Herman Goldstein Award Submission 2023
NUDGING DOWN BURGLARY

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NUDGING DOWN BURGLARY

Summary (Word count 389)

Scanning

This project sought to address the perpetual problem of burglary across policing, in the 12 months (Jan 2019 – Dec 2019 – pre-Covid) Durham Police recorded 2829 crimes of residential burglary (excludes aggravated offences) throughout the force area. The costs of these burglary offences in Durham equates to:

- Anticipation £2.0 Million,
- Consequences £9.7 Million
- Response £5.1 Million.
- Total £16.8 Million. (ONS cost of crime)

Whilst Office National Statistics (ONS) data indicates that reported offences of residential burglary have been reducing nationally since 2003, in the 12 months years prior to this trial (2019 period), there was no obvious reduction in recorded residential burglary offences in Durham policing area.

Analysis

Analysis of residential burglary offences in the Durham policing area in the same period identified that 6.7% of all individual properties suffered from repeat victimisation, yet 19.2% of all properties in the same postcodes in Durham suffered burglary offences within the prior 12 months pre covid, supporting near repeat theory. Analysis of the 'MO used' by the offender identified that a third of

offences were caused by the victim leaving their property insecure, making properties such as these vulnerable to a motivated offender.

Response

Using crime data from residential burglaries based on individual repeat postcodes, they were randomly assigned to a treatment or controlled location based on an eligibility criterion. A purposely designed Nudge leaflet using the MINDSCAPE / EAST mnemonic was issued to each address in the postcode location within a short period of time after the initial event.

The leaflet contained a specific google street image of each postcode relating to the location, the leaflet also contained specific information relating to the MO used by the offender targeting that postcode and what the occupant could do to reduce the opportunity to becoming a victim of such crime.

Assessment

The findings from this research indicate that the treatment group postcode demonstrated a reduction (8.5%) in reported residential burglaries in comparison to the control group, this was statistically different.

Further research also identified some wider benefits in the treated group postcode location demonstrated a reduction (6%) in all vehicle crime, this was statistically different.

The reduction in crime was averaged out in the three years prior to the trial. Cost benefit analysis indicates that for every £1 invested in a Nudge Leaflet brings recyclable saving of £5.39 within the treatment areas.

NUDGING DOWN BURGLARY

Description

Scanning

HM Government has made it clear in its "Beating Crime Plan" (HM Government 2021) that residential burglary is a perpetual problem in policing, such crimes send shock waves through its victims, their families, and the community. HM Government has directed that it intends to reduce burglary and the impact burglary has on its victims.

Office National Statistics Data (2020) (ONS) indicates that since 2003 the number of reported residential burglaries has reduced by 9% in the year ending up until 2020. ONS data also indicates that 1.68 % of the adult population has been the victim of residential burglary (ONS 2020). The emotional effects of burglary have increased 2003- 2020 period, with many victims showing increased trauma (ONS 2020, Shapland et al 2007).

The Home Office (2018) have calculated that the cost of a residential / domestic burglary equates to £5930 per offence, this is broken down into:

Anticipation	£710.00
Consequence	£3420.00
Response	£1800.00

During the 2019 period Durham Police recorded a total of 2829 offences of residential burglaries throughout the force area. (Excluding aggravating offences). The cost of these burglary offences to the Durham policing area during the 2019 equates to:

Anticipation	£2 Million
Consequence	£9.7 Million
Response	£5.1 Million
Total Cost	£16.8 Million

Burglary is not a problem unique to Durham Constabulary and affects households and police forces throughout the United Kingdom and beyond. There are many theories to evidence and identify why residential properties and nearby properties are targeted. (Weisel 2016, Pease 1998,2002, Townsley et al 2003, Chainey and Da Silva 2016).

Crime Pattern Theory (Brantingham and Brantingham 1995) considers the 'geography and temporal patterning of crime' with the offender's motivation and decision making, based on knowledge of the neighbourhood along with a suitable victim.

Residential burglary crime data covering January 2019 – December 2019 was examined to understand the mechanics of the offences, this included examining:

- Day of the week the offence occurred,
- Means used (MO's),
- Repeats
- Near repeats based on postcode location.

It is also important to place some context on the research and understand why these timings have been utilised. During 2020 the world change with the Covid pandemic, with many restrictions been placed on our private lives. Crimes recorded by the police during the pandemic dropped by 37% throughout the world with some countries seeing greater reductions, for example recorded burglary

offences in London dropped by some 27% without the need for other intervention, cities like San Francisco saw a 38% increase during the Covid restrictions (Lewsey 2021). It is therefore important to understanding the burglary problem in Durham prior to the unprecedented times of the Covid pandemic, the individual habits and routines of everyone changed.

Previous police and partnership responses to dealing with burglary and other crime types was undertaken utilising the College of Policing "What Works" website and a short literature review of some of the recent articles on Google Scholar relating to burglary offences.

The knowledge and evidence based on prior research projects has been used for the foundations of this research, this includes the near repeat phenomena (Johnson 2008, Townsley et al 2003) and the offender boost theory (Shaw & Pease 2000). It also included some more recent responses such as Operation Swordfish (Johnson et al 2017) which target hardened the victimised property and surrounding properties.

Analysis

Data held by Durham police identified that in the 12 months pre covid (Jan 19 – Dec 19) 2829 offences of residential burglary were recorded (see Appendix A, Table 1), with no significant reduction in recorded residential burglary offences. During the 2019 period Durham Police recorded on average 214 offences each month, with an average of 21 offences been solved each month.

Durham police hold a wealth of information relating to the offences of burglary, this includes report date, MO, property, suspects/offenders, solved / not solved etc. This vast data provides an ideal foundation to understand the characteristics of these burglaries.

Offences such as burglary take time to resolve due to the complexities of the offences such as the submission of forensic evidence, CPS Charging decisions, officers time (Coupe 2016) and many other competing demands, therefore there is often a difference between when crimes are reported crimes and when crimes are resolved. Therefore, on a rolling basis Durham Police were solving around 10 % of all residential burglaries throughout 2019 period. The opportunity to reduce crime naturally improves outcome rates policing but also improves the wellbeing of our communities. The methods deployed to reduce the number of offences need to be quick, simple, and effective with ever competing and changing demands within policing.

The examination of the 'offence locations' (full address and postcode) during the 2019 period identified that 6.7% of all individual properties suffered from repeat burglary victimisation throughout the force area. In the same period 19.2% of all properties in the same postcode location in Durham reported a residential burglary offence, this supports the evidence that 'near repeats' occur near the primary offence location per the work by Townsley et al 2003. They identified that properties within a 200-meter radius of the original property were at risk of been burgled in a two-month period. Further research by Johnson 2008 identified that properties within a 400-meter radius were also at risk within a month of being subject to a burglary. Crime such as burglary will continue to be committed as long as opportunities to commit such crime are presented (Chainey and da Silva 2016), therefore it is important to understand the factors which contribute to such offences.

The examination data in which the 'first day of the week' the crime occurred was examined, this did not identify any patterns or trends Monday – Sunday (see appendix A, Table 2). Therefore burglary crimes were fairly and equally distributed throughout the week and year.

A further in-depth analysis was undertaken regarding the examination of the Modus Operandi (MO), see Appendix A Table 3. The offence of residential burglary now includes shed and garages, it was felt important to distinguish between the MO for each specific offence type.

This is the most important part of the analysis as this forms the basis of the targeted response. It is evident from the data that the most common MO used was to force or damage the property in order to gain entry, this would indicate that the victim has taken some steps to prevent offences occurring in the first instances and therefore any additional responses may occur additional cost and increased officer's time.

The second most common factor is the victim behaviour, data in Durham during the 2019 period identified that 33 % of victims had left their property insecure making them vulnerable to a motivated offender (Cohen and Felson 1979), however this is a simple and modifiable method of preventing further offences if victims can change the way they behave, thereby making the offence more difficult to commit by the offender.

Response

In order to provide an effective solution, targeting the near repeat phenomenon appeared to be the most appropriate response based on the fact 33% of all burglaries resulted from an insecure property during the 2019 period. The concepts from OP Swordfish (Johnson et al 2017) were considered, unfortunately, as there was no funding sourced or secured for this project. It was not possible or practicable to target harden every property and this did not fit with the problem, a more financially sustainable and viable model had to be considered.

The response for this specific issue builds on work by Roach et al 2017 in which a 'Nudge Leaflet' was allocated to treated sites within the Durham Police area with the aim of reducing theft from insecure motor vehicles. This research reported that the treatment areas issued the leaflet demonstrated a reduction in the theft from motor vehicles, but so did some of the control areas. Generic crime prevention leaflets used by Durham Police and other forces were considered, but these did not identify highlight the specific problem.

Nudge Theory triggers or taps into the cognitive formulation and strengthen the hand of system 2 thinking by improving people's judgement and considerations, this is against the background of system 1 which is fast, automatic and intuitive (Kahneman 2011). Nudging should not impede on the welfare, autonomy, dignity and self-government (Sunstein 2015), this should be a freedom of choice but set it in such a way that people behave in a more 'prosocial way' Thaler and Sunstein (2008). Nudge theory has demonstrated that human behaviour is malleable and with the right messaging can be changed to be more prosocial without having a detrimental effect on an individual.

Mindscape is a mnemonic designed by the Behavioural Insights team to support nudging, with the components:

Messenger – We are heavily influenced by who communicates information

Incentives – Our responses to incentives are shaped by predictable mental short cuts

Norms – We are strongly influenced by what others do

Defaults – We go with the flow of pre set options

Salience – Our attention is drawn to what is novel and seems relevant to us

Commitments – We seek to consistent with our public promises and reciprocate acts

Affect – Our emotional associations can powerfully shape our actions

Priming- Our acts are often influenced by sub-conscious ques

Ego – We act in ways that make us feel better about ourselves

Further mnemonics are available such as 'EAST' but for the purpose of this experiment MINDSCAPE has been utilised as these builds on the '*salience*' within the mnemonic.

On a weekly basis recorded residential burglaries were identified, repeat postcode locations were identified and randomised using the 'Cambridge Randomiser' for independence and integrity of this experiment. (Offences involving violence were excluded). Residential postcodes were allocated into 'Treatment' and 'Control Groups.' and the postcode specific leaflet was delivered by the local Neighbourhood Policing Team (NPT) to every address within the postcode. Figure 1, see Appendix C , shows the treatment and control sites across the Durham policing area.

The weekly basis of randomisation was due to the researcher's capacity within the working environment but also considered a compromise around the timings of when repeat burglary offences occur.

The ***Salience*** within MINDSCAPE was the important factor to address this particular problem:

- The insecurity of the property and the fact a third of all burglaries were considered EASY due to the insecurity of the property
- The image portrayed within the leaflet was specific to each postcode using a Google Image of each respective street.

The purpose and criteria used within the leaflet was to target the choices of the victim, allowing them to make better choices about basic home security, therefore interrupting the offender's choice of an easy target. (Figure 2, Appendix C)

Additional generic policing information relating to PACT (Police & Community Together) Meetings, Crime Stoppers and a messaging system were also included within the rear of the leaflet

In order to track the delivery of the leaflets a 'Certiciate of Service' was completed in order to track the intervention, this included

- Date delivered
- Number of houses nudged
- Personelle responsible for the delivery
- Time taken

This tracking method allowed further analysis to be determined during the assessment process and supports the cost benefit analysis of this intervention.

Assessment

Assessment of the randomisation

The first stage of the assessment was to examine the randomisation process to establish if there were any outlying factors or anomalies within the treatment and /or control group.

Step 1 - Examined the trend in reported residential burglaries in the two years prior to the commencement of the trial, this was to establish if there had been any outlining reporting periods

and identify any issues with the external randomisation. The data indicated that both the treatment group and the control group postcode locations had a similar trend over time, with both groups demonstrating an actual rise in reported offences before the commencement of the trial. (See appendix B, Graph 1)

Step 2 - Examined the social and demographic data and the postcode location data was cross reference with the Indices of Multiple Deprivation (IMD), both the treatment and control groups had a similar data set (See Appendix B , Graph 2).

It was established that the randomisation process between both the treatment and control group was balanced fairly.

- 7994 houses were nudged in the treatment group during the period of the trial.
- The delivery of the leaflet took on average 37 minutes to deliver to all houses in the respective postcode.
- The Nudge Leaflets were delivered to every property on average 3.95 days when allocated to the local Neighbourhood Policing Team (NPT).

Residential Burglary

Crime recording data held by Durham police was used to examine the recorded crimes in both the treatment and control groups in the **six months** post intervention following the delivery of the 'Nudge Leaflet'.

Table 4 (see appendix A) summarizes the difference in the average number of burglary offences between the treatment and control groups in each respective postcode location pre and post intervention.

Analysis between the treatment and control group was conducted on SPSS using a paired T -Test. The data examined the difference in reported residential burglaries between the treatment and control group locations based on postcode location.

Using the paired samples t-test, burglary residential crimes recorded in postcodes in the CONTROL group decreased in the 6-months post-randomisation (mean=0.62 crimes per postcode, sd=1.24) in comparison to the equivalent period pre-randomisation (mean=1.53 crimes per postcode, sd=0.81) and this difference was statistically significant (132)=8.0, $p<0.05$ with a large effect size, Cohen's d=0.87.

In comparison, there was an even greater reduction post-randomisation in the TREATMENT group (mean=0.53 crimes per postcode, sd=1.04) when compared to the equivalent period pre-randomisation (mean=1.66 crimes per postcode, sd=0.92) and this was also statistically significant t(130)=10.1 with a large effect size, Cohen's d=1.15.

The effects of the 'Nudge Leaflet' have demonstrated an 8.5% reduction in reported offences of residential burglary in the treatment group postcode location.

The data was further examined to determine if there were any wider diffusion of benefits for other crime types. These offence types were tracked in the two years prior to the commencement of the trail. The data identified that vehicle crime in the treatment and control groups had a similar trend to residential burglary (Graph 3, Appendix B).

Vehicle Crime

Table 5 (see appendix A) summarizes the difference in the average number of vehicle crime offences between the treatment and control groups in each respective postcode location pre and post intervention.

Using the paired samples t-test, vehicle crimes recorded in postcodes in the CONTROL group decreased in the 6-months post-randomisation (mean=0.65 crimes per postcode, sd=0.58) than in the equivalent period pre-randomisation (mean=0.55 crimes per postcode, sd=0.56) and this difference was statistically significant t(48)=0.86, p=0.39 with a small effect size, Cohen's d=0.18.

In comparison, there was a greater reduction post-randomisation in the TREATMENT group (mean=0.70 crimes per postcode, sd=0.76) than in the equivalent period pre-randomisation (mean=0.55 crimes per postcode, sd=0.68) and this was also statistically significant t(39)=0.73 with small effect size, Cohen's d=0.21.

The effects of the 'Nudge Leaflet' have demonstrated a 6 % reduction in reported offences of vehicle crime in the treatment group postcode location. Reduction in other offence types cannot be attributed to the use of the Nudge leaflet due to the volatility of the recording of such crimes and the design of the Nudge leaflet to specifically target and encourage people to secure their property.

Whilst the world has seen a reduction in crime due to the design of this trial, the randomisation and the checks and balances within the data sets, the only differentiating factor in the treatment group has the issuing of the 'Nudge leaflet'. This reduction of both crime types is unlikely to have occurred by chance and therefore can be attributed to the intervention throughout the Durham Police force area.

Costs

The cost of the Nudge intervention has been calculated based on the tracking undertaken within this experiment. See Table 6 in Appendix A provides an overview of costs totaling £3125.94. The cost of the leaflet delivery has been absorbed into the normal duties of the respective teams. This has been considered a fairly cost-effective way to test the hypothesis that repeat locations can be targeted using nudge theory to reduce victimisation and provides some scalability to the wider use in policing.

Cost Benefit Analysis

The ONS Cost of Crime (ONS 2020) was used to calculate the police cost of crime on each postcode. The reduction in burglaries in the treatment group (-8.5%) was then removed from the cost per postcode. The cost difference per postcode was divide by the cost of the nudge per postcode. This method was applied over the prior three years prior to the trial therefore finding an average for the treatment group.

It is acknowledged that crime has been dropping national, but data in Durham indicates that in the prior Covid period this was not the case. The findings indicate that for every £1 invested in a nudge leaflet, brings a recyclable saving on average of £2.70, see Appendix A Table 7. This method of reducing residential burglaries is comparable with the use of alley gates, but without the initial cost (Sidebottom et al 2018).

The same methodology was applied to all vehicle crime, see Appendix A Table 8 which shows average savings per postcode over a 3 year period of £2.69.

Therefore, the benefits brought by using a nudge leaflet indicates that for every £1 invested in the nudge leaflet brings total recyclable savings of £5.39.

Results indicate that repeat areas as defined by the postcode in the treatment group experienced fewer burglaries than the control group in a 6 month follow up period. Results also indicate that the nudge leaflet had a wider benefit in also reducing vehicle crime in the treatment area, these findings were statistically different.

Partners

It is acknowledged that on occasions no single agency can manage or be responsible for the complexities of crime in their entirety and therefore a partnership approach is sometimes desired to a particular problem. Working in partnership can bring benefits such as additional resources, funding and community cohesion to name but a few. Whilst the use of the nudge leaflet was confined to purely a policing response during this phase, this methodology allows ***any*** officer to deploy this nudge leaflet as part of the initial actions at the scene to gather evidence and provide important and effective crime prevention strategies across a wider community network, meaning more victims become self-aware and protected. This nudge leaflet also allows for a 'pause' potentially whilst additional funding is sourced within the partnership arena for some potentially longer term solutions into a specific targeted responses. It is also acknowledged that further opportunities do exist within the partnership arena to expand the use of the 'Burglary Nudges' with other agencies, such as allowing the Fire Service to deliver the 'Nudge' leaflet and combining this with their 'Home Safety Checks' or for Street Wardens to deliver the Nudge leaflet so that both agencies have some gain from this community interaction.

I am aware that also aware that funding and partnerships approaches for specific problems are also time, resources and funding specific, which potentially limits the number of victims a particularly funded response is applied to. The methodology undertaken in this research provides some sustainability regardless of the financial pressures police services and partners face at a later date. During this trial, HM Government provided various funding streams under 'Safer Streets',

however the resources and financial constraints do not always make it practicable to replicate some of target hardening applied to quite specific locations over an entire policing area. Whilst a partnership approach is desired it also brings some wider challenges which must be considered and have been within this problem solving approach to repeat burglary locations.

Limitations

During the examination of this data, further work was undertaken to establish if the habits of those individuals within the treatment postcode had changed when a further offence was reported in the treatment area. Due to the limitations within the recorded MO if was not possible to determine if the MO's changed at these specific locations. i.e. there was a reduction in insecure properties. This is an area in which the force should address with additional training for the uniqueness of each burglary offence and how this may assist in the solvability factors of such offences in the future.

The timing of this trial has been set in unprecedent times, with the follow up period limited to the 6-month period post intervention. The data used in this trial has been built up on data from a pre covid period, peri covid period during the trial and six month follow up period. We are now in a post covid period, when the actions and habits of everyone have changed dramatically, therefore limiting further findings from this research.

Conclusion

Results have identified that using a 'Nudge leaflets' can reduce crime at repeat postcode locations and have a wider benefit across other crime types and prove to be an extremely cost-effective intervention for policing.

Word count 3505

Appendix A

Table 1: Showing the number of recorded residential burglary offences throughout Durham Police

Jan 2019 – Dec 2019:

Month & Year	NOT RESOLVED - CLOSED INVESTIGATION	RESOLVED	Grand Total
Jan-2019	194	22	216
Feb-2019	246	17	263
Mar-2019	290	16	306
Apr-2019	189	20	209
May-2019	223	20	243
Jun-2019	175	17	192
Jul-2019	213	26	239
Aug-2019	204	38	242
Sep-2019	171	15	186
Oct-2019	213	34	247
Nov-2019	205	17	222
Dec-2019	250	14	264

Table 2 – Showing the days of the week by percentage for when the offence first occurred:

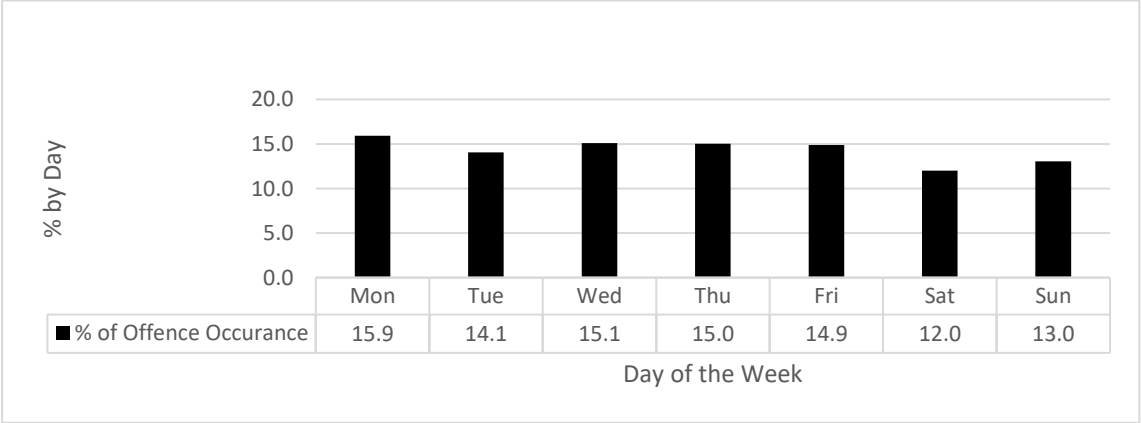


Table 3: **Evidencing the MO Used v Property Type during the 2019 and distribution of MO by percentage**

MO	% Of all Garages	% Of all Houses	% Of all Sheds
Attempt	0	0.7	0
Burn	0	0.2	0
Cut	0	0.2	0
Distract	0	1.1	0
Drill	0	0.2	1
Force / Damage	66	45.2	65
Keys	1	2.4	0
Reach	0	0.9	0
Remove	4	6.9	10
Sneak / Enter	19	**33.0**	19
UK	10	9.1	5
Grand Total	100	100	100

Table 4 summarizes the difference in the average number of burglary offences between the treatment and control groups in each respective postcode location pre and post intervention.

Group	Average Number of residential burglary crimes per Postcode Pre-Trial	Average Number of residential burglary crimes per Postcode post intervention
Control	1.53	0.62
Treatment	1.66	0.53

Table 5 - Difference in average number of vehicle crime offences between the treatment and control groups pre and post intervention.

Group	Average Number of vehicle crime per Postcode Pre-Trial	Average Number of vehicle crime per Postcode post intervention
Control	0.65	0.55
Treatment	0.70	0.55

Table 6 – Costs of the Nudge Leaflets within the experiment

Time and Resources	Cost
7994 A4 leaflets @ £0.20 Sheet	1598.80
5.33 Hours Police Office Time @£19.77/ h	105.37
87.3 Hours PCSO Time @ £ 10.62 / h	927.13
18.0 Hours Insp Time @ £ 27.48 / h	464.64
Total Cost of Nudge Interventions	3125.94

Table 7 Average savings per postcode over a three-year period for residential burglaries

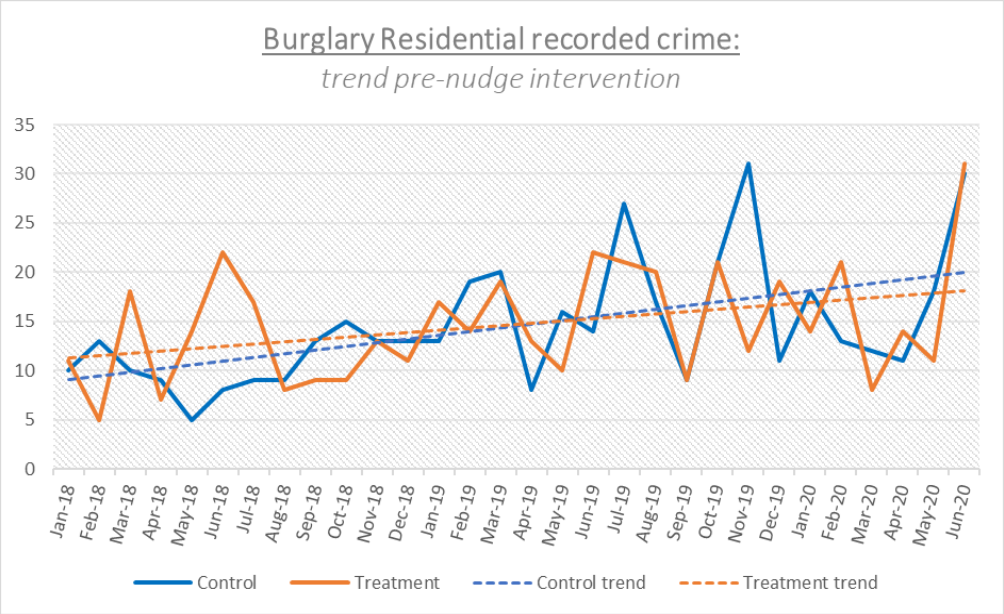
Burglary Residential Cost Analysis	Burglary Residential									
	Police Cost per crime	Recorded Crime Count	No. of Postcodes	Recorded Crime Count per Postcode	Police Cost per Postcode	% pt difference (due to nudge)	Police Cost per Postcode with Nudge	Cost Difference per Postcode (credit=saving, debit=spend)	Cost Difference per Postcode LESS Nudge cost	Police Cost-Benefit/Deficit for every £1 Nudge cost
2018	£ 530.00	2915	2083	1.40	£ 741.69	-8.5%	£ 678.32	£ 63.38	£ 40.22	£ 2.74
2019	£ 530.00	2869	2055	1.40	£ 739.94	-8.5%	£ 676.71	£ 63.23	£ 40.07	£ 2.73
2020	£ 530.00	2282	1699	1.34	£ 711.87	-8.5%	£ 651.04	£ 60.83	£ 37.67	£ 2.63
								Average Cost-Benefit/Deficit ratio		**£ 2.70**

Table 8 Average savings per postcode over a three-year period for vehicle crime.

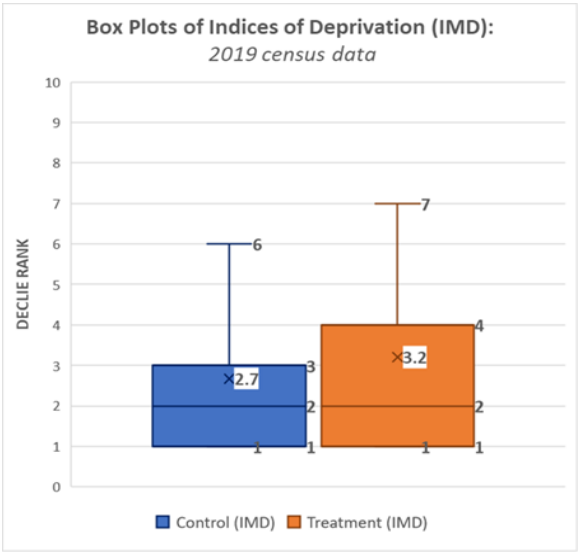
Vehicle Crime Cost Analysis	Vehicle Crime									
	Police Cost per crime	Recorded Crime Count	No. of Postcodes	Recorded Crime Count per Postcode	Police Cost per Postcode	% pt difference (due to nudge)	Police Cost per Postcode with Nudge	Cost Difference per Postcode (credit=saving, debit=spend)	Cost Difference per Postcode LESS Nudge cost	Police Cost-Benefit/Deficit for every £1 Nudge cost
2018	£ 762.20	3253	2372	1.37	£ 1,045.29	-6.0%	£ 982.12	£ 63.18	£ 40.02	£ 2.73
2019	£ 762.20	3098	2251	1.38	£ 1,049.00	-6.0%	£ 985.60	£ 63.40	£ 40.25	£ 2.74
2020	£ 762.20	2555	1951	1.31	£ 998.17	-6.0%	£ 937.84	£ 60.33	£ 37.17	£ 2.61
								Average Cost-Benefit/Deficit ratio		£ 2.69

Appendix B

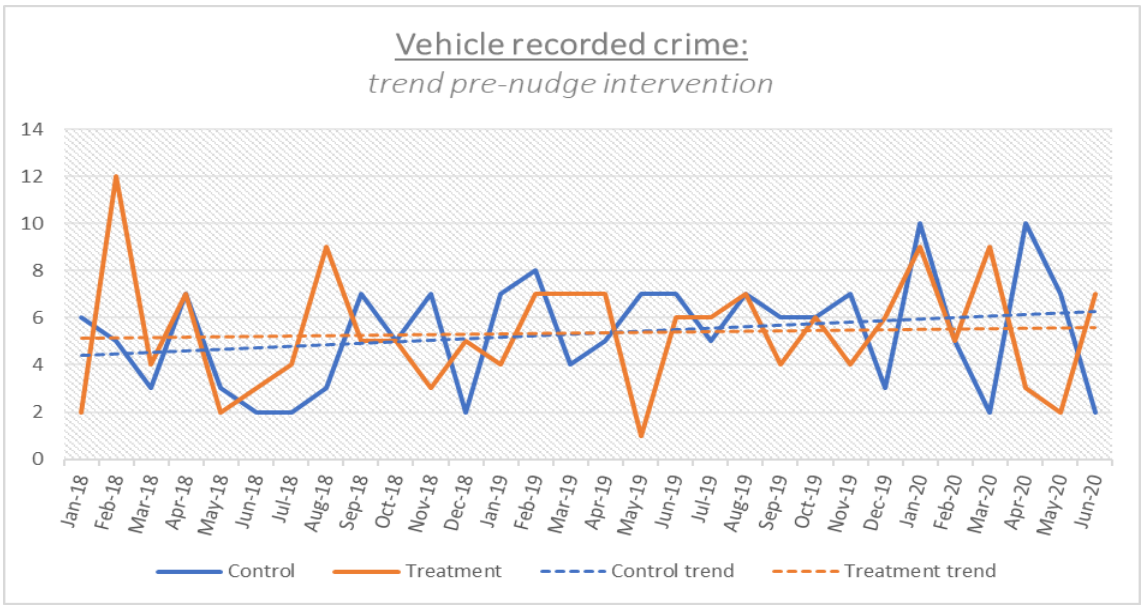
Graph 1 Evidencing the trend in reported residential burglary across Durham Police pre-trial between the treatment and control group.



Graph 2 Box Plots demonstrating the balance in Social Demographic Data using the IMD between the treatment and control group.



Graph 3 Evidencing the trend in reported vehicle crime across Durham Police pre-trial between the treatment and control group.



Appendix C

Figure 1 – Treatment and control postcode locations across the Durham Policing area.

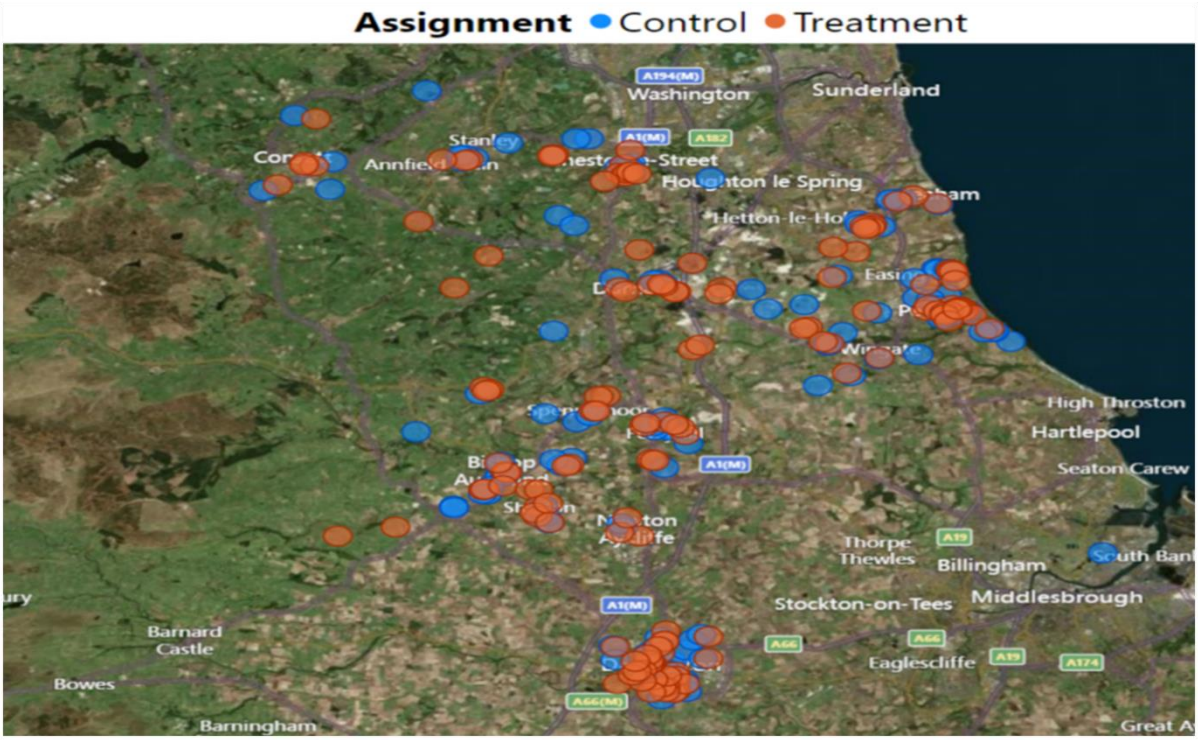


Figure 2

Front of Nudge Leaflet

Rear of Nudge Leaflet

Appendix D - References

Scanning References

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