UK Health Security Agency

Lambeth self-isolation pilot: impact evaluation

Contents

Background 3
Research questions 3
Method 4
Analytical approach 4
Data 5
Results 6
Summary of results 6
Sharing contacts 9
Compliance with isolation 10
Testing rates 10
TTSP application rates 11
Conclusion 12
Limitations 12
References 13
Appendix tables and figures 14
Synthetic control method 16
About the UK Health Security Agency 30

Background

The ‘What Works’ programme was implemented to address the challenges associated with self-isolation and engagement in the Test and Trace (T&T) system in response to the COVID-19 pandemic, with a specific focus on areas with enduring transmission and variants of concern.

The pilot in the London borough of Lambeth was aimed at reducing the financial barriers associated with self-isolation. Lambeth Council expanded the criteria for residents to be eligible for financial support under the Test and Trace Support Payment (TTSP) scheme, so that residents earning up to £30,000 per year were eligible to apply for financial support during self-isolation. Lambeth Council also reduced the number of steps and evidence required to be eligible for the scheme, to provide a maximum of £738, and not less than £500, for residents isolating at home for ten days. The pilot was implemented from 26 April 2021, and as the ‘pilot’ intervention was basically a relaxation of the eligibility criteria, it has been continued beyond the anticipated end date in May, as permitted under the terms of the discretionary scheme.

In addition to this, but external to the pilot (as this was implemented over a longer term and has also not ended), Lambeth Council implemented a financial incentive scheme from 29 April 2021 that allowed residents to claim the ‘Lambeth Stay Home Support Payment’ if they had a second isolation period that overlapped with their first one.

In addition, Lambeth Council implemented measures to offer practical support during self-isolation, partnering with Age UK Lambeth to offer practical and emotional support to self-isolating individuals of any age group. Lambeth Council also revised the criteria for access to temporary accommodation during self-isolation so that anyone sharing facilities with another adult would be eligible if they tested positive for COVID-19 in the preceding 48 hours. Individuals who tested negative for COVID-19 would also be eligible for the accommodation offer as a means of preventing transmission from others in their home who tested positive.

Research questions

The main aim of the evaluation was to assess the extent to which outcomes related to testing, tracing and compliance with self-isolation were affected by the pilot. It was hypothesized that the relaxed eligibility criteria would encourage better compliance with self-isolation among individuals who were previously unable (or ineligible) to be compensated for any income loss during self-isolation. The other measures introduced in terms of practical and financial support were also aimed at reducing barriers to self-isolate, especially among those in shared accommodation or otherwise less able to self-isolate effectively due to their living circumstances.

These measures may also have enabled individuals to more confidently name contacts as these contacts would be less at risk of losing income and may have access to more practical

support to self-isolate. This underlying logic also suggests that individuals may be more likely and willing to come forward for testing if they are more confident of being able to self-isolate without facing financial or practical barriers.

The main research questions the evaluation was aiming to answer were:

1. Test, trace, isolate behaviours

1. To what extent did the intervention lead to increased compliance with self-isolation?
2. To what extent did the intervention lead increased levels of testing?
3. To what extent did the intervention lead to higher levels of contact tracing?

2. Applications

1. To what extent did the intervention lead to increased uptake of the TTSP scheme?

Method

Analytical approach

The research questions were examined using the synthetic control method (SCM). Within an SCM approach, an area where an intervention is taking place is compared to a weighted combination of comparator areas, in this case local authorities, where the intervention is not implemented. Comparator local authorities were selected from a 'donor pool' of local authorities where the intervention (or other self-isolation pilot interventions in the 'What Works' programme) was not implemented for the period under analysis.

SCM is a powerful tool for evaluating public health interventions in the absence of an experimental design (1, 2, 3). SCM allows for an estimation of the impact of an intervention under weaker assumptions than other common approaches such as difference-in-differences (which relies on the strong assumption that pre-intervention trends would have continued in parallel after the introduction of the intervention in areas with and without the intervention).

Regions and local authorities that had implemented other self-isolation pilot interventions as part of the What Works programme were excluded from the donor pool to ensure that there were no external shocks unrelated to the pilot intervention in potential control areas. As long as the potential control areas within the donor pool are sufficiently similar to Lambeth in terms of the trends in the outcomes of interest and their determinants, a weighted combination of these control areas should be a credible counterfactual for the outcomes in Wandsworth in the absence of the intervention. As analysis is conducted at the local authority level, such that there is only one treated unit, traditional statistical inference is not applicable with the synthetic control method due to the small number of treated and control units. Permutation-based statistical

inference that relies on falsification of effect sizes was used following standards used by other studies that have implemented synthetic control analysis (4 to 9).

The analysis investigates differences in the outcomes of interest between Lambeth and the synthetic control area (defined as a weighted average of comparator areas selected to reduce the gap in the outcomes of interest in the weeks preceding the pilot intervention). Though the measures introduced as part of the pilot continued to be implemented beyond the stipulated end date, the pilot was initially intended to last about a month. A period of 6 weeks after implementation week was used to consider whether the pilot had any immediate or short-run impacts, assuming any impacts would be observed over this period. There is no established metric on the number of pre-intervention periods that need to be used to fit the synthetic control.

The methodological literature on SCM advocates a choice of pre-intervention periods that balances concerns about overfitting (as a small number of pre-intervention periods may result in the synthetic control being fitted by chance) and structural breaks (longer pre-intervention periods may result in lower accuracy of the fit) (3, 7). Therefore, a symmetric number of 6 weeks preceding the pilot start date were used for fitting the synthetic control, which also helped maximise the number of local authorities available for analysis in the donor pool. Other predictors of post-intervention values of the outcomes (other than pre-intervention values of the outcomes) were included in the controls to reduce concerns about spuriously fitting the synthetic control with a small number of pre-intervention periods.

SCM was implemented using the microsynth package in R, which calculates permutation-based p-values for each of the weeks following pilot implementation (10, 11). The main table summarising results only shows the infimum of these p-values as a summary statistic of whether the average impact over the whole post-pilot period used in analysis was statistically significant. The detailed discussion of the effects on each outcome makes use of SCM's ability to investigate whether effects differed over time and therefore describes whether impacts in specific periods post-intervention were statistically significant, if different from the results on average.

Data

The data used in this evaluation consists of detailed information on individuals collected as they progress through the contact tracing and self-isolation journey. Data on the proportion of contacts shared and outcomes of check-in calls was taken from CTAS, the contact tracing database with individual records for each positive case and their contacts. Data on testing and test results is taken from the National Pathology Exchange (NPEX) system, which contains information on all PCR (swab) tests performed by Testing Pillar 2 and LFT (Lateral Flow Tests) reported to NPEX. Data on local authority characteristics that is used in the synthetic control analysis is taken from ONS, NOMIS and other government sources.

The data used in analysis is summarised in Appendix Table 1. The table summarises the main outcomes of interest and the main predictors in Lambeth and all other local authorities included in the analysis sample for the 6 weeks preceding the pilot intervention (or the most recent period available for characteristics at the local authority level). The analysis sample consists of Lambeth and other local authorities where other pilot interventions in the 'What Works' programme were not implemented in the period considered.

Appendix Table 1 shows that levels of engagement with Test and Trace in terms of contact sharing tended to be statistically significantly lower in Lambeth than in other local authorities, while self-isolation compliance as measured by the proportion of isolating individuals with 100% successful check-in calls tended to be higher (though not statistically significant). The testing rate in Lambeth was significantly higher than in other local authorities even before the pilot intervention. However, this is likely due to the surge testing initiatives that took place in Lambeth in the weeks immediately preceding the pilot intervention. Rates of applications to the TTSP scheme among self-isolating individuals in Lambeth were similar to those in other local authorities in England in the pre-pilot period.

In terms of demographic composition, residents of Lambeth were significantly more likely to be younger on average, less likely to be Asian, white British, or other white ethnicities and more likely to be black or mixed ethnicities. Mortality rates in Lambeth were not significantly different from the average for other local authorities in the donor pool in 2019 and 2020. Though case rates in Lambeth were not statistically significantly different from other local authorities in the donor pool in the weeks preceding the pilot implementation, a higher proportion of deaths in 2020 were attributable to COVID-19 in Lambeth than in other local authorities.

Results

This section sets out the findings of the evaluation. It first presents a summary for all outcomes of interest, before going on to provide more detailed analysis for individual outcomes (which includes more detailed analysis of subperiods of the time when the intervention was implemented).

Summary of results

Table 1 below summarizes the results for the main outcomes of interest, all estimated using the synthetic control method. Results indicate that the post-pilot trends in the outcomes of interest are not statistically significantly different from the post-pilot periods in the synthetic weighted average of the non-intervention areas.

Table 1. Synthetic control method estimates of impact on outcomes of interest

	Total	Lambeth	Other local authorities	p value
Weekly proportion sharing at least one contact	0.804 (0.118)	0.649 (0.099)	0.805 (0.118)	0.001
Proportion with 100% successful check-in calls	0.840 (0.066)	0.875 (0.023)	0.839 (0.066)	0.184
Weekly proportion of self-isolating individuals who made TTSP applications	0.027 (0.021)	0.029 (0.007)	0.027 (0.021)	0.822
Weekly testing rate (tests / population)	0.030 (0.009)	0.067 (0.051)	0.030 (0.008)	< 0.001
Weekly case rate per 100,000 population (gov.uk)	34.396 (22.264)	20.867 (7.419)	34.478 (22.300)	0.136

1b. Demographic and employment characteristics

	Total	Lambeth	Other local authorities	p value
Age in years (ONS 2017)	41.479 (4.040)	33.775 (0.000)	41.526 (4.007)	< 0.001
Proportion male (ONS 2017)	0.495 (0.007)	0.503 (0.000)	0.495 (0.007)	0.01

1c. Ethnicity (ONS 2019)

	Total	Lambeth	Other local authorities	p value
White British	0.787 (0.187)	0.388 (0.000)	0.790 (0.185)	< 0.001
White other	0.052 (0.046)	0.143 (0.000)	0.052 (0.046)	< 0.001
Mixed	0.029 (0.020)	0.091 (0.000)	0.029 (0.019)	< 0.001
Asian	0.082 (0.091)	0.070 (0.000)	0.082 (0.092)	0.743
Black	0.038 (0.056)	0.282 (0.000)	0.036 (0.053)	< 0.001

	Total	Lambeth	Other local authorities	p value
Other ethnicities	0.011 (0.016)	0.025 (0.000)	0.011 (0.016)	0.024
Index of Multiple Deprivation rank (2019)	17,365.199 (5321.580)	11,294.590 (0.000)	17,401.991 (5316.587)	0.005
Proportion of population in IMD deciles 1 to 3	0.267 (0.207)	0.424 (0.000)	0.266 (0.207)	0.062
Hourly pay (ASHE, 2020)	15.725 (2.501)	19.580 (0.000)	15.702 (2.490)	< 0.001
Employment rate (ONS, 2020)	0.762 (0.043)	0.774 (0.000)	0.762 (0.043)	0.499
Age standardised mortality rates, 2019 (ONS, 2020)	911.338 (125.575)	863.820 (0.000)	911.638 (125.915)	0.353
Age standardised mortality rates, 2020 (ONS, 2020)	1,041.041 (160.042)	1,087.430 (0.000)	1,040.747 (160.505)	0.477
% of deaths due to COVID-19 (ONS, 2020)	12.276 (3.758)	16.200 (0.000)	12.251 (3.757)	0.010
Number of observations	996	6	990	

Key

*** significant at 0.01
** significant at 0.05
* significant at 0.1

Estimates are generated using the microsynth package. The number of local authorities in the donor pool is 165. The matching was done using the lagged values of the dependent variable for the pre-pilot period and covariates such as demographic and employment characteristics of the local authorities, as well as case rates in the pre-pilot period. Full details of the analysis for each outcome are included in the Appendix.

The Bonferroni corrected p-values reported here are the infimum of the set of p-values for the estimated gaps between Lambeth and the synthetic control areas in each of the post-pilot periods. The permutation-based p-values are obtained using the microsynth package in R, though the p-values for testing rates are calculated having removed the spike in testing rates due to surge testing between weeks -2 and 0 relative to pilot start date.

Alternative p-values calculated by running placebo tests individually and comparing the mean squared error in the post-intervention period between treatment and the local authorities in the donor pool gave a p-value of 0.02 for the whole period, which implies a statistically significant average impact on weekly testing rates over the whole period. Unadjusted p-values pre-Bonferroni correction for each post-pilot period are reported in the detailed tables for each outcome in the Appendix.

As synthetic control estimation is primarily graphical in nature, Table 1 presents numerical estimates of average impact on the outcomes of interest for the 7 weeks following pilot implementation. These estimates are calculated as the difference between the average gap in the outcomes between Lambeth and the synthetic control over the weeks post-pilot and the average gap in the outcomes in the 6 weeks before the pilot started. These estimates therefore adjust the post-pilot gap in outcomes by the degree to which the synthetic control is a poor fit for Lambeth in the pre-pilot period, and therefore is a more conservative estimate than using just the average impact estimate from the post-pilot period.

Table 1 also reports estimated p-values for confidence in the estimates, following the placebo-based approach most commonly used in the literature (3, 4, 5, 7, 8, 9, 10). Bonferroni adjusted p-values are presented for more conservative statistical inference since there are multiple outcomes of interest, and the chances of a Type I error (the probability of failing to reject a statistically insignificant result) increase with multiple comparisons.

Sharing contacts

Descriptive figures show that the proportion of cases sharing at least one contact in Lambeth and other local authorities in the donor pool tended to be lower in Lambeth in the weeks before the pilot (Appendix Table 1 and Appendix Figure 1).

Though this proportion rose for Lambeth a few weeks after the pilot was implemented, it remained relatively flat for other local authorities throughout. The synthetic control estimates also mirror this, showing that the trends for Lambeth and the synthetic Lambeth followed each other (at least on average) in the weeks preceding the pilot and even into the first weeks after the pilot was implemented[1] (Appendix Figure 2). In the later weeks of the pilot the proportion of cases sharing contacts in Lambeth rose above that of the synthetic control, though this increase seemed to peter off towards the end of the analysis period. The synthetic control estimates therefore show no statistically significant impact of the pilot on the likelihood of sharing contacts – the estimated average impact of a 2.5 percentage point increase in the likelihood of sharing contacts seen in Table 1 is not statistically significant (Appendix Table 2).

[1] Details on the variables used in the synthetic control estimation, and the local authorities and weights used to construct the 'synthetic Lambeth' trend are also included in the Appendix.

Compliance with isolation

The weekly proportion of individuals with 100% successful isolation check-in calls in Lambeth was similar to that in other local authorities both before and after the pilot was implemented (Appendix Figure 3). Results from the synthetic control analysis of this outcome in Table 1 indicate a statistically insignificant reduction in this proportion by about 4 percentage points on average in the weeks following pilot implementation. When looking at trends over time, there is no substantial systematic impact on self-isolation compliance because of this pilot as the trends for Lambeth and the synthetic control area are close together (Appendix Figure 4).

It is important to note that there are data quality issues with this measure as there is a dip in the graph for all local authorities in the weeks following pilot implementation. However, as it is believed that this is due to logistical and process issues (rather than a change in behaviour) and it happens across all local authorities, it may be less of a concern in terms of interpreting differences in changes between Lambeth and other local authorities.

Testing rates

Testing rates in Lambeth rose sharply in the weeks preceding the pilot implementation as surge testing was carried out in these weeks (Appendix Figure 5). However, even before and after this increase in testing rates, the levels of testing in Lambeth were higher than in other local authorities in the donor pool. Synthetic control estimates in Table 1 show a positive impact of a 0.9 percentage point increase in testing rates in the post-pilot period. While testing rates fell around the start of the pilot to levels similar to that of the synthetic control area (coinciding with the end of the surge testing period), the testing rates in Lambeth started picking up again to be higher than the synthetic control in later weeks of the analysis period (Appendix Figure 6).

Though the infimum of the p-values over the whole period suggest that this increase in testing rates was not statistically significant in all periods, the individual p-values suggest statistically significant increases in testing rates in earlier post-pilot weeks especially, though these weeks had smaller gaps with the synthetic control area (Appendix Table 8). Note that for this analysis, the surge testing period was excluded when trying to fit a synthetic control area, as the observed spike in testing rates during this period is not indicative of general trends affecting Lambeth as it is the result of the surge testing measures being implemented.[2] The synthetic control analysis also shows that the increase in testing rates picks up towards the end of the analysis period rather than immediately after the pilot was implemented, which may point to other unobserved factors driving this increase rather than it being an impact of the pilot.

[2] Estimates without excluding the surge testing period show a negative impact as the pre-intervention fit is worse as the synthetic Lambeth in this case would go through the middle of the spike in order to best fit the observed trend in Lambeth.

TTSP application rates

Descriptive analysis shows that the weekly TTSP application rate among self-isolating individuals increased sharply for those individuals isolating in the weeks following pilot implementation in Lambeth, with this increase continuing to the end of the analysis period (Appendix Figure 7). This is especially marked given that application rates in other local authorities in the donor pool stayed flat in the post-pilot period. However, synthetic control estimates in Table 1 show that though there was an increase in the application rates to the scheme among self-isolating individuals in Lambeth in the weeks following the pilot, by about 1.11 percentage points on average, this increase was not statistically significant (Appendix Figure 8).

Conclusion

The findings listed above suggest that the Lambeth self-isolation pilot (and other measures implemented around the same time) only had a (weakly) significant impact on testing rates in the weeks post pilot implementation, with no substantial impact on other outcomes of interest such as the rate of TTSP applications among self-isolating individuals, compliance with self-isolation, and contact sharing. This suggests that while individuals may have become slightly more willing to test because of wider eligibility criteria and other measures put in place, their other COVID-19 related behaviours were not impacted. Individuals may previously have been reluctant to test due to the fear of having to self-isolate and not being eligible for support, but reductions in these barriers may have encouraged more people to come forward for testing.

Limitations

SCM makes use of statistical techniques to reduce the effects of bias in estimation and is a robust analytical technique to the extent that it does not rely on strong assumptions and also allows for time-varying unobserved confounders. However, it cannot completely rule out the possibility of confounders and biased results, and therefore any findings should still be interpreted with caution. As synthetic control analysis conducts comparisons between 'treated' and comparator areas over time, it does rely on the assumption that there is conditional independence in the evolution of outcome trends over time, given past outcomes that have been matched on. It is also important to note that this analysis assumes that there were no other 'shocks' or changes that came into place at the same time as the pilot intervention. In such a situation, the estimates produced by the synthetic control method would be biased depending on how these other changes affected the outcomes of interest.

SCM uses data at an aggregate level, so the analysis may be underpowered to detect small but real impacts that did arise from the program. A caveat of this analysis is that the pilot intervention of the expansion of eligibility criteria was implemented around the same time as other components, but they were also not part of the pilot intervention and also have not ended. Therefore, it is likely that any impacts observed are due to the other measures introduced and not solely the relaxation of eligibility criteria – it will not be possible to disentangle them in analysis. This analysis also stops 6 weeks after the pilot intervention came into place, and as such only provides a short-term measure of impact. Therefore, it may be that some of the impacts of relaxing the eligibility criteria (and the other measures that came into place alongside) may not yet have emerged. Further analysis would be needed to assess whether the pilot has had a delayed effect on key outcomes.

This analysis was conducted using data in the contact tracing system, with some measures such as the proportion of isolating individuals with successful check-in calls only acting as proxies for the true outcome of interest (compliance with self-isolation requirements). This measure was also subject to some data quality problems due to process issues in the period over which analysis was conducted.

References

1. Bouttell J, Popham F, Lewsey J, Robinson M, and Craig P. 'Use of synthetic control methodology for evaluating public health interventions: a literature review' The Lancet 2017: volume 390, supplement 3, page S26
2. Bouttell J, Craig P, Lewsey J, Robinson M, and Popham F. 'Synthetic control methodology as a tool for evaluating population-level health interventions' Journal of Epidemiology and Community Health 2018: volume 72, pages 673 to 678
3. Kreif N, Grieve R, Hangartner D, Turner AJ, Nikolova S, and Sutton M. 'Examination of the synthetic control method for evaluating health policies with multiple treated units' Health Economics 2016: volume 25, issue 12, pages 1,514 to 1,528
4. Abadie A, Diamond A, and Hainmueller J. 'Synthetic control methods for comparative case studies: estimating the effect of California's Tobacco Control Program' Journal of the American Statistical Association 2010: volume 105, issue 490, pages 493 to 505
5. Abadie A, Diamond A, and Hainmueller J. 'Comparative politics and the synthetic control method' American Journal of Political Science 2015: volume 59, issue 2, pages 495 to 510
6. Abadie A and Gardeazabal J. 'The economic costs of conflict: a case study of the Basque Country' American Economic Review 2003: volume 93, issue 1, pages 113 to 132
7. Abadie A. 'Using synthetic controls: feasibility, data requirements, and methodological aspects' Journal of Economic Literature 2021: volume 59, issue 2, pages 391 to 425
8. Born B, Müller GJ, Schularick M, and Sedláček P. 'The costs of economic nationalism: evidence from the Brexit experiment' The Economic Journal 2019: volume 129, issue 623, pages 2,722 to 2,744
9. Friedson AI, McNichols D, Sabia JJ, and Dave D. 'Did California's Shelter-in-Place order work? Early coronavirus-related public health effects' National Bureau of Economic Research Working Paper 2020: number w26992
10. Robbins MW, Saunders J, and Kilmer B. 'A framework for synthetic control methods with high-dimensional, micro-level data: evaluating a neighborhood-specific crime intervention' Journal of the American Statistical Association 2017: volume 112, issue 517, pages 109 to 126
11. Robbins MW and Davenport S. 'Microsynth: synthetic control methods for disaggregated and micro-level data in R' Journal of Statistical Software 2021: volume 97, issue 2, pages 1 to 31

Appendix tables and figures

Appendix Table 1. Descriptive statistics of outcomes of interest and covarying characteristics in pre-pilot period

	Total	Lambeth	Other local authorities	p value
Weekly proportion sharing at least one contact	0.804 (0.118)	0.649 (0.099)	0.805 (0.118)	0.001
Proportion with 100% successful check-in calls	0.840 (0.066)	0.875 (0.023)	0.839 (0.066)	0.184
Weekly proportion of self-isolating individuals who made TTSP applications	0.027 (0.021)	0.029 (0.007)	0.027 (0.021)	0.822
Weekly testing rate (tests / population)	0.030 (0.009)	0.067 (0.051)	0.030 (0.008)	< 0.001
Weekly case rate per 100,000 population (gov.uk)	34.396 (22.264)	20.867 (7.419)	34.478 (22.300)	0.136

Appendix Table 1b. Demographic and employment characteristics

	Total	Lambeth	Other local authorities	p value
Age in years (ONS 2017)	41.479 (4.040)	33.775 (0.000)	41.526 (4.007)	< 0.001
Proportion male (ONS 2017)	0.495 (0.007)	0.503 (0.000)	0.495 (0.007)	0.01

Appendix Table 1c. Ethnicity (ONS 2019)

	Total	Lambeth	Other local authorities	p value
White British	0.787 (0.187)	0.388 (0.000)	0.790 (0.185)	< 0.001
White other	0.052 (0.046)	0.143 (0.000)	0.052 (0.046)	< 0.001
Mixed	0.029 (0.020)	0.091 (0.000)	0.029 (0.019)	< 0.001
Asian	0.082 (0.091)	0.070 (0.000)	0.082 (0.092)	0.743
Black	0.038 (0.056)	0.282 (0.000)	0.036 (0.053)	< 0.001
Other ethnicities	0.011 (0.016)	0.025 (0.000)	0.011 (0.016)	0.024
Index of Multiple Deprivation rank (2019)	17365.199 (5321.580)	11294.590 (0.000)	17401.991 (5316.587)	0.005

	Total	Lambeth	Other local authorities	p value
Proportion of population in IMD deciles 1 to 3	0.267 (0.207)	0.424 (0.000)	0.266 (0.207)	0.062
Hourly pay (ASHE, 2020)	15.725 (2.501)	19.580 (0.000)	15.702 (2.490)	< 0.001
Employment rate (ONS, 2020)	0.762 (0.043)	0.774 (0.000)	0.762 (0.043)	0.499
Age standardised mortality rates, 2019 (ONS, 2020)	911.338 (125.575)	863.820 (0.000)	911.638 (125.915)	0.353
Age standardised mortality rates, 2020 (ONS, 2020)	1041.041 (160.042)	1087.430 (0.000)	1040.747 (160.505)	0.477
% of deaths due to COVID-19 (ONS, 2020)	12.276 (3.758)	16.200 (0.000)	12.251 (3.757)	0.010
Number of observations	996	6	990	

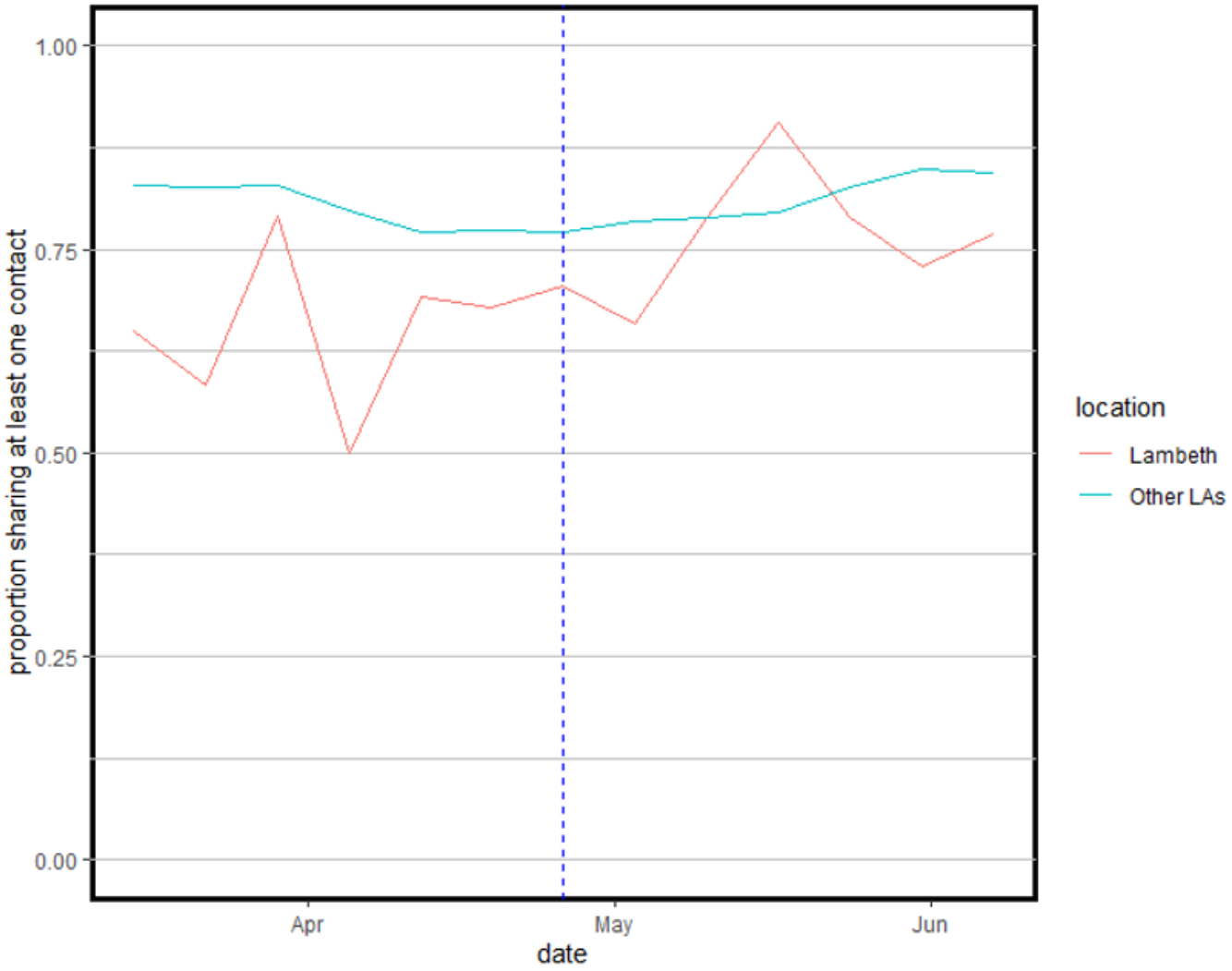
Notes

The table reports summary statistics for the variables of interest: means as well as standard deviations in parentheses. Each observation is the weekly aggregate statistic for the local authority in the week. Demographic and employment characteristics are taken as fixed from official characteristics and are matched at LSOA level where available before aggregating to the local authority level. The pre-pilot period consists of all weekly observations between 15 March 2021 and 26 April 2021.

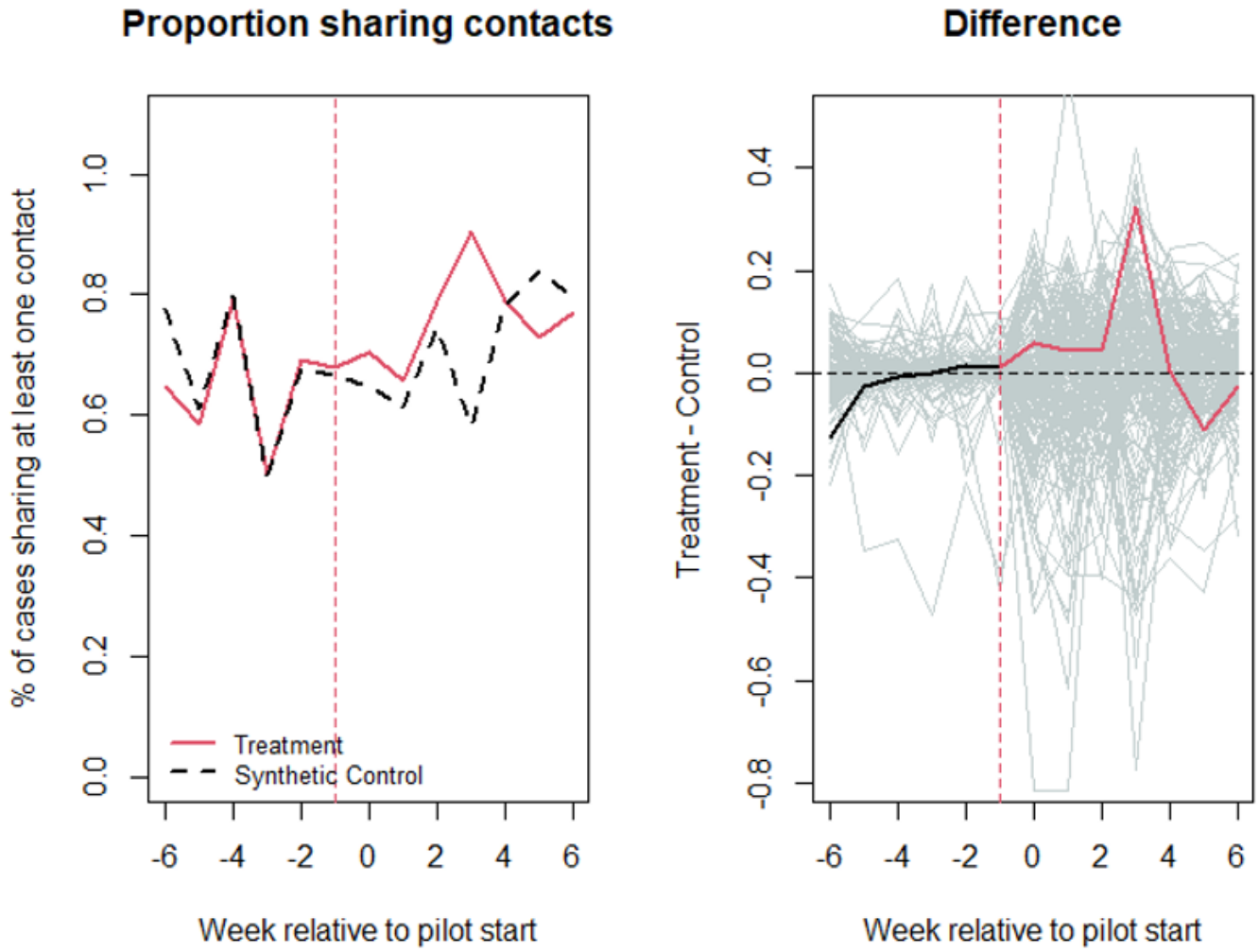
Synthetic control method

Proportion of cases sharing at least one contact

Appendix Figure 1. Weekly proportion of cases sharing contacts in Lambeth and other local authorities in donor pool



Appendix Figure 2. Synthetic control estimates of proportion of cases sharing at least one contact



Notes

Synthetic control estimation was done using the microsynth package in R. Estimation was done optimising fit of the synthetic control over the 6 pre-intervention periods.

Appendix Table 2. Synthetic control estimates of gaps between Lambeth and synthetic control in proportion sharing contacts

Week relative to pilot start date	Treatment - Control	Permutation p-values
-6	-0.1267	
-5	-0.0245	
-4	-0.0083	
-3	-0.0015	
-2	0.0161	
-1	0.0101	
0	0.0570	>0.9999 (0.5455)
1	0.0451	>0.9999 (0.5065)

Week relative to pilot start date	Treatment - Control	Permutation p-values
2	0.0450	>0.9999 (0.5195)
3	0.3233	>0.9999 (0.1688)
4	0.0050	>0.9999 (0.2338)
5	-0.1109	>0.9999 (0.4416)
6	-0.0260	>0.9999 (0.4805)
Pre-treatment average gap	-0.0225	
Post-treatment average gap	0.0484	
Average impact estimate	0.0259	

Notes

Synthetic control estimation was done using the microsynth package in R. P-values are adjusted for multiple hypothesis testing using the Bonferroni correction, which multiplies each p-value with the number of hypotheses being tested, and therefore adjusts for the inflated likelihood of committing a Type I error. Unadjusted p-values pre-Bonferroni correction are included in parentheses.

Appendix Table 3. Balance table showing variables used to select synthetic control for proportion sharing contacts

	Lambeth	Synthetic control	All local authorities (scaled)
Average hourly pay	19.5800	19.5356	15.7751
Employment rate	0.7741	0.7706	0.7622
Outcome_lag.-1	0.6780	0.6678	0.7702
Outcome_lag.-2	0.6909	0.6748	0.7674
Outcome_lag.-3	0.5000	0.5015	0.7912
Outcome_lag.-4	0.7907	0.7990	0.8284
Outcome_lag.-5	0.5844	0.6090	0.8227

Notes

Synthetic control estimation was conducted using these variables with the microsynth package in R.

Appendix Table 4. Weights and local authorities used to construct synthetic control for proportion sharing contacts

Local authorities	Weights
Guildford	0.202
Hammersmith and Fulham	0.112
Richmond upon Thames	0.075

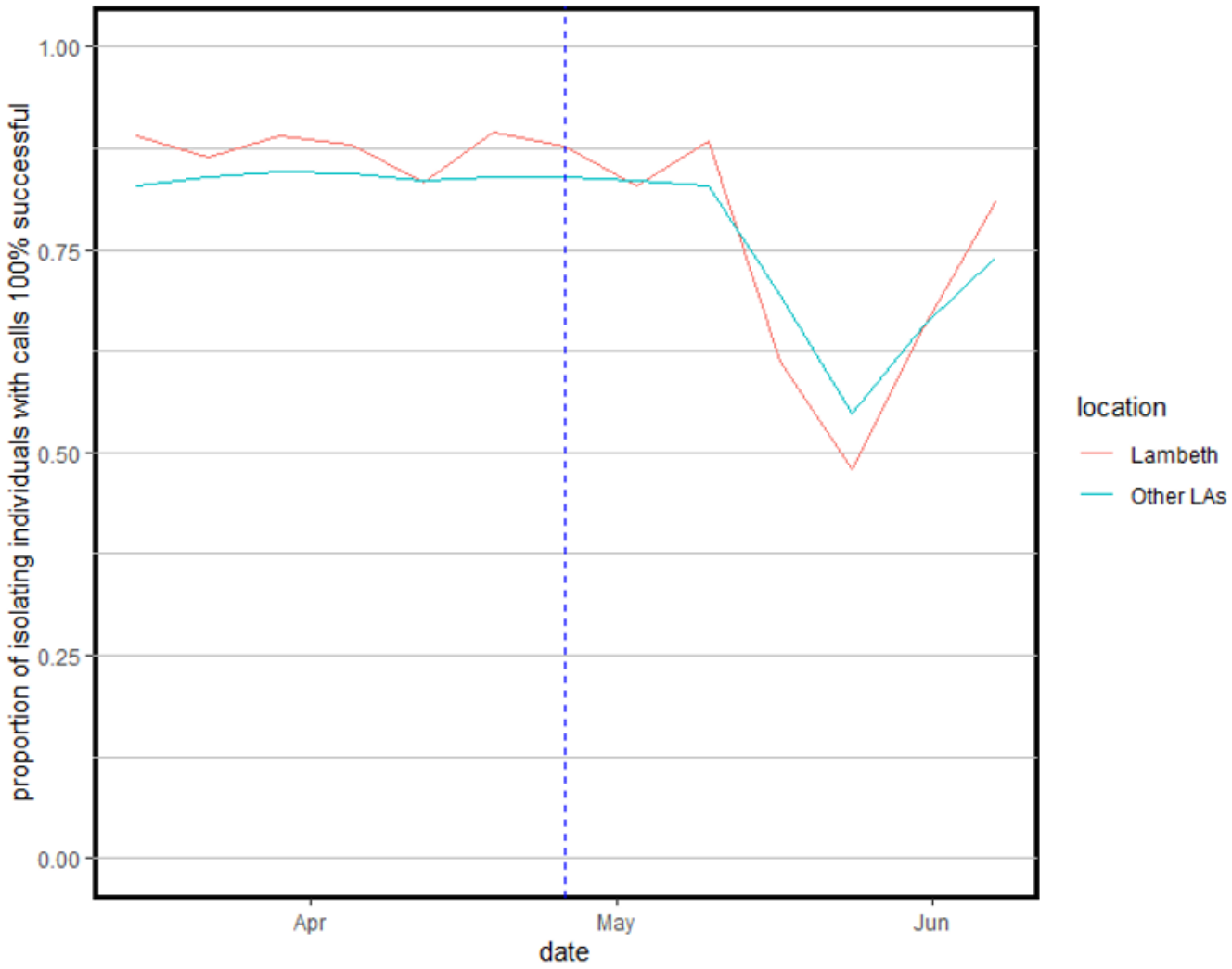
Local authorities	Weights
Three Rivers	0.358
Westminster	0.046
Winchester	0.208

Notes

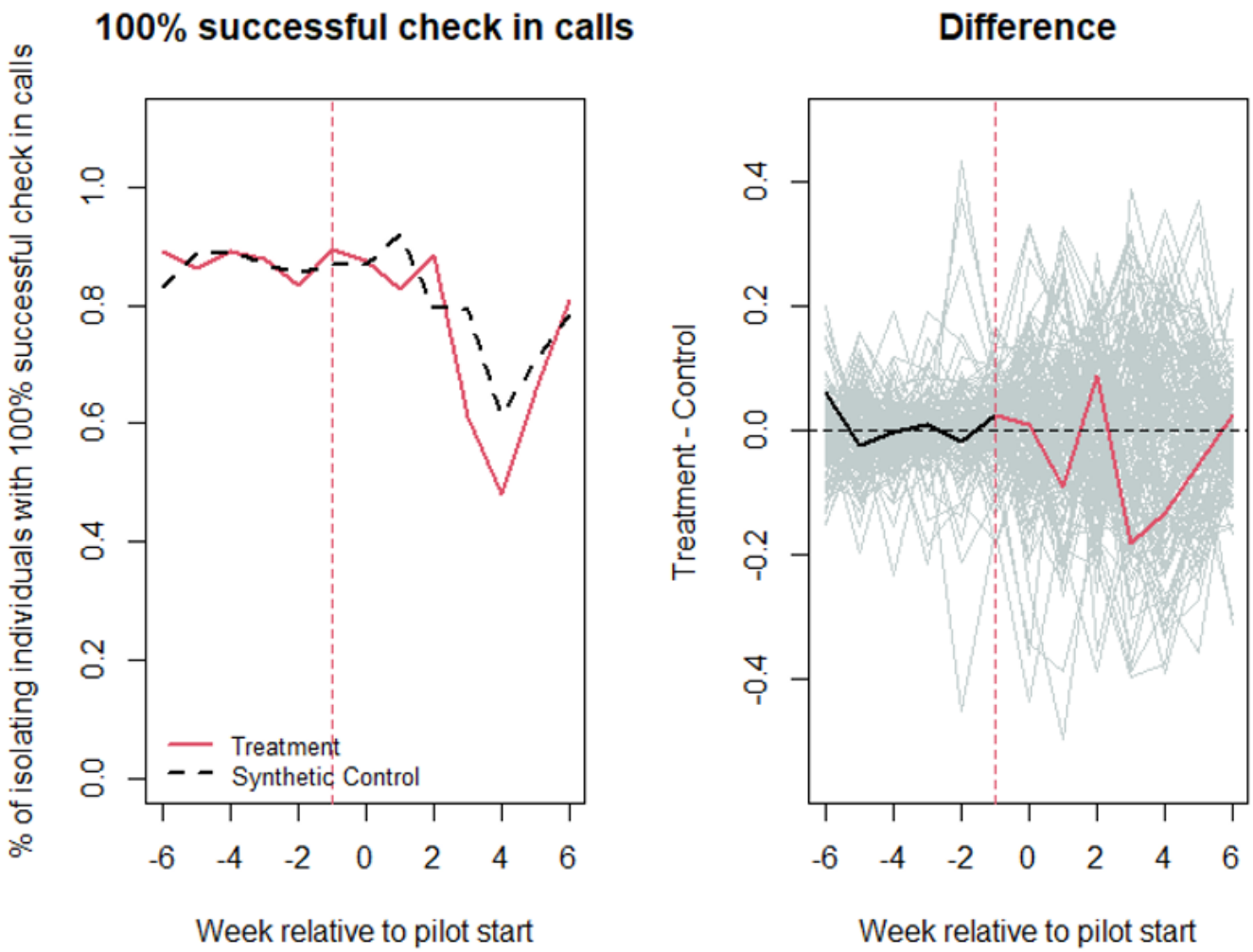
Weights used in synthetic control analysis as reported in analysis output from the microsynth package in R, for local authorities with weights greater than or equal to 0.001.

Proportion of isolating individuals with 100% successful check-in calls

Appendix Figure 3. Weekly proportion of isolating individuals with 100% successful check-in calls in Lambeth and other local authorities in donor pool



Appendix Figure 4. Synthetic control estimates of weekly proportion of self-isolating individuals with 100% successful check-in calls



Notes

Synthetic control estimation was done using the microsynth package in R. Estimation was done optimising fit of the synthetic control over the 6 pre-intervention periods.

Appendix Table 5. Synthetic control estimates of gaps between Lambeth and synthetic control in proportion with successful check-in calls

Week relative to pilot start date	Treatment - control	Permutation p-values
-6	0.0592	
-5	-0.0234	
-4	-0.0022	
-3	0.0097	
-2	-0.0185	
-1	0.0240	
0	0.0091	>0.9999 (0.9487)
1	-0.0921	>0.9999 (0.4744)

Week relative to pilot start date	Treatment - control	Permutation p-values
2	0.0883	>0.9999 (0.9359)
3	-0.1804	>0.9999 (0.3718)
4	-0.1324	>0.9999 (0.3205)
5	-0.0533	>0.9999 (0.3590)
6	0.0250	>0.9999 (0.4231)
Pre-treatment average gap	0.0081	
Post-treatment average gap	-0.0480	
Average impact estimate	-0.0398	

Notes

Synthetic control estimation was done using the microsynth package in R.P-values are adjusted for multiple hypothesis testing using the Bonferroni correction. Unadjusted p-values pre-Bonferroni correction are included in parentheses.

Appendix Table 6. Balance table showing variables used to select synthetic control for proportion with 100% successful check-in calls

	Lambeth	Synthetic control	All local authorities (scaled)
Mean IMD rank of local authority	11,294.5900	11,294.6400	17,278.0300
Percentage of local authority population in IMD deciles 1-3	0.4240	0.4532	0.2696
Case rate	31.0000	31.0109	49.4209
Average hourly pay	19.5800	19.5630	15.7699
Employment rate	0.7741	0.7465	0.7625
COVID-19 deaths as % of all deaths, 2020	16.2000	16.2141	12.3319
Outcome_lag.-1	0.8943	0.8703	0.8405
Outcome_lag.-2	0.8333	0.8519	0.8383
Outcome_lag.-3	0.8785	0.8688	0.8474
Outcome_lag.-4	0.8902	0.8924	0.8466

Notes

Synthetic control estimation was conducted using these variables with the microsynth package in R.

Appendix Table 7. Weights and local authorities used to construct synthetic control for proportion with 100% successful check-in calls

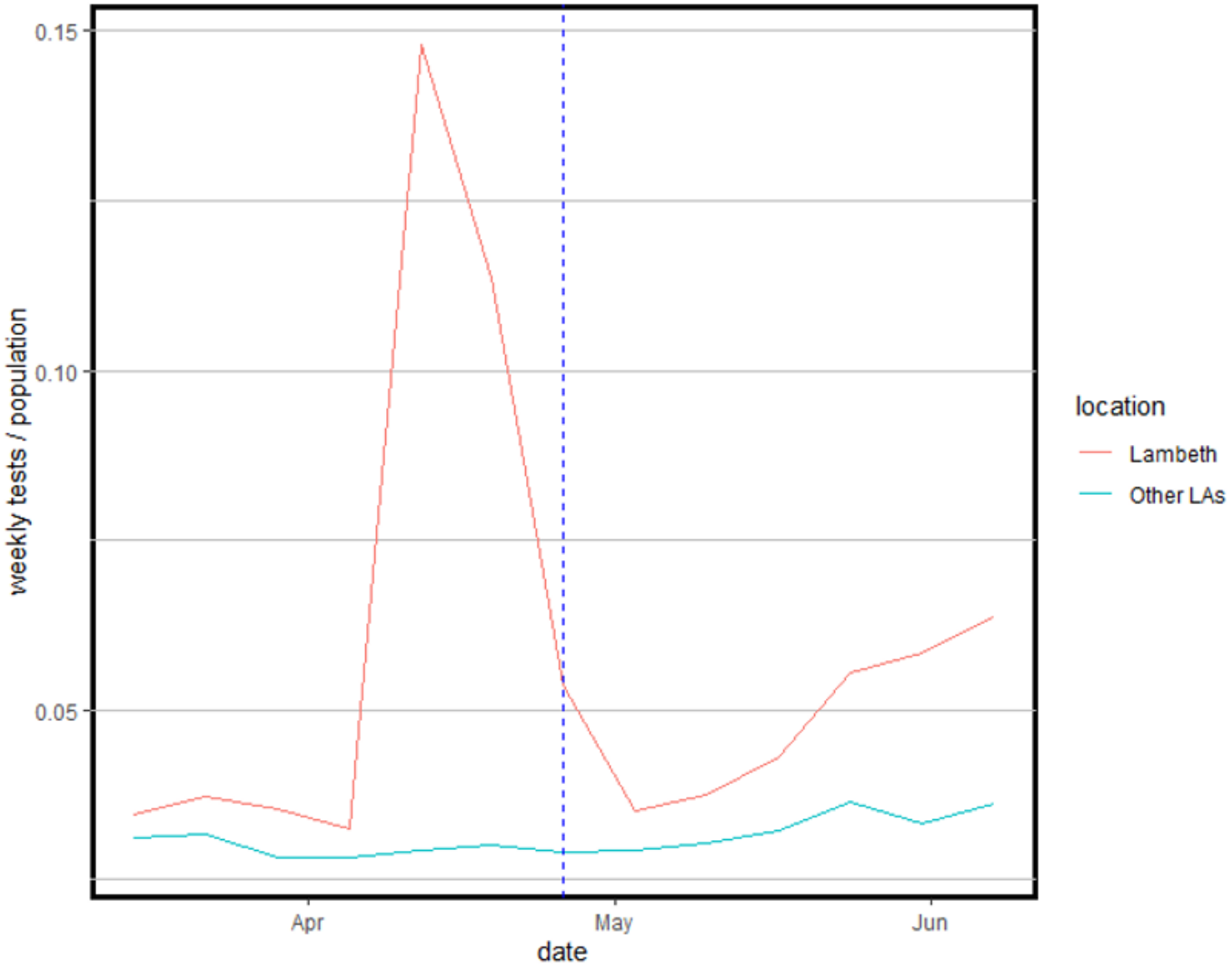
Local authorities	Weights
Blackpool	0.023
Islington	0.186
Portsmouth	0.038
Southwark	0.298
Waltham Forest	0.454

Notes

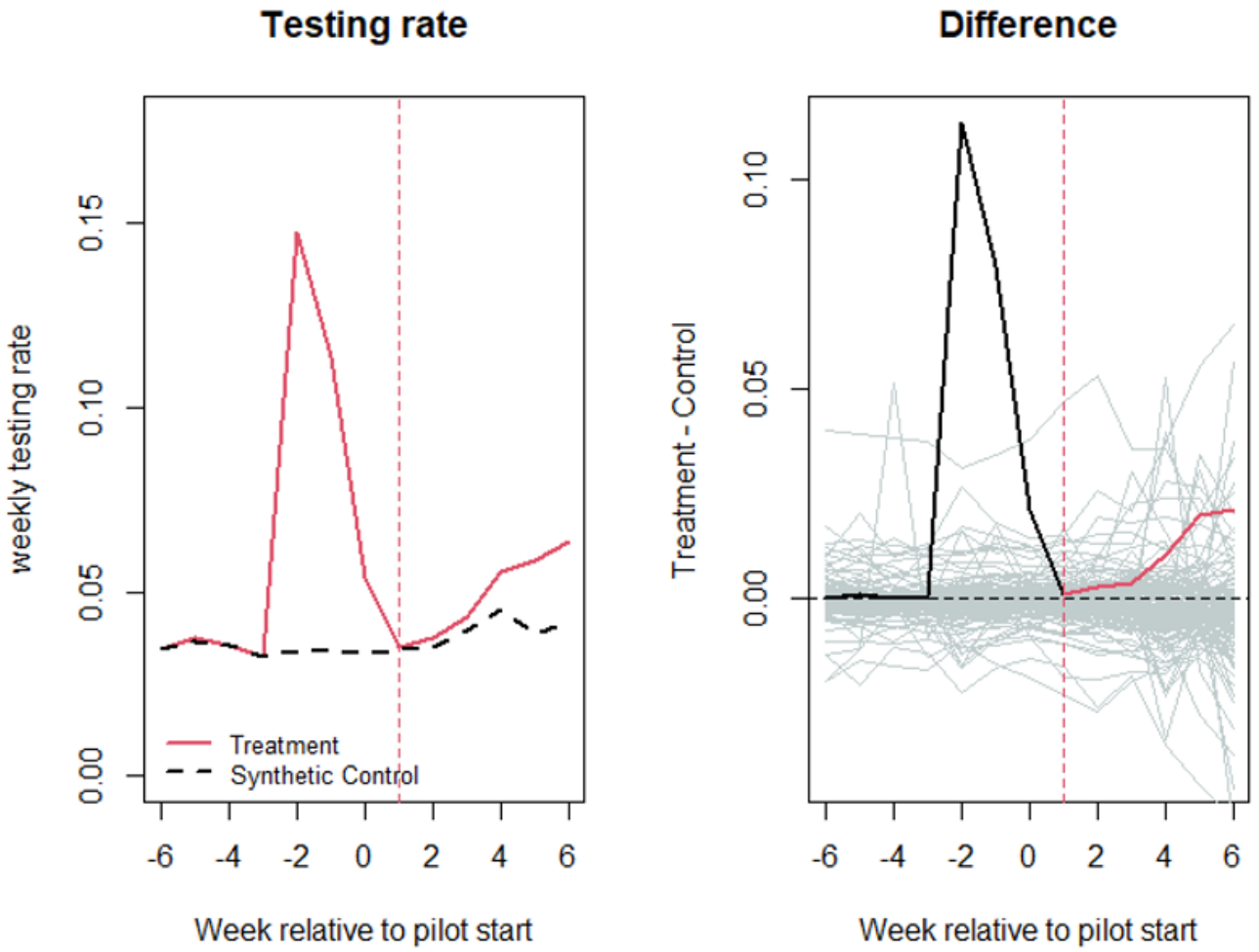
Weights used in synthetic control analysis as reported in analysis output from the microsynth package in R, for local authorities with weights greater than or equal to 0.001.

Weekly PCR testing rate

Appendix Figure 5. Weekly rate of PCR tests / population in Lambeth and other local authorities in donor pool



Appendix Figure 6. Synthetic control estimates of weekly testing rate



Notes

Synthetic control estimation was done using the microsynth package in R. Estimation was done optimising fit of the synthetic control over the pre-intervention periods between 6 and 3 weeks before the start of the pilot as surge testing measures were in place from the week before the pilot was implemented to the week the pilot intervention came into place.

Appendix Table 8. Synthetic control estimates of gaps between Lambeth and synthetic control in PCR testing rates

Week relative to pilot start date	Treatment - Control	Permutation p-values
-6	0.0000	
-5	0.0007	
-4	-0.0002	
-3	0.0002	
-2	0.1137	
-1	0.0796	
0	0.0210	
1	0.0009	<0.0001 (0.0000)

Week relative to pilot start date	Treatment - Control	Permutation p-values
2	0.0026	<0.0001 (0.0000)
3	0.0037	0.0768 (0.0128)
4	0.0102	0.0768 (0.0128)
5	0.0199	0.0768 (0.0128)
6	0.0213	0.1536 (0.0256)
Pre-treatment average gap	0.0002	
Post-treatment average gap	0.0098	
Average impact estimate	0.0096	

Notes

Synthetic control estimation was done using the microsynth package in R.P-values are adjusted for multiple hypothesis testing using the Bonferroni correction. P-values were estimated separately having removed the spike in testing rates due to surge testing. Alternative p-values calculated by running placebo tests individually and comparing the mean squared error in the post-intervention period between treatment and the local authorities in the donor pool gave a p-value of 0.02 for the whole period, which implies a statistically significant average impact on weekly testing rates over the whole period – this may be driven by the earlier periods as seen in the table above. Unadjusted p-values pre-Bonferroni correction are included in parentheses.

Appendix Table 9. Balance table showing variables used to select synthetic control for weekly PCR testing rate

	Lambeth	Synthetic control	All local authorities (scaled)
Mean IMD rank of local authority	11,294.5900	11,294.5900	17,278.0300
Average age in local authority	33.7747	33.7791	41.3761
Average hourly pay	19.5800	19.5799	15.7699
Employment rate	0.7741	0.7644	0.7625
Age standardised mortality rates, 2019	863.8200	863.8212	910.5864
Outcome_lag.-3	0.0325	0.0323	0.0284
Outcome_lag.-4	0.0355	0.0357	0.0284
Outcome_lag.-5	0.0373	0.0366	0.0320

Notes

Synthetic control estimation was conducted using these variables with the microsynth package in R.

Appendix Table 10. Weights and local authorities used to construct synthetic control for weekly PCR testing rate

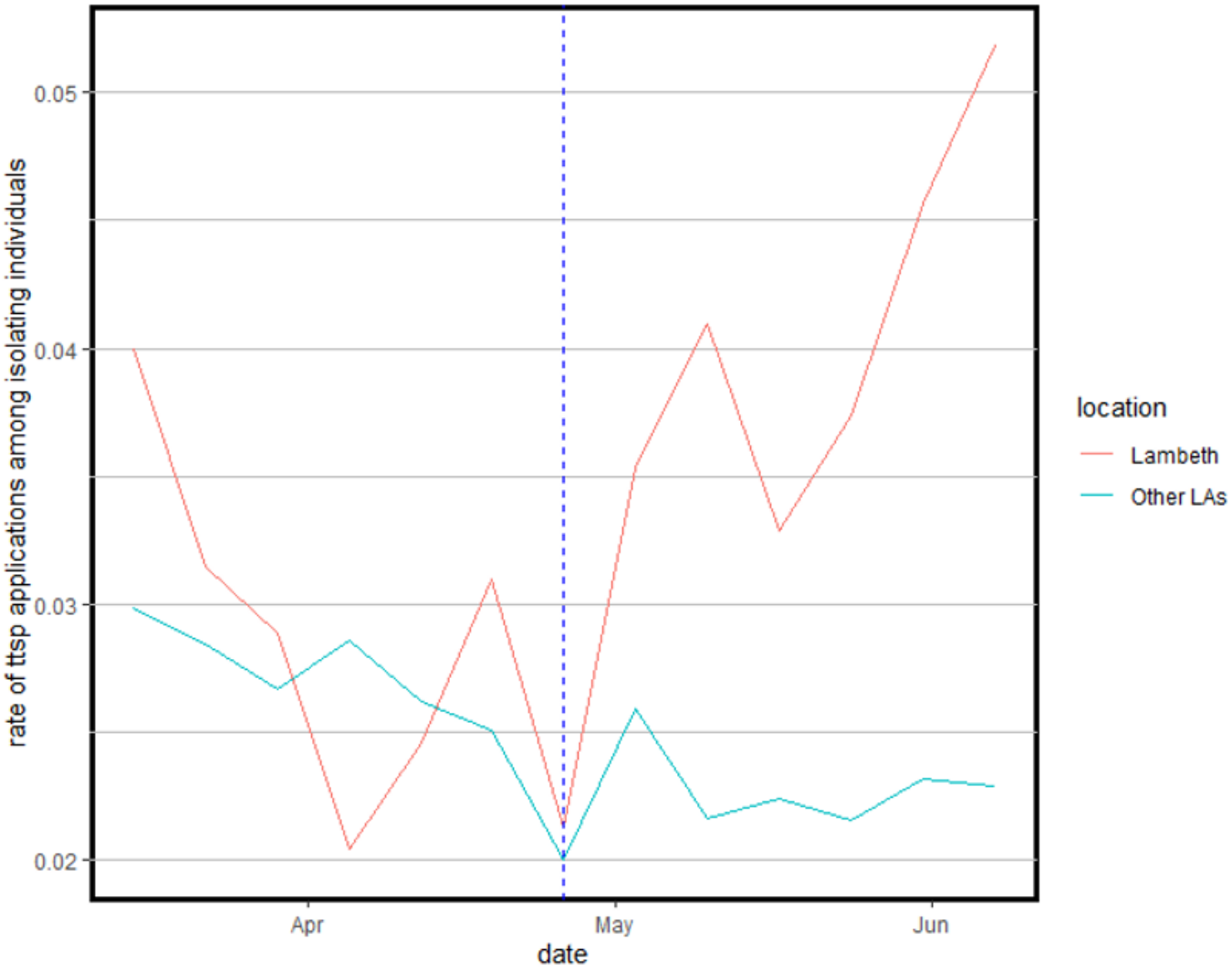
Local authorities	Weights
Cambridge	0.017
Camden	0.082
Islington	0.197
Lewisham	0.302
Southampton	0.094
Southwark	0.029
Tower Hamlets	0.279

Notes

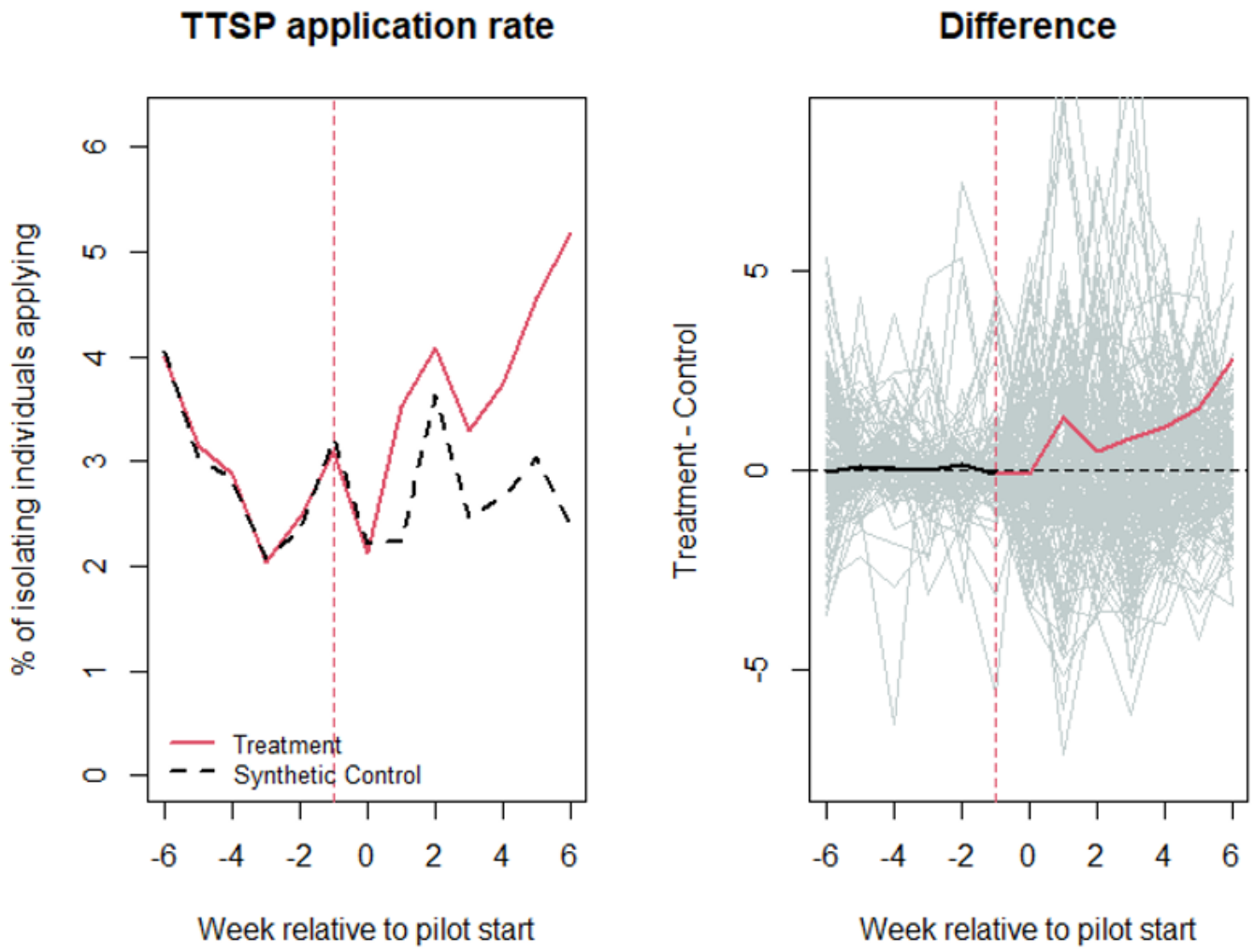
Weights used in synthetic control analysis as reported in analysis output from the microsynth package in R, for local authorities with weights greater than or equal to 0.001.

Weekly TTSP application rates among self-isolating individuals

Appendix Figure 7. Weekly TTSP application rate among self-isolating individuals in Lambeth and other local authorities in donor pool



Appendix Figure 8. Synthetic control estimates of weekly TTSP application rates among self-isolating individuals



Notes

Synthetic control estimation was done using the microsynth package in R. Estimation was done optimising fit of the synthetic control over the 6 pre-intervention periods.

Appendix Table 11. Synthetic control estimates of gaps between Lambeth and synthetic control in TTSP application rates

Week relative to pilot start date	Treatment - control	Permutation p-values
-6	-0.0491	
-5	0.1067	
-4	0.0539	
-3	-0.0293	
-2	0.1256	
-1	-0.1225	
0	-0.0895	>0.9999 (0.9615)
1	1.2942	>0.9999 (0.6026)

Week relative to pilot start date	Treatment - control	Permutation p-values
2	0.4647	>0.9999 (0.7051)
3	0.8110	>0.9999 (0.5385)
4	1.0718	>0.9999 (0.4744)
5	1.5309	>0.9999 (0.3846)
6	2.7932	>0.9999 (0.2436)
Pre-treatment average gap	0.0142	
Post-treatment average gap	1.1252	
Average impact estimate	1.1110	

Notes

Synthetic control estimation was done using the microsynth package in R.P-values are adjusted for multiple hypothesis testing using the Bonferroni correction. Unadjusted p-values pre-Bonferroni correction are included in parentheses.

Appendix Table 12. Balance table showing variables used to select synthetic control for weekly TTSP application rate among self-isolating individuals

	Lambeth	Synthetic control	All local authorities (scaled)
Mean IMD rank of local authority	11,294.5900	11,295.1000	17,278.0300
Percentage of local authority population in IMD deciles 1 to 3	0.4240	0.5095	0.2696
Average age in local authority	33.7747	34.3928	41.3761
Case rate	31.0000	31.3471	49.4209
Average hourly pay	19.5800	19.2200	15.7699
Employment rate	0.7741	0.7363	0.7625
Outcome_lag.-1	3.0986	3.2211	2.5719
Outcome_lag.-2	2.4590	2.3334	2.6139
Outcome_lag.-3	2.0408	2.0701	2.8990
Outcome_lag.-4	2.8881	2.8342	2.6804
Outcome_lag.-5	3.1429	3.0361	2.9060

Notes

Synthetic control estimation was conducted using these variables with the microsynth package in R.

Appendix Table 13. Weights and local authorities used to construct synthetic control for weekly TTSP application rate among self-isolating individuals

Local authorities	Weights
Barking and Dagenham	0.002
Enfield	0.180
Haringey	0.064
Islington	0.021
Portsmouth	0.046
Southwark	0.106
Thanet	0.014
Tower Hamlets	0.397
Waltham Forest	0.169

Notes

Weights used in synthetic control analysis as reported in analysis output from the microsynth package in R, for local authorities with weights greater than or equal to 0.001.

About the UK Health Security Agency

UKHSA is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

UKHSA is an executive agency, sponsored by the Department of Health and Social Care.

Published: October 2023
Publishing reference: GOV-15054

UKHSA supports the Sustainable Development Goals