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## Initial analysis of the impact of the Intensive Alternatives to Custody pilots on re-offending rates

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The Intensive Alternatives to Custody (IAC) pilot programme ran from April 2008 to March 2011 to test the use of intensive community orders in diverting offenders from short-term custodial sentences. The Ministry of Justice have undertaken initial analysis to compare re-offending rates for offenders receiving IAC with a well-matched control group receiving short custodial sentences and a well-matched control group receiving court orders. This paper summarises the key findings.

### Key points

When comparing offenders who started Intensive Alternatives to Custody (IAC) orders in 2009, with similar offenders who started other court orders in 2009, and similar offenders who were discharged from short custodial sentences in 2009, the key findings are:

- There is no evidence of a difference between IAC and other court orders in terms of impact on re-offending.
- There is no evidence at the 5% significance level\* of a difference between IAC and short term custody in terms of impact on re-offending, but at the 10% significance level# there is evidence of a positive impact of IAC compared to short term custody.

This is based on initial analysis using the variable by variable matching method to ensure that offenders in the control group (offenders receiving short custodial sentences or court orders) are matched to offenders with the same characteristics receiving IAC orders.

We plan to repeat the analysis using Propensity Score Matching and with a larger sample when full one year re-offending results are available for IAC orders started in 2010.

\* Evidence at the 5% significance level means that the difference would occur by chance less than 5 times out of 100

# Evidence at the 10% significance level means that the difference would occur by chance less than 10 times out of 100

## Background

The Intensive Alternatives to Custody (IAC) pilot programme ran from April 2008 to March 2011 to test the use of intensive community orders in diverting offenders from short-term custodial sentences.

The IAC pilots enabled courts to use existing community sentencing options in new ways by combining intensive probation supervision with a mix of demanding requirements and interventions delivered by partner agencies.

Seven areas were chosen to pilot the orders: Derbyshire, West Yorkshire, South Wales, Dyfed-Powys, Manchester & Salford, Merseyside, and Humberside. Each pilot area had a degree of flexibility in terms of the approach they took, which meant there was considerable variation between the group of offenders targeted in each pilot area and the interventions delivered in each site.

The Ministry of Justice have undertaken initial analysis of the IAC pilots to compare proven re-offending in a group receiving IAC with a well-matched control group receiving short custodial sentences and a well-matched control group receiving court orders. This paper summarises the key findings.

## Methodology

A dataset of offenders receiving different types of sentence in England and Wales was constructed using the Police National Computer (PNC). This identifies the sentences that offenders were given and information about their re-offending. It was matched to an IAC dataset to identify offenders who have been on the IAC programme.<sup>1</sup>

Proven re-offending rates<sup>2</sup> for IAC offenders were compared with proven re-offending rates for similar offenders in non IAC areas<sup>3</sup> receiving:

- Custodial sentences of less than 12 months, and

- Community orders and suspended sentence orders.

A 12 month follow up period was used to track re-offending, with a 6 month waiting period for conviction. The follow up period for re-offending starts from sentencing for community sentences and starts from prison release for the custodial cohort.

Data was combined from all seven pilot areas, in order to increase numbers. Due to the follow up period needed to track re-offending, it was only possible to analyse one year re-offending rates for offenders that started IAC orders up to the end of 2009. It was decided to exclude offenders who started IAC orders in 2008 because several pilot areas informed MoJ that it took time before the IAC programmes were running at an optimal level.

### Variable by variable matching method

The variable by variable matching method was used to ensure that the control group (offenders receiving short custodial sentences or court orders) was a good reflection of the selection criteria used by the different pilot areas.

Other matching techniques, such as Propensity Score Matching (PSM), were considered, but they are more resource intensive and earlier analysis by the MoJ<sup>4</sup> has produced similar results when using these different techniques, so it was decided to use the variable by variable method for this initial analysis.

The variable by variable method matches offenders, where each offender receiving one sentence is matched exactly to a different offender receiving the comparison sentence, based on six offender characteristics:

- age
- gender
- ethnicity
- index offence
- number of previous convictions
- index date (date of sentence for court orders and date of release for custody) within 3 months.

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<sup>1</sup> To allow for discrepancies in the start dates, IAC offenders who could be matched within 30 days of a court order sentence start were included in the analysis.

<sup>2</sup> The proportion of offenders that are convicted at court or receive a caution for an offence committed within the follow up period and then disposed of within the waiting period.

<sup>3</sup> Based on probation trust areas.

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<sup>4</sup> <http://www.justice.gov.uk/downloads/statistics/mojstats/2011-compendium-reoffending-stats-analysis.pdf>

If there was more than one offender that matched on these characteristics then one offender was selected at random. If an offender appeared multiple times in the dataset i.e. they have had more than one IAC order, only the first IAC order was included to avoid biasing the results, since offenders would have benefited from lessons learnt in the first IAC order.

The validity of the results is dependent on the Conditional Independence Assumption, which assumes assignment to an IAC is fully determined by these observable characteristics. However, it is acknowledged that there may be variables omitted from the matching procedure that relate to both the assignment to IAC and re-offending e.g. behavioural factors which are difficult to measure.

Feedback from pilot stakeholders suggests that offenders with chaotic lifestyles, multiple needs and motivation to change were perceived to be suitable for an IAC order. These factors were therefore potentially used as selection criteria for the IAC programme and they could impact on re-offending, but they were not taken account of in the analysis.

### IAC orders started in 2010

In order to investigate whether the results are likely to differ for offenders starting IAC orders in 2010, MoJ compared 3 month proven re-offending rates (with a 3 month waiting period) for offenders starting IAC orders in 2010, with 3 month proven re-offending rates for similar offenders on court orders. The same variable by variable matching approach was applied.

Data was not available for comparison with offenders on custodial sentences of less than 12 months due to the follow up period needed after prison release.

## Results

### Results for 2009 matched groups, one year re-offending rates

The IAC dataset contained 732 unique offenders with IAC orders started in 2009. 685 offenders were matched to the PNC dataset within 30 days of a court order sentence start and therefore could be included in the analysis.

Comparing the IAC records to court orders (either community orders or suspended sentence orders) achieved 356 exact matches (52% of records), and

comparing the IAC records to custodial sentences of less than 12 months achieved 228 exact matches (33% of records).<sup>5</sup>

Using exact matching does reduce the match rates in comparison to other matching techniques, but the match rates were high given that exact matching was used. This reflects the huge control population available to draw matches from, and the small number of offenders to match in the treatment group. The control population was considerably higher for offenders receiving court orders compared to offenders on short custodial sentences, which is reflected in the higher match rates found when matching to offenders on court orders.

**Table 1: 1 year proven re-offending rates for 2009 matched groups:**

Group	Number of matched offenders	Number of re-offenders	1 year proven re-offending rate (%)
IAC	356	195	54.8
Court Orders	356	178	50.0
IAC	228	128	56.1
Short custody	228	145	63.6

Table 1 shows a lower level of re-offending in the IAC group compared with the short custodial group; an estimated 7.5 percentage points over the 12 month follow up period. This result was not statistically significant at the 5% level, but was significant at the 10% level.<sup>6</sup>

This result is similar to the findings from analysis comparing re-offending rates for all community orders with short custodial sentences of less than 12 months. Offenders receiving community orders in 2008 were found to have lower re-offending rates by 8.3 percentage points.<sup>7</sup>

The analysis found a higher level of re-offending in the IAC group compared with the court order group.

<sup>5</sup> There may be some overlap in the IAC cases matched to custodial cases and court order cases

<sup>6</sup> Using the McNemar Chi-squared test (paired proportions) with continuity corrections gave a p value of 0.09

<sup>7</sup> <http://www.justice.gov.uk/downloads/statistics/mojstats/2011-compendium-reoffending-stats-analysis.pdf>

However, this result was not statistically significant and could therefore have been caused by chance.<sup>8</sup>

### Results for 2010 matched groups, 3 month re-offending rates

The IAC dataset contained 814 unique offenders with IAC orders in 2010. 764 offenders were matched to the PNC dataset within 30 days of a court order sentence start and therefore could be included in the analysis.

Comparing the IAC records to court orders (either community orders or suspended sentence orders) achieved 397 exact matches (52% of records).

**Table 2: 3 month proven re-offending rates for 2010 matched groups:**

Group	Number of matched offenders	Number of re-offenders	3 month proven re-offending rate (%)
IAC	397	85	21.4
Court Orders	397	82	20.7
IAC	-	-	-
Short custody <sup>9</sup>	-	-	-

Table 2 shows a slightly higher level of re-offending in the IAC group compared with the court order group; an estimated 0.7 percentage points over the 3 month follow up period.

This suggests that including IAC orders that started in 2010 in the analysis, may not change the main findings for comparisons to court orders.

### Sensitivities and checks

The use of coarsened exact matching was considered to improve match rates but was rejected because of the reduced robustness of the matching. Testing of sensitivities showed that the match rates could be improved. For example, relaxing the index date within 3 months rule to anytime in the year increased matches for offenders starting IAC orders in 2009 from 52% to 66% and 33% to 48%

respectively for court order and short sentence comparisons. However, these improved match rates come with a reduction in the perceived robustness of the match i.e. the further apart in time the pair being compared are, the more potential for local factors and general national factors to have changed, and this had no significant effect on the main findings (see table A in the annex).

Allowing a variance of 5% in the number of previous convictions would also lead to a substantial increase in matching, but again with the risk of a less robust match.

Further breakdowns from the variable by variable matching method are given in the annex. Tables B and C show how the final matched groups reflect the initial characteristics of the treatment and control populations. The re-offending rates of the IAC offenders in the matched group are very similar to the re-offending rates of IAC offenders in the unmatched population, which suggests the matching process has not biased the results.

Tables D–G show the geographical distribution of offenders in the control and treatment groups by police force area. Table H shows the 2009 National Statistics re-offending rates for offenders commencing a court order by probation trust. These suggest there is no cause for concern in terms of the re-offending rates for the geographic areas used in the analysis.

## Conclusions

This analysis produced evidence of a positive impact of IAC compared to short term custody at the 10% significance level. There is no evidence of a difference between IAC and other court orders in terms of impact on re-offending.

However, offenders in the control and treatment groups have been matched based on a set of six characteristics, and there may be other variables omitted from the matching procedure that could relate to both the assignment to IAC and re-offending.

As there are differences in the delivery of the IAC programmes across each of the seven pilot areas and the characteristics of those assigned to IAC, it is not possible to attribute any effect to a specific type of IAC scheme.

The findings from the 3 month re-offending rates for IAC started in 2010 suggest the 2010 one year

<sup>8</sup> Using the McNemar Chi-squared test (paired proportions) with continuity corrections gave a p value of 0.17.

<sup>9</sup> Data is not available for prison sentences of less than 12 months.

re-offending rates may not change the 2009 main findings for comparisons to court orders.

## Further research

We plan to repeat the analysis using Propensity Score Matching and with a larger sample when full one year re-offending results are available for IAC orders started in 2010. At that time the 2010 prison control group will be available to use as well.

Other possible analysis includes sensitivity analysis to understand the degree to which omitted variables may or may not affect the inferred causal relationship.

Also, further analysis could be done to assess whether the IAC offenders pose more or less of a risk of re-offending than the offenders on other court orders and short custodial sentences. Offender

Assessment System<sup>10</sup> (OASys) risk assessments are not completed for all offenders, but, where they are available, they could be compared for the treatment and control groups. In addition, PNC data could be used to generate a risk score for re-offending, based on variables such as age of first arrest, number/type of arrests, convictions, conviction type, and sex. Then the level of risk posed by all offenders in the treatment group could be compared with all offenders in the control groups. Furthermore, the risk levels of the unmatched offenders could be compared with the matched offenders.

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<sup>10</sup> The Offender Assessment System is a risk assessment and management system developed and used by the prison and probation services of England and Wales. It includes analysis of static (criminal history and demographic) and dynamic (social and personal) risk factors, risk of serious harm, sentence planning, a self-assessment (i.e. offender completed) questionnaire and a summary sheet.

## Annex: Statistical tables

**Table A: One year proven re-offending rates for 2009 matched groups with no time restriction on index dates:**

Group	Number of matched offenders	Number of re-offenders	1 year proven re-offending rate (%)
IAC	455	244	53.6
Court Orders	455	234	51.4
IAC	326	187	57.4
Short custody	326	212	65.0

**Table B: Summary characteristics of 2009 IAC vs. court orders**

	Treatment group – IAC offenders matched to PNC	Control group – Adults receiving court order	IAC offenders in matched group
Number of records	685	147,298	356
1 year proven re-offending rate	54.9%	N/A	54.8%
Average number of previous conviction events	12	7	9
Average age	26	31	25
Proportion of female offenders	12	16	11

**Table C: Summary characteristics of 2009 IAC vs. prison of less than 12 months**

	Treatment group – IAC offenders matched to PNC	Control group – Adults receiving prison of less than 12 months	IAC offenders in matched group
Number of records	685	34,782	228
1 year proven re-offending rate	54.9%	N/A	56.1%
Average number of previous conviction events	12	14	10
Average age	26	31	24
Proportion of female offenders	12	10	5 <sup>11</sup>

<sup>11</sup> There is a lower proportion of females in the matched group compared to the IAC unmatched population, because there are fewer women in prison than men and therefore a lower number to draw matches from.

**Table D: Police force area for matched court order comparison group, 2009**

<b>Police force</b>	<b>Count</b>	<b>Percentage</b>
Metropolitan Police	36	10%
West Midlands	23	6%
Hampshire	21	6%
South Yorkshire	20	6%
Northumbria	20	6%
Lancashire	17	5%
Essex	16	4%
Avon and Somerset	14	4%
Cleveland	13	4%
Staffordshire	12	3%
Cheshire	11	3%
Devon & Cornwall	10	3%
Durham	10	3%
Nottinghamshire	10	3%
Thames Valley	10	3%
Sussex	9	3%
Kent	8	2%
North Wales	8	2%
North Yorkshire	8	2%
Gloucestershire	8	2%
Suffolk	7	2%
Leicestershire	6	2%
Cambridgeshire	6	2%
Hertfordshire	5	1%
Warwickshire	4	1%
West Mercia	4	1%
Wiltshire	3	1%
Dyfed-Powys	3	1%
Greater Manchester	3	1%
Gwent	3	1%
Bedfordshire	3	1%
Dorset	3	1%
Cumbria	3	1%
Lincolnshire	3	1%
Northamptonshire	3	1%
Norfolk	3	1%
Surrey	3	1%
Derbyshire	2	1%
Humberside	2	1%
British Transport Police	1	0%
South Wales	1	0%
Merseyside	1	0%
<b>Total</b>	<b>356</b>	<b>100%</b>

A few offenders in the control group show as being from a police force area that matches the IAC areas, even though we excluded offenders from these areas. This reflects the method of exclusion (supervising probation trust area), whereas geography of offenders was based on processing police force.

**Table E: Police force area for matched prison comparison group, 2009**

<b>Police force</b>	<b>Count</b>	<b>Percentage</b>
Metropolitan Police	35	15%
Essex	15	7%
Thames Valley	13	6%
South Yorkshire	12	5%
West Midlands	10	4%
Hampshire	9	4%
Lancashire	9	4%
Devon & Cornwall	9	4%
Cleveland	8	4%
Suffolk	8	4%
North Wales	8	4%
Cheshire	7	3%
Sussex	7	3%
Norfolk	6	3%
Avon and Somerset	6	3%
Hertfordshire	5	2%
North Yorkshire	5	2%
Nottinghamshire	5	2%
Northumbria	4	2%
West Mercia	4	2%
Kent	4	2%
British Transport Police	4	2%
Cambridgeshire	4	2%
Cumbria	4	2%
Dorset	4	2%
Bedfordshire	3	1%
Leicestershire	3	1%
Lincolnshire	2	1%
Gloucestershire	2	1%
Warwickshire	2	1%
Surrey	2	1%
Staffordshire	2	1%
South Wales	2	1%
Northamptonshire	2	1%
Greater Manchester	1	0%
Gwent	1	0%
Wiltshire	1	0%
<b>Total</b>	<b>228</b>	<b>100%</b>

A few offenders in the control group show as being from a police force area that matches the IAC areas, even though we excluded offenders from these areas. This reflects the method of exclusion (supervising probation trust area), whereas geography of offenders was based on processing police force.



**Table F: Police force area for IAC group matched to court order group, 2009**

<b>Police force</b>	<b>Count</b>	<b>Percentage</b>
Manchester	69	19%
Derbyshire	65	18%
Humberside	59	17%
South Wales	52	15%
West Yorkshire	52	15%
Merseyside	37	10%
Dyfed-Powys	22	6%
<b>Total</b>	<b>356</b>	<b>100%</b>

**Table G: Police force area for IAC group matched to prison group, 2009**

<b>Police force</b>	<b>Count</b>	<b>Percentage</b>
Manchester	50	22%
Derbyshire	41	18%
West Yorkshire	33	14%
Humberside	33	14%
South Wales	28	12%
Merseyside	28	12%
Dyfed-Powys	15	7%
<b>Total</b>	<b>228</b>	<b>100%</b>

**Table H: 2009 National Statistics re-offending rates for offenders commencing a court order by probation trust**

<b>Probation trust</b>	<b>Proportion of offenders who re-offend</b>
Northumbria	43.7
Durham and Tees Valley	41.9
Lancashire	38.9
Gloucestershire	38.3
Wales	37
Humberside	36.9
Cumbria	36.5
Norfolk and Suffolk	36.1
Nottinghamshire	36
North Yorkshire	35.6
Cambridgeshire	35.4
Avon and Somerset	35.2
West Yorkshire	35
South Yorkshire	35
Merseyside	34.8
Hampshire	34.7
Unknown/more than 2 areas	34.6
Dorset	34.5
Wiltshire	34.2
West Mercia	34
London	34
Hertfordshire	34
Devon and Cornwall	33.8
Thames Valley	33.8
Greater Manchester	33.8
Kent	33.7
Surrey and Sussex	32.9
Lincolnshire	32.1
Essex	31.3
Cheshire	31
Northamptonshire	30.7
Staffordshire and West Midlands	30.3
Warwickshire	30.2
Leicestershire	29.8
Derbyshire	28.6
Bedfordshire	28.2