PbR Binary – Adjustment Due to Data Source Change – Technical Note

Background

1. The Transforming Rehabilitation reforms introduced a Payment by Results mechanism that utilises re-offending data to determine the payments to CRCs. During the procurement process, bidders were advised that the data source for offender starts in each PbR cohort would change prior to measurement of outcomes for the first PbR cohort: moving from pNOMIS (prison releases) and Form 20 (community order / suspended sentence starts) to nDelius (the case management system for probation).

2. The Ministry of Justice explored the change of data sources and the implications for proven re-offending National Statistics, which captures all offenders and not just those who form a PbR cohort. The study, published in October 2017, concluded that the change in data source was associated with an increase in proven re-offending by approximately 0.5 percentage points. This increase is in the "unadjusted" binary rate (i.e. before any adjustment is made associated with ORGS4/G[1]).

3. The Authority has explored the re-offending results for the July – September 2015 PbR cohort to determine whether the change of dataset has had a statistically significant effect on the binary re-offending measures which would have had a subsequent impact on the PbR mechanism i.e. the "adjusted" binary rate that incorporates ORGS4/G adjustments. This note provides an outline of the analysis carried out by the Authority, the Authority's conclusion, and the action it will take.

Analytical Approach

4. By the very nature of the Transforming Rehabilitation reforms, it is not possible to accurately gauge the change in re-offending rates that drive the PbR mechanism due to a change in data source alone. There are other factors that may have contributed, for instance, system wide changes relating to the allocation of offenders to the CRCs / NPS and the inclusion of offenders with sentences of 12 months and under, that also occurred at the same time as the change in data source. In addition, the data source change took place before the first PbR cohort was established.

5. Therefore, it is only possible to derive an estimate by applying an assumption framework. The logic adopted for this is as follows:
    a. The binary reoffending rates for the July – September 2015 proven re-offending cohort is calculated for each index disposal type, e.g. fine, Community Order, custodial sentence, using the two different sets of data source.
    b. The difference in the binary reoffending rates because of moving between the data sources is determined and notable sub-populations that appear to contribute the most to the overall change in proven re-offending rate are determined.

[1] For further details on OGRS4 see Chapter 8 of the publication at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/449357/research-analysis-offender-assessment-system.pdf

c. For those notable drivers, an estimate of their importance for subsequent PbR cohorts is determined by applying a weighting to reflect the number of offenders with each index disposal type.
d. By taking a simple weighted average, an element of variation between the different cohort populations is smoothed, although it is not possible to control for the uncertainties associated with some of the implicit assumptions that are made.

Calculations

6. Binary re-offending rates for the July – September 2015 cohort have been calculated using data from a) pNOMIS & Form 20 and b) nDelius (Table 1). Data from pNOMIS covers *all* offenders released that quarter and not just those covered by the PbR mechanism e.g. offenders issued with a fine would not have entered a PbR cohort, but are included in this measure.

Table 1: Adjusted$_{2011}$ proportion of offenders who reoffend (%) for PbR disposals

	Jul-Sep 2015: pNOMIS & Form 20	Jul-Sep 2015: nDelius	Difference (to 1 decimal place)
Community Order	36.3	36.2	-0.1
Suspended Sentence Order - With Requirements	31.8	31.9	0.2
Less than 12 months	60.1	62.9	2.8
12 months to less than 2 years	37.7	36.9	-0.8
2 years to less than 4 years	32.2	28.9	-3.3
4 years to 10 years	22.5	20.7	-1.7
More than 10 years	11.4	13.0	1.5
Indeterminate sentence for public protection	16.6	16.0	-0.6

7. The minor differences between the reoffending rates for Community Order and Suspended Sentence Order – With Requirements in Table 1 are associated with a subtle change in the processing methodology. As shown in Table 1, it is the shift from pNomis to nDelius that is associated with more complex and pronounced differences in proven re-offending.

8. As we do not know how the July - September 2015 cohort derived from pNOMIS and Form 20 would have been split between the CRCs and the NPS, we are assuming that only offenders with the following index disposals would drive the difference in the binary rate for the PbR cohort: Less than 12 months; 12 months to less than 2 years; 2 years to less than 4 years; and, 4 years to 10 years. This has been determined by taking those PbR disposals with the largest differences identified in Table 1, and assumes offenders having served more than 10 years or IPP orders would be managed by the NPS.

9. The total number of offenders for the Oct-Dec 2015 and Jan-Mar 2016 PbR cohorts are presented in Table 2. This data is sourced from nDelius.

Table 2: Number of offenders managed by CRCs by index disposal

	Oct-Dec 2015	Jan-Mar 2016
Less than 12 months	6,931	6,621
12 months to less than 2 years	1,275	1,232
2 years to less than 4 years	1,527	1,394
4 years to 10 years	570	543
CRC Cohort	28,122	27,595

10. By converting the above into a weighting, the difference in proven-reoffending rates due to the change in data source for July – September 2015 can be determined. Data for the first two PbR cohorts have been used to estimate the adjustment to the PbR binary reoffending rate to reflect the change in data source (Table 3). These cohorts have been used as they capture the increased offender population of less than 12 months custodial sentences that form part of the Transforming Rehabilitation changes.

Table 3: Weighting of the change of data source by index disposal for CRCs

	Oct-Dec 2015		
	Proportion of offenders relative to the PbR cohort.	Difference in re-offending measures corresponding to the change in data sources.	Contribution to the relative PbR adjustment.
Less than 12 months	24.6%	2.8	0.69
12 months to less than 2 years	4.5%	-0.8	-0.04
2 years to less than 4 years	5.4%	-3.3	-0.18
4 years to 10 years	2.0%	-1.7	-0.03
		TOTAL	0.44

	Jan-Mar 2016		
	Proportion of offenders relative to the PbR cohort.	Difference in re-offending measures corresponding to the change in data sources.	Contribution to the relative PbR adjustment.
Less than 12 months	24.0%	2.8	0.67
12 months to less than 2 years	4.5%	-0.8	-0.04
2 years to less than 4 years	5.1%	-3.3	-0.17
4 years to 10 years	2.0%	-1.7	-0.03
		TOTAL	0.44

AVERAGE	0.44

11. Following this approach, we estimate that the change in data source increased the binary reoffending rate for CRCs by 0.44 percentage points.

12. The above estimate considers only those offenders who were managed by the CRC. However, the proven re-offending rates from July – September 2015 are based upon the populations that would be covered (after the implementation of Transforming Rehabilitation) by both the NPS and the CRCs. Using the CRC populations is appropriate in this assumption framework because the CRCs are more likely to be managing offenders who have served shorter custodial sentences and the relative contribution to the change in proven-reoffending is different for band of sentence length. However, to provide an estimate of the uncertainty, the calculations have been repeated (not shown) using the combined CRC and NPS populations. The corresponding change in adjusted re-offending rates that would drive the PbR mechanism is 0.28 percentage points.

13. The following limitations exist:

    a. There is only one quarter's worth of data for which a comparison can be made. Therefore, given the wider system changes, it is possible that other effects are important e.g. changes in recording practice. It is not possible to source other data to improve this estimate.
    b. It is not possible to reproduce this logic at a local level to establish individual adjustments for each CRC with the available data. Therefore, the above estimate, which covers England and Wales, and the subsequent adjustment would need to be applied uniformly for all CRCs. This may mean that the adjustment could be an over- or under-estimate for each CRC.

Implementation of the Adjustment

14. The Authority will make an adjustment to the binary measure to reflect the consequences of the change in data source. The above adjustment will be captured alongside the ORGS4/S adjustment in PbR Official Statistics for the purposes of transparency for the delivery of the current CRC contracts. The adjustment will be made both retrospectively and for future Official Statistics releases under this contract.

Outcome of the Analytical Quality Assurance

15. This technical note, the underlying calculations and the calculation of the re-offending rates and the populations have been through proportionate analytical quality assurance and cleared by the Director and SRO - Probation Programme and the Director of Analysis. The quality assurance activities have refined earlier estimates following recommendations made during the assurance process.