Ministry of Justice

Assessing the effectiveness of Radio Frequency Electronic Monitoring for Community and Suspended Sentence Orders

Court reconvictions during and after a community sentence, breaches and warnings

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1. Summary

The Ministry of Justice (MoJ) evaluation of Radio Frequency (RF) Electronic Monitoring (EM) reported in Brunton-Smith (2025a) showed that curfew requirements with EM were effective at reducing reoffending in England and Wales during a given year. This was evident when considering offenders sentenced to community orders (40% reoffended within a year compared to 51% of those not on RF EM) and suspended sentences (32% reoffended within a year compared to 40%). This evaluation supplements the work reported in Brunton-Smith (2025a) in a number of important ways.[1]

First, this study provides a more complete assessment of the ways that RF EM might contribute to reduced reoffending among recipients of community sentences, looking separately at reoffending that occurred *during* the monitoring period and *after* the RF EM was removed. Specifically, this study compared court reconviction rates between offenders who received a curfew requirement with RF EM and a matched control group for: (i) offences that were committed within the first 83 days of the disposal starting for community orders and 140 days of the disposal starting for suspended sentence orders (the median length of time a tag was in place); (ii) offences that were committed at any point during the current disposal; and (iii) offences that were committed in the 12 months after the current disposal was complete.

Second, this study separately considered the impact of RF EM when used solely to monitor compliance with a curfew requirement of a sentence (a single requirement order) and when used in conjunction with a range of additional probation requirements. For offenders that were only in receipt of a curfew order with RF EM, the disposal duration and monitoring period would coincide. For offenders who were completing multiple requirement orders including a curfew order with EM, the total disposal duration may be considerably longer than the monitoring period.

[1] These evaluations were developed as part of a recent collaboration between the Ministry of Justice, the Economic and Social Research Council (ESRC) and the Cabinet Office Evaluation Accelerator Fund (EAF) to explore the feasibility of using administrative data to evaluate policy and practice interventions in the justice system. The statistics reported in Brunton-Smith (2025a) and Brunton-Smith (2025b) should therefore be considered as experimental.

Considered together, this captures the different mechanisms through which RF EM may reduce reoffending within community sentences. Lower levels of reoffending during the monitoring period would be reflective of the situational barriers to offending that EM is designed to provide (Belur et al., 2020). Lower levels of reoffending across the full disposal duration would indicate that EM is enhancing the effectiveness of community orders and suspended sentences orders. Lower levels of reoffending after the monitoring ended would be more consistent with a general deterrent and/or rehabilitative effect of EM (Renzema, 2010).

Third, this study used court reconviction data rather than proven reoffending from the Police National Computer (PNC). Estimates of reoffending using court reconviction data and proven reoffending are not directly comparable because of differences in the way that in-scope offences are identified. PNC data include information on offences that receive a police caution but do not end up in court, and the PNC omits some offences that are included in court reconviction data.[2] Importantly, whilst the two measures of reoffending are not directly comparable, repeating the analysis reported in Brunton-Smith (2025a) using court reconviction data produced consistent estimates of RF EM impact in both settings (see appendix table A.1).

Fourth, in addition to court reconvictions, this study examined whether RF EM could help enhance the effectiveness of other sentence requirements and was associated with fewer probationary warning letters.

Fifth, the quasi-experimental approach was expanded. Three statistical approaches to causal estimation were used (Propensity Score Matching, Coarsened Exact Matching and Causal Machine Learning) so that weaknesses inherent in each approach could be mitigated by the strengths of the alternative strategies. The list of confounder variables

[2] Comparisons of the two data sources suggests the most common offences that PNC does not record relate to motor vehicles – e.g., using a motor vehicle whilst uninsured against third-party risks, speeding offences or keeping a vehicle on the highway without a driving licence (http://www.gov.uk/government/statistics/proven-reoffending-statistics-october-2015-to-december-2015).

included in the analysis to enhance comparability between the EM and control groups was also expanded with the inclusion of OASys risk scores.[3]

Sixth, the evaluation window was expanded to look at changes in the effectiveness of RF EM over time. All probation records with sentence requirements that started between January 2014 and December 2018 were selected, with results reported separately by year.

Finally, the effect of RF EM in reducing court reconvictions was examined separately for different types of offender based on the index offence type for which the individual was originally disposed.

1.1 Key findings

Impact of RF EM as part of a community order

The study found that adult offenders who received a curfew requirement with EM as part of a community order between 2014 and 2018 were significantly less likely to be reconvicted in court of another offence whilst being electronically monitored.

The estimated reconviction rate for offenders subject to RF EM was five percentage points lower (17% versus 22%) for offences committed within the first 83 days, which was the median length of time an offender on a community order was being electronically monitored.[4]

Differences in reoffending between offenders on a community order subject to RF EM and the control group were similar during the median EM period when using alternative causal estimation approaches, despite higher overall levels of reoffending when higher risk offenders were considered (with a valid OASys record) and lower overall levels of reoffending when lower risk offenders were considered (using CEM).

[3] OASys information was not available for all offenders and there was evidence of selection bias: 82 per cent of those with a valid OASys record spent time in custody since 2011, compared to 44 per cent of those without such a record. As a result, statistical models were estimated with and without OASys variables included. A good level of consistency was observed between the two approaches, although court reconviction rates were generally higher among the subset of offenders with an OASys record, see section 4.1 and 4.2).

[4] Estimated using PSM.

The overall five percentage point reduction in the court reconviction rate during the median EM period was similar to that of offenders who were only in receipt of a single requirement of curfew with RF EM (14% compared to 18% of the matched control group). The estimated reduction was a more modest, but still statistically significant, three percentage points during the median EM period when offenders in receipt of a multiple requirement order were considered (20% compared to 23% of the matched control group).

The reduction in the rate of court reconvictions during the median monitoring period of 83 days was largest for offenders sentenced for robbery (a 12 percentage point reduction) and theft (a five percentage points reduction).[5]

In terms of the entire community order disposal period, the rate of court reconviction was seven percentage points lower among adults who received a curfew requirement with RF EM (24% compared to 31% of the matched control group).[6] Differences were again comparable across causal estimation approaches.

RF EM was similarly effective for offenders on single requirement community orders and on multi-requirement orders during the disposal period, where the estimated reduction in the rate of court reconviction was five percentage points (14% versus 19%) and four percentage points (34% versus 38%) respectively, although the reoffending rates were notably higher overall for offenders subject to multiple requirements.

In terms of the index offence type, the largest statistically significant difference was in relation to theft, where there was a six percentage point reduction in the rate of court reconviction during the community order disposal period.

Adult offenders who were subject to a curfew requirement with RF EM also received fewer warning letters from probation practitioners during the disposal period for breach of probationary requirements, were significantly more likely to complete any other requirements that were attached to the sentence (e.g., unpaid work order) and were less likely to be convicted in court for a breach of their sentence.

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5 Estimated using CML.

6 The median duration of disposals was 364 days, but the disposal duration for an individual offender could be considerably shorter (or longer). For each offender, the reoffending window was the time between the reported start and end date of their current disposal.

However, there was no clear evidence of differences in court reconviction rates for new offences committed within the first 12 months after completion of a community order between those subject to RF EM and those without RF EM.[7] Court reconviction rates were either statistically indistinguishable between the two groups or modestly higher among RF EM recipients, depending on the choice of causal estimation method (39% compared to 38% in the control group when using PSM).

Impact of RF EM as part of a suspended sentence

Adults serving suspended sentence orders between 2014 and 2018 that included a curfew requirement with RF EM were less likely to be reconvicted in court of further offences whilst being electronically monitored.

The court reconviction rate during the median EM period of 140 days was estimated to be three percentage points lower among offenders serving a suspended sentence order that included a curfew requirement with RF EM (15% versus 18%).[8]

Differences were comparable across causal estimation approaches and there were comparatively little differences identified across index offence types during both the median EM period and the suspended sentence disposal period.

The reduction in the court reconviction rate was larger when adults were only subject to a single requirement of curfew with RF EM as part of their suspended sentence order, with an estimated reduction of five percentage points (12% versus 17%) during the median EM period. For offenders serving a multiple requirement order the reduction was approximately two percentage points (16% versus 18%) during the median EM period.

With regard to the entire suspended sentence disposal period, the court reconviction rate was around three percentage points lower for those offenders in receipt of a curfew

7 Offenders who reoffended during the disposal period may have been serving a custodial sentence and as a result may be unable to commit a new offence for some (or all) of the 12 month reconviction window. Given that court reconviction rates during the current disposal were higher for offenders in the control group, it is possible that the reoffending rates for this group are biased downwards.

8 Estimated using PSM. Results were consistent when using alternative causal estimation approaches.

requirement with RF EM across all causal estimation approaches (24% compared to 27% of the matched control group).[9]

Offenders in receipt of a curfew requirement with RF EM were also significantly less likely to breach the conditions of their suspended sentence than the matched control group.

In contrast to community orders, there was also modest evidence that offenders serving a suspended sentence including RF EM were less likely to be reconvicted for an offence committed within 12 months of the completion of their order. Adults whose suspended sentences included a curfew requirement with RF EM had a court reconviction rate that was approximately three percentage points lower than those without RF EM (30% versus 33%).[10]

The reduction in court reconvictions for offences committed within 12 months of the current disposal was about five percentage points (36% versus 41%) in respect of offenders who received a single requirement of curfew with RF EM as part of their suspended sentence order, but two percentage points lower (28% versus 30%) among multi-requirement orders.

Overall conclusion

Overall, the current study has identified a positive impact of receiving a community sentence including a curfew with RF EM when compared to a statistically matched control group of offenders whose sentence did not include RF EM. Court reconviction rates were lower for offenders in receipt of RF EM, whether as a single requirement or as part of a multiple requirement order.

Results were consistent with the suggestion that RF EM acted as both a situational barrier to offending (with lower rates of reoffending during the median EM period) and as a tool to enhance the effectiveness of the community sentence (with lower levels of reoffending

[9] The median duration of disposals was 364 days, but the disposal duration for an individual offender could be considerably shorter (or longer). For each offender, the reoffending window was the time between the reported start and end date of their current disposal.

[10] The higher reoffending rates observed during the current disposal in the control group means that there is a risk that the 12 month court reconviction rates for this group will biased downwards.

during the full disposal period and higher compliance with other probationary requirements).

There is less consistent evidence of a broader deterrent effect of RF EM, with similar court reconviction rates for offences committed within 12 months of the disposal end date for community orders, but a modest reduction in court reconviction rates for suspended sentence orders.

2. Background and project aims

2.1 Context

EM has been widely used internationally since the 1990s. It was first employed as an alternative to remand and supervision of parolees (Killias et al., 2010), and then as an alternative sanction for a range of different community sentences (Renzema, 2003; Whitfield, 2001).

Individuals are required to wear an electronic tag (normally fitted to a subject's ankle) which regularly communicates with a Home Monitoring Unit (HMU), collating information about compliance with an individual's sentencing order. This is intended to support the police, courts, probation, prisons and the wider justice system by remotely monitoring and recording information on an individual's whereabouts (Ministry of Justice, 2024).

There are three main variants of EM: Radio Frequency (RF); geo-location supported technologies such as Global Positioning Schemes (GPS); and alcohol monitoring technologies.

RF EM is used to monitor whether a wearer is in a particular indoor location, most typically the home, with the electronic tag able to signal when the wearer leaves and returns to the specified address (Hucklesby and Holdsworth, 2020). It was introduced in England and Wales in 1999 to monitor compliance with curfew orders.

More advanced GPS supported EM was introduced in 2018 across England and Wales; rollout was fully completed in 2021. This form of EM is able to collect real-time (or close to real-time) information on offender locations, enabling more granular information over offender movements (Belur et al., 2020). Importantly, whilst data are collected in real-time, the information is still typically viewed retrospectively.

The use of alcohol monitoring tags began in the early 2020s across England and Wales.[11] Remote alcohol monitoring can detect alcohol from perspiration and is used where alcohol is considered a risk factor in a person's offending.[12]

In principle, all offenders in receipt of a community sentence that includes a curfew order or exclusion requirement are eligible for EM. However, official sentencing guidelines[13,14] include considerable latitude for sentencer discretion. In particular, sentencers may choose not to impose EM in situations where:

i) there is a person (other than the offender) without whose co-operation it would not be practicable to secure the monitoring and that person does not consent; and/or
ii) electronic monitoring is unavailable and/or impractical; and/or
iii) the particular circumstances of the case, lead the sentencer to consider it inappropriate to do so.

In practice, the number of cases in which EM would not be used for these reasons is likely to be low (Hucklesby and Holdsworth, 2016).

Official statistics[15] show that in England and Wales the total number of individuals who were actively monitored by an EM device (including GPS and alcohol monitoring) was almost 21,000 as at 30 June 2024, which has risen from around 10,000 in early 2020 (Ministry of Justice, 2024). However, community orders and suspended sentence orders accounted for 15 per cent of the total EM caseload, in contrast to around 50 per cent in mid-2017. The largest component of the actively monitored EM caseload at the end of June 2024 was court bail (35%), followed by post-release (28%) and then by immigration (21%).

11 https://www.gov.uk/government/news/alcohol-tags-helping-thousands-of-offenders-stay-sober

12 Alcohol monitoring is used to support the community sentencing option, termed the Alcohol Abstinence and Monitoring Requirement (AAMR), and for offenders released from prison via Alcohol Monitoring on Licence (AML).

13 https://www.sentencingcouncil.org.uk/overarching-guides/magistrates-court/item/imposition-of-community-and-custodial-sentences/

14 These guidelines were effective from February 2017, so they were not in place for most of the study period in this report.

15 https://www.gov.uk/government/statistics/electronic-monitoring-statistics-publication-june-2024

The types of device being used has also changed, with RF EM no longer the main form of EM. At the end of June 2024 a total of about 7,300 individuals were monitored by RF EM (a decrease of 4% since June 2023), whilst about 10,800 individuals were monitored using GPS (an increase of 34% from June 2023) and some 3,200 individuals were fitted with an alcohol monitor (an increase of 38% from June 2023).

2.2 Effectiveness of EM

Despite its widespread use in a range of jurisdictions there remains comparatively little robust evidence on the effectiveness of EM generally.

A total of 24 studies[16] undertaken between 1991 and 2018 have been judged to be sufficiently robust to be included in meta-analyses intending to summarise the best quality research on EM (Belur et al., 2020; Gendreau et al., 2000; Mackenzie, 1997; Renzema and Mayo-Wilson, 2005). This includes just four that have included the random allocation of EM (treatment) to offenders (Austin and Hardyman, 1991; Baumer, Mendelson and Rhine, 1991; Killias et al, 2010; Lapham et al., 2007), with the remaining studies all relying on some form of quasi-experimental (statistical) adjustment to identify a causal estimate of EM effectiveness.[17] The studies were also generally based on small samples, and only three studies used data from the UK.

Collectively, these studies do not find in favour of the effectiveness of EM in general, although there are exceptions depending on the circumstances of use.

In particular, the most recently updated meta-analysis (Belur et al., 2020) failed to identify a significant reduction in offending, although they did observe a modest (and statistically significant) delay in offending among the five studies that looked at time to reoffence. The three earlier meta-analyses were similarly critical of the evidence base, failing to identify a

[16] Only four studies have adopted a fully randomised design with the remaining eligible studies included in existing meta-analyses all relying on statistical controls (and some also matching) to create plausible comparison groups.

[17] Findings from studies adopting a full RCT design were generally no different to those using quasi-experimental approaches. For example, Killias et al (2010) reported a non-significant effect of EM, whilst Lapham et al., (2007) find a significant, but short-lived reduction in ‘drinking under the influence’ offences.

significant effect of EM on reoffending (Gendreau et al., 2000; Mackenzie, 1997; Renzema and Mayo-Wilson, 2005).

However, despite summarising the results from the highest quality studies to date, there are important limitations with the existing evidence base. First, the majority of these studies were based on data from small samples, leaving open the possibility that the failure to identify a consistent effect of EM is the result of a lack of statistical power. The three existing studies based on larger samples all looked at the use of EM on release from prison say nothing about the effectiveness of EM as part of a community order (Di-Tella and Schargrodsky, 2013; Marie, Moreton and Goncalves, 2011; Marie, 2011).

Second, most studies (n=13) were conducted in North America where uses of EM are often different from the UK. Only three studies were based on data from the UK and two of these were focused on the effectiveness of EM in support of Home Detention Curfew (Marie, Moreton and Goncalves, 2011; Marie, 2011). The third study by Sugg, Moore and Howard (2001) did examine EM in support of curfew orders, but was based on a sample of just 261 offenders subject to EM.

The relative absence of high-quality studies suggests that the failure to find strong evidence that the use of EM can reduce reoffending is not necessarily a definitive conclusion. Renzema (2010) identifies a lack of specificity in existing studies, with many simply comparing reoffending rates of EM against those that did not receive EM. By contrast, Renzema suggests a more detailed set of effectiveness measures by which EM should be judged: (i) does EM affect criminal behaviour during the monitoring period?; (ii) does EM reduce reoffending after the monitoring period has ended?; and (iii) does EM have other positive/negative effects beyond reduced reoffending?

Existing research has outlined a number of ways that EM might be effective during and after the monitoring period.

First, EM might reduce reoffending by increasing offender accountability *during* the period of monitoring. For example, Bales et al's (2010) examination of the effectiveness of EM in the American state of Florida found that EM reduced the likelihood of failure under community supervision by about 31 per cent, compared to offenders placed on other forms of community supervision.

Second, even if EM does not have an independent impact on behaviour, the accountability it brings to treatment attendance might increase the impact of treatment, thereby reducing reoffending after the period of monitoring. Bonta, Wallace-Capretta, & Rooney (2000, p. 324) found that, compared to imprisoned offenders of the same risk levels, high risk offenders receiving a combination of EM and cognitive behavioural treatment had lower levels of reoffending. In contrast, lower risk prisoners did better than those receiving the same combination of treatments.

Third, EM could increase general deterrence by making community sentences more onerous, reducing the reoffending of tagged offenders *after* completion of their sentence and also having a more general effect on overall offending. For example, Killias et al (2010) report results from a randomised control trial in Switzerland covering some 240 offenders, noting comparatively large (approx. 10 percentage point) differences in reoffending in favour of EM over community service.

Belur et al., (2020) provide further detail on the pathways through which EM may benefit society that have been tested in existing studies. They point to situational, social and behavioural routes through which EM may reduce offending.

Situational factors include an increase in the (perceived) risks associated with offending by making detection more likely. For example, Bales et al (2010) found that 54 per cent of offenders that were subject to EM reported wanting to follow rules because it felt like they were being watched. They also point to studies suggesting that EM acts as a barrier to offending by making it more difficult, with effort required to break the device (Florida, 2004; Gies et al., 2013; Lobley & Smith, 2000; Tennessee, 2007).

EM may also remove (or limit) some of the reasons that are used to justify offending, allowing for more flexible curfew provisions that enable offenders to maintain work and other pro-social activities, whilst also facilitating a more intensive support package for offenders by providing probation officers with important evidence on compliance (Belur et al, 2020).

Social mechanisms include the enhanced capacity for offenders to maintain close ties with family during their sentence when on EM rather than a custodial sentence, with the importance of family relations for desistance regularly identified in existing research (e.g., Killias et al., 2010).

Behavioural mechanisms capture the enhanced levels of structure that EM may introduce into offenders' daily routines through the requirement to remain in a specific location during particular hours, as well as the role of EM in enhancing the therapeutic element of community based interventions (Pearson, 2012).

Critics have also pointed to some of the potential unintended consequences of EM that should not be ignored. In particular, there is a potential net-widening effect of EM for sentenced offenders. Rather than simply diverting some offenders away from custody, there is a risk that offenders who might ordinarily have received a community sentence would have their punishment augmented by EM and as a result experience a greater restriction of their liberty (Jackson, De Keijser and Michon, 1995). It may also have stigmatising effects on individual offenders, reducing the opportunities to effectively rehabilitate by acting as an additional negative label (Renzema, 2010).

EM may also have impacts on family members not subject to the use of EM who are living in the same property (Belur et al., 2020). This may be because of the technology itself (e.g., the presence of the receiver and related technology) or by being (implicitly or explicitly) drawn into the monitoring process to help ensure offenders satisfy any curfew requirements.

2.3 Research questions

This study used a quasi-experimental design that applied propensity score matching (PSM), coarsened exact matching (CEM) and causal machine learning (CML) models to provide evidence of the effectiveness of EM for a cohort of offenders completing probationary requirements between 2014 and 2018. Focusing solely on RF technology and taking a retrospective approach, the study addressed the following research questions:

1. Does a curfew requirement with RF EM as part of a community order prevent offenders from committing further crime whilst under supervision?
2. Does a curfew requirement with RF EM as part of a community order reduce future reoffending behaviour?
3. Does a curfew requirement with RF EM as part of a community order improve compliance with probation supervision?
4. Does a curfew requirement with RF EM as part of a suspended sentence prevent offenders from committing further crime whilst under supervision?
5. Does a curfew requirement with RF EM as part of a suspended sentence order reduce future reoffending behaviour?

3. Data and method

The current evaluation used data from the probation service management information system, nDelius. A total of 563,361 probation records for offenders serving community orders or suspended sentence orders that started between January 2014 and December 2018 were extracted. Offenders must have been aged 18-90 at the start of their requirement. An individual offender may have multiple probation records if they are managed by the probation service on more than one occasion.

These data were linked to data on the number of prior (from January 2011) and future (up to December 2021) court convictions for each offender from the magistrates' courts and Crown Court databases.

The data were also linked to EM service provider data to identify the cohort of offenders who received a curfew requirement with EM as part of their sentence.

Linkage between databases was probabilistic using the Ministry of Justice's Splink package (Ministry of Justice, 2021), with links generated based on similarity of names (forename, surnames, other names), date of birth and location. Full descriptive statistics are included in appendix tables A.2 and A.3.

3.1 Measuring EM

The cohort of EM treated offenders was identified using direct source data from the main EM service provider, which was EMS Capita during the period of study. It is important to note that all of these records involved the use of RF EM as opposed to other forms of EM. These data were linked to individual offenders.

A probation record for an offender in the EM provider's database was classified as including EM if:

- the order start date recorded by the EM service provider was the same as (or up to seven days later than) the curfew start date recorded in the probation database; or

- if the start date for any probationary requirement was the same as the EM order start date.

The seven day window between curfew start date and EM start date allows for possible delays in EM installation, but leaves open the possibility that some curfew requirements may erroneously be flagged as involving EM – for example, if an offender was sentenced to a community order with no EM within seven days of them being granted bail with EM for another offence. The impact of this is likely to be small, with the majority of linked records (95%) sharing an identical order date across both databases.

Approximately 75 per cent of EM records were directly matched to probation records.[18]

Offenders completing a curfew requirement with EM as part of a community order were monitored for approximately three months (median 83 days). The proportion of offenders subject to a single requirement community order was similar in the cohort of offenders completing a sentence that included RF EM and the cohort not subject to RF EM (49% compared to 50%).

For offenders completing a curfew requirement with EM as part of a suspended sentence order, offenders were monitored for approximately five months (median 140 days). Approximately 74 per cent of records including RF EM were single requirement suspended sentence orders, compared to 57 per cent for records that did not involve RF EM. The median length of time an offender was monitored was longer than for community orders.

3.2 Statistical matching and causal estimation

The current evaluation used a quasi-experimental study design to statistically approximate a randomised control trial.[19] Three different statistical approaches to causal estimation were used in this study (PSM, CEM, CML) so that weaknesses inherent in each approach could be mitigated by the strengths of the alternative strategies. In all cases, the primary

[18] Match rates were slightly lower for community orders (73%) than suspended sentence orders (80%). If reoffending rates (and related outcomes) for these unlinked records are systematically different, it is possible that the estimates of the effectiveness of RF EM would be biased.

[19] Randomisation is a technique that enables correct estimation of the causal effect of an intervention. If EM is allocated at random to a subset of offenders, then any differences in the outcomes for those subject to EM must be the result of EM.

objective is correctly to account for all offender characteristics that are determinants of an offenders' sentence including RF EM, and that are also correlated with the reoffending. Assuming this can be achieved, the approaches can approximate the conditions of a randomised experiment and enable correct identification of the causal effect of RF EM on reoffending. A full technical description of how the approaches were applied, including theoretical rationale, balance tables and match rates can be found in Brunton-Smith (2025b).

PSM and CEM are both matching approaches to causal estimation where the main aim is to identify a plausible match for each 'treated' offender (e.g., completing a curfew requirement with RF EM) that looks 'similar' on all included covariates, but who was not in receipt of RF EM. The approaches differ primarily in the way that 'similarity' is defined.

PSM generally favours a higher match rate (i.e., the proportion of treated individuals that can be matched with an offender in the control group) at the expense of the closeness of the match (i.e., how similar the offenders look to one another on the included covariates).[20] By contrast, CEM emphasises the closeness of the match (offenders must look almost identical in the treatment and control groups), but it is less likely that a perfect match will be identified for each offender subject to RF EM.

The final matched groups satisfied all standard criteria for similarity.[21] CEM achieved a closer match between the treatment and control groups but fewer successfully matched RF EM records: 70 per cent of RF EM community orders were matched and 61 per cent of RF EM suspended sentence orders were matched.[22] All RF EM records were successfully matched using PSM with the exception of 10 suspended sentence records.

[20] The current evaluation used a caliper value of 0.1 to define the closeness of matches.

[21] Balance was assessed by examining standardised mean differences (with 0.05 difference or less considered optimal), variance ratios (where values should be, at a minimum, between 0.5 and 2, but ideally between 0.8 and 1.25) and overlap statistics (values should ideally be lower than 0.1) (Greifer, 2023; Rubin, 2001).

[22] Unmatched records tended to have a shorter offending history and fewer offences being considered as part of the current sentence.

Since only a subset of all probation records were used by PSM and CEM, these approaches can only be used to estimate the effectiveness of RF EM for those offenders who were in receipt of RF EM: the Average effect of the Treatment on the Treated (ATT).[23]

CML is a model-based approach to causal estimation that uses machine learning to identify the appropriate functional form for the relationship between confounders, treatment and outcome. This ensures robust estimates of the effectiveness of RF EM whilst also retaining the benefits from other, model-based approaches (like OLS regression). In particular, it retains all observations in the treatment and control groups meaning it is well optimised to enable direct estimation of how court reconvictions for *any* offender (in treatment or control group) differed if they were in receipt of RF EM – namely, the Average Treatment Effect (ATE). It can also be used to estimate the impact of RF EM for particular types of offender: the Conditional Average Treatment Effect (CATE). In this evaluation, impact was examined by offence type.

However, like all machine learning approaches CML can be prone to overfitting and requires careful tuning of model parameters. It was also necessary to assume a linear probability model when estimating the outcome model, with no equivalent nonlinear modelling approach.[24]

3.3 Potential confounders

A total of 59 control variables were selected from probation records to account for those offender features that are plausibly correlated with whether an offender's sentence includes an RF EM component, as well as correlated with future reoffending.

Here, the key assumption is that the mechanisms determining receipt of RF EM are conditionally independent of reoffending. (For full details on the rationale for selecting these variables, the assumptions that underpin the causal estimation strategy, and post-match balance, see Brunton-Smith, 2025b.) The selected variables covered: basic demographic information (gender, age at sentenced offence, ethnicity), the sentenced

[23] The lower match rates for CEM further restricts the target of inference to the subset of matchable RF EM offenders.

[24] This assumption was not problematic in the context of court reconviction data because the primary focus is the *difference* in the reconviction rate between the RF EM and non-RF EM groups, and the reconviction rates are not close to 0 or 1.

offence (the 14 Home Office categories), prior court convictions (numeric, and separated into the same 14 offence types), disposal length, year and number of probation requirements.

Information on criminogenic needs from OASys records were also identified covering: accommodation, employment, relationships, lifestyle and associates, drug misuse, alcohol misuse, thinking and behaviour, plus attitudes.[25] Offender risk assessments must have been made prior to the sentenced offence.[26]

Importantly, information on criminogenic needs was only available for a subset of offenders and there was substantial evidence of selection bias. Approximately 82 per cent of offenders with a valid OASys assessment had spent time in custody since 2011, compared to 42 per cent of those without an OASys assessment. As a result, all analyses were estimated on the full sample of probation records and the subset including OASys information separately.

3.4 Measuring reoffending

Reoffending was measured using court reconvictions. For each in-scope probation record, all available records from the magistrates' courts and Crown Court databases for the same offender were scanned to identify new offences. Offences must have resulted in a court conviction. Offences classified as a breach of an existing sentence were excluded.[27]

For each offender in England and Wales who received a curfew requirement with RF EM between 2014 and 2018, any new offence that was committed and resulted in a court reconviction was identified (i) between the disposal start date and the median time before

[25] In all cases, offenders were flagged as 'in need of support' if the responses to a set of questions exceeded an accepted threshold. For example, accommodation need was flagged if an offender had problems with at least two of: currently having no fixed abode or being in transient accommodation, living in unsuitable accommodation, living in temporary accommodation, or living in an unsuitable location.

[26] No additional restrictions on the duration between the assessment being made and the current sentenced offence occurring were imposed so some assessments may have been completed a long time prior to the offence. Where offenders had more than one valid OASys record, the most recent risk assessment was selected.

[27] This approach closely corresponds to the methodology used to measure proven reoffending using PNC.

the electronic monitor was removed, (ii) between the disposal start and disposal end date,[28] and (iii) within 12 months of the disposal completion date.

For each offender in the control group, any new offences that were committed and resulted in a court reconviction was identified (i) between the disposal start date and the median time that an electronic monitor *would have been removed*, assuming the same monitoring durations as the treated group, (ii) between the disposal start and disposal end date, and (iii) within 12 months of the disposal completion date.

Estimates of reoffending using court reconviction data are not directly comparable with proven reoffending using the PNC because of differences in the way that in-scope offences are identified. Most notably, PNC data include information on offences that receive a police caution but do not end up in court, and the PNC omits some proven offences that are included in court reconviction data.[29]

Importantly, whilst the two measures of reoffending are not directly comparable, repeating the analysis reported in Brunton-Smith (2025a) using court reconviction data produced consistent estimates of RF EM impact (see appendix table A.1).

3.5 Other impact measures

For offenders serving community orders, details of compliance with other probationary requirements that were included as part of the disposal were also extracted from nDelius.

Specifically, to the extent that it is an accurate measure within nDelius, the number of warning letters sent from the probation officer to the offender was collated for all offenders serving a community sentence. The proportion of probation requirements that each offender was identified as having completed was also recorded.

In both cases, compliance indicators associated with the curfew requirement with RF EM itself were excluded because no equivalent compliance records would be available for the

[28] For offenders that were only completing a curfew requirement with EM (single requirement order) this is the same as the monitoring duration.

[29] Comparisons of the two data sources suggests the most common offences that PNC does not record relate to motor vehicles – e.g., using a motor vehicle whilst uninsured against third-party risks, speeding offences or keeping a vehicle on the highway without a driving licence (http://www.gov.uk/government/statistics/proven-reoffending-statistics-october-2015-to-december-2015).

control group. Court reconvictions for a breach of an existing community sentence were also recorded.

For probation records covering suspended sentences, information recorded in nDelius about whether the disposal requirements were breached was retained.

3.6 Limitations

There are number of limitations with this retrospective impact evaluation.

Most importantly, the current evaluation is not able reliably to isolate the impact of RF EM from the broader effectiveness of curfew requirements. All offenders subject to RF EM in this study also received a curfew requirement as part of their community order or suspended sentence order, so one cannot discount that the possibility that the reduced rate of court reconvictions was actually a more general result of the curfew requirement. However, the fact that court reconvictions for offences that occurred during the median EM period (the median duration of 83 days for community orders and 140 days for suspended sentence orders) were lower for those subject to RF EM is consistent with the situational impact of EM.

The use of median tagging length is also imperfect. Some offenders will be subject to RF EM for less time than this, and for this group we may be overestimating the impact of RF EM if new offences were committed after their tag was removed. By contrast, some offenders may wear an RF EM tag for much longer than the median length, and for this group it is likely that we are underestimating RF EM effectiveness. When considering the treatment and control groups generated using PSM it is possible to provide a more granular assessment of impact during the median EM period by assigning each control unit the monitoring duration of their treated alter.[30] Overall effectiveness whilst offenders were subject to RF EM was largely unchanged using this approach (see appendix tables A.4 and A.9).

There are also inherent limitations with the quasi-experimental approach.

[30] The other causal estimation approaches do not use a 1:1 matching algorithm so an appropriate alter cannot be identified.

First, casual estimation is reliant on the assumption that there are no unobserved confounders that are associated with treatment and associated with reoffending. This assumption is untestable and it remains possible that important confounders are missing. Importantly, the current results were robust to the inclusion of offender needs. This is consistent with earlier work from Eaton and Mews (2019) which showed little difference in the effectiveness of community penalties (and suspended sentences) when compared to custodial sentences with and without taking account of OASys risks.

However, OASys information was only available for a subset of offenders that tended to have more serious offending histories (82% of those with a valid OASys record spent time in custody since 2011, compared to 42% of those without OASys). OASys assessments are also less likely to be available for first time offenders before sentencing. As a result, whilst the consistency across approaches can be taken as a good indication that the main confounders have been effectively captured, the estimated rate of court reconvictions should be interpreted with caution. The results were also robust to different causal estimation approaches (PSM, CEM, CML).

Second, the results may also be susceptible to selection bias. Current official sentencing guidelines identify a number of factors that may lead an individual to be considered ineligible for EM: a lack of consent from someone (other than the offender) required for EM to be installed; a lack of availability of EM; and particular case circumstances. No relevant information was available about these factors to enable records to be excluded from the control group prior to estimation. It therefore remains possible that some offenders deemed ineligible for EM are being included in the comparison and as result, the impact of EM is being under (or over) estimated.

Selection bias may also be evident when 12 month court reconviction rates following the current disposal are considered. Some offenders who reoffended during the current disposal may have received a custodial sentence that left them unable to offend for some (or all) of the follow up period. Assuming the propensity to be sentenced to custody was unrelated to whether an offender was in receipt of RF EM, then the higher rate of court reconvictions in the control group for offences committed during the current disposal would result in the estimated rates of court convictions being biased downwards.

Third, results may also be affected by post-treatment bias. In order to effectively examine the impact of RF EM during disposals it was necessary to include disposal length in the list of confounder variables. Current sentencing guidelines require sentencers to make an initial judgement on the disposal length in Step One of the sentencing process (when considering harm and culpability), prior to determining additional conditions like the use of RF EM. However, this can be adjusted at later guideline steps and so it remains possible that the total disposal length is, in part, determined by whether or not RF EM was used. Similarly, the number of sentence requirements imposed may also be partially determined by whether to use EM. Consequently, reported estimates of impact may be biased.

Fourth, the results are susceptible to researcher dependency effects. Throughout the analysis a range of important decisions were required – in relation to selection of confounders, choice of matching approach and closeness of matches, whether match with replacement, assessment of balance, and selection of CML model and tuning of hyperparameters. Different choices could plausibly have resulted in different conclusions. To somewhat mitigate this risk, results have been reported across different matching algorithms and estimation approaches, with results showing a good degree of consistency across different approaches.

As a further check on the robustness of the results, CML "placebo" models were estimated with EM randomly assigned to offenders (the total number of offenders in receipt of EM was constrained to match the true proportions). If the current results were not reflective of real differences in outcomes between records with EM and those without, but instead reflected modelling decisions and coding choices, then we might anticipate similar effects to be observed when comparing randomly generated treatment and control groups. In all cases, the rates of court reconvictions were statistically indistinguishable between the placebo treatment and control groups (see appendix tables A.5, A.8, A.11 and A.13).[31]

There are also limitations with the use of data collected for routine administrative purposes that cannot be ignored.

[31] CML lends itself nicely to this type of placebo analysis with effect size estimation occurring simultaneously with adjustment for treatment confounding and all treated and untreated units retained in the final model. A similar approach is not available for CEM and PSM.

All analysis must assume that records were an accurate reflection of the true underlying processes being measured. In some instances, data inaccuracies were identified and corrected prior to analysis, and a careful process of data screening was undertaken to minimise the impact of measurement error.

For example, disposal start and termination dates were user input by probation practitioners or their admin staff and consequently were subject to user-input error. Records for RF EM with no additional requirements were initially identified as having a zero-day disposal length because probation staff input the same date for disposal start and termination, necessitating the augmentation of probation recorded disposal start and end dates with EM service provider installation and removal date records. It remains possible that other data errors remain.

The potential impact of any remaining errors on the conclusions cannot be known *a priori*, and as a result the current findings must be interpreted with a degree of caution. The results are therefore only valid under the assumption that any remaining errors are uncorrelated with the treatment and included outcomes.

The data were also subject to missingness across included covariates. In particular, comparatively high levels of missingness were observed in the measurement of offender ethnicity with nine per cent of records not including a valid ethnic code. These observations were omitted from the analysis. All estimated results were consistent when matching was undertaken without considering ethnicity.

Finally, not all EM service data could be accurately mapped on to specific probation events, with approximately 25 per cent of EM records omitted from the analysis. If reoffending rates (and related outcomes) for these unlinked records are systematically different, it is possible that the estimates of the effectiveness of RF EM would be biased.

4. Findings

4.1 Effectiveness of RF EM as part of a community order

Does a curfew requirement with RF EM as part of a community order prevent offenders from committing further crime whilst under supervision?

Offenders who were subject to RF EM as part of a community order were less likely to be reconvicted for another offence committed whilst being monitored within the median EM period of 83 days than offenders in the matched control group over the same time period, as shown in figure 4.1 and Appendix table A.4.

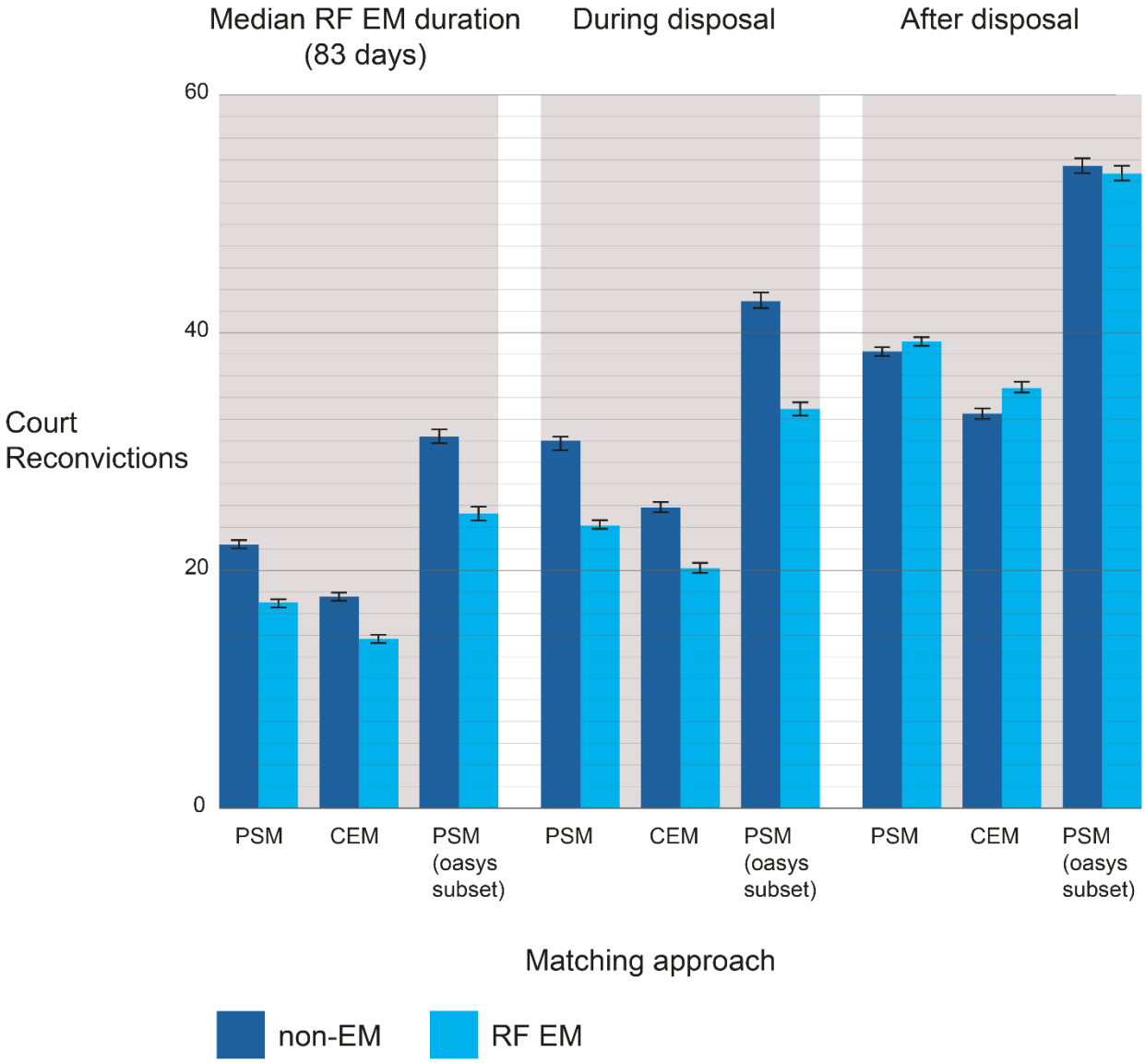
Using PSM, approximately 17 per cent of offenders in the RF EM group were convicted of another offence compared to 22 per cent of offenders not subject to RF EM, which represented a five percentage point reduction (CI -5.3% to -4.4%).[32]

By the time that the sentenced disposal was complete[33] around 24 per cent of offenders that had been subject to RF EM had committed a new offence compared to 31 per cent of the matched control group, a seven percentage point reduction (CI -7.5% to -6.5%).

[32] Unless specifically noted, figures reported in text refer to the results using PSM. Results using alternative matching approaches were generally consistent, although the figures differed because of differences in the sample of offenders included in each comparison (appendix table A.4).

[33] For most offenders, EM is typically only used for a small portion of the full disposal length. The median disposal length was 364 days.

Figure 4.1: Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a community order, 2014-18



The percentage point reduction in court reconvictions for those subject to RF EM within community orders was broadly consistent across all matching approaches with respect to the median duration, to the entire disposal period and to the post-disposal period. However, the subset of offenders who were exactly matched (using CEM) tended to have lower overall rates of court reconviction whether they were monitored or not.

This makes sense, given that exactly matched offenders tended to have less extensive offending histories, and as a result would be expected to have a lower reoffending rate.

Conversely, the subset of offenders with a valid OASys record tended to have higher overall reconviction rates, reflecting their more extensive offending histories.

As shown in appendix table A.5, the average reduction in the rate of court reconvictions for offences committed whilst subject to RF EM was largest for offenders originally sentenced for a robbery (12 percentage points, CI -22.5% to -1.5%)[34] or theft offence (five percentage points, CI -6.1% to -4.0%).

Appendix table A.5 also shows that, for offences committed across the duration of the disposal, the reduction in court reconvictions was larger than average for offenders sentenced for theft (six percentage points, CI -7.6% to -5.2%), summary non-motoring offences (five percentage points, CI -5.8% to -3.8%) and sex offences (five percentage points, CI -8.6% to -0.8%).

With regard to single and multi-requirement orders, Appendix table A.6 shows that there was a consistently lower rate of court reconvictions among offenders who received a curfew requirement with RF EM during the median EM period and across the entire disposal. Importantly, however, overall reconviction rates were notably higher for all offenders subject to a multiple requirement order.

It can be seen in Appendix table A.7 that the reduction in the rate of court reconvictions was also consistent for each year from 2014 to 2018 during the median EM period and across the entire disposal, with modest evidence that the relative reduction in reconvictions grew over the time period.

Does a curfew requirement with RF EM as part of a community order reduce future reoffending behaviour?

Figure 4.1 and Appendix table A.4 also include details of court reconviction rates for offences that were committed within 12 months of the completion of the community order, according to the different matching approaches. The rates of court reconvictions were generally similar between those subject to RF EM and those not subject to RF EM among

[34] The wide confidence interval reflects the small number of offenders originally sentenced for robbery (n=212).

community order recipients. Approximately 39 per cent of offenders whose community order included a curfew requirement with RF EM were reconvicted in court for a new offence committed within 12 months of the completion of their disposal. This compared to 38 per cent of the control group.

The difference between the groups was small, but did reach conventional levels of statistical significance (a one percentage point *increase* in reconvictions for those subject to RF EM, CI 0.3% to 1.4%). This suggests that a small amount of reoffending might simply have been delayed, although the finding could also have been a statistical artefact given the underlying data quality. The difference was moderately larger when the sample of offenders with RF EM that could be exactly matched to the control group were considered (two percentage points, CI 1.5% to 2.8%).

No differences in court reconviction rates were present when offender needs (assessed by valid OASys records) were accounted for or when using the full cohort of offenders sentenced to a community order (using CML).

When impact was assessed separately for each type of index offence, as summarised in Appendix table A.5, there was evidence of a modest increase in the rate of court reconvictions among offenders originally sentenced for violence against the person (the rate of reconvictions was one percentage point higher when the sentence included RF EM, CI 0.8% to 1.7%), fraud (five percentage points higher, CI 2.5% to 6.8%) and summary motoring offences (five percentage points higher, CI 3.5% to 5.8%).

When differences between single requirement and multiple requirement community orders were considered, it was evident that the modest increase in the rate of court reconvictions was localised to offenders serving single requirement community orders, as shown in Appendix table A.6.

Offenders who received a single requirement of curfew with RF EM had higher reconviction rates than the matched control group (43% of those subject to RF EM were reconvicted for offences committed within 12 months of the disposal's end, compared to 41% of the control group). Offenders subject to multi-requirement orders had the same reconviction rates in the RF EM and control groups (34% were reconvicted for offences committed within 12 months of the disposal's end).

Results by year were consistent with the overall picture. Appendix table A.7 shows that there were similar reconviction rates for offenders in receipt of RF EM and those not monitored in each year.

Does a curfew requirement with RF EM as part of a community order improve compliance with probation supervision?

Table 4.1 shows that offenders whose community order included a curfew requirement with RF EM were less likely to be convicted in court for a new offence identified as a breach of their original sentence conditions. Approximately seven per cent of offenders whose curfew was monitored by EM was convicted, compared to 16 per cent of the control group (a nine percentage point reduction, CI -9.7% to -8.9%).

Table 4.1. Differences in compliance with probation supervision between offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of community order, 2014-18

Sentence breach (resulting in new conviction)

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	16%	7%	-9%	-9.7%	-8.9%	0.43	103,739
PSM (full offence classification)	16%	7%	-9%	-9.4%	-8.6%	0.44	103,746
PSM (RF EM must be curfew)	16%	7%	-9%	-9.6%	-8.9%	0.43	103,371
PSM (including valid OASys records)	24%	11%	-13%	-13.5%	-12.1%	0.47	42,633
CEM	12%	5%	-7%	-7.8%	-6.9%	0.41	161,883
CML (ATE)	12%	5%	-7%	-7.7%	-6.8%	0.39	128,728
CEM (RF EM must be curfew)	12%	5%	-7%	-7.8%	-6.9%	0.40	161,734
CML (ATT)			-5%	-6.4%	-4.5%		364,485
CML (ATE)			-5%	-6.0%	-4.3%		364,485

Requirement completion rate

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	0.54	0.65	0.12	0.11	0.12	0.12	76,589
PSM (full offence classification)	0.53	0.66	0.13	0.12	0.13	0.13	76,596
PSM (RF EM must be curfew)	0.54	0.66	0.12	0.11	0.13	0.12	76,269
PSM (including valid OASys records)	0.42	0.58	0.15	0.14	0.16	0.15	31,758
CEM	0.60	0.71	0.10	0.09	0.11	0.10	142,017
CEM (full offence classification)	0.62	0.72	0.11	0.10	0.12	0.11	111,790
CEM (RF EM must be curfew)	0.61	0.71	0.10	0.09	0.11	0.10	141,901
CML (ATT)			0.06	0.05	0.08		337,644
CML (ATE)			0.06	0.05	0.08		337,644

Number of warning letters received

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	1.31	0.91	-0.41	-0.45	-0.37	-0.41	76,962
PSM (full offence classification)	1.38	0.91	-0.47	-0.52	-0.43	-0.47	76,969
PSM (RF EM must be curfew)	1.36	0.90	-0.45	-0.49	-0.41	-0.45	76,642
PSM (including valid OASys records)	1.42	0.99	-0.43	-0.50	-0.37	-0.43	31,907
CEM	1.24	0.76	-0.49	-0.53	-0.44	-0.49	142,248
CEM (full offence classification)	1.18	0.71	-0.48	-0.52	-0.43	-0.48	111,961
CEM (RF EM must be curfew)	1.24	0.75	-0.49	-0.53	-0.44	-0.49	142,132
CML (ATT)			-0.34	-0.40	-0.28		364,485
CML (ATE)			-0.34	-0.40	-0.28		364,485

Offenders who received a curfew requirement with RF EM also received fewer warning letters from their probation practitioner during their sentence (they received fewer than one letter per offender, compared to an average of 1.3 letters received by the group of offenders in the control group).

They were also more likely to complete any other sentence requirements (e.g., unpaid work orders). Offenders subject to RF EM completed approximately two-thirds of their sentence requirements, whilst offenders not subject to RF EM completed approximately half of their sentence requirements. Appendix table A.8 shows that the differences in the requirement completion rate were largest for offenders originally convicted for a breach of sentence or for a robbery or criminal damage.

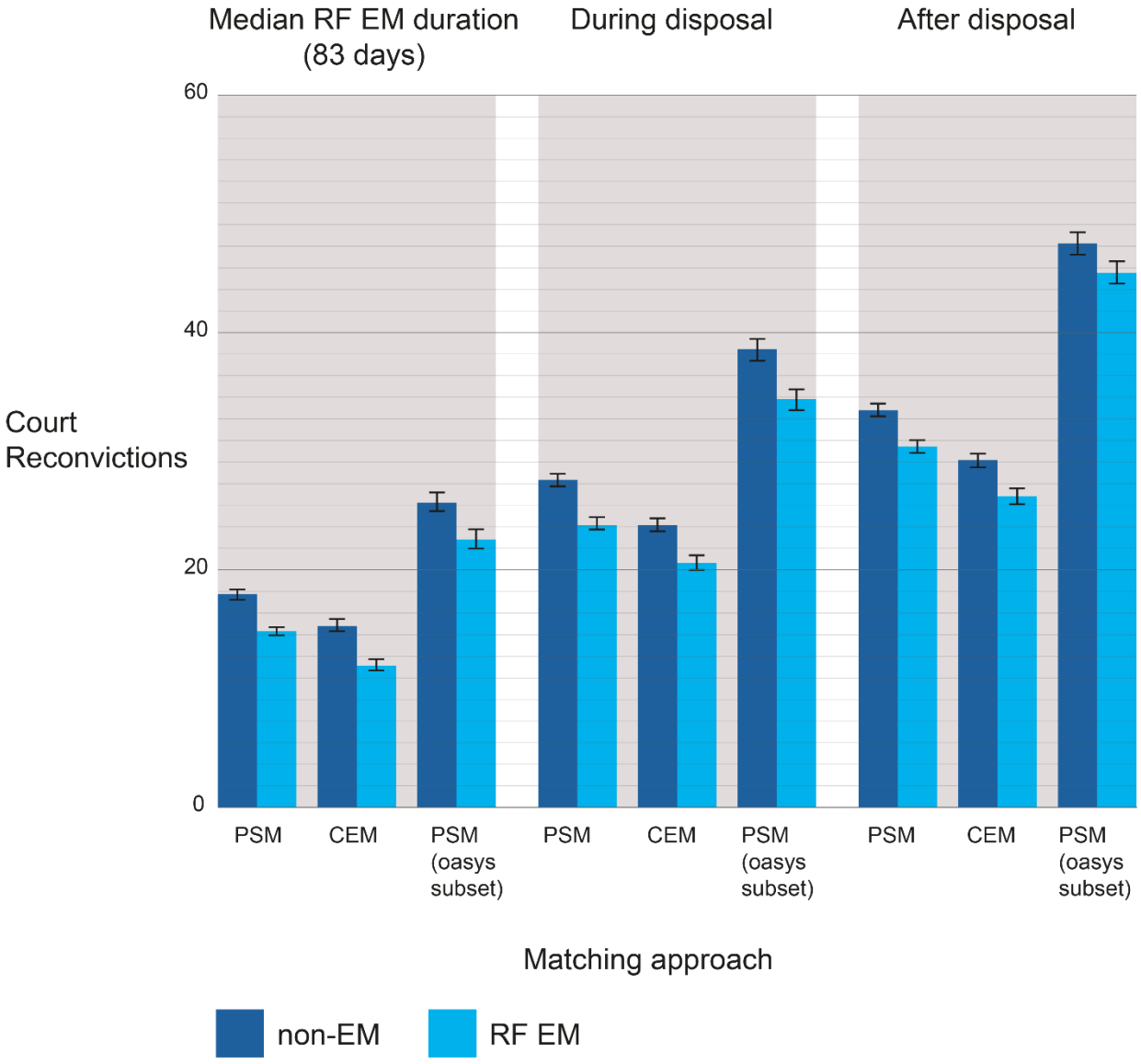
4.2 Effectiveness of RF EM as part of a suspended sentence order

Does a curfew requirement with RF EM as part of a suspended sentence prevent offenders from committing further crime whilst under supervision?

As seen in figure 4.2 and Appendix table A.9, court reconviction rates for offences committed whilst an offender was monitored were around three percentage points lower (CI -3.7% to -2.5%) for offenders who were subject to RF EM than the matched control group.

Approximately 15 per cent of offenders reoffended whilst monitored, compared to 18 per cent of those offenders in the control group during the median EM period. The reduction in court reconviction rates was similar when offences committed during the full disposal window were considered (four percentage points, CI -4.3% to -2.9%). A higher share of offenders had been reconvicted by the completion of their disposal in both groups.

Figure 4.2: Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a suspended sentence order, 2014-18



Results were similar across matching approaches and, as shown in Appendix table A.10, over time.

When considering different index offences, which are summarised in Appendix table A.11, the reduction in court reconvictions only reaches statistical significance for offenders originally sentenced for theft, violence, drug and summary offences during the median EM period and the entire disposal period. The percentage point reduction for each of these original offence groups was roughly similar in size.

As can be seen in Appendix table A.12, percentage point reductions in court reconvictions were notably larger when considering offenders subject to single requirement orders than multi-requirement orders. Approximately 12 per cent of offenders who received a single order curfew requirement with RF EM were convicted of another offence during the relevant median EM period, compared to around 17 per cent of the control group, a five percentage point reduction (CI -6.6% to -3.7%). By contrast, approximately 16 per cent of offenders subject to multiple requirements including a curfew with RF EM were reconvicted for an offence that was committed during the relevant median EM period, compared to 18 per cent of the control group (a two percentage point reduction, CI -2.5% to -1.1%).

A similar difference is evident when considering offences completed across the remainder of the disposal[35] and in the year following the disposal's end.

Offenders subject to RF EM were also less likely to have a disposal requirement terminated because of a breach of the conditions of the suspended sentence (10% compared to 21%) or because of any breach of the probation requirement conditions (23% compared to 42%), as shown in table 4.2.

Table 4.2. Differences in compliance with probation supervision between offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of suspended sentence order, 2014-18

Breach of suspended sentence

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	21%	10%	-11%	-11.5%	-10.4%	0.45	51,668
PSM (full offence classification)	21%	10%	-11%	-12.0%	-10.9%	0.44	51,673
PSM (RF EM must be curfew)	21%	10%	-11%	-11.5%	-10.4%	0.45	51,509
PSM (including valid OASys records)	31%	16%	-15%	-15.6%	-13.5%	0.52	20,045
CEM	17%	7%	-10%	-11.2%	-9.7%	0.39	67,053
CEM (full offence classification)	16%	6%	-10%	-10.8%	-9.3%	0.38	48,677

[35] For offenders subject to a single requirement order with RF EM, offences completed during the disposal will correspond closely to the median monitoring duration. Differences in reconviction rates reflect the use of the median monitoring duration rather than actual monitoring length.

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
CEM (RF EM must be curfew)	17%	7%	-10%	-11.2%	-9.7%	0.39	67,006
CML (ATT)			-8%	-9.8%	-7.1%		191,243
CML (ATE)			-8%	-9.7%	-7.1%		191,243

Any probation requirement revoked

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	42%	23%	-18%	-19.2%	-17.8%	0.55	51,668
PSM (full offence classification)	41%	23%	-18%	-18.8%	-17.5%	0.56	51,673
PSM (RF EM must be curfew)	41%	23%	-18%	-18.9%	-17.5%	0.56	51,509
PSM (including valid OASys records)	57%	34%	-23%	-24.2%	-21.9%	0.59	20,045
CEM	37%	19%	-18%	-19.2%	-17.2%	0.51	67,053
CEM (full offence classification)	36%	18%	-18%	-18.8%	-16.8%	0.50	48,677
CEM (RF EM must be curfew)	37%	19%	-18%	-19.2%	-17.2%	0.51	67,006
CML (ATT)			-15%	-16.9%	-13.2%		191,243
CML (ATE)			-15%	-16.8%	-13.2%		191,243

The percentage point differences in probationary compliance measures were largest for offenders originally convicted for a breach of sentence or for a theft offence, which are summarised in Appendix table A.13.

Does a curfew requirement with RF EM as part of a suspended sentence order reduce future reoffending behaviour?

There was evidence of a modest deterrent effect of RF EM beyond the duration of the sentence for offenders who received a curfew requirement with RF EM as part of a suspended sentence, as seen in figure 4.2.

Approximately 30 per cent of offenders who had been monitored were reconvicted in court for another offence committed within 12 months of completing their disposal, compared to 33 per cent of the control group (a three percentage point reduction, CI -3.8% to -2.3%). The size of this percentage point reduction was similar across all three estimation approaches, as shown in Appendix table A.9, and over time, as shown in Appendix table A.10.

The difference was, however, larger when single requirement orders were considered, with a reduction of around five percentage points (CI -6.8% to -3.2%) compared to two percentage points for multiple requirement orders (CI -3.0% to -1.3%), as summarised in Appendix table A.12. In common with community orders, overall rates of court reconviction were higher for suspended sentence offenders completing single requirement orders.

With regard to the results of CML set out in Appendix table A.11, the modest deterrent effect appeared localised to criminal damage (a 17 percentage point reduction, CI -24.8% to -8.5%),[36] violence (four percentage points, CI -5.1% to -2.4%) and theft (three percentage points, CI -5.2% to -0.7%).

[36] The wide confidence interval is a result of the small number of offenders (n=1,145) whose sentenced offence was criminal damage.

5. Conclusions and implications

5.1 Conclusions

This retrospective impact evaluation has applied robust quasi-experimental methods to linked administrative records collected by the MoJ as part of the operation of the criminal justice system in England and Wales, with the goal of assessing the extent to which RF EM was effective at improving outcomes for offenders serving their community sentences between 2014 and 2018.

The impact of RF EM was considered separately as part of a community order and as a supplement to a suspended sentence order.

In general, the study has shown positive results of RF EM in both settings, with relevant offenders less likely to be reconvicted in court for new offences committed both whilst subject to RF EM and across the entire duration of their disposal.

Percentage point reductions in the rate of court reconvictions were most pronounced for offenders completing single requirement community orders, but still reached statistical significance for offenders completing multiple requirement community orders.

Importantly, the results displayed a high level of consistency across causal estimation approaches providing greater support for the overall conclusions. Rather than RF EM increasing the detection rate for offences, there is evidence that it acts as a direct situational barrier to offending and may also increase the effectiveness of probationary requirements (Belur et al., 2020).

There was also evidence that the impact of RF EM may depend on the type of index offence that was being sentenced.

In terms of community orders' and suspended sentence orders' index offences, RF EM was found to be most effective when used for theft, violence, drug offences and summary offences. The particular benefits of RF EM for theft and drug offences suggests that it was functioning as a situational barrier making it more difficult for offenders to commit an

offence during the study period, whilst the reduction in violent offences may also have been a result of the perceived likelihood of detection.

The picture was less clear when the potential deterrent effect of RF EM for future offending after disposals have ended was considered. There was no evidence of a lasting deterrent effect of RF EM when it was used as part of a community order: the proportion of offenders reconvicted at court for an offence committed within 12 months of completion of their disposal was almost identical between the groups with and without an RF EM condition.

Indeed, when distinguishing between single and multiple requirement orders, it is apparent that for most of the causal estimation methods used the court reconviction rate was actually higher for offenders who were only subject to a curfew order with RF EM (by up to three percentage points). This could indicate that a modest amount of reoffending was deferred until after the monitoring period has ended. By contrast, court reconviction rates were identical when the curfew order with EM was served in conjunction with other requirements.

The failure to detect a robust deterrent effect of EM after monitoring has ended is consistent with existing research (e.g., Belur et al., 2020; Mackenzie, 1997; Gendreau et al., 2000). However, it could also be a reflection of selection bias, with offenders in the control group more likely to have been sentenced to (and serving) a custodial sentence during the 12 month follow up period and as a result being unable to reoffend. Assuming that the propensity to be sentenced to custody is unrelated to whether an offender was in receipt of RF EM, the higher rate of court reconvictions in the control group for offences committed during the current disposal would result in the estimated rates of court convictions being biased downwards when compared to the RF EM group.

There did, however, appear to be a modest deterrent effect when RF EM was used to augment a suspended sentence order, with court reconviction rates for offences committed within 12 months of the disposal end approximately three percentage points lower for this group. This may suggest that the inclusion of RF EM makes a suspended sentence order feel more onerous to an offender who would otherwise not be subject to additional sanctions. However, it is unclear why this effect would only be present when

suspended sentence orders are considered and, as a result, should be interpreted with caution.

The impacts of RF EM were also observed beyond an effect on reoffending. Offenders serving community orders that included a curfew requirement with RF EM were less likely to be convicted for a new offence that was a result of a breach of the original sentence than the control group. There was also evidence that offenders were less likely to receive warning letters and more likely to complete other sentence requirements if they were subject to RF EM.

Suspended sentences were less likely to be breached if the offender was also in receipt of RF EM. This suggests that the additional use of this form of EM may help offenders to engage better with the conditions of their sentence (Renzema, 2010) and may also support probation practitioners in ensuring offenders comply with sentence requirements (Belur et al 2020).

5.2 Implications

The findings indicated that RF EM augmented existing community sentences with benefits for reduced offending whilst RF EM was in place during the study period.

This conclusion is consistent with the suggestion that EM can act as a situational barrier to offending, although it is not acting as a complete block on offending since the court reconviction rates were not zero.

RF EM appeared to have similar effects on reoffending in relation to suspended sentences during the study period.

There was also evidence that RF EM helped as a tool to support completion of other probationary requirements and reduced breaches of community sentence conditions.

But there was no clear indication of RF EM working as a deterrent for future offending, at least when used as part of a community order. Consequently, RF EM might not be effective when used in place of other strategies aimed at reducing future reoffending. In isolation, RF EM did not appear to have further effects beyond the time it was in place, although it might help to enhance other effects.

The picture was marginally more positive when suspended sentences were considered with some evidence of a modest reduction in court reconviction rates after the median EM period had ended. Supporting compliance with a suspended sentence order with RF EM may then, in some conditions, have additional effects for reducing overall levels of offending in England and Wales.

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Appendix
Tables

Table A.1. Comparison of court reconvictions with proven reoffending, April 2016-March 2017[37]

	Community order		Suspended sentence	
	Without RF EM	**With RF EM**	**Without RF EM**	**With RF EM**
12 month court reconvictions	49%	44%	35%	31%
12 month sentence breach (resulting in new conviction)	25%	13%	28%	23%
12 month (PNC) reoffending	51%	40%	40%	32%
Sample size	9,932	10,169	5,743	5,944

[37] Conviction must have been within 18 months of disposal start date

Table A.2. Descriptive statistics for community orders, 2014-18[38]

	non-RF EM	RF EM	Total
	(N=319,862)	(N=52,115)	(N=371,977)
Age (at offence)	32.93 (10.76) 31: 18.00-87.00	32.82 (10.72) 31: 18.00-85.00	32.92 (10.75) 31: 18.00-87.00

Gender

	non-RF EM	RF EM	Total
	(N=319,862)	(N=52,115)	(N=371,977)
Female (reference)	53,140 (16.6%)	9,171 (17.6%)	62,311 (16.8%)
Male	266,722 (83.4%)	42,944 (82.4%)	309,666 (83.2%)

Ethnicity

	non-RF EM	RF EM	Total
	(N=319,862)	(N=52,115)	(N=371,977)
Asian Indian	4,840 (1.5%)	481 (0.9%)	5,321 (1.4%)
Asian Pakistani	6,451 (2.0%)	982 (1.9%)	7,433 (2.0%)
Asian Bangladeshi	2,515 (0.8%)	250 (0.5%)	2,765 (0.7%)
Asian Chinese	287 (0.1%)	16 (0.0%)	303 (0.1%)
Asian Other	3,358 (1.0%)	306 (0.6%)	3,664 (1.0%)
Black Caribbean	9,604 (3.0%)	1,304 (2.5%)	10,908 (2.9%)
Black African	8,701 (2.7%)	933 (1.8%)	9,634 (2.6%)
Black Other	2,776 (0.9%)	304 (0.6%)	3,080 (0.8%)
White and Black Caribbean	6,074 (1.9%)	962 (1.8%)	7,036 (1.9%)
White and Black African	1,454 (0.5%)	194 (0.4%)	1,648 (0.4%)
White and Asian	1,253 (0.4%)	203 (0.4%)	1,456 (0.4%)
Mixed Other	2,039 (0.6%)	255 (0.5%)	2,294 (0.6%)
Arab	712 (0.2%)	70 (0.1%)	782 (0.2%)
Other ethnicity	3,954 (1.2%)	351 (0.7%)	4,305 (1.2%)
White British	240,248 (75.1%)	43,178 (82.9%)	283,426 (76.2%)
White Irish	2,569 (0.8%)	436 (0.8%)	3,005 (0.8%)
White Roma	1,682 (0.5%)	303 (0.6%)	1,985 (0.5%)
White Other	21,345 (6.7%)	1,587 (3.0%)	22,932 (6.2%)

[38] Numeric variables report: mean, (sd), median, min-max values. Qualitative variables report N (%)

Index offence

	non-RF EM	RF EM	Total
	(N=319,862)	(N=52,115)	(N=371,977)
Criminal damage	1,628 (0.5%)	296 (0.6%)	1,924 (0.5%)
Drugs	15,988 (5.0%)	3,041 (5.8%)	19,029 (5.1%)
Fraud	13,197 (4.1%)	1,735 (3.3%)	14,932 (4.0%)
Miscellaneous	13,060 (4.1%)	2,038 (3.9%)	15,098 (4.1%)
Weapons	629 (0.2%)	102 (0.2%)	731 (0.2%)
Public order	9,520 (3.0%)	1,625 (3.1%)	11,145 (3.0%)
Robbery	185 (0.1%)	27 (0.1%)	212 (0.1%)
Sex offences	2,816 (0.9%)	315 (0.6%)	3,131 (0.8%)
Summary	50,437 (15.8%)	8,796 (16.9%)	59,233 (15.9%)
Summary (motoring)	44,333 (13.9%)	5,935 (11.4%)	50,268 (13.5%)
Theft	57,568 (18.0%)	12,725 (24.4%)	70,293 (18.9%)
Violence	109,783 (34.3%)	15,244 (29.3%)	125,027 (33.6%)
Other (Breach)	348 (0.1%)	185 (0.4%)	533 (0.1%)
Other (Child offence)	370 (0.1%)	51 (0.1%)	421 (0.1%)

	non-RF EM	RF EM	Total
	(N=319,862)	(N=52,115)	(N=371,977)
History of drug offences (N)	0.11 (0.54) 0: 0.00-21.00	0.16 (0.67) 0: 0.00-18.00	0.11 (0.56) 0: 0.00-21.00
History of weapons offences (N)	0.01 (0.10) 0: 0.00-12.00	0.01 (0.11) 0: 0.00-6.00	0.01 (0.10) 0: 0.00-12.00
History of public order offences (N)	0.01 (0.18) 0: 0.00-19.00	0.02 (0.22) 0: 0.00-16.00	0.01 (0.19) 0: 0.00-19.00
History of robbery (N)	0.01 (0.11) 0: 0.00-9.00	0.01 (0.12) 0: 0.00-6.00	0.01 (0.11) 0: 0.00-9.00
History of theft (N)	0.73 (2.34) 0: 0.00-75.00	1.27 (3.22) 0: 0.00-74.00	0.81 (2.49) 0: 0.00-75.00
History of Violence (N)	0.03 (0.26) 0: 0.00-18.00	0.05 (0.35) 0: 0.00-12.00	0.04 (0.27) 0: 0.00-18.00
History of summary offences (N)	1.13 (2.37) 0: 0.00-147.00	1.50 (2.85) 0: 0.00-76.00	1.18 (2.44) 0: 0.00-147.00
Other history (N)	0.09 (0.42) 0: 0.00-20.00	0.14 (0.53) 0: 0.00-13.00	0.10 (0.44) 0: 0.00-20.00

	non-RF EM	RF EM	Total
	(N=319,862)	(N=52,115)	(N=371,977)
Prior prison sentences (N)	0.20 (1.11) 0: 0.00-43.00	0.34 (1.51) 0: 0.00-43.00	0.22 (1.18) 0: 0.00-43.00

	non-RF EM	RF EM	Total
	(N=319,862)	(N=52,115)	(N=371,977)
Number of offences in probation disposal	0.52 (1.00) 0: 0.00-22.00	0.51 (1.01) 0: 0.00-23.00	0.52 (1.00) 0: 0.00-23.00
Number of requirements	1.70 (0.87) 1: 1.00-13.00	1.76 (0.98) 1: 1.00-11.00	1.71 (0.89) 1: 1.00-13.00
Disposal length	322.97 (215.74) 364: 0.00-3,300.00	188.01 (179.15) 99: 0.00-2,280.00	304.06 (216.13) 364: 0.00-3,300.00
Electronic monitoring period		103.08 (94.32) 83: 0.00-2,848.00	

Year (requirement started)

	non-RF EM	RF EM	Total
	(N=319,862)	(N=52,115)	(N=371,977)
2014	76,296 (23.9%)	8,799 (16.9%)	85,095 (22.9%)
2015	71,325 (22.3%)	9,344 (17.9%)	80,669 (21.7%)
2016	58,540 (18.3%)	12,146 (23.3%)	70,686 (19.0%)
2017	57,125 (17.9%)	11,025 (21.2%)	68,150 (18.3%)
2018	56,576 (17.7%)	10,801 (20.7%)	67,377 (18.1%)

Table A.3. Descriptive statistics for suspended sentence orders, 2014-18[39]

	non-RF EM	RF EM	Total
	(N=165,526)	(N=25,858)	(N=191,384)
Age (at offence)	32.74 (10.76) 31: 18.00-88.00	31.56 (11.05) 29: 18.00-86.00	32.58 (10.81) 30: 18.00-88.00

Gender

	non-RF EM	RF EM	Total
	(N=165,526)	(N=25,858)	(N=191,384)
Female (reference)	23,464 (14.2%)	3,542 (13.7%)	27,006 (14.1%)
Male	142,062 (85.8%)	22,316 (86.3%)	164,378 (85.9%)

Ethnicity

	non-RF EM	RF EM	Total
	(N=165,526)	(N=25,858)	(N=191,384)
Asian Indian	2,530 (1.5%)	313 (1.2%)	2,843 (1.5%)
Asian Pakistani	4,214 (2.5%)	617 (2.4%)	4,831 (2.5%)
Asian Bangladeshi	1,536 (0.9%)	209 (0.8%)	1,745 (0.9%)
Asian Chinese	216 (0.1%)	16 (0.1%)	232 (0.1%)
Asian Other	1,794 (1.1%)	203 (0.8%)	1,997 (1.0%)
Black Caribbean	5,753 (3.5%)	794 (3.1%)	6,547 (3.4%)
Black African	4,871 (2.9%)	618 (2.4%)	5,489 (2.9%)
Black Other	1,481 (0.9%)	221 (0.9%)	1,702 (0.9%)
White and Black Caribbean	3,518 (2.1%)	582 (2.3%)	4,100 (2.1%)
White and Black African	752 (0.5%)	115 (0.4%)	867 (0.5%)
White and Asian	636 (0.4%)	117 (0.5%)	753 (0.4%)
Mixed Other	1,133 (0.7%)	157 (0.6%)	1,290 (0.7%)
Arab	398 (0.2%)	50 (0.2%)	448 (0.2%)
Other ethnicity	2,051 (1.2%)	203 (0.8%)	2,254 (1.2%)
White British	123,200 (74.4%)	20,404 (78.9%)	143,604 (75.0%)
White Irish	1,348 (0.8%)	212 (0.8%)	1,560 (0.8%)
White Roma	887 (0.5%)	174 (0.7%)	1,061 (0.6%)
White Other	9,208 (5.6%)	853 (3.3%)	10,061 (5.3%)

[39] Numeric variables report: mean, (sd), median, min-max values. Qualitative variables report N (%)

Index offence

	non-RF EM	RF EM	Total
	(N=165,526)	(N=25,858)	(N=191,384)
Criminal damage	1,002 (0.6%)	143 (0.6%)	1,145 (0.6%)
Drugs	15,555 (9.4%)	3,114 (12.0%)	18,669 (9.8%)
Fraud	8,740 (5.3%)	1,249 (4.8%)	9,989 (5.2%)
Miscellaneous	12,057 (7.3%)	1,383 (5.3%)	13,440 (7.0%)
Weapons	616 (0.4%)	112 (0.4%)	728 (0.4%)
Public order	7,139 (4.3%)	1,351 (5.2%)	8,490 (4.4%)
Robbery	1,035 (0.6%)	255 (1.0%)	1,290 (0.7%)
Sex offences	2,437 (1.5%)	277 (1.1%)	2,714 (1.4%)
Summary	14,404 (8.7%)	2,044 (7.9%)	16,448 (8.6%)
Summary (motoring)	18,227 (11.0%)	3,002 (11.6%)	21,229 (11.1%)
Theft	28,686 (17.3%)	4,781 (18.5%)	33,467 (17.5%)
Violence	54,841 (33.1%)	8,040 (31.1%)	62,881 (32.9%)
Other (Breach)	215 (0.1%)	45 (0.2%)	260 (0.1%)
Other (Child offence)	572 (0.3%)	62 (0.2%)	634 (0.3%)

	non-RF EM	RF EM	Total
	(N=165,526)	(N=25,858)	(N=191,384)
History of drug offences (N)	0.12 (0.56) 0: 0.00-30.00	0.16 (0.64) 0: 0.00-11.00	0.13 (0.57) 0: 0.00-30.00
History of weapons offences (N)	0.01 (0.12) 0: 0.00-12.00	0.01 (0.13) 0: 0.00-6.00	0.01 (0.12) 0: 0.00-12.00
History of public order offences (N)	0.01 (0.19) 0: 0.00-35.00	0.01 (0.22) 0: 0.00-22.00	0.01 (0.20) 0: 0.00-35.00
History of robbery (N)	0.01 (0.12) 0: 0.00-7.00	0.01 (0.16) 0: 0.00-9.00	0.01 (0.13) 0: 0.00-9.00
History of theft (N)	0.92 (2.82) 0: 0.00-74.00	0.96 (2.87) 0: 0.00-42.00	0.92 (2.83) 0: 0.00-74.00
History of Violence (N)	0.06 (0.34) 0: 0.00-21.00	0.06 (0.37) 0: 0.00-15.00	0.06 (0.35) 0: 0.00-21.00
History of summary offences (N)	1.12 (2.45) 0: 0.00-163.00	1.23 (2.58) 0: 0.00-79.00	1.14 (2.47) 0: 0.00-163.00
Other history (N)	0.12 (0.49) 0: 0.00-17.00	0.14 (0.55) 0: 0.00-18.00	0.12 (0.50) 0: 0.00-18.00

	non-RF EM	RF EM	Total
	(N=165,526)	(N=25,858)	(N=191,384)
Prior prison sentences (N)	0.31 (1.43) 0: 0.00-45.00	0.34 (1.58) 0: 0.00-42.00	0.31 (1.45) 0: 0.00-45.00

	non-RF EM	RF EM	Total
	(N=165,526)	(N=25,858)	(N=191,384)
Number of offences in probation disposal	0.73 (1.30) 0: 0.00-32.00	0.73 (1.27) 0: 0.00-19.00	0.73 (1.30) 0: 0.00-32.00
Number of requirements	1.81 (0.89) 2: 1.00-14.00	2.25 (1.09) 2: 1.00-11.00	1.87 (0.93) 2: 1.00-14.00
Disposal length	395.17 (227.78) 364: 0.00-2,909.00	358.99 (256.53) 364: 0.00-1,729.00	390.28 (232.20) 364: 0.00-2,909.00
Electronic monitoring period		179.97 (151.49) 140: 0.00-1,830.00	

Year (requirement started)

	non-RF EM	RF EM	Total
	(N=165,526)	(N=25,858)	(N=191,384)
2014	38,052 (23.0%)	4,170 (16.1%)	42,222 (22.1%)
2015	37,650 (22.7%)	4,776 (18.5%)	42,426 (22.2%)
2016	32,945 (19.9%)	6,528 (25.2%)	39,473 (20.6%)
2017	32,261 (19.5%)	5,955 (23.0%)	38,216 (20.0%)
2018	24,618 (14.9%)	4,429 (17.1%)	29,047 (15.2%)

Table A.4. Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a community order, 2014-18

Reconviction for offences committed within median EM duration (83 days)

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	22%	17%	-5%	-5.3%	-4.4%	0.79	103,762
PSM (full offence classification)	22%	17%	-5%	-5.4%	-4.5%	0.78	103,769
PSM (RF EM must be curfew)	22%	17%	-5%	-5.5%	-4.5%	0.78	103,371
PSM (including valid OASys records)	31%	25%	-6%	-7.2%	-5.6%	0.79	42,648
CEM	18%	14%	-4%	-4.0%	-3.0%	0.81	161,893
CEM (full offence classification)	17%	14%	-3%	-4.0%	-2.9%	0.80	128,735
CEM (RF EM must be curfew)	18%	14%	-4%	-4.1%	-3.1%	0.80	161,734
CML (ATT)			-3%	-4.0%	-1.8%		364,485
CML (ATE)			-3%	-4.1%	-1.9%		364,485
PSM[40]	21%	17%	-4%	-4.9%	-3.9%	0.80	103,762

Reconviction for offences committed during current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	31%	24%	-7%	-7.5%	-6.5%	0.77	103,704
PSM (full offence classification)	30%	24%	-7%	-7.4%	-6.4%	0.77	103,711
PSM (RF EM must be curfew)	30%	24%	-7%	-7.4%	-6.4%	0.77	103,371
PSM (including valid OASys records)	42%	33%	-9%	-9.9%	-8.2%	0.78	42,612
CEM	25%	20%	-5%	-5.6%	-4.4%	0.80	161,856
CEM (full offence classification)	25%	19%	-5%	-5.8%	-4.5%	0.79	128,704

[40] Monitoring duration directly measured for RF EM and assigned directly to control pair

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
CEM (RF EM must be curfew)	25%	20%	-5%	-5.6%	-4.5%	0.80	161,734
CML (ATT)			-4%	-5.2%	-2.5%		364,485
CML (ATE)			-4%	-4.9%	-2.3%		364,485

Reconviction for offences committed in 12 months after current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	38%	39%	1%	0.3%	1.4%	1.02	103,762
PSM (full offence classification)	38%	39%	1%	0.5%	1.6%	1.03	103,769
PSM (RF EM must be curfew)	38%	39%	1%	0.2%	1.3%	1.02	103,371
PSM (including valid OASys records)	53%	53%	-1%	-1.5%	0.3%	0.99	42,648
CEM	33%	35%	2%	1.5%	2.8%	1.07	161,893
CEM (full offence classification)	33%	34%	2%	1.0%	2.4%	1.05	128,735
CEM (RF EM must be curfew)	33%	35%	2%	1.5%	2.8%	1.07	161,734
CML (ATT)			1%	-0.3%	2.3%		364,485
CML (ATE)			1%	0.0%	2.5%		364,485

Table A.5. Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a community order (by index offence), 2014-18[41]

Reconviction for offences committed within median EM duration (83 days)

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	-3%	-4.0%	-1.8%	0.1%	-0.8%	0.9%
CML (ATE)	-3%	-4.1%	-1.9%	0.1%	-0.8%	0.9%
Index offence: Criminal damage	-3.7%	-9.5%	2.1%	4.0%	0.7%	7.2%
Index offence: Drug offence	-0.6%	-2.0%	0.8%	-0.4%	-2.5%	1.6%
Index offence: Fraud	-0.5%	-2.5%	1.4%	-0.9%	-2.2%	0.4%
Index offence: Miscellaneous	-0.7%	-3.0%	1.5%	2.3%	0.1%	4.6%
Index offence: Weapons	2.9%	-8.9%	14.7%	6.9%	-0.9%	14.7%
Index offence: Public order	-3.5%	-4.3%	-2.7%	-0.9%	-2.3%	0.6%
Index offence: Robbery	-12.0%	-22.5%	-1.5%	15.5%	-8.5%	39.6%
Index offence: Sex offence	-0.1%	-3.0%	2.7%	-0.1%	-2.8%	2.6%
Index offence: Summary (non-motoring)	-3.3%	-4.1%	-2.5%	-0.1%	-0.8%	0.6%
Index offence: Summary (motoring)	-1.2%	-2.1%	-0.3%	0.3%	-0.3%	0.9%
Index offence: Theft	-5.0%	-6.1%	-4.0%	-0.5%	-1.1%	0.1%
Index offence: Violence	-3.2%	-3.9%	-2.4%	0.3%	-0.2%	0.8%
Index offence: Other (breach)	5.7%	-2.9%	14.2%	0.5%	-3.6%	4.5%
Index offence: Other (child offence)	9.8%	-6.3%	25.9%	1.0%	-7.4%	9.4%

[41] Results estimated using CML

Reconviction for offences committed during current disposal

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	-4%	-5.2%	-2.5%	0.1%	-1.1%	1.4%
CML (ATE)	-4%	-4.9%	-2.3%	0.1%	-1.1%	1.4%
Index offence: Criminal damage	-4.5%	-11.6%	2.5%	2.6%	-2.9%	8.0%
Index offence: Drug offence	-2.7%	-4.6%	-0.7%	-1.3%	-3.7%	1.2%
Index offence: Fraud	-1.8%	-4.3%	0.8%	-1.5%	-3.6%	0.6%
Index offence: Miscellaneous	-2.0%	-4.3%	0.3%	3.9%	1.1%	6.7%
Index offence: Weapons	6.5%	-9.7%	22.7%	1.2%	-8.2%	10.7%
Index offence: Public order	-2.5%	-5.4%	0.3%	-1.0%	-3.9%	1.9%
Index offence: Robbery	6.3%	-17.4%	30.0%	-4.1%	-25.8%	17.5%
Index offence: Sex offence	-4.7%	-8.6%	-0.8%	-2.2%	-7.5%	3.1%
Index offence: Summary (non-motoring)	-4.8%	-5.8%	-3.8%	0.7%	-0.5%	1.9%
Index offence: Summary (motoring)	-2.0%	-3.0%	-1.0%	0.2%	-0.3%	0.7%
Index offence: Theft	-6.4%	-7.6%	-5.2%	-0.1%	-1.1%	0.8%
Index offence: Violence	-2.7%	-3.6%	-1.9%	0.1%	-0.8%	1.1%
Index offence: Other (breach)	-3.3%	-9.8%	3.2%	-5.9%	-16.0%	4.2%
Index offence: Other (child offence)	0.0%	-16.2%	16.2%	5.9%	-6.8%	18.7%

Reconviction for offences committed in 12 months after current disposal

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	1.0%	-0.3%	2.3%	0.3%	-0.8%	1.5%
CML (ATE)	1.2%	0.0%	2.5%	0.3%	-0.9%	1.5%
Index offence: Criminal damage	-1.4%	-5.9%	3.2%	-1.1%	-6.3%	4.1%
Index offence: Drug offence	1.3%	-2.0%	4.7%	-1.1%	-3.1%	1.0%
Index offence: Fraud	4.6%	2.5%	6.8%	0.0%	-2.1%	2.1%
Index offence: Miscellaneous	1.7%	-0.6%	4.0%	1.2%	-0.9%	3.2%
Index offence: Weapons	5.6%	-6.5%	17.8%	3.6%	-7.5%	14.6%
Index offence: Public order	-1.5%	-3.5%	0.5%	0.1%	-2.6%	2.7%
Index offence: Robbery	-15.8%	-35.2%	3.7%	-9.5%	-20.8%	1.8%
Index offence: Sex offence	-1.2%	-7.3%	4.9%	-2.2%	-6.3%	1.9%
Index offence: Summary (non-motoring)	0.3%	-1.3%	2.0%	0.5%	-0.8%	1.8%
Index offence: Summary (motoring)	4.7%	3.5%	5.8%	1.1%	0.3%	2.0%
Index offence: Theft	-0.6%	-1.5%	0.3%	0.5%	-0.6%	1.6%
Index offence: Violence	1.2%	0.8%	1.7%	0.1%	-0.5%	0.6%
Index offence: Other (breach)	0.5%	-10.1%	11.0%	0.4%	-8.9%	9.7%
Index offence: Other (child offence)	-13.4%	-29.0%	2.3%	-4.0%	-15.3%	7.2%

Table A.6. Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a community order (single vs multiple requirement orders), 2014-18

Single requirement order

Reconviction for offences committed within median EM duration (56 days for single requirements, 115 days for multiple requirements)

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	18%	14%	-5%	-5.4%	-4.0%	0.76	49,305
PSM (full offence classification)	18%	14%	-4%	-4.9%	-3.5%	0.78	49,784
PSM (RF EM must be curfew)	18%	14%	-5%	-5.4%	-4.0%	0.76	49,016
PSM (including valid OASys records)	27%	20%	-7%	-8.0%	-5.3%	0.75	19,321
CEM	15%	11%	-4%	-4.8%	-3.3%	0.75	65,913
CEM (full offence classification)	15%	11%	-4%	-4.8%	-3.2%	0.74	52,375
CEM (RF EM must be curfew)	15%	11%	-4%	-4.9%	-3.4%	0.74	65,885
CML (ATT)			-4%	-5.9%	-2.4%		185,873
CML (ATE)			-5%	-6.4%	-2.7%		185,873

Reconviction for offences committed during current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	19%	14%	-5%	-5.7%	-4.3%	0.75	49,247
PSM (full offence classification)	18%	14%	-4%	-4.9%	-3.6%	0.78	49,726
PSM (RF EM must be curfew)	18%	14%	-5%	-5.4%	-4.0%	0.77	49,016
PSM (including valid OASys records)	26%	20%	-7%	-7.9%	-5.4%	0.75	19,285
CEM	16%	11%	-5%	-5.5%	-4.0%	0.72	65,876
CEM (full offence classification)	16%	11%	-5%	-5.8%	-4.2%	0.70	52,344
CEM (RF EM must be curfew)	16%	11%	-5%	-5.6%	-4.1%	0.72	65,885

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
CML (ATT)			-6%	-7.9%	-3.6%		185,873
CML (ATE)			-6%	-8.6%	-4.1%		185,873

Reconviction for offences committed in 12 months after current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	41%	43%	3%	1.7%	3.4%	1.06	49,305
PSM (full offence classification)	40%	43%	3%	2.1%	3.9%	1.07	49,784
PSM (RF EM must be curfew)	41%	43%	3%	1.7%	3.5%	1.06	49,016
PSM (including valid OASys records)	59%	58%	-2%	-3.2%	-0.3%	0.97	19,321
CEM	36%	39%	3%	2.3%	4.3%	1.10	65,913
CEM (full offence classification)	36%	39%	3%	1.6%	3.8%	1.08	52,375
CEM (RF EM must be curfew)	36%	39%	3%	2.5%	4.4%	1.10	65,885
CML (ATT)			4%	0.8%	6.4%		185,873
CML (ATE)			3%	0.3%	5.7%		185,873

Multiple requirement order

Reconviction for offences committed within median EM duration (56 days for single requirements, 115 days for multiple requirements)

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	23%	20%	-3%	-4.1%	-2.8%	0.86	54,457
PSM (full offence classification)	23%	20%	-3%	-4.0%	-2.7%	0.86	53,985
PSM (RF EM must be curfew)	23%	20%	-3%	-3.9%	-2.6%	0.87	54,355
PSM (including valid oasys records)	32%	28%	-4%	-4.9%	-2.5%	0.89	23,327
CEM	20%	17%	-3%	-3.7%	-2.3%	0.85	95,980
CEM (full offence classification)	19%	16%	-3%	-3.4%	-1.9%	0.86	76,360

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
CEM (RF EM must be curfew)	19%	16%	-3%	-3.8%	-2.4%	0.84	95,849
CML (ATT)			-2%	-3.6%	-0.8%		178,612
CML (ATE)			-2%	-3.7%	-0.7%		178,612

Reconviction for offences committed during current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	38%	34%	-4%	-4.4%	-2.7%	0.90	54,457
PSM (full offence classification)	38%	34%	-4%	-4.9%	-3.2%	0.89	53,985
PSM (RF EM must be curfew)	38%	34%	-4%	-4.4%	-2.8%	0.90	54,355
PSM (including valid oasys records)	52%	47%	-5%	-5.9%	-3.2%	0.91	23,327
CEM	33%	30%	-3%	-4.2%	-2.5%	0.90	95,980
CEM (full offence classification)	33%	29%	-3%	-4.2%	-2.4%	0.90	76,360
CEM (RF EM must be curfew)	33%	30%	-3%	-4.3%	-2.6%	0.90	95,849
CML (ATT)			-2%	-3.2%	0.1%		178,612
CML (ATE)			-2%	-3.3%	0.0%		178,612

Reconviction for offences committed in 12 months after current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	34%	34%	0%	-1.3%	0.3%	0.99	54,457
PSM (full offence classification)	34%	34%	0%	-1.0%	0.6%	1.00	53,985
PSM (RF EM must be curfew)	34%	34%	0%	-1.0%	0.6%	1.00	54,355
PSM (including valid oasys records)	47%	48%	1%	-0.6%	2.1%	1.02	23,327
CEM	30%	30%	0%	-0.7%	0.9%	1.00	95,980
CEM (full offence classification)	29%	29%	0%	-1.1%	0.7%	1.00	76,360

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
CEM (RF EM must be curfew)	30%	30%	0%	-0.8%	0.9%	1.00	95,849
CML (ATT)			0%	-1.6%	2.1%		178,612
CML (ATE)			0%	-1.8%	2.1%		178,612

Table A.7. Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a community order (by year), 2014-18[42]

Reconviction for offences committed within median EM duration (83 days)

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
2014	21%	18%	-3%	-4.1%	-1.8%	0.86	17,882
2015	20%	16%	-3%	-4.5%	-2.4%	0.84	19,017
2016	24%	18%	-7%	-7.6%	-5.6%	0.73	23,290
2017	23%	17%	-6%	-6.7%	-4.7%	0.75	22,018
2018	22%	17%	-5%	-5.7%	-3.7%	0.79	21,555

Reconviction for offences committed during current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
2014	30%	25%	-5%	-6.6%	-4.0%	0.82	17,872
2015	27%	22%	-5%	-6.3%	-4.0%	0.81	19,004
2016	33%	23%	-10%	-10.6%	-8.4%	0.71	23,278
2017	31%	23%	-8%	-9.2%	-7.0%	0.74	22,007
2018	32%	25%	-7%	-8.6%	-6.3%	0.76	21,543

Reconviction for offences committed in 12 months after current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
2014	38%	39%	1%	-0.1%	2.7%	1.03	17,882
2015	36%	38%	2%	0.6%	3.2%	1.05	19,017
2016	40%	40%	0%	-1.5%	0.9%	1.00	23,290
2017	38%	39%	1%	-0.4%	2.0%	1.02	22,018
2018	37%	38%	1%	-0.1%	2.3%	1.03	21,555

[42] Results estimated using PSM

Table A.8. Differences in compliance with probation supervision between offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of community order (by index offence), 2014-18[43]

Sentence breach (resulting in new conviction)

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	-5.4%	-6.4%	-4.5%	-0.1%	-0.8%	0.6%
CML (ATE)	-5.2%	-6.0%	-4.3%	-0.1%	-0.8%	0.6%
Index offence: Criminal damage	-7.7%	-12.8%	-2.7%	1.0%	-2.7%	4.6%
Index offence: Drug offence	-2.7%	-3.8%	-1.6%	0.5%	-0.2%	1.3%
Index offence: Fraud	-3.0%	-4.6%	-1.3%	-0.3%	-1.2%	0.7%
Index offence: Miscellaneous	-5.5%	-8.1%	-2.9%	-1.1%	-2.4%	0.1%
Index offence: Weapons	-3.7%	-10.0%	2.6%	-2.1%	-5.7%	1.5%
Index offence: Public order	-6.9%	-10.0%	-3.9%	-1.7%	-3.5%	0.0%
Index offence: Robbery	-6.2%	-13.0%	0.5%	-3.0%	-14.5%	8.5%
Index offence: Sex offence	-5.8%	-8.7%	-2.9%	0.9%	-1.2%	3.0%
Index offence: Summary (non-motoring)	-5.7%	-6.0%	-5.3%	-0.1%	-0.5%	0.3%
Index offence: Summary (motoring)	-2.6%	-3.2%	-2.0%	-0.3%	-0.8%	0.2%
Index offence: Theft	-8.3%	-9.4%	-7.1%	0.0%	-0.9%	1.0%
Index offence: Violence	-4.6%	-5.0%	-4.2%	0.1%	-0.2%	0.5%
Index offence: Other (breach)	-5.2%	-9.5%	-0.9%	-0.8%	-8.6%	6.9%
Index offence: Other (child offence)	-3.1%	-15.8%	9.5%	-2.2%	-10.6%	6.3%

[43] Results estimated using CML

Requirement completion rate

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	0.06	0.05	0.08	0.00	-0.01	0.01
CML (ATE)	0.06	0.05	0.08	0.00	-0.01	0.01
Index offence: Criminal damage	0.10	0.03	0.16	0.00	-0.07	0.07
Index offence: Drug offence	0.05	0.03	0.08	0.01	0.00	0.02
Index offence: Fraud	0.09	0.07	0.11	0.00	-0.02	0.02
Index offence: Miscellaneous	0.06	0.02	0.10	0.00	-0.03	0.03
Index offence: Weapons	0.01	-0.13	0.16	0.03	-0.08	0.14
Index offence: Public order	0.06	0.04	0.09	0.01	-0.03	0.04
Index offence: Robbery	0.10	0.00	0.21	0.08	-0.08	0.24
Index offence: Sex offence	0.08	0.03	0.12	0.02	-0.02	0.07
Index offence: Summary (non-motoring)	0.07	0.06	0.08	0.01	0.00	0.02
Index offence: Summary (motoring)	0.06	0.04	0.08	-0.01	-0.02	0.01
Index offence: Theft	0.05	0.04	0.07	0.00	-0.01	0.01
Index offence: Violence	0.07	0.06	0.07	0.00	-0.01	0.01
Index offence: Other (breach)	0.14	0.08	0.20	0.08	-0.01	0.17
Index offence: Other (child offence)	0.09	0.04	0.15	-0.04	-0.18	0.11

Number of warning letters received

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	-0.34	-0.40	-0.28	-0.02	-0.08	0.04
CML (ATE)	-0.34	-0.40	-0.28	-0.02	-0.08	0.04
Index offence: Criminal damage	-0.25	-0.60	0.10	-0.08	-0.31	0.14
Index offence: Drug offence	-0.44	-0.54	-0.34	-0.01	-0.13	0.10
Index offence: Fraud	-0.29	-0.35	-0.23	0.00	-0.08	0.08
Index offence: Miscellaneous	-0.29	-0.45	-0.13	-0.02	-0.17	0.13
Index offence: Weapons	0.35	-0.95	1.65	-0.36	-0.69	-0.03
Index offence: Public order	-0.35	-0.43	-0.27	0.04	-0.10	0.19
Index offence: Robbery	-0.92	-1.88	0.03	-0.55	-1.32	0.21
Index offence: Sex offence	-0.28	-0.43	-0.13	0.14	-0.01	0.30
Index offence: Summary (non-motoring)	-0.38	-0.43	-0.32	0.00	-0.04	0.04
Index offence: Summary (motoring)	-0.30	-0.35	-0.25	-0.03	-0.10	0.03
Index offence: Theft	-0.31	-0.37	-0.26	-0.06	-0.09	-0.03
Index offence: Violence	-0.34	-0.38	-0.31	-0.01	-0.05	0.03
Index offence: Other (breach)	-1.11	-1.60	-0.61	0.53	-0.37	1.44
Index offence: Other (child offence)	-0.50	-1.55	0.54	0.17	-0.43	0.77

Table A.9. Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a suspended sentence order, 2014-18[44]

Reconviction for offences committed within median EM duration (140 days)

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	18%	15%	-3%	-3.7%	-2.5%	0.83	51,668
PSM (full offence classification)	18%	15%	-3%	-3.7%	-2.5%	0.82	51,673
PSM (RF EM must be curfew)	18%	15%	-3%	-3.5%	-2.3%	0.83	51,509
PSM (including valid OASys records)	25%	22%	-3%	-4.2%	-1.9%	0.88	20,045
CEM	15%	12%	-3%	-3.9%	-2.5%	0.78	67,053
CEM (full offence classification)	15%	11%	-3%	-3.9%	-2.4%	0.78	48,677
CEM (RF EM must be curfew)	15%	12%	-3%	-3.9%	-2.6%	0.78	67,006
CML (ATT)			-2%	-4.0%	-0.7%		191,243
CML (ATE)			-2%	-4.1%	-0.7%		191,243
PSM[45]	19%	15%	-5%	-5.2%	-4.0%	0.77	51,668

Reconviction for offences committed during current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	27%	24%	-4%	-4.3%	-2.9%	0.86	51,638
PSM (full offence classification)	28%	24%	-4%	-4.8%	-3.3%	0.85	51,643
PSM (RF EM must be curfew)	27%	24%	-4%	-4.3%	-2.9%	0.86	51,509
PSM (including valid OASys records)	38%	34%	-4%	-5.5%	-2.9%	0.89	20,030
CEM	24%	20%	-3%	-4.0%	-2.3%	0.87	67,036
CEM (full offence classification)	24%	20%	-4%	-4.7%	-2.9%	0.84	48,662
CEM (RF EM must be curfew)	24%	20%	-3%	-4.0%	-2.4%	0.87	67,006
CML (ATT)			-2%	-4.3%	-0.5%		191,243
CML (ATE)			-2%	-4.2%	-0.5%		191,243

[44] Monitoring duration directly measured for RF EM and assigned directly to control pair

[45] Monitoring duration directly measured for RF EM and assigned directly to control pair

Reconviction for offences committed in 12 months after current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	33%	30%	-3%	-3.8%	-2.3%	0.92	51,668
PSM (full offence classification)	32%	30%	-2%	-3.0%	-1.5%	0.94	51,673
PSM (RF EM must be curfew)	33%	30%	-3%	-3.6%	-2.1%	0.92	51,509
PSM (including valid OASys records)	47%	45%	-2%	-3.7%	-1.1%	0.95	20,045
CEM	29%	26%	-3%	-3.9%	-2.1%	0.90	67,053
CEM (full offence classification)	28%	25%	-3%	-3.5%	-1.6%	0.91	48,677
CEM (RF EM must be curfew)	29%	26%	-3%	-3.8%	-2.1%	0.90	67,006
CML (ATT)			-2%	-4.1%	0.0%		191,243
CML (ATE)			-2%	-4.0%	0.0%		191,243

Table A.10. Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a suspended sentence order (by year), 2014-18[46]

Reconviction for offences committed within median EM duration (140 days)

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
2014	18%	15%	-3%	-4.7%	-1.6%	0.85	8,200
2015	17%	14%	-3%	-4.9%	-2.1%	0.80	9,582
2016	18%	15%	-3%	-4.6%	-2.1%	0.81	12,976
2017	18%	15%	-3%	-3.9%	-1.3%	0.84	11,902
2018	17%	14%	-3%	-4.5%	-1.6%	0.81	9,008

Reconviction for offences committed during current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
2014	25%	22%	-3%	-4.7%	-1.0%	0.88	8,195
2015	27%	24%	-3%	-4.6%	-1.2%	0.88	9,572
2016	29%	24%	-5%	-6.1%	-3.2%	0.83	12,972
2017	28%	24%	-4%	-5.5%	-2.4%	0.85	11,896
2018	27%	23%	-4%	-5.9%	-2.3%	0.85	9,003

Reconviction for offences committed in 12 months after current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
2014	34%	30%	-4%	-5.8%	-1.9%	0.90	8,200
2015	32%	29%	-3%	-5.2%	-1.7%	0.90	9,582
2016	35%	32%	-3%	-4.3%	-1.3%	0.92	12,976
2017	32%	30%	-2%	-3.9%	-0.8%	0.93	11,902
2018	32%	29%	-3%	-4.5%	-1.0%	0.91	9,008

[46] Results estimated using PSM

Table A.11. Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a suspended sentence order (by index offence), 2014-18[47]

Reconviction for offences committed within median EM duration (140 days)

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	-2.4%	-4.0%	-0.7%	-0.4%	-1.5%	0.7%
CML (ATE)	-2.4%	-4.1%	-0.7%	-0.4%	-1.6%	0.7%
Index offence: Criminal damage	-2.9%	-10.2%	4.5%	0.9%	-5.3%	7.1%
Index offence: Drug offence	-2.2%	-3.9%	-0.5%	-0.3%	-1.4%	0.9%
Index offence: Fraud	-1.2%	-4.0%	1.6%	-1.9%	-3.3%	-0.5%
Index offence: Miscellaneous	-2.1%	-4.8%	0.7%	0.2%	-1.1%	1.5%
Index offence: Weapons	-5.0%	-18.3%	8.2%	1.6%	-4.1%	7.3%
Index offence: Public order	0.1%	-1.2%	1.5%	-0.4%	-2.1%	1.3%
Index offence: Robbery	0.4%	-5.5%	6.3%	-1.2%	-7.9%	5.6%
Index offence: Sex offence	-2.3%	-6.3%	1.6%	-2.9%	-4.5%	-1.3%
Index offence: Summary (non-motoring)	-4.4%	-6.1%	-2.6%	-0.5%	-1.9%	0.9%
Index offence: Summary (motoring)	-2.3%	-3.8%	-0.8%	0.1%	-0.8%	1.0%
Index offence: Theft	-3.1%	-5.0%	-1.2%	-0.3%	-1.4%	0.8%
Index offence: Violence	-2.2%	-2.8%	-1.6%	-0.5%	-1.1%	0.0%
Index offence: Other (breach)	-13.4%	-37.1%	10.2%	-0.3%	-12.2%	11.6%
Index offence: Other (child offence)	3.7%	-4.6%	12.1%	-3.0%	-10.5%	4.5%

[47] Results estimated using CML

Reconviction for offences committed during current disposal

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	-2.4%	-4.3%	-0.5%	-0.8%	-2.5%	0.8%
CML (ATE)	-2.4%	-4.2%	-0.5%	-0.8%	-2.4%	0.8%
Index offence: Criminal damage	-0.7%	-10.6%	9.2%	4.5%	-1.3%	10.4%
Index offence: Drug offence	-2.8%	-4.0%	-1.6%	0.4%	-1.2%	2.1%
Index offence: Fraud	-0.8%	-3.0%	1.3%	-3.0%	-4.3%	-1.8%
Index offence: Miscellaneous	-0.7%	-2.4%	1.0%	-0.9%	-2.2%	0.4%
Index offence: Weapons	-3.0%	-15.7%	9.7%	3.7%	-1.8%	9.1%
Index offence: Public order	-1.6%	-3.8%	0.7%	-1.8%	-5.1%	1.5%
Index offence: Robbery	-0.3%	-7.6%	7.0%	-3.8%	-11.5%	3.9%
Index offence: Sex offence	-1.5%	-4.5%	1.4%	-4.1%	-5.6%	-2.5%
Index offence: Summary (non-motoring)	-2.9%	-5.3%	-0.5%	-1.2%	-3.8%	1.4%
Index offence: Summary (motoring)	-3.0%	-4.7%	-1.4%	-0.5%	-2.0%	1.1%
Index offence: Theft	-3.2%	-5.1%	-1.4%	0.5%	-0.8%	1.8%
Index offence: Violence	-2.2%	-3.6%	-0.8%	-1.3%	-2.4%	-0.3%
Index offence: Other (breach)	-9.5%	-24.0%	5.1%	-0.1%	-17.5%	17.3%
Index offence: Other (child offence)	-1.1%	-14.1%	12.0%	-4.6%	-15.2%	6.1%

Reconviction for offences committed in 12 months after current disposal

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	-2.0%	-4.1%	0.0%	0.5%	-1.2%	2.2%
CML (ATE)	-2.0%	-4.0%	0.0%	0.4%	-1.3%	2.1%
Index offence: Criminal damage	-16.7%	-24.8%	-8.5%	1.9%	-6.6%	10.4%
Index offence: Drug offence	0.8%	-1.0%	2.5%	0.6%	-1.3%	2.4%
Index offence: Fraud	-1.4%	-3.3%	0.5%	-2.2%	-4.7%	0.3%
Index offence: Miscellaneous	2.2%	-0.5%	4.9%	0.1%	-2.1%	2.3%
Index offence: Weapons	2.2%	-6.0%	10.4%	-0.3%	-3.9%	3.3%
Index offence: Public order	-2.4%	-5.2%	0.4%	0.1%	-1.6%	1.9%
Index offence: Robbery	-1.4%	-11.8%	8.9%	-2.8%	-12.5%	6.9%
Index offence: Sex offence	-1.3%	-4.2%	1.5%	2.9%	1.2%	4.7%
Index offence: Summary (non-motoring)	-0.6%	-2.4%	1.2%	0.5%	-1.4%	2.4%
Index offence: Summary (motoring)	-0.7%	-2.5%	1.0%	0.7%	-0.8%	2.2%
Index offence: Theft	-3.0%	-5.2%	-0.7%	1.2%	-0.3%	2.8%
Index offence: Violence	-3.7%	-5.1%	-2.4%	0.2%	-0.9%	1.3%
Index offence: Other (breach)	-22.6%	-46.1%	0.8%	-7.5%	-23.2%	8.2%
Index offence: Other (child offence)	-4.1%	-13.7%	5.5%	7.5%	0.0%	15.0%

Table A.12. Adult court reconvictions for offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of a suspended sentence order (single vs multiple requirement orders), 2014-18

Single requirement order

Reconviction for offences committed within median EM duration (83 days for single requirements, 182 days for multiple requirements)

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	17%	12%	-5%	-6.6%	-3.7%	0.68	13,078
PSM (full offence classification)	16%	12%	-4%	-5.9%	-3.1%	0.71	13,367
PSM (RF EM must be curfew)	16%	12%	-4%	-5.6%	-2.7%	0.73	12,904
PSM (including valid OASys records)	25%	18%	-7%	-9.6%	-4.2%	0.72	4,925
CEM	15%	10%	-5%	-6.5%	-3.9%	0.66	14,879
CEM (full offence classification)	14%	9%	-5%	-6.2%	-3.3%	0.66	10,720
CEM (RF EM must be curfew)	15%	10%	-5%	-6.5%	-3.8%	0.66	14,849
CML (ATT)			-5%	-8.7%	-1.2%		77,682
CML (ATE)			-5%	-8.6%	-1.8%		77,682

Reconviction for offences committed during current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	17%	10%	-7%	-8.4%	-5.5%	0.60	13,048
PSM (full offence classification)	18%	10%	-7%	-8.6%	-5.8%	0.59	13,337
PSM (RF EM must be curfew)	17%	10%	-6%	-7.9%	-5.0%	0.62	12,904
PSM (including valid OASys records)	24%	15%	-9%	-11.5%	-6.2%	0.63	4,910
CEM	15%	9%	-6%	-7.4%	-4.8%	0.62	14,862
CEM (full offence classification)	14%	9%	-6%	-7.3%	-4.3%	0.63	10,705
CEM (RF EM must be curfew)	15%	9%	-6%	-7.4%	-4.8%	0.62	14,849
CML (ATT)			-7%	-10.7%	-2.6%		77,682
CML (ATE)			-7%	-10.6%	-3.3%		77,682

Reconviction for offences committed in 12 months after current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	41%	36%	-5%	-6.8%	-3.2%	0.88	13,078
PSM (full offence classification)	38%	36%	-2%	-3.6%	0.0%	0.95	13,367
PSM (RF EM must be curfew)	41%	36%	-5%	-6.4%	-2.7%	0.89	12,904
PSM (including valid OASys records)	57%	51%	-6%	-8.7%	-2.4%	0.90	4,925
CEM	36%	31%	-5%	-6.5%	-3.0%	0.87	14,879
CEM (full offence classification)	35%	30%	-4%	-6.4%	-2.3%	0.88	10,720
CEM (RF EM must be curfew)	36%	31%	-5%	-6.3%	-2.8%	0.88	14,849
CML (ATT)			-2%	-7.1%	3.2%		77,682
CML (ATE)			-2%	-7.1%	2.2%		77,682

Multiple requirement order

Reconviction for offences committed within median EM duration (83 days for single requirements, 182 days for multiple requirements)

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	18%	16%	-2%	-2.5%	-1.1%	0.90	38,590
PSM (full offence classification)	19%	16%	-2%	-2.9%	-1.4%	0.88	38,306
PSM (RF EM must be curfew)	18%	16%	-2%	-2.4%	-1.0%	0.90	38,605
PSM (including valid OASys records)	26%	25%	-1%	-2.5%	0.2%	0.96	15,120
CEM	15%	13%	-2%	-2.9%	-1.3%	0.86	52,174
CEM (full offence classification)	15%	13%	-2%	-3.3%	-1.5%	0.84	37,957
CEM (RF EM must be curfew)	15%	13%	-2%	-2.9%	-1.3%	0.86	52,157
CML (ATT)			-1%	-3.2%	0.5%		113,561
CML (ATE)			-1%	-3.2%	0.5%		113,561

Reconviction for offences committed during current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	30%	28%	-2%	-2.5%	-0.7%	0.95	38,590
PSM (full offence classification)	31%	28%	-2%	-3.3%	-1.4%	0.92	38,306
PSM (RF EM must be curfew)	30%	28%	-1%	-2.4%	-0.6%	0.95	38,605
PSM (including valid OASys records)	42%	41%	-2%	-3.2%	0.0%	0.96	15,120
CEM	27%	25%	-2%	-3.1%	-1.1%	0.92	52,174
CEM (full offence classification)	27%	24%	-3%	-4.3%	-2.0%	0.88	37,957
CEM (RF EM must be curfew)	27%	25%	-2%	-3.1%	-1.1%	0.92	52,157
CML (ATT)			-1%	-3.2%	1.0%		113,561
CML (ATE)			-1%	-3.4%	1.0%		113,561

Reconviction for offences committed in 12 months after current disposal

	Non-EM	RF EM	Difference	95% CI lower	95% CI upper	Risk ratio	N
PSM	30%	28%	-2%	-3.0%	-1.3%	0.93	38,590
PSM (full offence classification)	30%	28%	-2%	-2.9%	-1.1%	0.93	38,306
PSM (RF EM must be curfew)	30%	28%	-2%	-3.1%	-1.3%	0.93	38,605
PSM (including valid OASys records)	43%	42%	-1%	-2.9%	0.3%	0.97	15,120
CEM	26%	24%	-2%	-3.3%	-1.4%	0.91	52,174
CEM (full offence classification)	25%	23%	-2%	-3.0%	-0.8%	0.93	37,957
CEM (RF EM must be curfew)	26%	24%	-2%	-3.3%	-1.4%	0.91	52,157
CML (ATT)			-2%	-3.9%	0.2%		113,561
CML (ATE)			-2%	-3.8%	0.3%		113,561

Table A.13. Differences in compliance with probation supervision between offenders who received a curfew requirement with RF EM and a matched control group not subject to RF EM as part of suspended sentence order (by index offence), 2014-18[48]

Breach of suspended sentence

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	-8.5%	-9.8%	-7.1%	0.3%	-0.7%	1.3%
CML (ATE)	-8.4%	-9.7%	-7.1%	0.3%	-0.7%	1.3%
Index offence: Criminal damage	-2.9%	-6.7%	0.9%	1.0%	-5.1%	7.2%
Index offence: Drug offence	-4.5%	-5.5%	-3.6%	0.3%	-0.8%	1.5%
Index offence: Fraud	-6.8%	-8.6%	-5.0%	-0.4%	-1.2%	0.5%
Index offence: Miscellaneous	-5.8%	-6.7%	-4.8%	0.3%	-0.4%	1.0%
Index offence: Weapons	-7.7%	-14.2%	-1.1%	-0.4%	-3.5%	2.7%
Index offence: Public order	-6.9%	-7.7%	-6.1%	0.0%	-1.7%	1.8%
Index offence: Robbery	-3.7%	-9.7%	2.3%	3.0%	-2.0%	8.1%
Index offence: Sex offence	-2.8%	-5.3%	-0.3%	2.5%	0.1%	4.9%
Index offence: Summary (non-motoring)	-9.6%	-11.1%	-8.1%	0.3%	-0.8%	1.5%
Index offence: Summary (motoring)	-7.6%	-9.4%	-5.8%	-0.6%	-1.6%	0.3%
Index offence: Theft	-13.3%	-14.5%	-12.0%	-0.2%	-1.3%	1.0%
Index offence: Violence	-8.4%	-9.4%	-7.4%	0.8%	0.3%	1.2%
Index offence: Other (breach)	-39.5%	-63.6%	-15.4%	-0.5%	-16.1%	15.0%
Index offence: Other (child offence)	-2.0%	-5.3%	1.2%	-2.8%	-7.0%	1.4%

[48] Results estimated using CML

Any probation requirement revoked

	RF EM compared to non-EM			Placebo (RF EM) compared to non-EM		
	Difference	95% CI lower	95% CI upper	Difference	95% CI lower	95% CI upper
CML (ATT)	-15.1%	-16.9%	-13.2%	0.3%	-1.0%	1.6%
CML (ATE)	-15.0%	-16.8%	-13.2%	0.3%	-0.9%	1.6%
Index offence: Criminal damage	-10.3%	-15.2%	-5.5%	6.6%	1.1%	12.2%
Index offence: Drug offence	-7.5%	-9.0%	-5.9%	1.6%	0.9%	2.4%
Index offence: Fraud	-7.4%	-9.4%	-5.5%	-0.5%	-2.5%	1.4%
Index offence: Miscellaneous	-10.3%	-12.5%	-8.0%	-0.8%	-1.8%	0.2%
Index offence: Weapons	-17.7%	-28.9%	-6.5%	-1.6%	-8.8%	5.6%
Index offence: Public order	-16.0%	-17.6%	-14.5%	-0.1%	-3.4%	3.2%
Index offence: Robbery	-4.7%	-11.4%	2.1%	-1.2%	-9.1%	6.8%
Index offence: Sex offence	-10.0%	-15.2%	-4.8%	2.0%	-1.4%	5.4%
Index offence: Summary (non-motoring)	-18.9%	-20.8%	-17.0%	1.0%	-0.3%	2.3%
Index offence: Summary (motoring)	-12.9%	-14.5%	-11.3%	-0.8%	-1.8%	0.2%
Index offence: Theft	-23.2%	-24.5%	-21.8%	0.1%	-0.8%	1.1%
Index offence: Violence	-15.1%	-16.8%	-13.5%	0.6%	-0.4%	1.5%
Index offence: Other (breach)	-41.6%	-63.5%	-19.7%	-13.7%	-24.5%	-2.9%
Index offence: Other (child offence)	-2.5%	-14.9%	9.9%	2.9%	-3.6%	9.3%