculated to test model accuracy (Appendix A). The area under the ROC curve is plotted against model sensitivity (true positive rate) and 1- specificity (false positive rate) and represents the probability that the model correctly discriminates between a positive case and a negative case. As depicted in Appendix A, the model had an area under the ROC curve score of .762 (95% CI = .699 - .826). This means that there was on average a 76.2% probability that a randomly selected person who breaches ROHD will have a higher risk score than a randomly selected person who does not breach ROHD. For example, risk scores equal to or greater than 10.0% have a 94.4% probability of correctly identifying that a ROHD breach will occur (true positive), and a 68.6% probability of identifying a ROHD when none will occur (false positive). Likewise, risk scores greater than 20.0% have a 65.3% probability of being a true positive, and a 30.6% probability of being false negative. The sensitivity and 1-specificity values for risk score deciles are presented in Appendix A: Table 1.

Nomograms are prediction tools used to estimate the multivariate probability of an outcome derived from a risk prediction model. We created a nomogram estimating the risk of ROHD breach based on employment status prior to admission, participation in the making changes program, participation in a prison employment program, ROR score, and sentenced offence type. The nomogram below (Figure 7) is interpreted by first aligning the predictor category with the respective points value, summing those points, and then matching the total points with the risk of breach axis. For example, someone with an ROR score of 9 (30.61 points) who was sentenced for a drug offence (56.56 points), did an employment training program in prison (0 points), did not do the making changes program (28.50 points), and was unemployed prior to admission (35.59 points), has a 27.6% risk of breaching ROHD. According to the ROC above, a risk score of 27.6% or greater has a true positive rate of 52.8%, and a false positive rate of 16.3%. The points for each predictor, and the total points corresponding to the risk of ROHD breach, are also presented below in tables 7 and 8.

Figure 7: Nomogram of predicted risk of ROHD breach
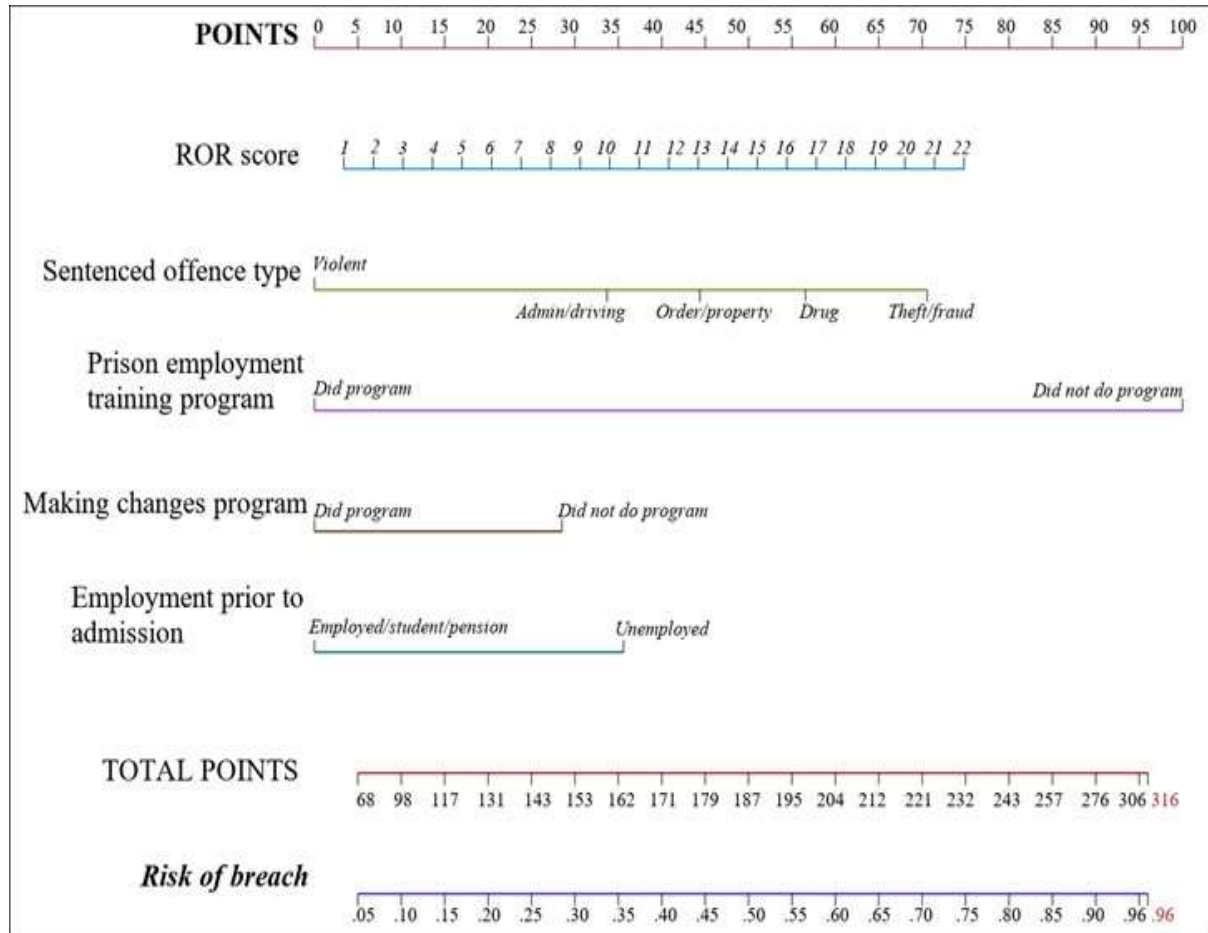
Table 7: Unstandardized *beta* and relative points for predictors of ROHD breach.

PREDICTOR	*beta*	Points
Unemployed prior to admission	0.879	35.59
Did not engage in making change program	0.704	28.50
Did not engage in employment program	2.554	103.40
SENTENCED OFFENCE TYPE		
Violent	reference group	0
Administrative/driving offence	0.833	33.7
Public order/property offence	1.096	44.4
Drug offence	1.397	56.56
Theft/fraud offence	1.743	70.57
ROR SCORE		
1	0.084	3.40
2	0.168	6.80
3	0.252	10.20
4	0.336	13.60
5	0.420	17.00
6	0.504	20.40
7	0.588	23.81
8	0.672	27.21

PREDICTOR		*beta*	Points
9		0.756	30.61
10		0.840	34.01
11		0.924	37.41
12		1.008	40.81
13		1.092	44.21
14		1.176	47.61
15		1.260	51.01
16		1.344	54.41
17		1.428	57.81
18		1.512	61.21
19		1.596	64.62
20		1.68	68.02
21		1.764	71.42
22		1.848	74.82
	Constant	-4.699	

Table 8: Total points, linear project, and corresponding risk of ROHD breach

Total points	Linear project	Risk of ROHD breach
68	-2.94	5.0%
98	-2.20	10.0%
117	-1.74	15.0%
131	-1.39	20.0%
143	-1.10	25.0%
153	-0.85	30.0%
162	-0.62	35.0%
171	-0.41	40.0%
179	-0.20	45.0%
187	0	50.0%
195	0.20	55.0%
204	0.41	60.0%
212	0.62	65.0%
221	0.85	70.0%
232	1.10	75.0%
243	1.39	80.0%
257	1.74	85.0%
276	2.20	90.0%
306	2.94	95.0%
316	3.18	96.0%

Court Ordered Home Detention

Sample characteristics: Court Ordered Home Detention

Table 9 below provides bivariate descriptions of prisoners sentenced to COHD from 1 November 2018 to 1 July 2021 and ending before 27 August 2021 stratified by gender (n=409). Most of the sample were male (81.7%). The average age of the entire sample at the time they were sentenced to COHD was 38.1 (sd=10.5) years, and there were no differences in age between males and females. Around one-in-ten prisoners in COHD were Aboriginal, and significantly more females who received COHD were of Aboriginal background (16.2%) compared to males (7.7%) who received COHD. Information on level of education and employment prior to the most recent custody episode were not available for these analyses.

Table 9: Demographic, criminal justice, and sentence characteristics of people sentenced to COHD between 1st November 2018 and 1st July 2021 by gender (n=409)

	Total sample (n=409) n (%) / x̄(sd)	Males (n=334) n (%) / x̄(sd)	Females (n=75) n (%) / x̄(sd)	x^2(df), φ / t(df), Cohen's d
Demographics				
Age at release to COHD[a]	38.09 (10.51)	38.32 (10.93)	37.15 (8.65)	n.s
Aboriginal[b]	37 (9.3%)	25 (7.7%)	12 (16.2%)	x^2(1)=5.21[*], .11
Offence history				
Has multiple sentences	140 (34.2%)	117 (35.0%)	23 (30.7%)	n.s
Index offence (COHD sentence)[c]				
Drug	14 (5.2%)	11 (5.0%)	3 (5.8%)	n.s
Administrative/driving	211 (78.1%)	173 (79.4%)	38 (73.1%)	n.s
Theft	46 (17.0%)	30 (13.8%)	16 (30.8%)	x^2(1)=8.59[**], .18
Fraud	12 (4.4%)	7 (3.2%)	5 (9.6%)	x^2(1)=4.06[*], .12
Violent	29 (10.7%)	26 (11.9%)	3 (5.8%)	n.s
Public order/property	56 (20.7%)	44 (20.2%)	12 (23.1%)	n.s
Risk ratings				
Risk of Reoffending (ROR)[d]	10.72 (4.23)	10.77 (4.24)	10.46 (4.23)	n.s
Offender Risk Needs Inventory (ORNI-R)[e]	25.90 (4.26)	25.98 (4.45)	25.50 (3.40)	n.s
Sentence characteristics				
Length of COHD sentenced days	195.69 (252.63)	192.96 (247.81)	207.81 (274.50)	n.s
Days in COHD	155.34 (157.94)	155.15 (154.79)	156.20 (172.38)	n.s
COHD breaches				
Breached COHD conditions	65 (15.9%)	51 (15.3%)	14 (18.7%)	n.s
Days to breach	107.18 (82.16)	112.45 (85.41)	88.00 (68.34)	n.s
Return to custody (RTC) post-COHD				
RTC by 27th August 2021	71 (17.4%)	60 (18.0%)	11 (14.7%)	n.s
Days RTC	238.63 (209.63)	239.47 (208.94)	234.09 (223.62)	n.s

p<.10⁺, p<.05*, p<.01**, p<.001***
Note: Percentages exclude missing cases
a. n=348
b. n=399
c. n=270
d. n=376
e. n=67

Around one-third (34.2%) of those in COHD had multiple prior sentences, with no significant differences in the proportion of males and females. In terms of the index offences for which individuals received COHD, most were involved in an administrative/driving offence (78.1%), one-in five were involved in a public order/property offence (20.7%), 17.0% were involved in a theft offence, 10.7% for a violent offence, 5.2% for a drug offence, and 4.4% for a fraud offence. Two key patterns emerged in terms of gender. First, nearly three times as many females compared to males (30.8% compared to 13.8%) received COHD for theft offences; and second, females were substantially over-represented in terms of receiving COHD for fraud related offences compared to males (9.6% compared to 3.2%). There were no differences evident between the proportions of males and females who received COHD in terms of assessed risk, sentence lengths, breaches of COHD, or return to custody.

Variables associated with breaches of COHD and returns to custody post-COHD

Table 10 shows bivariate comparisons of demographic, criminal justice and sentence characteristics of prisoners serving COHD across those who breached conditions and those who did not. In total, 65 (15.9%) individuals breached conditions of COHD. A significantly greater proportion of those who breached COHD had multiple prior sentences (69.2% compared to 27.6%) and were sentenced for a theft (39.5% compared to 12.8%) or public order/property (41.9% compared to 16.7%) related offence. Those who breached COHD also had significantly higher ROR scores (x=13.4 sd=3.4 compared to x=10.2 sd=4.2) and were more likely to return to custody by the end of the observation period (24.6% compared to 16.0%).

Table 10: Demographic, criminal justice, and sentence characteristics of people sentenced to COHD from 1 November 2018 to 1 July 2021, and ending before 27 August 2021, by breach status (n=409)

	Total sample (n=409) n (%) / x̄(sd)	No breach (n=344) n (%) / x̄(sd)	Breach (n=65) n (%) / x̄(sd)	x^2(df), φ / t(df), Cohen's d
Demographics				
Age at release to COHD[a]	38.09 (10.51)	38.00 (10.58)	38.49 (10.28)	*n.s*
Male	334 (81.7%)	283 (82.3%)	51 (78.5%)	*n.s*
Aboriginal[b]	37 (9.3%)	28 (8.4%)	9 (13.8%)	*n.s*
Offence history				
Has multiple sentences	140 (34.2%)	95 (27.6%)	45 (69.2%)	x^2(1)=42.05***, .32
Index offence (COHD sentence)[c]				
Drug	14 (5.2%)	12 (5.3%)	2 (4.7%)	*n.s*
Administrative/driving	211 (78.1%)	177 (78.0%)	34 (79.1%)	*n.s*

	Total sample (n=409) n (%) / x̄(sd)	No breach (n=344) n (%) / x̄(sd)	Breach (n=65) n (%) / x̄(sd)	x^2(df), φ / t(df), Cohen's d
Theft	46 (17.0%)	29 (12.8%)	17 (39.5%)	x^2(1)=18.32***, .26
Fraud	12 (4.4%)	9 (4.0%)	3 (7.0%)	n.s
Violent	29 (10.7%)	23 (10.1%)	6 (14.0%)	n.s
Public order/property	56 (20.7%)	38 (16.7%)	18 (41.9%)	x^2(1)=13.88***, .23
Risk ratings				
Risk of Reoffending (ROR)[d]	10.72 (4.23)	10.23 (4.19)	13.38 (3.39)	t(92.03)=6.26***, 0.77
Offender Risk Needs Inventory (ORNI-R)[e]	25.90 (4.26)	25.63 (4.60)	26.75 (2.91)	n.s
Sentence characteristics[h=]				
Length of COHD sentenced days	195.69 (252.63)	193.63 (242.29)	206.60 (303.46)	n.s
Days in COHD	155.34 (157.94)	164.44 (167.01)	107.18 (82.16)	t(113.37)=3.53***, 0.39
Return to custody (RTC) post-COHD				
RTC by 24th August 2021	71 (17.4%)	55 (16.0%)	16 (24.6%)	x^2(1)=2.84+, .08
Days to RTC	238.63 (209.63)	243.53 (219.04)	221.81 (178.75)	n.s

p<.10[+], p<.05[*], p<.01[**], p<.001[***]
Note: Percentages exclude missing cases
a. n=348
b. n=399
c. n=270
d. n=376
e. n=67

Table 11 shows bivariate comparisons of demographic, criminal justice and sentence characteristics of prisoners serving COHD across those who returned to custody at some point in the follow-up period and those who did not. Seventy-one individuals (17.4%) who received COHD returned to custody at some point during the follow-up period. Those who returned to custody were significantly more likely to be younger (x=35.9 sd=9.5 compared to x=38.6 sd=10.7), have multiple prior sentences (x=64.8% compared to x=27.8%), have higher ROR scores (x=12.3 sd=4.1 compared to x=10.4 sd=4.2), and breach their COHD order (22.5% compared to 14.5%). There were no significant differences between those who did and did not return to custody based on sex, Aboriginal identity, index offence, and sentence characteristics.

Table 11: Demographic, criminal justice, and sentence characteristics of people sentenced to COHD from 1 November 2018 to 1 July 2021, and ending before 27 August 2021, by return to custody status (n=409)

	Total sample (n=409) n (%) / x̄(sd)	No return to custody (n=338) n (%) / x̄(sd)	Return to custody (n=71) n (%) / x̄(sd)	x^2(df), φ / t(df), Cohen's d
Demographics				
Age at release to COHD[a]	38.09 (10.51)	38.63 (10.70)	35.94 (9.49)	t(346)=1.92+, 0.27

	Total sample (n=409) n (%) / x̄(sd)	No return to custody (n=338) n (%) / x̄(sd)	Return to custody (n=71) n (%) / x̄(sd)	$x^2(df)$, φ / $t(df)$, Cohen's d
Male	334 (81.7%)	274 (81.1%)	60 (84.5%)	n.s
Aboriginal[b]	37 (9.3%)	30 (9.1%)	7 (9.9%)	n.s
Offence history				
Has multiple sentences	140 (34.2%)	94 (27.8%)	46 (64.8%)	$x^2(1)$=35.64***, .30
Index offence (COHD sentence)[c]				
Drug	14 (5.2%)	12 (5.4%)	2 (4.3%)	n.s
Administrative/driving	211 (78.1%)	172 (76.8%)	39 (84.8%)	n.s
Theft	46 (17.0%)	36 (16.1%)	10 (21.7%)	n.s
Fraud	12 (4.4%)	11 (4.9%)	1 (2.2%)	n.s
Violent	29 (10.7%)	25 (11.2%)	4 (8.7%)	n.s
Public order/property	56 (20.7%)	45 (20.1%)	11 (23.9%)	n.s
Risk ratings				
Risk of Reoffending (ROR)[d]	10.72 (4.23)	10.37 (4.18)	12.31 (4.13)	$t(374)$=3.46**, 0.47
Offender Risk Needs Inventory (ORNI-R)[e]	25.90 (4.26)	25.96 (4.34)	25.75 (4.19)	n.s
Sentence characteristics				
Length of COHD sentenced days	195.69 (252.63)	199.39 (254.90)	178.07)	n.s
Days in COHD	155.34 (157.94)	158.67 (156.86)	139.48 (163.19)	n.s
COHD breaches				
Breached COHD conditions	65 (15.9%)	49 (14.5%)	16 (22.5%)	$x^2(1)$=2.84+, .08
Days to breach	107.18 (82.16)	110.41 (71.79)	97.31 (110.34)	n.s

$p<.10^+$, $p<.05^*$, $p<.01^{**}$, $p<.001^{***}$
Note: Percentages exclude missing cases
a. n=348
b. n=399
c. n=270
d. n=376
e. n=67

Table 12 displays the adjusted Cox Regression models of the variables associated with breaches of COHD and returns to custody post COHD at the bivariate level. In terms of breaches, the results show that net of other factors, having multiple prior sentences (HR=2.63 [95% CI = 1.24-5.60]) and higher ROR scores (HR=1.85 [95% CI = 1.04-3.28]) were associated with around a two-times sooner likelihood of COHD breach, independent of index offence type. For returns to custody, the likelihood of returning to custody sooner was significantly greater for those with multiple prior sentences (HR=3.75 times [95% CI = 2.14-6.55]), and marginally significant for younger age (HR=0.74 [95% CI=0.53-1.04]) and shorter ROHD sentence (HR=0.58 [95% CI = 0.31-1.07]). ROR score was not associated with sooner returns to custody, independent of other factors.

Table 12: Adjusted Cox regression models predicting breaches/RTC among prisoners sentenced to COHD between 1 November 2018 and 1 July 2021, ending by 27 August 2021

VARIABLES	MODEL 1 COHD BREACH HR (95% CI)	MODEL 2 COHD RTC HR (95% CI)
Demographics		
Age at release to COHD		0.74 (0.53-1.04)[+]
Offence history		
Has multiple sentences	2.63 (1.24-5.60)[*]	3.75 (2.14-6.55)[***]
Index offence (COHD sentence)		
Theft	1.40 (0.66-2.95)	
Public order/property	1.07 (0.50-2.26)	
Risk ratings		
Risk of Reoffending (ROR)^{sqrt}	1.85 (1.04-3.28)[*]	1.26 (0.83-1.92)
Sentence characteristics		
Length of COHD (sentenced days)^{sqrt}		0.58 (0.31-1.07)[+]

$p<.10^{+}$, $p<.05^{*}$, $p<.01^{**}$, $p<.001^{***}$

Predicting those at risk of breaching COHD order

Backwards stepwise logistic regression analysis was conducted to identify the optimal predictors for inclusion in a model predicting the risk of COHD breach. Variable entry and removal probability were set to 0.1. The sample was limited to the 409 individuals who left COHD, by either discharge or breach, by the end of the observation period (27 August 2021). The original model (step 0) included the following variables: sex, age at COHD admission, Aboriginal identity, prior sentence, ROR score, days sentenced to COHD, and offence type for current sentence. Note, that unlike ROHD, the COHD cohort could have more than one offence type ascribed to their sentence. Model selection was determined using the Akaike Information Criterion (AIC), which balances model fit and complexity, with lower AIC scores corresponding to a better model.

Inclusion of all variables in the step 0 model resulted in an AIC score of 180.10. Sequential backwards removal of variables gradually improved model fit. The step 12 model had the lowest AIC score (170.84) and included ROR score (OR=1.10 [95% CI= 0.99-1.22]), prior sentence (OR=4.02 [95% CI=1.74-9.27]) and sentenced for a theft related offence (OR=3.65 [95% CI=1.62-8.22]). The model had acceptable fit ($x^2(8) = 8.81$, $p=.36$), and explained 25.6% of the variance. The final model was based on data from 249 individuals, as 243 had missing data for one or more variables.

Next, 1000 bootstrap samples were simulated to assess model consistency. The average regression coefficients produced from the bootstrapped samples were consistent with our original model. The 95% confidence interval for the bootstrapped samples were 1.00 to 1.22 for ROR score, 1.85 to 10.80 for prior sentence, and 1.71 to 9.18 for theft related offence. As presented in Appendix B, the model had an area under the Receiver Operating Characteristics (ROC) of .794 (95% CI = .716 - .872), meaning the model has a 79.4% average probability of correctly discriminating between someone who does and does not breach COHD (see appendix B: Figure

1). The sensitivity and 1-specificity values for risk score deciles are presented in Appendix B: Table 1.

A nomogram was created estimating the risk of COHD breach based on ROR score, prior sentence, and sentenced for a theft related offence (see Figure 8). The prediction model, as presented in the nomogram, can predict up to a 70% greater risk of COHD breach. The nomogram is interpreted by first aligning the predictor category with the respective points value, summing those points, and then matching the total points with the risk of breach axis. For example, someone with an ROR score of 13 (61.90 points) who was sentenced for a theft related offence (66.31 points) has a 20.2% risk of breaching COHD. The area under the ROC curve indicates that a risk score of 20.2% or greater has a true positive rate of 63.2% and a false positive rate of 21.8%. The points for each predictor, and the total points corresponding to the risk of ROHD breach, are also presented in tables 13 and 14.

Figure 8: Nomogram of predicted risk of COHD breach
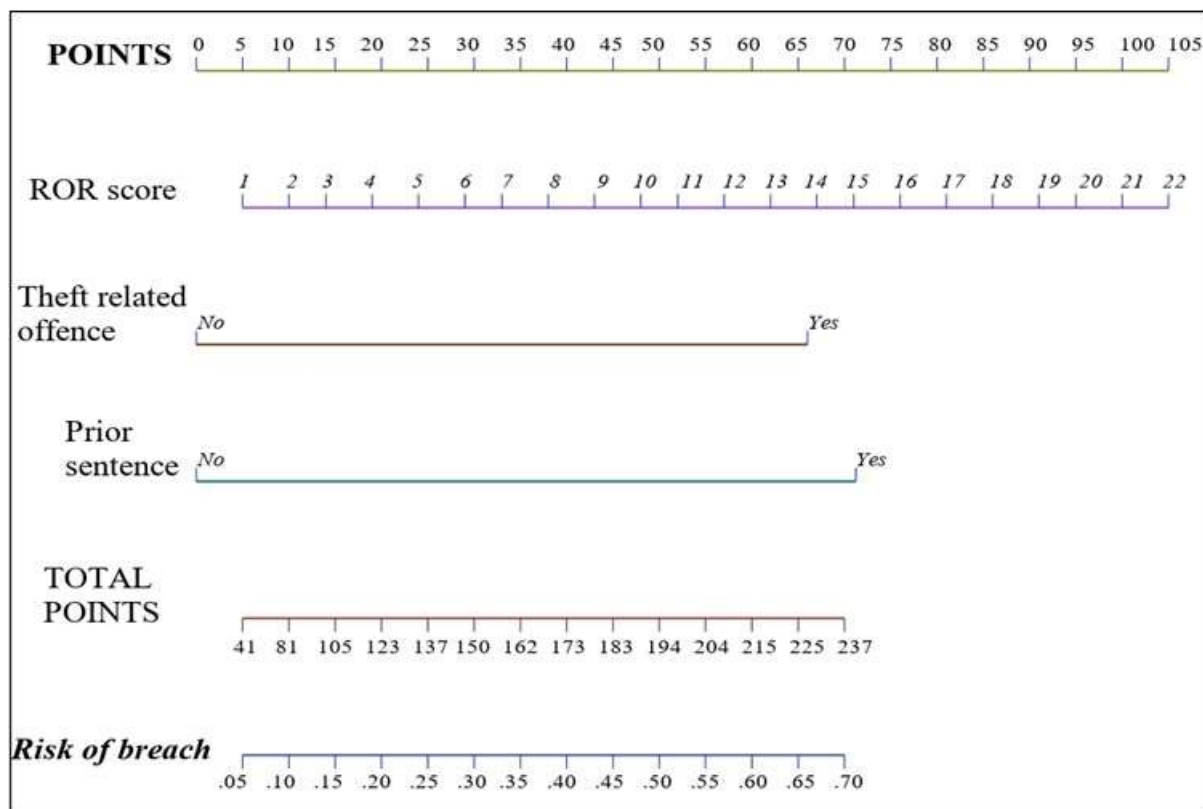
Table 13: Unstandardised *beta* and relative points for predictors.

PREDICTOR	*beta*	Points
Prior sentence	1.391	71.22
Sentenced for a theft related offence	1.295	66.31
ROR SCORE		
1	0.093	4.76
2	0.186	9.52
3	0.279	14.29

PREDICTOR	beta	Points
4	0.372	19.05
5	0.465	23.81
6	0.558	28.57
7	0.651	33.33
8	0.744	38.10
9	0.837	42.86
10	0.930	47.62
11	1.023	52.38
12	1.116	57.14
13	1.209	61.90
14	1.302	66.67
15	1.395	71.43
16	1.488	76.19
17	1.581	80.95
18	1.674	85.71
19	1.767	90.48
20	1.860	95.24
21	1.953	100.00
22	2.046	104.76
Constant	-3.876	

Table 14: Total points, linear project, and corresponding risk of COHD breach

Total points	Linear project	Risk of COHD breach
41	-2.94	5.0%
81	-2.20	10.0%
105	-1.74	15.0%
123	-1.39	20.0%
137	-1.10	25.0%
150	-0.85	30.0%
162	-0.62	35.0%
173	-0.41	40.0%
183	-0.20	45.0%
194	0	50.0%
204	0.20	55.0%
215	0.41	60.0%
225	0.62	65.0%
237	0.85	70.0%

Does HD reduce the likelihood of returning to custody compared to a prison sentence?

ROHD. Data was available for 533 individuals sent to ROHD and 9,156 individuals discharged from prison (PD). Cases from the prisoner discharge data were removed if they were not eligible for home detention (i.e., on remand, sentenced for a sex offence or homicide, etc.). Data from both groups were removed if ROHD or PD admissions occurred before 1 November 2018, discharges after 1 July 2021, and ROR scores were missing. Those with ROHD and PD data were also removed. Exclusion of ineligible cases from both groups resulted in a sample size of 233 for ROHD and 473 for PD (see Figure 3 in the methodology section).

Cross tabulations presented in Table 15 below indicate that those on ROHD were significantly more likely to be older, sentenced for a drug offence, participate in the making changes and violence prevention program, and had a longer non-parole period. By contrast, the PD group were significantly more likely to be Aboriginal, have a prior sentence, sentenced for fraud, violence, and public order/property related offence, and return to custody. There were no significant differences between the groups regarding sex, educational attainment, employment status, sentenced to an administrative/driving or theft related offence, ROR score, and participation in a domestic violence or literacy and numeracy program.

Table 15: Demographic, criminal justice, and sentence characteristics of people sentenced to HD between 1st November 2018 and 1st July 2021, and ending before 27th August 2021 by ROHD status (n=706)

	Total sample (n=706) n (%) / x̄(sd)	Prison Discharge (n=473) n (%) / x̄(sd)	ROHD (n=233) n (%) / x̄(sd)	x^2(df), φ / t(df), Cohen's d
Demographics				
Age at sentence	38.12 (10.56)	37.07 (10.25)	40.25 (11.07)	t(427.94)=3.68***, 0.30
Male	603 (85.4%)	403 (85.2%)	200 (85.8%)	n.s
Aboriginal[a]	93 (14.1%)	77 (16.7%)	16 (8.2%)	x^2(1)=8.20**, .11
Completed high school[b]	132 (27.2%)	87 (26.8%)	45 (28.0%)	n.s
Employed[c]	157 (32.0%)	103 (31.1%)	54 (34.0%)	n.s
Offence history				
Has prior sentence	282 (39.9%)	200 (42.3%)	82 (35.2%)	x^2(1)=3.27+, .07
Index offence (ROHD sentence)[d]				
Drug	166 (23.5%)	51 (10.8%)	115 (49.4%)	x^2(1)=129.15***, .43
Administrative/driving	84 (11.9%)	61 (12.9%)	23 (9.9%)	n.s
Theft	34 (4.8%)	24 (5.1%)	10 (4.3%)	n.s
Fraud	55 (7.8%)	43 (9.1%)	12 (5.2%)	x^2(1)=3.38+, .07
Violent	131 (18.6%)	101 (21.4%)	30 (4.2%)	x^2(1)=7.42**, .10
Public order/property	230 (32.6%)	189 (40.0%)	41 (17.6%)	x^2(1)=35.54***, .22
Risk ratings				
Risk of Reoffending (ROR)	12.17 (5.10)	12.30 (5.01)	11.88 (5.28)	n.s
Prison programs				
Domestic violence	111 (15.7%)	79 (16.7%)	32 (13.7%)	n.s

	Total sample (n=706) n (%) / x̄(sd)	Prison Discharge (n=473) n (%) / x̄(sd)	ROHD (n=233) n (%) / x̄(sd)	$x^2(df)$, φ / $t(df)$, Cohen's d
Literacy and numeracy	123 (17.4%)	78 (16.5%)	45 (19.3%)	n.s
Making changes	74 (10.5%)	16 (3.4%)	58 (24.9%)	$x^2(1)=76.98^{***}$, .33
Violence prevention	19 (2.7%)	9 (1.9%)	10 (4.3%)	$x^2(1)=3.40^{+}$, .07
Sentence characteristics				
Non-parole period (days)	370.18 (471.54)	140.95 (197.96)	835.53 (520.89)	$t(352.45)=25.53^{***}$, 2.28
Return to custody				
Return to custody	148 (21.0%)	122 (25.8%)	26 (11.2%)	$x^2(1)=20.18^{***}$, .17

$p<.10^{+}$, $p<.05^{*}$, $p<.01^{**}$, $p<.001^{***}$
Note: Percentages exclude missing cases
a. n=658
b. n=486
c. n=490
d. n=798

Propensity score matching (PSM) is a technique that matches participants from different groups based on theoretically and empirically relevant covariates (Lane et al., 2012)[7], and was used to create a matched ROHD and PD group to determine the effect of ROHD on returns to custody up to 24 August 2021. Groups were matched on variables available in both data sets that were associated with significant group differences and returns to custody. These variables were age, sex, Aboriginal status, multiple prior sentences, sentenced offence type, ROR score, participation in making changes program. To preserve statistical power, sentenced offence types were categorised as violent, non-violent (i.e., administrative/driving, theft, fraud, and order/property offence), and drug offence. Variable matching aims to reduce the likelihood that the factors influencing group membership do not bias the association between sentence type and returns to custody.

One-to-one matching without replacement and a match tolerance of .001 was used to match those in ROHD (n=233) or PD (n=473). This resulted in 75 pairs (n=150). The even distribution of variables between the ROHD and prisoner discharge group, referred to as balance, was determined by calculating the standardised bias and standardised mean difference. A standardised mean difference score of less than .20 suggests balance is achieved. Covariates with a standardised bias score greater than .10 should be included in regression models to remove residual confounding (Nguyen et al., 2017)[8]. Appendix C: Table 1 presents the balance and fit descriptive statistics and indicates that there are no significant differences between the PD and ROHD group in the post-matched sample. Standardised bias scores were >.10 for all variables, indicating very little risk of potential bias.

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[7] Lane, F. C., To, Y. M., Shelley, K., & Henson, R. K. (2012). An Illustrative Example of Propensity Score Matching with Education Research. *Career and Technical Education Research*, 37(3), 187-212. https://doi.org/10.5328/cter37.3.187

[8] Nguyen, T.L., Collins, G.S., Spence, J., Daurès, J.P., Devereaux, P.J., Landais, P., & Le Manach, Y., 2017. Double-adjustment in propensity score matching analysis: choosing a threshold for considering residual imbalance. BMC Med Res Methodol. 17(1), 1-8.

In the post-matched sample, a significantly greater proportion of the PD group (n = 38, 50.7%) than the ROHD group (n=12, 16.0%) returned to custody by the end of the observation period ($x^2(1) = 20.28$, $p<.001$, φ = .37) (Figure 9). Multivariable binary logistic regression analysis indicates that the odds of returning to custody was 6.02 (95% CI = 2.72 – 13.33) times lower for those in ROHD, adjusted for propensity scores. Reanalysis of the pre-matched sample revealed a similar result, indicating that the findings are not a product of the matching process. Specifically, a significantly greater proportion of the PD (n=122, 25.8%) than the ROHD group (n=26, 11.2%) returned to custody ($x^2(1)=5.39$, $p<.001$, φ=.17). Multivariable binary logistic regression analysis indicates that the odds of returning to custody was 2.09 (95% CI = 1.20 – 3.65) times lower for those in ROHD, adjusted for age, sex, Aboriginal status, multiple prior sentences, sentenced offence type, ROR score, and participation in the *Making Changes* program.

Figure 9: Matched proportions of prisoners serving ROHD with those released from prison who returned to custody

Proportion returning to custody
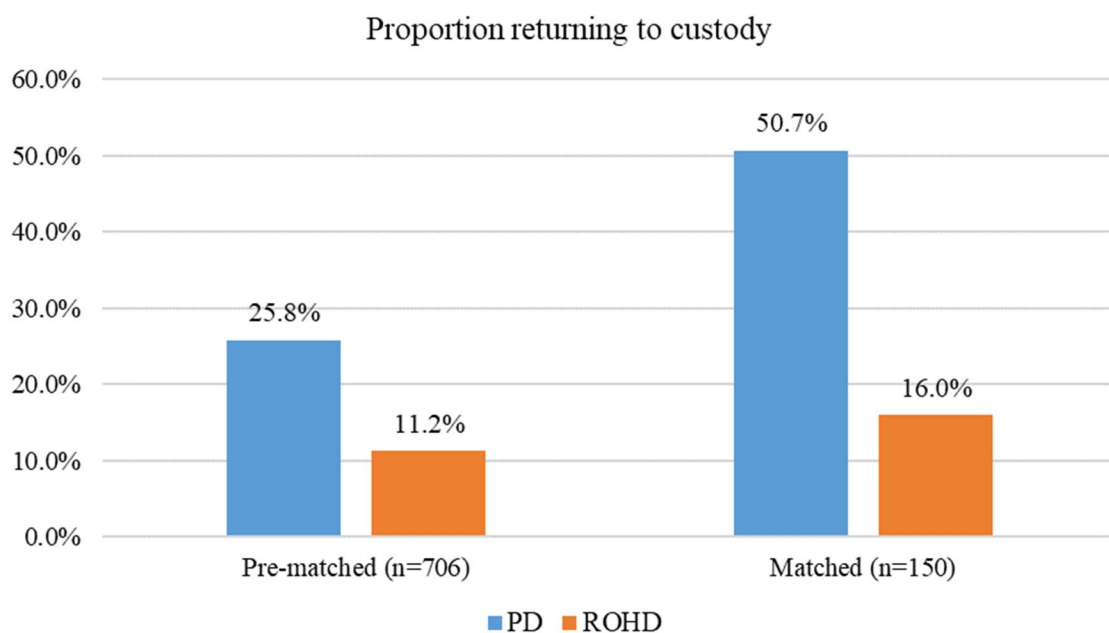
COHD. Data was available for 492 people sentenced to COHD and 9156 Prisoners Discharged (PD). Cases from the prisoner discharge data were removed if they were not eligible for home detention (i.e., on remand, sentenced for a sex offence or homicide). Data from both groups were removed if COHD or PD admissions occurred before 1 November 2018, discharges after 1 July 2021, and ROR scores or age at admission were missing. Those with COHD and PD data were also removed. Exclusion of ineligible cases from both groups resulted in a sample size of 314 for COHD and 473 for prison discharges (see Figure 4 in the methodology section).

Cross tabulations presented in Table 16 indicate that those in COHD were significantly more likely to be sentenced for an administrative/driving and theft related offence, than those discharged from prison. By contrast, the PD group were significantly more likely to be male, Aboriginal, be sentenced for a drug, fraud, violent, and public order/property related offence, and return to custody. There were no significant differences between the groups regarding age, prior sentence, and ROR score.

Table 16: Demographic, criminal justice, and sentence characteristics of people sentenced to HD between 1st November 2018 and 1st July 2021, and ending before 24th August 2021 by COHD status (n=787)

	Total sample (n=787) n (%) / x̄(sd)	Prison Discharge (n=473) n (%) / x̄(sd)	COHD (n=314) n (%) / x̄(sd)	$x^2(df)$, ϕ / $t(df)$, Cohen's d
Demographics				
Age at sentence	37.43 (10.20)	37.07 (10.15)	37.97 (10.27)	n.s
Male	654 (83.1%)	403 (85.2%)	251 (79.9%)	$x^2(1)=3.72^+$, .07
Aboriginal[a]	104 (13.5%)	77 (16.7%)	27 (8.8%)	$x^2(1)=9.87^{**}$, .11
Offence history				
Has prior sentence	328 (41.7%)	200 (42.3%)	128 (40.8%)	n.s
Index offence (ROHD sentence)				
Drug	64 (8.1%)	51 (10.8%)	13 (4.1%)	$x^2(1)=11.14^{***}$, .12
Administrative/driving	215 (27.3%)	55 (11.6%)	160 (51.0%)	$x^2(1)=147.00^{***}$, .43
Theft	66 (8.4%)	24 (5.1%)	42 (13.4%)	$x^2(1)=16.93^{***}$, .15
Fraud	54 (6.9%)	43 (9.1%)	11 (3.5%)	$x^2(1)=9.22^{**}$, .11
Violent	128 (16.3%)	101 (21.4%)	27 (8.6%)	$x^2(1)=22.54^{***}$, .17
Public order/property	245 (31.1%)	195 (41.2%)	50 (15.9%)	$x^2(1)=56.36^{***}$, .27
Risk ratings				
Risk of Reoffending (ROR)	11.83 (4.72)	12.30 (5.01)	11.12 (4.14)	n.s
Return to custody				
Return to custody	174 (22.1%)	122 (25.8%)	52 (16.6%)	$x^2(1)=9.34^{**}$, .11

$p<.10^+$, $p<.05^*$, $p<.01^{**}$, $p<.001^{***}$
Note: Percentages exclude missing cases
a. n=770

Propensity score matching (PSM) matches participants from different groups based on theoretically and empirically relevant covariates (Lane et al., 2012), and was used to create a matched COHD and PD group to determine the effect of COHD on returns to custody up to 27 August 2021. Groups were matched on variables available in both data sets that were associated with significant group differences and returns to custody. Specifically, these variables were age, sex, Aboriginal status, prior sentences, sentenced offence type, and ROR score. Note that to preserve statistical power, ROR score was categorised as low (score 1-11), moderate (12-15), and high (16+). Likewise, sentenced offence types were recoded into violent and non-violent offence (i.e., drug, administrative/driving, theft, fraud, and order/property offence). Variable matching aims to reduce the likelihood that the factors influencing group membership do not bias the association between sentence type and returns to custody.

One-to-one matching without replacement and a match tolerance of .001 was used to match those in COHD (n=314) or PD (n=473). This resulted in 204 pairs (n=408). The even distribution of variables between the COHD and prisoner discharge group, referred to as balance, was determined by calculating the standardised bias and standardised mean difference. A standardised

mean difference score of less than .20 suggests balance is achieved. Covariates with a standardised bias score greater than .10 should be included in regression models to remove residual confounding (Nguyen et al., 2017). Appendix D: Table 1 presents the balance and fit descriptive statistics and indicates that there are no significant differences between the ROHD and COHD group in the post-matched sample. Standardised bias scores were >.10 for all variables, indicating very little risk of potential bias.

In the post-matched sample, a significantly greater proportion of the PD group (n=55, 27.0%) than the COHD group (n=35, 17.2%) returned to custody by the end of the observation period (x^2 (1) = 5.70, p=.017, φ=.12) (Figure 8). Multivariable binary logistic regression analysis indicates that those in COHD were 1.79 (95% CI = 1.11-2.89) times less likely to return to custody than the PD group, adjusted for predicted probability. Reanalysis of the pre-matched sample confirms that this finding was not an artefact of the data matching process. Specifically, in the pre-matched sample, 25.8% (n=122) of the PD group, and 16.6% (n=52) of the COHD group returned to custody. Further, the odds of returning to custody was significantly lower for the COHD than the PD group (OR=1.68 [95% CI = 1.13 – 2.49]). Overall, this indicates that those sentenced to COHD are significantly less likely to return to custody than the PD group, independent of age, sex, Aboriginal identity, prior sentence, sentenced for a violent offence, and ROR score.

Figure 10: Matched proportions of prisoners serving COHD with those released from prison who returned to custody
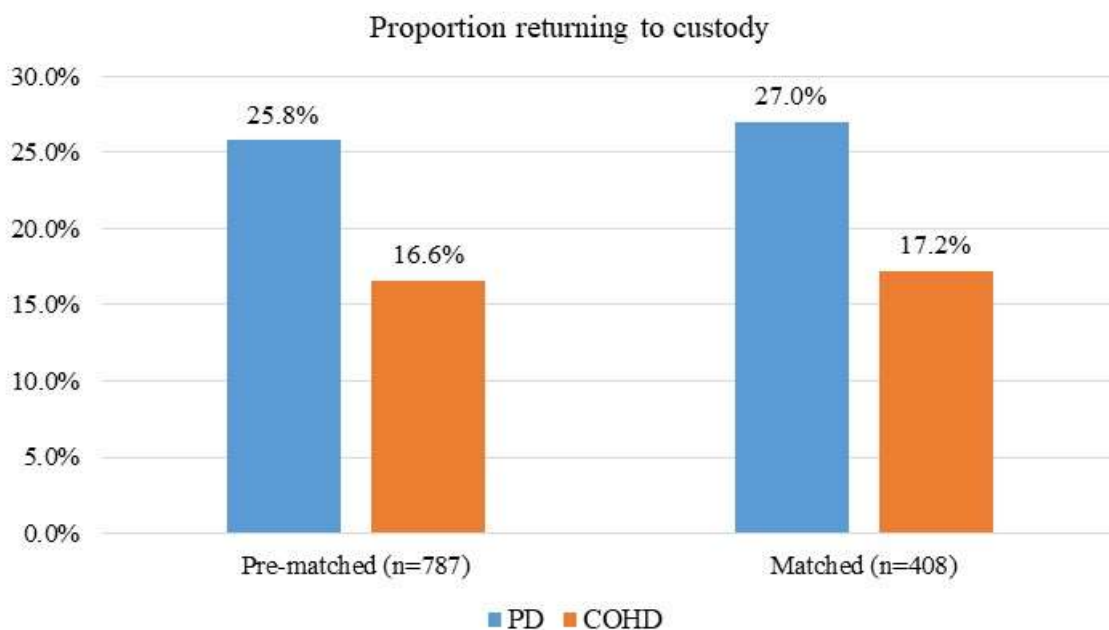
Potential impact of COVID-19 on breaches of orders and returns to custody

Given the COVID-19 pandemic, we examined whether and to what extent this potentially had an impact on the outcome variables under examination in the current evaluation including breaches of HD orders and returns to custody following HD orders. Initially, we used several different measures for estimating the potential impact of COVID-19 on prisoner breaches. These included whether prisoners were: (1) admitted to ROHD/sentenced to COHD during COVID-19; (2) were admitted to

ROHD/sentenced to COHD but left during the pandemic; and (3) were released to ROHD during a lockdown.

In terms of breaches, bivariate analyses suggested there was a positive association between being admitted to ROHD during COVID-19 and breaching conditions, and a negative association between being admitted to ROHD prior to COVID-19 and being released during the pandemic (Appendix E: Table 1). In short, those who were admitted to ROHD during COVID-19 were slightly more likely to have breached the conditions of their order, while those admitted prior to the pandemic and released during it were less likely to breach their ROHD order. These results are likely explained in part simply by the amount of time that characterised the observation period prior to and during the pandemic, but nonetheless it was important to determine if they had an impact on the likelihood of breaching conditions relative to the other variables that were analysed. Therefore, Table 17 displays the adjusted cox regression models predicting breaches of ROHD including the two variables discussed above. While the results show that being admitted to ROHD prior to the pandemic and completing ROHD during the pandemic was associated with a lower likelihood of breaching conditions of the order, the previous results remained in that the key predictors of breaching ROHD conditions were risk assessment score and not engaging in employment programs during time spent in custody.

In terms of returns to custody, bivariate analyses revealed that the impact of COVID-19 was negatively associated with returns to custody; those who returned to custody were less likely to have been admitted to ROHD during COVID-19, and similarly, those who were released during COVID-19 were also less likely to return to custody in the observation period (Appendix E: Table 2). Again, it was not possible to model these analyses for returns to custody because of the low base rate of this outcome. Finally, there were no statistical associations evident with being admitted to ROHD during a lock down and breaching the conditions of an order or returning to custody following an order.

Table 17: Adjusted Cox regression models predicting breaches/RTC among prisoners sentenced to ROHD between 1 November 2018 and 1 July 2021, ending by 27 August 2021

VARIABLES	MODEL 1 ROHD BREACH HR (95% CI)
Demographics	
Age	
Aboriginal	
Offence history	
Has multiple sentences	
Index offence (ROHD sentence)	
Drug	
Administrative/driving	0.91 (0.43-1.94)
Violent	
Public order/property	
Risk ratings	
Risk of Reoffending (ROR)^{sqrt}	1.63 (1.19-2.23)**

Prison programs	
Employment	0.20 (0.11-0.37)***
COVID	
Admitted to ROHD during COVID	0.69 (0.40-1.19)
Admitted prior to, but left during, COVID	0.13 (0.05-0.30)***
Sentence characteristics	
Length of ROHD (sentenced days)^{sqrt}	0.98 (0.93-1.03)
Goodness of fit	$x^2(8)=14.11, p=.08$
Nagelkerke R^2	.313

$p<.10^+$, $p<.05^*$, $p<.01^{**}$, $p<.001^{***}$

We re-ran these same analyses for those prisoners sentenced to COHD in the current study and a different pattern emerged. First, being sentenced to COHD during COVID-19 was not associated with breaching orders. Second, those who were sentenced to COHD prior to COVID-19 and were scheduled to complete their orders during COVID-19 were less likely to breach the conditions of their orders. Third, however, being sentenced to COHD during a lockdown was associated with an increased likelihood of breaching an order (Appendix F: Table 1).

Finally, in terms of returns to custody, those sentenced to COHD during COVID-19 were less likely to return to custody during the observations period (Appendix F: Table 2). Again, a plausible explanation for this finding is simply that the time period for which these individuals were observed in terms of returning to custody was far shorter than for individuals sentenced to COHD during the pandemic; being sentenced prior to COVID-19 and completing COHD during the pandemic was not associated with returns to custody, nor was being sentenced to COHD during a lockdown associated with returns to custody.

Table 18 displays the adjusted cox regression models predicting breaches of COHD and returns to custody following COHD including the COVID-19 related variables discussed above. While the results show that being admitted to COHD prior to the pandemic and completing COHD during the pandemic was associated with a lower likelihood of breaching conditions of the order, again, the key predictors of breaching ROHD conditions were risk assessment score and the presence of prior multiple sentences. For returns to custody following a COHD sentence, being sentenced to COHD during COVID-19 was associated with a decreased likelihood of returning to custody during the follow-up period, whereas having multiple prior sentences was associated with a more rapid return to custody net of the other variables in the model.

Table 18: Adjusted Cox regression models predicting breaches/RTC among prisoners sentenced to COHD between 1st November 2018 and 1 July 2021, ending by 27 August 2021

VARIABLES	MODEL 1 COHD BREACH HR (95% CI)	MODEL 2 COHD RTC HR (95% CI)
Demographics		
Age at release to COHD		0.83 (0.56-1.23)+
Offence history		

VARIABLES	MODEL 1 COHD BREACH HR (95% CI)	MODEL 2 COHD RTC HR (95% CI)
Has multiple sentences	3.05 (1.44-6.47)*	3.76 (1.97-7.17)***
Index offence (ROHD sentence)		
Theft	1.04 (0.44-2.45)	
Public order/property	1.51 (0.68-3.39)	
Risk ratings		
Risk of Reoffending (ROR)^{sqrt}	1.81 (1.02-3.22)*	1.28 (0.77-2.15)
COVID		
Admitted to COHD during COVID		0.23 (0.12-0.47)***
Admitted prior to, but left during, COVID	0.15 (0.04-0.68)*	
Admitted to COHD during lockdown	0.99 (0.33-2.98)	
Sentence characteristics		
Length of ROHD (sentenced days)^{sqrt}		0.96 (0.91-1.02)+
Goodness of fit	$x^2(8)=7.23, p=.51$	$x^2(8)=13.65, p=.09$
Nagelkerke R^2	.291	.216

$p<.10^+$, $p<.05^*$, $p<.01^{**}$, $p<.001^{***}$

4 Economic evaluation

This chapter presents findings for the extended Phase 2 of the HD economic evaluation, comprising a further 3-year study period from 2018-19 to 2020-21. As described in chapter 2, the ongoing economic component utilises the approach established in Phase 1. This section presents the results for the first report in the extended Phase two evaluation with the final report to follow in November 2022 when final data are available.

Introduction

Since the Phase one HD evaluation (2016-2018), the substantial costs associated with incarceration have continued to increase with growth in prison populations. Nationally in 2018-19 the government expenditure for corrective services was almost $4.77 billion when including depreciation, a real increase of 5.8 per cent from 2017-18 (Productivity Commission, 2020). Corrective services expenditure plus depreciation continued to increase in 2019-20 to $5.09 billion, a further real increase of 5.1 per cent from 2018-19 (Productivity Commission, 2021b).

The cost and growth in corrective services at the start of the Phase 1 project was particularly acute in SA which was experiencing one of the fastest growth rates in prisoner population in Australia, an increase of 67% over the 12 years from 2004 to 2016 (Government of South Australia, 2016). In response to this trend, the SA Government commenced a range of initiatives through the Correctional Services strategic plan with an emphasis on alternatives to custodial offender management, rehabilitation and a focus on outcomes (Government of South Australia, 2018). As noted in the Phase 1 report (Cale et al., 2018), these initiatives were implicitly aimed to reduce pressure on the State's custodial facilities and potential need for further high-cost investment in expansion or development of new prisons and the associated ongoing recurrent maintenance and running costs of new facilities.

In this national context of increasing pressure on prison capacity, the South Australian 10by20 Strategy Progress Report indicated the South Australian strategy was helping restrain custodial sentences including through home detention as an alternative to prison and through contributing to the lowest rate of return to corrective services in Australia at 44.9% (Government of South Australia, 2020). The rate of reoffending in South Australia reflects ongoing increased investment in rehabilitation programs, strengthening alternatives to custody such as HD and building better prison services (South Australian Department of Correctional Services, 2020). This longitudinal Phase 2 project was established to validate results since the preliminary Phase 1 evaluation and further examine the effectiveness and related cost effectiveness of the HD program.

At the time of preparing the Phase 2 HD evaluation results the Productivity Commission released a first research report into the criminal justice system emphasising the record number of people in Australian prisons (Productivity Commission, 2021a). The report provides perspective of the continuing long-term increase in the imprisonment rate since the 1980s, around the highest level in a century, while during the same period the Australian crime rate has been declining. Australian imprisonment rates are above Organisation for Economic Co-Operation and Development averages with the implication that further growth will continue to require large capital investment in further prison capacity in addition to the high daily cost within the available system. The

Productivity Commission (2021a) suggests that as the rising imprisonment rate is not explained through the amount or types of crime, government policy is at least part of the cause.

In this context the high cost of imprisonment is viewed in economic terms of the resulting justice system outcomes in the same way that increased spending in other sectors such as healthcare is evaluated in terms of health outcomes, and alternative interventions. As for healthcare policy, this provides valuable insights into the complex trade-offs facing policy makers.

The report notes the complexity in the reasons for increased prison rates including increased reporting of some crimes such as domestic violence, as well as changes in criminal justice policy which has made bail more difficult to access, with more offenders remanded in custody. The focus of the report is to examine alternatives to prison, including home detention, and potential effectiveness and related cost effectiveness of each option.

The Productivity Commission report (2021a) applies an economic framework to the underlying objectives and trade-offs in the prison system and notes some of the evidence gaps for policy makers including the developing evidence of HD presented in this and previous evaluations of HD in South Australia. The report notes the gap in longitudinal studies of pathways through the criminal justice system and how these affect outcomes for different cohorts. This extended Phase 2 evaluation is developing the evidence base and contributing to the longitudinal follow up of HD detainees.

The productivity report notes case study examples of policies and programs that have demonstrated net benefits through keeping some low-risk offenders out of prison by diversion, home detention or early parole, with reference to the South Australian HD Phase 1 evaluation for COHD and early release in the case of ROHD.

The report emphasises the importance of integrated services (such as HISSP) to support effective treatment of underlying issues helping offenders to reintegrate, rehabilitate and avoid further offending. It is noted that integrated offender support programs including the Australian Capital Territory's Extended Throughcare model appear to be effective in reducing recidivism (Griffiths, Zmudzki, & Bates, 2017). The report also underlines the value in pursing new initiatives and the need to measure and monitor outcomes and evaluate programs independently to drive continuous improvement, in line with this continuing evaluation of HD in SA.

Program growth

The first Phase of the HD evaluation showed growth in the SA HD programs since the introduction of ROHD in 2014 and the subsequent implementation of COHD in 2016 (see Figure 11, shaded left section). The current Phase 2 evaluation now extends data for detainees placed on HD orders since June 2014 to June 2021 with around 1,800 ROHD and 1,000 COHD, 2,742 HD orders in total. The total number of HD orders reflects ongoing cycling through the program at different durations for new detainees and those completing their HD order. The average HD duration for the study period 2018-19 to 2020-21 is around 6 months. To indicate the number of HD detainees in the program at any point, concurrent orders were derived as the number of total entries less the number of exits each month, (see Figure 11 dotted lines per order type). This shows that the program utilisation (concurrent detainees per month) has increased since the Phase 1 evaluation

to around 175 for ROHD and around 215 for COHD during 2020-21. These higher levels of program utilisation have been sustained consistently for the following 2 years in 2019-20 and 2020-21 indicating established stable high utilisation of the HD programs.

At the end of the Phase 1 study period in June 2017-18 both ROHD and COHD programs were fully implemented with around 150 detainees consistently placed under each order type. Although the COHD program commenced two years after the start of ROHD the number of concurrent detainees, as new orders commence and completed orders end, COHD showed initial indications that it had started to exceed the ROHD.

Growth in the HD programs has continued since the Phase 1 evaluation examined program costs for two complete financial years: 2016-17 and 2017-18. This timeframe overlapped with development in the HD programs, the implementation of the extended ROHD legislation and introduction of COHD in September 2016. ROHD has been provided in SA since 1993, before the Phase 1 study period in 2016-17 and 2017-18. During the Phase 1 evaluation timeframe the demand for ROHD orders remained consistently strong with around 1,100 cumulative program entries as at June 2018 (see Figure 11, blue solid line).[9] Over the same period the number of completed orders was similarly stable reflecting the throughput of typical HD sentences of several months (blue dashed line).

Figure 11: HD program development by type of order
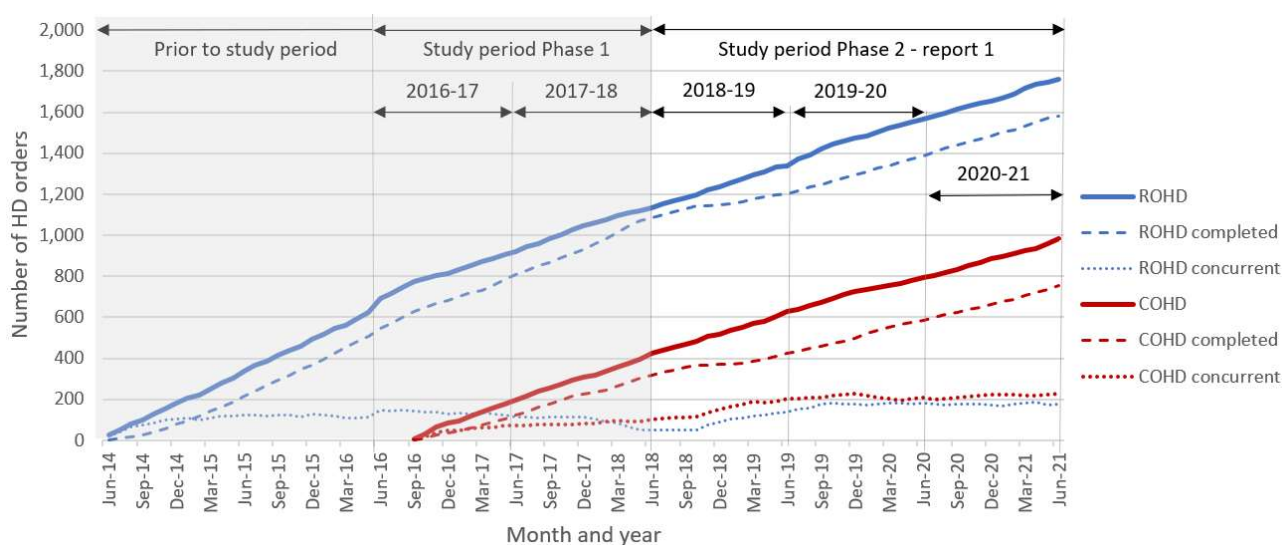
Source: SADCS offender data
Notes: Data on HD orders not available for July to October 2018, figures for these months have been interpolated. Figures include total HD orders including repeat orders for some detainees. Shaded section indicates completed Phase 1 study period.

The COHD orders commenced in September 2016 and similarly showed sustained growth and program demand. As for ROHD, the COHD program development is shown as cumulative entries

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[9] Minor variation to figures reported in the quantitative sections of the report due to timeframe cut-off and the quantitative figures focusing on completed orders.

(Figure 11, solid red line), cumulative completed orders (dashed red line) and the net concurrent number of orders derived from entries per month less completions per month (red dotted line).

The HD program is not directly capped through capacity of staffing or equipment and the supply of monitoring devices could be further scaled up as needed. The current level of about 400 detainees at any point in time is a net balance and there are routinely multiple orders of variable duration continually cycling in and out within each year. The trend in concurrent levels of detainees demonstrates sustained high demand and utilisation for the HD program during the evaluation period. Reported performance measures for the HD program has shown consistent achievement of the target 85% successful completion of orders including the most recent study period year in 2019-20 (South Australian Department of Correctional Services, 2020).

Program cost

In line with the Phase 1 evaluation report, program budget funding was announced by the SA Government in 2016/17 and 2017/18, and allocated over forward years to 2020/21, (see Table 19 below). These combined budget allocations were established to implement supervision and management of offenders subject to the 2016 introduction of court-ordered home detention and continue to expand the use of the Department for Correctional Services' sentenced HD program. The HD program budget allocation for the study period was $7.9 million in 2018-19, $8.1 million in 2019-20 and $8.2 million in 2020-21, a total of $24.1 million over the 3 financial years.

Table 19: Home detention budget allocation 2016/17 to 2020/21 ($million)

	2016/17	2017/18	2018/19	2019/20	2020/21	Total
2016/17 Budget allocation	2.041	4.402	4.512	4.625	4.694	20.274
2017/18 Budget allocation	0.618	3.280	3.351	3.425	3.497	14.171
Total	**2.659**	**7.682**	**7.863**	**8.050**	**8.191**	**34.445**

Source: SADCS Finance Directorate, SA Treasury Agency Statements
Note: The 2016/17 budget has been indexed at 1.5% for the current 2020/21 allocation of $4.694 million

HD funding is part of broader community-based supervision services including bail supervision, intensive bail supervision, parole and probation services, community services and the preparation of court reports (Government of South Australia, 2021).

Program staffing and HD operational costs

In line with the methodological approach presented in Chapter 2, the South Australian home detention program costs have been prepared based on the RoGS operating figures combined with estimated Electronic Monitoring (EM) and related Intensive Compliance Unit (ICU) costs for the program population, (see Table 20 below). The estimated total HD program cost was $4.8 million in 2018/19 and $4.3 million in 2019/20. There was an increase in SA net operating expenses from 2017-18 to 2018-19 resulting from a review of allocations relating to activities accounted for in Central Office cost centres concerning Community Corrections (Productivity Commission,

2021b).[10] The operating expenditure figure for 2020/21 is presented as indicative, as the RoGS base figures were not available at the time of the first report.[11]

Program staffing is a core cost component as HD detainees are case managed by a Community Corrections Officer and DCS is responsible for supervising offenders in the community. To cross validate program costs the initial Phase of the economic analysis examined HD related units across community corrections based on HD staffing and FTE positions provided by DCS Finance Directorate. The HD proportions were applied to each unit budget variance report to derive the total cost of HD for the study period. This alternative costing approach produced figures consistent with the RoGs based method. The final HD program costs present the RoGS allocation approach to support consistency and comparability with published Corrective Services cost reporting.

The HISSP service provider agreement was reassessed and recontracted from November 2017 through OARS Community Transitions and continued throughout the current 3-year evaluation period. The total cost of HD support services provided through HISSP were $1.3 million in 2018/19 with a decrease to $1.2 million in 2019/20. The total HD program cost including HISSP was $6.1 million in 2018/19, $5.5 million in 2019/20 and $5.1 million in 2020-21, a total of $16.7 million over the 3 financial years.

Table 20: DCS State-wide home detention program costs 2018-19 to 2020-21

Cost item	Source / calculation	2018/19	2019/20	2020/21
Net total operating expenditure (a)	ROGS	$ 53,893,000	$ 51,610,258	$ 52,384,412
EM and ICU costs* (b)	SADCS Finance	$ 10,688,645	$ 10,265,436	$ 10,163,359
Net operating expenditure less EM and ICU (c)	a-b	$ 43,204,355	$ 41,344,822	$ 42,221,053
Number of offender days (d)	ROGS	$ 2,187,848	$ 2,221,085	$ 2,076,804
Cost per day excluding EM and ICU (e)	(c divided by d)	$ 19.75	$ 18.61	$ 20.33
Avg daily CC population with EM and ICU input (f)	ROGS	864	1,032	988
Annualised cost of EM and ICU** (g)	SADCS Finance	$ 11,653,396	$ 11,050,885	$ 11,232,613
Daily cost of EM and ICU (h)	(g / 365.25)/f	$ 36.93	$ 29.32	$ 31.13
Cost of supervision, EM and ICU (i)	(e+h)	$ 56.67	$ 47.93	$ 51.46
Number of offender days (j)	(f x 365.25)	$ 315,576	$ 376,938	$ 360,867
Proportion of population in-scope (ROHD and COHD) (k)	Data run by GES	27%	24%	18%
Number of offender days for in-scope population (l)	(j x k)	$ 84,336	$ 89,622	$ 65,995
Annualised cost of ROHD and COHD		**$ 4,779,751**	**$ 4,295,803**	**$ 3,395,882**
HISSP service provider costs		$ 1,320,610	$ 1,201,181	$ 1,693,725
Total program cost per year		**$ 6,100,361**	**$ 5,496,984**	**$ 5,089,608**

Source: SADCS Finance Directorate
Notes: * Includes the portion of the EM contract and lost and damaged goods which was allocated to the Community Corrections population in the ROGS calculation, ** Includes the full annual cost of the EM contract and lost and damaged goods, EM = Electronic Monitoring, ICU = Intensive Compliance Unit, CC = Community Corrections

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[10] Table 8A.2, footnote e.
[11] Assumed as 2019-20 expenditure indexed at 1.5%.

Average cost per HD detainee

Average HD cost per detainee per month has been calculated across the 3-year study period based on total cost in 2020-21 dollars combined with total months of home detention for each order type. Cost data are aggregate across both ROHD and COHD order types with a total program cost for the 3-year study period from 2018/19 to 2020/21 of $16.95 million, (see Table 21 below). During the 3-year study period, based on orders that commenced within the financial year, there were 533 ROHD orders and 492 COHD orders, a total of 1,025 detainees.

Consistent with the Phase 1 economic evaluation the average cost figures are based on aggregate costs across both HD order types and are presented as indicative figures which mask inherent variation in the type, duration and support service mix of detainees. The average cost per detainee corresponds to an average HD sentence for ROHD of 5.4 months and 6.8 months for COHD.

Table 21: Average HD cost based on months in program 2018-19 to 2020-21

HD order type	Study period HD orders	% total orders	Average HD months	SD HD months	Total HD months	Proportion of total cost	Average cost based on HD months
ROHD	533	52.0%	5.4	5.8	2,885	$ 7,856,228	$ 14,740
COHD	492	48.0%	6.8	6.6	3,341	$ 9,097,564	$ 18,491
Total HD	**1,025**	**100.0%**			**6,226**	**$ 16,953,792**	**$ 16,540**

Source: SADCS Finance Directorate, SADCS offender data, SD=standard deviation
Notes: Figures presented in 2020-21 dollars indexed at 1.5% per annum.

Based on the total number of HD months during the study period from 2018-19 to 2020-21 of 6,226 this represents an average HD cost of $2,723 per month and an average cost per HD order of $16,540. On average ROHD orders were 5.4 months with estimated average cost per detainee of $14,740. Detainees serving COHD orders spent their full sentence in HD with a slightly higher average 6.8 months and an estimated average cost of $18,491.

Although HD sentences are generally around six months this annualises to $32,676 in the case of a full year in HD, which represents around 28% of the annual cost of prison in South Australia at $114,077 (Productivity Commission, 2021b).[12] The total program cost of $17.0 million is within the total budget for the 3-year study period of $24.5 million over 2018-19 to 2020-21.[13]

Custodial cost offsets from HD

The cost effectiveness analysis focused on a comparison of total program costs and HD activity during the study period, (see Figure 12, centre segment). For consistency with the Phase 1 evaluation this figure provides overarching perspective of the scale and proportion of HD cost components, before examining the detailed breakdown.

In line with the Phase 1 evaluation report the left segment (blue bar) is not shown as a directly comparative figure as it includes several years of prison sentences for some individuals in the HD study group. The figure is not used in any comparative calculations of custodial time avoided but indicates the scale of total cost of prison sentences for the study group prior to their ROHD order,

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[12] Productivity Commission, Report on Government Services, Corrective Services, part C Chapter 8, Table 8A.19. South Australian daily total net operating expenditure and capital costs of 312.54 *365=$114,077.
[13] Adjusted to 2020-21 dollars at 1.5% per annum.

$115.5 million.[14] This simply provides a high-level perspective of the HD program cost of $16.95 million over the three-year study period (green bar). These two elements are shown as positive cost figures above the zero baseline.

Figure 12: Home detention cost and custodial cost offsets
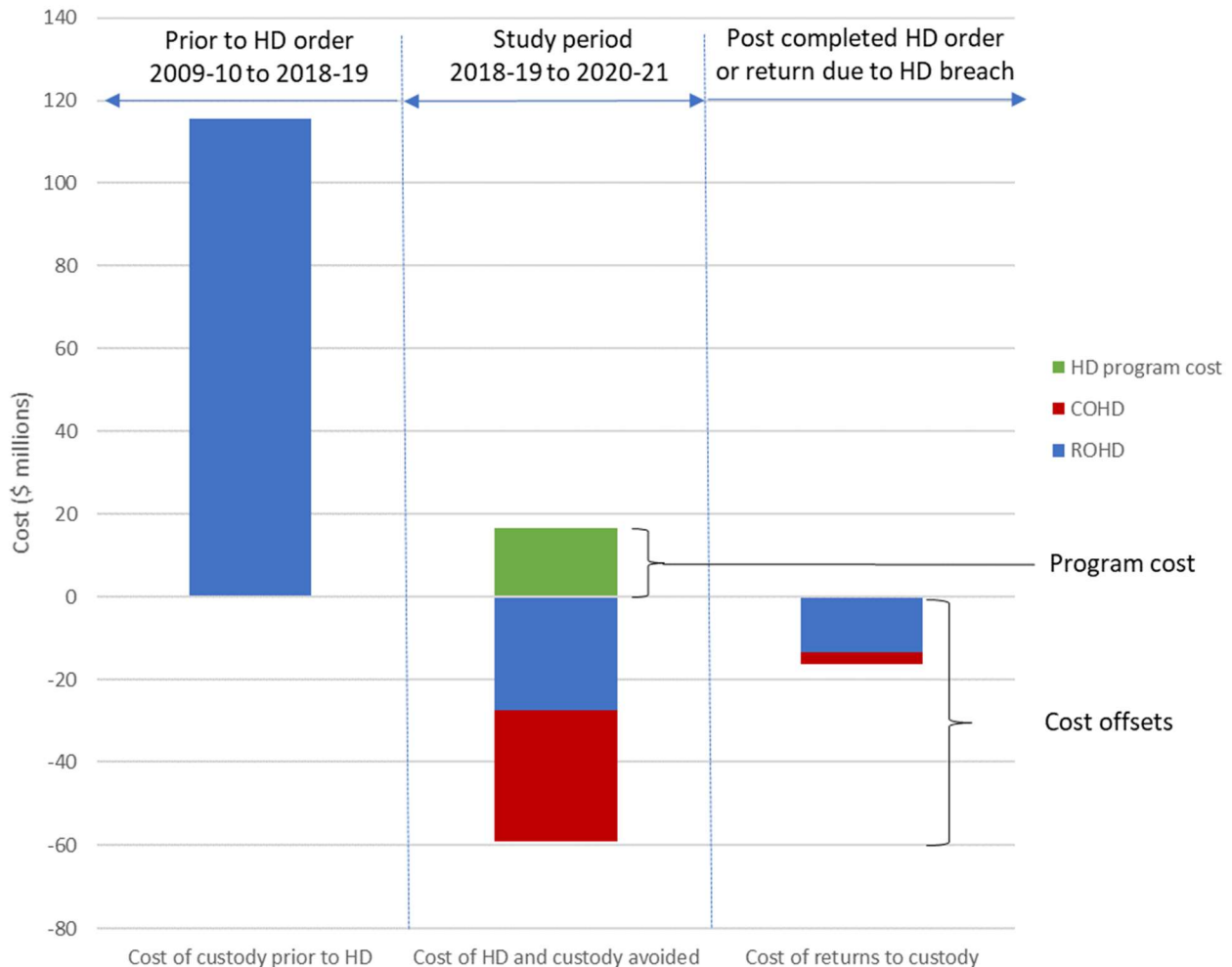
Source: SADCS offender data, DCS Finance Directorate

The comparative custodial cost offsets for the ROHD study group are based exclusively on commencement of a HD order during the study period, calculated from expected release date and HD commencement date that reduced the number of days in prison, shown as negative costs below the zero baseline. For the ROHD group this represents a cost offset of $27.4 million over the three financial years.[15] The fact that a core element of custodial cost offset is directly measurable is a particularly positive observation of the HD outcomes. This is not typical of community-based offender support programs that generally require assessment through custodial baselines compared to follow up of returns to custody. Previous studies have shown that community-based support programs for released prisoners such as the Extended Throughcare program in the ACT reduce recidivism, but custodial offsets are based on prior history and reflect inherent uncertainty

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[14] Based on prior prison sentences for the ROHD group at an average of 1.9 years (n=533, SD=1.6), a total of 1,013 prison years representing a total cost of $115.5 million.
[15] Based on ROHD days within study period, at an average of 5.4 months (n=533, SD=5.8 months, total of 240.4 years of custody avoided representing $27.4 million.

in potential future returns to custody and related severity and sentence of offences (Griffiths et al., 2017).

Whereas ROHD results in reduced prison days due to early release, COHD represents a complete prison diversion with the full HD sentence an avoided custodial term. Similar calculations were made to derive the COHD custodial cost offsets during the study period of $31.8 million (red bar).[16] In line with the Phase 1 evaluation this provides the core base figures for the estimated program cost effectiveness as all values are based directly on measurable costs and prison days avoided during the study period. Combined, the HD program cost of $16.95 million is generating cost offsets through prison time avoided of $59.2 million. This result provides a comparable summary to the Phase 1 evaluation and validates the core HD cost offsets reported in the previous report. Further extended Phase 2 analysis is presented in the following sections.

Custodial cost offsets from reduced returns to custody

In addition to the core prison time avoided within the study period, the HD program is also generating further cost offsets following completion of orders through reduced returns to custody (RTC). As presented in the quantitative analysis of the propensity score matched comparison group, only 11.2% of ROHD detainees returned to prison compared to 25.8% of the prison discharge group representing a reduced RTC rate of 14.6%. The COHD study group also returned to custody at a lower rate of 17.2% compared to the control group RTC rate of 27.0%, a reduced rate of 9.8%.

These estimated RTC figures reflect characteristic uncertainty in future detainee pathways and are subject to variation in actual custodial returns and the related prison cost offsets. For this reason, the figures shown in Figure 12 (right hand segment) are presented as indicative further offsets based on reduced RTC average sentences.[17] In line with the quantitative analyses, the ROHD returns are based on an average sentence (prison and ROHD component) of 1.5 years resulting in an estimated further cost offset of $13.3 million.[18] The reduced COHD returns to custody provide a further cost offset but a substantially lower estimated decline. The smaller estimated offset is due to COHD being HD only with no prison sentence and therefore a shorter average sentence of 0.54 years which is combined with a smaller RTC reduction of 9.8%.[19] Based on these preliminary estimates, HD is generating a further $16.3 million in cost offsets through reduced RTC episodes.

Examined together it is clear that the HD program cost of $16.85 million is generating $59.2 million of direct prison offsets with high confidence, plus a further estimated future offset beyond the study timeframe, with no identified additional correctional services cost, of $16.3 million. Although there is uncertainty around the additional offset estimate this suggests a combined custodial cost offset in the order of $75.5 million. It is exceptional that government programs deliver this level of cost effectiveness where the total program cost is generating multiples in offsets of around 3.5 times

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[16] Based on COHD days within study period at an average of 6.8 months (n=492, SD=6.6 months, total of 278.4 years of custody avoided representing $31.8 million.

[17] Average prior sentence data has been used as RTC custodial data does not include further details of each return sentence.

[18] Based on a 14.6% reduced probability of an average sentence of 1.5 years (n=533).

[19] Based on a 9.8% reduced probability of an average sentence of 0.54 years (n=492).

within the study timeframe and nearly 4.5 times if the future reductions in RTC are considered. Further details of the RTC component are presented in the following economic modelling sections.

Program outcomes and benefits

The economic evaluation takes the core perspective of DCS as the funding agency and examines outcomes and cost offsets to corrective services. This provides a focus for program cost effectiveness based on data sources available for the evaluation. As described in the Phase 1 evaluation report (Cale et al, 2018), the HD program is supporting a wide range of positive outcomes for detainees with the overarching aims of improving community integration, social and health outcomes and reducing reoffending rates. The HD Program benefits may extend into the medium and longer-term with interrelated positive outcomes such as increased ability to obtain and sustain appropriate housing and reduced risk of homelessness, management of drug and alcohol abuse, improved community and workforce participation, improved education and job skill training, improved and sustained physical and mental health, as well as improved outcomes for families and children of offenders.

There are also positive outcomes such as the relative contribution of using innovative technology such as electronic monitoring, the benefits that may result from tailored individualised case management and related potential turning points that may support improved lifetime pathway trajectories with life changing long term outcomes. Although HD detainees are without exception lower risk offenders than those committing violent crimes, there are potential rehabilitation points for this group, particularly COHD who may be first time offenders and avoid being exposed to the prison environment. In this context, the economic evaluation presents a base case of the SA HD program effectiveness and related cost effectiveness, but research shows that there are further likely positive outcomes that, if study group data were available, would add further to the cost effectiveness of results.

Research indicates that increasing numbers of Australians with limited educational backgrounds, financial capacity and employment opportunities, and mental and cognitive disabilities are imprisoned each year, and as a result of their incapacity to reintegrate with society successfully when released often return to prison reflecting inequity for socially disadvantaged persons (Eileen Baldry & Russell, 2017; Russell & Baldry, 2020). This research shows the associated high social costs of prison where those incarcerated are usually worse off when released with around a half being homeless and the rest being in unstable or unsuitable housing and over 75 per cent being unemployed (Baldry et al., 2006). Imprisonment results in loss of housing and employment, often more indebtedness, and when compounded with underlying complex support needs results in continuing the imprisonment cycle.

The research into prisoner outcomes suggests that families of prisoners also often face related economic, social and emotional disadvantages with large numbers of children suffering from the imprisonment of a parent at some time in their childhood. Children of women prisoners' experience loss of their mother and are often placed in out of home care or in the informal care of extended family. Further, children of prisoners typically experience disrupted schooling and greater poverty and are more open to abuse and the likelihood of themselves ending up in prison.

In this context the assessment of HD program costs presented in the previous section show the up-front program establishment and ongoing costs but are compared only for a subgroup of program benefits that can be measured in monetary terms. Full program benefits are often diffused, difficult to quantify, and may result after substantial time lags beyond the study timeframe. Assessment of these types of benefits require data linkage over extended post-program periods with secondary data sources such as healthcare, community programs, accommodation and justice systems.

The HD program aims to develop more structured days for offenders so in cases of no employment, detainees are required to undertake education, or they may do community service. Separate benefits may stem from the complexities for women in HD in their daily activity including family responsibilities. And further indirect benefits may result from reduced pressure on prison overcrowding and helping facilitate sufficient space and suitable environments for undertaking rehabilitation programs.

Finally, the SA HD program as an alternative to prison supports community benefits through detainees serving their sentence in an appropriate supervised environment, with support, training and rehabilitation services while retaining connection to live within the community. The extent that HD is avoiding prison as well as reducing returns to custody will have ongoing benefits resulting from the program investment in the HD order options.

Program cost effectiveness

The Phase 1 evaluation report assessed program cost effectiveness in the context of the established growth trend in the South Australian prison population and the associated high cost of additional prison demand. The SA DCS 10 by 20 initiative incorporated the potential impact of diversionary strategies including HD to support improved outcomes as well as relieve custodial demand pressure and avoid, or delay, the need for development of new infrastructure. The strategy underlined the key role that non-custodial interventions could play in alleviating prison capacity pressure through alternatives to custodial sentencing, diversionary options for first time offenders from entering the prison system and reducing recidivism through community-based programs to support rehabilitation (Cale et al., 2018).

In this overarching context, this Phase 2 cost effectiveness evaluation validates core cost offsets during the study period and extends the longitudinal follow up to further examine the actual impact of reduced recidivism by individuals placed on HD orders compared to those on custodial prison sentences. The economic Markov modelling firstly developed a base case to assess the cost effectiveness of the direct cost offsets resulting from prison time avoided due to the alternative HD order. From the base case the model is then extended to incorporate the reduced rate of returns to custody for those serving HD orders compared to the control group.

HD cost effectiveness base case

The predominant HD cost offsets are driven by the cost of prison avoided by being placed on a HD order, directly reflecting the high cost of imprisonment with the much lower cost of HD. The cost offsets for each HD order are known with certainty as the full duration of the ROHD or COHD is a direct alternative to being in prison. In this context the base case model establishes a base line

where the custodial alternative is the cost of prison for the equivalent HD sentence, (see Figure 13 below). The no HD control group is shown as the alternative cost of imprisonment of around $58,000 for the average 6-month HD sentence.[20] This is the equivalent custodial cost for each detainee if they had remained in prison (indicated as red square). The no HD control group represent zero prison years avoided as they would have remained in custody if they had not been placed on the alternative HD order (therefore shown as zero prison years avoided on the horizontal axis).

Figure 13: Estimated cost effectiveness per HD detainee - base case
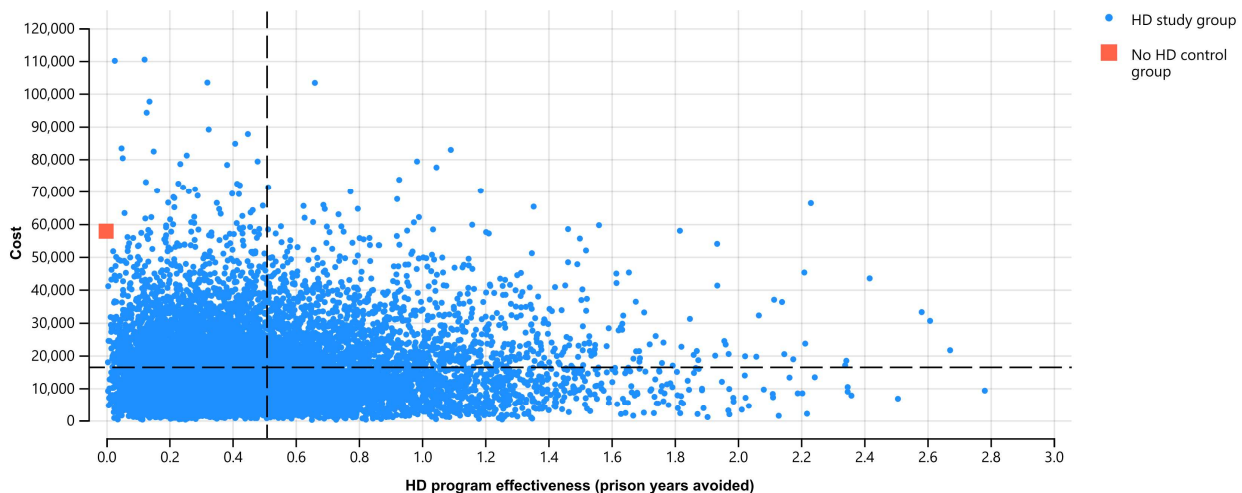
Source: SADCS offender data, DCS Finance Directorate

The HD study group reflects the cost of the HD program for the duration of each ROHD and COHD order.[21] The study group bootstrapping scatter plot (blue dots) represents the variation in HD duration with a mean of half a prison year avoided and an average HD program cost per detainee of $16,436 (shown as dotted line intersection). This represents the variation in HD sentences as prison years avoided on the horizontal axis (average 0.51 years – dotted line) and the net cost of the HD program less the cost offset of avoiding prison. The model bootstrap distribution shows HD prison years saved as always positive, seeing as all HD results in avoided time in prison.

From the base case cost and outcome distributions in Figure 13, HD program cost effectiveness is estimated as the incremental cost of HD, compared to the incremental outcome of prison years avoided, (see Figure 14 below). The point estimates from model bootstrapping indicate a lower mean cost of $41,287 for HD compared to the equivalent duration sentence in prison.[22] This lower cost is associated with the mean HD program effectiveness of 0.51 years (shown as dotted line intersection). This represents a highly cost-effective outcome as the program is delivering a positive outcome of prison years avoided as well as being lower cost. This type of economic modelling commonly compares positive costs for the study and control groups with respective outcomes to calculate an incremental cost effectiveness ratio. This facilitates comparison to evaluate a program that may be twice the cost of a comparator, but in generating five times better

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[20] Average HD sentence 0.506 years * $114,077 (2019-20) = $57,723
[21] ROHD mean 5.4 months (S.D. 5.8 months), COHD mean 6.8 months (S.D. 6.6 months).
[22] Mean HD cost $16,260 compared to mean prison cost of $57,723.

outcomes, is cost effective. In the case of HD, the incremental cost effectiveness ratio is negative because of lower cost and better outcomes and is considered 'cost saving'. The 95% confidence interval for model variation in all parameters is shown as the green ellipse.

Figure 14: Incremental cost effectiveness per HD detainee – base case
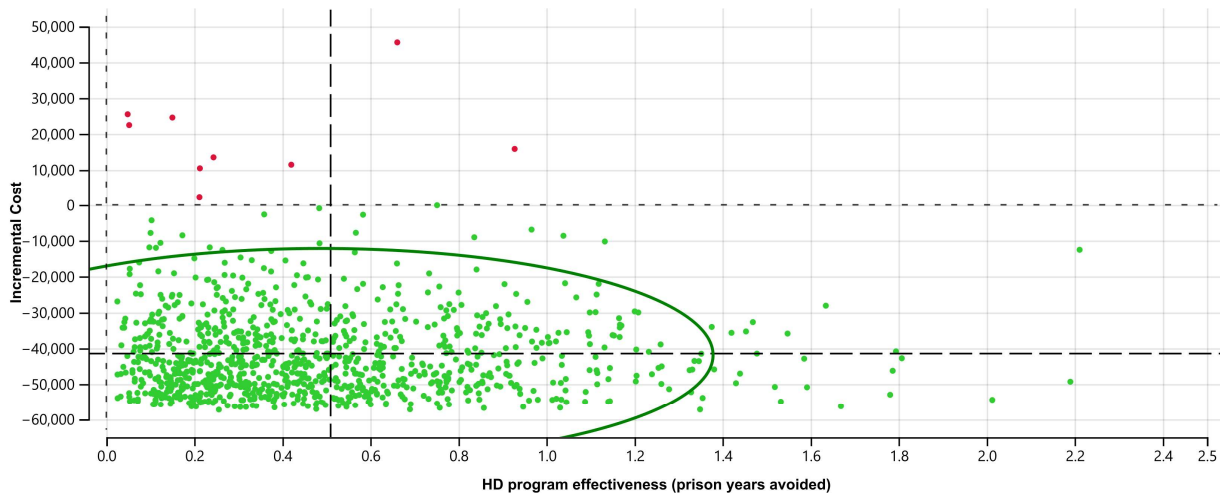
Source: SADCS offender data, DCS Finance Directorate
Note: 95% confidence interval indicated by green ellipse

The base case model findings are consistent with and validate the Phase 1 evaluation results (Cale et al, 2018). The outcome is not surprising given the diversion from high-cost prison custody to substantially lower cost monitoring and supervision in a home setting. Although there is variation in the cost offsets through the amount of prison time avoided for each HD order, the core base case component of the cost effectiveness modelling is directly driven by the number of HD orders and associated sentence durations, this offset projects forward with confidence. This is not the case with changes in returns to custody given the uncertainty of actual returns. For this reason, the RTC component has been added to the base case separately to assess the further positive incremental outcomes and related variation.

Cost effectiveness including RTCs

The second component of cost offsets resulting from the HD program relates to reduced returns to custody (RTC) for those having completed a HD order compared to the no HD control group. Based on the quantitative analyses (section 3) the percentage of RTCs was 14.6% lower for ROHD and 9.8% lower for those subject to COHD compared to the matched control group.[23] The model integrated these rates of return in each HD order type to estimate the additional program cost effectiveness resulting from this improved outcome occurring beyond the HD order period.

Separate to the base case cost offsets the future RTC rates reflect inherent uncertainty which could result in a range of future actual cost offsets. The Markov model framework was extended to include the expected rates of return combined with the average sentence durations prior to HD and related variation. As presented in the quantitative analyses the offender data indicates returns to

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[23] ROHD 11.2% RTCs compared to 25.8% control = 14.6%, COHD 17.2% compared to 27.0% control group = 9.8%.

custody but does not include finalised sentence details. For this reason, the model assumes RTC is for the same average sentence for the study period HD orders.

When the RTC model parameters are included the cost effectiveness per detainee extends the base case estimates and introduces additional uncertainty into the estimated cost effectiveness, (see Figure 15 below). Where the base case scenario identified the control group as a single baseline point, the RTCs now reflect the calculated cost and total prison years avoided as a negative value (the estimated cost of the return to prison years), from the previous zero baseline. The control group bootstrapped scatter plot reflects this variation above the $57,000 cost of the average HD order duration and variation across RTC sentences (red point estimates). The average total cost when RCTs are included is $88,171 made up of the base case $57,723 plus an average $30,448 for the estimated returned prison time.[24]

Figure 15: Estimated cost effectiveness per HD detainee – including RTC
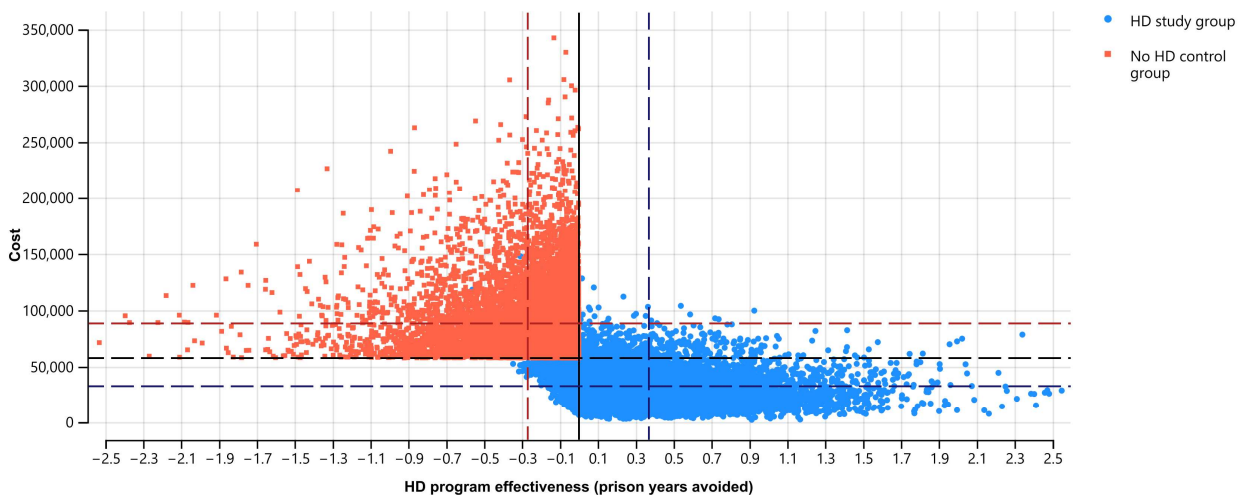
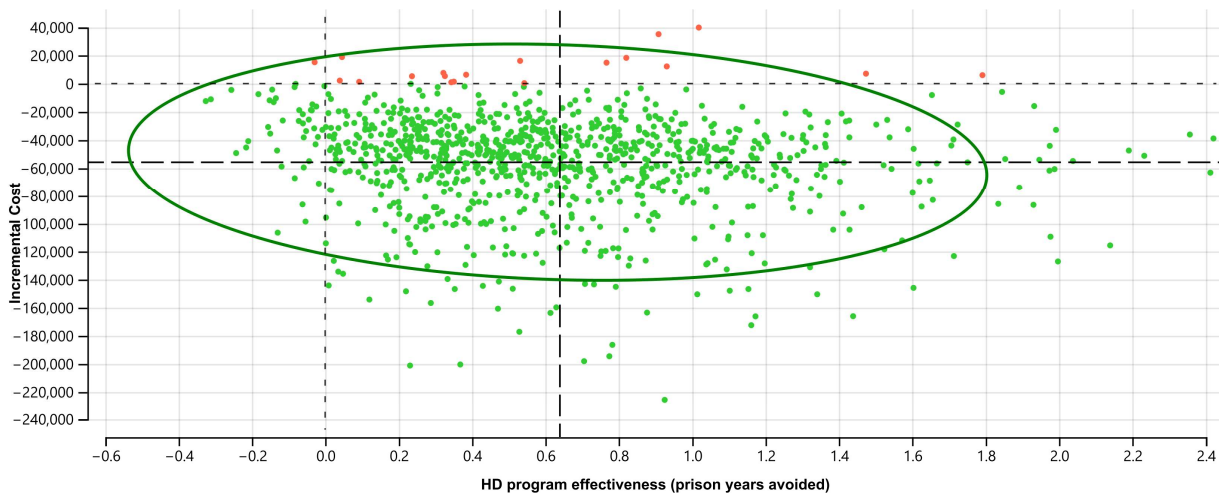Source: SADCS offender data, DCS Finance Directorate

The HD study group similarly now incorporate the cost of the HD program with reduced prison years avoided to reflect the addition of the returns to custody. This shows that the study group has decreased mean prison years avoided from 0.51 to 0.37 in total, a decrease from base case of 0.14 years. In line with the higher proportion of RTCs in the matched control group the impact is higher with a decrease in prison years avoided of -0.27 (red dashed line intersection).

The combined contribution to HD program cost effectiveness is again presented as the incremental cost and prison years avoided, (see Figure 16 below). The model results show the estimated increased contribution to cost effectiveness per detainee resulting from relatively lower RTCs. The incremental cost (cost of HD program plus prison cost offsets) has increased $14,140 to $55,427. Although the prison years avoided decreased for the HD study group when RTCs are included, as the control group prison years avoided decreased by more, the incremental effectiveness has increased by 0.14 years to 0.64 (dashed line intercept).

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[24] The control group RTC assumes 26% probability of return as average between ROHD 25.8% and COHD 27.0%. The control group RTC sentence assumes 1.02 years as average between ROHD 1.50 years and COHD 0.54 years. This equates to an average 0.27 years in returned prison time at an average cost of around $30,448.

The inclusion of estimated RTCs contributes to increased HD program cost effectiveness and the results remain exceptional as 'cost saving' including increased cost offsets as well as additional prison years avoided. In line with the high variation in return sentences the bootstrapped results reflect a substantial range around the mean cost effectiveness estimate, shown with joint 95% confidence across all model parameters as the green ellipse.

Figure 16: Incremental cost effectiveness per HD detainee – including RTC

Source: SADCS offender data, DCS Finance Directorate
Note: 95% confidence interval indicated by green ellipse

This helps better assess the contribution of the RTC component of the cost offsets showing that although there is substantial variation, the 95% confidence interval indicates significantly lower cost as well as increased prison years avoided for the HD study group.

It is conventional to report probabilistic sensitivity analysis (PSA) as cost effectiveness acceptability curves representing the probability of the program being cost effective at respective cost thresholds. In the case of the HD modelling the estimated probability of being cost effective is effectively 100% as the results are 'cost saving'. The red point estimate dots in Figure 16 above show incremental cost greater than zero, but these are also associated with positive effectiveness of prison years avoided (to the right of the zero vertical axis).

HD Cost effectiveness results

The economic model base case takes a conservative approach to establish the core scenario that is known with certainty. In this context the base case uses a single year timeframe focusing on the average HD duration and the directly related prison time avoided because of the community-based alternative during the study period, (see Table 22 below). The cost effectiveness results present the estimated program cost and prison years avoided as shown in the bootstrap model distributions in the previous sections. The base case presents the average HD program cost of $16,436 (combined ROHD and COHD) compared to the control group cost of $57,723 as the equivalent HD period had detainees remained in prison. This provides an incremental higher cost of $41,287 for the control group.

Similarly, the effectiveness for the HD study group in prison years avoided (PYA) results directly from the average HD period of 0.51 years compared to the baseline control group with zero prison years avoided. It is conventional to present cost effectiveness results as incremental cost effectiveness ratios with an estimated probability of being cost effective based on model distributions and bootstrapping analysis. For the HD cost effectiveness base case, the results are exceptional as the HD study group are lower cost and produce an improved outcome in prison years avoided. For this reason, an incremental cost effectiveness ratio is not presented, and the result is shown as cost saving.[25]

Table 22: HD Program cost effectiveness results

| | Cost | | Effectiveness | | |
Model scenario	Total cost	Additional cost	PYAs	Additional PYAs	Cost per PYA
Base case – During study period					
HD Study group:	$16,436		0.51		
Control group:					Cost saving
Prisoners discharged	$57,723	$41,287	0.00	-0.51	
Extended scenario including RTCs					
HD Study group:	$32,745		0.37		
Control group:					Cost saving
Prisoners discharged	$88,171	$55,427	-0.27	-0.64	

Source: SADCS offender data, DCS Finance Directorate

Notes: Cost effectiveness is the estimated costs per Prison Year Avoided (PYA). Estimated over a 1-year timeframe following entry to the HD program. Costs indexed to 2020-21 dollars.

The extended scenario results including the comparative lower rate of returns to custody in the HD study group is presented in the same format, (Table 22). In this scenario the HD study group average cost increases to $32,745 (the HD program cost plus the additional cost of study group returns to prison) and the prison years avoided decreases by the amount of the returns to custody (from 0.51 PYA to 0.37). The control group average cost increases by the additional return to prison duration and the PYA decrease by the comparatively higher RTC rate amount for the control group, from the zero-base case to -0.27 prison years avoided. This extends the estimated cost saving result of the HD study group to $55,527 per detainee with an estimated comparative saving of 0.61 prison years avoided. The probabilistic sensitivity analysis in Figure 14 and Figure 16 show that although the results reflect substantial variation, due to the distribution of individual sentences, the results are contained within the 95% confidence interval.

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[25] The occurrence of a lower cost and positive outcome is referred to as 'dominated' and results in a negative incremental cost effectiveness ratio which is not intuitive and not necessary as the 'cost saving' result is already highly cost effective.

Other potential HD benefits and cost offsets

In addition to the highly positive HD program cost effectiveness results for the base case and reduced returns to custody there are highly likely further benefits and related cost offsets. Although data for these additional outcomes are not available for the HD study group, previous research indicates that these dimensions are well established plausible components of HD program pathways. These additional potential benefits are not explicitly incorporated in the economic modelling but plausibly provide further upside returns from the HD program investment. This emphasises the conservative approach taken and that the very positive results presented in the previous sections establish the core outcomes known with confidence and are likely to be associated with implicit further effectiveness and related cost effectiveness.

For example, previous research has examined the lifetime pathway of prison populations with inherent complex needs that have been shown can manifest across interrelated sectors for homelessness, mental and physical health, disability, criminal justice, social benefits, education and employment (E Baldry, Dowse, McCausland, & Clarence, 2012). As noted in the Phase 1 economic evaluation, this research compiled case studies of individuals that share similar complex needs, disadvantage, vulnerabilities and risk factors to the HD study group. The work estimated a range of institutional life-course costs associated with cycling in and out of criminal justice across age groups, with figures ranging from $900,000 to $4.5 million per individual. In this longer-term pathway cost perspective, the estimated cost per HD order of around $16,000 is potentially marginal given the possibility of positively altering the lifetime pathway, at least for a proportion of HD participants. The research specifically positions the importance of key elements of the Program including establishing stable and secure housing and the value of associated wrap around support services such as HISSP.

The Phase 1 economic evaluation also noted separate research examining the lifetime cost perspective of reducing recidivism, similarly in the context of vulnerable prison groups, including younger people and Aboriginal people (Office of the Inspector of Custodial Services, 2014). This research based on Western Australian recidivism rates emphasises the high-cost implications of repeat offending in terms of imprisonment costs, as well as indirectly through related rates of increased crime, more victims and flow-on related costs to interrelated government agencies. This provides evidence of the multidimensional flow on benefits associated with reduced rates of recidivism. These are related benefits in context of the validated reduced returns to custody in the HD study group Phase 2 longitudinal follow up and potentially facilitate ongoing pathway benefits contributing to cost offset benefits into the future.

From this direct cost perspective, there are then the range of potential government and social costs across healthcare, drug and alcohol support, homelessness, employment and other often immeasurable pathway implications. This longer-term perspective is particularly relevant for intervention programs such as HD as there is no substantial upfront investment to recover over time, and pathway stabilisation may continue to generate continuing positive outcomes without further program investment. Although HD detainees are assessed as lower risk there are no doubt frequent cases were avoiding prison and receiving support services in a safe and secure environment may make a profound difference. While the forward pathway and preliminary findings on reduced HD recidivism reflect inherent uncertainty about future lifetime pathways, it is plausible that these lifetime perspectives are relevant in some cases.

These types of additional benefits could include increased participation in education and employment and other measures of quality of life for the Program participants, their families, partners and children. The forward scenarios illustrate that even under consistently conservative assumptions HD detainees in a proportion of cases may benefit from improved lifetime trajectories, which are potentially reflected in significant positive benefits and system cost offsets, extending well beyond the HD episode and potentially offsetting the cost of HD investment many times over.

There are also indirect costs of imprisonment including lost employment, declining physical or mental health and family separation, likely to fall on prisoners' families and society more generally (Productivity Commission, 2021a). Although many of these costs are potentially significant, they are often difficult to measure, at least in monetary terms. The recent Productivity Commission work (2021a) notes that alternative punishments such as diversion from prison can significantly reduce these indirect costs.

It is clear that the cost of being in prison goes beyond the direct operating expenditure and capital costs with indirect costs of prison often including lost productivity for paid and unpaid work and workplace disruption while offenders are in prison (Morgan, 2018). This research indicates these cost items are an average of $28,284 per prisoner.[26] Other costs related to imprisonment have been estimated for items including lost productivity across paid and unpaid work, workplace disruption and replacement and injury through prison assaults. These costs have been estimated to add in the order of 20% to the direct sentence cost of prison alone. A supplementary economic modelling scenario indicates these indirect costs could add a further $8,500 of cost offsets per detainee, results provided in Appendix G.

Further costs relate to policing and court costs, and these would add further offsets to the HD cost effectiveness through reduced RTCs. This adds to the conservative approach taken for the evaluation and provides potentially further cost effectiveness upside. As many of the costs associated with crime relate to serious criminal and violent offences and home detention is targeted at low-risk offenders these indirect costs are likely to be lower in line with committed offences and risk profiles.

The costs of crime in Australia extend across interrelated sectors and many aspects for offenders, their families and the broader community. These may include medical costs, lost output, and intangible costs, which set a monetary value on pain, suffering and lost quality of life (Mayhew, 2003). Cost estimates are presented for homicide, assault, sexual assault, robbery, burglary, theft of vehicles, theft from vehicles, shop theft, other theft, criminal damage or vandalism, arson, fraud, drug offences, overall crime costs, and other costs, including criminal justice system costs, costs of victim assistance, security costs, household precaution costs, and insurance costs. Overall crime costs come to $19 billion, with additional costs (such as policing, prisons and security) adding nearly another $13 billion, giving a total estimated bill of nearly $32 billion per year. Fraud is the costliest crime, followed by violent crime (homicide, assault and sexual assault) and burglary.

There are also potential improved outcomes within the RTC cases, for example individuals who may have committed more serious crimes in the past or with a history in repeat offending may face RTC for a relatively minor technical breach or minor offence. The current outcome quantitative

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[26] Estimated for average HD order of 6.1 months, base costs from 2014-15 indexed at 1.5% per annum to 2019-20.

analysis data flag RTC but masks the potential fact that for individuals RTC may have resulted after a longer stable period out of custody than previously and for a significantly less serious offence, which in context represents an improved outcome.

5 Conclusions

The report presents preliminary findings for the second evaluation of HD in SA. Specifically, the report details findings of the outcomes analysis for offenders on ROHD and COHD and the related economic evaluation for the period November 2018 to end June 2021.

The quantitative analysis includes comprehensive bivariate descriptions of offenders sentenced to both ROHD and COHD between November 2018 (end of first evaluation) and 27 August 2021. A comparison of both cohorts shows many similarities between the demographic and criminal history profiles of both groups including ages (mean of 39.7 for all those of ROHD and 38.1 for all on COHD); the proportion of Aboriginal and Torres Strait Islander offenders sentenced to these programs (8.9% for ROHD and 9.3% for COHD); and the proportion of offenders with an offence history indicating multiple sentences (35.3% for ROHD and 34.2% for COHD). There are distinct differences in the index offence of those receiving ROHD and COHD with the highest proportion of those on ROHD sentenced for a drug offence (35%) and the highest proportion of those on COHD sentenced for an administrative or driving offence (78.1%).

Findings for the quantitative analysis also show a higher rate of breaching associated with ROHD. Almost one in five offenders (19.4%) sentenced to ROHD breached their conditions with analysis showing that a higher Risk of Reoffending (ROR) score; not participating in a prison employment program; and a shorter sentence were factors associated with a faster rate of ROHD breach. In comparison 15.9% of offenders breached COHD with analysis indicating that those with multiple prior sentences and higher ROR scores were twice as likely to breach their conditions.

Analysis that compared those on ROHD with those discharged from prison showed that those on ROHD were significantly more likely to be older, sentenced for a drug offence, participate in making changes and violence prevention programs, and had a longer non-parole period. In contrast, those discharged from prison were significantly more likely to be Aboriginal or Torres Strait Islander, have a prior sentence, be sentenced for fraud, violence or a public/order property related offence and return to prison.

Propensity score matching was used to compare those on ROHD with a matched group of offenders discharged from prison. This analysis showed that those on ROHD were significantly less likely than a matched group to return to custody by the end of the observation period (25.8% versus 11.2%). Indeed, the odds of returning to custody was a little more than two times lower for those in ROHD. Propensity score matching was also used to compare those on COHD with a matched group of offenders discharged from prison. While this analysis highlighted some differences between the samples[27], it also indicated that those on COHD were 1.79 times less likely to return to custody than those who discharged from prison.

The researchers also used measures to examine any potential impact that COVID-19 may have had on the outcome variables under examination (specifically breaching and returns to custody).

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[27] Those in COHD were significantly more likely than the prison discharged group to be sentenced for an administrative/driving or theft related offence; prison discharged group were more likely to be male, Aboriginal, be sentenced for a drug, fraud, public order/property related offence, and return to custody.

This analysis indicates that those who were admitted to ROHD during COVID-19 were slightly more likely to have breached the conditions of their order, while those admitted prior to the pandemic and released during it were less likely to breach their ROHD order. A different pattern is evident for those on COHD. Here, analysis indicates that those who were sentenced to COHD prior to COVID-19 and were scheduled to complete their orders during COVID-19 were less likely to breach the conditions of their orders. However, being sentenced to COHD during a lockdown was associated with an increased likelihood of breaching an order. This analysis should be considered with caution due to the short time frame and low sample sizes.

The economic analysis indicates that the South Australian HD program is highly cost-effective. Through prison time avoided the program cost of $17.0 million is generating $59.2 million of direct prison offsets with high confidence, plus a further estimated future offset beyond the study timeframe of $16.3 million, a total estimated cost offset of $75.5 million. Per HD detainee this equates to an average HD cost of $16,436 resulting in cost savings of $41,287 per detainee through direct HD prison time avoided and $55,427 when including subsequent reduced returns to custody.

The HD program is also potentially producing a range of implicit positive outcomes that are difficult to measure, particularly in monetary terms. These benefits may include increased ability to obtain and sustain appropriate housing and reduced risk of homelessness, management of drug and alcohol abuse, improved community and workforce participation, improved education and job skill training, improved and sustained physical and mental health, as well as improved outcomes for families, partners and children of offenders.

This longitudinal follow up evaluation has confirmed initial positive outcomes for HD detainees and developed enhanced modelling of the substantial cost offsets reported in the Phase 1 study period. The total HD program cost is generating multiples in offsets of around 3.5 times within the study timeframe and nearly 4.5 times if the future reductions in RTC are considered. This first report of the Phase 2 economic evaluation confirms that even under conservative assumptions, the South Australian HD program is resulting in significant positive benefits and system cost offsets. These benefits can extend well beyond the HD episode, potentially offsetting the cost of HD investment many times over.

Finally, this evaluation extends for an additional year, with the final report due to DCS in November 2022. This final report will build on our longitudinal examination of the effectiveness and cost-effectiveness of the HD program in SA.

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Appendix A
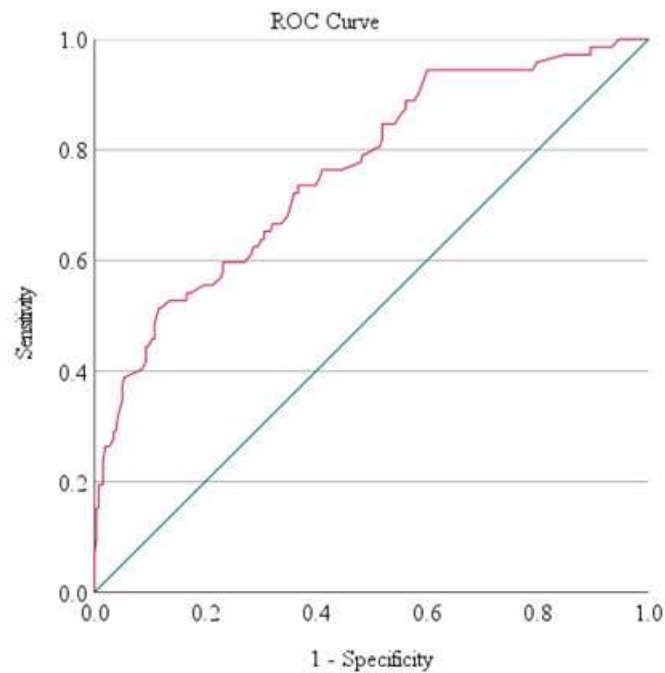
Figure 1. Area under the ROC curve for model predicting risk of ROHD breach

Table 1. Sensitivity and 1-specificity for risk score deciles from prediction model.

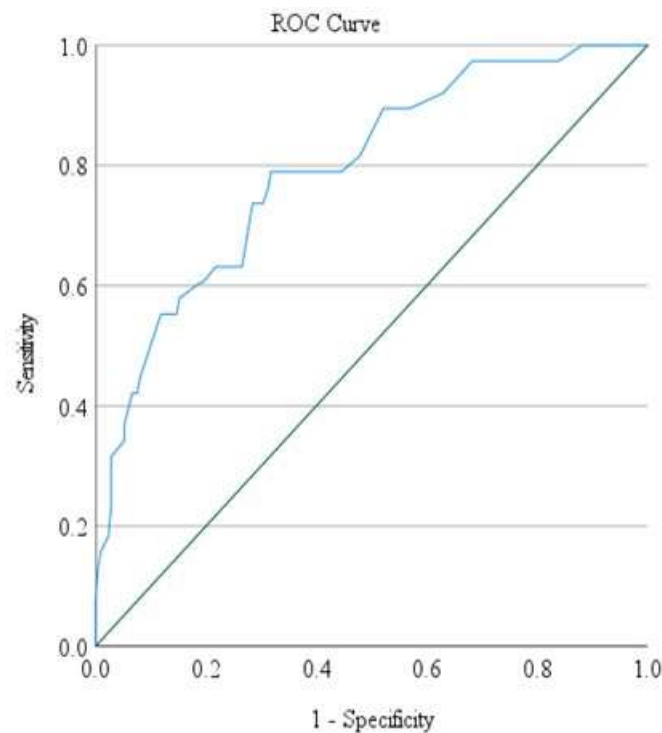| RISK SCORE DECILES	SENSITIVITY	1-SPECIFICITY
6.92%	97.2%	88.4%
9.22%	94.4%	76.0%
10.95%	94.4%	63.2%
12.85%	84.7%	53.1%
16.32%	76.4%	42.6%
19.56%	66.7%	32.2%
23.43%	55.6%	21.3%
28.89%	51.4%	11.6%
43.16%	31.9%	4.3%
88.34%	2.8%	<0.1%

Appendix B

Figure 1. Area under the ROC curve for model predicting risk of COHD breach

Table 1. Sensitivity and 1-specificity for risk score deciles from prediction model.

RISK SCORE DECILES	SENSITIVITY	1-SPECIFICITY
3.20%	1.00	.948
4.19%	.974	.787
5.00%	.921	.630
5.97%	.895	.569
7.11%	.790	.450
12.72%	.789	.330
18.86%	.632	.252
23.52%	.553	.147
43.59%	.342	.052
66.26%	.026	.000

Appendix C

Table 1. Balance and fit descriptive statistics

	PRE-MATCH (n=706)				POST-MATCH (N=150)			
	PD (n=473)	ROHD (n=233)	*t*	*d*	PD (n=75)	ROHD (n=75)	*t*	*d*
Age	37.07	40.25	3.79	0.31	37.63	36.91	0.47	0.07
Male	0.85	0.86	0.23	0.02	0.89	0.87	0.50	0.09
Aboriginal	0.17	0.08	3.25	0.23	0.11	0.13	0.50	0.09
Prior sentence	0.42	0.35	1.83	0.14	0.44	0.39	0.66	0.10
Violent offence	0.21	0.13	2.93	0.21	0.17	0.19	0.21	0.03
Non-violent offence	0.68	0.38	7.84	0.64	0.65	0.63	0.34	0.06
Drug offence	0.11	0.49	10.78	1.23	0.17	0.19	0.21	0.03
ROR score	12.30	11.88	1.03	0.08	12.40	12.72	0.41	0.07
Making changes	0.03	0.25	7.23	1.19	0.03	0.04	0.45	0.08
Predicted probability	0.23	0.46	11.59	1.59	0.25	0.25	<0.01	<0.01
Standardised mean difference (covariates only)				0.45				0.07

Note: $^*p<.05$; $^{**}p<.01$; $^{***}p<.001$.
d = standardised bias
t = *t* statistic

Appendix D

Table 1. Balance and fit descriptive statistics

	PRE-MATCH (n=787)				POST-MATCH (N=408)			
	PD (n=473)	COHD (n=314)	*t*	*d*	PD (n=204)	ROHD (n=204)	*t*	*d*
Age	37.07	37.97	1.21	.09	37.37	38.19	0.86	.09
Male	0.85	0.80	1.89	.15	0.84	0.85	0.27	.03
Aboriginal	0.17	0.09	3.33	.21	0.10	0.09	0.33	.01
Prior sentence	0.42	0.41	0.42	.03	0.37	0.37	0.10	.01
Violent offence	0.21	0.09	5.18	.31	0.11	0.11	0.00	.00
ROR score	1.99	1.66	5.55	.39	1.75	1.75	0.00	.00
Predicted probability	0.37	0.45	8.25	.49	0.42	0.42	0.01	<.01
Standardised mean difference (covariates only)				.20				.02

Note: $^*p<.05$; $^{**}p<.01$; $^{***}p<.001$.
d = standardised bias
t = *t* statistic

Appendix E

Table 1. ROHD breaches by COVID status				
	Total sample (n=434) n (%) / $\bar{x}$(sd)	No breach (n=349) n (%) / $\bar{x}$(sd)	Breach (n=85) n (%) / $\bar{x}$(sd)	$x^2(df)$, ϕ / $t(df)$, Cohen's d
COVID (15th March onwards)				
Admitted to ROHD during COVID	151 (34.8%)	113 (32.4%)	38 (44.7%)	$x^2(1)=4.58^*$, .10
Admitted prior to, but left during, COVID	96 (22.1%)	87 (24.9%)	9 (9.4%)	$x^2(1)=8.16^{**}$, .14
Admitted to ROHD during lockdown	42 (9.7%)	33 (9.5%)	9 (10.6%)	*n.s*
COVID from 15th March 2020 to end of observation period. Lockdown from 15th March 2020 to 30th June 2020				

Table 2. ROHD RTC by COVID status				
	Total sample (n=434) n (%) / $\bar{x}$(sd)	No RTC (n=379) n (%) / $\bar{x}$(sd)	RTC (n=55) n (%) / $\bar{x}$(sd)	$x^2(df)$, ϕ / $t(df)$, Cohen's d
COVID (15th March onwards)				
Admitted to ROHD during COVID	151 (34.8%)	142 (37.5%)	9 (16.4%)	$x^2(1)=9.43^{**}$, .15
Admitted prior to, but left during, COVID	96 (22.1%)	93 (24.5%)	3 (5.5%)	$x^2(1)=10.15^{**}$, .15
Admitted to ROHD during lockdown	42 (9.7%)	37 (9.8%)	5 (9.1%)	*n.s*
COVID from 15th March 2020 to end of observation period. Lockdown from 15th March 2020 to 30th June 2020				

Appendix F

Table 1. COHD breaches by COVID status				
	Total sample (n=409) n (%) / $\bar{x}$(sd)	No breach (n=344) n (%) / $\bar{x}$(sd)	Breach (n=65) n (%) / $\bar{x}$(sd)	$x^2(df)$, ϕ / $t(df)$, Cohen's d
COVID (15th March onwards)				
Admitted to COHD during COVID	151 (36.9%)	122 (35.5%)	29 (44.6%)	*n.s*
Admitted prior to, but left during, COVID	73 (17.8%)	68 (19.8%)	5 (7.7%)	$x^2(1)$=5.44*, .12
Admitted to COHD during lockdown	32 (7.8%)	22 (6.4%)	10 (15.4%)	$x^2(1)$=6.13*, .12
COVID from 15th March 2020 to end of observation period. Lockdown from 15th March 2020 to 30th June 2020				

Table 2. COHD breaches by COVID status				
	Total sample (n=409) n (%) / $\bar{x}$(sd)	No RTC (n=338) n (%) / $\bar{x}$(sd)	RTC (n=71) n (%) / $\bar{x}$(sd)	$x^2(df)$, ϕ / $t(df)$, Cohen's d
COVID (15th March onwards)				
Admitted to COHD during COVID	151 (36.9%)	136 (40.2%)	15 (21.1%)	$x^2(1)$=9.20**, .15
Admitted prior to, but left during, COVID	73 (17.8%)	63 (18.6%)	10 (14.1%)	*n.s*
Admitted to COHD during lockdown	32 (7.8%)	27 (8.0%)	5 (7.0%)	*n.s*
COVID from 15th March 2020 to end of observation period. Lockdown from 15th March 2020 to 30th June 2020				

Appendix G Supplementary economic modelling

Table 23: HD Program cost effectiveness – extended scenarios

| | Cost | | Effectiveness | | |
Model scenario	Total cost	Additional cost	PYAs	Additional PYAs	Cost per PYA
Plus 20% indirect prison costs					
HD Study group:	$35,963		0.37		
Control group:					Cost saving
Prisoners discharged	$99,920	$63,957	-0.27	-0.64	

Source: SADCS offender data, DCS Finance Directorate