

---

# Alcohol Abstinence Monitoring Requirement Final Impact Evaluation

December 2020

MOPAC Evidence and Insight

Adele Harrison, Julia Yesberg, Michael Keenan

Red Quadrant

Tim McSweeney, Russell Webster



**M O P A C**

---

**MAYOR OF LONDON**

OFFICE FOR POLICING AND CRIME

## 1. Executive Summary

In 2011, the Mayor's Office for Policing And Crime (MOPAC) secured legislation to allow for the introduction of a new sentencing power – the Alcohol Abstinence Monitoring Requirement (AAMR) – to tackle the problem of alcohol related offending in London. The innovation has been constantly underpinned by evaluation, resulting in multiple publications encompassing performance, process and indicative impact of the original pilot scheme. The current report concludes the evaluation and presents final performance and impact findings.

In terms of performance, over the entirety of the pan-London AAMR project (April 2016 to June 2018), a total of **1,173 AAMRs** were issued by the London courts. Offenders were subject to the tag for an average of 64 days.

Of the AAMR cases where breach information was available (n=1,014), there were only 60 cases where the offender had been returned to court and been found or pled guilty to the breach.<sup>1</sup> This indicates an **overall 94% compliance rate**: a figure that has remained stable throughout the entirety of the project. In total, offenders were monitored for 71,584 days and were sober for 69,996 of these days. These figures indicate that in 98% of the days offenders were monitored, they did not consume alcohol. This in itself can be considered a considerable success of the innovation.

To explore final impact upon offending, a statistical technique known as Propensity Score Matching was used to develop the counterfactual (i.e., what would have happened in the absence of the AAMR) which focussed upon examining reoffending within different time periods through the measures of both *arrest* and *charges*. As a result of this procedure, a total of 431 AAMR individuals were successfully matched to a control individual. There were no significant differences on any matching variable, confirming the success of the procedure.

Overall, looking across both arrests and charge data, we see that the results mirror each other in that the level of reoffending for offenders on the AAMR is not significantly different to those on similar orders six months or 12 months post sentence commencement. However, they do commit more reoffences than the comparison group across both *entire timeframes*. One complication in this analysis is the markedly different lengths of the orders – AAMR offenders were subject to the tag for an average of 64 days (range 4 days - 121 days) whilst the control cohort spent on average 445 days on the order (range 180 days -1095 days). So essentially, the AAMR cohort had more time off the order to reoffend than the control group across both timeframes, and it is important that this is taken into account when interpreting these results.

Looking closer at **arrest**, results indicate:

- In terms of arrest data in the first six months of supervision, overall, there was no significant difference between exposure to the AAMR and the level of re-offending committed in the six months post-commencement of supervision (24.2% vs. 25.6%)  $\chi^2(1, N=718)=.19, p=.666$ ;

---

<sup>1</sup> For the purpose of measuring compliance, we have recorded an unsuccessful completion when alerts about violations on the tag led to enforcement action being taken by the Offender Manager that led to a breach conviction at Court.

RR=1.057; CI=.82-1.36) or 12 months post commencement of supervision (35.5% vs. 40.1%;  $\chi^2(1, N=704) = 1.55, p=.214$ ; RR=1.12; CI=0.93-1.36).

- During the six-month post commencement, the AAMR group had a significantly higher average number of reoffences compared to the comparison (a mean of 2.9 versus 1.45;  $p=.005$ ). This was also observed during 12-month post commencement (a mean of 3.72 versus 1.83;  $p=.000$ ).
- The comparison group on average reoffended quicker than the AAMR group during the first six-months post commencement (73.5 days versus 85.7 days) although this was not a significant difference ( $p=.099$ ). This pattern was reversed during 12-months post commencement, with the AAMR group reoffending sooner (140.88 days vs 145.9 days) but again the results were not significant ( $p=.691$ ).
- Overall, 35.5% of AAMR offenders offended (arrest) within 12 months since order commencement. However, only a minority committed their offence on the tag (4.8%,  $n=17$ ). The clear majority of offenders committed their reoffences after the tag had been removed, but prior to sentence end (27%,  $n=95$ ). There are statistically significant differences between the proportions of individuals being arrested in the following periods: on tag vs. remainder of sentence: ( $t=-8.61, p=.000, df=350, STD=.470$ ), on tag vs. after sentence: ( $t=-7.08, p=.000, df=350, STD=.444$ ). Therefore, we can say that offenders are significantly less likely to reoffend whilst on the tag and this is likely a deterrent effect for the period that the tag is worn.

Key findings from the analysis of **charge** data indicate:

- There was no significant difference between exposure to the AAMR and the proportion to re-offend (as measured by an MPS charge for a further offence) committed in the six-months post-commencement of supervision (13.9% vs. 11.1%;  $p=.217$ ) or 12 months post commencement of supervision (21.6% vs. 18.9%;  $p=.364$ ).
- During the six-month post commencement, the AAMR group had a significantly higher average number of reoffences compared to the comparison (a mean of 2.7 versus 1.6;  $p=.005$ ). This was also observed during 12-month post commencement (a mean of 3.1 versus 1.9;  $p=.001$ ).
- The comparison group on average reoffended quicker than the AAMR group during the first six-months post commencement (77.6 days versus 84.7 days). This was not a significant difference ( $p=.458$ ). This pattern was reversed during 12-months post commencement, with the AAMR group reoffending sooner (139.5 days vs 152.5 days) but again the results were not significant ( $p=.417$ ).
- A total of 21.6% ( $N=81$ ) of AAMR offenders offended (charge) in the 12 months since order commencement. However, within this, only a minority (4% of the total cohort,  $N=15$ ) committed their offence during the AAMR, committing 27 offences between them. This means that 16.8% of the total cohort ( $N=63$ ) offended after the tag had been removed and committed a total of 201 offences between them after this date. The average speed to

first reoffence for these 63 offenders was 132.6 days, just over twice the time offenders were subject to the tag (64 days, range 4-121 days).

- Analysis was conducted to attempt to predict the factors that were predicting overall offending. The factor with the largest effect on risk of reoffending was age: each year of increasing age exerted a protective effect, reducing the risk of reoffending by around three per cent. The other factor associated with risk of reoffending was order type; compared to those serving a Suspended Sentence Order, offenders serving a Community Order had a 32 per cent reduced risk of recidivism.

Overall results indicate that there is little difference between the AAMR cohort and the comparison group. These echo similar findings to the earlier published pilot evaluation. Given that implementing innovation can bring risks, that the AAMR is broadly achieving the same results as similar orders over a shorter timeframe, should be considered in a positive light, especially when viewed with the previous process learning that staff and judiciary perceptions were, on the whole positive towards this order as it gives them different options and another tool in the toolbox to prevent offending. However, the cost benefit analysis does indicate that the costs associated with the AAMR do outweigh the costs of placing a similar cohort of offenders on a community sentence involving probation supervision by £257,314. In other words, the net cost to society of sentencing an individual offender on a AAMR is £2,573 more than sentencing the same individual to a community sentence involving probation supervision. These results should be treated as indicative as there were some limitations to the cost benefit analysis, which are discussed in detail within the report.

Overall, the evaluation of AAMR has spanned 4 reports<sup>2</sup> commencing with the process exploration of the initial pilot reporting in 2016, through annual reports, to the London wide rollout and examination of impact to this final impact study. This method of evidence-based working has enabled MOPAC and programme staff to base decisions over this time upon data and learning which has been a positive approach to implementing innovation and a manner of working that should be more frequent within the Criminal Justice Service.

---

<sup>2</sup> Pepper, M. & Dawson, P. (2016) *The Alcohol Abstinence Monitoring Requirement: A process review of the proof of concept pilot*, MOPAC.

<sup>2</sup> Hobson, Z., Harrison, A. & Dawson, P. (2017) *Alcohol Abstinence Monitoring Requirement – South London Pilot Indicative Impact Report*, MOPAC

<sup>2</sup> Hobson Z., Harrison A. & Duckworth, L. (2019) *Alcohol Abstinence Monitoring Requirement – A review of Process and Performance from year 2*. MOPAC

## 2. Introduction

### The Alcohol Abstinence Monitoring Requirement

In 2011 the Mayor's Office for Policing And Crime (MOPAC) secured legislation to allow for the introduction of a new sentencing power – the Alcohol Abstinence Monitoring Requirement (AAMR) – to tackle the significant problem of alcohol related offending in London. The AAMR gives the judiciary the statutory power to impose compulsory sobriety where an offence is alcohol related. The AAMR involves fitting a tag to the offender's ankle and monitoring their alcohol consumption for up to 120 days.

Following the positive learning from the initial AAMR proof of concept pilot<sup>3</sup>, a two-year pan London roll out of the AAMR was launched in April 2016, joint funded by MOPAC and the Ministry of Justice. The aim of this expansion was to test the impact of the AAMR, in line with the Conservative government's 2015 manifesto commitment to make sobriety tags available across England and Wales. The pan London AAMR programme's main delivery period ended at the end of March 2018, with a further three-month extension period until June 2018 to enable a managed closedown of the programme. The innovation has been routinely supported by evaluation exploring the performance, process and indicative impact of the tag (Hobson et al, 2017<sup>4</sup>, Hobson et al, 2019<sup>5</sup>) - refer to these reports for broader performance and process learning. Initial indicative analysis on the pilot scheme was published (Hobson, Harrison & Dawson, 2017<sup>6</sup>) reporting no significant differences comparing the AAMR cohort and a matched comparison across reoffending. Following these results the technology has been rolled out nationally. current report provides a final performance update for the pan-London AAMR programme and presents findings assessing the impact of AAMR on offending.

## 3. Methodology

To evaluate whether the AAMR has had an impact on reoffending, the AAMR cohort was matched using a statistical technique known as Propensity Score Matching to a similar group of offenders who had not received AAMR. This is well established and robust method of generating a counterfactual (Rosenbaum and Rubin, 1983). This section outlines the process behind this approach.

### **AAMR Sample**

The overall AAMR cohort consisted of 1,165 individuals. However, to be included in the impact analysis, several exclusions had to be made. First, all cases sentenced after March 2018 were excluded (n=159) as no data was provided from probation for these cases during the closedown period (April-June 2018). Second, all NPS cases were excluded (n=150) because data for the control sample was only available for CRC cases (see next section). All cases with missing data (e.g., OGRS, age, ethnicity) were also excluded (n=126). Cases where a PNCID number was shared by more than one individual

---

3 Pepper, M. & Dawson, P. (2016) *The Alcohol Abstinence Monitoring Requirement: A process review of the proof of concept pilot*, MOPAC.

4 Hobson, Z., Harrison, A. & Dawson, P. (2017) *Alcohol Abstinence Monitoring Requirement – South London Pilot Indicative Impact Report*,. MOPAC

5 Hobson Z., Harrison A. & Duckworth, L. (2019) *Alcohol Abstinence Monitoring Requirement – A review of Process and Performance from year 2*. MOPAC

6 Hobson, Z., Harrison, A. & Dawson, P. (2017) *Alcohol Abstinence Monitoring Requirement – South London Pilot Indicative Impact Report*,. MOPAC

(n=39), or where a PNCID number was missing (n=7) were excluded. Finally, all cases where the AAMR tag was not successfully fitted were excluded (n=73), leading to an eligible AAMR sample of **611** tagged individuals.

### ***Control Sample***

To identify a control group, caseload data was obtained from the London CRC in March 2019. Offenders who were on a Community Order (CO) or Suspended Sentence Order (SSO) were initially selected (n=12,990). This sample was further reduced by selecting only those offenders with a moderate alcohol need, defined as: a score of '1' on the overall OASys Alcohol misuse item (indicating alcohol is linked to offending) and a score of '1' on the OASys Alcohol misuse sub-item 9.1 (indicating alcohol is a moderate problem).

Based on these criteria, 1,149 offenders were identified. Cases were removed if the sentence had been imposed prior to April 2018 as MOPAC was not provided with any data for the AAMR cases during the closedown period (n=297), where relevant information to facilitate matching was missing (e.g., ethnicity, PNCID number; n=113) and for those who had received an AAMR (n=37). The final sample for matching consisted of **702** offenders managed by the CRC on a CO or SSO who had a moderate alcohol problem.

### ***Generating the counterfactual***

The first step of propensity score matching technique was to develop a regression model that is able to predict group membership (i.e., the propensity of receiving the AAMR treatment). Five theoretically relevant matching variables were selected and entered in a logistic regression model predicting group membership. The variables were: (1) OGRS score, (2) Age, (3) Gender, (4) Ethnicity, (5) Index Offence. The resulting model was significant, meaning that the procedure can continue.

The approach then seeks to match pairs (i.e., control and AAMR) of individuals on their propensity score of receiving the treatment. To do so, an approach called nearest neighbour optimal matching method was used (Austin, 2011). A caliper was set for the propensity scores, meaning a control individual could only be matched to an AAMR individual if their propensity score fell within 0.2 of the standard deviation of the logit of the propensity score. The optimal matching method ensured the best-matched pairs were chosen. The matching procedure was conducted without replacement, meaning once a control individual was matched to an AAMR individual, they could not be matched again.

As a result of this procedure, a total of **431** AAMR individuals were successfully matched to a control individual using CRIS charge data. A suitable match could not be found for 180 AAMR individuals, primarily due to an over-representation of driving-related index offences, a younger age profile, and lower OGRS scores in the AAMR cohort. Table 1 shows the match between the AAMR and control sample was strong. There were no significant differences on any of the matching variables, confirming the success of the PSM procedure.

**Table 1. AAMR and Control Cohorts Matching Criteria (N=862). Match based on the first approach taken using CRIS outcome data**

<b>Matching Criteria</b>	<b>AAMR N=431</b>	<b>Control N=431</b>	<b>Equivalence tests (t-tests or chi-square)</b>
<b>OGRS 2-year score</b>	Average = 42.4 (SD = 23.8)	Average = 41.1 (SD = 24.0)	$t(860) = 0.85, p = .396$
<b>Age (average)</b>	Average = 34.5 (SD = 10.2)	Average = 35.0 (SD = 9.9)	$t(860) = -0.69, p = .488$
<b>Gender</b>			$\chi^2(1) = .039, p = .844$
Male	86.3% (n=372)	85.8% (n=370)	
<b>Ethnicity</b>			$\chi^2(4) = 3.34, p = .502$
White	63.3% (n=273)	63.3% (n=273)	
Black	16.0% (n=69)	13.9% (n=60)	
Asian	11.8% (n=51)	13.0% (n=56)	
Mixed	4.4% (n=19)	6.5% (n=28)	
Other	4.4% (n=19)	3.2% (n=14)	
<b>Index Offence Type</b>			$\chi^2(6) = .901, p = .989$
Violence	53.4% (n=230)	53.4% (n=230)	
Driving	18.1% (n=78)	19.0% (n=82)	
Damage/Theft	13.9% (n=60)	13.7% (n=59)	
Harassment	9.0% (n=39)	9.5% (n=41)	
Public Order	3.5% (n=15)	3.0% (n=13)	
Breach	1.4% (n=6)	0.9% (n=4)	
Drugs	0.7% (n=3)	0.5% (n=2)	

### ***Outcome measures and data matching***

The next stage was to collect the key outcomes measures (i.e., charge) from the MPS systems to compare the treatment and control. Charge data was adopted opposed to proven reoffending<sup>7</sup> due to practicalities and timeliness – especially given the control sample were from a later period after the AAMR innovation ended, a necessary aspect given the AAMR was a pan-London initiative. Given this, the focus on the evaluation was charge data which covers a narrow timeframe, although research has discussed the broad equivalence between using charge data and proven reoffending (Ringland, 2013).

To explore the impact of the AAMR, the evaluation sought to look at offending within a number of time frames post sentence commencement: 1) 6 months, 2) 12 months and 3) offending on and off the tag. However, upon collecting the police charge data difficulties were experienced in returning successful matches from CRIS. Successful matches were observed for CRIS data relating to 72% for the AAMR cohort and 67% for the comparison group.

In order to improve the number of successful matches a variety of methods were employed – for example CRC quality assured all the PNC IDs, extraction dates for analysis were also widened in order to try and capture more trigger offences - the time period for data extraction from the CRIS system was widened to October 2015 to December 2019 for the AAMR cohort, and October 2017 to December 2019 for the control cohort. We then used fuzzy matching approaches to extract CRIS data, but this did not affect the number of successful matches returned from CRIS, the sample retrieved was still only 73% from the AAMR cohort and 69% from the Control cohort. We then explored the possibility of using arrest data from custody systems as there is no requirement to record drunk and disorderly information on CRIS and it was felt that this could affect the amount of successful matches being returned. MPS custody systems capture all offences including drunk and disorderly and approximately 17% (AAMR) and 19% (Control) of the offences within the arrest data returned fit this category. Fuzzy matching was also undertaken to improve the number of successful matches.

Successful matches were observed for Custody data relating to 84% (n=402) of the AMMR cohort and 88% (n=422) for the control group. The percentage of successful matches has increased using arrest data - however, we can't be sure that an outcome was generated for the arrest. Table 2 shows the breakdown of AMMR and Control cohort by outcome from the arrest data. Up to 29% generate no outcome information at all. This is higher for the AAMR group.

---

<sup>7</sup> A proven re-offence is defined as any offence committed in a one year follow-up period and receiving a court conviction, caution, reprimand or warning in the one year follow up or a further six months waiting period.



Table 2 – Outcomes from arrest – MPS custody data set

	AAMR	Control
No Further Action	17%	23%
Charged and Bailed To Court	16%	17%
Charged and Detained For Court	13%	17%
Bailed To Police Station	8%	8%
Detained For Court On Warrant	4%	4%
Released Under Investigation	6%	3%
Simple Caution	1%	2%
To Court Breach of Bail	1%	2%
Fixed Penalty Notice Issue	1%	2%
Detained for Court - No Charge	0%	1%
To Prison	0%	1%
Processed on behalf of another force	0%	1%
Cautioned	0%	1%
To Court (Postal Requisitions)	1%	1%
Bailed To Court On Warrant	0%	0%
Other outcome	0%	1%
Missing/Blank - Not Known	29%	16%

The primary limitation on the comparison of the AAMR cohort with the control group is that the control group were formed at a later date than the AAMR group, which was by design to identify a control group given the AAMR was rolled out pan London. However, this has placed several constraints on the control group that should be acknowledged:

1. Sentence end date – a large portion of the control group have either not finished (4%, n=18) their sentence or had a more limited timeframe (less than 12 months) after their sentence date (15%, n=62), reducing the number of cases that could be included in the analysis.
2. COVID-19 lockdown period – this period of time saw a very unnatural crime landscape where the volume of offences reduced drastically. Several of the control group sentences and/or post sentence periods have run into the lockdown period (taken as 23/03/2020 onwards). 181 cases were removed from the analysis due to this reason.

In order to conduct a comparison between the AAMR cohort and control group both individuals in a matched pair needed to a) both have data for the particular period being looked at; b) the period must be complete (i.e., for a time period this must not end after the data download date and for a sanction period this must be complete); and c) the period must not run into the COVID-19 lockdown period. This has produced a base size for the arrest analysis which is 359.

Arrest extraction dates for analysis were widened in order to try and capture more trigger offences - the time period for data extraction from custody system was October 2015 to September 2020 for the AAMR cohort and October 2017 to September 2020 for the control cohort. Any matched pair who both returned data for the period, and who both held at least 6 months data post sentence that was unaffected by the COVID-19 lockdown were included in the analysis. This equated to 359 matched pairs.

In terms of the CRIS charge data, all charges that occurred within 12-months of an offender's sentence commencement date was recorded as a re-offence. Thirteen percent of the assembled matched comparison group (n=56) had not been supervised for a 12-month period at the point CRIS data were extracted in December 2019. These cases and their corresponding AAMR matches were therefore excluded from our analyses of offending outcomes at 12 months (N=375 matched pairs).

Given the issues we have encountered with data quality and MPS recording practices, plus impact of Covid-19 on the control cohort data extraction period, combining the above approaches provides the best methodology in understanding the impact of AAMR upon reoffending. The report therefore focusses on findings from both approaches.

**Table 1a.** AAMR and Control Cohorts Matching Criteria (N=718) based on the second approach using Arrest data (18 months prior thru to 6 months post sentence)

Matching Criteria	AAMR	Control	Equivalence tests (t-tests or chi-square)
	N=359	N=359	
<b>OGRS 2-year score</b>	Average = 45.14 (SD = 23.03)	Average = 44.50 (SD = 23.57)	t(716) = -0.368, p = .375
<b>Age</b>	Average = 34.36 (SD = 10.27)	Average = 34.66 (SD = 9.75)	t(716) = 0.406, p = .299
<b>Gender</b>			X2(1) = .050, p = .823
Male	86.9% (n=312)	87.5% (n=314)	
<b>Ethnicity</b>			X2(5) = 4.010, p = .548
White British	42.1% (n=151)	46.2% (n=166)	
White other	19.5% (n=70)	16.2% (n=58)	
Black	17.5% (n=63)	15.3% (n=55)	
Asian	12.3% (n=44)	12.0% (n=43)	
Mixed	5.0% (n=18)	7.2% (n=26)	
Other	3.6% (n=13)	3.1% (n=11)	
<b>Index Offence Type</b>			X2(6) = 1.575, p = .954
Violence	50.4% (n=181)	52.1% (n=187)	
Driving	17.8% (n=64)	18.1% (n=65)	
Damage/Theft	15.6% (n=56)	15.3% (n=55)	
Harassment	10% (n=36)	10.3% (n=37)	
Public Order	3.3% (n=12)	2.5% (n=9)	
Breach	1.9% (n=7)	1.1% (n=4)	
Drugs	0.8% (n=3)	0.6% (n=2)	

#### 4. Performance Results (April 2016-June 2018)

##### *Insights on the AAMR Tag and performance*

Over the entirety of the pan-London AAMR project (April 2016 to June 2018), a total of **1,173** AAMRs were issued by the London courts (91% by Magistrates' Courts, n=1,070). Overall, Croydon Magistrates' Court was the most active in imposing the AAMR (15%, n=178), followed by Highbury Corner (12%, n=141), Camberwell Green (9%, n=111) and Uxbridge (9%, n=106) Magistrates' Courts.

The majority of AAMRs were imposed for **Violence** (45%, n=456) or **Driving Offences** (29%, n=291), followed by Damage/Theft (10%, n=106) and Harassment (9%, n=88).<sup>8</sup> AAMRs were usually imposed as a requirement of a **Community Order** (73%, n=851) rather than a Suspended Sentence Order (27%, n=322). Most orders received **multiple requirements** (69%, n=702), most commonly a Rehabilitation Activity Requirement (n=350), Unpaid Work (n=340), Prohibited Activity (n=197), Accredited Programme (n=89), and Curfew (n=54).<sup>9</sup>

In 86% of cases, EMS received the notification from the Courts on the same day as sentencing (n=834), or the following day (n=172). However, only 43% (n=436/1006) of offenders (where EMS was notified on the same or following day) were tagged on the same day or within one day of notification. On average, offenders were tagged within four days of EMS receiving the notification. In 10% of cases the tag was not fitted (n=118). This could be due to a variety of reasons for example they had lied about their drinking and were actually not suitable, they absconded or refused to be tagged or they immediately changed address, became homeless or moved out of London and hence the sentence became unworkable. For those that were fitted, fitting was done on either the first (69%, n=724) or second attempt (20%, n=210). Offenders were subject to the tag for an average of **64 days** (range 4 days - 121 days). The control cohort spent on average 445 days on the order (range 180 days -1095 days).

Of the AAMR cases where breach information was available (n=1,014), there were only 60 cases where the offender had been returned to court and been found or pled guilty to the breach.<sup>10</sup> This indicates an **overall 94% compliance rate** with the AAMR: a figure that has remained stable throughout the entirety of the project. In total, offenders were monitored for 71,584 days and were sober for 69,996 of these days. These figures indicate that in 98% of the days offenders were monitored, they did not consume alcohol. This is itself can be considered a considerable success for the innovation.

##### *Tag Wearer Demographics*

The majority of offenders who were sentenced to an AAMR were **male** (87%, n=1,018), with an average age of **33 years old** (ranging from 18–73 years). Three-fifths of offenders (60%, n=698) were aged between 18 and 34 years at the time of sentencing.<sup>11</sup> Over half of offenders were **white** (63%,

---

<sup>8</sup> Offence type was missing for 159 cases.

<sup>9</sup> Additional requirements were missing for 159 cases.

<sup>10</sup> For the purpose of measuring compliance we have recorded an unsuccessful completion when alerts about violations on the tag led to enforcement action being taken by the Offender Manager that led to a breach conviction at Court.

<sup>11</sup> Age was missing for 4 cases.

n=555), 17% were black (n=149), 12% were Asian (n=105) and the remainder were Mixed or Other ethnic group (n=66).<sup>12</sup>

The NPS and CRC consider the risk an offender poses in two ways – risk of serious harm and risk of reoffending. Nearly two thirds of offenders were considered to be a **medium risk of serious harm** (63%, n=610), with just 1% (n=14) being considered a high risk of serious harm.<sup>13</sup> The average OGRS 2-year<sup>14</sup> score was **36%** (ranging from 0 to 97%), indicating that just over one third of offenders would be predicted to reoffend within two years.<sup>15</sup> This figure shows that those receiving the AAMR are broadly identified as having a **low risk of reoffending**. This has remained a constant throughout the duration of the AAMR evaluation.

## 5. Impact Analysis Results

To explore impact of the AAMR, the evaluation focussed upon offending behaviours across a variety of timeframes (6 months post commencement of supervision, 12 months post commencement of supervision, offending on and off the tag, predicting the drivers of reoffending and an economic analysis). This section works through these measures to seek to understand the impact, if any of the AAMR.

### Offending in the first six months post commencement of supervision

The first timeframe explores offending (as measured by both arrest and charge data) within the first six months post commencement of the order.

In terms of arrest data in the first six months of supervision, overall, there was no significant difference between exposure to the AAMR and the level of re-offending committed in the six months post-commencement of supervision (24.2% vs. 25.6%)  $\chi^2(1, N=718)=.19, p=.666; RR=1.057; CI=.82-1.36$ . See table 2a.

There had been a total of 388 reoffences leading to an MPS arrest in the six months post-commencement of supervision, with an average (mean) of 2.2 offences (Mdn=1.5, SD=1.9, R=1-14, n=179). There is a significant difference in arrests between the AAMR group and the control group six months post sentence commencement, with the AMMR group being subject to a higher number of arrests (253 vs 135). The number of reoffences was significantly higher for the AAMR group (M=2.9, Mdn=2.0, SD=2.42, R=1-14, n=87) relative to the comparison group (M=1.45, Mdn=1.0, SD=0.75, R=1-5, n=92) ( $t=-3.30, p=.005$ ).

---

<sup>12</sup> Ethnicity was missing for 298 cases.

<sup>13</sup> Risk of harm was missing for 200 cases.

<sup>14</sup> OGRS is a predictor of re-offending based only on static risks – age, gender and criminal history. It allows probation, prison and youth justice staff to produce predictions for individual offenders even when the use of dynamic risk assessment tools (e.g. The Offender Assessment System (OASys) or Asset) is not possible.

<sup>15</sup> OGRS Year 2 score was missing for 209 cases.

The overall average (mean) time to first re-offence was 79.53 days (Mdn=75.5, SD=48.98, R=1-183, n=92), with the comparison group reoffending sooner (M=73.5, Mdn=66.0, SD=47.91, n=135) than the AAMR group (M=85.7, Mdn=88.0, SD=49.57, n=87), but not significantly so ( $t=-1.66$ ,  $p=.099$ ).

**Table 2a:** *Offending in the six months post-commencement of supervision (arrest)*

	<b>AAMR Cohort (N=359)</b>	<b>Control Cohort (N=359)</b>
	Arrests	Arrests
<b>% (number) of offenders who reoffended</b>	24.2% (87)	25.6% (92)
<b>Total number of reoffences</b>	253*	135
<b>Minimum number of reoffences</b>	1	1
<b>Maximum number of reoffences</b>	14	5
<b>Average reoffences</b>	2.90*	1.45
<b>Average speed to first reoffence (days)</b>	85.7	73.5
<b>Range (days)</b>	1-178	6-183

Turning to charge data for an offence in the first six months subsequent to the AAMR. Overall, there was no significant difference between exposure to the AAMR and the level of re-offending committed in the six months post-commencement of supervision (13.9% vs. 11.1%;  $\chi^2(1, N=862)=0.15$ ,  $p=.217$ ; RR=1.29; CI=0.86-1.94). See table 2b.

There was a total of 238 reoffences leading to an MPS charge in the six months post-commencement of supervision, with an average (mean) of 2.2 offences (Mdn=1.0, SD=2.0, R=1-14, n= 108). The number of reoffences was significantly higher for the AAMR group (M=2.7, Mdn=2, SD=2.4, R=1-14, n=60) relative to the comparison group (M=1.6, Mdn=1.0, SD=1.2, R=1-8, n=48) ( $t=-2.89$ ,  $p=.00$ ).

The average (mean) time to first re-offence was 81.6 days (Mdn=80.0, SD=49.0, R=0-180, n=108), with the comparison group reoffending sooner (M=77.6, Mdn=71.0, SD=49.8, n=48) than the AAMR group (M=84.7, Mdn=89.5, SD=48.6, n=60), but not significantly so ( $t(106)=-.745$ ,  $p=.458$ ).

**Table 2b:** *Offending in the six months post-commencement of supervision (charge)*

	<b>AAMR Cohort (N=431)</b>	<b>Control Cohort (N=431)</b>
	Charges	Charges
<b>% (number) of offenders who reoffended</b>	13.9% (60)	11.1% (48)
<b>Total number of reoffences</b>	160*	78
<b>Minimum number of reoffences</b>	1	1
<b>Maximum number of reoffences</b>	14	8
<b>Average reoffences per offender</b>	2.7*	1.6
<b>Average speed to first reoffence (days)</b>	84.7	77.6
<b>Range (days)</b>	0-180	5-175

There were no significant difference between the AAMR (84.7 days) and the comparison group (77.6 days) in the average time to first reoffence within six months.

### Offending in the 12 months post-commencement

The next timeframe explores a longer follow on period, that of offending (again as measured by both arrest and charge data) within the first 12 months post commencement of the order.

*There was no association between exposure to the AAMR and the level of re-offending (as measured by arrest for a further offence) committed in the 12 months post-commencement of supervision (35.5% vs. 40.1%;  $\chi^2(1, N=704) = 1.55, p=.214$ ; RR=1.12; CI=0.93-1.36).*

There had been a total of 723 reoffences leading to an MPS arrest in the 12 months post-commencement of supervision, with an average (mean) of 2.72 offences (Mdn=2.00, SD=2.65, R=1-22, n= 266). There is a significant difference in arrests between the AAMR group and the control group 12 months post sentence commencement, with the AMMR group being subject to a higher number of arrests (465 vs 258). The number of reoffences was significantly higher for the AAMR group (M=3.72, Mdn=3.00, SD=3.33, R=1-22, n=125) relative to the comparison group (M=1.83, Mdn=1.00, SD=1.33 R=1-7, n=141) ( $t=-6.025, p=.000$ ).

The average (mean) time to first re-offence was 143.53 days (Mdn=121.00, SD=102.37, R=1-364, n=266), with the AAMR group reoffending sooner (M=140.88, Mdn=120.00, SD=97.70, n=125) than the comparison group (M=145.92, Mdn=123.00, SD=106.73, n=141), but not significantly so ( $t=.397, p=.691$ ).

**Table 3a:** *Offending in the 12 months post-commencement of supervision (arrest)*

	<b>AAMR Cohort (N=352)</b>	<b>Control Cohort (N=352)</b>
	Arrests	Arrests
<b>% (number) of offenders who reoffended</b>	35.5% (125)	40.1% (141)
<b>Total number of reoffences</b>	465*	258
<b>Minimum number of reoffences</b>	1	0
<b>Maximum number of reoffences</b>	22	7
<b>Average reoffences per offender</b>	3.72*	1.83
<b>Average speed to first reoffence (days)</b>	140.88	145.92
<b>Range (days)</b>	1-355	6-364

*In terms of charge data over the longer 12 month period, again, there were no significant difference between exposure to the AAMR and the level of re-offending committed in the 12 months post-commencement of supervision (21.6% vs. 18.9%;  $\chi^2(1, N=750)^{16}=0.82, p=.364; RR=1.18; CI=0.82-1.68$ ).*

There was a total of 391 reoffences leading to an MPS charge in the 12 months post-commencement of supervision, with an average (mean) of 2.6 offences (Mdn=2.0, SD=2.4, R=1–16, n= 152). The number of reoffences was significantly higher for the AAMR group (M=3.1, Mdn=2, SD=2.6, R=1-14, n=81) relative to the comparison group (M=1.9, Mdn=1.0, SD=2.0, R=1-16, n=71) ( $t(147)=3.2, p=.001$ ).

The average (mean) time to first re-offence was 145.6 days (Mdn=122.5, SD=98.1, R=0-361, n=152), with the AAMR group reoffending sooner (M=139.5, Mdn=116.0, SD=98.1, n=81) than the comparison group (M=152.5, Mdn=145.0, SD=98.3, n=71), but not significantly so ( $t(150)= -.813, p=.417$ ).

**Table 3b:** *Offending in the 12 months post-commencement of supervision (charge)*

	<b>AAMR Cohort (N=375)</b>	<b>Control Cohort (N=375)</b>
	Charges	Charges
<b>% (number) of offenders who reoffended</b>	21.6% (81)	18.9% (71)
<b>Total number of reoffences</b>	255	136
<b>Minimum number of reoffences</b>	1	1
<b>Maximum number of reoffences</b>	14	16
<b>Average reoffences per offender</b>	3.1 *	1.9
<b>Average speed to first reoffence (days)</b>	139.5	152.5
<b>Range (days)</b>	0-361	5-346

<sup>16</sup> One AAMR case which lacked details on supervision start date was excluded from all subsequent outcome analyses.



## Which factors were predictive of reoffending in the 12 months post-commencement of supervision?

The evaluation considered nine key variables in our exploratory analyses of factors associated with the likelihood of overall reoffending (across both treatment and control) at 12 months: age; gender; ethnicity, main offence; whether exposed to an AAMR; number of different requirements imposed; and type of order<sup>17</sup>. These factors were chosen based on previous research by the Ministry of Justice, which identified that there are key static factors which can influence reoffending<sup>1819</sup>. On the basis of the results from the analysis, the following variables were excluded from multivariate modelling, as they were not associated with offending:

- gender (reference was 'male') ( $\chi^2 = .530$ ,  $p = .467$ ),
- whether exposed to an AAMR (reference was 'yes') ( $\chi^2 = .922$ ,  $p = .337$ ),
- ethnicity (reference was 'White') ( $\chi^2 = 1.034$ ,  $p = .309$ ); and
- main offence (reference was 'violence') ( $\chi^2 = 1.256$ ,  $p = .262$ ).

Only the three factors associated with a reoffence leading to a charge within 12 months of commencing supervision were included in the final multivariate model. These were (in order of entry based on p-values and Wald statistic): **age** ( $\chi^2 = 9.8$ ,  $p = .002$ ); **type of order** (reference was 'Suspended Sentence Order') ( $\chi^2 = 6.215$ ,  $p = .013$ ); and **number of requirements** ( $\chi^2 = 3.96$ ,  $p = .047$ ).

The final model identified two of the three factors as being significantly predictive of a reoffence. In this model, adjusting for covariates, the factor with the largest effect on risk of reoffending was age. **Each year of increasing age exerted a protective effect, reducing the risk of reoffending by around three per cent.** Compared to those serving a Suspended Sentence Order, offenders serving a Community Order had a 32 per cent reduced risk of recidivism. The results of the model are set out in Table 4.

---

<sup>17</sup> For categorical variables the model value served as the reference category. We used  $p = .25$  as a cut-off for inclusion in multivariate analysis.

<sup>18</sup> Transforming rehabilitation: A summary of evidence on Reducing Reoffending, MoJ Analytical Series, 2013. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/243718/evidence-reduce-reoffending.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/243718/evidence-reduce-reoffending.pdf)

<sup>19</sup> The factors associated with proven reoffending following release from prison, MoJ Analytical Series 2013. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/491119/re-offending-release-waves-1-3-spcr-findings.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/491119/re-offending-release-waves-1-3-spcr-findings.pdf)

**Table 4:** Results of a Cox proportional hazards model of reoffending in the 12 months post-commencement of supervision (N=750)

<b>Covariate</b>	<b>Hazard ratio (HR) (95% CI)</b>	<b>Adjusted HR (95% CI)</b>	<b><math>\chi^2</math></b>	<b>p</b>
<b>Age</b>	.973 (.956 - .990)	.974 (.958 - .991)	8.60	.003
<b>Gender [reference was 'male']</b>	.836 (.517 – 1.353)	-		
<b>Ethnicity [reference was White]</b>	1.072 (.937 – 1.226)	-		
<b>Main offence [reference was 'violence']</b>	.957 (.887 – 1.033)	-		
<b>Whether exposed to an AAMR [reference was 'no']</b>	1.169 (.850 – 1.608)	-		
<b>Number of requirements imposed</b>	1.055 (1.001 – 1.111)	1.041 (.987 – 1.098)	2.16	.141
<b>Type of order [reference was 'Suspended Sentence Order']</b>	.656 (.472 - .914)	.680 (.488 - .949)	5.15	.023

## Offending on and off the AAMR tag

So far, the analysis has explored offending within set timeframes (be it 6 or 12 months) reporting that there was no overall difference in proportion to offend across these periods, but higher levels of offences conducted by the AAMR group. One complication in this analysis is the markedly different lengths of the orders – offenders were subject to the tag for an average of **64 days** (range 4 days - 121 days) whilst the control cohort spent on average 445 days on the order (range 180 days -1095 days). So essentially, in any period under study - the AAMR will be more likely to have completed compared to the control. With this in mind, the analysis now turns to exploring whether the AAMR offending occurred during or after the tag was removed.

For the AAMR group, the time spent on the tag was usually a relatively short period at the start of their sentence (between 2 weeks to 2 months). Overall, 35.5% of AAMR offenders offended (arrest) within 12 months since order commencement, however, only a minority committed their offence on the tag itself (4.8%, n=17). The clear majority of offenders committed their reoffences after the tag had been removed, but prior to sentence end (27%, n=95). There are statistically significant differences between the proportions of individuals being arrested in the following periods: On tag vs. Remainder of sentence: (t=-8.61, p=.000, df=350, STD=.470), On tag vs. After sentence: (t=-7.08, p=.000, df=350, STD=.444). There is no statistically significant difference between the remainder of sentence period and post sentence period.

Those with a low OGRS score (30 or under) are significantly more likely to have 0 arrests in the remainder of their sentence (86%, n=91) compared to medium (score 31-60, 71%, n=107) or high (score 61 or over, 62%, n=59) OGRS scoring individuals ( $X^2(2) = 14.879$ ,  $p = .001$ ). Similarly, those whose index offence was driving are significantly more likely to have 0 arrests for the remainder of their sentence (91%, n=58) compared to all other offences (69%, n=199) ( $X^2(6) = 12.853$ ,  $p = .045$ ).

**Table 5:** AAMR cohort arrests whilst on tag and rest of sentence

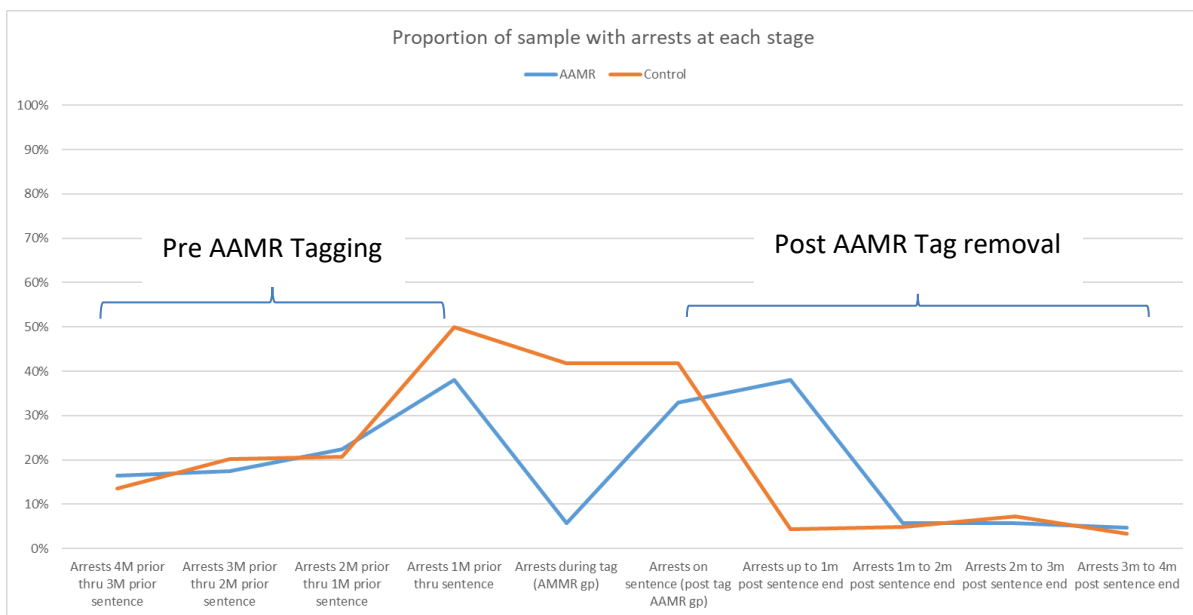
	Period on tag (N=351 <sup>20</sup> )	Period off tag on sentence (N=351)	Period 6 months after sentence end (N=351)
	Arrests	Arrests	Arrests
<b>% (number) of offenders who reoffended</b>	4.8% (17)	27.0% (95)	21.9% (77)
<b>Total number of reoffences</b>	52*	324	141
<b>Minimum number of reoffences</b>	1	1	1
<b>Maximum number of reoffences</b>	13	14	12
<b>Average reoffences</b>	3.05	9.26	1.83

<sup>20</sup> N is reduced to 351 (instead of 359) due to missing tag dates (either fitted or removed).

**Returning to the charge data a similar pattern can be seen.** Overall, we know that 21.6 % (N=81) of offenders on the AAMR offended (charged) in 12 months since order commencement out of a total of 375. Within this, only a minority (4% of the total cohort, N=15) committed their offence during the AAMR, committing 27 offences between them. This means that 16.8% of the total cohort (N=63) offended after the tag had been removed and committed a total of 201 offences between them (3 offenders had no tag removal date and therefore were excluded from the analysis). The average speed to first reoffence for these 63 offenders was 132.6 days (range = 3-309). This is just over double the average time the offenders were subject to the tag (64 days, range = 4-121 days).

Unfortunately, given the longer timeframes of the order received by the control group, it is not possible to explore an equivalent offending 'off' the order for this group. The nearest comparison to draw upon would be MoJ reoffending statistics which show that 28.5% of adult offenders reoffended during April 2017 to March 2018, which is significantly higher than our AAMR cohort measured via arrest or charge. However, we have been able to further explore the proportion of offenders arrested on a monthly basis for both the AAMR and Control. Figure 1 below compares the monthly average arrests across the AAMR cohort and the Control cohort, clearly showing a dip in arrests during the tagging period for the AAMR cohort compared to the 'on sentence' period for the control cohort.<sup>21</sup>

Figure 1: proportion of sample with arrests pre, during and post sentence date



<sup>21</sup> AAMR criteria for inclusion - at least 1 month on AAMR tag and at least 1 month sentence post tag. This aided calculating monthly offending rates for comparison with other monthly periods. Due to limitations on the Control group (sentence end date not reached or 4 month post period going into COVID-19 lockdown), only those with shorter sentences can be included. Those included have an average sentence length of 11.65 months vs. 17.09 months for those who can't be included. This is likely to be related to general seriousness / volume of offending prior to the index sentence. the two groups are therefore not matched based on the PSM pairings.

### **Economic Break-Even Analysis**

The final analysis within the evaluation sought to explore the economic break-even point of the AAMR. That is, what level of reduced reoffending would need to be observed in order for the AAMR to 'break even' on the costs. MOPAC commissioned Red Quadrant to conduct this analysis.

Calculating costs for delivery of the AAMR included both tagging and supervision<sup>22</sup>. The total cost of the AAMR group is calculated by adding the direct costs of delivering the AAMR (100 x £1409.76 = £140,976) to the economic costs of predicted reoffending (£346,919<sup>23</sup>) making a total of £487,895.

The equivalent costs for a matched group of offenders on a community sentence involving just probation supervision<sup>24</sup> would be the direct costs of delivering that supervision (100 x £599.56 = £59,956) added to the economic costs of predicted reoffending (£170,625<sup>25</sup>) making a total of £230,581.

Therefore, currently the total costs of placing 100 offenders on a AAMR outweigh the costs of placing a similar cohort of offenders on a community sentence involving probation supervision by £257,314. In other words, the net cost to society of sentencing an individual offender on a AAMR is £2,573 more than sentencing the same individual to a community sentence involving probation supervision.

If we are to base our breakeven analysis on the findings of this impact study which finds that the economic cost (comprising the cost of delivering the sentence with the economic consequences of the

---

<sup>22</sup> Given the uncertainty of future costings and the fact that any future rollout of AAMRs in London will not require dedicated resources from MOPAC, we have decided to exclude this additional cost and have based this CBEA on a unit cost per AAMR of £1391.25 (Tagging, which includes renting of monitoring equipment, monitoring costs and delivery costs) + £18.51 (Supervision) = £1409.76.

<sup>23</sup> Since this information relates to charges rather than convictions we have assumed that all charges are prosecuted but reduced the total cost in line with the latest national conviction rate of 87% to leave a revised total economic cost of £1,300,946. Finally, for the purpose of making cost comparisons easier to follow, we have produced a figure for the economic cost of reoffending for a cohort of 100 individuals sentenced to a AAMR. Assuming 21.6% of this cohort offends, based on results from our impact analysis involving a matched AAMR and comparison group, the total economic cost of the reoffending of a cohort of 100 offenders placed on a AAMR is  $£1,300,946 \div 81 \times 21.6$ ) £346,919.

<sup>24</sup> To calculate the level of supervision Red Quadrant have assumed that the supervising officer spends an average of 30 minutes per week supervising an individual on a community sentence and requires that individual to attend every week. The assumption of 30 minutes is based on the findings of Tidmarsh (2019) who observed 47 supervision interviews undertaken by offender managers working in a CRC as part of an ethnographic study and recorded the average length of those interviews as 17 minutes. We have allowed an additional 13 minutes for recording and other administrative duties. Using this methodology, the unit cost for the supervision element of a one year community sentence would be 26 hours of the offender manager's time at an hourly rate of £23.06, a total of £599.56.

<sup>25</sup> Since this information relates to charges rather than convictions we have assumed that all charges are prosecuted reduced the total cost in line with the latest national conviction rate of 87% to leave a revised total economic cost of £640,972. Finally, for the purpose of making cost comparisons easier to follow, we have produced a figure for the economic cost of reoffending for a comparison cohort of 100 individuals. Assuming 18.9% of this cohort offends, based on the findings from our impact analysis, the total economic cost of the reoffending of a cohort of 100 offenders placed on a community sentence involving supervision is  $£640,972 \div 71 \times 18.9$ ) £170,625.

higher reoffending rate) of sentencing 100 offenders in London to a AAMR is an additional £257,314 compared to sentencing those same offenders to a community sentence involving supervision only, the breakeven point would be achieved by a cohort of 100 AAMR cases committing, for example, around 24 fewer offences of violence against the person. We have chosen to illustrate the breakeven point by this offence group because it is the most commonly committed offence by the AAMR cohort and has a high economic cost to society as calculated by the Ministry of Justice of £10,667 per offence. However, the results should only be viewed as indicative as successful matches were not returned for all of the AAMR and control cohort offenders from CRIS. It is also worth noting that the control group offenders may have also received support such as a community payback scheme or treatment programmes as part of a condition associated with their community sentence, however, these costs were not accounted for in the CBA, costs were based on a community sentence requiring supervision only.

## 6. Conclusion

The AAMR was introduced as a pilot concept in 2014 to address the significant problem of alcohol related offending in London. This sentencing power enabled courts to impose, as part of a Community Order or Suspended Sentence Order, a requirement that compelled an offender to abstain from alcohol for a fixed time period and be regularly tested via electronic monitoring. Previous reports present the findings from a series of performance and process evaluations, highlighting the implementation success, positive views of both staff and individuals wearing the tag, and learning generated from proof of concept to pan-London roll-out<sup>26</sup>. Similarly, early results exploring impact were published in 2017 focussing upon the pilot cohort, reporting no significant differences comparing the pilot AAMR cohort and a matched comparison across reoffending. This report concludes the AAMR evaluation in taking a final look at the impact of the AAMR on reoffending behaviour over the course of the pan-London roll-out (April 2016-June 2018). Following these results the technology has been rolled out nationally.

Prior to discussing the results, it is worth highlighting that there were some limitations with the data - successful matches were only observed for police data relating to 72% for the AAMR cohort and 67% for the comparison group. Possible reasons for a lack of match for both cohorts include the inaccuracy of PNC IDs at point of recording, missing PNC IDs, wider data error or MPS crime reporting processes. When comparing the AAMR matched sample with those that did not retrieve a successful match from CRIS we saw no significant differences between the samples across the demographics and offence type matching criteria, however, there was a small difference between OGRS 2 scores and as a result a variety of means were attempted to increase the match; such as quality assuring all PNC IDs, fuzzy matching using PNC ID, name and date of birth, and exploring wider data sources to capture offences which are not recorded on CRIS systems, all of which increased the successful hits to 84% (AAMR) and 88% (control). Even with this challenge, the current analysis of AAMR remains one of the largest explorations to date of the technology.

In terms of the results, this analysis has demonstrated that the AAMR is broadly comparable to other Community Orders/Suspended Sentence Orders in terms of reoffending behaviour as measured by both arrests or charges and echoes previous findings from our early impact analysis<sup>27</sup>. To illustrate, across both 6 and 12 months subsequent to the order, the proportions of AAMR and control that offend (be it arrest or charge) are not significantly different. The difference that is observed is that the AAMR cohort have a higher average number of offences (arrest or charge) than the control cohort, across both 6 and 12 months - indicating that when they do reoffend, they commit more (at an average of 1 offence more in both 6 – 12 months). This 1 offence more was a statistically significant difference, but overall questions could be posed as to whether this difference has a practical significance as well.

Where offending did occur for the AAMR group, it was far more likely to occur once the tag was removed. To further illustrate this, the average speed to first reoffence for the AAMR offenders was 132.6 days (range = 3-309), which is just over double the time the individuals were subject to the tag (64 days, range = 4 -121 days). Whilst both the AAMR and the control cohort do reoffend to some

---

<sup>26</sup> Hobson Z., Harrison A. & Duckworth, L. (2019) *Alcohol Abstinence Monitoring Requirement – A review of Process and Performance from year 2*. MOPAC

<sup>27</sup> Hobson, Z., Harrison, A. & Dawson, P. (2017) *Alcohol Abstinence Monitoring Requirement – South London Pilot Indicative Impact Report*. MOPAC

degree, it is also worth reflecting that offending rates are lower for the AAMR cohort and control than the wider reoffending rates throughout England and Wales (28.7%)<sup>28</sup>, confirming that both cohorts are at low risk of reoffending in general.

Overall, reflecting upon the offending results - given the far shorter length of the AAMR order, which brings with it a far longer 'at risk' period (i.e., no AAMR order) relative to the control group, such comparisons over 6 and 12 months should be viewed as an overly rigorous test of success for the AAMR. However, these results do demonstrate the need for continued support for this group subsequent to tag removal to address potential offending.

Analysis also sought to identify factors that had the largest effect on risk of reoffending; these were age (older less likely to offend) and type of order the offender was sentenced to (community orders had a reduced risk of recidivism), which is something that has been echoed by other studies<sup>29 30</sup>.

Whilst we are seeing similar findings to other Community Orders/Suspended Sentence Orders in terms of reoffending behaviour, the financial analysis does indicate that the AAMR is more costly than these orders. If we are to base our breakeven analysis on the findings of this impact study which finds that the economic cost (comprising the cost of delivering the sentence with the economic consequences of the higher reoffending rate) of sentencing 100 offenders in London to a AAMR is an additional £257,314 compared to sentencing those same offenders to a community sentence involving supervision only, the breakeven point would be achieved by a cohort of 100 AAMR cases committing, for example, around 24 fewer offences of violence against the person.

This report concludes the evaluation of the AAMR. The evaluation has been active since 2014, monitoring the AAMR from a small-scale proof of concept to the pan-London implementation. The evaluation has covered performance, process, impact and economic aspects with findings being routinely fed back into practice. Overall, findings appear positive in terms of the technology itself, the implementation, and the perceptions of both staff and individuals. This evaluation has also highlighted the challenges of reducing reoffending, particularly for low risk offending groups and the importance of providing adequate support to offenders at the end of their orders. Given the inherent risks of delivering innovation, to be broadly achieving the same results as longer term, albeit less costly orders, the AAMR innovation should be seen as a firm foundation to build upon.

---

<sup>28</sup> Proven Reoffending Statistics Quarterly Bulletin, England and Wales, January 2018- March 2018  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/861994/proven\\_reoffending\\_bulletin\\_January\\_to\\_March\\_18.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/861994/proven_reoffending_bulletin_January_to_March_18.pdf)

<sup>29</sup>Howard, P., Francis, B., Soothill, K. and Humphreys, L. (2009) OGRS 3: The revised Offender Group Reconviction Scale. Ministry of Justice Research Summary 7/09. Available at  
<http://www.justice.gov.uk/publications/docs/oasys-research-summary-07-09-ii.pdf>

<sup>30</sup> A, Mews et al (2015) The risk of short custodial sentences, community sentences and suspended sentence orders on reoffending. Ministry of Justice Analytical Series.  
<https://pdfs.semanticscholar.org/6051/a8528d7a7f8c11b299575c0913497edf740b.pdf>



## REFERENCES

Austin, P. (2011). *An Introduction to propensity score methods for reducing the effects for confounding in observational studies*. *Multivariate Behavioural Research*, 46, 399-424. Taylor and Francis Group, LLC.

A, Mews et al (2015) *The risk of short custodial sentences, community sentences and suspended sentence orders on reoffending*. Ministry of Justice Analytical Series. <https://pdfs.semanticscholar.org/6051/a8528d7a7f8c11b299575c0913497edf740b.pdf>

Evaluation of the AAMR tagging pilot: 2 year process evaluation finding, NatCen, 2019. <http://www.hlnycrc.co.uk/wp-content/uploads/sites/4/2020/01/Process-Evaluation-Year-2-Interim-Report-Final.pdf>

Hobson, Z., Harrison, A. & Dawson, P. (2017) *Alcohol Abstinence Monitoring Requirement – South London Pilot Indicative Impact Report*,. MOPAC

Hobson Z., Harrison A. & Duckworth, L. (2019) *Alcohol Abstinence Monitoring Requirement – A review of Process and Performance from year 2*. MOPAC

Howard, P., Francis, B., Soothill, K. and Humphreys, L. (2009) *OGRS 3: The revised Offender Group Reconviction Scale*. Ministry of Justice Research Summary 7/09. <http://www.justice.gov.uk/publications/docs/oasys-research-summary-07-09-ii.pdf>

Proven Reoffending Statistics Quarterly Bulletin, England and Wales, January 2018- March 2018 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/861994/proven\\_reoffending\\_bulletin\\_January\\_to\\_March\\_18.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/861994/proven_reoffending_bulletin_January_to_March_18.pdf)

Ringland, C. (2013). *Measuring recidivism: Police versus court data*. *BOCSAR NSW Crime and Justice Bulletins*, 12.

Transforming rehabilitation: A summary of evidence on Reducing Reoffending, MoJ Analytical Series, 2013. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/243718/evidence-reduce-reoffending.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/243718/evidence-reduce-reoffending.pdf)

The factors associated with proven reoffending following release from prison, MoJ Analytical Series 2013. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/491119/re-offending-release-waves-1-3-spcr-findings.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/491119/re-offending-release-waves-1-3-spcr-findings.pdf)

Pepper, M. & Dawson, P. (2016) *The Alcohol Abstinence Monitoring Requirement: A process review of the proof of concept pilot*, MOPAC.

## Appendix A – Propensity Score Matching Procedure

The first step of propensity score matching technique was to develop a regression model that is able to predict group membership (i.e., the propensity of receiving the AAMR treatment). Five theoretically relevant matching variables were selected and entered in a logistic regression model predicting group membership. The variables were: (1) OGRS score, (2) Age, (3) Gender, (4) Ethnicity, (5) Index Offence. The resulting model was significant, meaning that the procedure of using this approach can continue as the variables are significant in predicting AAMR group membership.

### Block 1: Method = Enter

#### Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	183.465	14	.000
	Block	183.465	14	.000
	Model	183.465	14	.000

#### Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1702.976 <sup>a</sup>	.126	.168

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

#### Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	9.059	8	.337

The classification table confirms the model is correctly predicting group membership for 64.5% of the cohort. 472 cases were correctly predicted to be within the control and 407 were correctly predicted to be within the AAMR cohort.

**Classification Table<sup>a</sup>**

Observed		Predicted		Percentage Correct
		AAMR or control		
Step 1	AAMR or control	Control	AAMR	
			472	233
		250	407	61.9
Overall Percentage				64.5

a. The cut value is .500

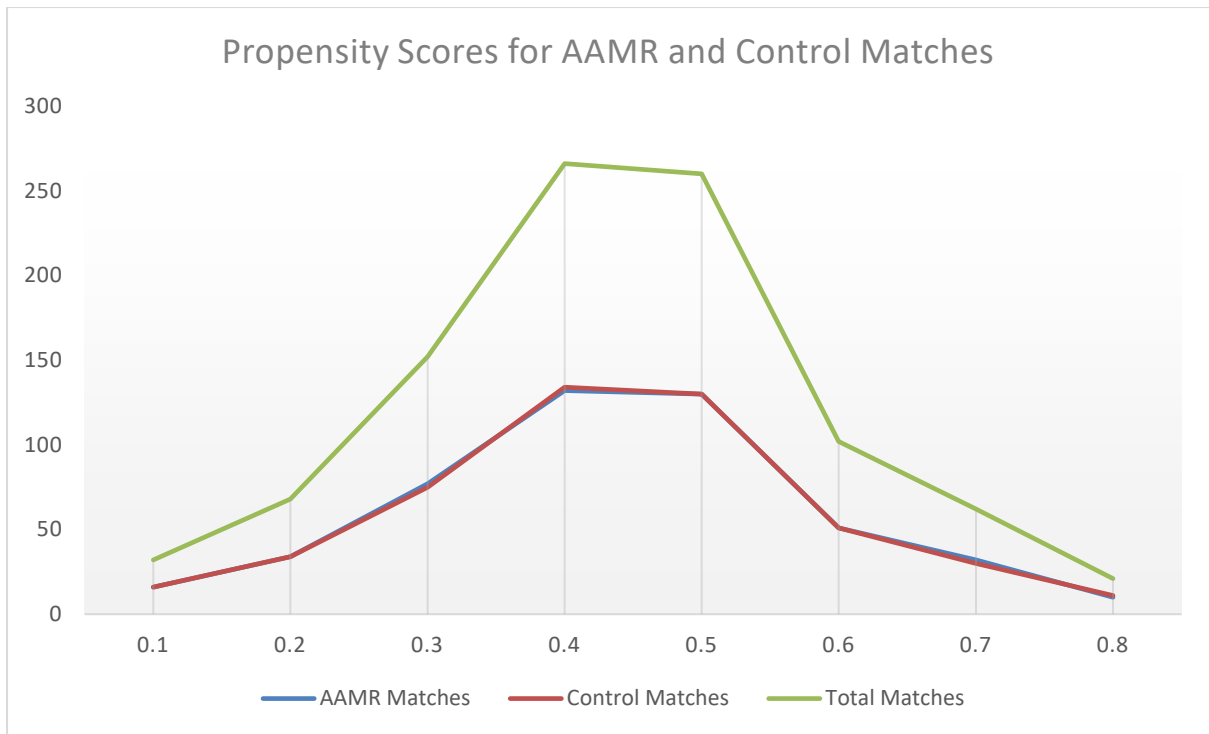
**Variables in the Equation**

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1 <sup>a</sup>	Gender(1)	-.298	.172	3.008	1	.083	.742	.530	1.040
	Age	-.052	.006	71.330	1	.000	.949	.937	.961
	Ethnicity			7.481	4	.113			
	Ethnicity(1)	.015	.337	.002	1	.965	1.015	.525	1.963
	Ethnicity(2)	.033	.361	.008	1	.927	1.034	.510	2.097
	Ethnicity(3)	-.203	.370	.300	1	.584	.816	.395	1.687
	Ethnicity(4)	-.666	.421	2.505	1	.113	.514	.225	1.172
	Indexoffence			69.082	7	.000			
	Indexoffence(1)	-.865	.434	3.963	1	.047	.421	.180	.987
	Indexoffence(2)	.043	.180	.057	1	.812	1.044	.734	1.484
	Indexoffence(3)	1.117	.160	48.882	1	.000	3.056	2.234	4.180
	Indexoffence(4)	-1.292	.564	5.252	1	.022	.275	.091	.829
	Indexoffence(5)	-.160	.207	.596	1	.440	.853	.569	1.278
	Indexoffence(6)	.660	.369	3.204	1	.073	1.935	.939	3.987
	Indexoffence(7)	21.199	40192.969	.000	1	1.000	1608555528	.000	.
	OGRS2	-.011	.003	15.069	1	.000	.989	.984	.995
Constant	2.100	.424	24.543	1	.000	8.162			

a. Variable(s) entered on step 1: Gender, Age, Ethnicity, Indexoffence, OGRS2.

The variables in the equation table shows that age, Index offence and OGRS2 were significant in predicting AAMR group membership.

The approach then seeks to match pairs (i.e., control and AAMR) of individuals on their propensity score of receiving the treatment. To do so, an approach called nearest neighbour optimal matching method was used (Austin, 2011). A caliper was set for the propensity scores, meaning a control individual could only be matched to an AAMR individual if their propensity score fell within 0.2 of the standard deviation of the logit of the propensity score. The optimal matching method ensured the best-matched pairs were chosen. The matching procedure was conducted without replacement, meaning once a control individual was matched to an AAMR individual, they could not be matched again.



The above histogram shows a normal distribution for both AAMR and control propensity scores included in the match, with a symmetrical distribution and near superimposition of both groups, proving that the match is robust and there is a low probability of confounding.