Progress and Pressure: Understanding economic and social change in England's neighbourhoods – Technical appendix

This document outlines the methodological steps undertaken as part of the Independent Commission on Neighbourhood (ICON)'s research working paper "Progress and Pressure: Understanding economic and social change in England's neighbourhoods".

It provides further detail on the overall analytical approach, including the assumptions we have used, in select sections of the report. Specifically, we describe the steps undertaken to compute the Neighbourhood Improvement Index, and our analysis of the Big Local programme.

For the Big Local analysis, we also include a full breakdown of our findings in Appendix 1.

Neighbourhood Improvement Index

The Neighbourhood Improvement Index is a composite metric designed to quantify and aggregate the relative improvement or decline of Lower Layer Super Output Areas (LSOAs) across a range of key socio-economic and environmental indicators. This index aims to provide an overall measure of positive or negative change at the neighbourhood level, enabling the identification of areas experiencing significant net improvement or decline over time.

The index is constructed through a multi-step process, leveraging changes in LSOA-level indicator decile rankings from the earliest to most recent point where data is available. (e.g., 2011 and 2021):

- Indicator Selection: The full list of indicators used in the composite index are:
    - the proportion of residents on: disability benefit, out of work benefit;
    - the proportion of residents who are: in employment, economically inactive, have no qualifications, have a degree-level equivalent qualification, live in bad health;
    - the proportion of households who: have no car, no central heating, are overcrowded, contain children living in low income
    - other health variables: years of potential life lost (YPLL), acute morbidity, mood and anxiety disorders, small area mental health index (SAMHI)
    - other economic indicators: GVA per head, number of VAT registered businesses per capita
- Movement Categorisation: The change in each LSOA's relative decile performance is categorised into predefined "movement" labels. For this index, we use a slightly more extended set of movement categories than we used in the main report (p. 9), to reflect where there have been more significant changes in the position of neighbourhoods. Specifically, we include "major" categories for both improvement and decline, to reflect where neighbourhoods have changed +/1 4 deciles, from the earliest to most recent point where data is available. These categories capture both the direction and magnitude of the change and are documented bellow.
- Weight Assignment: Each of these "movement" categories is assigned a predefined numerical weight, reflecting its contribution to overall neighbourhood improvement. Positive weights are assigned to improvement categories, negative weights to decline categories, and zero weights to stable or less impactful movements.

    - Major improvement: +2

- o Improvement: +1

- o Escaped from bottom: +1

- o Declined: -1

- o Major decline: -2

- o Trapped at the bottom: -3

- o Fell to bottom: -1

- o Secure at the top: 0

- o Fell from top: 0

- o Stable: 0

- Calculation of Net Score: For each LSOA, the individual movement category for every included indicator is identified. The corresponding numerical weights for each indicator's movement are then summed. This sum constitutes the Net Score for that LSOA. A higher positive Net Score indicates greater overall net improvement across the indicators, while a negative Net Score indicates a net decline.

- In the main report, we aggregate each LSOA to their corresponding local authority (LA) and compute a population-weighted net score at the LA level. We then standardise this via a ranking that ranks each local authority in England, where 1 = highest net improvement, 308 = highest net decline.

Analysis of the Big Local programme

Overall analytical approach

To isolate the potential effects of Big Local on neighbourhood outcomes, we adopt a difference-in-differences (DiD) framework to estimate the impact of Big Local — testing whether neighbourhoods covered by the programme improved more (or deteriorated less) than expected, relative to their matched counterparts. This is structured as an *intent-to-treat* analysis: estimating the average effect of being designated a Big Local area, regardless of variation in local implementation or programme intensity.

Each of the 150 Big Local areas—covering 861 Lower Super Output Areas (LSOAs)—was matched to a set of comparison neighbourhoods using nearest-neighbour matching on key pre-treatment characteristics, including levels of deprivation, employment trends, and health indicators. Matching was conducted using Mahalanobis distance without replacement, selecting three control LSOAs for each treated LSOA. To account for time-invariant regional conditions, the models include region fixed effects. To address the issue of spatial autocorrelation and heteroskedasticity, we report robust standard errors clustered at the LSOA level. Variables were harmonised across available years (typically 2011 and 2021), with exceptions made where alternate years were the only option (e.g., child poverty: 2014–2021).

The findings should be interpreted as indicative of relative change—that is, whether Big Local areas improved (or deteriorated less) than expected, relative to matched neighbourhoods over the same time period.

The analysis comes with two caveats. First, we cannot observe whether comparison areas may have received other neighbourhood-level investment or whether they undertook their own community initiatives. Second, we do not yet incorporate programme-level data reflecting the investments made, and activities carried out, in Big Local areas. A more detailed version of this analysis, incorporating programme-level spend and delivery data, is currently underway and will allow for further exploration of how local implementation shaped outcomes

Costings

We attempt to estimate the potential economic benefits of the Big Local programme, estimating both direct savings accrued to the state as well as wider economic benefits to society.

We do so only for the findings where we identify statistically significant, positive change that may be attributed to the Big Local programme. These are: employment, economic inactivity, degree-level qualifications, total crime, and anti-social behaviour (ASB).

Due to the absence of a clear set of guidelines on estimating costs resulting from ASB specifically, and to prevent double-counting, we exclude it from our costings. We assume reported incidences of ASB are reported and accounted for within the "total crime" statistics.

Employment, economic inactivity, degree-level qualifications

The Big Local program was found to have statistically significant impacts on three types of economic outcomes – a 0.67% increase in employment, a 0.57% decrease in economic activity, and a 0.38% increase in degree level qualifications. We produced monetary estimates for six benefits associated with these outcomes. The methodology behind each estimate is as follows.

Net additional earnings: Including assumptions about gross annual salary and a high proportion of new employment being part-time, we estimate an average annual take-home pay of £18,471, and an uplift in income tax and NIC revenue of £2,529. These figures were applied to our employment coefficient and Big Local population estimate to give estimates for the total uplift in earnings and total uplift in tax revenues. An optimism bias of 10% was deducted from each of these benefits for conservatism.

Lifetime earnings of obtaining a degree: the Institute for Fiscal Studies[1] estimated lifetime returns of having a degree to be £290,000 to the individual and £285,000 to the exchequer. After splitting this across an assumed 40-year lifecycle and apportioning this to the Big Local degree premium coefficient and relevant population size, a large optimism bias of 50% was deducted from total individual returns and 75% to total exchequer returns. This reflects that annual earnings from a degree are not linear, but increase over time, offsetting the costs of obtaining a degree.

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[1] https://ifs.org.uk/sites/default/files/output_url_files/R167-The-impact-of-undergraduate-degrees-on-lifetime-earnings.pdf

The wellbeing impact of moving from involuntary unemployment to employment: The government's Wellbeing Guidance for Appraisal[2] gives an estimated monetary value of £13,000 associated with the wellbeing benefits of employment. Applying a conservative 2.5% uplift in personal stated wellbeing for people finding employment in Big Local areas, and applying the uplift to the employment coefficient and population size, gives the total monetary impact. An optimism bias of 10% was applied for conservatism.

Unemployment benefit savings: As people move from involuntary unemployment to employment, the number of people receiving unemployment benefits reduces, creating a saving for the exchequer. Using public information on the cost of Universal Credit[3], an annual saving of £3,717 was applied to the employment coefficient and population size, giving the total savings to the exchequer. An optimism bias of 10% was applied for conservatism.

The total monetary economic benefits were reduced by a further 20% to account for any potential displacement – in other words, controlling for the possibility that the increase in employment and/or degree qualifications were associated with in-migration to Big Local areas rather than an improvement in outcomes for people living in Big Local areas at the beginning of the timeframe.

To reflect the long-term, sustained impact of the Big Local programme, we projected this annual cost saving over a 5-year appraisal period, starting from 2021. These future savings were then discounted back to a 2021 present value using the HM Treasury Green Book's recommended discount rate of 3.5%. The summation of these discounted annual savings provided the Net Present Value of economic and fiscal benefits.

Crime

Our costings for crime are derived from the monetary estimates published in the Home Office's "The economic and social costs of crime", which is recommended as part of HM Treasury's Green Book supplementary guidance.[4]

We take the unit costs of crimes by category (pp.15-16), excluding commercial crimes as we assume that the overwhelming majority of the crimes committed within the neighbourhoods we identify are crimes committed against the individual, and uprate costs to 2021 values.

We combine the list of crimes against the individual with national crime statistics for England from the Crime Survey of England & Wales (CSEW) for the year our crime data was collected (2021), enabling us to identify the proportion of each type of crime committed nationally of all crimes committed against the individual in that year (specifically using incidence rates from April 2021 to March 2022).

To compute the costs, we first calculated a weighted average unit cost per crime incident against the individual. This was achieved by multiplying the 2021-uprated unit cost of each relevant crime category by its national proportion (from the CSEW 2021-2022 data) relative to all crimes committed against the individual. This approach resulted in an average societal cost per crime of £7,374.35 (in 2021 prices).

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[2] https://assets.publishing.service.gov.uk/media/60fa9169d3bf7f0448719daf/Wellbeing_guidance_for_appraisal_-_supplementary_Green_Book_guidance.pdf
[3] https://www.gov.uk/universal-credit/what-youll-get
[4] The full document can be found here: https://www.gov.uk/government/publications/the-economic-and-social-costs-of-crime

We then identified the proportion of this societal cost that accrues specifically to the state (covering police, criminal justice service, and health service costs, but excluding victim costs). This state-specific portion of the unit cost was then applied to our difference-in-differences (DiD) coefficient for total crime. The DiD analysis showed an estimated additional reduction of 6.83 incidents per 1,000 residents in Big Local areas by 2021 (relative to the counterfactual).

For each Big Local LSOA, this crime reduction coefficient was applied to its 2021 population to estimate the annual number of avoided crime incidents. This figure was then multiplied by the state-specific unit cost per incident. This calculation yielded an estimated annual cost saving to the state from crime reduction in 2021 of £22.7 million.

To reflect the long-term, sustained impact of the Big Local programme, we projected this annual cost saving over a 5-year appraisal period, starting from 2021. These future savings were then discounted back to a 2021 present value using the HM Treasury Green Book's recommended discount rate of 3.5%. The summation of these discounted annual savings provided the Net Present Value of the crime reduction benefit to the state. Our analysis of these findings suggests that the sharper reductions in crime that Big Local may have enabled would equate to direct fiscal savings worth around £107 million to the Exchequer, as well as £357 million in wider social benefits.

Appendix 1: Full results - Big Local model

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1. Employment rate

- Finding: Big Local areas saw a smaller drop in employment than similar areas without the programme
- DiD Estimate: +0.66 percentage points ($p < 0.001$)
- Significance: Positive, statistically significant
- Context: Before Big Local began, treated and control areas had similar employment levels. From 2011 to 2021, jobs fell everywhere, but the fall was 0.66 ppt smaller in Big Local places.
- Conclusion: Big Local programme may have helped cushion communities against wider job losses.

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2. Out-of-Work benefits

- Finding: The rise in out-of-work benefit receipt was marginally smaller in Big Local areas than in matched controls.
- DiD Estimate: −0.13 percentage points ($p = 0.49$)
- Significance: Positive, not statistically significant
- Context: Pre-programme, Big Local areas had slightly higher benefit rates. From 2011 to 2021, benefit receipt in control areas increased by 0.73 ppt; Big Local areas saw an increase 0.13 ppt smaller, but this differential is not statistically ignificant.
- Conclusion: No clear indication that designation as a Big Local area altered trends in out-of-work benefit receipt.

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3. Economic Inactivity

- Finding: The share of residents classified as economically inactive rose less in Big Local areas than in matched controls.
- DiD Estimate: −0.57 percentage points ($p<0.01$)
- Significance: Positive, statistically significant
- Context: Pre-programme, inactivity levels were similar across Big Local and control areas. From 2011 to 2021, inactivity in matched controls increased by 7.58 ppt; Big Local areas saw an increase 0.57 ppt smaller.
- Conclusion: Big Local may have helped curb the pace in which economic inactivity rose in communities that received the investment.

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4. No qualifications

- Finding: The reduction in the share of residents with no qualifications was slightly larger in Big Local areas than in matched controls.
- DiD Estimate: −0.16 percentage points ($p = 0.38$)
- Significance: Negative direction, not statistically significant
- Context: Before the programme, Big Local areas had a marginally higher share of residents with no qualifications. From 2011 to 2021, control areas saw that share fall by 5.59 ppt; Big Local areas experienced an extra 0.16 ppt drop, although this difference is not statistically significant.

- Conclusion: There is no clear evidence that Big Local designation altered trends in the share of residents without qualifications.

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5. Degree-level qualifications

- Finding: The share of residents with degree-level qualifications rose more in Big Local areas than in similar areas without the programme.
- DiD Estimate: +0.38 percentage points (p < 0.01)
- Significance: Positive, statistically significant
- Context: Before Big Local began, treated areas had about 1.52 ppt fewer residents with degree-level qualifications. From 2011 to 2021, matched controls saw that share increase by 7.43 ppt; Big Local areas experienced an additional 0.38 ppt rise relative to controls.
- Conclusion: Big Local may have helped support faster growth in higher education attainment among residents.

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6. Bad health

- Finding: The reduction in the share of residents reporting bad health was marginally smaller in Big Local areas than in matched controls
- DiD Estimate: +0.01 percentage points (p = 0.81)
- Significance: Negative, not statistically significant
- Context: Before the programme, Big Local areas had a slightly higher prevalence of bad health. From 2011 to 2021, bad health in matched controls fell by 0.40 ppt; Big Local areas saw a 0.39 ppt fall (i.e. 0.01 ppt smaller), but this difference is trivial and not statistically significant.
- Conclusion: No clear evidence that Big Local altered trends in bad health; overall community health improved similarly across areas.

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7. Mental health (Small area mental health index/SAMHI)

- Finding: Improvements in the mental health index were marginally larger in Big Local areas than in similar areas without the programme
- DiD Estimate: +0.01 index points (p = 0.56)
- Significance: Positive direction, not statistically significant
- Context: Before Big Local began, treated areas scored slightly higher on the index. From 2011 to 2021, matched controls improved by 1.67 points; Big Local areas saw an additional 0.01-point gain, though this differential is negligible and not significant.
- Conclusion: No clear evidence that Big Local altered trends in residents' mental health

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8. Total crime rate

- Finding: Overall crime rates fell more in Big Local areas than in matched controls.
- DiD Estimate: −6.83 (p = 0.03)
- Significance: Positive direction, statistically significant

- Context: Before the programme, Big Local areas had slightly higher crime rates. Between 2011 and 2021, crime in matched controls declined by 13.97 incidences per 1000 residents; Big Local areas experienced an additional 6.83 drop relative to controls.
- Conclusion: Big Local may have helped reduce overall levels of crime

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9. Anti-social behaviour (ASB)

- Finding: Anti-social behaviour fell more in Big Local areas than in similar areas without the programme
- DiD Estimate: −4.31 units (p < 0.01)
- Significance: Positive direction, statistically significant
- Context: Before the programme, Big Local areas had higher anti-social behaviour rates. Between 2011 and 2021, ASB in matched controls fell by 40.68 incidences per 1000 residents; Big Local areas saw an additional 4.31-drop relative to controls
- Conclusion: Big Local may have helped reduce overall levels of ASB

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10. Criminal damage

- Finding: The rise in criminal damage incidents was marginally larger in Big Local areas than in matched controls.
- DiD Estimate: +0.10 units (p = 0.76)
- Significance: Negative direction, not statistically significant
- Context: Before the programme, Big Local areas had slightly higher criminal damage levels. From 2011 to 2021, criminal damage in control areas increased by 7.72 68 incidences per 1000 residents; Big Local areas saw an additional 0.10 increase relative to controls, though this difference is not statistically significant.
- Conclusion: No clear evidence that Big Local altered trends in criminal damage.

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11. Burglary

- Finding: Burglary fell more in Big Local areas than in similar areas without the programme
- DiD Estimate: −1.12 units (p = 0.08)
- Significance: Positive direction, marginally significant
- Context: Pre-programme, Big Local areas had higher burglary levels. From 2011 to 2021, matched controls saw burglary decline by 11.51 units incidences per 1000 residents; Big Local areas experienced an additional 1.12 drop relative to controls
- Conclusion: Suggestive evidence that Big Local contributed to larger reductions in burglary, though the result is only marginally significant.

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12. Gross Value Added (GVA) per head

- Finding: Growth in GVA per head was marginally smaller in Big Local areas than in similar areas without the programme
- DiD Estimate: –£220 per head (p = 0.84)
- Significance: Negative direction, not statistically significant
- Context: Before the programme, Big Local areas had GVA per head slightly lower than matched controls. From 2011 to 2021, controls saw a nominal £5,171 increase; Big Local areas experienced an additional £220 smaller gain relative to controls
- Conclusion: No clear evidence that Big Local area altered trends in economic output per capita

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13. Children in low-income households

- Finding: The increase in children in low-income households was marginally smaller in Big Local areas than in matched controls.
- DiD Estimate: –0.04 percentage points (p = 0.88)
- Significance: Positive direction, not statistically significant
- Context: Before the programme, Big Local areas had slightly higher shares of children living in low income households. From 2011 to 2021, the share in matched controls rose by 5.47 ppt; Big Local areas saw an increase 0.04 ppt smaller, but this difference is not significant.
- Conclusion: No clear evidence that Big Local area altered trends in the proportion of children living in low-income households

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14. Number of VAT-registered business units (proxy for business activity)

- Finding: Growth in VAT-registered business units was slightly stronger in Big Local areas than in similar areas without the programme
- DiD Estimate: +9.19 units (p = 0.30)
- Significance: Positive direction, not statistically significant
- Context: Before the programme, Big Local areas had slightly fewer VAT-registered business units than matched controls. From 2011 to 2021, control areas saw an increase of 135 units; Big Local areas experienced an additional 9-unit gain relative to controls, though this difference is not statistically significant.
- Conclusion: No clear evidence that Big Local area altered trends in business formuation (as measured by VAT registrations)