Justice Data Lab
Re-offending Analysis:
NOMS CFO Employment Programme

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Summary

This report assesses the impact on re-offending of an employment programme co-ordinated by the NOMS CFO (National Offender Management Service Co-Financing Organisation) in England. The programme providers work with offenders in prison and the community to help them access mainstream services, with the aim of gaining skills and finding employment outside of custody. This follows previous assessments of the programme by the Justice Data Lab in December 2013 and August 2014[1]. This analysis looks at the effectiveness of the employment programme received by individuals whilst in custody, on leaving custody and during community sentences separately. This report presents the overall national picture, with regional analyses due to be completed and published separately at a later date.

As well as the standard comparisons for the three cohorts provided by NOMS (as described below) against matched control groups of similar offenders (Justice Data Lab (JDL) comparisons), the re-offending outcomes for each group have been compared to those for each of the remaining groups (i.e. bespoke comparisons). These comparisons assess the different impact the employment programme has on the re-offending of those who take part in each setting. Please note that the bespoke comparisons are not matched control analyses and that any differences between the groups in their re-offending are likely to reflect the differences in the characteristics and criminal histories of each group. More details on the composition of the groups can be found in Annex B, as well as the Excel Annex to this report in tables B1-B3.

JDL Comparisons

The analysis consists of three groups which were defined as follows:
- **Intervention received in custody** - those who took part in the employment programme during a custodial sentence.
- **Intervention received on leaving custody** - those who took part in the employment programme up to six months after completing a custodial sentence.
- **Intervention received in the community** - those who took part in the employment programme during a community sentence (e.g. a community order or suspended sentence order). While this group includes those whose index disposal was a fine or absolute discharge, this is only for those who will have been referred to the probation service (i.e. those who have had community or suspended sentence orders previously).

Each group was compared to similar groups of offenders excluding those the JDL were able to identify from the data provided by NOMS CFO.

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[1] www.gov.uk/government/statistics/justice-data-lab-statistics-december-2013 and
www.gov.uk/government/statistics/justice-data-lab-statistics-august-2014

Figure 1 – The one year proven reoffending rate[2] for the JDL comparisons carried out for each intervention group

Intervention received	Matched treatment group	Matched control group	1 year proven re-offending rate[1]			
			Treatment group[1]	Control Group[1]	Statistically significant	Estimate of Impact On Re-offending
In custody	5,908	144,679	44%	46%	N	-2.5 to 0.1% pts
On leaving custody	4,617	84,252	29%	29%	N	-1.6 to 1.1% pts
In the community	7,136	328,348	28%	27%	N	-0.7 to 1.4% pts

1) percentages given to the nearest whole number

Those who took part in the employment programme co-ordinated by NOMS CFO in custody were found to have lower one year proven reoffending rates than for their JDL control group, while those who took part on leaving custody had a very similar re-offending rate compared to their JDL control group. In the community group, those who took part in the employment programme co-ordinated by NOMS CFO had a slightly higher one-year proven re-offending rate than their JDL control group. However, statistical significance testing has shown that none of these differences in the re-offending rates are statistically significant[3].

These results suggest that at this stage there is insufficient evidence to draw a conclusion about the impact of the employment programme co-ordinated by NOMS CFO on the re-offending rate of those who take part. However, the results of the analysis do not mean the employment programme failed to impact on re-offending behaviour.

What you can say:
- There is insufficient evidence at this stage to draw a conclusion about the impact of taking part in the employment programme co-ordinated by NOMS CFO, either while in custody, upon leaving custody, or when in the community, on the one-year proven re-offending rate.
- However, for those who took part in the employment programme on leaving custody, this led to a reduction in the frequency of re-offending of between 0.01 and 0.12 offences per individual. Also, the time to first re-offence was significantly improved for those who took part in custody and upon leaving custody.

What you cannot say: This analysis shows that:
- taking part in the employment programme co-ordinated by NOMS CFO while in custody led to a reduction in re-offending of 2 percentage points or any other amount;
- taking part in the employment programme co-ordinated by NOMS CFO on leaving custody led to a reduction in re-offending of less than 1 percentage point, or any other amount; or

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[2] The **one year proven re-offending rate** is defined in the glossary in Annex C
[3] For the custody group the p-value was 0.061, for the custody leavers group it was 0.718 and for the community group it was 0.462. Statistical significance testing is described on page 23 of this report.

- taking part in the employment programme co-ordinated by NOMS CFO while in the community led to an increase in re-offending of 1 percentage point, or any other amount

There are differences between these results and those of previous analyses which are likely to be due to differences in the characteristics of the treatment and control groups.

Bespoke Comparisons

Three bespoke comparisons compare each group to the other groups in turn:

- **'On leaving custody' to 'In custody'** – compares those who took part in the employment programme while following release from custody to those who took part in the employment programme in custody
- **'In the community' to 'In custody'** – compares those who took part in the employment programme while in the community (excluding those in the 'on leaving custody group) to those who took part in the employment programme while in custody
- **'In the community' to 'On leaving custody'** – compares those who took part in the employment programme while on during community sentences to others who took part in the employment programme shortly after release from custody

Figure 2 – The one year proven reoffending rate[1] for the bespoke comparisons

Intervention received				1 year proven re-offending rate			
Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Statistically significant	Estimate of impact on re-offending
On leaving custody	In custody	4,619	5,910	29	44	Y	-16.9 to -13.3% pts
In the community	In custody	7,140	5,910	28	44	Y	-18.0 to -14.8% pts
In the community	On leaving custody	7,140	4,619	28	29	N	-3.0 to 0.4% pts

The one year proven re-offending rate was 29% for offenders who took part in the employment programme on leaving custody and 28% for those who took part in the community. These were both significantly lower than the re-offending rate of those who took part in custody (44%)[4].

However, when comparing the re-offending rate of those who took part in the employment programme in the community and on leaving custody (28% compared to 29%) the difference was not significant[5].

This suggests that those who take part in the employment programme in the community, whether or not they have just left custody, have a lower re-offending rate than those who take part in the employment programme while in custody. This is likely

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[4] The p values for these significance tests were both <0.001. Statistical significance testing is described on page 23 of this report.

[5] The p value for this significance test was 0.124. Statistical significance testing is described on page 23 of this report

to be representative of the different characteristics of those within each group. Further details can be found in the Excel Annex tables B1-B3

What you can say:
'On leaving custody' to 'In custody' – those who took part in the employment programme on leaving custody had a lower re-offending rate of between 17 and 13 percentage points compared to those who took part while in custody.
'In the community' to 'In custody' – those who took part in the employment programme in the community had a lower re-offending rate of between 18 and 15 percentage points compared to those who took part while in custody.
'In the community' to 'On leaving custody' – there is insufficient evidence at this stage to draw a conclusion about the differences between these groups in their reoffending rates.

What you cannot say:
'In the community' to 'On leaving custody' – this analysis shows that those who took part in the employment programme in the community had a lower proven re-offending of 1 percentage point compared to those who took part in the same programme on leaving custody

Introduction

NOMS CFO service providers work with offenders in prison and the community, to help them access mainstream services, with the aim of gaining skills and employment. This initiative is funded in partnership with the European Social Fund (ESF). The interventions are targeted at offenders considered to be 'hard to help', and who are typically unskilled, unqualified or de-motivated, and can often have drugs/alcohol, behavioural, debt or accommodation problems.
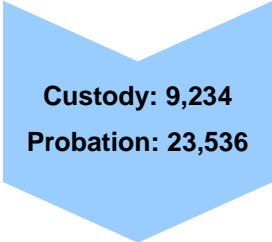
The programme is about helping to put offenders into employment, or making services provided by the Skills Funding Agency and Department for Work and Pensions more accessible, as it is recognised that offenders in employment are less likely to re-offend than those who are unemployed[6]. The programme uses a case management model which involves assessment, support in light of offenders' identified barriers to employment e.g. training; education; housing; finance; health; alcohol; drugs; relationships; attitude/life skills, and access to further learning or employment. The programme is voluntary and participants can self-refer or be targeted by the providers, with the only conditions being that participants must be unemployed or economically inactive, within the last three years of their sentence (for those individuals in custody), and eligible to work in the UK. Unsentenced offenders in prisons are also eligible for the programme.

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[6] Including a report published by Ministry of Justice in 2013 on the impact of employment on re-offending: www.gov.uk/government/uploads/system/uploads/attachment_data/file/217412/impact-employment-reoffending.pdf
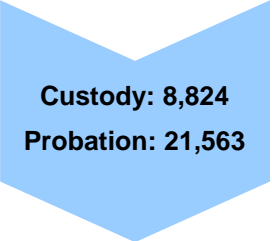
This analysis relates to offenders who started the programme between March 2011 and December 2012.

Data Lab Control Comparisons

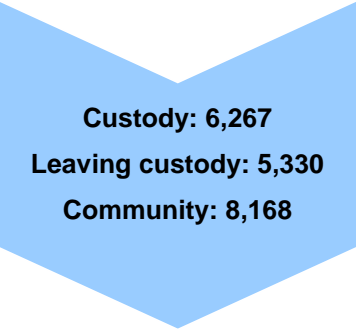### Processing the Data

Custody: 9,234
Probation: 23,536

NOMS CFO sent data to the Justice Data Lab for 32,770 offenders. 9,234 of these indicated that the offender started the employment programme while in custody and 23,536 indicated that the offender started the employment programme while on probation (i.e. either after leaving prison or with a community sentence).

Custody: 8,824
Probation: 21,563

Of the 'custody' records, 8,824 could be matched to the Police National Computer (PNC), a match rate of 96%. Of the 'probation' records, 21,563 were matched to the PNC a match rate of 92%.

After linking the records to the re-offending data the 'probation' records were split into two groups. The 'leaving custody' group included those who started the employment programme up to six months after completing a custodial sentence, whilst those with a community order or suspended sentence order became the 'community' group.

Custody: 6,267
Leaving custody: 5,330
Community: 8,168

An identifiable sentence could be found for 6,267 of the custody group, 5,330 of the leaving custody group and 8,168 of the community group.

The definition of identifiable sentence differs for each group:

- Custody – a custodial sentence where the employment programme start date was after the conviction date and within three years of the index date. It is a condition of the programme that prisoners are in the last three years of their sentence.
- Leaving custody – a custodial sentence where the employment programme start date was after the conviction date and up to six months after the index date.
- Community – a community or suspended sentence order where the employment programme start date was after the conviction date and between three months before and six months after the index date of the order given.

The high rate of attrition seen between matching to the PNC and finding an identifiable sentence may be due to one or more of the following reasons;

- 12 of the individuals in the custody group (27 in the probation group) who were matched to the PNC were removed as they did not appear to have received a conviction or their cases were still pending. A further individual was removed from each group after investigation showed them to be dubious matches.
- 265 of the custody group (650 from the probation group), who were matched to the PNC could not be matched to the MoJ's re-offending data. This may be because they were not released prior to December 2013 and information on their re-offending is not available.
- For other offenders who could be linked to the re-offending data, a suitable sentence could not be found. This applies to 2,279 of the custody group, and 7,387 offenders in the other groups.

Custody: 5,910
Leaving custody: 4,619
Community: 7,140

Offenders were excluded from each group (357 from 'custody', 583 from 'leaving custody' and 521 from the 'community' group) as they did not meet the criteria for JDL analyses (see Table C in the Excel annex).

The main reason for removal was current or previous sex offences and, for those on probation, a re-offence committed before getting the intervention.

The characteristics of those not included in the treatment groups, but matched to the re-offending data, were compared against the characteristics of the treatment groups to assess any possible bias:

- In terms of gender and nationality, two treatment groups showed similar characteristics to the unmatched offenders. The exception was in the community group, where the treatment group offenders were more likely to be female (17% compared to 11%). Also there was a larger proportion of foreign and unknown nationality offenders in this treatment group (66% compared to 35% of unmatched offenders).
- Assessing the ethnicity make-up of the groups, those in the 'custody' and 'community' treatment groups were similar to the respective unmatched offenders. Those in the 'on leaving custody' treatment group were more likely than the unmatched offenders to be black (17% compared to 8%) and less likely to be white (75% compared to 87%)
- There were differences in the severity of the index offence. Those in the custody treatment group were more likely to have severity tier 2 offences (24% compared to 11%) and less likely to have tier 3 offences (67% compared to 84%). For the on leaving custody group the treated offenders were less likely to have tier 1 offences (12% compared to 47%) and more likely to have tier 2 or 3 offences (88% compared to 49%). In the community treatment group offenders were similar to the unmatched offenders in severity of offence.

- In terms of custodial sentence length, the offenders in the custody treatment group were less likely than the unmatched offenders for whom this is recorded to have a prison sentence of over 4 years (17% compared to 26%). For those in the on leaving custody treatment group they were more likely to have a sentence of 1-4 years (69% compared to 57%) and less likely to have a sentence of over 4 years (20% compared to 37%).
- The community treatment group were more likely than the unmatched offenders to have community orders as their index disposal (64% compared to 58%) and less likely to have fines or conditional discharges (5% compared to 12%)

As such, the final treatment groups may not be representative of all offenders dealt with by NOMS CFO so all results should be interpreted with care.

Creating a Matched Control Group

Figure 4 shows the results of matching the treatment and control groups. For each group, a number of offenders could not be matched to offenders with similar characteristics, but who did not take part in the employment programme co-ordinated by NOMS CFO, and so were removed from the final matched treatment groups.

Figure 4 – Matched treatment and control group sizes

Intervention received	Total treatment group available	Matched treatment group	Matched control group
In custody	5,910	5,908	144,679
On leaving custody	4,619	4,617	84,252
In the community	7,140	7,136	328,348

As the analyses for those who took part in the employment programme on leaving custody or in the community refer to those who received the employment programme outside of custody, additional checks were imposed on the control group to ensure that the matched individuals had similar characteristics. For both groups, members of the matched control group could not have committed a proven re-offence before the intervention start date for the matched counterparts who took part in the NOMS CFO employment programme. Any matches where the matched control had committed a proven re-offence prior to the intervention start date of the treatment group counterpart were excluded from the analysis.

Another check was also imposed for the group who took part in the employment programme in the community. All the members of the matched control group could only be matched to the NOMS CFO employment programme counterparts if they received the same sentence type.

These checks made sure that we have greater confidence that the matched control group presents a more accurate counterfactual for comparison.

Tables A1 to A3 in the Excel Annex provide information on the characteristics of the matched treatment and control groups. Further data on the matching process is available upon request.

Results

One-year Reoffending Rate

As in the summary, Figure 5 compares the reoffending rate of those who received the service in each setting (the treatment group) against the relevant matched control group of similar offenders. It gives an indication of whether the change was significant and gives the range of values in which we can be confident that the true difference in reoffending lies.

Figure 5 – Table comparing the reoffending of treated offenders against the matched control group of similar offenders.

|			1 year proven re-offending rate[1]			
Intervention received	Matched treatment group	Matched control group	Treatment group[1]	Control Group[1]	Statistically significant	Estimate of Impact On Re-offending
In custody	5,908	144,679	44%	46%	N	-2.5 to 0.1% pts
On leaving custody	4,617	84,252	29%	29%	N	-1.6 to 1.1% pts
In the community	7,136	328,348	28%	27%	N	-0.7 to 1.4% pts

1) percentages given to the nearest whole number

Figure 6 presents, for each JDL comparison, the 95 per cent confidence intervals for the re-offending rates of the treatment and control groups, showing the ranges in which the true re-offending rates are likely to lie. For the analyses the confidence intervals suggest that the true differences in re-offending between the treatment and control groups are:

- between a 3 percentage point decrease and an increase of just over 0 percentage points in re-offending for those who took part in the employment programme in custody
- between a 2 percentage point decrease and a 1 percentage point increase in re-offending for those who took part in the employment programme on leaving custody
- between a 1 percentage point decrease and a 1 percentage point increase in reoffending for those who took part in the employment programme in the community

These ranges are based on comparing each set of confidence intervals showed in Figure 6.

Figure 6 – The best estimates for the one year proven re-offending rate for the groups of offenders who took part in the NOMS CFO employment programme and their matched control groups
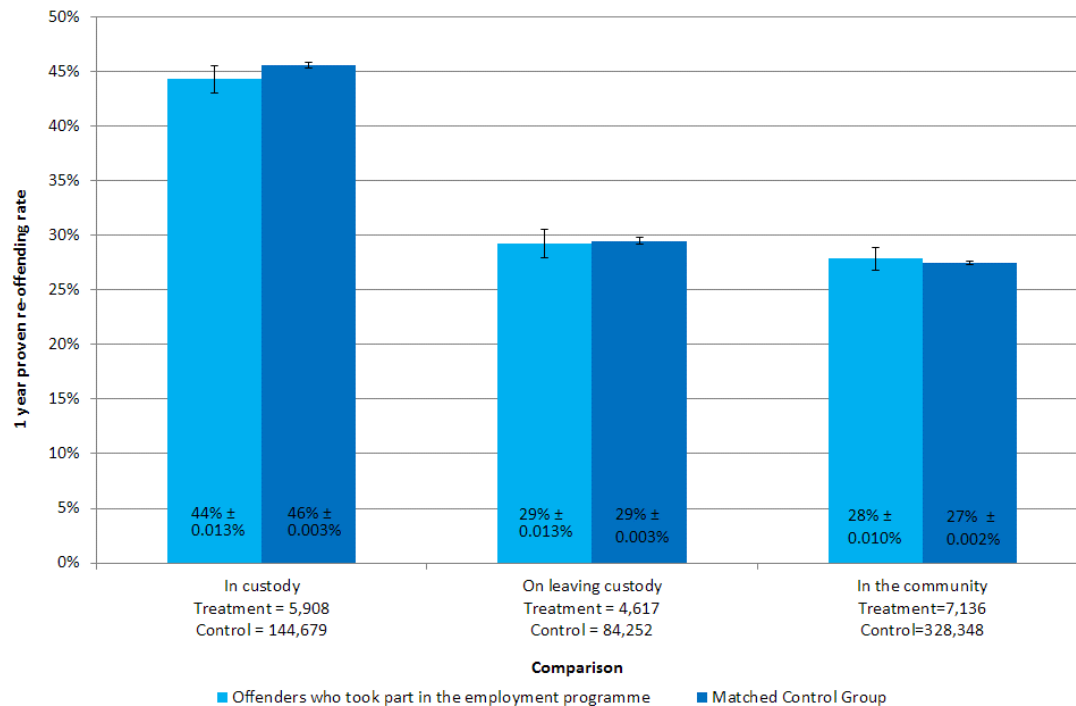
It is important to show confidence intervals because both the treatment and matched control groups are samples of larger populations; the re-offending rate is therefore an estimate for each population based on a sample, rather than the actual rate.

The precision of these estimates could be improved if the sizes of the NOMS CFO employment programme groups used in these analyses were increased[7].

Additional proven re-offending measures
Frequency of re-offending

Figure 7 shows, for each comparison, the frequency of reoffending of those who took part in the employment programme and a matched control group of similar offenders. It also gives information as to whether the change was statistically significant or not.

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[7] If the measured difference in the one-year re-offending rate is correct a 95% chance that this difference would become statistically significant if the treatment group contained at least; 28,354 individuals for the 'in custody' group, and 391,466 individuals for the 'in the community group'. For the leaving custody group the number cannot be estimated.

Figure 7 –The frequency of re-offending of treated offenders against a matched control group of similar offenders.

Intervention received	Matched treatment group	Matched control group	Frequency of re-offending (offences per person)[1]			
			Treatment	Control	Statistically significant	p-value
In custody	5,908	144,679	1.81	1.87	N	0.207
On leaving custody	4,617	84,252	0.75	0.82	Y	0.018
In the community	7,136	328,348	0.73	0.73	N	0.816

1) Figures given to two decimal places

The frequency of re-offending for those who took part in the employment programme on leaving custody was significantly lower than the frequency of re-offending in the matched control group.

The frequency of re-offending for those who took part in the employment programme in custody was lower than the re-offending for the matched control group, while the frequency of re-offending for those who took part in the employment programme in the community was very similar to that for the matched control group. Both of these differences were not statistically significant.

The results for the custody and community groups were both in line with the results for the one-year proven re-offending rate. For the 'on leaving custody' group, the difference was found to be significant rather than not significant. The difference was also clearer than for the one-year proven re-offending rate, with those in the treatment group clearly committing fewer re-offences than those in the control group.

The same caveats and limitations apply to these findings[8].

Time to re-offending

Figure 8 shows, for each comparison, the number who reoffended within each group and the average number of days to the first offence. It also gives an indication as to whether the change is significant.

Figure 8 – Table comparing the average number of days to the first offence for those who re-offended from the treatment groups and matched control groups of similar offenders.

Intervention received	Re-offenders from treatment group	Re-offenders from control group	Average days to first re-offence			
			Treatment	Control	Statistically significant	p-value
In custody	2,617	73,593	126	121	Y	0.007
On leaving custody	1,349	37,741	185	177	Y	0.001
In the community	1,990	129,459	175	175	N	0.961

The average number of days to first re-offence for those who took part in the employment programme, both while in custody and on leaving custody, and re-

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[8] The caveats and limitations of this analysis are described on page 21 of this report.

offended within a year was significantly higher than for those who re-offended from their respective matched control groups. For those who took part in the employment programme in the community and re-offended within a year the average number of days to first re-offence was the same as for those who re-offended from the matched control group, and this finding was not significant.

The findings for the community group are in line with the one-year proven re-offending rate. For the other groups the differences were significant rather than inconclusive, although the direction of the differences reflected those for the frequency of re-offending rather than the re-offending rate. The groups who committed fewer re-offences also took longer to commit their first re-offence.

The same caveats and limitations apply to these findings[8].

Note: The following measures are exploratory, aiming to provide greater detail to users on re-offending outcomes. We look for feedback on them to ensure they are as useful as possible. All of these measures consider only those who committed a proven re-offence during a one-year follow-up period and for whom re-offence severity data was available (as shown in Figure 9).

Figure 9 – Table showing the numbers in each group who both re-offended and for whom re-offence severity data is available

Intervention received	Treatment group	Control group
In custody	2,573	66,438
On leaving custody	1,331	37,278
In the community	1,959	127,829

Measures of severity of re-offending

These measures report on the severity[9] of re-offences that occurred within a one-year follow-up period, with tier 1 representing the most serious offences.

One-year proven re-offending rates in each tier of severity
Figure 10 shows the rates of re-offending for those individuals who committed their *first* re-offence in each tier during a one-year follow-up period. Testing has shown that none of these differences is statistically significant. Over 80% of first re-offences are in the lowest tier of severity, tier 3.

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[9] See Annex C definition from glossary.

Figure 10 – Tier of first re-offence for those who re-offend within a one-year follow-up period

Intervention received	Re-offending measure	Treatment group (%)	Control group (%)	Statistically significant	p-value
In custody	First re-offence in tier 1	1	1	N	0.257
	First re-offence in tier 2	12	12	N	0.964
	First re-offence in tier 3	87	87	N	0.704
On leaving custody	First re-offence in tier 1	1	2	N	0.305
	First re-offence in tier 2	15	14	N	0.284
	First re-offence in tier 3	84	85	N	0.464
In the community	First re-offence in tier 1	1	1	N	0.217
	First re-offence in tier 2	5	5	N	0.489
	First re-offence in tier 3	94	94	N	0.838

Frequencies of one-year proven re-offending in each tier of severity

Figure 11 shows the frequencies of re-offending in each tier of severity for those individuals who committed a re-offence during a one-year follow-up period. Testing has shown that only one difference is statistically significant; the lower frequency of re-offences in tier 3 for those who took part in the employment programme on leaving custody. This indicates that while those who took part in the employment programme on leaving custody committed a similar frequency of the more serious tier 1 and tier 2 re-offences, they committed fewer tier 3 offences compared to the matched control group. This severity category is also the most common.

Figure 11 – Frequency of re-offending in each tier for those who re-offend within a one-year follow-up period

Intervention received	Re-offending measure	Treatment group	Control group	Statistically significant	p-value
In custody	Re-offending frequency in tier 1	0.02	0.02	N	0.278
	Re-offending frequency in tier 2	0.34	0.34	N	0.873
	Re-offending frequency in tier 3	3.73	3.73	N	0.994
On leaving custody	Re-offending frequency in tier 1	0.02	0.03	N	0.878
	Re-offending frequency in tier 2	0.33	0.32	N	0.720
	Re-offending frequency in tier 3	2.23	2.40	Y	0.007
In the community	Re-offending frequency in tier 1	0.01	0.02	N	0.349
	Re-offending frequency in tier 2	0.12	0.12	N	0.960
	Re-offending frequency in tier 3	2.48	2.49	N	0.885

Severity of first re-offence within a year relative to index offence

Figure 12 shows the rates of re-offending for those individuals who committed their *first* re-offence either in a more severe tier than their index offence, in the same tier or in a less severe tier. Testing has shown that none of the differences in proportions is statistically significant.

Figure 12 – Severity of first re-offence relative to index offence

Intervention received	Severity of first re-offence compared to index offence	Treatment group	Control group	Statistically significant	p-value
In custody	more severe	0.06	0.06	N	0.885
	same severity	0.68	0.69	N	0.651
	less severe	0.25	0.25	N	0.572
On leaving custody	more severe	0.06	0.06	N	0.925
	same severity	0.56	0.58	N	0.236
	less severe	0.37	0.36	N	0.207
In the community	more severe	0.05	0.05	N	0.885
	same severity	0.87	0.88	N	0.748
	less severe	0.08	0.07	N	0.776

Measures of re-offending resulting in custody

These measures refer to re-offences that occurred within a one-year follow-up period and resulted in the individual receiving a custodial sentence. They do not specify the lengths of sentences given (which can impact the frequency of one-year custodial sentencing), or detail any reasoning behind the custodial sentence. Figure 13 summarises the tests of these measures:

Figure 13 - Rate of custody for first re-offence and frequency of custodial sentencing

Re-offending measure	Intervention received	Treatment group	Control group	Statistically significant	p-value
Custody for first re-offence	In custody	45%	47%	Y	0.012
	On leaving custody	39%	43%	Y	0.003
	In the community	24%	28%	Y	<0.001
Frequency of custody for re-offence	In custody	2.06	2.12	N	0.270
	On leaving custody	1.17	1.30	Y	0.014
	In the community	0.82	0.90	Y	0.023

Rate of custody for first re-offence within a year
For all groups those who took part in the employment programme and re-offended within a year there was a statistically lower proportion who received a custodial sentence for their first re-offence than for those in the matched control groups who re-offended within a year. This indicates that, for all groups, taking part in the employment programme reduces the likelihood of committing a re-offence that leads to custody.

Frequency of one-year custodial sentencing
For those who took part in the employment programme on leaving custody or in the community and re-offended within a year there was also a significantly lower frequency of re-offences receiving a custodial sentence compared to those who re-offended from the matched control groups. The custody group also showed a reduction in the frequency of re-offences leading to custody but this difference was not statistically significant.

Bespoke Comparisons

These comparisons assess the re-offending of each group against each of the others in turn. They consider the different impact taking part in the employment programme in each setting has on the re-offending rates of those who take part.

Care must be taken in interpreting these comparisons as the observed characteristics of the groups compared do differ as set out in annex B. This is to be expected as they are not comparisons between a treatment group and a control group whose observed characteristics have been matched. These differences in observed characteristics may account for some of the differences in reoffending outcomes, whilst unobserved characteristics such as motivation may also play a part.

Results

Figure 14 – The one year proven reoffending rate[1] for each of the bespoke comparisons

Intervention received				1 year proven re-offending rate			
Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Statistically significant	Estimate of impact on re-offending
On leaving custody	In custody	4,619	5,910	29	44	Y	-16.9 to -13.3% pts
In the community	In custody	7,140	5,910	28	44	Y	-18.0 to -14.8% pts
In the community	On leaving custody	7,140	4,619	28	29	N	-3.0 to 0.4% pts

The one year proven re-offending rate was 29% for offenders who took part in the employment programme on leaving custody and 28% for those who took part in the community. These were both significantly lower than the re-offending rate of those who took part in custody (44%)[10].

However, when comparing the re-offending rate of those who took part in the employment programme in the community and on leaving custody (28% compared to 29%) the difference was not significant[11].

This suggests that those who take part in the employment programme in the community, whether or not they have just left custody, have a lower re-offending rate than those who take part in the employment programme while in custody. This is likely to be representative of the different characteristics of those within each group. Further details can be found in the Excel Annex tables B1-B3

Figure 15 shows the 95% confidence intervals for the re-offending rates of each bespoke comparison group, showing the ranges in which the true re-offending rates are likely to lie. For the analyses the confidence intervals suggest that the true differences in re-offending between the treatment and control groups are:

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[10] The p values for these significance tests were both <0.001. Statistical significance testing is described on page 23 of this report.

[11] The p value for this significance test was 0.124. Statistical significance testing is described on page 23 of this report

- a decrease between 17 and 13 percentage points in re-offending between those who took part in the employment programme on leaving custody and those who took part whilst in custody.
- a decrease between 18 and 15 percentage points in re-offending between those who took part in the employment programme in the community and those who took part whilst in custody.
- between a 3 percentage point decrease and a 1 percentage point increase in re-offending between those who took part in the employment programme in the community and those who took part on leaving custody.

Figure 15 – The best estimates for the one year proven re-offending rate for the bespoke comparison groups
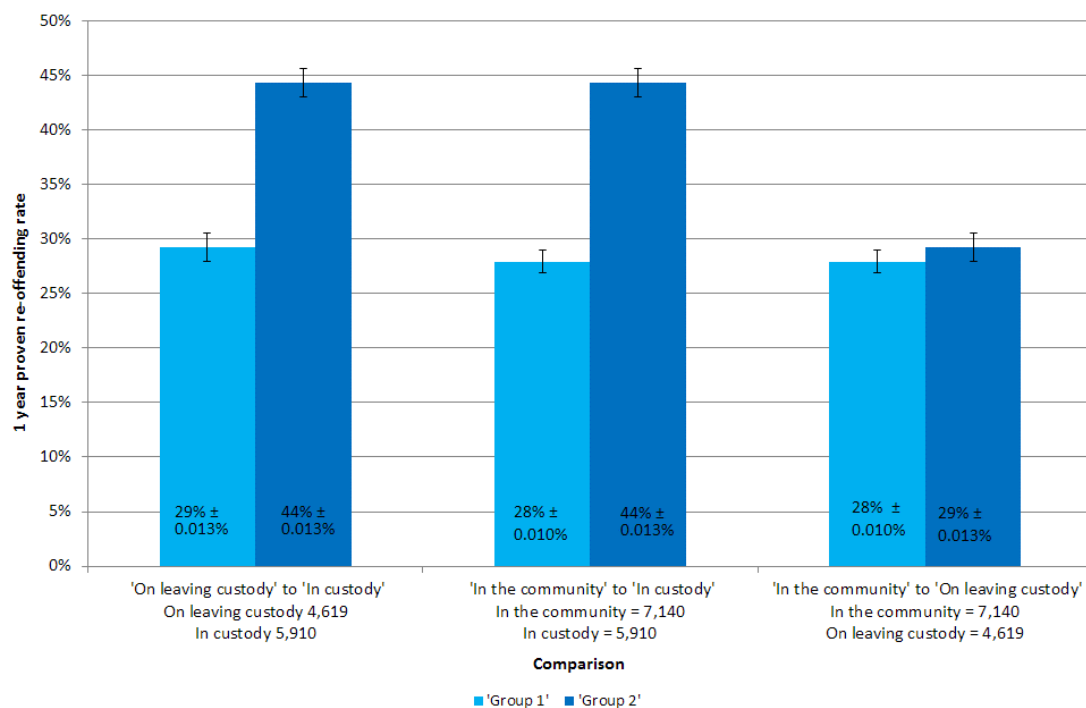
Excel tables B1-B3 provide information on the characteristics of each set of comparison groups.

Additional proven re-offending measures
Frequency of re-offending

Figure 16 compares the frequency of reoffending for each of the bespoke comparisons. It also gives information as to whether the change was statistically significant or not.

Figure 16 - Table comparing the frequency of reoffending of offenders in each of the three bespoke comparison groups

| Intervention received | | | | Frequency of re-offending (offences per individual) | | | |
Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Statistically significant	p-value
On leaving custody	In custody	4,619	5,910	0.76	1.81	Y	<0.001
In the community	In custody	7,140	5,910	0.73	1.81	Y	<0.001
In the community	On leaving custody	7,140	4,619	0.73	0.76	N	0.515

Comparisons of the frequency of re-offending are in line with the one year proven re-offending results. The groups who took part in the employment programme on leaving custody or in the community had a significantly lower frequency of re-offending than those who took part while in custody. Those who took part in the community had a lower frequency of re-offending than those who took part on leaving custody, but this difference was not significant.

This also indicates that those who take part in the employment programme while in custody re-offend more than those in the other two groups.

Time to re-offending

Figure 17 – Table comparing the average number of days to the first offence for those who re-offended from each of the bespoke comparison groups.

| Intervention received | | Group 1 | | Group 2 | | | |
Group 1	Group 2	Re-offenders from group 1	Average days to first re-offence	Re-offenders from group 2	Average days to first re-offence	Statistically significant	p-value
On leaving custody	In custody	1,350	185	2,619	126	Y	<0.001
In the community	In custody	1,993	175	2,619	126	Y	<0.001
In the community	On leaving custody	1,993	175	1,350	185	Y	<0.001

On this measure those who took part in the employment programme in custody and re-offended within a year had, on average, significantly fewer days to their first re-offence than those who re-offended from each of the other groups. This is in line with the one-year proven re-offending measure.

However, those who took part in the employment programme in the community and re-offended within a year had, on average, significantly fewer days to their first re-offence than those who took part on leaving custody. This indicates that those who take part in the employment programme on leaving custody take longer to commit a re-offence than others who take part in the employment programme in the community.

New exploratory measures

Note: All of the following measures consider only those who committed a proven re-offence during a one-year follow-up period and for whom re-offence severity data was available (as shown in figure 18).

Figure 18 - Table showing the numbers in each group who both re-offended and for whom re-offence severity data is available

Intervention received		Group 1	Group 2
Group 1	Group 2		
On leaving custody	In custody	1,332	2,575
In the community	In custody	1,962	2,575
In the community	On leaving custody	1,962	1,332

Measures of severity of re-offending

As with the JDL comparisons, these measures report on the severity of re-offences that occurred within a one-year follow-up period, with tier 1 representing the most serious offences.

One-year proven re-offending rates in each tier of severity
Figure 19 shows the rates of re-offending for those individuals who committed their *first* re-offence in each tier during a one-year follow-up period. Testing has shown that:

- there are no significant differences in the proportions of severity tier 1 first re-offences for any comparison.
- of those who re-offended within a year, those who took part in the employment programme in the community committed a lower proportion of tier 2 first re-offences than those who took part while in custody or on leaving custody and a higher proportion of tier 3 first re-offences.
- those who took part in the employment programme while in custody and re-offended within a year had a significantly lower proportion of tier 2 first re-offences, and higher proportion of tier 3 first re-offences, than those who took part upon leaving custody.

Figure 19 – Tier of first re-offence for those who re-offend within a one-year follow-up period

Intervention received		Re-offending measure	Group 1 (%)	Group 2 (%)	Statistically significant	p-value
Group 1	Group 2					
On leaving custody	In custody	First re-offence in tier 1	1	1	N	0.517
		First re-offence in tier 2	15	12	Y	0.004
		First re-offence in tier 3	84	87	Y	0.003
In the community	In custody	First re-offence in tier 1	1	1	N	0.454
		First re-offence in tier 2	5	12	Y	<0.001
		First re-offence in tier 3	94	87	Y	<0.001
In the community	On leaving custody	First re-offence in tier 1	1	1	N	0.222
		First re-offence in tier 2	5	15	Y	<0.001
		First re-offence in tier 3	94	84	Y	<0.001

Frequencies of one-year proven re-offending in each tier of severity
Figure 20 shows the frequencies of re-offending in each tier of severity for those individuals who committed a re-offence during a one-year follow-up period. The

results are largely in line with those for the severity of first re-offence given in figure 19, with one difference. Those who took part in the employment programme on leaving custody and re-offended had a slightly lower frequency of severity 2 re-offences than those who took part in the employment programme in custody and re-offended, but this difference was not statistically significant.

The majority of re-offences committed are in tier 3, which is consistent with the re-offending rates above.

Figure 20 – Frequency of re-offending in each tier for those who re-offend within a one-year follow-up period

Intervention received		Re-offending measure	Group 1	Group 2	Statistically significant	p-value
Group 1	Group 2					
On leaving custody	In custody	Re-offending frequency in tier 1	0.02	0.02	N	0.539
		Re-offending frequency in tier 2	0.33	0.34	N	0.859
		Re-offending frequency in tier 3	2.23	3.72	Y	<0.001
In the community	In custody	Re-offending frequency in tier 1	0.01	0.02	N	0.116
		Re-offending frequency in tier 2	0.12	0.34	Y	<0.001
		Re-offending frequency in tier 3	2.49	3.72	Y	<0.001
In the community	On leaving custody	Re-offending frequency in tier 1	0.01	0.02	N	0.056
		Re-offending frequency in tier 2	0.12	0.33	Y	<0.001
		Re-offending frequency in tier 3	2.49	2.23	Y	0.003

Severity of first re-offence within a year relative to index offence
Figure 21 shows the rates of re-offending for those individuals who committed their *first* re-offence either in a more severe tier than their index offence, in the same tier or in a less severe tier.

Testing has shown that the difference in the proportions of more severe offences is not statistically significant. Many of the results are affected by the fact that over 90% of those who took part in the employment programme in the community and re-offended had index offences of severity tier 3 and could not commit less severe re-offences. This compares to 68% in the 'in custody' group and 53% in the 'on leaving custody' group. However, of those who took part upon leaving custody and re-offended a significantly higher proportion committed a less severe first re-offence than of those who took part in the employment programme in custody.

Figure 21 – Severity of first re-offence relative to index offence

Intervention received		Severity of first re-offence compared to index offence	Group 1	Group 2	Statistically significant	p-value
Group 1	Group 2					
On leaving custody	In custody	more severe	0.06	0.06	N	0.985
		same severity	0.56	0.68	Y	<0.001
		less severe	0.38	0.25	Y	<0.001
In the community	In custody	more severe	0.05	0.06	N	0.083
		same severity	0.87	0.68	Y	<0.001
		less severe	0.08	0.25	Y	<0.001
In the community	On leaving custody	more severe	0.05	0.06	N	0.146
		same severity	0.87	0.56	Y	<0.001
		less severe	0.08	0.38	Y	<0.001

Measures of re-offending resulting in custody

These measures refer to re-offences that occurred within a one-year follow-up period and resulted in the individual receiving a custodial sentence. They do not specify the lengths of sentences given (which can impact the frequency of custodial sentencing), or detail any reasoning behind the custodial sentence. Figure 22 summarises the tests of these measures.

Figure 22 - Rate of custody for first re-offence and frequency of custodial sentencing

Re-offending measure	Intervention received		Group 1	Group 2	Statistically significant	p-value
	Group 1	Group 2				
Custody for first re-offence	On leaving custody	In custody	39%	45%	Y	0.001
	In the community	In custody	24%	45%	Y	<0.001
	In the community	On leaving custody	24%	39%	Y	<0.001
Frequency of custody for re-offence	On leaving custody	In custody	1.17	2.05	Y	<0.001
	In the community	In custody	0.82	2.05	Y	<0.001
	In the community	On leaving custody	0.82	1.17	Y	<0.001

Rate of custody for first re-offence within a year
Of those who took part in the employment programme in the community and re-offended, a significantly lower proportion received a custodial sentence for their first re-offence compared to those who re-offended from either of the other groups. Similarly, of those who took part in the employment programme on leaving custody a significantly lower proportion received a custodial sentence for their first re-offence than of those who took part in the employment programme in custody and re-offended.

Frequency of one-year custodial sentencing
These results match those for the rate of custody for first re-offence. They also reflect the higher proportion of less serious, severity tier 3, re-offences among those who took part in the employment programme in the community.

Annex A

Caveats and Limitations

The statistical methods used in this analysis are based on data collected for administrative purposes. While these include details of each offender's previous criminal, benefit and employment history alongside more basic offender characteristics such as age, gender and ethnicity, it is possible that other important contextual information that may help explain the results has not been accounted for. In particular, we are aware that the characteristics used for matching within these analyses will not mirror the selection process for those receiving support through the NOMS CFO employment programme.

It is possible that underlying characteristics about the individuals included in the analysis which were not captured by the data (e.g. further previous employment history; education history; whether the individual was actively looking for employment, employment and benefit status of the individual following release from custody etc) may have impacted participants' success in achieving the aims of the programme, and may also have a role in affecting their re-offending behaviour. It is also possible that there are additional underlying characteristics about the individuals included in the analysis which were not captured by the data, for example attendance at other interventions targeted at offenders, that may have impacted re-offending behaviour. Therefore, there remains a possibility that any difference in re-offending behaviour after matching reflects differences in underlying characteristics between the two groups which are not recorded in the data, rather than differences in re-offending behaviour associated with support through this employment programme. A rerun of the analysis is planned using data from the Offender Assessment System, which will aim to control for the complex needs of the offenders who take part in the employment programme.

Where the programme was started in custody, it is likely that the individual will have received the majority of their support within the community – following their release from custody. However, we cannot be sure for each individual the extent to which this happened. Furthermore, an individual may receive support from one provider during their time in custody; however on release they may receive support from another provider if they return home which may be in another region. It is not possible for us to statistically control for this.

In this analysis we have not been able to statistically control for post-conviction employment outcomes in the control group, therefore this analysis cannot present a direct comparison between the NOMS CFO employment programme and any other type of employment, or the NOMS CFO employment programme and no employment at all. This analysis presents a comparison between offenders with similar characteristics, where one group (the treatment group) was known to receive support through the NOMS CFO employment programme, and the comparison group did not.

Many organisations that work with offenders will look to target specific needs of individuals; for example improving housing, or employability. However, how the organisations select those individuals to work with could lead to selection bias, which can impact on the direction of the results. For example; individuals may self select into a service, because they are highly motivated to address one or more of their needs. This would result in a positive selection bias, meaning that for these persons we would generally expect a better re-offending outcome as they are more motivated. Alternatively, some organisations might specifically target persons who are known to have more complex needs and whose attitudes to addressing their needs are more challenging. This would result in a negative selection bias, meaning that for these persons we would generally expect a poorer re-offending outcome as they are not motivated. However, factors which would lead to selection bias in either direction are not represented in our underlying data, and cannot be reflected in our modelling. This means that all results should be interpreted with care, as selection bias cannot be accounted for in analyses.

Furthermore, only 5,908 of the 9,234 (64%) offenders on the NOMS CFO employment programme between March 2011 and December 2012 whilst in custody, and 11,753 of the 23,536 (50%) offenders on the NOMS CFO employment programme in the community or on leaving custody, were in the final treatment groups. The section "Processing the Data" outlines key steps taken to obtain the final groups used in the analysis. In many analyses, the creation of the matched control group will mean that some individuals, who will usually have particular characteristics – for example a particular ethnicity, or have committed a certain type of offence, will need to be removed to ensure that the modelling will work. Steps will always be taken at this stage to preserve as many individuals as possible, but due to the intricacies of statistical modelling some attrition at this stage will often result. In all analyses from the Justice Data Lab, persons who have ever been convicted of sex offences will be removed, as these individuals are known to have very different patterns of re-offending. As such, the final treatment group may not be representative of all offenders who have been on this programme; it is possible that the cohort as a whole experienced a different impact on their re-offending behaviour.

The re-offending rates included in this analysis **should not** be compared to the national average, nor any other reports or publications which include re-offending rates – including those assessing the impact of other interventions, such as the previous analyses of the NOMS CFO employment programme[12]. The re-offending rates included in this report are specific to the characteristics of those who received support through the NOMS CFO employment programme between march 2011 and December 2012 who could be matched. Any other comparison would not be comparing like for like.

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[12] www.gov.uk/government/statistics/justice-data-lab-statistics-december-2013 and www.gov.uk/government/statistics/justice-data-lab-statistics-august-2014

For a full description of the methodology, including the matching process, see www.justice.gov.uk/downloads/justice-data-lab/justice-data-lab-methodology.pdf

Assessing Statistical Significance

This analysis uses statistical testing to assess whether any differences in the observed re-offending rates are due to chance, or if the intervention is likely to have led to a real change in behaviour. The outcome of the statistical testing is a value between 0 and 1, called a 'p-value', indicating the certainty that a real difference in re-offending between the two groups has been observed. A value closer to 0 indicates that the difference in the observed re-offending rates is not merely due to chance. For example, a p-value of 0.01 suggests there is only a 1 per cent likelihood that any observed difference in re-offending has been caused by chance.

For the purposes of the analysis presented in this report, we have taken a p-value of up to 0.05 as indicative of a real difference in re-offending rates between the treatment and control groups.

The confidence intervals in the figure are helpful in judging whether something is significant at the 0.05 level. If the confidence intervals for the two groups do not overlap, this indicates that there is a real difference between the re-offending rates.

Annex B - Characteristics of treatment and control groups

The accompanying Excel file contains tables, for each comparison, showing the characteristics of the treatment and control groups.

JDL control group comparisons (tables A1-A3)
The tables show that, for the comparison of those who took part in the employment programme in custody, the groups were well matched on all key variables associated with receiving treatment and/or re-offending

For the other comparisons, the groups were well matched on most key variables but some standardised differences focusing on criminal history are highlighted as amber (i.e. between 5% to 10% or -5% to -10%). This suggests that the control group could have been slightly better matched in these cases, but were still indicative of a control group who exhibit similar characteristics.

Bespoke comparisons (tables B1-B3)
As these comparisons are not set up to be matched control groups, it was not expected that each pair would be well matched. Below gives a summary of how each set compare to each other on key variables associated with receiving treatment and/or re-offending:

'On leaving custody' to 'In custody': The poorest comparisons are custodial sentence length, criminal history and gender. Those who took part in the employment programme on leaving custody were less likely to be have shorter sentences of under a year and more likely to have sentences of between 1 and 4 years; had less previous offences; and were less likely to be female. There was also a mismatch in offence types, with those who took part in the employment programme on leaving custody less likely to have theft and handling offences and more likely to have drug related offences. The groups were similar in terms of both age at index offence and age at first offence.

'In the community' to 'In custody':
Generally, these groups do not compare well. The poorest match is for nationality, indicating that community group has a higher proportion of foreign/unknown nationalities than the custody group.

Also poorly matched were the criminal history and employment/benefit history variables. Those who took part in the community had less previous offences; were more likely to have been in work in the year/month prior to conviction and more likely to be claiming out of work benefits, in particular jobseekers allowance. As with the 'On leaving custody' and 'In custody' groups there was also a mismatch of offence types with those took part in the employment programme in the community less likely to have burglary offences and more likely to have motoring or fraud and forgery/criminal damage offences. This difference in offence types reflects the type of offences for which an offender may receive a custodial sentence.

'In the community' to 'On leaving custody':

Overall, these were the worst matched groups. Again, the poorest matched category is nationality, which is affected by the community group having an increased proportion in the 'Foreign and unknown' category.

Those who took part in the employment programme in the community were less likely to be male; less likely to have burglary or drugs related offences and more likely to have fraud and forgery/motoring/criminal damage offences; were more likely to be white and less likely to be black; and had fewer previous offences. Again, the difference in offence types reflects the type of offences for which an offender may receive a custodial sentence.

Annex C - Glossary of terms

95% Confidence Intervals
If we were to repeat this analysis numerous times then 95% of the time the confidence intervals surrounding the re-offending measure would contain the true mean.

Copas Rate
The Copas rate controls for the rate at which an offender has built up convictions throughout their criminal career. The higher the rate, the more convictions an offender has in a given amount of time.

Custodial Sentence
An individual is sentenced to serve time in custody as a result of being convicted of an offence.

Follow-up period
This refers to the time period of which re-offending is measured from the index date of the index offence. This is 12 months for the one year follow-up period.

Frequency of one year proven re-offending
The number of re-offences committed in a one year follow-up period which were proven through receipt of a court conviction, caution, reprimand or warning during the one year follow-up or in a further six month waiting period. The one year follow-up period begins when offenders leave custody, start their court sentence, or from receipt of their caution.

Index Date
The set point from when proven re-offences are measured. This is defined as the date of prison discharge, date of court conviction for non-custodial sentences, date of receipt for a caution, reprimand or final warning or the date of a positive drug test.

Index Offence
The offence of which an individual has been convicted of, and consequently the re-offending behaviour will be measured from.

One year proven re-offending rate
The proportion of offenders in a cohort who commit an offence in a one year follow-up period which was proven through receipt of a court conviction, caution, reprimand or warning during the one year follow-up or in a further six month waiting period. The one year follow-up period begins when offenders leave custody or start their probation sentence.

P-value
A value between 0 and 1 of which indicates the certainty that a real difference in re-offending between the two groups has been observed. Statistical significance testing is described on page 18 of this report.

Re-offence
An offence committed following conviction of the index offence which was proven through receipt of a court conviction, caution, reprimand or warning. The first re-offence refers to the first offence committed after conviction for index offence.

Severity
The Ministry of Justice and the Home Office have developed a severity classification system to identify three tiers of offences, with Tier 1 offences being the most serious and tier 3 offences being the least serious. Annex A of the "measurements and definitions" document, which accompanies proven re-offending quarterly statistics, gives the latest classification for tier 1 and tier 2 offences – please see the following link:
www.gov.uk/government/uploads/system/uploads/attachment_data/file/368435/proven-reoffending-definitions-measurement-oct13.pdf

Standardised Differences
The standardised differences shown in Annex B measure the effect sizes for the comparison of the treatment and control groups. Each of these effect sizes represent the quality of the matching between the two groups for each individual variable.

Suspended Sentence Order
A court order made up of the same requirements as a community order and, in the absence of breach, is served wholly in the community supervised by the Probation Service.

Time to re-offending
Time to re-offending is defined as the average number of days between the index date (release date from custody or start of probation date) and the offence date of the first re-offence within the one year follow-up period described in the definitions above. This measure is only calculated for individuals that re-offended in the one year follow-up period.

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General information about the official statistics system of the United Kingdom is available from www.statistics.gov.uk