CENTRE FOR THRIVING PLACES

EXPLORING THE EFFECTS OF SOCIAL CAPITAL ON COVID-19 RATES AT THE LOCAL LEVEL

A WORKING PAPER PREPARED BY CENTRE FOR THRIVING PLACES

ABSTRACT

Although the COVID-19 pandemic has been particularly severe in the UK, there has been a high degree of geographic variation in COVID-19 case rates across the country. Several factors have been put forward to explain such variation in the UK and elsewhere, such as differences in population mobility, deprivation and rurality and in levels of trust in others and in government and institutions. Research from other countries suggests aspects of social capital may be differentially related to case rates at the local area level. This working paper reports on regression analysis of the impact of two types of social capital on COVID-19 case rates at the local authority level in England and Wales: civic social capital and informal social capital. Whilst civic social capital was broadly associated with lower case rates, informal social capital variables did not have a consistent significant effect. These findings are discussed with reference to similar findings from the USA and also to the effect of the control variables. A key conclusion for local authorities and others is that building positive relationships between citizens and local non-governmental organisations (e.g., sports, religious and volunteering groups) could strengthen responses to future pandemics.

CONTENTS

The research to support this report was conducted between November 2021 and July 2022 as a collaboration between Centre for Thriving Places and doctoral researchers at the University of Groningen. Our thanks to Professor Dimitris Ballas for the introduction. This paper was authored by Saamah Abdallah, Mel Cairns, Luise Koeppen and Thanasis Ziogas with support from Katie Tiplady-Startin and Liz Zeidler. Please email any comments or queries to the authors to: hello@centreforthrivingplaces.org

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The social fragmentation index data was calculated for use in the Thriving Places Index based on a methodology developed by Sir Peter Congdon, Queen Mary University (Congdon, 1996). The covid case rate, population density, English Indices of Multiple Deprivation (IMD) and local authority ageing statistics data contains public sector information licensed under the Open Government Licence v3.0.

INTRODUCTION

It is difficult to overstate the profound and multiple impacts that the COVID-19 pandemic, and the government restrictions in response to it, have had on so many aspects of everyday life. Some were short term, like the supermarket shortages and furloughs, and others are still being felt, such as the impact of home-schooling on children's wellbeing and education and the mental health burden of living with heightened fear, anxiety and uncertainty for so long.

In particular, in the UK the comparatively high number of people whose deaths were linked to the disease (World Health Organization, 2022) has been especially heartbreaking for those left behind, not to mention the 2 million people continuing to suffer with long COVID (Office for National Statistics, 2022). There has been extensive discussion as to why some countries, like the UK, have suffered more from the pandemic than others (e.g., Banjamin et al., 2020; Bayati et al., 2021; El Mouhayyar et al., 2021; Hale, 2022). However, as well as between-country variation in COVID-19 case rates, there is also large variation *within* countries, which studies have attributed to various local level factors including levels of trust in government, levels of deprivation and population density (Shanka and Menebo, 2022; Cook et al., 2020).

Social capital can be understood as the social norms, networks, values and trust that enable us to organise ourselves to co-operate for the good of ourselves and other members of society (Putnam, 1993; Pryor, 2021). Adding to the current evidence regarding these potential drivers, this paper will introduce new analysis to shed light on the relationship between social capital and COVID-19 case rates at the local authority level in England and Wales. First, we will briefly summarise the published evidence relating to other predictors of COVID-19 case rates in the UK and elsewhere, and introduce social capital as a possible additional factor, with reference to relevant research from other countries. Then we will outline our methodological approach, including the specific variables we have included and the data analysis methods. Results will be presented in descriptive form, including maps and tables, along with the results of our statistical analysis. We will then discuss the results with reference to published evidence and consider the implications of these findings.

The authors hope that this analysis will shed further light on the existing evidence from other countries regarding social capital as a predictor of COVID-19 case rates, by considering this in the context of a country with relatively high case rates.

BACKGROUND

Controlling the spread of the COVID-19 pandemic has been one of the most important policy questions worldwide since early 2020. The geography of the pandemic has been explored both internationally and within countries (e.g. Davenport et al., 2020; Ehlert, 2021; Holmager et al., 2021; Leung et al., 2020). As discussed above, the amount of variation in COVID-19 case rates in different parts of the UK has been large. For example, according to the UK Coronavirus Dashboard (Gov.uk, 2022), at the time of writing Westminster, Camden, Orkney, Herefordshire and Cornwall all had less than 30,000 recorded cases of COVID-19 per 100,000 people whereas Halton and several areas of Scotland had over 40,000 recorded cases per 100,000 population.

Several potential explanations for variations in case rates in the UK and elsewhere have been put forward but the published evidence relating to case rates themselves is limited. Therefore, the brief overview of relevant literature that follows also includes research considering related dependent variables such as death rates and compliance with restrictions.

In terms of limiting the spread of infection, psychological and behavioural drivers are likely to have played a role. UK-level analysis by Schneider et al. (2021) finds a positive relationship between risk perception and infection control measures, and that factors like individualistic or prosocial values and government trust have a greater effect on risk perception than objective risk level does. Highlighting the importance of compliance with 'stay at home' messaging, Sartorius et al. (2021) found that reduced population mobility in England in the early months of the pandemic had a significant impact on reducing case rates. Their model showed that the geographical variation in this reduction in mobility therefore played a substantial part in the geographical variation of cases.

However, other research has pointed to more structural factors. Office for National Statistics (2020a) report that at least early in the pandemic COVID-related death rates were significantly higher in the most deprived areas of England and higher in the most deprived areas of Wales than in the least deprived areas of each country. In addition, COVID-related death rates were significantly higher in major urban conurbations than any other rural-urban classification, with the lowest rates found in the sparsest rural areas (ibid.). In a local-authority-level analysis of case rates in the North of England, Cook et al. (2020) also point to the strength of the relationship with deprivation, along with population density.

Arising from both structural and psychological factors, social capital has also been claimed to determine the spread of the virus, at least in other countries. Social capital is a broad term comprising several elements, such as community cohesion and belonging, social support and relationships, civic participation and trust in one's neighbours and in institutions (Pryor, 2021; Putnam, 1993).

This breadth suggests contradictory hypotheses in terms of how social capital could relate to case rates. For example, greater social capital could lead to more face-to-face interactions, thereby facilitating infection, or it could lead to greater respect for restrictions and greater care for the more vulnerable in the community.

This contradiction is borne out in the existing evidence from outside the UK. Cross-nationally, countries with higher social capital (operationalised in terms of institutional trust, social trust and political trust) have been found to have been able to avoid the worst impacts of the pandemic without imposing severe restrictions (Bartolini et al., 2020; Wu, 2021). However, Imbulana Arachchi and Managi (2021) report effects on COVID-19 death rates in different directions for different elements of social capital; neighbourhood attachment and social trust were associated with higher death rates and family cohesion and security with lower ones.

In particular, trust, whether in others (Hale, 2022) or in government (Thornton, 2022), has been put forward as a key factor in between-country variation in covid infection rates. Shanka and Menebo (2022) found that within Ethiopia greater trust in government was associated at the individual level with increased compliance with restrictions and public health guidance, somewhat mediated by awareness of the consequences of non-compliance. In the Swiss context, Siegrist et al. (2021) reported that for individuals, higher government trust was associated with higher perceived riskiness of COVID-19 but that higher trust in other people was associated with lower perceived risk from the virus.

Local area-level research has considered social capital within the USA and China, for example. In the USA, it has also been reported that different aspects of social capital at the county level are differentially associated with case rates (Ding et al., 2020). Specifically, whilst more 'civic' or institutionally-related social capital was associated with greater social distancing, more informal social capital in terms of social relationships was associated with *less* social distancing. The features of civic and informal social capital as distinct types are discussed on pp. 7-8. Meanwhile, using as a dependent variable individual's self-reports as to whether they knew someone who had COVID-19, Wu (2021) found, in Hubei province in China, that higher average political trust, collective efficacy and greater social networks within a city reduced reported COVID-19 rates. Wu also cleverly separated out individual and local area effects, and showed that – in the case of political trust and social networks – his effects could not be explained by individual level variation alone. In other words, it makes sense to measure social capital at the local level, not just at the individual level.

This study seeks to build on these within-country findings in the UK. Using the Understanding Society Survey to assess social capital at the local level it provides the opportunity to tap a more purely subjective assessment of social capital than the US study.

METHODOLOGY

Unit of analysis

The unit of analysis was lower tier districts in England and Wales post-2020 restructuring. This potentially included 324 Districts, Metropolitan Districts, London Boroughs and Unitary Authorities in England, and 22 Local Authorities in Wales. Scotland and Northern Ireland were excluded from the analyses due to differences in data definitions and availability.

Independent variables

Six measures of social capital at the local authority level were considered, five of which were derived from the UK Household Longitudinal Survey (UKHLS, also known as Understanding Society) while the sixth measure of (informal) social capital used was the **social fragmentation index** (SFI), developed by Peter Congdon (1996, see also Curtis et al., 2019). The Understanding Society data was from wave 9 (2017-2018), which included several modules relevant for measuring social capital including modules on neighbourhood, political engagement, political efficacy, groups and organisations and social networks. The following measures of social capital were gathered for each local area.

Informal social capital variables:

- **Neighbourhood attachment.** This was the principal factor in a maximum likelihood factor analysis of the eight questions in the self-completion neighbourhood module which includes questions on sense of belonging and attachment to the neighbourhood and experience of social support within the neighbourhood (full list of questions in appendix). Rotation of the results was not possible because only one factor was extracted. The factor explained 57% of individual-level variance in the eight questions and all eight questions loaded onto it with a loading of 0.57 or more. The distributions of responses for all LAs for the first question (belong to neighbourhood) are included in the appendix for illustrative purposes.
- **Friendship network.** A single question on the number of close friends was used.

Civic social capital variables:

- **Civic engagement.** This was the principal factor in a maximum likelihood factor analysis of three questions in the political engagement and political efficacy modules. Again, rotation was not possible. The questions included measured satisfaction with and commitment to democracy, and sense of political

efficacy (see full list of questions in Appendix I). The factor explained 63% of individual-level variance in the three questions. The two questions on political efficacy loaded negatively and strongly (factor loadings of -0.82 and -0.88) whilst the questions on satisfaction with democracy only loaded mildly (0.31).

- Civic duty. A single question on whether it is a duty to vote in elections. We had intended to include this question in the civic engagement composite, but in factor analysis it did not load satisfactorily on the principal factor.
- Activity in organisations. Respondents were given a list of 16 different organisation types and indicated which ones they were active in. We used the total number of *types* of organisations that were ticked.

In all cases the simple averages of all respondents within the local authority were used, using standard cross-sectional weights. Whilst the UKHLS does not actively seek to achieve representative samples at this level, preliminary analyses demonstrated that these local area estimates correlate meaningfully with expected variables, demonstrating external validity.[1] Only local authorities where at least 30 respondents answered the relevant questions were used. This resulted in the exclusion of 38 local authorities in England (mostly small rural districts) and 2 in Wales.

Regarding the SFI, it is calculated based on demographic data from an area, including the percentages of people who a) live alone, b) live in private rented accommodation, c) moved within the previous year and d) are married/cohabiting. We used SFI values calculated for the 2021 Thriving Places Index (Centre for Thriving Places, 2021), using the 2020 Annual Population Survey. It should be stressed that the SFI is not a pure measure of social fragmentation, but rather a measure of demographic conditions which are typically associated with social fragmentation (as demonstrated in Congdon, 1996; Curtis et al., 2019).

Control variables

Following previous studies on the predictors of COVID-19 incidence rates, we controlled for the following:

- Index of Multiple Deprivation (2019, as the IMD is calculated differently in Wales, we only conducted this analysis for England). The precise indicator was the proportion of LSOAs within a local authority that were in the most deprived decile nationally (Ministry of Housing, Communities and Local Government, 2019).

[1] For example, local level averages for the question on neighbourhood trust correlates negatively with IMD, crime severity and social fragmentation with Rs of between -0.39 and -0.49 and positively with election turnout, volunteering rates and average subjective life satisfaction with Rs of between 0.41 and 0.46.

- Population density (people per sq. km, 2020 mid year estimates) (Office for National Statistics, 2021)
- % aged 65 or over (2019 mid year estimates) (Office for National Statistics, 2020b)

Dependent variables

The outcome variable was the **cumulative rate of COVID-19 cases** within a local authority (per 100,000 people) up until 12th January 2022, which was the latest data at the time of download. Cases were used rather than deaths, because we anticipated that social capital would be most relevant in terms of transmission of COVID (either by increasing the risk of transmission, or by increasing the likelihood to adopt social distancing measures). Social capital would be less likely to play a role in determining mortality, where one would expect demographic structure and underlying health conditions to be more important (El Mouhayyar et al., 2021). In terms of timing, 12th January 2022 was close to the time of the largest peak in COVID-19 cases in the UK, associated with the spread of the Omicron variant.

Analysis approach

Standard OLS regressions were conducted with the control variables entered first, and then the social capital variables considered using the stepwise entry function (with a p value of 0.05 as the entry threshold and 0.10 as removal threshold). This data-driven approach ensures that only the strongest predictors enter the model. By excluding variables that do not provide any additional explanatory power, it reduces the risk of collinearity distorting the results. One regression was conducted for England and Wales combined (without IMD) and another was conducted for just England (including IMD).

RESULTS

Figures 1 to 3 show the distributions of the dependent variable (COVID-19 rate) and two of the hypothesised predictors (neighbourhood attachment and civic engagement) across England and Wales.

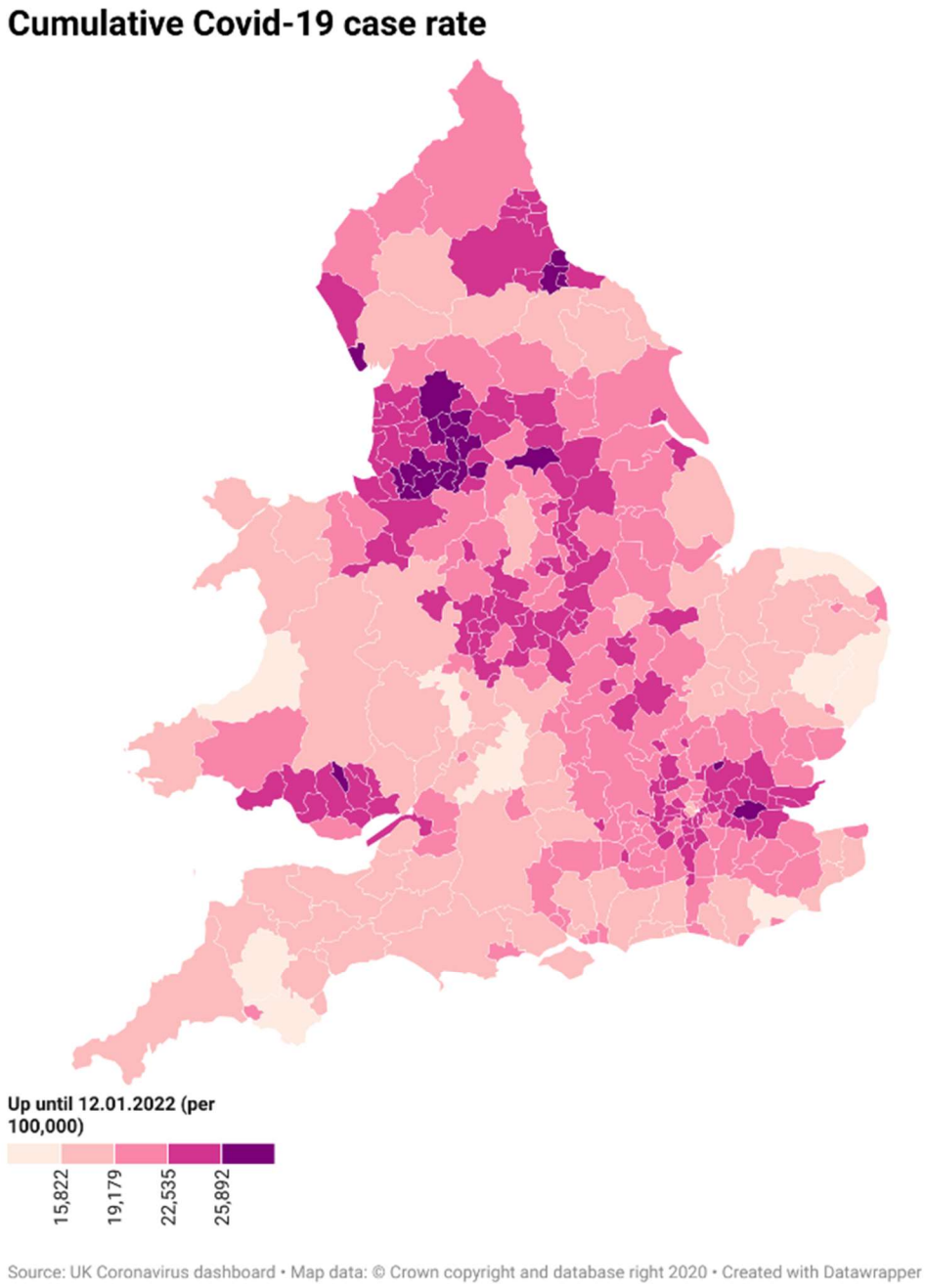

Figure 1: COVID-19 case rate across England and Wales

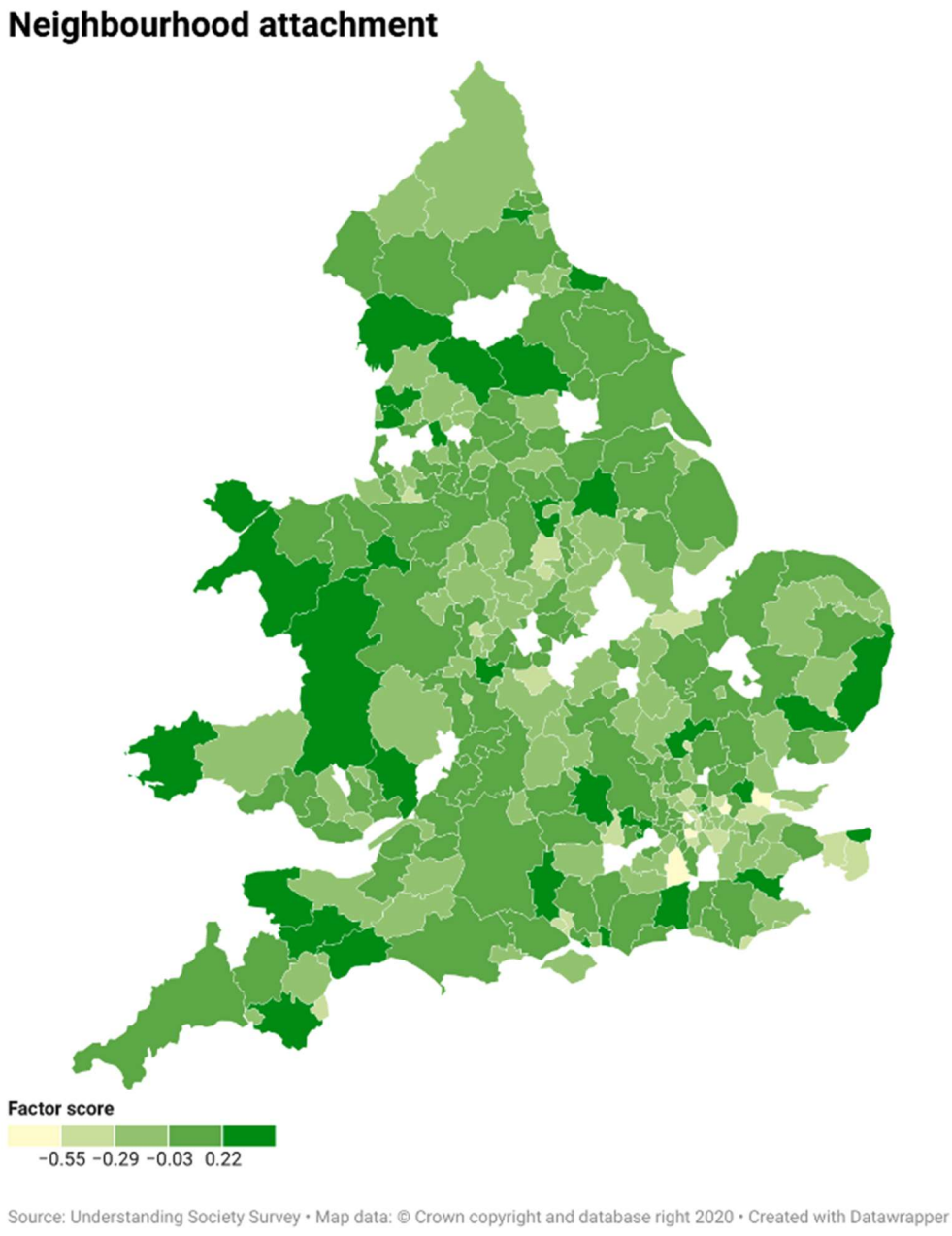

Figure 2: The neighbourhood attachment dimension of social capital across England and Wales

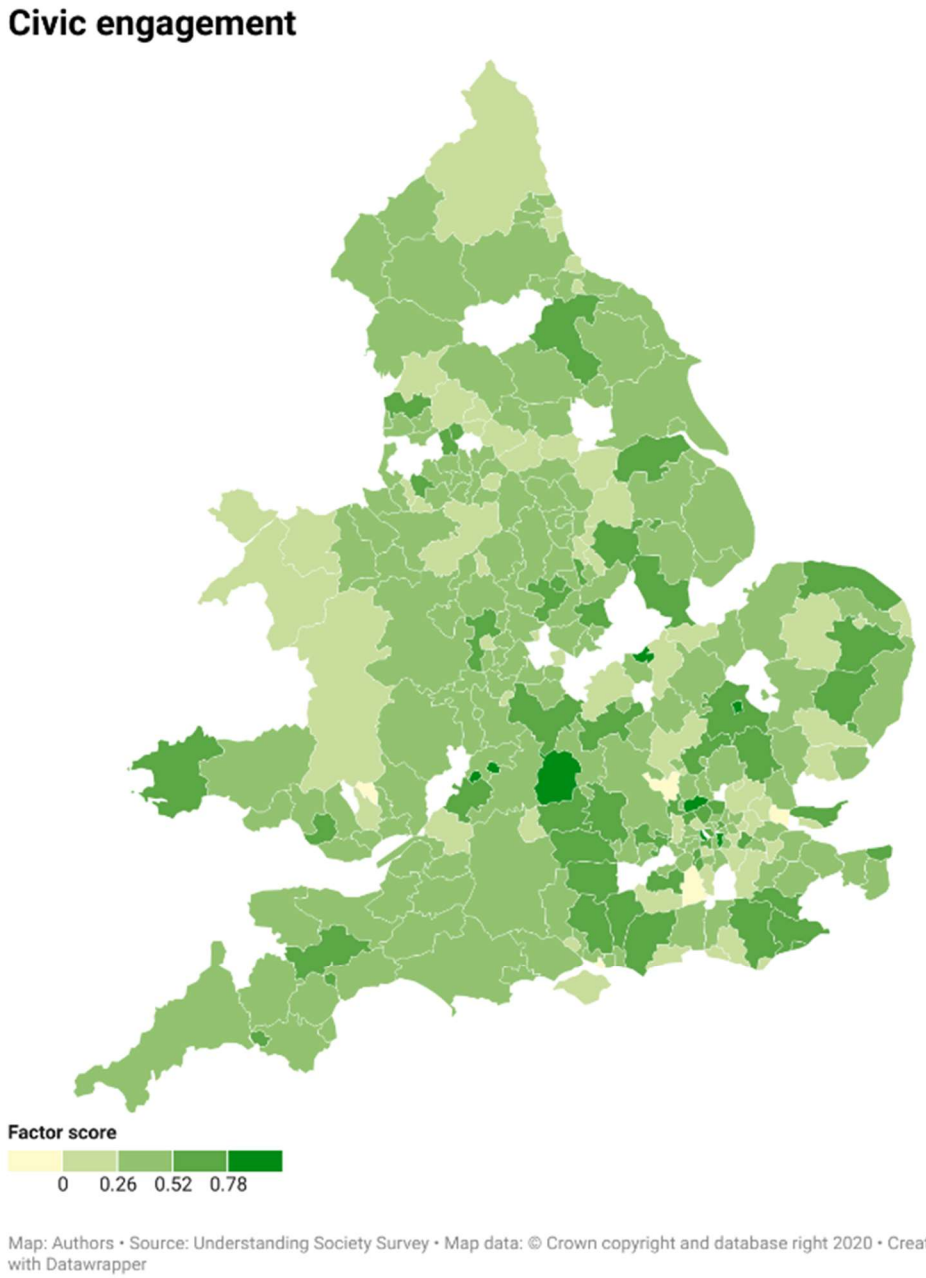

Figure 3: The civic engagement dimension of social capital across England and Wales

Table 1 presents the descriptive statistics for all the variables included in analyses as well as the bivariate correlations between them whilst Table 2 presents the results of the OLS regression both for England alone and England and Wales combined.

	Mean	SD	COVID-19 rate	Population density	Age 65+	IMD (England only)	Social fragmentation	Organisations	Friends	Civic duty	Neighbourhood attachment	Civic engagement
COVID-19 rate	21699	3107		.24**	-.57**	.49**	.12*	-.38**	-.13*	-.29**	-.18**	-.22**
Population density	1799	2657	.23**		-.71**	.08	.59**	-.02	-.06	.07	-.26**	.09
Age 65+	19.7%	4.9%	-.58**	-.71**		-.19**	-.46**	.15*	.10	.04	.33**	.00
IMD (England only)	7.8%	10.9%					.28*	-.47**	-.23**	-.41**	-.06	-.18**
Social fragmentation	-0.11	0.82	.13*	.58**	-.46**			-.06	-.03	-.05	-.13**	.07
Organisations	0.76	0.23	-.36**	-0.00	.13*		-.05		.40**	.51**	.27**	.20**
Friends	4.89	0.60	-.12*	-.06	.10		-.04	.38**		.38**	.22**	.14**
Civic duty	2.90	0.27	-.28**	.09	.03		-.05	.52**	.38**		.19**	.24**
Neighbourhood attachment	-0.03	0.21	-.20**	-.28**	.35**		-.16**	.24**	.23**	.15**		.10
Civic engagement	0.39	0.18	-.20**	.09	-.01		.06	.21**	.15**	.26**	.08	

Table 1: Descriptive statistics and bivariate correlations

Means and SDs are for the total dataset. Correlations under the diagonal are for the total dataset. Correlations above the diagonal are for England only. * Significant at 0.05 level ** Significant at 0.1 level

	Model 1: England & Wales			Model 2: England Only		
	Standardised Beta	t	Sig.	Standardised Beta	t	Sig.
Population density	-.28	-4.71	.000	-.16	-2.55	.011
% Aged 65+	-.76	-12.50	.000	-.70	-11.94	.000
IMD (England only)				.36	7.42	.000
Social fragmentation index				-.20	-3.86	.000
Civic engagement	-.12	-2.85	.005	-.11	-2.56	.011
Civic duty	-.11	-2.30	.022			
Organisation activity	-.18	-3.65	.000	-.10	-2.23	.027

Table 2: Regression results (Model 1: n = 300, Model 2: n = 280)

The strongest predictor of COVID-19 incidence rate was the percentage of the population aged 65 or over, with local authorities with higher percentages of older population having lower incidence rates. All else being equal the case rate decreased by 480 cases per 100,000 people for every percentage point increase in the old age population. That represents about a 2% decrease at the mean case rate for England and Wales.

Perhaps surprisingly, local authorities with denser populations had *lower* infection rates, once the age structure had been controlled for. Meanwhile, deprivation (measured using the English IMD) was associated with higher incidence rates.

Turning to the six social capital variables considered in the analyses, three entered the stepwise regression for England and Wales combined – **civic engagement, civic duty** and **organisation activity**. In all three cases, the three variables were associated with lower incidence rates. For example, an increase of 0.5 in the average number of types of organisations whose activities an individual is involved in (which represents approximately a 2 SD increase at the local authority level) was associated with a decrease in incidence rate of 1,230 per 100,000 people – a 6% decrease compared to the average rate for England and Wales.

When IMD was controlled for, and consequently only English authorities were considered, slightly different results emerged. **Organisation activity** and **civic engagement** still reduced incidence rates, although the effects were somewhat weaker, suggesting that some of the effect that was seen without controlling for IMD may be a result of the lower social capital (and higher COVID-19 incidence rates) in more deprived local authorities. **Civic duty** ceased to be significant. Exploring the information on excluded variables during each step of the regression, it can be seen that civic duty ceases to be a significant predictor once civic engagement – with which it correlates highly – is controlled for.

In the place of civic duty, another social capital variable emerges significant: the **social fragmentation index**. However, this had the opposite effect. Places with higher social fragmentation indices (i.e. those that can be expected based on demographics to have lower social capital) had *lower* COVID-19 incidence rates. Again, it should be noted that this negative relationship only emerges when controlling for other factors, most importantly the percentage aged 65+. Areas that have more older people tend to have much lower incidence rates and lower social fragmentation. However, if one is to take two areas with the same proportions of older people, the place with lower social fragmentation will have a higher incidence rate.

Neither of the two indicators of more informal social capital (neighbourhood attachment and friendship network) emerged as significant in either of the two main models. **Friendship network** almost reached the significance threshold in both models (p=.078 in Model 1, p=.077 in Model 2). In both cases, larger friendship networks were associated with higher COVID-19 incidence rates. The **neighbourhood attachment** index did not approximate significance in either model, but was significant in a model looking at England alone without the IMD. Again, in this case, higher neighbourhood attachment was associated with higher incidence rates (p=.050). In both these examples, relationships only became negatively and (marginally) significant once the other more formal social capital variables had been controlled for. In simple bivariate correlations, even informal social capital was associated significantly and positively with COVID-19 incidence rates.

DISCUSSION

Different types of social capital

The analyses reported here found that some forms of social capital at the local authority level consistently predicted a reduced cumulative incidence rate of COVID-19 in England and Wales – namely civic engagement and participation in organised activities. Civic duty, which was originally intended to be part of civic engagement, also predicted reduced COVID-19 rates but only when IMD was not included in the regression model. All these three variables can be considered forms of civic or institutionally-related social capital.

By contrast, the two measures of informal social capital – friendship networks and neighbourhood attachment – did not reduce incidence rates, once civic social capital had been controlled for. If anything, there was tentative evidence that they were associated with higher incidence rates.

This distinction in some ways echoes the results of a similar study looking at COVID-19 responses in counties in the USA (Ding et al., 2020). Ding et al. distinguish between two components of social capital. Community engagement includes the numbers of associations in an area, and the degree of participation in those associations. Commitment to broader social institutions includes voter turnout, census response and trust in institutions. The outcome they considered was the degree to which people responded to increasing case rates or social distancing orders (in other words an increasing COVID-19 threat) by staying at home (as measured by tracking mobile phone locations). They found that whilst commitment to broader social institutions strengthened the response to increasing COVID-19 threat, community engagement weakened it. They argue that this latter effect is because the downsides of social distancing are greater in communities where there is strong engagement, simply because there is more to lose.

However, Ding et al.'s (2020) distinction between community engagement and commitment to broader social institutions is not quite the same as our distinction between civic social capital and informal social capital. Indeed, our notion of civic social capital includes *both* Ding et al.'s dimensions – in particular, our measure of organisational activity is very similar to Ding et al.'s measure of community engagement. This means that, whilst at first glance it may seem to that our results corroborate Ding et al., the opposite is the case. Whereas Ding et al. found that community engagement through associations was related to a weaker response to

COVID-19, we found that places where organisational activity was greater had lower COVID-19 incidence rates.

There are many possible explanations for this difference which we cannot immediately address here. They may be due to different outcome measures (they used stay at home behaviour, whereas we used incidence rates), different contexts (USA vs. UK), different time frames (we used data until January 2022, whereas they used data from the first three months of the pandemic) or small differences in operationalisation (perhaps the organisations included in the Understanding Society questions are more 'institutional' than the associations considered in the data sources that Ding et al. use).

What can be said is that our findings support Ding et al.'s suggestion that more formal aspects of social capital are more likely to lead to more effective responses to the pandemic, whereas informal social relationships may have a more ambivalent effect.

Demographics and deprivation

Our results related to the control variables considered also contribute to the published evidence. Regarding the proportion of older people in a local area, our results are consistent with previous studies that have addressed this question (Ehlert, 2021; Mogi et al., 2020). When there are more older people in an area, case rates are likely to be lower. This may reflect differences in the degree of interactions between individuals before the pandemic – i.e. retired people may have contact with fewer people, primarily because they do not work. Or it may be due to the greater risk that older people face from COVID-19, which means they are more likely to take precautions to avoid getting infected.

The findings that denser (i.e. more urban) areas had lower incidence rates, once other variables are controlled for, is perhaps more surprising and contradicts some previous studies (Ehlert, 2021; Holmager et al., 2021). However, it is important to stress that the effect of population density was only negative once the percentage of the population aged 65+ was controlled for. The simple bivariate correlation between population density and incidence rate was actually positive. Bearing in mind that more urban areas have much younger populations, this suggests that the high incidence rates in those areas can be attributed to those younger populations, rather than the urban landscape per se. Rather, denser contexts may have made the presence of the pandemic more salient to residents, thus leading them to take more precautions.

It should be noted that the discrepancy between our findings and that of Ehlert (2021) are unlikely to be explainable by referring to other control variables – as they also controlled for the percentage of people over a certain age. Rather, the difference is more likely to be due to different time scales, given that they included incidences only up until June 2020. At that point, it is plausible to assume (and somewhat supported by Pana et al., 2021) that the spread of the virus across Europe was driven by international connectivity, which is higher in urban areas. As we have considered data up until the beginning of 2022, these initial patterns have become less important.

Lastly, it is worth noting the clear adverse effect of IMD, with higher deprivation leading to more COVID-19 cases. This is consistent with Ding et al. (2020), who found that people in higher income areas of the USA were more likely to respond to the pandemic by staying at home. It is also consistent with Office for National Statistics (2020a) findings regarding the much higher mortality rate in the most deprived areas. They point to the fact that urban conurbations displayed the highest mortality rates of all urban/rural classifications and that they "also make up a larger proportion of the most deprived areas than other classifications" (ibid.).

Implications for policy

The COVID-19 pandemic has resulted in reductions in freedom that have not been seen for decades, if not centuries, in many Western countries. We have been told where we can and cannot go, who we can and cannot see and even what we should wear. Compliance with these restrictions has been found to be critical in stemming the spread of the disease (e.g. Sartorius et al., 2021; Fischer et al., 2021), but is contingent on a minimal level of trust in the institutions who define the restrictions. It may also be contingent on a degree of common purpose with people in one's community.

We found that the three variables that relate to one's sense of trust and attachment to institutions in the country or local area (civic engagement, sense of duty to vote and organisational activity) lead to reduced incidence rates. This is consistent with previous studies that have demonstrated, at the individual level, that trust in government is associated with greater compliance with precautionary measures (e.g. Shanka & Menebo, 2022). What this body of evidence highlights is the importance of a healthy relationship between citizens and institutions in combatting pandemics such as COVID-19. Our findings suggest that this is not just about our relationship with government, but can also be about engagement with non-governmental institutions such as sports clubs, religious organisations and volunteering groups. Strengthening such groups may help in dealing with future public health challenges.

Caveats

Two caveats should be made with regards to the current findings. Firstly, it is very important to pay attention to the time frame for analyses. We have taken a long time frame approach – including all COVID-19 cases from the beginning of the pandemic till January 2022, which was the latest point for which we had data. Different findings may emerge if one takes a shorter time perspective or a longer one. If one wants to understand a long-term perspective though, then this study is a marked improvement over earlier studies which were only able to consider the first few months of the pandemic. At that point connectivity and short-term factors were likely to play a greater role in determining the spread of the pandemic.

Secondly, we are not able to claim definitively that the effects we have found are genuinely at the local level, rather than just an aggregation of individual level effects. Places with higher social capital had lower incidence rates, but this could simply be because *individuals* who have higher social capital are less likely to get infected and there are, by definition, more of those individuals in such places. This distinction cannot be tested with the data considered in this study because the outcome variable is case rates in a local area rather than individual risk of infection. However, at least in one other study (Wu, 2021), it has been demonstrated that local level effects operate above and beyond individual level effects. There is no reason to assume that the same wouldn't apply in the UK.

Conclusion

This analysis found that lower COVID-19 case rates were significantly predicted by two civic or institutionally-related social capital variables, that is organisation activity and civic engagement, whether the control variables were included in the model or not. More surprisingly, greater social fragmentation also predicted lower case rates when controlling for deprivation, population density and particularly percentage of the population aged 65+. In addition, neither of the two informal social capital variables, friendship networks and neighbourhood attachment, significantly predicted lower case rates, but was associated with higher rates albeit not significantly. Research from China and the USA finds somewhat similar results, suggesting that building positive relationships between citizens and local non-governmental organisations (e.g., sports, religious and volunteering groups) could strengthen responses to future pandemics.

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APPENDICES

Appendix I: Independent variables

The questions from the Understanding Society Survey (USS) which have been used to calculate each independent variable are listed below. More detail about the variables can be found by searching the variable codes given in capitals on the USS variable search page:
https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation

Neighbourhood Attachment – 8 questions (SCOPNGBH)

USS survey question: Here are some statements about neighbourhoods. Please answer how strongly you agree or disagree with each statement.

SCOPNGBHA: I feel like I belong to this neighbourhood.

SCOPNGBHB: The friendships and associations I have with other people in my neighbourhood mean a lot to me.

SCOPNGBHC: If I needed advice about something I could go to someone in my neighbourhood.

SCOPNGBHD: I borrow things and exchange favours with my neighbours.
SCOPNGBHE: I would be willing to work together with others on something to improve my neighbourhood.

SCOPNGBHF: I plan to remain a resident of this neighbourhood for a number of years.

SCOPNGBHG: I think of myself as similar to the people that live in this neighbourhood.

SCOPNGBHH: I regularly stop and talk with people in my neighbourhood.

Possible answers for all statements:

- Don't know
- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree

- Strongly disagree

Friendship Networks (CLOSENUM)

USS survey question: How many close friends?

Possible answers:

- Don't know
- Numeric value

Civic Engagement - 3 questions (DEMORIENT, POLEFF3 and POLEFF4)

USS survey question (DEMORIENT): On the whole, are you very satisfied, fairly satisfied, a little dissatisfied or very dissatisfied with the way democracy works in this country?

Possible answers:

- Don't know
- Very satisfied
- Fairly satisfied
- A little dissatisfied
- Very dissatisfied

USS survey question (POLEFF3): Public officials don't care much about what people like me think.

Possible answers:

- Don't know
- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

USS survey question (POLEFF4): People like me don't have any say in what the government does.

Possible answers:

- Don't know
- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree

- Strongly disagree

Civic Duty (CIVICDUTY)
USS survey question: Here are some questions about political issues. Do **you personally** agree or disagree...
First, I would be seriously neglecting my duty as a citizen if I didn't vote.

Possible answers:
- Don't know
- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Can't vote

Organisation activity (ORGA)
USS survey question: Whether you are a member or not, do you join in the activities of any of these organisations on a regular basis?

ORGA1 Political Party
ORGA2 Trade Unions
ORGA3 Environmental Group
ORGA4 Parents/School Association
ORGA5 Tenants/Residents Group
ORGA6 Religious/Church Organisation
ORGA7 Voluntary Services Group
ORGA8 Pensioners Group/Organisation
ORGA9 Scouts/Guides Organisation
ORGA10 Professional Organisation
ORGA11 Other Community Group
ORGA12 Social/Working Men's Club
ORGA13 Sports Club
ORGA14 WI/Townswomen's Guild
ORGA15 Women's Group/Fem Organisation
ORGA16 Other

Possible answers:
- Don't know

- Mentioned
- Not mentioned

Appendix II: Independent variable example

The table below provides an example of one of the questions from the Understanding Society Survey that was aggregated to calculate the independent variable Neighbourhood Attachment, as an example.

SCOPNGBHA: I feel like I belong to this neighbourhood.

Local Authority Code	Local Authority Name	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
E06000001	Hartlepool	25%	51%	20%	0%	4%
E06000002	Middlesbrough	16%	59%	21%	0%	3%
E06000003	Redcar and Cleveland	26%	44%	29%	2%	0%
E06000004	Stockton-on-Tees	18%	46%	29%	1%	5%
E06000005	Darlington	18%	43%	32%	2%	5%
E06000006	Halton	4%	47%	33%	16%	0%
E06000007	Warrington	16%	51%	27%	6%	0%
E06000008	Blackburn with Darwen	31%	40%	23%	6%	0%
E06000009	Blackpool	8%	50%	40%	2%	0%
E06000010	Kingston upon Hull	20%	34%	33%	4%	9%
E06000011	East Riding of Yorkshire	18%	41%	31%	7%	3%
E06000012	North East Lincolnshire	13%	44%	31%	1%	10%
E06000013	North Lincolnshire	30%	39%	18%	9%	5%
E06000014	York	19%	48%	27%	5%	2%
E06000015	Derby	11%	39%	39%	6%	5%
E06000016	Leicester	10%	41%	37%	8%	4%
E06000017	Rutland	*	*	*	*	*
E06000018	Nottingham	15%	36%	44%	3%	3%
E06000019	Herefordshire	11%	49%	30%	4%	4%
E06000020	Telford and Wrekin	10%	32%	44%	11%	3%
E06000021	Stoke-on-Trent	16%	39%	39%	2%	4%
E06000022	Bath and North East Somerset	14%	55%	22%	9%	0%
E06000023	Bristol	13%	46%	31%	5%	5%
E06000024	North Somerset	27%	45%	22%	3%	4%
E06000025	South Gloucestershire	15%	50%	28%	6%	1%
E06000026	Plymouth	14%	40%	30%	7%	8%
E06000027	Torbay	13%	24%	49%	13%	2%

E06000028	Bournemouth	15%	37%	36%	7%	5%
E06000029	Poole	16%	49%	30%	4%	2%
E06000030	Swindon	13%	42%	36%	7%	2%
E06000031	Peterborough	14%	48%	22%	3%	14%
E06000032	Luton	23%	43%	25%	5%	4%
E06000033	Southend-on-Sea	12%	29%	48%	8%	4%
E06000034	Thurrock	2%	39%	52%	2%	4%
E06000035	Medway	15%	28%	53%	3%	1%
E06000036	Bracknell Forest	21%	48%	23%	8%	0%
E06000037	West Berkshire	10%	55%	27%	7%	1%
E06000038	Reading	23%	34%	36%	3%	4%
E06000039	Slough	31%	32%	22%	16%	0%
E06000040	Windsor and Maidenhead	31%	55%	11%	1%	2%
E06000041	Wokingham	1%	43%	36%	17%	3%
E06000042	Milton Keynes	12%	43%	34%	8%	2%
E06000043	Brighton and Hove	17%	27%	44%	9%	2%
E06000044	Portsmouth	16%	29%	42%	11%	3%
E06000045	Southampton	9%	41%	30%	18%	2%
E06000046	Isle of Wight	13%	44%	37%	5%	0%
E06000047	County Durham	20%	44%	26%	8%	3%
E06000049	Cheshire East	23%	40%	32%	5%	1%
E06000050	Cheshire West and Chester	17%	45%	28%	8%	1%
E06000051	Shropshire	24%	48%	22%	6%	0%
E06000052	Cornwall	25%	38%	29%	5%	3%
E06000054	Wiltshire	20%	40%	35%	4%	1%
E06000055	Bedford	17%	35%	40%	4%	3%
E06000056	Central Bedfordshire	18%	39%	30%	8%	5%
E06000057	Northumberland	18%	37%	35%	4%	5%
E07000004	Aylesbury Vale	16%	46%	32%	4%	2%
E07000005	Chiltern	20%	46%	29%	2%	2%
E07000006	South Bucks	*	*	*	*	*
E07000007	Wycombe	12%	43%	40%	5%	0%
E07000008	Cambridge	28%	33%	24%	13%	2%
E07000009	East Cambridgeshire	*	*	*	*	*
E07000010	Fenland	17%	57%	21%	4%	0%
E07000011	Huntingdonshire	20%	50%	28%	1%	2%
E07000012	South Cambridgeshire	19%	53%	27%	0%	1%
E07000026	Allerdale	15%	55%	14%	16%	0%
E07000027	Barrow-in-Furness	*	*	*	*	*
E07000028	Carlisle	12%	37%	40%	9%	2%
E07000029	Copeland	43%	34%	20%	2%	2%
E07000030	Eden	25%	43%	28%	4%	0%
E07000031	South Lakeland	14%	61%	16%	6%	4%

E07000032	Amber Valley	10%	32%	41%	17%	0%
E07000033	Bolsover	11%	45%	36%	9%	0%
E07000034	Chesterfield	7%	49%	30%	8%	6%
E07000035	Derbyshire Dales	18%	50%	32%	0%	0%
E07000036	Erewash	14%	38%	41%	6%	2%
E07000037	High Peak	30%	44%	21%	3%	2%
E07000038	North East Derbyshire	26%	46%	24%	4%	1%
E07000039	South Derbyshire	18%	52%	20%	3%	8%
E07000040	East Devon	25%	35%	39%	1%	0%
E07000041	Exeter	17%	44%	33%	3%	3%
E07000042	Mid Devon	30%	46%	24%	0%	0%
E07000043	North Devon	25%	50%	17%	8%	0%
E07000044	South Hams	29%	47%	21%	3%	0%
E07000045	Teignbridge	23%	34%	34%	7%	3%
E07000046	Torridge	*	*	*	*	*
E07000047	West Devon	25%	39%	22%	5%	8%
E07000048	Christchurch	*	*	*	*	*
E07000049	East Dorset	23%	46%	23%	5%	4%
E07000050	North Dorset	16%	30%	45%	6%	3%
E07000051	Purbeck	*	*	*	*	*
E07000052	West Dorset	26%	55%	16%	3%	0%
E07000053	Weymouth and Portland	33%	43%	6%	19%	0%
E07000061	Eastbourne	2%	56%	34%	3%	5%
E07000062	Hastings	7%	47%	37%	2%	7%
E07000063	Lewes	25%	43%	20%	12%	0%
E07000064	Rother	23%	39%	35%	2%	0%
E07000065	Wealden	11%	59%	21%	7%	2%
E07000066	Basildon	14%	35%	27%	5%	19%
E07000067	Braintree	12%	44%	29%	8%	7%
E07000068	Brentwood	26%	55%	15%	3%	0%
E07000069	Castle Point	5%	48%	40%	0%	7%
E07000070	Chelmsford	19%	42%	27%	9%	4%
E07000071	Colchester	12%	59%	20%	6%	3%
E07000072	Epping Forest	28%	46%	17%	0%	9%
E07000073	Harlow	16%	48%	23%	14%	0%
E07000074	Maldon	*	*	*	*	*
E07000075	Rochford	14%	32%	42%	9%	4%
E07000076	Tendring	3%	50%	37%	4%	6%
E07000077	Uttlesford	20%	51%	24%	1%	4%
E07000078	Cheltenham	23%	45%	25%	7%	0%
E07000079	Cotswold	22%	53%	19%	0%	5%
E07000080	Forest of Dean	11%	47%	36%	3%	3%
E07000081	Gloucester	19%	41%	26%	5%	9%

E07000082	Stroud	23%	38%	24%	8%	7%
E07000083	Tewkesbury	20%	48%	25%	6%	1%
E07000084	Basingstoke and Deane	11%	35%	41%	11%	2%
E07000085	East Hampshire	17%	57%	18%	8%	0%
E07000086	Eastleigh	13%	34%	30%	15%	8%
E07000087	Fareham	20%	45%	30%	4%	2%
E07000088	Gosport	11%	67%	22%	0%	0%
E07000089	Hart	*	*	*	*	*
E07000090	Havant	19%	59%	22%	0%	0%
E07000091	New Forest	31%	40%	25%	3%	0%
E07000092	Rushmoor	*	*	*	*	*
E07000093	Test Valley	39%	37%	20%	0%	4%
E07000094	Winchester	16%	61%	17%	3%	4%
E07000095	Broxbourne	*	*	*	*	*
E07000096	Dacorum	11%	32%	43%	13%	0%
E07000098	Hertsmere	17%	48%	35%	0%	0%
E07000099	North Hertfordshire	28%	43%	25%	1%	2%
E07000102	Three Rivers	20%	41%	13%	13%	13%
E07000103	Watford	12%	70%	15%	0%	3%
E07000105	Ashford	5%	39%	51%	5%	0%
E07000106	Canterbury	11%	42%	25%	10%	12%
E07000107	Dartford	8%	49%	40%	4%	0%
E07000108	Dover	19%	24%	46%	10%	2%
E07000109	Gravesham	11%	44%	41%	5%	0%
E07000110	Maidstone	8%	50%	32%	8%	1%
E07000111	Sevenoaks	9%	37%	46%	2%	5%
E07000112	Shepway	24%	36%	27%	9%	4%
E07000113	Swale	20%	35%	40%	5%	0%
E07000114	Thanet	20%	66%	7%	7%	0%
E07000115	Tonbridge and Malling	9%	43%	39%	5%	4%
E07000116	Tunbridge Wells	16%	52%	25%	6%	0%
E07000117	Burnley	19%	34%	35%	12%	0%
E07000118	Chorley	*	*	*	*	*
E07000119	Fylde	26%	43%	29%	2%	0%
E07000120	Hyndburn	16%	14%	55%	15%	0%
E07000121	Lancaster	18%	27%	44%	5%	6%
E07000122	Pendle	11%	52%	27%	9%	1%
E07000123	Preston	6%	48%	36%	5%	4%
E07000124	Ribble Valley	16%	46%	22%	13%	2%
E07000125	Rossendale	*	*	*	*	*
E07000126	South Ribble	20%	36%	30%	11%	3%
E07000127	West Lancashire	*	*	*	*	*
E07000128	Wyre	34%	52%	12%	0%	1%

E07000129	Blaby	23%	36%	29%	12%	0%
E07000130	Charnwood	6%	59%	29%	5%	0%
E07000131	Harborough	*	*	*	*	*
E07000132	Hinckley and Bosworth	15%	33%	50%	0%	2%
E07000133	Melton	*	*	*	*	*
E07000134	North West Leicestershire	25%	40%	29%	1%	4%
E07000135	Oadby and Wigston	19%	69%	7%	5%	0%
E07000136	Boston	23%	42%	21%	6%	8%
E07000137	East Lindsey	16%	45%	30%	4%	5%
E07000138	Lincoln	17%	28%	34%	18%	4%
E07000139	North Kesteven	26%	48%	24%	3%	0%
E07000140	South Holland	31%	24%	30%	14%	0%
E07000141	South Kesteven	18%	34%	35%	7%	5%
E07000142	West Lindsey	22%	49%	18%	11%	0%
E07000143	Breckland	23%	32%	30%	11%	4%
E07000144	Broadland	12%	46%	33%	4%	5%
E07000145	Great Yarmouth	11%	38%	43%	4%	3%
E07000146	King's Lynn and West Norfolk	18%	38%	34%	10%	0%
E07000147	North Norfolk	20%	44%	27%	6%	3%
E07000148	Norwich	8%	34%	52%	5%	0%
E07000149	South Norfolk	23%	48%	21%	3%	5%
E07000150	Corby	14%	45%	26%	3%	12%
E07000151	Daventry	21%	28%	39%	11%	0%
E07000152	East Northamptonshire	9%	54%	34%	3%	0%
E07000153	Kettering	25%	40%	30%	5%	0%
E07000154	Northampton	10%	47%	31%	8%	4%
E07000155	South Northamptonshire	23%	36%	30%	11%	0%
E07000156	Wellingborough	*	*	*	*	*
E07000163	Craven	29%	50%	11%	10%	0%
E07000164	Hambleton	23%	43%	29%	0%	5%
E07000165	Harrogate	38%	36%	16%	8%	2%
E07000166	Richmondshire	*	*	*	*	*
E07000167	Ryedale	15%	53%	29%	4%	0%
E07000168	Scarborough	21%	37%	31%	9%	1%
E07000169	Selby	34%	48%	12%	6%	0%
E07000170	Ashfield	22%	29%	46%	3%	0%
E07000171	Bassetlaw	24%	51%	22%	3%	0%
E07000172	Broxtowe	20%	43%	35%	0%	2%
E07000173	Gedling	19%	33%	44%	4%	0%
E07000174	Mansfield	19%	32%	35%	14%	0%
E07000175	Newark and Sherwood	6%	59%	35%	0%	0%
E07000176	Rushcliffe	16%	41%	27%	12%	4%

E07000177	Cherwell	17%	26%	34%	15%	8%
E07000178	Oxford	16%	45%	33%	4%	3%
E07000179	South Oxfordshire	24%	63%	13%	0%	0%
E07000180	Vale of White Horse	16%	47%	33%	2%	2%
E07000181	West Oxfordshire	8%	45%	38%	9%	0%
E07000187	Mendip	19%	41%	27%	8%	5%
E07000188	Sedgemoor	18%	47%	33%	2%	0%
E07000189	South Somerset	16%	35%	38%	7%	3%
E07000190	Taunton Deane	13%	36%	31%	16%	4%
E07000191	West Somerset	*	*	*	*	*
E07000192	Cannock Chase	27%	32%	35%	4%	1%
E07000193	East Staffordshire	12%	43%	36%	9%	0%
E07000194	Lichfield	12%	35%	50%	3%	0%
E07000195	Newcastle-under-Lyme	10%	36%	41%	4%	8%
E07000196	South Staffordshire	24%	35%	35%	6%	0%
E07000197	Stafford	9%	43%	39%	4%	5%
E07000198	Staffordshire Moorlands	5%	59%	25%	6%	6%
E07000199	Tamworth	20%	43%	28%	9%	0%
E07000200	Babergh	25%	38%	33%	4%	0%
E07000201	Forest Heath	*	*	*	*	*
E07000202	Ipswich	3%	43%	38%	16%	1%
E07000203	Mid Suffolk	8%	46%	29%	12%	5%
E07000204	St Edmundsbury	27%	40%	30%	3%	0%
E07000205	Suffolk Coastal	33%	40%	24%	4%	0%
E07000206	Waveney	29%	36%	29%	5%	2%
E07000207	Elmbridge	22%	26%	41%	11%	0%
E07000208	Epsom and Ewell	22%	43%	33%	2%	0%
E07000209	Guildford	13%	37%	37%	8%	4%
E07000210	Mole Valley	10%	28%	39%	14%	9%
E07000211	Reigate and Banstead	11%	38%	39%	12%	0%
E07000212	Runnymede	*	*	*	*	*
E07000213	Spelthorne	17%	54%	26%	3%	0%
E07000214	Surrey Heath	*	*	*	*	*
E07000215	Tandridge	29%	67%	0%	3%	0%
E07000216	Waverley	20%	39%	31%	9%	0%
E07000217	Woking	16%	56%	21%	5%	2%
E07000218	North Warwickshire	*	*	*	*	*
E07000219	Nuneaton and Bedworth	23%	51%	24%	3%	0%
E07000220	Rugby	*	*	*	*	*
E07000221	Stratford-on-Avon	15%	47%	29%	3%	6%
E07000222	Warwick	14%	42%	30%	10%	5%
E07000223	Adur	*	*	*	*	*
E07000224	Arun	4%	56%	40%	0%	0%

E07000225	Chichester	29%	37%	30%	3%	0%
E07000226	Crawley	0%	57%	43%	0%	0%
E07000227	Horsham	14%	57%	25%	4%	0%
E07000228	Mid Sussex	16%	60%	24%	0%	0%
E07000229	Worthing	5%	45%	28%	12%	10%
E07000234	Bromsgrove	23%	47%	29%	0%	0%
E07000235	Malvern Hills	27%	39%	25%	7%	2%
E07000236	Redditch	14%	31%	48%	1%	5%
E07000237	Worcester	8%	27%	52%	3%	10%
E07000238	Wychavon	18%	35%	36%	8%	2%
E07000239	Wyre Forest	9%	43%	37%	7%	4%
E07000240	St Albans	23%	49%	22%	0%	6%
E07000241	Welwyn Hatfield	7%	47%	37%	9%	0%
E07000242	East Hertfordshire	25%	41%	25%	9%	0%
E07000243	Stevenage	15%	21%	57%	7%	0%
E08000001	Bolton	10%	52%	23%	11%	4%
E08000002	Bury	26%	42%	27%	5%	0%
E08000003	Manchester	25%	42%	26%	5%	2%
E08000004	Oldham	24%	42%	17%	12%	5%
E08000005	Rochdale	18%	40%	34%	5%	3%
E08000006	Salford	20%	42%	26%	7%	6%
E08000007	Stockport	27%	44%	23%	4%	1%
E08000008	Tameside	17%	44%	28%	9%	3%
E08000009	Trafford	21%	49%	25%	2%	3%
E08000010	Wigan	16%	46%	31%	7%	0%
E08000011	Knowsley	18%	36%	37%	5%	4%
E08000012	Liverpool	27%	42%	28%	2%	2%
E08000013	St. Helens	14%	47%	30%	6%	3%
E08000014	Sefton	21%	45%	30%	5%	0%
E08000015	Wirral	20%	38%	29%	9%	4%
E08000016	Barnsley	10%	56%	23%	3%	7%
E08000017	Doncaster	19%	35%	35%	8%	2%
E08000018	Rotherham	14%	46%	32%	3%	5%
E08000019	Sheffield	19%	47%	27%	4%	3%
E08000021	Newcastle upon Tyne	27%	31%	38%	3%	1%
E08000022	North Tyneside	22%	45%	31%	2%	0%
E08000023	South Tyneside	31%	39%	23%	5%	1%
E08000024	Sunderland	18%	47%	21%	6%	8%
E08000025	Birmingham	21%	39%	35%	4%	2%
E08000026	Coventry	19%	45%	32%	4%	0%
E08000027	Dudley	10%	36%	42%	7%	4%
E08000028	Sandwell	15%	43%	33%	7%	2%
E08000029	Solihull	28%	43%	22%	6%	2%

E08000030	Walsall	21%	34%	36%	9%	0%
E08000031	Wolverhampton	13%	41%	36%	9%	1%
E08000032	Bradford	19%	46%	27%	5%	3%
E08000033	Calderdale	12%	46%	32%	7%	2%
E08000034	Kirklees	24%	51%	19%	3%	3%
E08000035	Leeds	19%	44%	27%	6%	4%
E08000036	Wakefield	21%	37%	28%	9%	4%
E08000037	Gateshead	30%	48%	17%	5%	0%
E09000002	Barking and Dagenham	3%	28%	41%	23%	5%
E09000003	Barnet	11%	49%	24%	8%	8%
E09000004	Bexley	14%	33%	47%	5%	1%
E09000005	Brent	13%	55%	16%	5%	11%
E09000006	Bromley	11%	44%	28%	15%	2%
E09000007	Camden	11%	53%	23%	10%	2%
E09000008	Croydon	15%	38%	39%	6%	2%
E09000009	Ealing	22%	46%	31%	0%	1%
E09000010	Enfield	18%	50%	29%	4%	0%
E09000011	Greenwich	18%	40%	31%	3%	8%
E09000012	Hackney	46%	33%	13%	7%	1%
E09000013	Hammersmith and Fulham	10%	37%	22%	29%	2%
E09000014	Haringey	26%	35%	36%	1%	2%
E09000015	Harrow	17%	46%	24%	8%	5%
E09000016	Havering	13%	41%	36%	7%	3%
E09000017	Hillingdon	16%	55%	22%	6%	2%
E09000018	Hounslow	17%	40%	36%	6%	0%
E09000019	Islington	31%	48%	21%	0%	1%
E09000020	Kensington and Chelsea	28%	57%	15%	0%	0%
E09000021	Kingston upon Thames	12%	54%	27%	4%	3%
E09000022	Lambeth	16%	25%	46%	13%	0%
E09000023	Lewisham	23%	35%	32%	5%	4%
E09000024	Merton	10%	34%	21%	15%	21%
E09000025	Newham	16%	47%	24%	10%	4%
E09000026	Redbridge	9%	34%	41%	7%	9%
E09000027	Richmond upon Thames	34%	36%	25%	0%	4%
E09000028	Southwark	6%	61%	28%	5%	0%
E09000029	Sutton	9%	45%	32%	10%	3%
E09000030	Tower Hamlets	18%	45%	24%	10%	3%
E09000031	Waltham Forest	10%	50%	30%	10%	0%
E09000032	Wandsworth	23%	46%	23%	6%	1%
E09000033	Westminster	14%	45%	33%	0%	9%
W06000001	Isle of Anglesey	25%	53%	20%	0%	1%
W06000002	Gwynedd	35%	41%	22%	1%	2%
W06000003	Conwy	22%	28%	47%	3%	0%

W06000004	Denbighshire	31%	25%	41%	4%	0%
W06000005	Flintshire	18%	44%	27%	8%	3%
W06000006	Wrexham	25%	55%	10%	7%	2%
W06000008	Ceredigion	*	*	*	*	*
W06000009	Pembrokeshire	33%	34%	24%	8%	0%
W06000010	Carmarthenshire	14%	39%	39%	5%	4%
W06000011	Swansea	21%	44%	28%	5%	3%
W06000012	Neath Port Talbot	19%	43%	38%	1%	0%
W06000013	Bridgend	24%	39%	28%	4%	5%
W06000014	Vale of Glamorgan	7%	56%	33%	5%	0%
W06000015	Cardiff	18%	47%	28%	6%	0%
W06000016	Rhondda Cynon Taf	15%	30%	46%	1%	9%
W06000018	Caerphilly	23%	46%	21%	9%	1%
W06000019	Blaenau Gwent	24%	42%	19%	14%	1%
W06000020	Torfaen	30%	37%	29%	0%	4%
W06000021	Monmouthshire	35%	37%	19%	9%	0%
W06000022	Newport	29%	35%	27%	9%	0%
W06000023	Powys	33%	42%	19%	4%	2%
W06000024	Merthyr Tydfil	19%	57%	20%	4%	0%