

Town Centre Uplift Analysis

A report by the MPS Strategic Insight Unit, November 2022

Executive Summary

In August 2021, the MPS' Strategic Insight Unit (SIU) supported Front Line Policing (FLP) HQ to identify 68 town centres in London, and select which ones would receive an uplift of one of 19 newly created dedicated Town Centre Teams (TCTs), totalling 437 officers. SIU were also asked to evaluate the impact of TCTs but – because of the way that the intervention was designed and implemented - we have been limited in our ability to conduct a robust evaluation.

This paper summarises analysis conducted by the SIU to understand the effect of the TCT uplift on crime outcomes.

- TCT uplift took place in two stages: 12 town centres (one per BCU) received the uplift in December 2021; the remaining seven received the officer uplift in February 2022. To evaluate the effect of TCTs, we study crime trends before and after the uplift in the selected areas.
- We used two approaches:
 - Analysis 1 compared town centres receiving the uplift with those that were not selected, using the same SIU definitions of 'town centre' used to decide which areas would receive the uplift.
 - Analysis 2 compared town centres areas receiving the uplift to surrounding areas slightly further away. Analysis 2 used the actual areas implemented by TCTs, which are larger in size than the SIU-defined town centres used in Analysis 1.
- There is only one outcome measure (an increase in recorded drugs offences) that shows a *consistent*, statistically significant effect across December and February uplift areas in both analytical approaches used.
- For some other crime outcomes (arrests, Total Notifiable Offences, sexual offences) there is a mixed picture and effects are very small.
 - Both Analysis 1 and 2 found a (statistically) significant increase in overall arrests associated with TCTs, however in Analysis 1, this increase was only (statistically) significant in the February uplift areas.
 - There was a clear increase in recorded TNOs in Analysis 2, but the increase in Analysis 1 was not (statistically) significant.
 - Both analyses found (statistically) significant reductions in sexual offending, but this was only significant in the December uplift not the February uplift in Analysis 1 and was barely significant in Analysis 2 - even when using a lower threshold of significance than the academic standard.

Additionally, these reductions are so marginal that caution should be exercised in claiming a causal link or operational success.

- The impact on shoplifting and Violence Against Women and Girls (VAWG) is unclear and any positive statistically significant finding is inconsistent between uplift areas / type of analysis and is, in any event, marginal.
- We did not find any significant change in crime trends for hate crime, knife crime, violence with injury or public order offences after the uplift in either analysis.
- We are most confident in the results that are robust to changing the comparison group: that is the effect on drug offences, arrests, and sexual offences.
- We have estimated TCT uplift benefits in terms of operational impact (see Table 3 on page 20). For **each week** after the uplift, combined across all 19 Town Centre Teams, we estimate uplift is associated with 40 more drug offences being identified, 10 more arrests, 170 more Total Notifiable Offences (TNOs) identified, and 3-6 fewer sexual offences than there would have been in the absence of the uplift.
- The statistical analysis undertaken suggests some impact of TCT uplift, however, the method of evaluation has limitations in establishing causality. For instance, we cannot control for other changing circumstances that coincide with the timing of the uplift which may have impacted crime outcomes, nor account for potential spill-overs of crime from uplift areas to other parts of the city.
- In addition, the TCTs are costly, with several hundred officers assigned to them. It is unclear that the small reductions in offending seen here are sufficient to justify a deployment of this size, albeit we are unable to measure other outcomes such as increases in trust and confidence nor measure the extent and impact of officer abstraction to non-TCT deployments.

1. Introduction and background

1.1 Identification and allocation of town centre teams

In August 2021, the SIU supported FLP HQ in selecting the town centres that would receive an uplift of one of 19 newly created dedicated Town Centre Teams (TCTs). TCTs comprise one inspector, three sergeants, and 21 constables (1-1-21); an uplift of 437 officers.

To support the selection of suitable areas, SIU leveraged precise spatial socioeconomic indicators to identify the areas that could be accurately defined as a town centre and fairly compared with each other. To identify the town centres with the highest police demand, we applied a grid of hexagons across London and built a model of variables to measure and rank order the hexagons based on socioeconomic attributes and crime demand. This exercise identified 68 town centres,¹ which we ranked from highest to lowest demand. This model is described in more detail in Appendix A.1.

Using this list, FLP HQ allocated one TCT to each BCU by selecting the highest ranked town centre in their geographic area. These 12 TCTs were the first to receive uplift on 13th December 2021. The remaining seven TCTs were allocated on 14th February 2022 and were chosen from the remaining high demand areas not allocated initially. The December uplift areas are distinctly different to the February areas, being associated with higher levels of crime.

BCUs determined the precise geographical boundaries for the operational deployment of TCTs. They were encouraged to consult SIU, but decisions were typically taken without our input: as a result, the actual deployment of TCT uplift did not precisely align with the areas recommended by data modelling and many BCUs created geographic boundaries far larger than a town centre (e.g. one is the size of a ward). This boundary issue may have diluted the 'dosage' of the uplift.

1.2 Evaluation measures

The SIU was asked to evaluate the impact of TCTs, but, because we were not involved in the design of the TCT intervention, we have been limited in our ability to conduct a robust evaluation – our evaluation has limitations to establish casual links to impact associated with uplift.²

We based the evaluation on those targets listed in the performance framework for TCTs (designed by FLP HQ) that are measurable for the distinct geographic areas covered. Our primary metrics relate to measures of reported crime and arrests. The targets also include increases in trust and confidence but, unfortunately, the Public Attitudes Survey (our primary measure of trust and confidence) is not delivered with the geographical precision that would be needed to assess impact of TCTs.

¹ Most but not all of the areas matched MOPAC's urban planning data and definition of an official town centre for civic planning purposes.

² For example, we were not able to incorporate random assignment or other robust evaluation techniques, and there may be issues with the assumption of parallel trends in the uplift and control areas.

The boundary issue discussed in section 1.1 led us to conduct two forms of analysis in order to ascertain the impact of TCT uplift: Analysis 1 uses the grid hexagon system as defined by SIU and Analysis 2 uses the actual geography used by the TCTs, more details are included in Section 2.

2. Methodology

2.1 Research design for the evaluation

Our primary research question is whether crime outcomes in town centres receiving the uplift evolved similarly or differently than crime outcomes in comparison groups after the uplift took place (this is called a difference-in-differences design - see Appendix A.2).

We constructed a database of crimes using geo-localised offences from CRIS records. The units of observations are hexagon-shaped grids of 170 metres in length and a diameter from one corner to the opposite of 340 metres (more than three football pitches), as used in the SIU 2021 model to determine which areas should receive uplift. The temporal units used in the analysis were weeks.³

As noted previously, we took two approaches to analysis:

- In Analysis 1 (see Appendix A.3 for details) we take all the grids inside the town centres identified by the SIU in August 2021. We compare grid-weeks in town centres which received the uplift to grid-weeks in town centres that didn't. Since all town centres were identified on the basis of offending and socioeconomic indicators we believe these are reasonably comparable areas, even if they are non-identical, and that they would have evolved similarly in the absence of the uplift.
- In Analysis 2 (see Appendix A.4 for details) we select all the grids inside town centre areas receiving the uplift (according to operational delivery), and change the comparison group to grids that are just outside the boundary of the town centre areas (areas between 200 and 500m). The rationale for doing so is that, their proximity, borough characteristics and other confounders of crime may be similar to those grids inside the boundary, and that they would have evolved in parallel in the absence of the uplift.

The crime outcomes that we evaluate were selected using the targets listed in the performance framework for TCTs (designed by FLP HQ) and included arrests, Total Number of Offences (TNOs), violence with injury, hate crimes, violence against women and girls (VAWG), knife and firearm offences, sex offences, drug offences, public order offences, and shoplifting. These categories are non-exclusive: as an example if someone was arrested for a knife crime offence in which there was injury to the victim, we would count that single occurrence under arrests, knife and firearm offences, and violence with injury.

³ We opted for weeks to provide results that could be easily interpreted, and which would allow us to have sufficient number of observations in the data while minimising sparsity (a large number of zeros). Choosing months instead of weeks would have decreased substantially the number of observations in our dataset; choosing days instead of weeks would have meant introducing many more zeros in our distribution.

3. Results

3.1 Summary of results

The SIU carried out an evaluation of the impact of the TCT officer uplift on various crime outcomes: crime counts for various crime categories, and arrests. In order to evaluate the effect of the uplift we designed two analyses.

Analysis 1 (full results detailed in section 3.2) uses SIU-defined town centres (from the 2021 modelling exercise) and compares small spatial units (hexagon-shaped grids) in the 19 town centres which were selected to receive the uplift to those in the 49 town centres which were not selected.

The results show that there was an increase in drug offences recorded inside the uplift-areas, of about 43 more offences per week, combined across *all* areas receiving an uplift. This analysis also reveals some differences between the December and the February uplift areas. The December areas had a small decrease in sexual offences (6 fewer sex offences a week). The February uplift areas had an increase in recorded shoplifting (11 more offences), and an increase in arrests (of 10 more arrests per week).

Analysis 2 (full results detailed in Section 3.3) compares areas inside the uplift boundaries to areas slightly further away (within 200 and 500 metres). This analysis also estimates that the uplift areas saw an increase in reported drug offences. The estimated magnitude is very similar: 40 more offences recorded per week across all grids. We also estimate an increase in arrests of 10 per week, an increase of 170 Total Notifiable Offences and a decrease in sexual offences (3 per week).

We are most confident in those results that hold for Analysis 1 and Analysis 2: that is the effect on drug offences, arrests, and sexual offences. We find no statistically significant change in knife crime, hate crime, violence with injury, or VAWG.

3.2 Analysis 1: Detailed analysis of areas defined by SIU scoring

In the first analysis we studied the SIU-defined town centre areas, a subset of which are depicted in Figure 1 below. The SIU-defined town centres comprised 1.96 hexagons grids apiece, but some were larger and contained five or more adjoining hexagons.

We categorised our town centre grids into three groups, summarised in Table 1: hexagon-grids in town centres which received the uplift in December, hexagon grids in town centres which received the uplift in February, and hexagon grids in town centres which did not receive the uplift. We observe each hexagon for 54 weeks for all our crime categories except for VAWG – which we observe for 25 weeks.⁴

⁴ The data for VAWG is only available for a smaller time frame (since November 2021) following changes to data collection and classification in relation to VAWG offences.

Figure 1 – Sub-set of Town Centres identified by the SIU selected into December uplift, February uplift, and not selected.

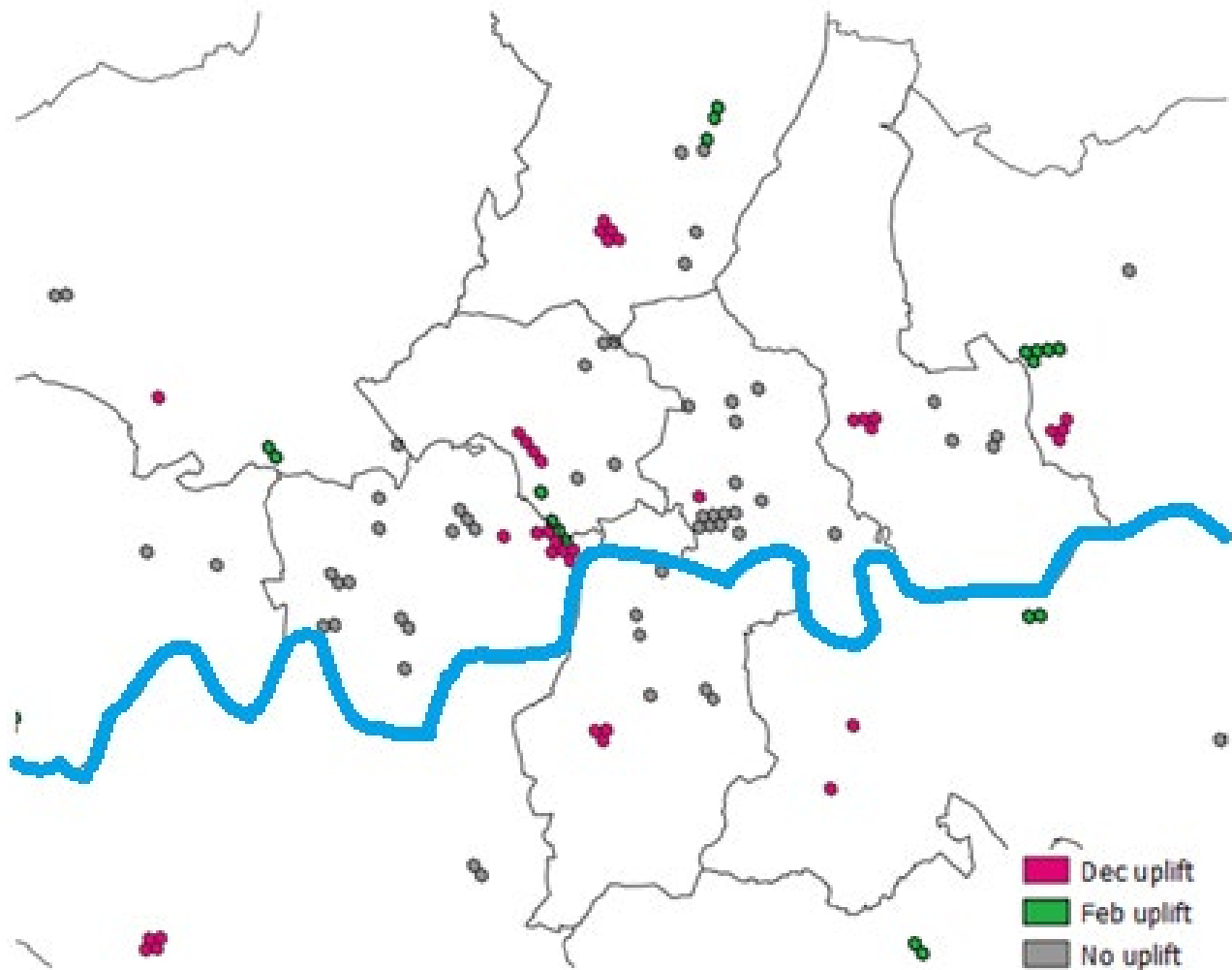
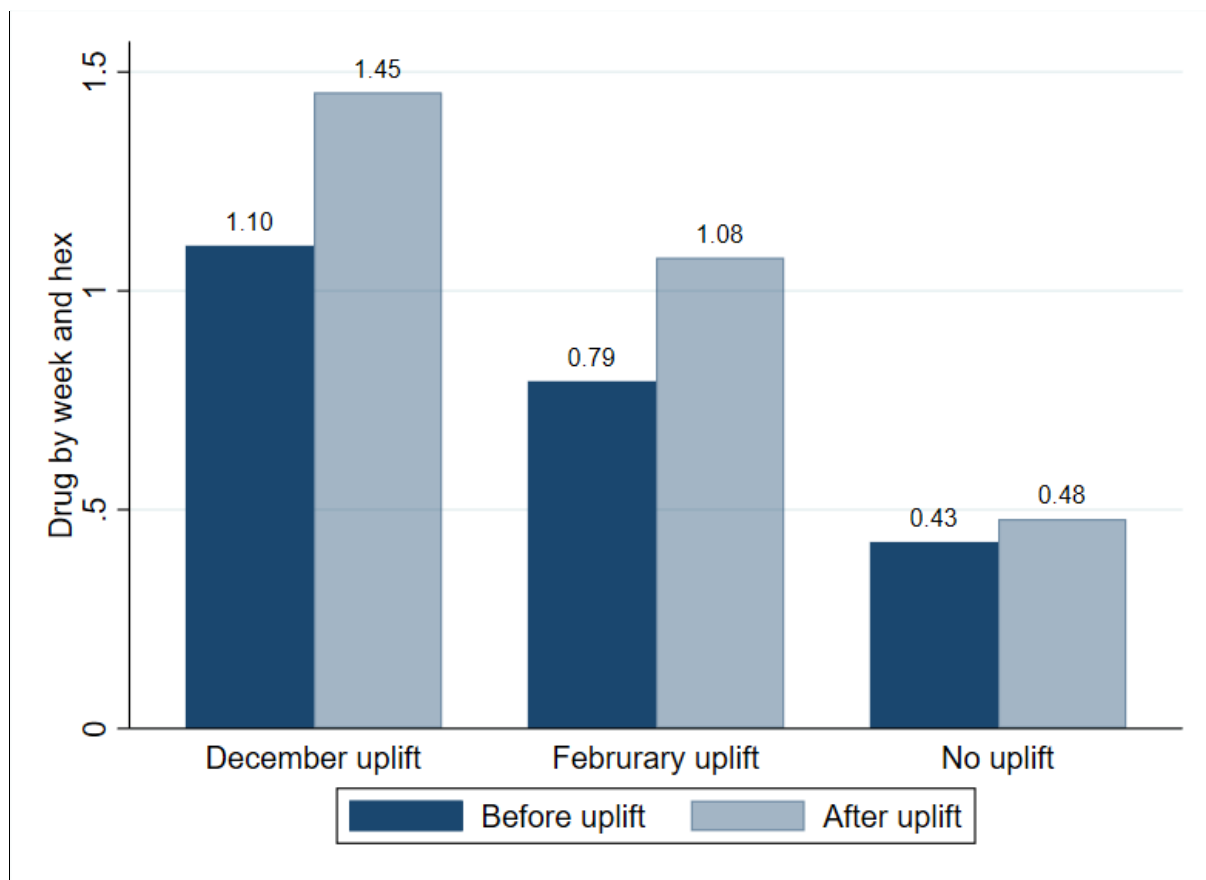


Table 1 – Sample size in Analysis 1

	Hexagons	Town Centres
Dec uplift	42	12
Feb uplift	22	7
No uplift	69	49
Total	133	68

In the analysis, we take into account the staggered nature of the implementation (that not all areas received the uplift at the same time). The graph in Figure 2 shows the average number of crimes in each hexagon-week before and after the uplift. Given that the hexagon-grids are of the same size, this unit of measurement makes it easy to compare across the December, February and no uplift areas, even when the total number of hexagons in each category differs.

Figure 2 – Average number of drug offences in each hexagon-week, by uplift group.



As seen in Figure 2, before the uplift, the average number of drug offences in hexagons that would receive the uplift in December was 1.10 each week. This was much higher than drug offences in areas that would receive the uplift in February, or in areas that never received the uplift. This is revealing of how town centres with higher densities of crime were prioritised to receive uplift.⁵

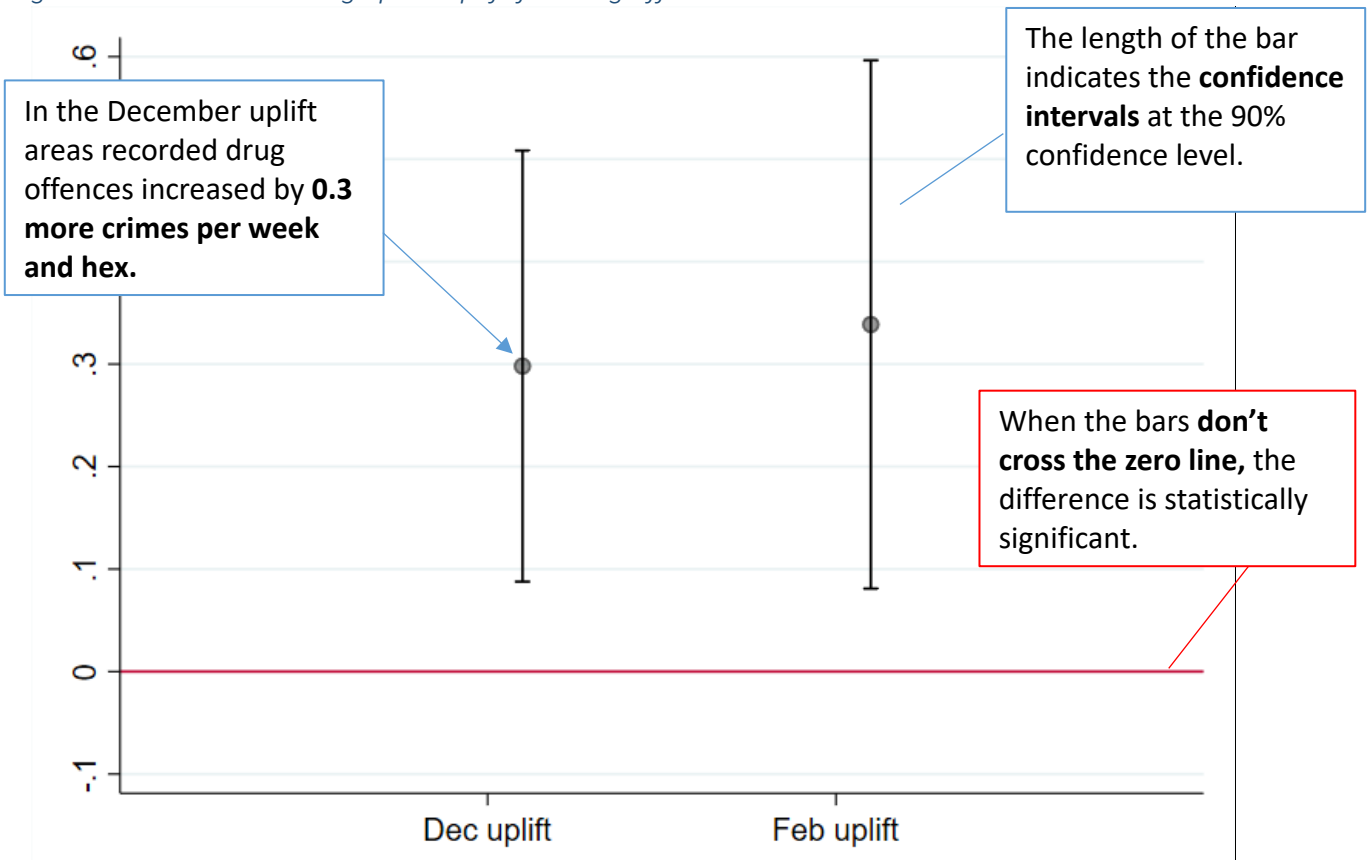
After the uplift, drug offences in the December areas grew to 1.45. That means a difference of 0.30 crimes per hex-week. In the February uplift areas, the averages also go up from 0.79 to 1.08; which is 0.29 crimes per hex-week. In the no-uplift areas, the average number also increases but the difference is much lower (only 0.05 crimes per hex and week).

From these summary statistics, the difference-in-differences (the change in areas receiving uplift compared to the change in areas receiving no uplift) is 0.25 for the December uplift ($0.30 - 0.05$), and 0.24 for the February uplift ($0.29 - 0.05$). We ran an ordinary-least-squares regression to empirically estimate those values, and test their significance. Our regression takes into account the temporal characteristics of each week, and the spatial differences across boroughs in London (see Appendix A for details).

⁵ Although Figure 2 focuses exclusively on drug offences, the December uplift locations exhibited higher counts of offending across all crime types when compared to those in the February uplift and those that never received an uplift.

Figure 3 below shows the estimated difference-in-differences coefficients and their confidence intervals for December uplift vs no uplift, and February uplift vs no uplift for drugs offences.⁶ The circle is the estimated difference (by how much crime changed inside the uplift areas), and the bars indicate the confidence intervals (how precise our estimates are). We report the coefficients at the 90% confidence level.⁷ **Whenever the confidence intervals don't cross the zero line the estimates are statistically significantly different from zero.** See Appendix A for a full reporting of coefficients and associated standard errors.

Figure 3 – Estimated change post-uplift for Drug offences



The coefficients reveal that the differences are significant at the 90% confidence level. As such, there was an increase in drug offences recorded in the uplift areas after the uplift when compared to the town centres which were not selected for the uplift. The magnitude of the effect is around 0.30 crimes per hexagon and week. In the actual implementation of TCTs, there were 142 hexagons in areas that received the uplift,

⁶ To calculate the confidence intervals we use clustered standard errors on hexagon level, which allow to take into account serial correlation in the error term.

⁷ By statistical convention, the confidence level required to reach statistical significance is 95% instead of 90%. Our use of a less-stringent definition means that it is easier to define the observed difference-in-differences as significant. The shift to a more relaxed standard compensates for a rather conservative level of clustering to calculate our standard errors. For operational decision making, however, a 90% certainty that these estimates are something other than zero is likely to be sufficient. The full set of results and associated standard errors are available in the Appendix.

which means the uplift resulted in 40 more drug offences being recorded ($0.3 \times 142 = 42.6$) each week.

Figures 4-12 replicate the above analysis for each of the different crimes considered. We estimated the uplift correlates with an increase in arrests and in reported shoplifting offences in the February uplift areas. We estimated a small decrease in sexual offences in the December uplift areas. For all the other offences, we did not see a statistically significant change in trends after the uplift in the uplift areas when compared to town centres which were not selected to receive the uplift.

Figure 4 – Pre vs post Arrests (left), and estimated change post-uplift (right)

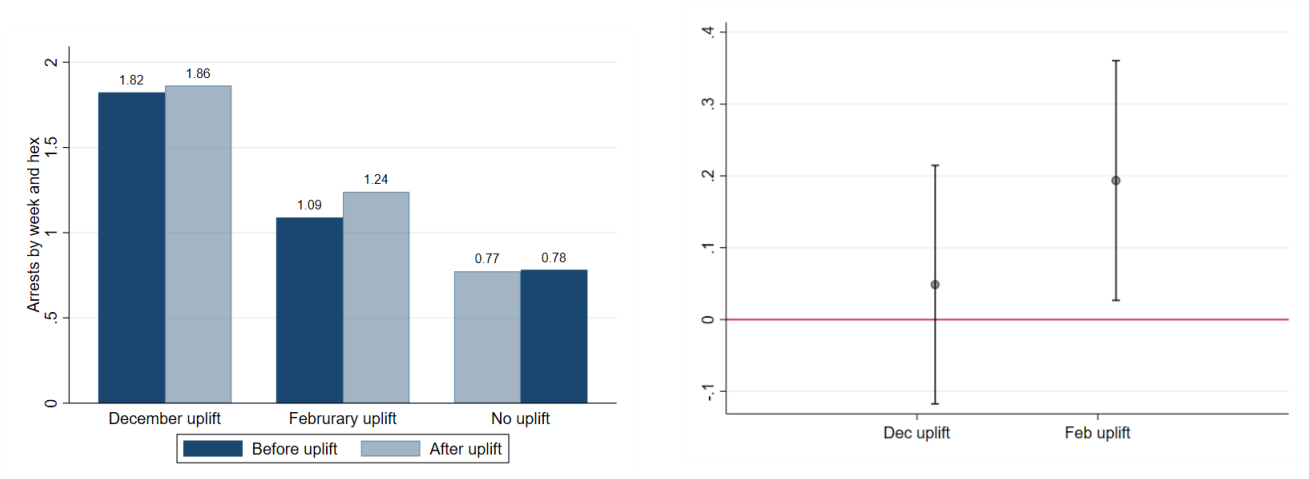


Figure 5 – Pre vs post Total Notifiable of Offences (left), and estimated change post-uplift (right)

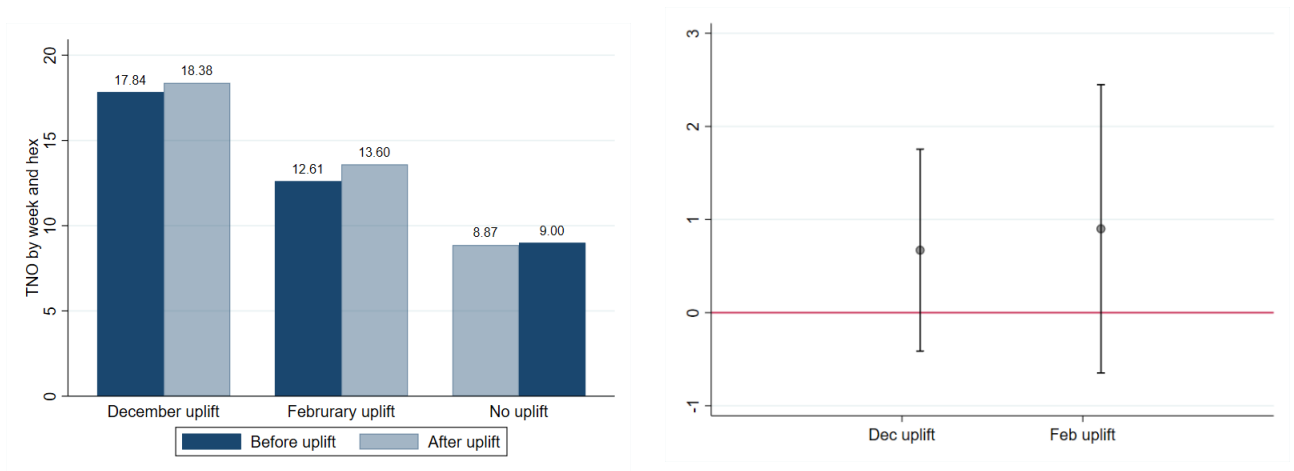


Figure 6 –Pre vs post Violence with Injury offences (left), and estimated change post-uplift (right)

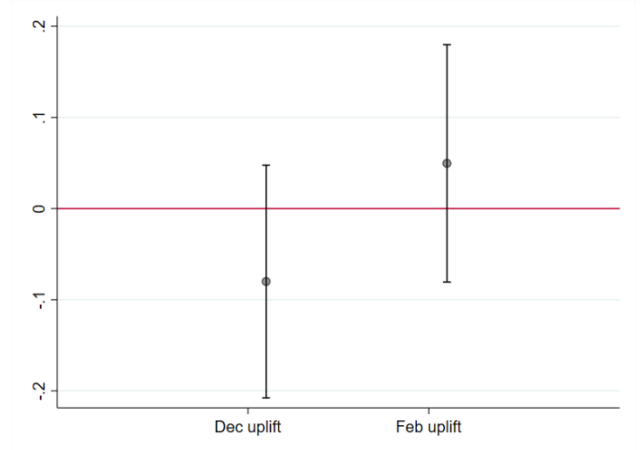
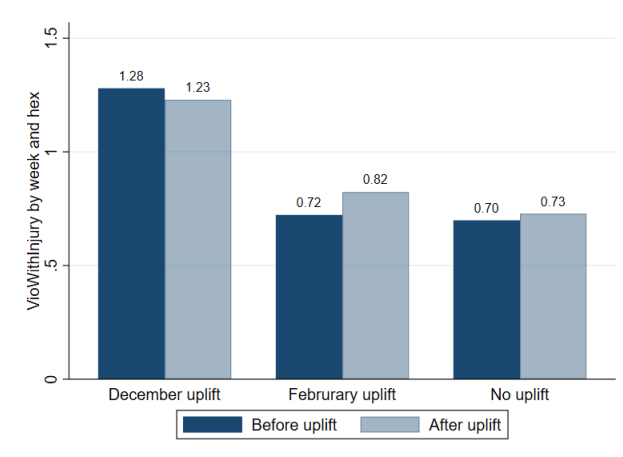


Figure 7 –Pre vs post Hate crimes (left), and estimated change post-uplift (right)

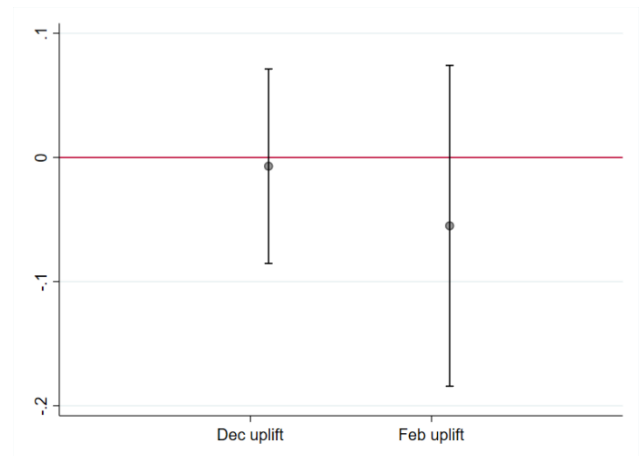
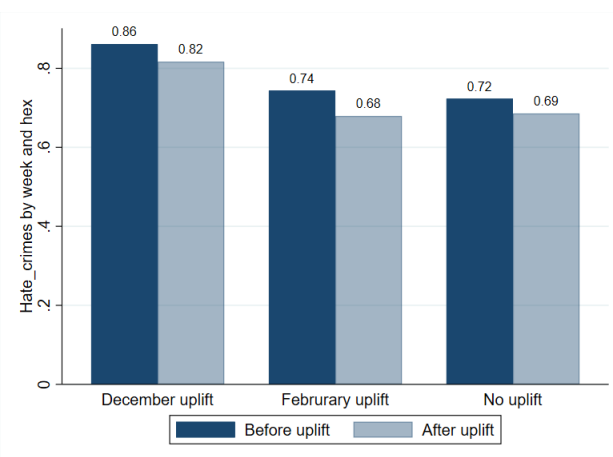


Figure 8 –Pre vs post Sexual offences (left), and estimated change post-uplift (right)

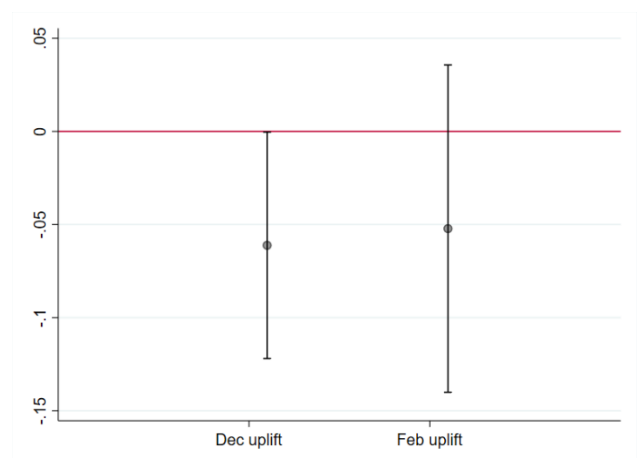
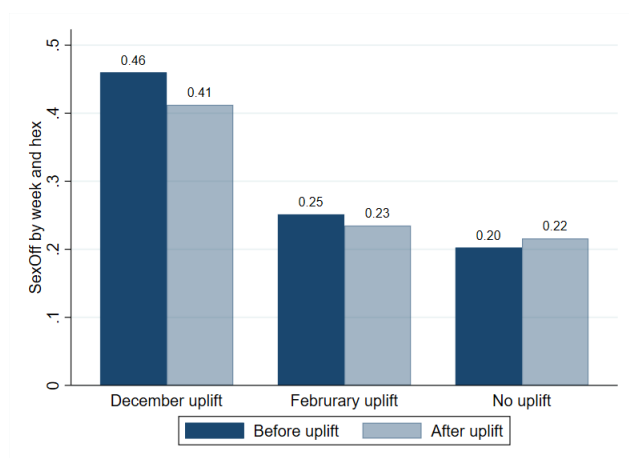


Figure 9 – Pre vs post Public order offences (left), and estimated change post-uplift (right)

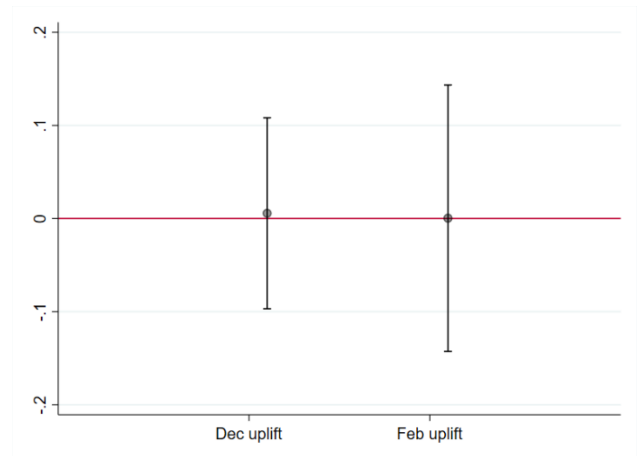
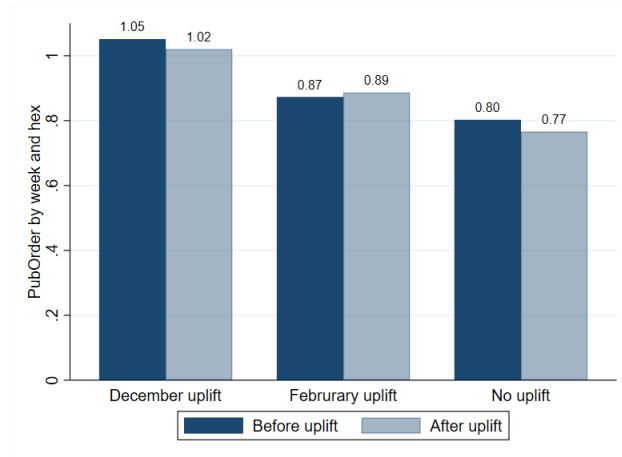


Figure 10 – Pre vs post Shoplifting offences (left), and estimated change post-uplift (right)

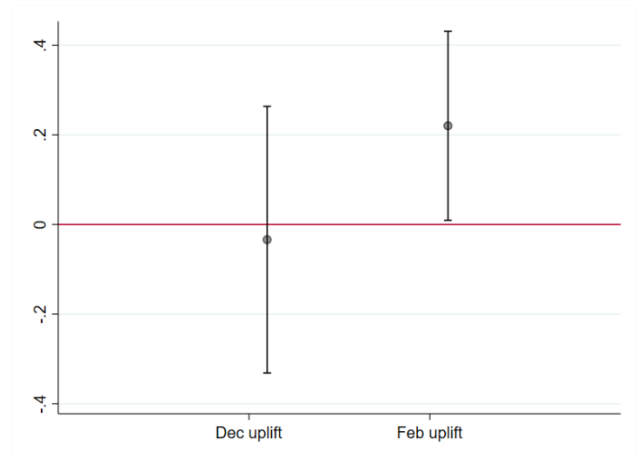
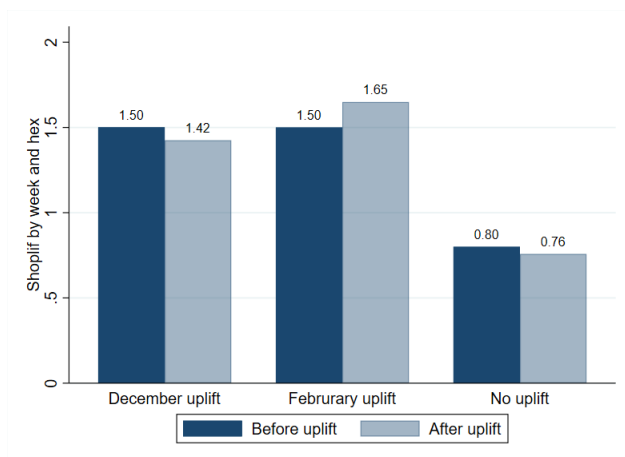


Figure 11 - Pre vs post Knife crimes (left), and estimated change post-uplift (right)

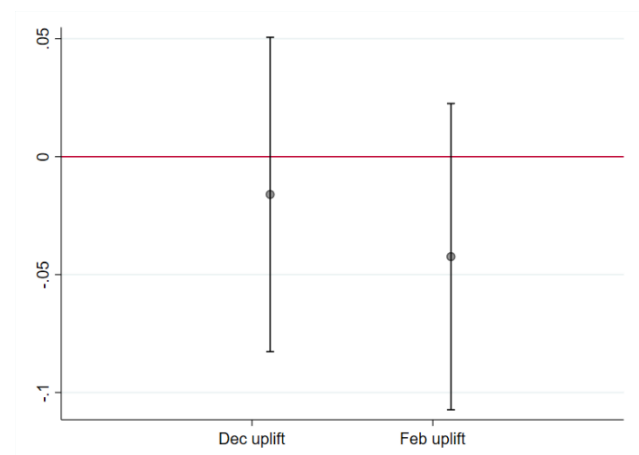
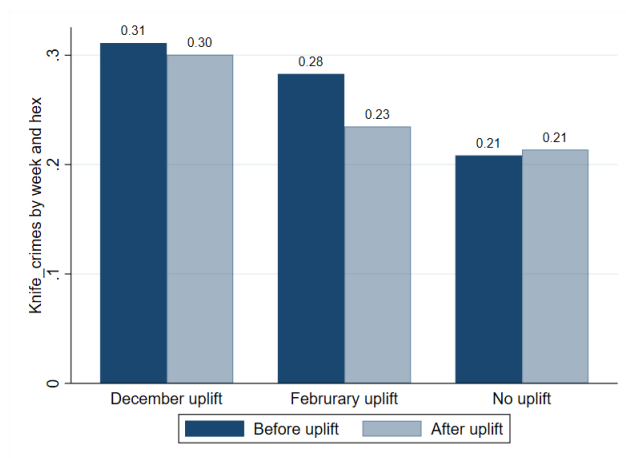
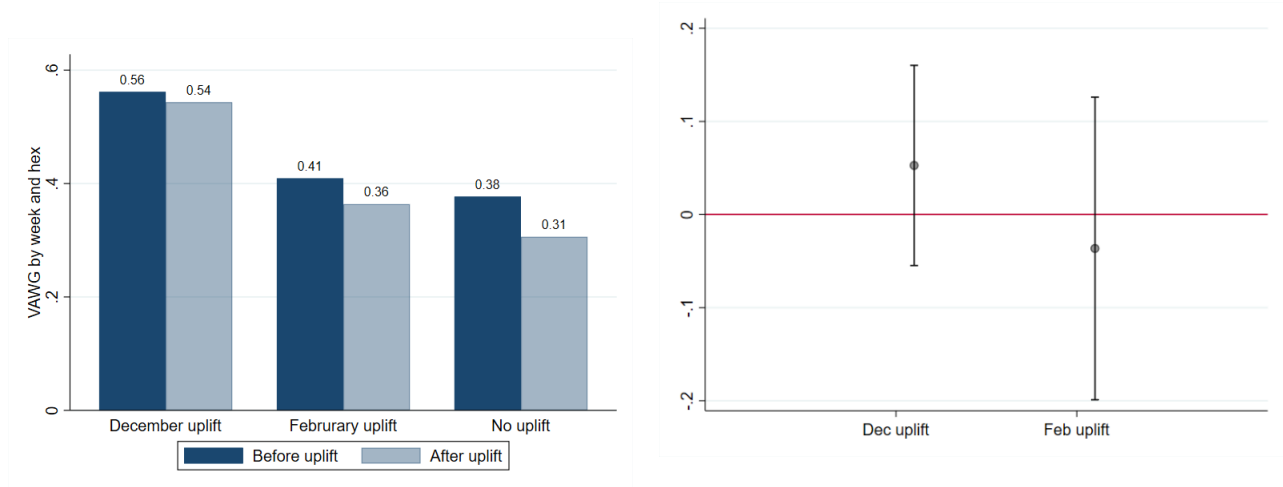


Figure 12 – Pre vs post VAWG offences (left), and estimated change post-uplift (right)



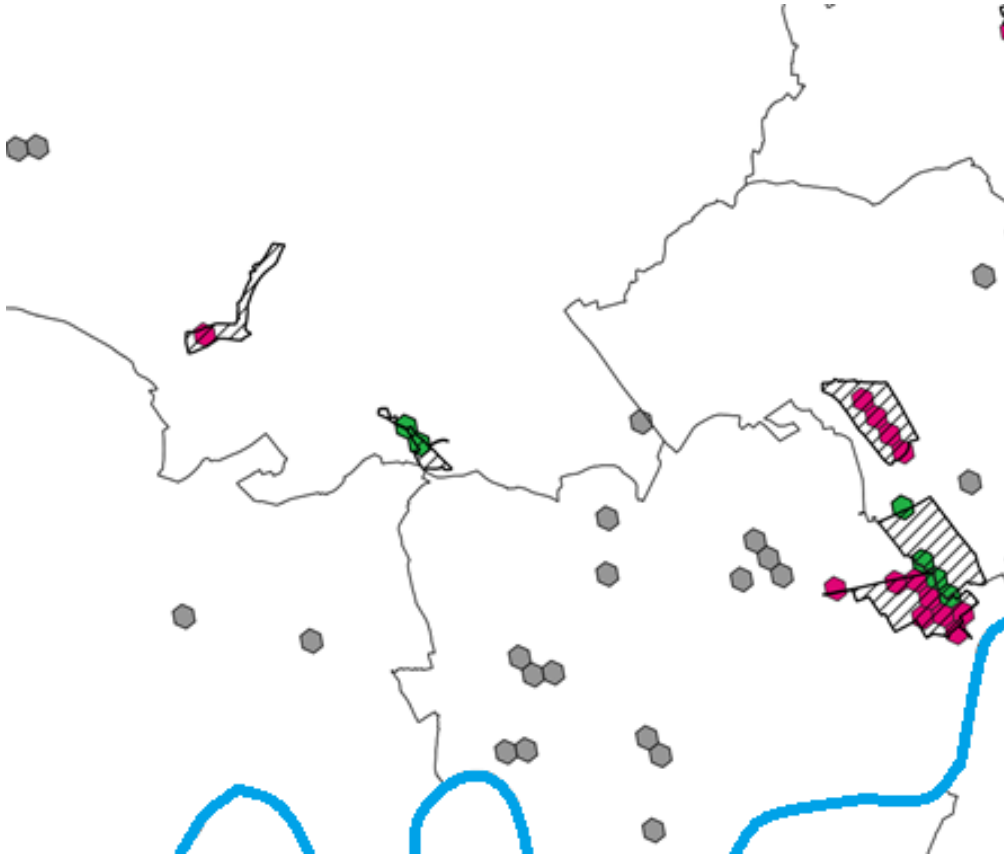
Even using a relaxed definition of statistical significance (90% instead of the academic standard of 95%), *consistent* shifts in recorded offending within TCT uplift areas are confined to drugs offences. Most offence classifications exhibit no observable difference between the areas which received Town Centre Teams, and the areas which did not. We are left with only a small number of significant differences-in-differences, which vary between December and February uplift areas.

We estimate the uplift correlates with an increase in arrests and in shoplifting offences in the February uplift areas. We also estimate a small decrease in sexual offences, barely significant even under our less stringent confidence levels, in the December uplift areas (but not in those which received the uplift in February). For all the other offences, we cannot see a statistically significant change in trends after the uplift in the uplift areas when compared to town centres which were not selected to receive the uplift.

3.3 Analysis 2: Detailed analysis of areas defined by operational delivery

The implementation of the TCTs (i.e. the areas that were finally selected to have additional officers) didn't perfectly match the SIU-defined hexagon-grid. Figure 13 (below) exemplifies the differences between the town centre areas suggested by SIU and implementation in practice in five town centres, in Central-West, Central-North, North West, and West BCUs.

Figure 13 – SIU-defined hexagons (as in Analysis 1), and actual implementation (dashed areas).



For this reason, together with the fact that the choice of a comparison group is crucial in this evaluation we performed a second analysis. This time we studied the actual areas that received the uplift, which tended to be much larger than the SIU defined hexagons. For comparison purposes, we created non-identical, but comparable, areas.

We distinguish three groups:

- hexagons inside the town centres (as implemented),
- hexagons within 200 metres of the boundary (a buffer group), and
- hexagons between 200 and 500 metres from the town centre boundaries (our non-identical comparison group).⁸

There were 646 hexagons across these three groups, as illustrated in Table 2. A map with an example is in Figure 6.

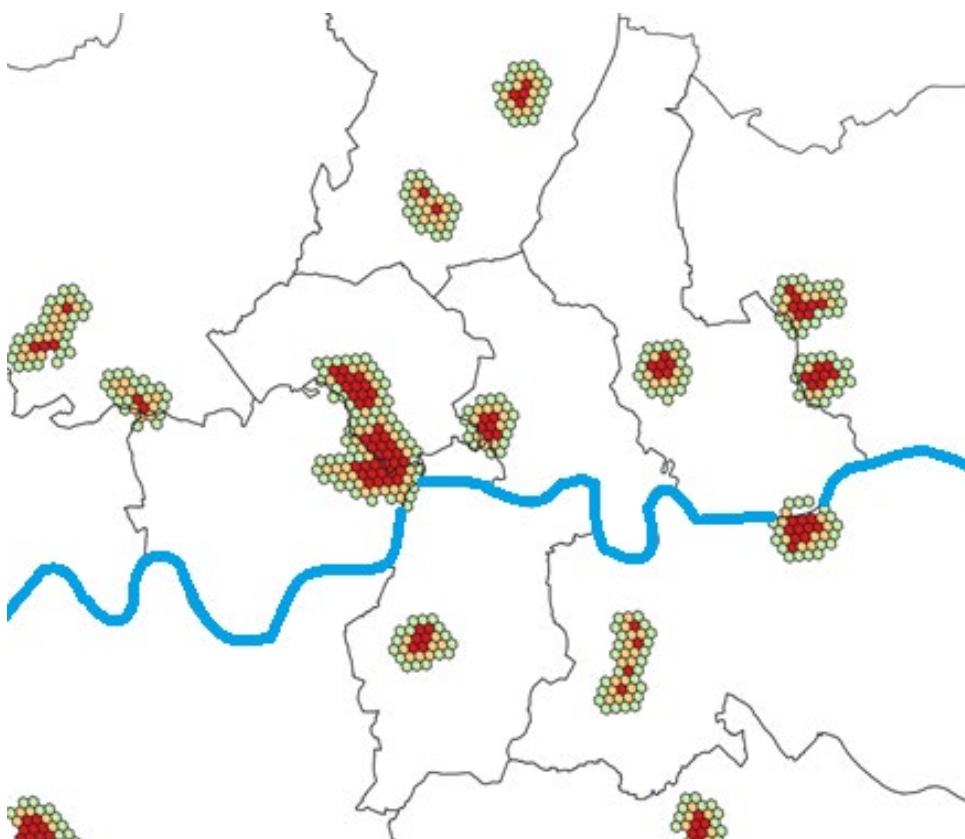
⁸ We calculate the distance by measuring the metres between the hexagon centroid and the nearest boundary of the Town Centre.

Table 2 – Sample size in Analysis 2

	Hexagons
Inside TCs	142
Near (within 200m)	177
Further (200-500m)	327
Total	646

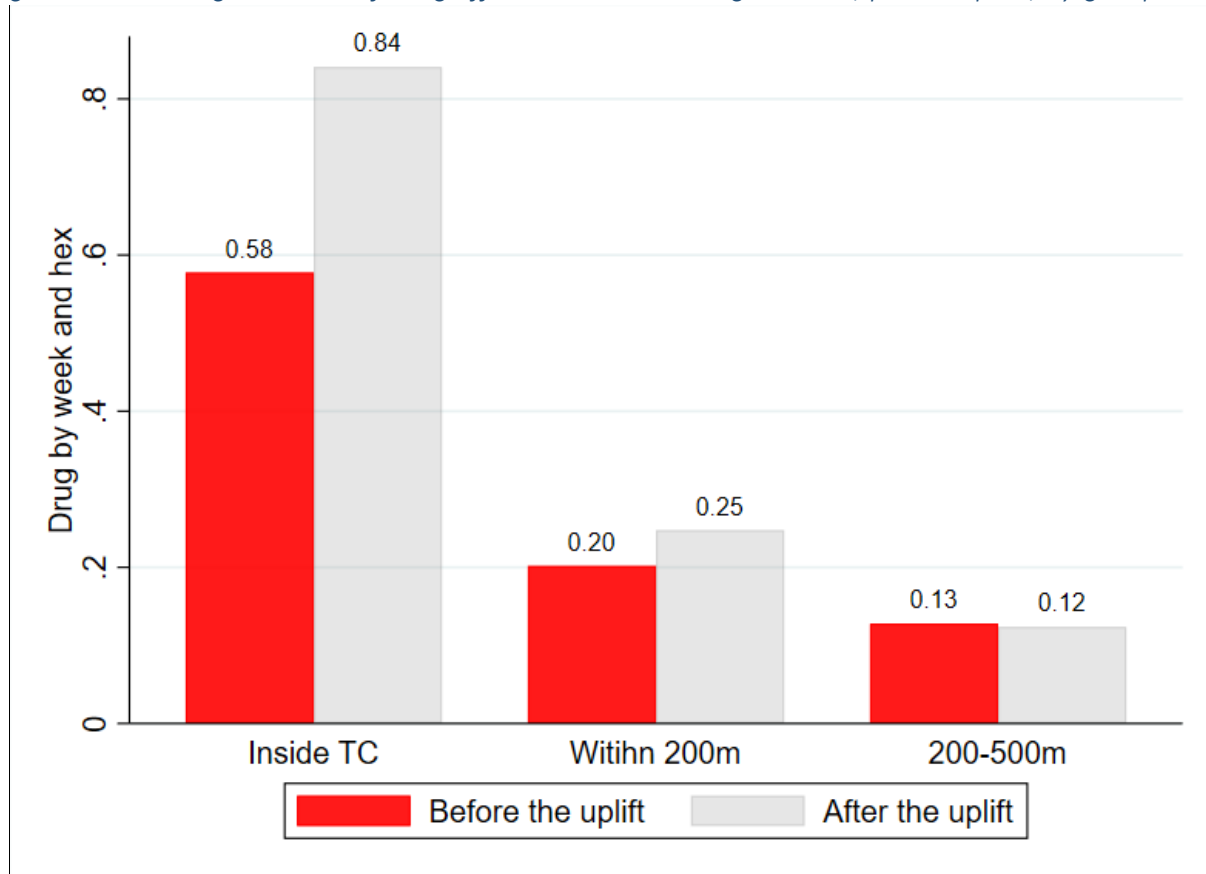
There is a total of 142 hexagon grids inside town centres which received the uplift. Of those, 92 received the uplift in December, and 50 in February. As a buffer group we have 177 grids within 200m, and 327 grids within 200 and 500 metres.

Figure 14 – Town Centre areas (red), hexes within 200m (yellow) and hexes between 200 and 500m (green).



In a similar fashion as Analysis 1, we compared crimes in hex-weeks inside the town centre implementation boundaries to crimes in hex-weeks in the areas outside (200 to 500 meters). The graph in Figure 15 shows the average number of drug offences in weeks before and after, by distance category group.

Figure 15 – Average number of drug offences in each hexagon-week, pre and post, by group.

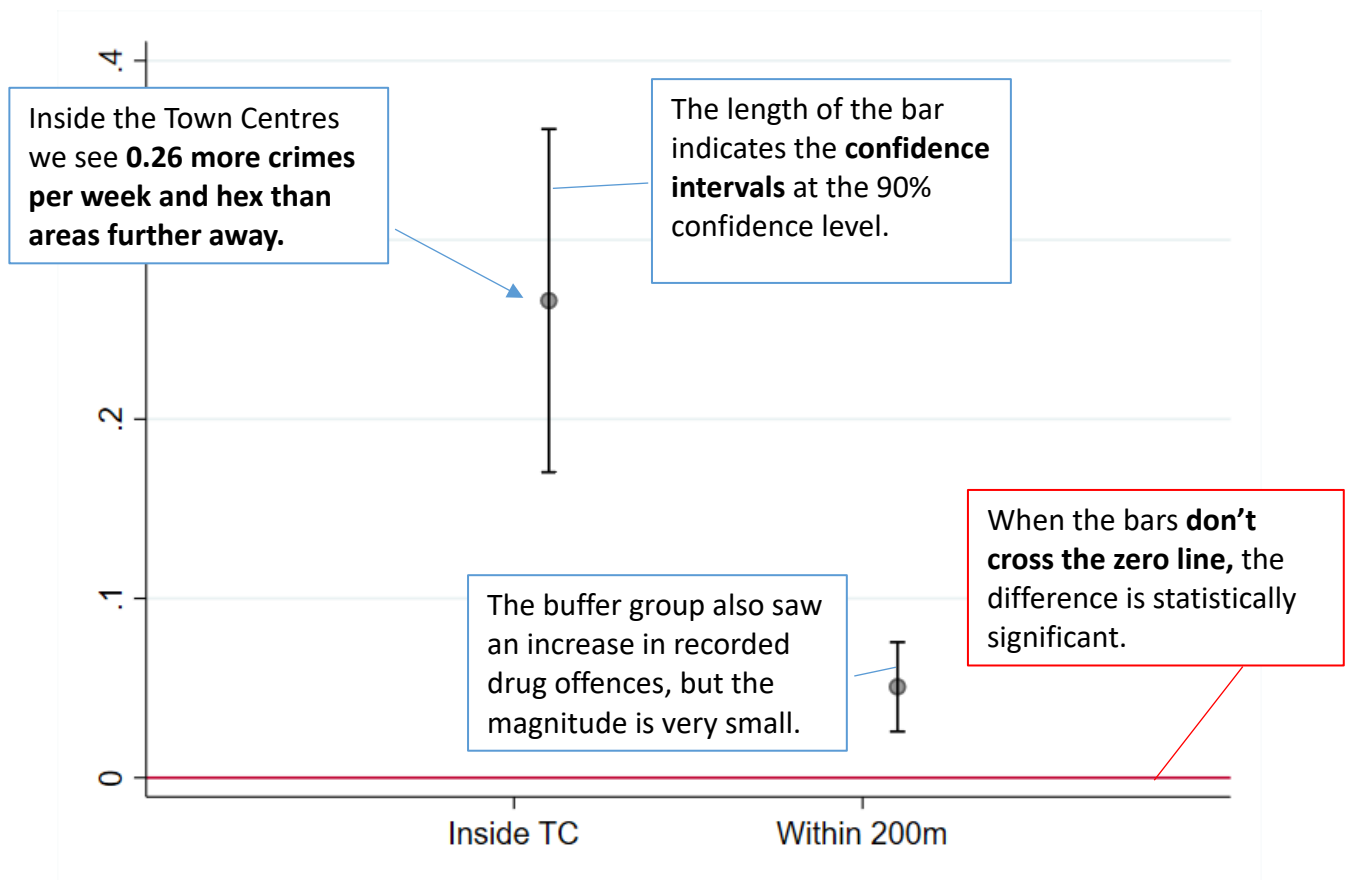


Before the uplift the average number of drug offences each week in hex-grids inside the town centre boundaries was 0.58. As we can see, hexagons outside the boundary had lower drug offence levels, even before the uplift. After the uplift, crimes increase by 0.26 per hex-week in the town centre areas. Notably, this is the same magnitude that we estimated in Analysis 1. In areas within 200 metres from the boundary the increase is only 0.05, and in areas between 200 and 500m of the boundary it is -0.01.

As before, we ran a regression to estimate whether these differences are statistically significant. We control for week and borough effects (details in the Appendix).⁹ We statistically compare whether the 0.26 change (the increase inside town centres) is significantly different to the -0.01 change (in areas between 200 and 500m), and whether the 0.05 change (in areas within 200m) is statistically significantly different to the -0.01 change (again, in areas between 200 and 500m). The results are shown in Figure 16. The methodology is explained in detail in the Appendix.

⁹ While the results are not sensitive to including week and borough fixed effects, we believe these may allow to capture variation in crime due to particular weeks, or boroughs. For instance, variations driven by particular events taking place in London in a given week, temperature etc., and other characteristics that are unique to each borough (for instance, being near a touristic landmark, a stadium etc.).

Figure 16 – Estimated change post-uplift for Drug offences.



In Figure 16 the coefficients confirm that there was a (statistically) significant increase in drug offences inside town centres. There was also a slight increase outside the boundary. We replicate the two graphs above for all our other outcomes in Figures 17 to 25.

As was true in Analysis 1, nearly all of these comparisons show no discernible association between the town centre deployments and reduced offending (other than drugs offences). Statistically significant differences were found in just three measures inside town centres receiving uplift; an increase in Total Notifiable Offences, an increase in arrests and a slight decrease in sexual offences (that was just barely significant, even with the relaxed standards used here). For all the other outcomes, we find no statistically significant changes in crime trends after the uplift when compared to areas slightly further away.

Figure 17 – Pre vs post Arrests (left), and estimated change post-uplift (right)

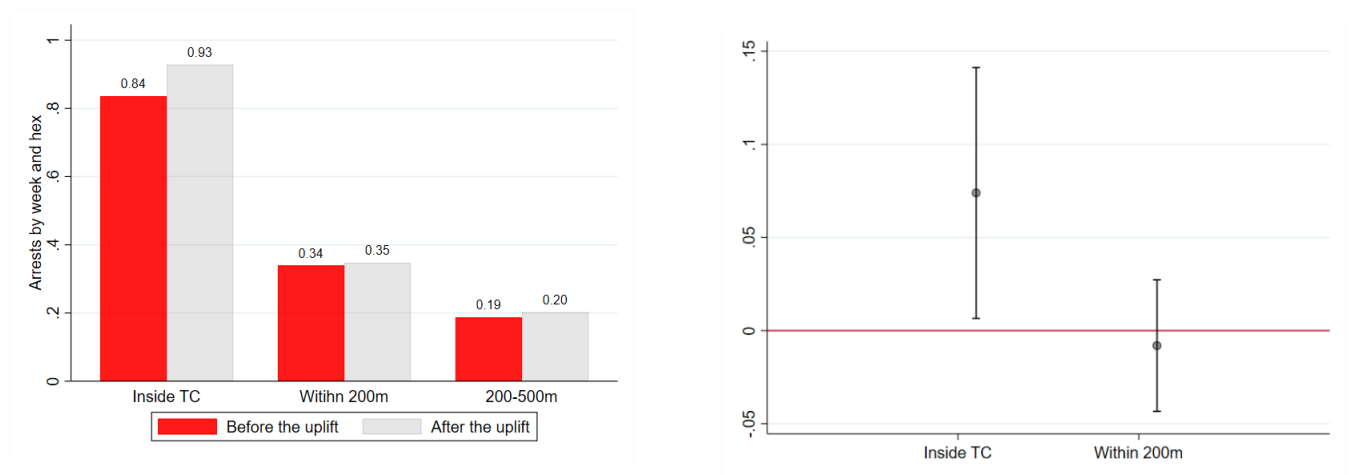


Figure 18 – Pre vs post Total Notifiable of Offences (left), and estimated change post-uplift (right)

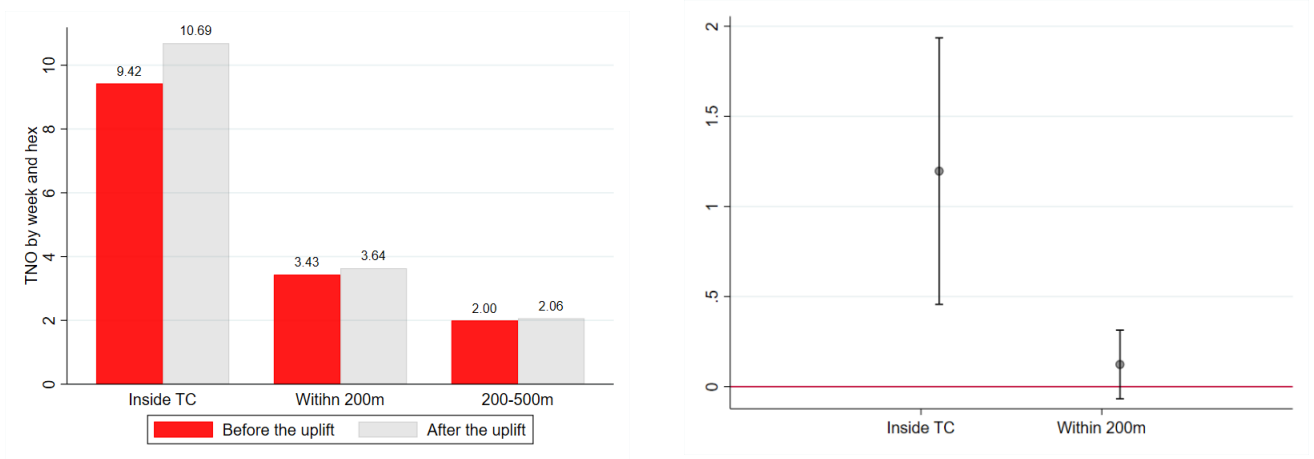


Figure 19 - Pre vs post Violence with Injury (left), and estimated change post-uplift (right)

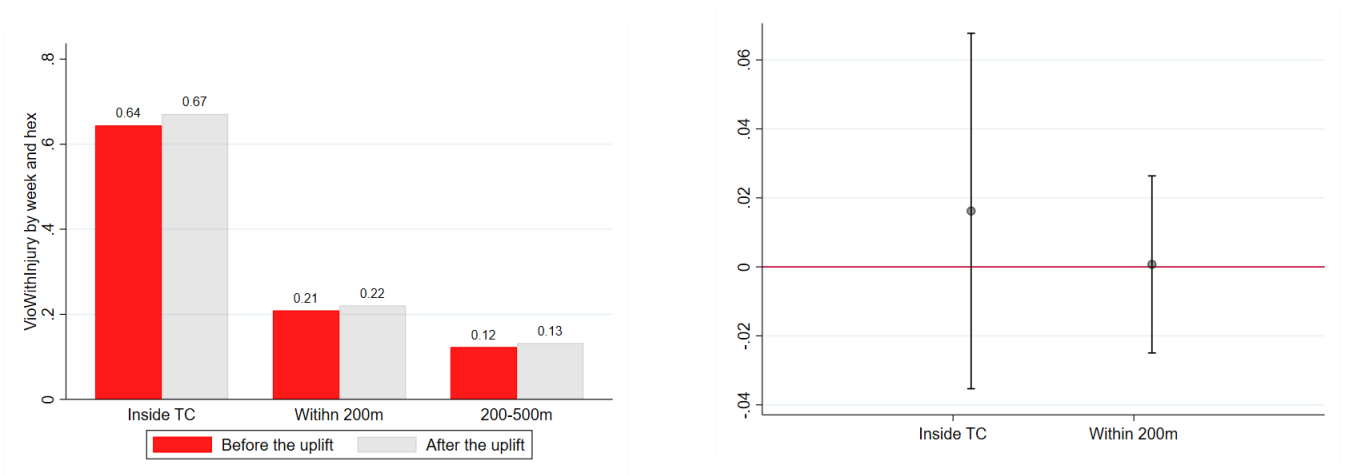


Figure 20 - Pre vs post Hate crimes (left), and estimated change post-uplift (right)

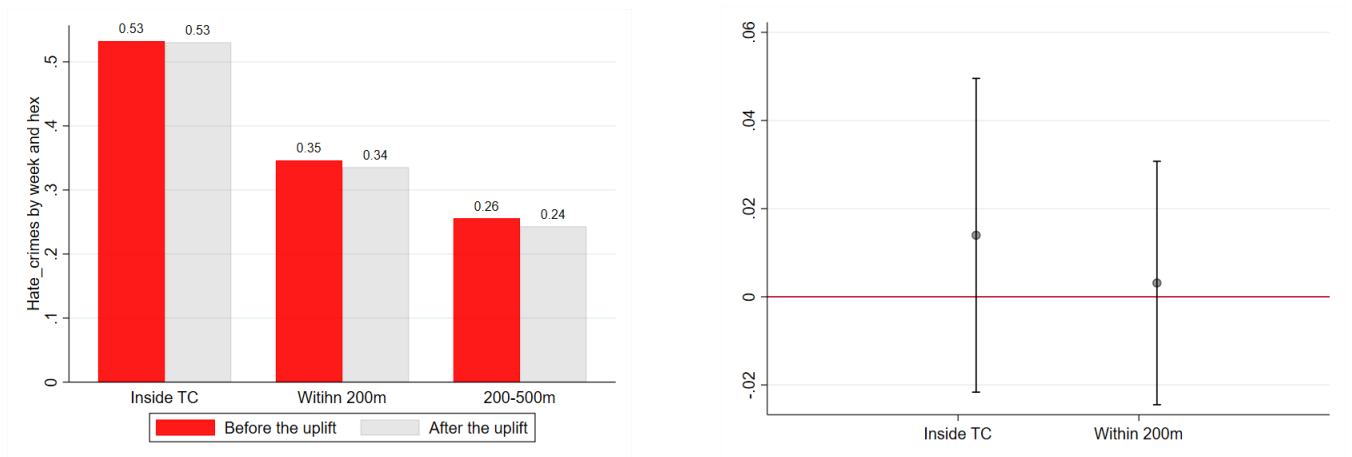


Figure 21 –Pre vs post Sexual offences (left), and estimated change post-uplift (right)

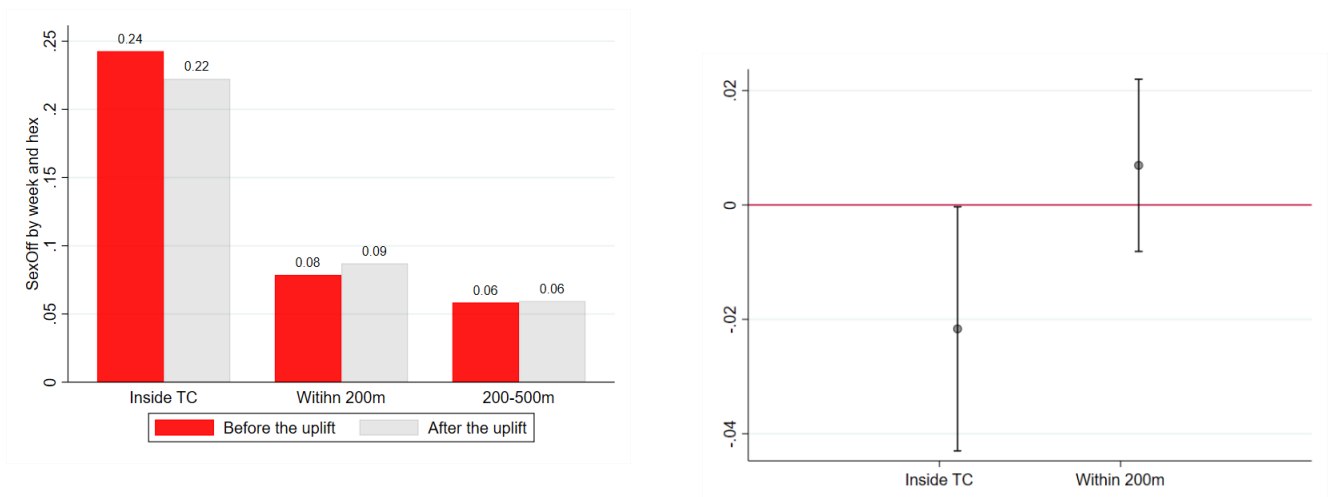


Figure 22 - Pre vs post Public order offences (left), and estimated change post-uplift (right)

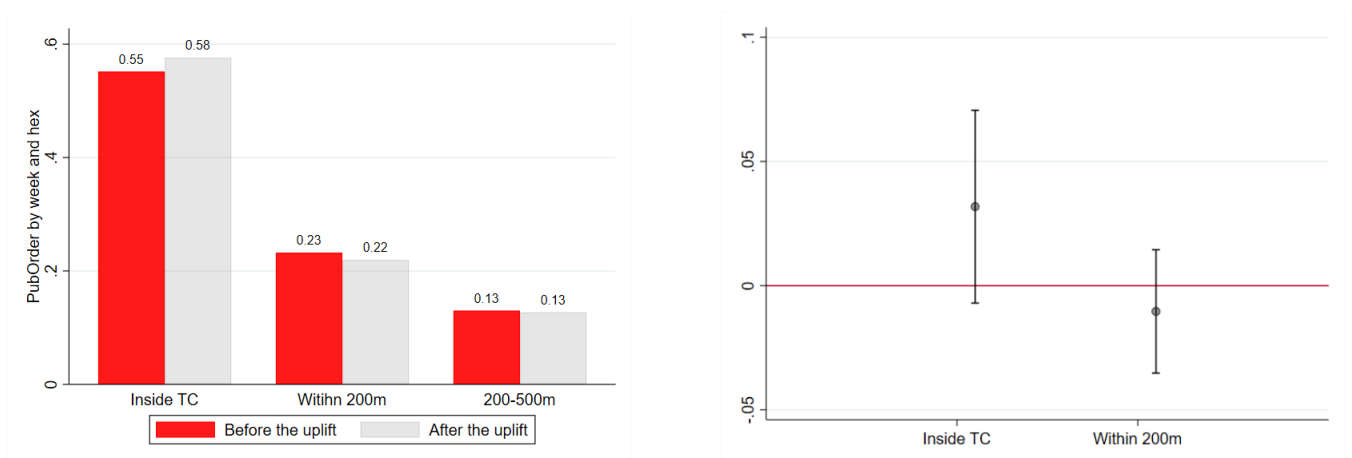


Figure 23 –Pre vs post Shoplifting offences (left), and estimated change post-uplift (right)

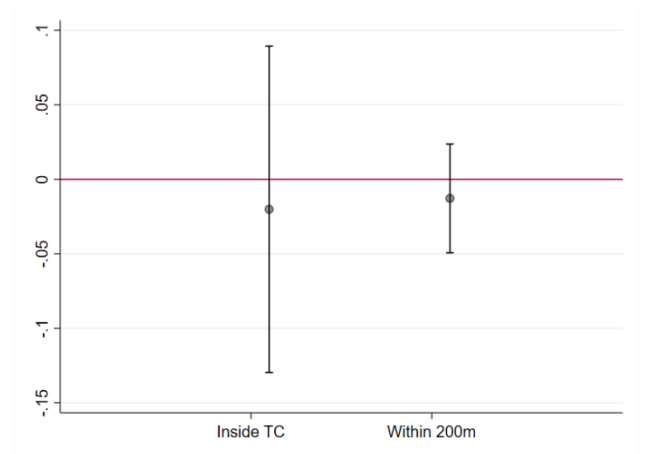
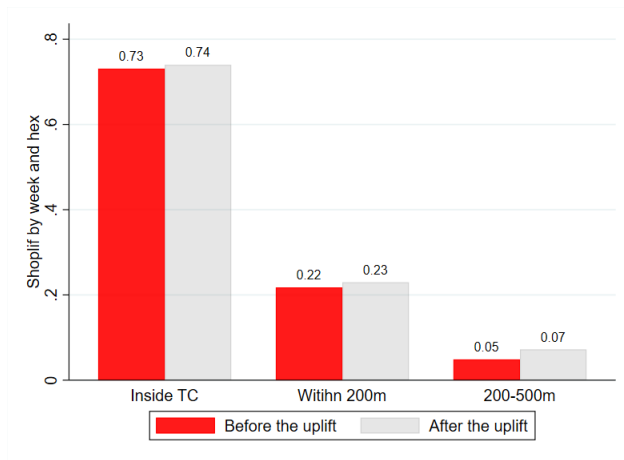


Figure 24 – Pre vs post Knife crime (left), and estimated change post-uplift (right)

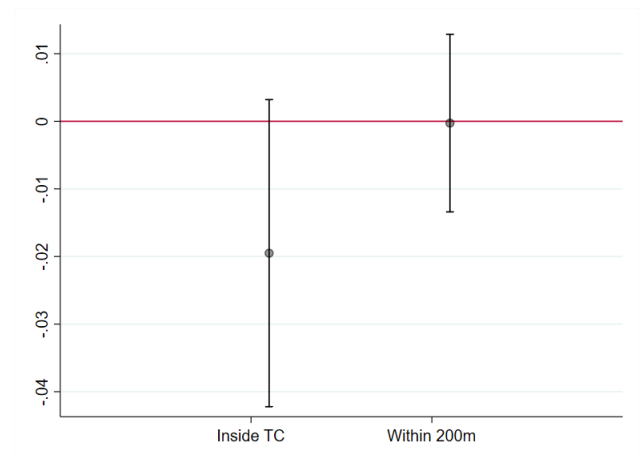
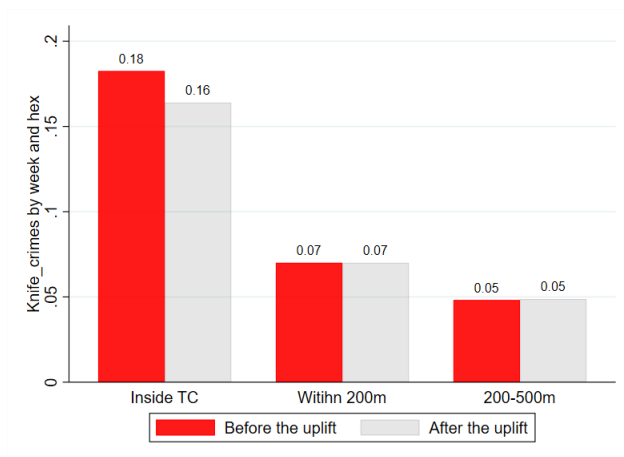
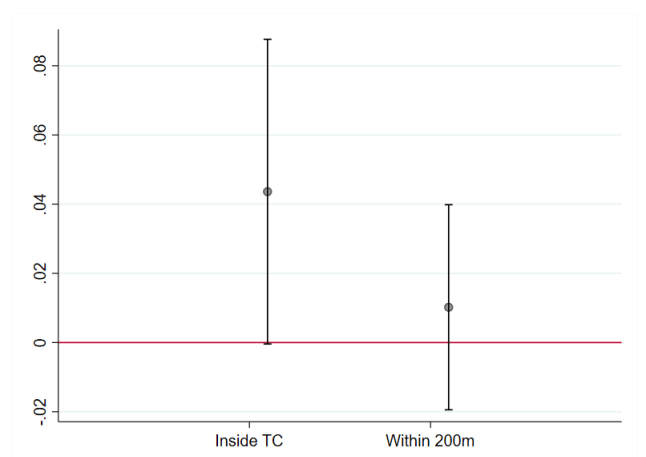
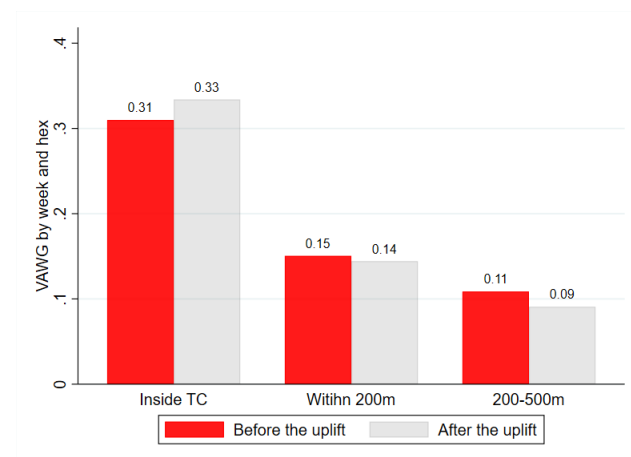


Figure 25 – Pre vs post VAWG offences (left), and estimated change post-uplift (right)



3.4 Comparison between analyses 1 and 2

Table 3 shows the estimated magnitudes in each analysis and colour codes in green those for which we have statistical significance at the 90% confidence level. Those in red are the results in which we didn't find a significant change in crime trends in the town centre areas with respect to the non-identical comparison groups.

We calculate using our coefficients what the numbers mean in terms of number of offences per week. This reveals some differences between what are changes of technical statistical significance against what is significant operationally given the uplift in the officers required to deliver Town Centre Teams.

Table 3 – Comparison of analysis 1 and 2, by weekly crime outcome, in all nineteen Town Centre Teams combined

Category	Analysis 1 SIU-defined Town Centres receiving the uplift vs no uplift Town Centres	Analysis 2 Implemented Town Centres vs areas slightly further away (200 to 500m)
Drug offences	43 more offences per week	40 more offences per week
Arrests	10 more arrests per week	10 more arrests per week
TNO	Not significant	170 more TNO per week
Violence with Injury	Not significant	Not significant
Hate crimes	Not significant	Not significant
Sexual offences	6 fewer offences	3 fewer offences
Public order	Not significant	Not significant
Shoplifting	11 more offences	Not significant
Knife crime	Not significant	Not significant
VAWG	Not significant	Not significant

4. Conclusions

The SIU has carried out an evaluation of the impact of the Town Centre Team officer uplift on various crime outcomes: crime counts for various crime categories, and arrests. In order to evaluate the effect of the uplift, we designed two analyses.

The first analysis uses SIU-defined town centres and compares small spatial units (grids) in the 19 town centres which were selected to receive the uplift to grids in the 49 town centres which were not selected. The results show that there was an increase in drug offences recorded inside the uplift-areas, of about 43 more offences per week combined across all areas receiving an uplift.

This analysis also reveals some differences between the December and the February uplift areas. The December areas had a small decrease in sexual offences (6 fewer sex offences combined each week). The February uplift areas had an increase in recorded shoplifting (11 more offences combined each week), and an increase in arrests (of 10 more arrests per week across all 19 teams).

We do a second analysis comparing areas inside the uplift boundaries to areas slightly further away from the boundary (within 200 and 500 metres). This analysis also estimates that the uplift areas saw an increase in recorded drug offences. The estimated magnitude is very similar: 40 more offences recorded per week. We also estimate an increase in arrests of 10 per week.

The second analysis also estimates an increase in Total Notifiable Offences inside the town centre areas (of 170 more offences), and a decrease in sexual offences of 3 per week.

We are most confident in the results that are robust to changing the comparison group: that is the effect on drug offences, arrests, and sexual offences. We find no statistically significant change in Knife crime, Hate crime, Violence with Injury, or VAWG.

Overall, these results show very little potential impact from the Town Centre Team deployments. Most crime types are entirely unchanged in the areas which received them. The most consistent impact is increased drug offending, which we suspect is driven by a heightened amount of stop and search within the uplifted locations. Other than that, however, any offending changes seem to be both inconsistent and small in magnitude.

The statistical analysis undertaken suggests some impact of TCT uplift, however, the method of evaluation has limitations in establishing causality. For instance, we cannot control for other changing circumstances that coincide with the timing of the uplift which may have impacted crime outcomes, nor account for potential spill-overs of crime from uplift areas to other parts of the city.

The TCTs are costly, with several hundred officers assigned to them. It is unclear that the small reductions in offending seen here are sufficient to justify a deployment of this size, albeit we are unable to measure other outcomes such as increases in trust and confidence nor measure the extent and impact of officer abstraction to non-TCT deployments.

Appendix A

A.1 Identifying Town Centres

By mid-2021, several years of increased recruiting and training of new officers began to affect the total number of police officers available to work in London. The leadership of the MPS decided that the ideal locations in which to deploy these additional resources would be in the various town centre areas that are spread across different parts of the city. The desire was to deploy an additional 400-500 officers, with at least one new town centre team in each of London's 12 Basic Command Units (BCUs).

The SIU identified Town Centre areas in London using a data-driven approach that leveraged precise spatial socioeconomic indicators. The model incorporated variables on policing demand (number of crimes per month), crime harm (using the Cambridge Crime Harm Index), distance from Central London, and day-time population density (as measured by the density of cash machines – a proxy for footfall).

This analysis led to the identification of 68 Town Centres. The Town centres identified by the SIU had an average size of 1.96 hexagon-grids, and were areas characterised by high-crime, relative proximity to central London, a high daytime population, and what was suspected to be a sizable cash economy.

Of those candidates, 19 Town Centres were selected to receive the uplift, which was planned to be of 25 additional officers per Town Centre (1 Inspector, 3 PS, and 21 PCs). This selection followed a multi-step process which deployed this uplift in two distinct phases. First, the top scorer for each BCU was chosen, which led to 12 Town Centres receiving the uplift on the 13th of December 2021. The remaining 7 Town Centre areas were the next highest-crime Town Centres identified and received the uplift on the 14th of February 2022.

High-crime areas were prioritised to receive the uplift, and hence the decision on which areas to select was not random. In addition, the locations chosen for the uplift tended to be larger in geographic size (3.37 hex grids) than those which were not (1.41 hexes). For that reason, we couldn't evaluate these two groups using a randomised control trial, but instead looked for suitable comparison groups and used a differences-in-differences approach. This strategy evaluates whether crime trends evolved differently in the uplift areas after the uplift than crime trends in the (non-identical) comparison group. We allow for differences in crime levels to exist, and measure whether that difference in levels remained constant after the uplift, increased, or decreased.

A.2 Research design: differences-in-differences

We do two separate analyses, each using a differences-in-differences research design.

Analysis 1 uses the full list of Town Centres (TCs) identified by the SIU (68 TCs), and compares the December (12 TCs) and February (7 TCs) uplift areas to the remaining Town

Centres which were not selected (49 TCs). The advantage of this approach is that it allows the analysis to have a pre-defined comparison group: the no-uplift Town Centres.

A limitation of this analysis is that the geography of the Town Centres, as implemented on the ground, was not identical to the shapes proposed by the SIU. The implementation areas were on average larger, which means they covered the SIU-proposed area, and extended to nearby streets to adapt to the geography and operational needs of each area. Therefore our first analysis fails to take into account the full spatial characteristics of the real implementation. In addition, we know that there are real and important differences between those locations which received an uplift and those locations which did not. No statistical approach, including the difference in differences method used here, will be able to fully control for all of the many differences between these two groups.

For these reasons, we do a second analysis using the geographies in which the Town Centre teams were implemented in reality. In this instance, we need to define a suitable comparison group. We select areas which were slightly outside the Town Centre team boundaries (between 200 and 500 metres). As before, we are allowing for these areas to have lower crime levels; our interest is whether such difference (between the town centre areas and their nearby comparators) changed or remained constant when compared to the uplift areas.

A.3 Analysis 1

Our first analysis uses the areas identified by the SIU as Town centres in August 2021. Our sample is composed by the 133 unique hexagons identified as Town Centres; of which 42 (in 12 TCs; one in each BCU) received the uplift in December 2021, 22 (in 7 TCs) received the uplift in February 2022, and 69 hexagons didn't receive the uplift.

Our approach deems the December and the February uplift areas as “treated” and the no-uplift areas as “comparison”. We use a difference-in-differences approach to understand whether crime evolved differently in the uplift areas when compares to the no-uplift areas.

Formally we estimate the equation below, where i denotes a hexagon shaped grid and t denotes a week between July 2021 and August 2022. C indicates the count of a crime outcome in each grid and week (Arrests, Total Number of Offences, Violence with Injury, Hate crimes, Violence against Women and Girls, Knife and Firearm offences, Sex offences, Drug offences, Public order offences, or Shoplifting), Dec is equal to 1 if an hexagon-grid would receive the December uplift, and Feb is equal to 1 if an hexagon-grid would receive the February uplift. Note that these variables are time-invariant, and they allow to control for the average level of crimes in a particular area (and hence to allow that they may be different already before the uplift). $Post$ is equal to 1 if a week is after the uplift took place. This is coded to be 1 after the 13th of December 2021 in the *December uplift* and in the *No-uplift* areas. For the February areas, it is coded as 1 after the 14th of February 2022.

$$C_{it} = \alpha + \eta Dec_i * Post_{it} + \sigma Feb_i * P_{it} + \beta Dec_i + \gamma Feb_i + \delta Post_{it} + \mu_t + \mu_{j(i)} + \epsilon_{it}$$

We include week-level fixed effects μ_t and borough fixed effects $\mu_{j(i)}$. The idiosyncratic error term is denoted ϵ_{it} . Our coefficients of interest are η and σ , which measure the differential evolution of crime outcomes after the uplift in the December and February areas, respectively, when compared to the areas that never received the uplift.

The results of our regression are in Table A1. We omit the constant, the borough, and the estimated week fixed effects from the output for ease of interpretation. Results can be provided upon request. We highlight, in green, the difference-in-differences coefficients which are significant at the 90% confidence level.¹⁰ The standard errors are shown in parenthesis and calculated at the cluster level, where a cluster is a hexagon-grid.

The number of observations is substantially smaller in the VAWG category because the data is only available since November 2021. For all the other crime categories we include data since July 2021.

Table A1 – Difference-in-differences estimated coefficients – Analysis 1

	Arrests	Total Notifiable Offences	Violence with Injury	Hate crimes	Sex. Offences	Drugs	Public order	Shoplifting	Knife crimes	VAWG
Dec * Post ($\hat{\eta}$)	0.049 (0.101)	0.670 (0.657)	-0.080 (0.077)	-0.007 (0.047)	-0.061* (0.037)	0.298* (0.127)	0.006 (0.062)	-0.034 (0.180)	-0.016 (0.040)	0.053 (0.065)
Feb * Post ($\hat{\sigma}$)	0.194* (0.101)	0.900 (0.938)	0.050 (0.079)	-0.055 (0.078)	-0.052 (0.053)	0.339* (0.156)	0.000 (0.087)	0.220* (0.128)	-0.042 (0.039)	-0.036 (0.098)
Dec ($\hat{\beta}$)	1.326* (0.375)	12.939* (3.891)	0.689* (0.280)	0.170 (0.119)	0.339* (0.147)	0.733* (0.254)	0.396* (0.152)	1.233* (0.425)	0.100* (0.058)	0.252 (0.175)
Feb ($\hat{\gamma}$)	0.607* (0.269)	9.270* (3.906)	-0.170 (0.307)	0.016 (0.116)	0.195 (0.140)	0.521* (0.291)	0.146 (0.165)	0.894* (0.396)	0.098* (0.052)	0.167 (0.163)
Post ($\hat{\delta}$)	-0.009 (0.125)	-0.805 (0.532)	-0.010 (0.082)	0.041 (0.070)	0.080 (0.061)	-0.145 (0.139)	0.024 (0.078)	-0.236 (0.218)	-0.010 (0.043)	-0.032 (0.079)
Borough FE ($\mu_{i(j)}$)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Week FE (μ_t)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,182	7,182	7,182	7,182	7,182	7,182	7,182	7,182	7,182	3,325
R-squared	0.219	0.381	0.126	0.059	0.098	0.160	0.080	0.207	0.044	0.108

Note: The table shows the results of the estimated coefficients, and associated standard error of the estimand in parenthesis. The asterisks indicate the coefficients are significant at the 90% confidence level.

This analysis cannot demonstrate causality, but a statistically significant coefficient would be required in order for any causal impact to exist between the town centre deployments and subsequent crime rates. To be useful in this regard, there are key assumptions that need to be satisfied. The first is that there was **no anticipation** of the treatment (the uplift). This would be violated if, for instance, the Town centres began increasing the number of officers before the uplift was deemed to take place. While we cannot formally test whether this assumption holds we don't have reason to believe there would have been an anticipation in the implementation.

¹⁰ Normal statistical convention is to use a more stringent level of testing, which would require these differences to be 95% likely to be caused by something other than random chance. Very few of the differences found here, however, reach that level of statistical significance. We therefore chose to use a more relaxed definition.

The second key assumption is formally called “parallel trends” and it requires that the town centres that received the uplift and the ones that didn’t were following **similar crime trend** before the uplift. Notice that this does not mean that they necessarily had similar crime levels. Areas can have different levels in the treatment and comparison groups, as long as the trend is similar before the uplift took place.

The third assumption requires that there are **no spill-overs** (which would be violated if crime strategically moved from the areas receiving the uplift to the Town Centres not receiving the uplift). In this kind of analysis, there is no way to know whether this kind of displacement took place, but it is worth noting that academic studies of hot spot policing rarely find any evidence crime shifting into nearby locations. In fact, the more typical pattern, known as “diffusion of benefits”, is for crime rates to reduce in nearby (but untreated) locations.

A.4 Analysis 2

The implementation of the Town centres didn’t take place in boundaries exactly as the SIU had defined. This means that for real implementation, we didn’t have an in-house, ready comparison group. While we know where the town centre teams operated, because they can map the areas where they actually worked, we can never know which portions of the comparison hexagons would have been targeted if town centre teams had been deployed there.

For this reason, we decided to run a spatial difference-in-differences analysis, which compares areas inside the uplift boundaries, to areas slightly further away. As before, we compare whether the number of crimes evolved differently after the uplift, whilst allowing for areas to have different levels of crime. The question is not whether the levels changed, but instead whether the gap between uplift areas and no uplift areas changed after the uplift.

This differences-in-differences approach requires, as before, that there is no anticipation of the treatment (that the areas don’t start increasing the number of officers in uplift areas before the uplift date), and that the two areas follow parallel trends before the uplift (that the difference in levels is on average constant).

Formally the regression we run is below, where i denotes a hexagon shaped grid and t denotes a week between July 2021 and August 2022.¹¹ C is a crime outcome (Arrests, Total Number of Offences, Violence with Injury, Hate crimes, Violence against Women and Girls, Knife and Firearm offences, Sex offences, Drug offences, Public order offences, or Shoplifting), In is equal to 1 if an hexagon-grid received the uplift, and $Near$ is equal to 1 if an area is near the boundary (within 200m). These variables are time-invariant. $Post$ is equal to 1 if a week is after the uplift took place. As before, this is coded to be 1 after the 13th of December 2021 in the *December uplift* and in the *No-uplift* areas. For the February areas it is 1 after the 14th of February 2022.

¹¹ The VAWG data are only available since November 2021, hence in that regression the sample is observations between November 2021 and August 2022.

$$C_{it} = \psi + \Phi In_i * Post_{it} + \Psi Near_i * Post_{it} + \phi In_i + \tau Near_i + \xi P_{it} + \mu_t + \mu_{j(i)} + u_{it}$$

We include week fixed effects μ_t and borough fixed effects $\mu_{j(i)}$. The idiosyncratic error term is denoted u_{it} . Our coefficient of interest is Φ , which measures the differential evolution of crime outcomes after the uplift, respectively, when compares to areas between 200 and 500 metres further away. The coefficient Ψ measures whether the buffer areas (within 200 metres of the boundary) evolved differently from the 200-500 group.

The results of our regression are in Table A2. We omit the constant, borough, and week fixed effects from the output for ease of interpretation. Results can be provided upon request. Our standard errors are calculated at the cluster level, where a cluster is a particular hexagon. As before, we highlight in green the coefficients which are significantly different from zero.

Table A2 – Difference-in-differences estimated coefficients – Analysis 2.

	Arrests	Total Notifiable Offences	Violence with Injury	Hate crimes	Sex. Offences	Drugs	Public order	Shoplifting	Knife crimes	VAWG
In * Post ($\hat{\Phi}$)	0.074* (0.041)	1.196* (0.448)	0.016 (0.031)	0.014 (0.022)	-0.022* (0.013)	0.266* (0.058)	0.032 (0.024)	-0.020 (0.066)	-0.020 (0.014)	0.044 (0.027)
Near * Post ($\hat{\Psi}$)	-0.008 (0.021)	0.123 (0.115)	0.001 (0.016)	0.003 (0.017)	0.007 (0.009)	0.051* (0.015)	-0.010 (0.015)	-0.013 (0.022)	-0.000 (0.008)	0.010 (0.018)
In ($\hat{\phi}$)	0.660* (0.096)	7.514* (0.864)	0.532* (0.068)	0.272* (0.036)	0.183* (0.034)	0.457* (0.059)	0.435* (0.047)	0.722* (0.115)	0.138* (0.018)	0.199* (0.035)
Near ($\hat{\tau}$)	0.132* (0.038)	1.097* (0.312)	0.069* (0.021)	0.087* (0.021)	0.014 (0.009)	0.062* (0.021)	0.092* (0.022)	0.151* (0.053)	0.019* (0.007)	0.034* (0.016)
Post ($\hat{\xi}$)	0.017 (0.033)	-0.466 (0.296)	0.001 (0.022)	-0.031 (0.021)	0.008 (0.011)	-0.010 (0.031)	-0.010 (0.018)	0.042 (0.038)	-0.006 (0.010)	-0.034* (0.015)
Borough FE ($\mu_{i(j)}$)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Week FE (μ_t)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34,884	34,884	34,884	34,884	34,884	34,884	34,884	34,884	34,884	16,150
R-squared	0.106	0.314	0.119	0.049	0.054	0.112	0.097	0.121	0.042	0.069

Note: The table shows the results of the estimated coefficients, and associated standard error of the estimand in parenthesis. The asterisks indicate the coefficients are significant at the 90% confidence level.