

Generations Apart?

The growth of age segregation in England and Wales

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The Intergenerational Foundation (www.if.org.uk) is an independent, non-party-political charity that exists to protect the rights of younger and future generations in British policy-making. While increasing longevity is to be welcomed, our changing national demographic and expectations of entitlement are placing increasingly heavy burdens on younger and future generations. From housing, health and education to employment, taxation, pensions, voting, spending and environmental degradation, younger generations are under increasing pressure to maintain the intergenerational compact whilst losing out disproportionately to older, wealthier cohorts. IF questions this status quo, calling instead for sustainable long-term policies that are fair to all – the old, the young and those to come.

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Executive summary

- Increasing age segregation is driving the generations apart, shows new and original analysis by the Intergenerational Foundation.
- This phenomenon is bad for society because it undermines solidarity between the generations, hinders care of the elderly, exacerbates loneliness and marginalizes young people. It is also contributing to a general increase in segregation by age group, social class and ethnicity that is estimated to cost the UK economy **£6 billion each year**.
- This original research has found that **rural areas have aged nearly twice as rapidly as urban ones over the past 25 years**, as cities have become magnets for young people.
- It shows that age segregation has also got worse *within* our 25 biggest cities, where **over half of over-65s would now have to relocate for different age groups to be evenly spread out**.
- It found that children are no longer growing up in the same areas where retirees are growing old, undermining mixed-age communities – **for the typical child in these 25 largest cities, just 5% of their neighbours are now over 65**.
- It demonstrates that the pattern of large cities having a youthful core surrounded by ageing suburbs has become more concentrated as young people can no longer afford to move out.
- The rise in the number of students over the last 25 years has particularly increased segregation: **it is worst in university cities, with the two most-segregated cities being Brighton and Cardiff**.
- Changes in the housing market are another key cause of the rise in age segregation, but this is reversible if policy-makers target "mixed-age communities".
- One option IF has previously championed would be **making it easier for older homeowners to subdivide their properties**, creating smaller units which could be sold or rented to younger households.
- We also need to encourage older people to stay in their urban communities by creating suitable homes for them to downsize into.
- We need to avoid creating neighbourhoods where the housing is only suitable for one age group.



1. Introduction – Why does age segregation matter?

“Integration increases trust, and trust increases a society’s capacity to solve problems. Without action to promote greater integration, the danger grows that in the face of the many and complex challenges of the future, instead of asking ‘how can we solve this together?’, the people of the UK will ask ‘who can we blame?’”

The Social Integration Commission (2014)¹

Most forms of social segregation – whether by gender, religion, race or wealth – are generally the targets of criticism in contemporary Britain. This is despite the fact that segregation between different groups within society, especially the divide between rich and poor, have become significantly more pronounced since the 1970s.² However, one aspect of this phenomenon which has received relatively little attention has been the increase in segregation between different age groups. As the social geographer Professor Danny Dorling has argued, “forty years ago there was a wider social mix of population living in most areas of Britain in terms of age, lifestyle, work and social class... However, today communities tend to be more geographically polarised: we tend now more to live alongside people with similar age, economic and lifestyle status.”³ Therefore the purpose of this research report is threefold: to argue that age segregation is a negative phenomenon which has a number of undesirable consequences for our society, to provide an accurate picture of the current state of age segregation in England and Wales, and to propose some potential remedies that seek to facilitate genuinely intergenerational communities.

What is age segregation?

Simply put, age segregation is the division of individuals within society on the basis of their age. Unlike the other types of segregation which were referred to above, many forms of age segregation are actively endorsed because they are seen as natural and beneficial: for example, dividing children on the basis of age for schooling and in competitive sport. It has been argued that age segregation has become one of the characteristic features of 20th and 21st century Western society, as the demise of multi-generational activities such as churchgoing has meant many people now spend much of their lives within educational institutions and workplaces where they are surrounded by people of similar ages to themselves.⁴ Unsurprisingly in this context, most people socialize largely with people who are of a similar age to them.

¹The Social Integration Commission (2014) *2nd Report – Social integration: A wake-up call* London: Social Integration Commission

² Dorling et al. (2008) *Changing UK: The way we live now* Sheffield: The University of Sheffield

³ Ibid.

⁴ Hagestad, G. and Uhlenberg, P. (2006) “Should We Be Concerned about Age Segregation? Some Theoretical and Empirical Explorations” *Research on Aging*, 28(6), 638–53



The Social Integration Commission found from their recent survey of 4,269 people that the average Briton engages in 42% fewer social interactions with people of different ages to themselves than they would if their social contacts were distributed evenly across the age range, rising to 54% if you exclude social interactions occurring within families.⁵

Government policy also often tacitly endorses age segregation by being designed to address the needs of specific age groups, particularly policy towards the built environment (e.g. “community safety initiatives targeting young people (stereotypically associated with ‘anti-social’ behaviour) or older people (stereotypically associated with being fearful and vulnerable)”).⁶ Given the general acceptance of age segregation within society, spatial patterns of age segregation have generally been viewed as benign by demographers, as they are often seen as the outcome of people’s personal choices to live with who they want.⁷ However, there now appears to be an increasing awareness of the importance of geographical age segregation in both Europe and America, and the issues which this raises for policy in these ageing societies.

What do we know about age segregation?

Some extreme examples of age segregation have received attention from the media in recent years: a 2015 *Guardian* article reported on the village of Nagoro in rural Japan, where the 35 remaining elderly residents have erected 160 life-sized dolls to compensate for the absence of young people,⁸ while attention has also been drawn to the 6,000 villages in Italy which are officially “extinct” and a further 15,000 that have lost over 90% of their populations, often leaving only the elderly behind.⁹

The relatively small volume of previous academic research into age segregation has suggested it is a significant and growing phenomenon in many Western countries. The University of Sheffield’s *Changing UK: The way we live now* project reported in 2008 that, applying the Index of Dissimilarity (see next section) to Great Britain as a whole, the number of people who would have to move neighbourhood to achieve an equal spread of different age groups across the country rose by over 1 million between 1971 and 2006 to 4.3 million. This research also suggested that the growing trend towards age segregation has unevenly affected different age groups – over-75s actually became slightly more evenly distributed among the general population between 1971 and 2006, whereas it was people in their 20s who experienced the largest increase in segregation.¹⁰ This finding was supported by a more recent

⁵ The Social Integration Commission (2014) *1st Report – How integrated is modern Britain?* London: Social Integration Commission

⁶ Johnston, L. and Titterton, V. (2015) *Sustainability learning review 2015: Linking Generations NI* Belfast: Queen’s University

⁷ Winkler, R. and Klaas, R. (2012) “Residential segregation by age in the United States” *Journal of Maps*, 8, 4, 374–8

⁸ McCurry, J. (2015) “In ageing Japanese village, dolls take place of dwindling population” *Guardian*, 7 January 2015

⁹ Marchetti, S. (2015) “Italy’s rural villages are dying out” *Politico* 28 April 2015

¹⁰ Dorling et al. (2008) *Changing UK: The way we live now* Sheffield: The University of Sheffield



analysis which showed that segregation between people aged under 50 and over 50 increased between 2001 and 2011 at both the neighbourhood and local authority scale.¹¹ Other researchers have identified similar patterns in both the Netherlands and the USA. The Dutch study¹² suggested that older people are significantly under-exposed to younger ones compared to what you would expect if the population interacted evenly (68% of the over-75s studied reported having no personal interactions with non-relatives under 35) and that living in an age-segregated neighbourhood was strongly related to a lack of contact with younger non-relatives. This finding was echoed by the American study¹³ which found that age segregation between pensioners and non-pensioners was about as significant as racial segregation between Caucasians and Hispanics.

In addition to demonstrating that age segregation exists and is getting worse, these studies have provided some other useful insights which point to its possible causes. Firstly, the American study referred to above also concluded that age segregation is correlated at both the macro- and micro-level (see next section); the researchers found that US states where the overall population profile is particularly elderly or youthful tended to have the most pronounced patterns of age segregation at the neighbourhood level.¹⁴ This suggests that in places where young or old are distinctly in the minority, they are more likely to end up clustering tightly together. Secondly, the existing research suggests that a person's social interactions tend to be shaped by the type of people who they are exposed to through proximity, especially among older people, who spend more of their time actually within their immediate neighbourhood than any other age group does.^{15,16} Although it seems perfectly intuitive, this is an important finding because it suggests that people form social relationships with the type of people who end up living near them, instead of actively seeking out certain types of people to socialise with; therefore, any form of segregation is likely to diminish the social contact between different groups. Thirdly, several of these researchers have argued that the UK's pattern of increasing age segregation is intimately connected with problems in the housing market, particularly the constraints over where younger people can afford to live which are created by rising house prices and the availability of particular types of housing in different areas.¹⁷ If age segregation is being driven by Britain's housing crisis then it is only by fixing the housing market that we are likely to find a solution.

¹¹ Graham, E. and Sabater, A. (2015) *Population change and housing across the lifecourse: Demographic perspectives, methodological challenges and emerging issues* ESRC Centre for Population Change, Working Paper Series; no. 64

¹² Uhlenberg, P. and Gierveld, J. (2004) "Age-segregation in later life: an examination of personal networks" *Ageing & Society* 24, 5–28

¹³ Winkler, R. and Klaas, R. (2012) "Residential segregation by age in the United States" *Journal of Maps*, 8, 4, 374–8

¹⁴ Ibid.

¹⁵ The Social Integration Commission (2014) *2nd Report – Social integration: A wake-up call* London: Social Integration Commission

¹⁶ Philipson, C. (2013) *How do we develop age-friendly strategies for our cities? Perspectives from research* Manchester: The University of Manchester

¹⁷ Graham, E. and Sabater, A. (2015) *Population change and housing across the lifecourse: Demographic perspectives, methodological challenges and emerging issues* ESRC Centre for Population Change, Working Paper Series; no. 64



Why does age segregation matter?

Geographical patterns of age segregation have tended to be seen as benign by demographers. It has even been argued that age segregation can benefit individuals by delivering “agglomeration” benefits which arise from large numbers of similar people sharing the same areas: “Families with young children will find benefits of networks and facilities, and mutual support as well as information, if they live in neighbourhoods with substantial numbers of families at the same stage in life. Young singles who eat out and have a taste for urban entertainment and culture will similarly find agglomeration economies in consumption if they find neighbourhoods in which large numbers of like-minded people are concentrated.”¹⁸

However, the majority of researchers who have investigated age segregation have concluded that it is a problem, and that mixed-aged communities are preferable to age-segregated ones. Specifically, it has been argued that age-segregation has the following drawbacks for society:

Economic Costs

The Social Integration Commission argued in 2014 that the three dimensions of segregation which it analysed – age, ethnicity and socio-economic status – impose a combined cost of £6 billion per year on the UK economy.¹⁹ This is generated largely by the combined impacts of higher unemployment (due to people in segregated communities not having access to the right kind of personal networks to find job opportunities) and higher health and social care costs (from people having fewer social connections and feeling higher levels of anxiety towards their surroundings). It is also likely that age segregation creates economic inefficiencies. For example, it has been demonstrated (as you would expect) that parents and their adult children provide fewer services for each other, such as childcare and help with ageing-related health problems, if they live further apart.²⁰ Therefore, age segregation seems likely to impose higher costs on individuals if they have to purchase these services privately (or forgo them instead) because their families do not live in close enough proximity provide them.

Social Costs

One of the main negative impacts of age segregation is that it undermines trust and solidarity between different generations by reducing the amount of social contact between them. Research has shown that this reduces social capital by making younger and older people feel that the other is more “alien.”²¹ This is likely to be because a lack of face-to-face social contact between different groups has also been

¹⁸ Cheshire, P. (2007) *Segregated neighbourhoods and mixed communities - A critical analysis* York: Joseph Rowntree Foundation

¹⁹ The Social Integration Commission (2014) *2nd Report – Social integration: A wake-up call* London: Social Integration Commission

²⁰ Chan, T.W. and Ermisch, J.F. (2011) *Intergenerational exchange of instrumental support: dynamic evidence from the British Household Panel Survey* Paper presented at the British Society for Population Studies, University of York

²¹ Jones, R. L. (2011) “Imagining old age” In: Katz, J.; Peace, S. and Spurr, S. eds. *Adult lives: A life course perspective* Bristol: Policy Press, 18–26



shown to result in more people relying on media stereotypes to form their impressions of “others,” which are often negative.²² As it has been demonstrated that attitudes towards immigrants in the UK among native-born whites are less hostile in areas where more immigrants live (and vice-versa),²³ this could help to explain the results observed by IF’s previous research into attitudes between the generations in Britain, which found that the UK was the European country where older people had the least positive impression of the young.²⁴ A further related problem is that this lack of social contact between different generations “reduces opportunities for different age groups to share common goals and for intergenerational knowledge transfers, thus impeding the creation and maintenance of a generative society”²⁵ – so both young and old may be missing out on opportunities to learn from each other because they so seldom interact.

Political Costs

It has also been argued that age segregation has a negative impact on local and national politics by creating “increased competition between age groups for limited public and private resources to support the interests, agendas, services, and institutions that best meet their age-specific needs.”²⁶ Given that total public spending per capita is significantly higher for older people compared to working-age adults, increasing age segregation could lead to the flow of public resources becoming increasingly concentrated in more elderly areas. Another potential problem is that the greater propensity to vote among older people will prompt politicians to focus their attentions on more elderly areas, resulting in the marginalization of youthful ones.

²² The Social Integration Commission (2014) *2nd Report – Social integration: A wake-up call* London: Social Integration Commission

²³ Kaufmann, E. and Harris, G. (2015) “White Flight’ or Positive Contact? Local Diversity and Attitudes to Immigration in Britain” *Comparative Political Studies*, 48, 1563–90

²⁴ Leach, J. (2011) *The poor perception of young people in the UK* London: Intergenerational Foundation

²⁵ Graham, E. and Sabater, A. (2015) *Population change and housing across the lifecycle: Demographic perspectives, methodological challenges and emerging issues* ESRC Centre for Population Change, Working Paper Series; no. 64

²⁶ *Ibid.*



2. Outline methodology

This section provides a relatively brief overview of the project methodology. To read a more detailed account, please refer to Appendix 1.

All attempts to analyse segregation are complicated by the fact that it operates across multiple spatial scales, including both within small areas, such as the individual neighbourhoods that make up towns and cities (the “micro-level”), and between larger areas, such as a city and its surrounding rural hinterlands (the “macro-level”).²⁷ For example, it’s possible for a city to be very racially diverse, and yet consist of highly segregated neighbourhoods (which would make it segregated at the micro-level), or equally for a racially diverse city to have very well integrated neighbourhoods, and yet have neighbouring rural areas which are extremely un-diverse (so segregation is occurring at the macro-level between town and countryside). It has been argued that both types of segregation can be equally important, as “micro segregation depicts the daily interactions that individuals have within their immediate neighborhood, while macro segregation is more important for political decision-making and interactions that individuals are likely to have with one another shopping, visiting key neighborhood institutions, or at work.”²⁸ Therefore this project attempted to explore age segregation within England and Wales at each of these spatial scales in order to fully investigate what is happening.

Macro-level age segregation

Age segregation was investigated at the macro-level by using the 2011 Office for National Statistics (ONS) rural-urban classification to see if there were significant differences in the typical age profiles between rural and urban areas. This is the official system developed by the ONS for classifying a geographical unit as either “rural” or “urban” based on a combination of its population (a settlement required a minimum of 10,000 residents to be classified as urban) and its context (how sparsely its population is distributed).²⁹ On this basis, middle layer super output areas (MSOAs) (census-based geographical units containing 5,000–10,000 individuals) were classified into 8 groups, as shown in Fig.1.

The median ages (the midpoint within the age distribution) of different MSOAs were then compared to investigate the extent of rural-urban variation.

²⁷ Parisi, D.; Lichter, D.T. and Taquino, M.C. (2011) “Multi-Scale Residential Segregation: Black Exceptionalism and America’s Changing Color Line” *Social Forces*, 89(3), 829–52.

²⁸ Winkler, R. and Klaas, R. (2012) “Residential segregation by age in the United States” *Journal of Maps*, 8, 4, 374–8

²⁹ ONS (2013) *The 2011 Rural-Urban Classification for Small Area Geographies: A User Guide* Newport: ONS

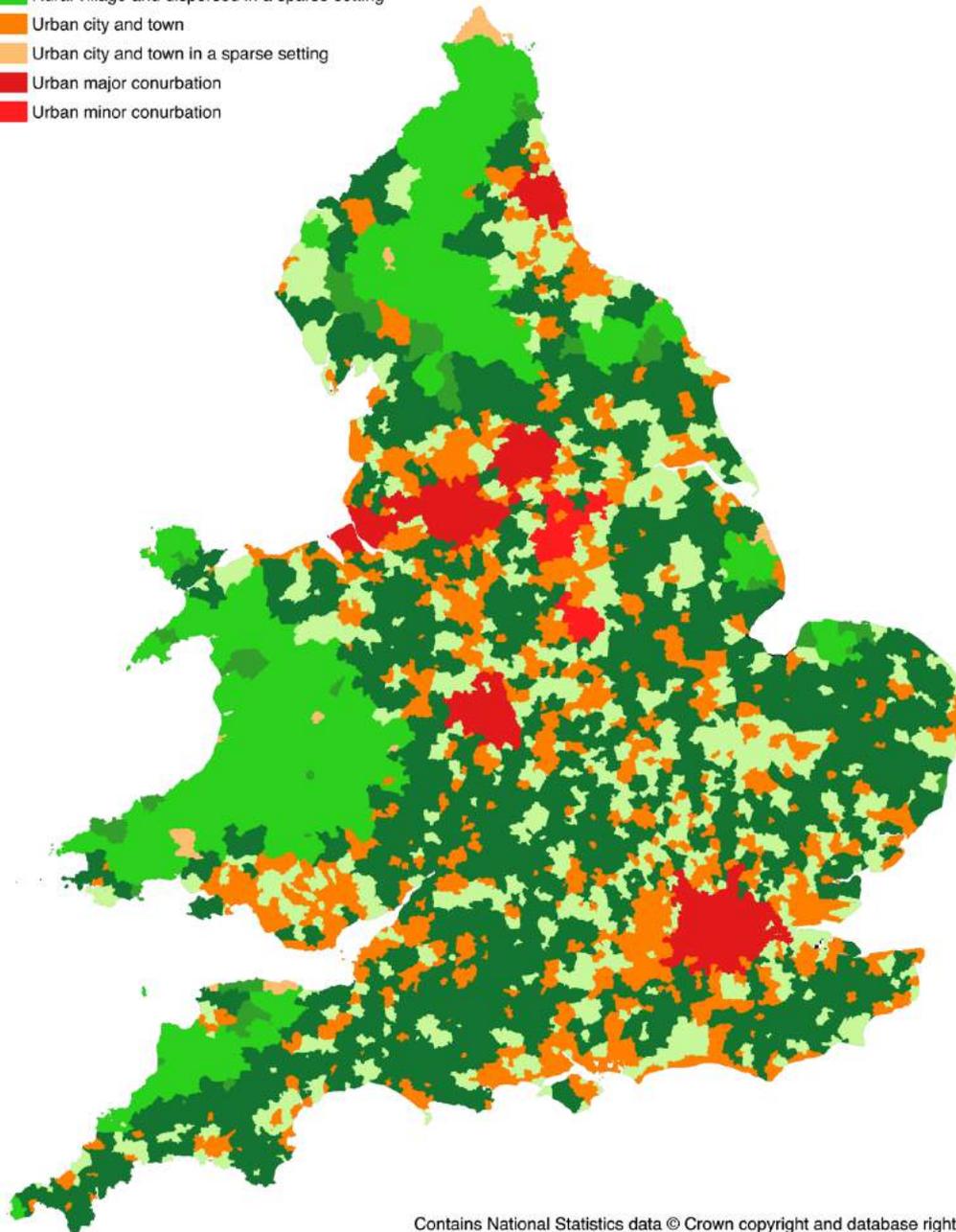


Legend

ONS 2011 MSOAs Rural-Urban Classification

- Rural town and fringe
- Rural town and fringe in a sparse setting
- Rural village and dispersed
- Rural village and dispersed in a sparse setting
- Urban city and town
- Urban city and town in a sparse setting
- Urban major conurbation
- Urban minor conurbation

0 50 100 150 200 km



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Fig.1 Map showing 2011 England and Wales MSOAs by their ONS rural-urban classification



Micro-level age segregation

Age segregation was explored at the micro-level by measuring how age-segregated individual neighbourhoods are within the 25 largest Primary Urban Areas (PUAs) by population in England and Wales (Fig.2) (PUAs are a way of defining city boundaries which attempts to capture the full extent of their built-up areas).³⁰

Three established techniques which were originally developed for measuring racial segregation in American cities were used:³¹

- **The Index of Dissimilarity** (which measures how many people would need to move from their current neighbourhood for them to be evenly distributed across the city);
- **The Index of Isolation** (which measures the percentage of a particular group's neighbours who belong to the same group);
- **The Index of Exposure** (which measures the percentage of one group's neighbours who belong to a different group).

As analysing the micro-level requires a finer level of detail than at the macro-level, estimates of the age profile of the population for lower layer super output areas (LSOAs) (subdivisions of MSOAs containing only 1,000–3,000 individuals) were used to calculate the above indexes, as a means of obtaining neighbourhood-level data on the age profile of the population.

Population estimates

This project used annual small-area population estimates from four previous years in order to investigate how age-segregation has changed over time: 1991, 2001, 2011 (the last three Census years) and 2014 (the most recent year for which small-area data were available). This required matching the pre-2011 data to the 2011 census MSOA and LSOA boundaries.³²

³⁰ Centre for Cities (2014) *Primary Urban Areas: Spatial definitions* London: Centre for Cities

³¹ Iceland, J. and Weinberg, D.H. (2002) *Racial and Ethnic Residential Segregation in the United States: 1980-2000* Suitland, Maryland: US Census Bureau

³² The author is grateful to Professor Paul Norman, University of Leeds, for permitting the use of his bespoke dataset of annual population estimates by sex and age for the period 1971–2001 which have been matched to the 2011 Census geography boundaries. To read a full description of this data source's methodology, see Appendix 1.

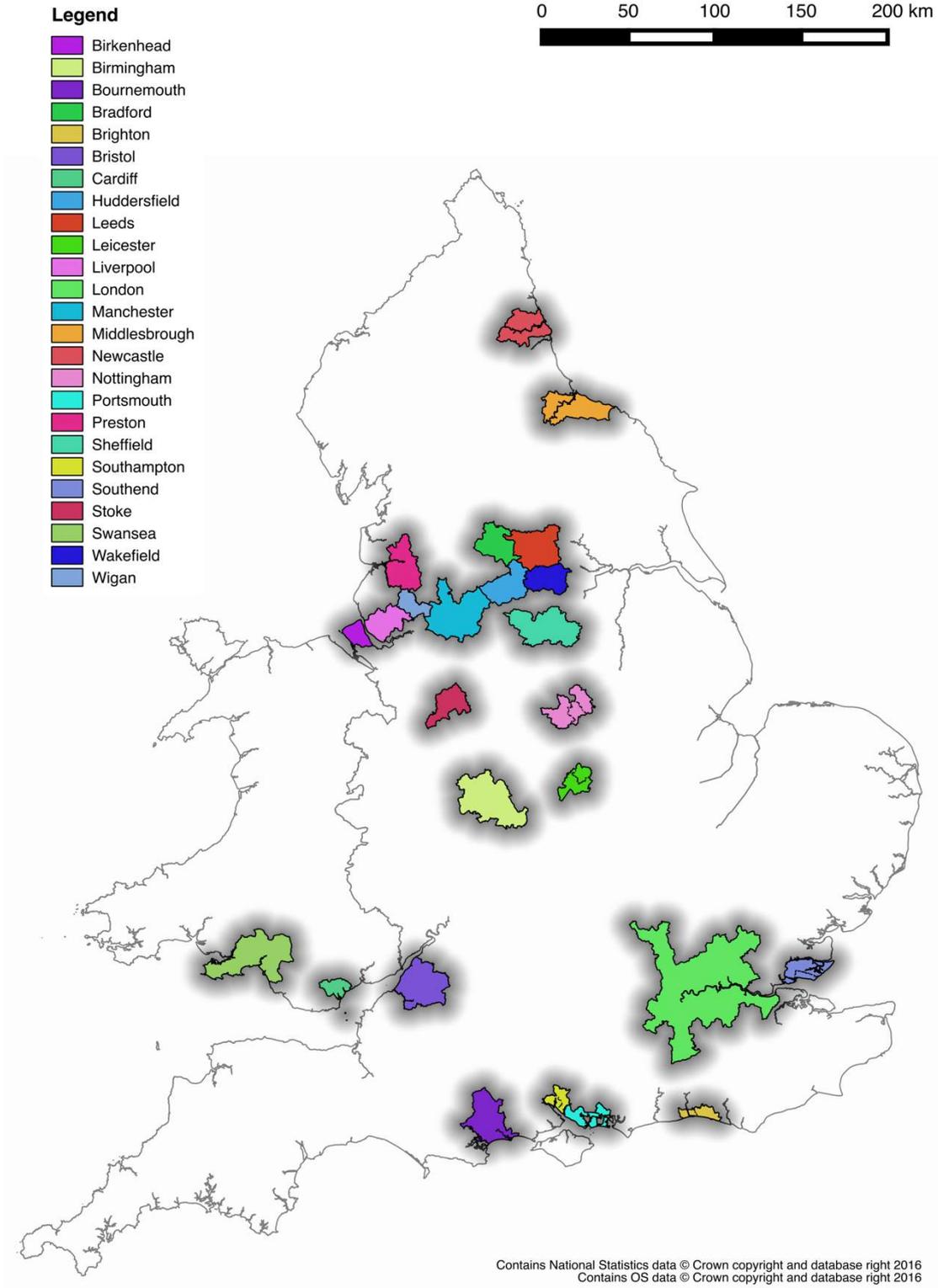


Fig.2 Map showing the 25 largest urban areas in England and Wales by population



3. Research findings

The results of this research are presented below for both the macro- and micro-scales.

a) Macro-level: The growing rural/urban divide

This analysis confirmed that there is a significant and rapidly-growing divide between the age profiles of rural and urban areas, as previous research has suggested.³³ This project's most original finding was that during the 24 years between 1991 and 2014, the median age of rural areas rose almost twice as rapidly as the median age of urban ones.

Fig.3 displays each MSOA with shading that reflects its median age in 2014. Although it may not be easy to detect at this resolution, it is characterised by a clear pattern: places with the highest median ages are predominantly in rural parts of the country, particularly around coastal areas, while urban MSOAs stand out for being more youthful. There is also evidence of a north-south divide, as the broader south east surrounding London contains a number of lighter MSOAs – which represent comparatively youthful smaller towns and cities in the region such as Watford, Milton Keynes and Cambridge – whereas the MSOAs which are outside the large northern cities appear to be shaded darker. This pattern supports the finding from previous studies that there is a substantial net inflow of internal migrants who are in their 20s from northern towns and cities to London, while the out-flow of former London residents in their 20s and 30s tends to be to other towns in the south east.³⁴

Fig.4 emphasize these patterns in more detail by zooming in on London and Liverpool and Manchester. In London's case (which is shown with its official administrative boundaries highlighted, rather than the boundaries of its PUA), the inner-city boroughs appear strikingly youthful compared to most of the more suburban outer-London ones, with large swathes of east inner-London consisting entirely of neighbourhoods where half the population is under 25. To a large extent this can be explained by inner-London's diversity, with these areas being home to large communities of non-white ethnic groups (particularly Bangladeshis and Pakistanis) which have a significantly more youthful population profile than the national average.³⁵

³³ ONS (2013) *2011 Census Analysis - Comparing Rural and Urban Areas of England and Wales* Newport: ONS

³⁴ Centre for Cities (2014) *Cities Outlook 2014* London: Centre for Cities

³⁵ Greater London Authority (2013) *Diversity in London* London: GLA

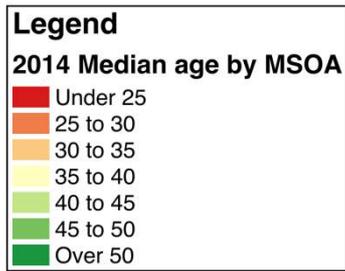


The map displaying the median ages for MSOAs around Liverpool and Manchester has been overlaid with the outlines of their “built-up areas” recorded at the 2011 census.³⁶

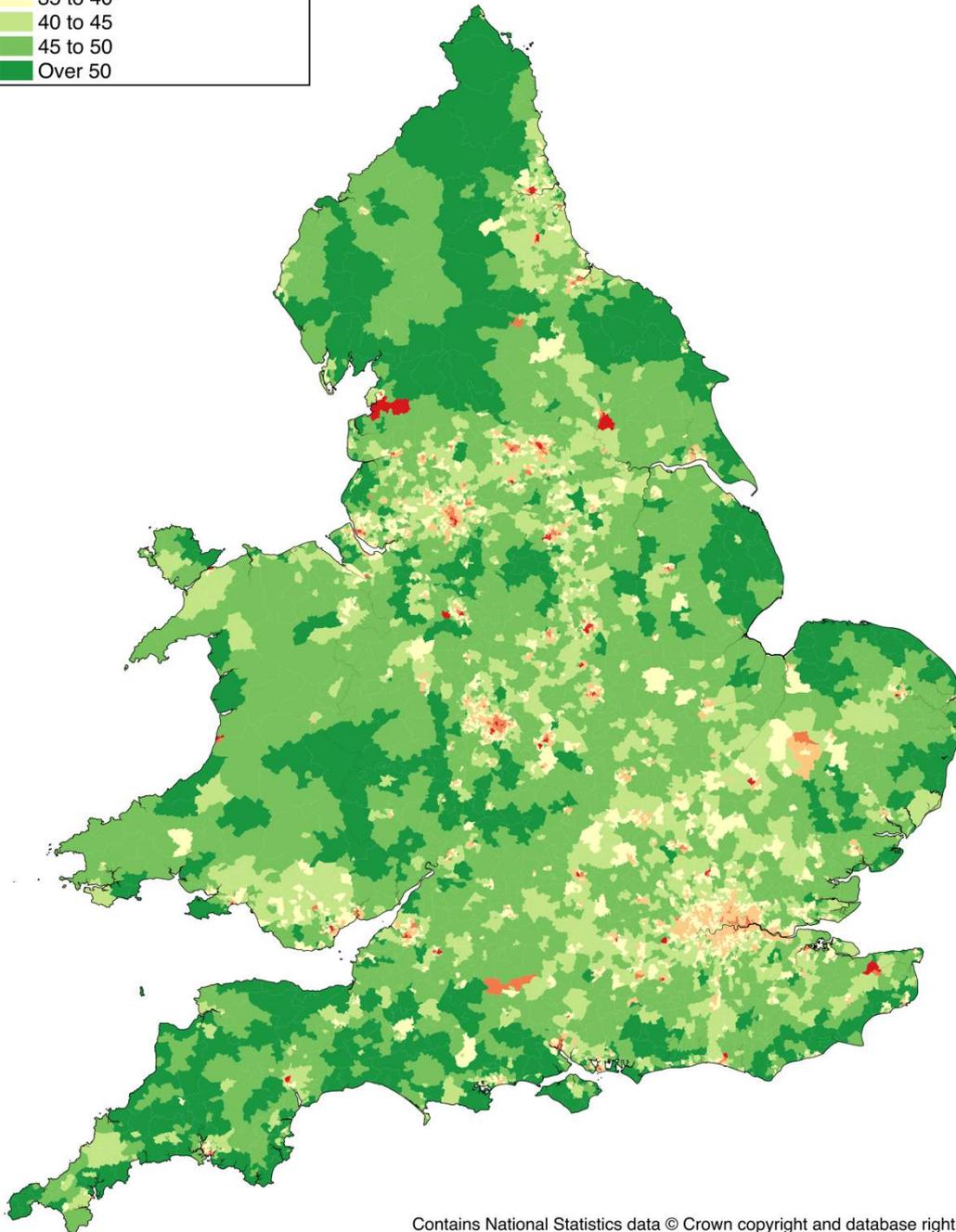
This reveals a pattern which was repeated in almost every significant built-up area in England and Wales; a cluster of extremely youthful neighbourhoods in the city’s core, from which neighbourhoods with higher median ages gradually radiate outwards. In other words, this map illustrates starkly that there is both a rural-urban divide between cities and their surrounding countryside, and also that neighbourhoods in the middle of cities tend to be significantly more youthful than suburban ones. This is likely to have a number of explanations which will be considered in more detail further on, but possible causes are likely to include the growth of private renting in city centres among students and young families who can no longer afford to move to the suburbs, larger concentrations in city centres of immigrant and non-white ethnic groups which have high fertility, and the regeneration of city centre areas which has made them more attractive places for younger people to live.

One of the starkest examples of the differences between urban and rural areas can be seen in the distribution of where MSOAs with a median age of over 50 are located (shown in Fig.5). These have been highlighted alongside the built-up areas in England and Wales in order to demonstrate that they are predominantly clustered in the less urban parts of the country, such as Cornwall, along England’s east coast, in Cumbria and in the Cotswolds. This pattern is likely to be explained by a combination of young people being drawn away from these areas towards the cities (as mentioned above), and also older people choosing to move to them for their retirements.

³⁶ Built-up areas” are a way of classifying developed pieces of land which are larger than 20 hectares and not separated by gaps of more than 200m (ONS (2013) *2011 Built-up areas: methodology and guidance* Newport: ONS)



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Fig.3 Map showing the 2014 median age of every MSOA in England and Wales

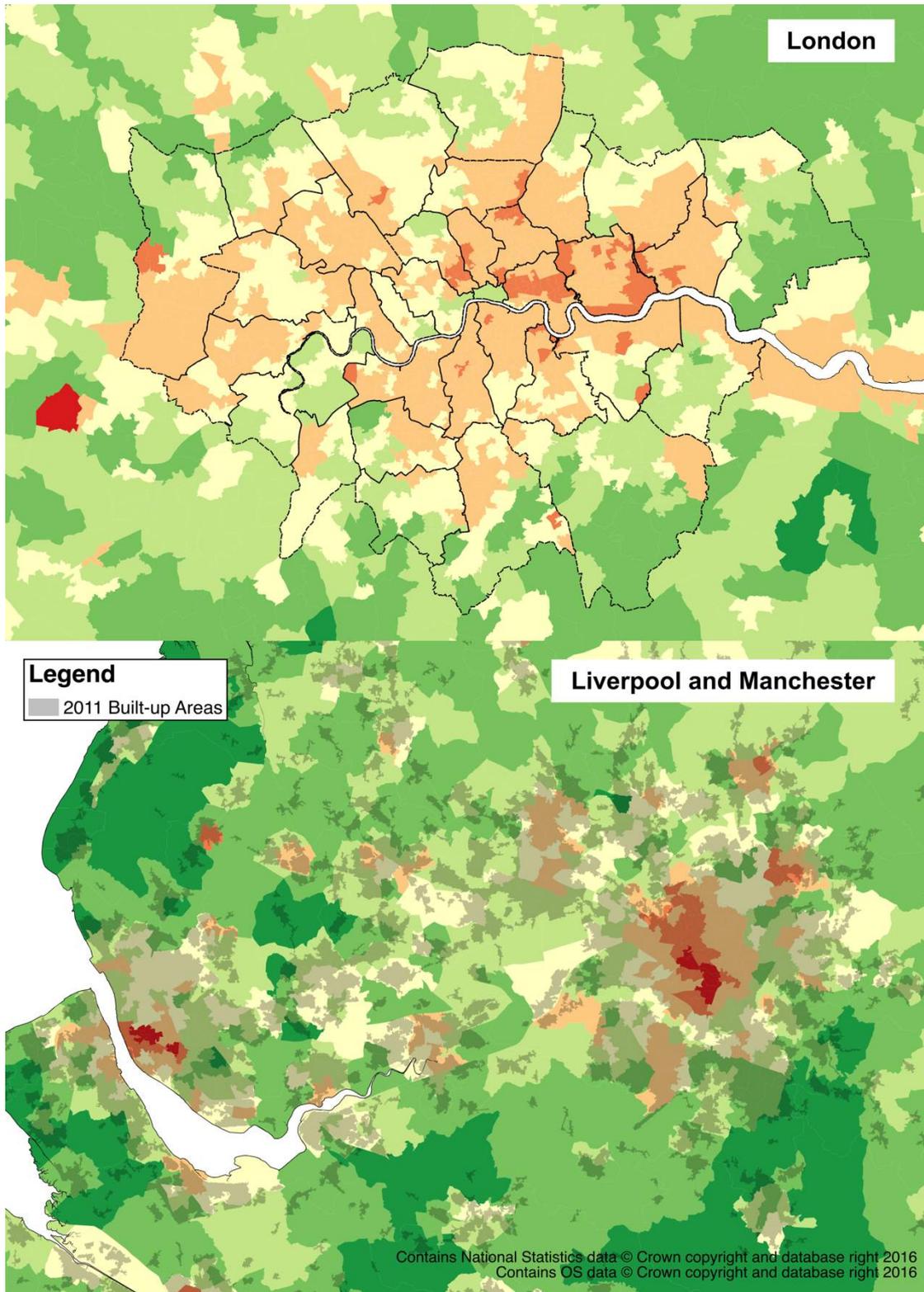
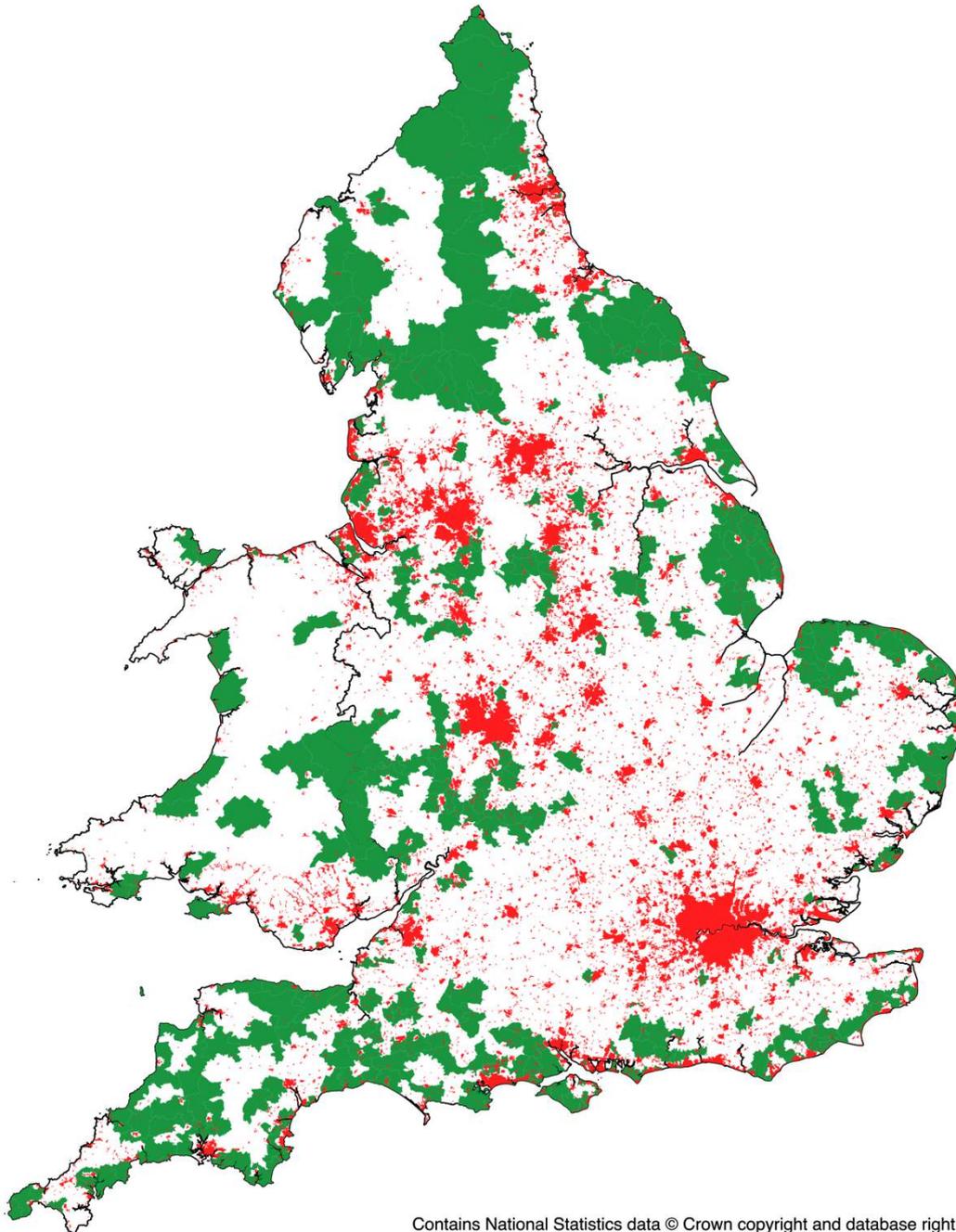


Fig.4 Higher resolution extracts from Fig.3 showing London, and Liverpool and Manchester



Legend
■ 2011 Built-up Areas
■ 2014 Median age by MSA

England & Wales



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Fig.5 Map showing MSAOs with a median age of 50+ in relation to built-up areas



The picture shown in Fig.5 has changed quite dramatically over time. Of the 7,201 MSOAs in England and Wales, just 65 of them had a median age of over 50 in 1991 (of which 47 were urban areas), whereas by 2014 this had risen to 487 (of which 60% were in rural areas). It is especially interesting to compare this trend to the trend for MSOAs with a median age below 30, which have *decreased* in number from 621 in 1991 to 337 in 2014 (virtually all of which are urban). This is shown below in Fig.6:

Where are the "youngest" and "oldest" neighbourhoods?

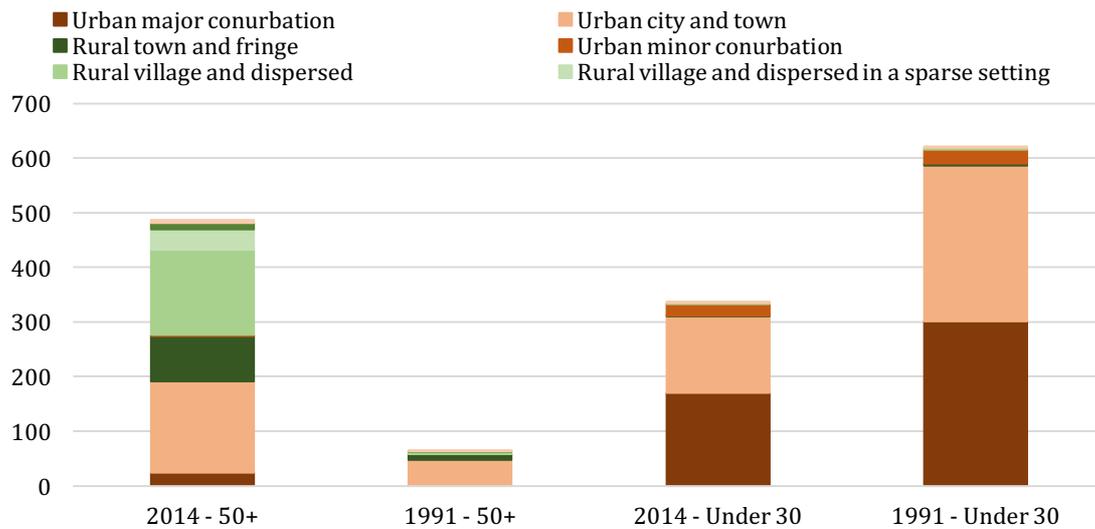


Fig.6 Comparison between the number of MSOAs with a median age of 50+ and under 30 in 1991 and 2014

The overall pattern of change of over time between 1991 and 2014 has been that the median age of most MSOAs across the country has risen slightly, but there are significant exceptions – particularly inner-city areas which have become more youthful and certain rural areas which have got older.

Nationally, the median age of the typical MSOA rose by 4 years between 1991 and 2014, but while the typical urban MSOA also saw its median age increase by 4 years, for the typical rural MSOA it went up by 7 years – so rural areas have aged almost twice as quickly as urban ones. The exact breakdown between all the different rural and urban classifications are shown below in Fig.7:



How quickly have different types of neighbourhoods been ageing?

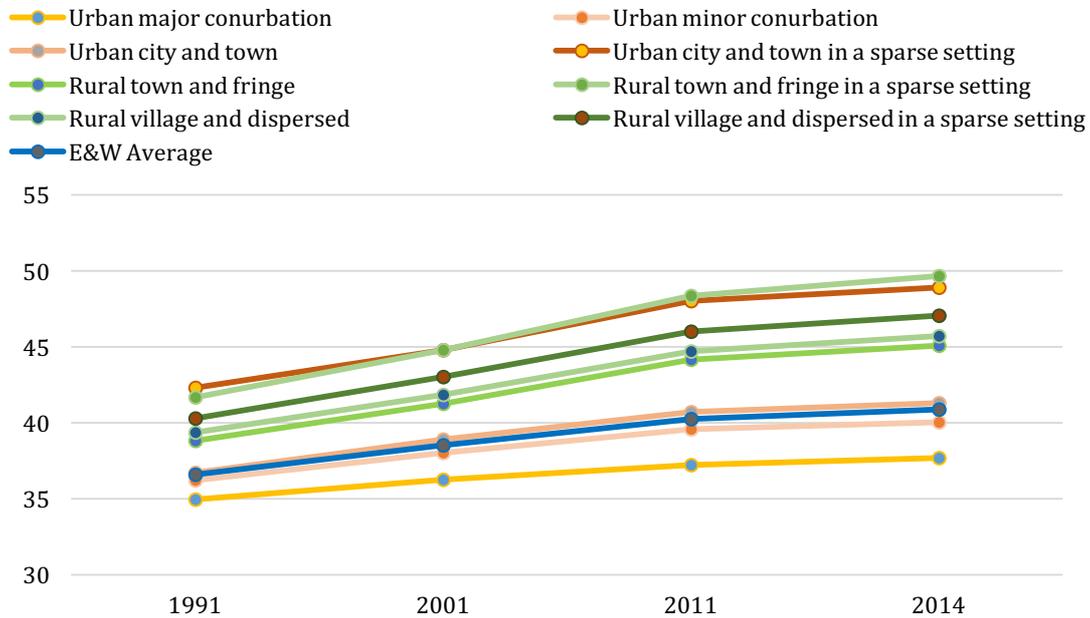


Fig. 7 Median age of different rural-urban classifications over time

What's particularly striking about Fig.7 is the extent to which the divergence between the different rural-urban classifications has grown since 1991: the most recent data suggests that there is now a 12-year gap between the median ages of the most youthful settlement type (urban mayor conurbations, 38 years) and the most aged, (rural town and fringe in a sparse setting, 50 years), compared to just a 7-year gap in 1991. This provides the strongest evidence that macro-level age segregation is intensifying in England and Wales.

Fig. 9 demonstrates these trends visually, by showing that a general process of ageing has unfolded across most neighbourhoods in the country, while the neighbourhoods which have aged the most since 1991 are in predominantly rural areas, most notably a cluster on the Suffolk coast between Ipswich and Lowestoft. However, this map also reveals a small number of rural neighbourhoods where the median age has actually fallen quite dramatically during this period, which in several cases was caused by the expansion of higher education (for example, the yellow MSOA which stands out in rural Lancashire contains the village of Bailrigg which hosts Lancaster University).

However, this resolution obscures the fact that the opposite trend has been seen in most of the major cities. Figs. 10 and 11 provide close-ups of London and other large cities which show that, in most cases, their inner-city areas have become dramatically more youthful throughout this period. Some probable causes of this trend have already been suggested, but two particularly significant ones are likely to have been, firstly, the big increase in the fertility rate of England and Wales that occurred between 2001 and 2013 (which was driven in part by higher fertility among



women with immigrant backgrounds, so inner-city areas with large numbers of immigrants such as East London were disproportionately affected)³⁷ and, secondly, the rise in the number of students. This is demonstrated below in Fig.8, where places which appear in the subsequent maps have been highlighted in red:

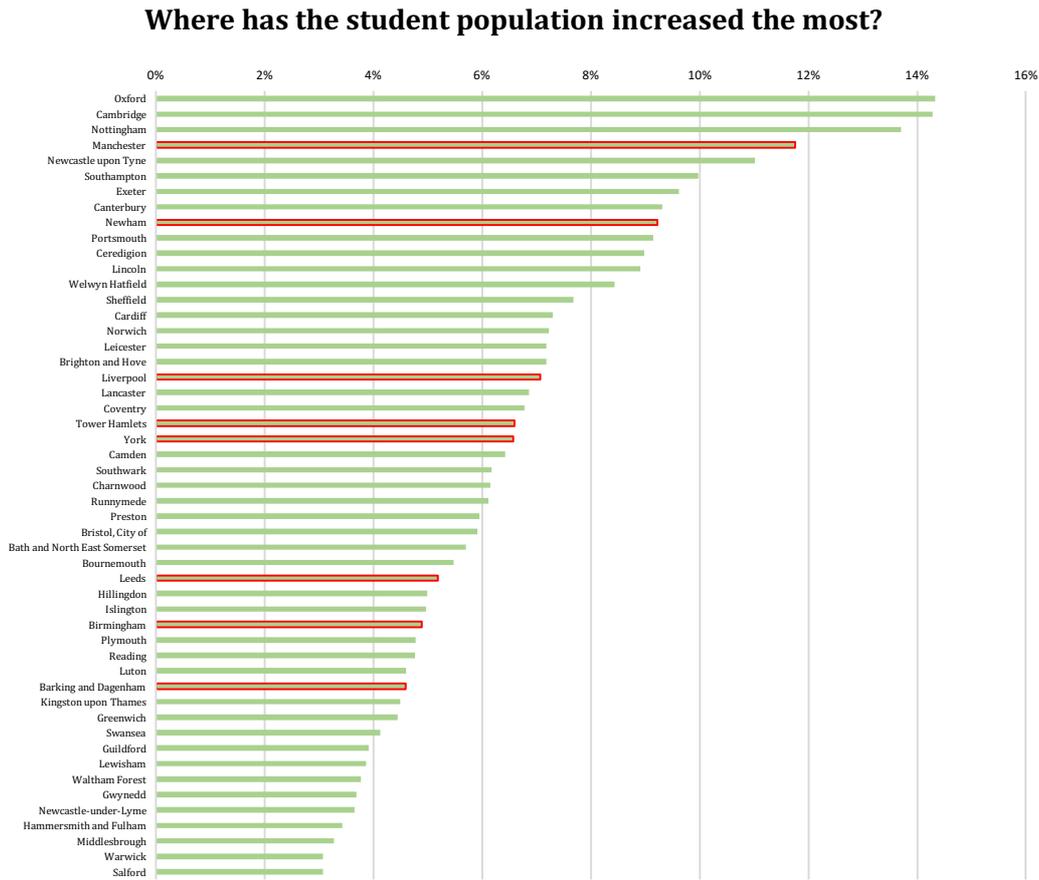


Fig.8 Percentage increase in proportion of population which is students, by local authority district, 1991–2011³⁸

³⁷ ONS (2013) *Why has the fertility rate risen over the last decade in England and Wales?* Newport: ONS

³⁸ Data sourced from the 1991 and 2011 censuses via Nomis.

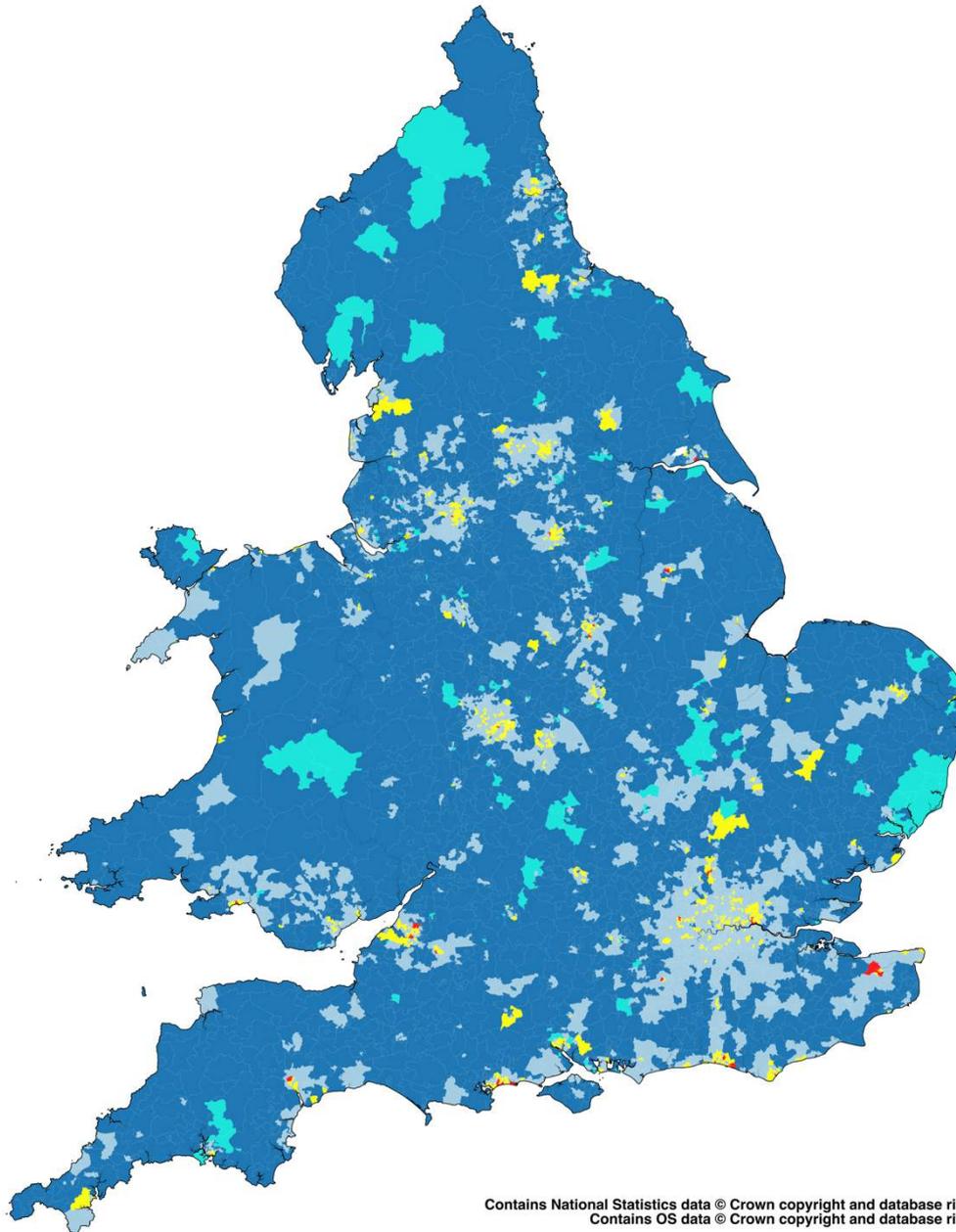


Legend

Change in median age, 1991-2014

- -10 to -5 years
- -5 to 0 years
- 0 to +5 years
- +5 to +10 years
- +10 to +15 years

England & Wales



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Fig.9 Map showing change in median age by MSOA between 1991 and 2014

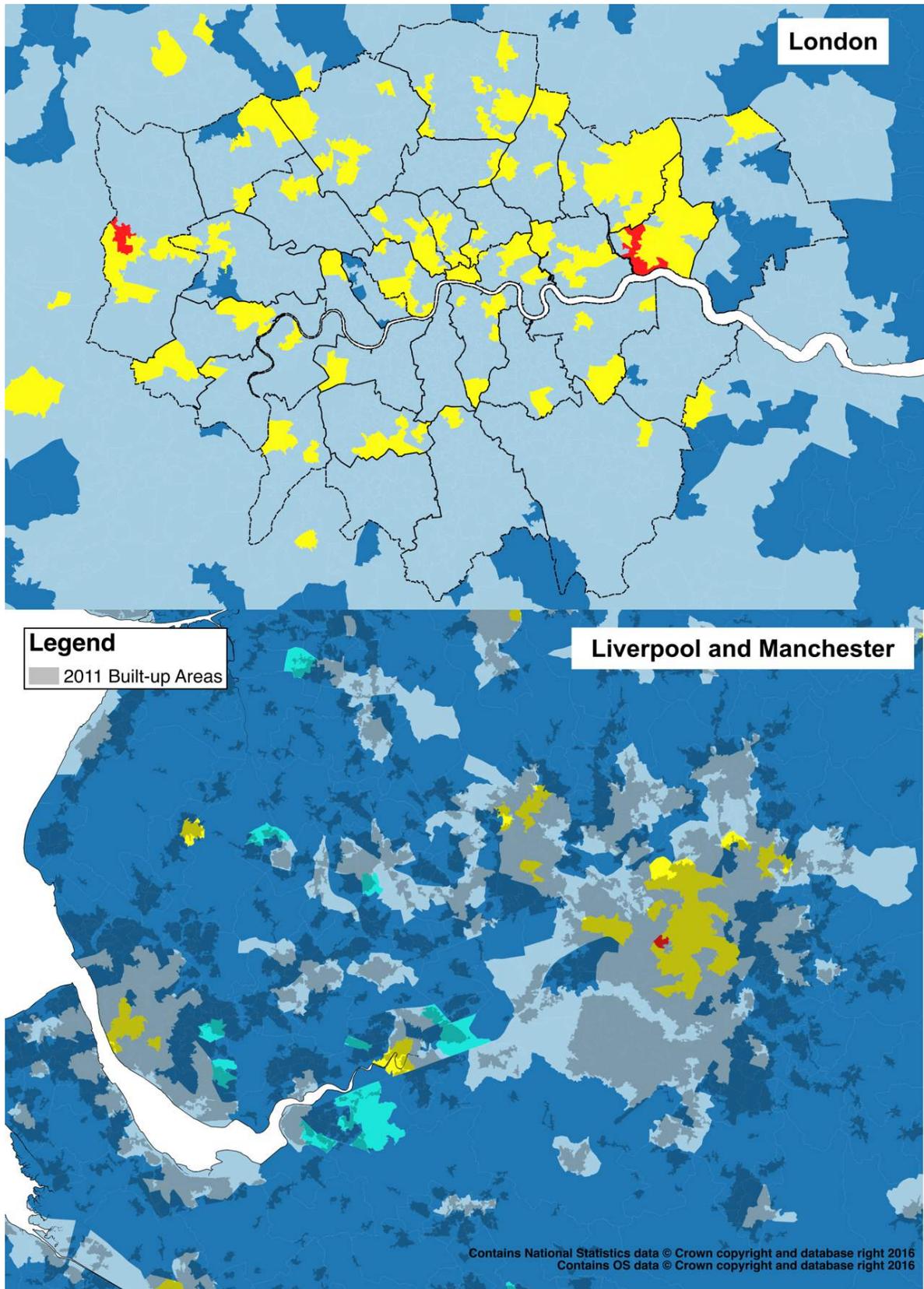


Fig.10 Higher resolution extracts from Fig.8 showing London, and Liverpool and Manchester

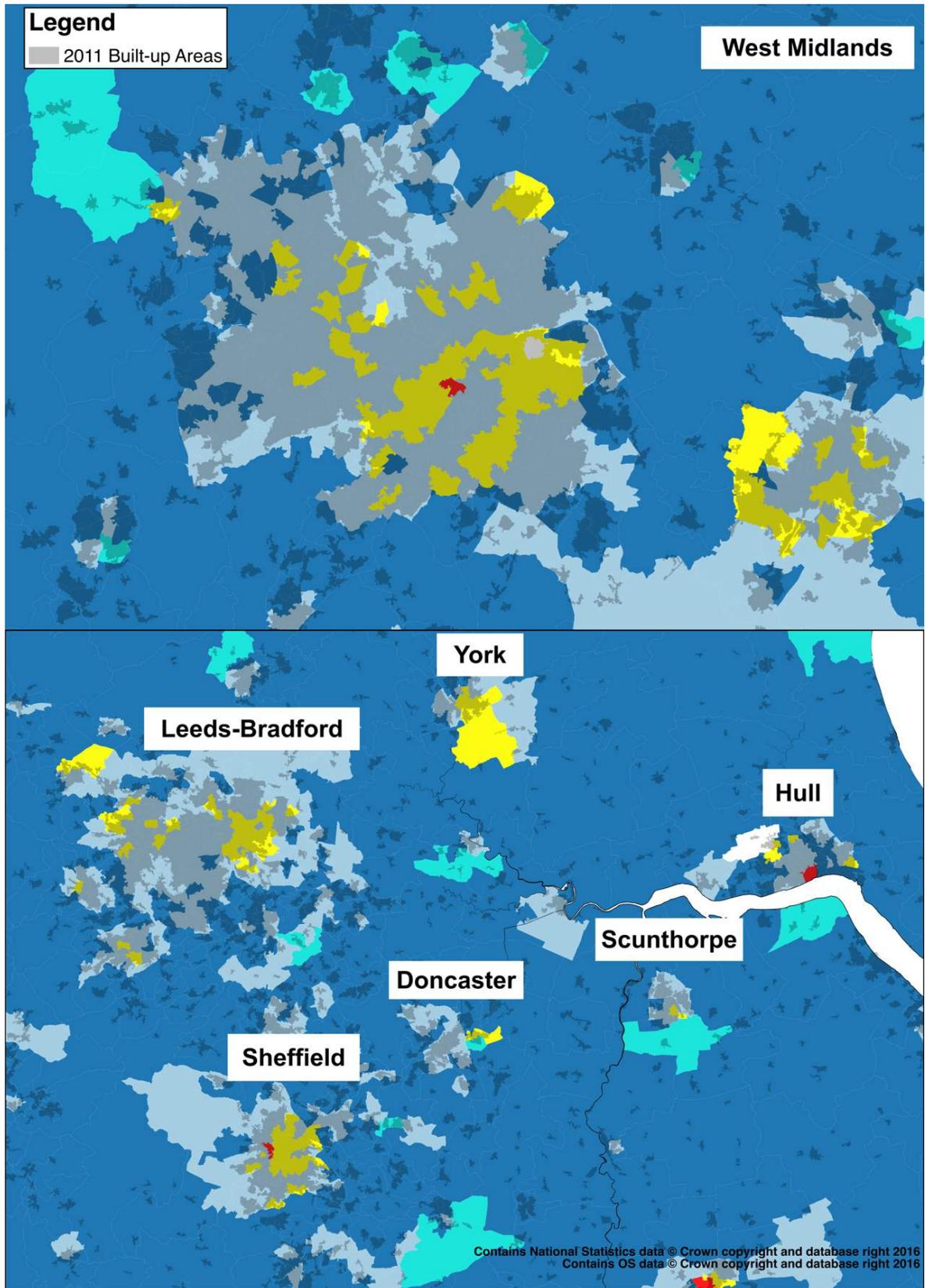


Fig.11 Higher resolution extracts from Fig.8 showing the West Midlands and Yorkshire



b) Micro-level: Urban age segregation

In addition to the growth in macro-level age segregation, this analysis also confirmed that the 25 largest urban areas in England and Wales have become increasingly age segregated at the micro-level. The relationships between three particular age groups were explored in depth: children (under-18s), young adults (18 to 34 year-olds) and retirees (over-65s).³⁹ Concentrating on these three groups should have achieved a broad coverage of most of the age range, as children are likely to live with parents who are in their 30s and 40s (given that the average age at which people become parents was 30 for a woman and 33 for a man in 2014).⁴⁰ The three most significant findings which resulted from applying the indexes of segregation described in the Outline Methodology are explained below:

1. Retirees and young adults are extremely segregated

Calculating the Index of Dissimilarity between retirees and young adults produced an average result of 50 across all 25 PUAs; that means 50% of residents aged over-65 would currently have to move to a different neighbourhood in order for them to be evenly distributed among 18 to 34 year-olds. In two cities, Nottingham and Cardiff, over 60% would have to move, and even in the city with the lowest score, Wigan, 36% would have to. What's particularly striking has been the dramatic growth in this segregation measure over time: in 1991 only 24% of the retirees would have needed to move, so the level of segregation between these two age groups appears to have practically doubled in just under 25 years. It has risen particularly rapidly since 2001, by an average of 8.3% across the 25 cities as a whole and by over 10% in 6 of them (Newcastle, Preston, Leeds, Brighton, Sheffield and Nottingham), as shown in Fig.12.

2. Retirees and children are becoming increasingly segregated

There has also been a significant (although smaller) increase in the Index of Dissimilarity between retirees and children across all 25 PUAs. In 2014, just over a third (33.5%) of over-65s would have had to move from their present neighbourhood to be evenly distributed among under-18s. There was only a small variation between the city with the highest score (Brighton, 36) and the one with the lowest (Birmingham, 31.5), so this phenomenon is remarkably consistent.

These findings from the Index of Dissimilarity are supported by those from the Index of Interaction, which measures the likelihood of two particular groups sharing the same neighbourhood; this found that the typical under-18 who is growing up in one of the 25 largest PUAs lives in a neighbourhood where only 5.5% of their neighbours is over 65. On average, 17% of the population of these PUAs is made up of retirees, so the likelihood of an under-18 and an over-65 sharing the same neighbourhood is only about a third of what you would expect based on chance. Interestingly, this form of

³⁹ The only available data for 1991 were divided into slightly different age categories – under-19s, 20 to 34 year-olds and over-65s – so the historical comparisons contained in this section are not exact.

⁴⁰ ONS (2015) *Births by Parents' Characteristics in England and Wales*: 2014 Newport: ONS



segregation appears to have increased dramatically between 1991 and 2001, and then been relatively stable ever since (Fig.13): in 1991 the average Index of Dissimilarity across all 25 cities was just 20, and 15.4% of the average child's neighbours were over-65, which suggests that something big has happened since then to make children and retirees much more segregated.

How much has segregation increased between retirees and young adults?

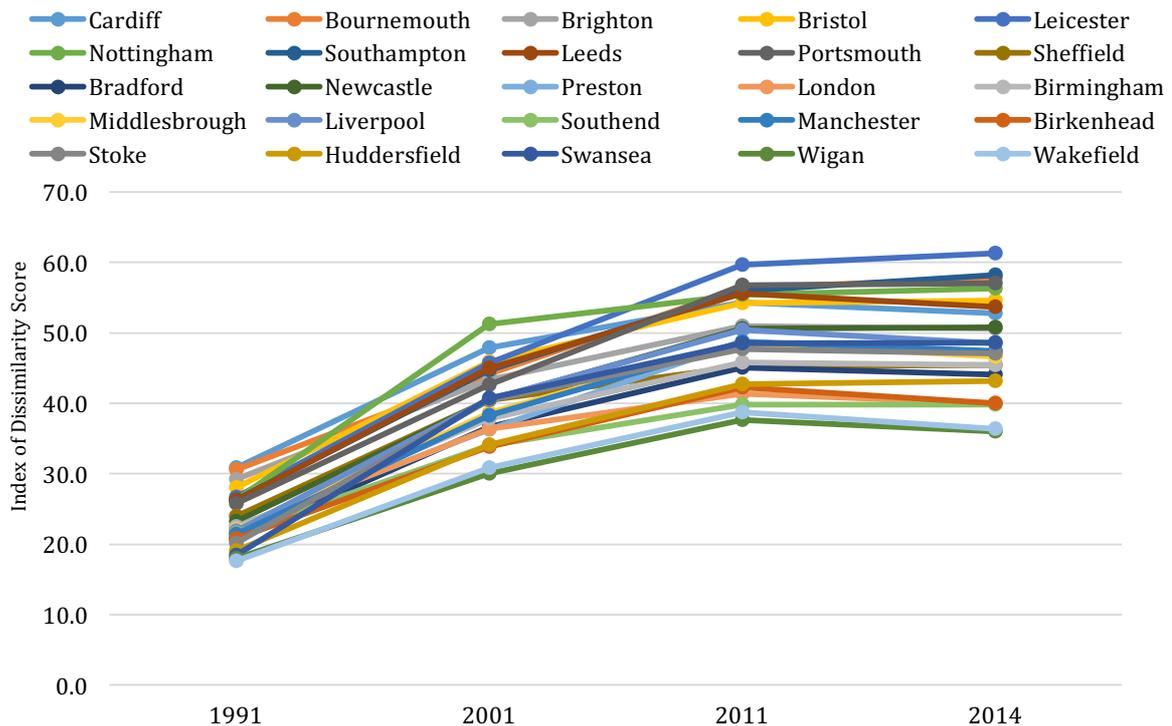


Fig.12 Segregation between retirees and young adults measured using the Index of Dissimilarity (higher score = more segregation), 1991–2014

3. Young adults are increasingly living among themselves

Of the three age groups being studied, young adults were the only one which showed an especially high propensity towards living among themselves, as measured using the Index of Isolation (which gives the percentage chance of having neighbours who belong to the same age group). The broad pattern which this Index showed is for children and retirees to live in neighbourhoods where the share of their neighbours who belong to the same group is about what you'd expect based on chance; so although these two groups rarely share the same neighbourhoods, they don't tend to occupy homogenous ones either (partly because children normally live with adults).



How much has segregation increased between retirees and children?

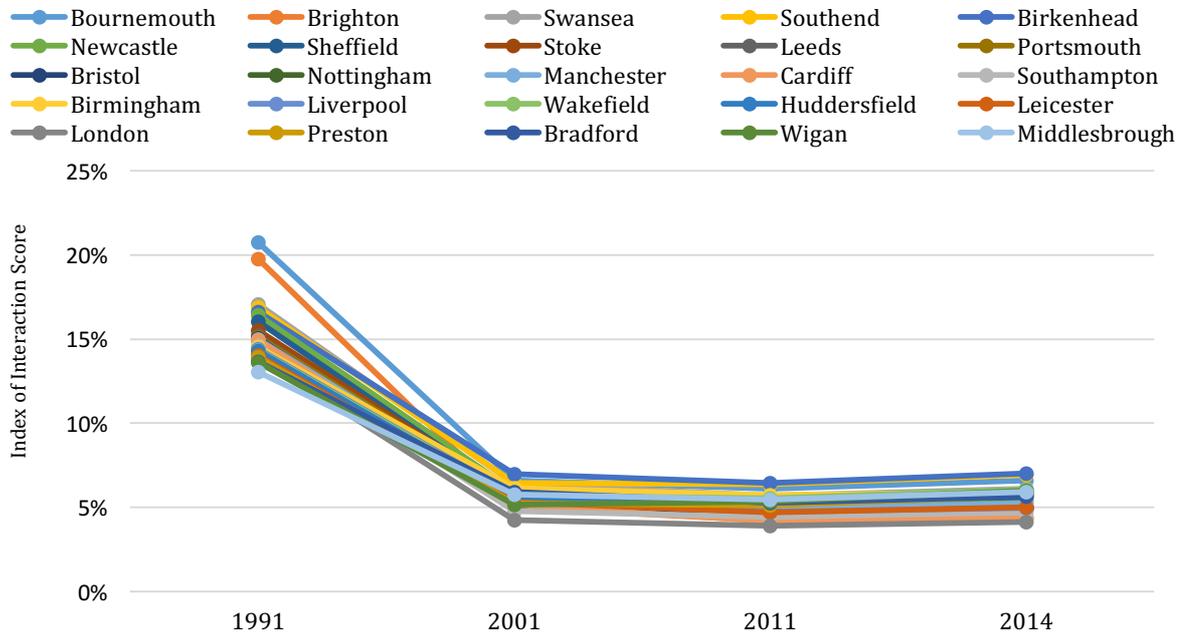


Fig.13 Segregation between children and retirees measured using the Index of Interaction (lower score = more segregation), 1991–2014

How much has age segregation increased among young adults?

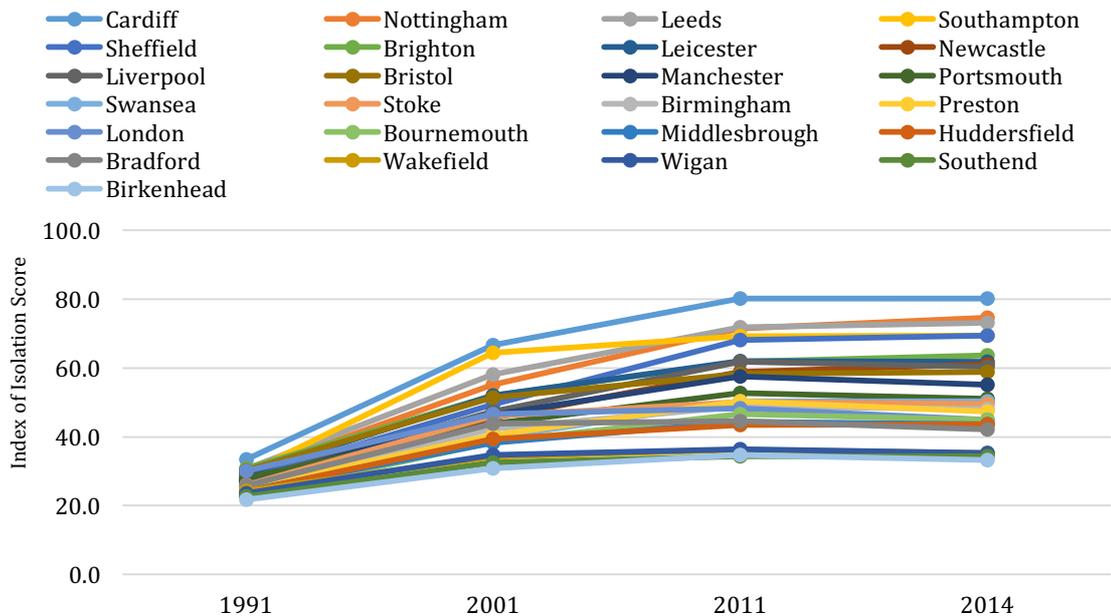


Fig.14 Segregation of young adults measured using the Index of Isolation (higher score = more segregation), 1991–2014



However, the pattern among young adults is very different: in all 25 cities the typical 18–34 year-old now lives in a neighbourhood where between 33% and 80% of their neighbours are in the same age range, and the likelihood of them doing so has risen dramatically since 1991 when the average Index of Isolation score was just 26.9% (Fig.14). As Fig.14 shows, there is a wide variation between the extent of young adults' isolation, although the places where it has increased the most since 1991 have generally been the ones where it was highest to begin with. Although it is difficult to test their relationship because comparable data which cover the same geographical areas does not exist, the places where the isolation of young adults has risen the most (Cardiff, Nottingham, Leeds, Southampton and Sheffield) are all university cities with large numbers of students (as Fig.8 shows) who will largely be living in privately rented accommodation, so the expansion of higher education has probably contributed significantly to this trend.

Which cities are most- and least-segregated?

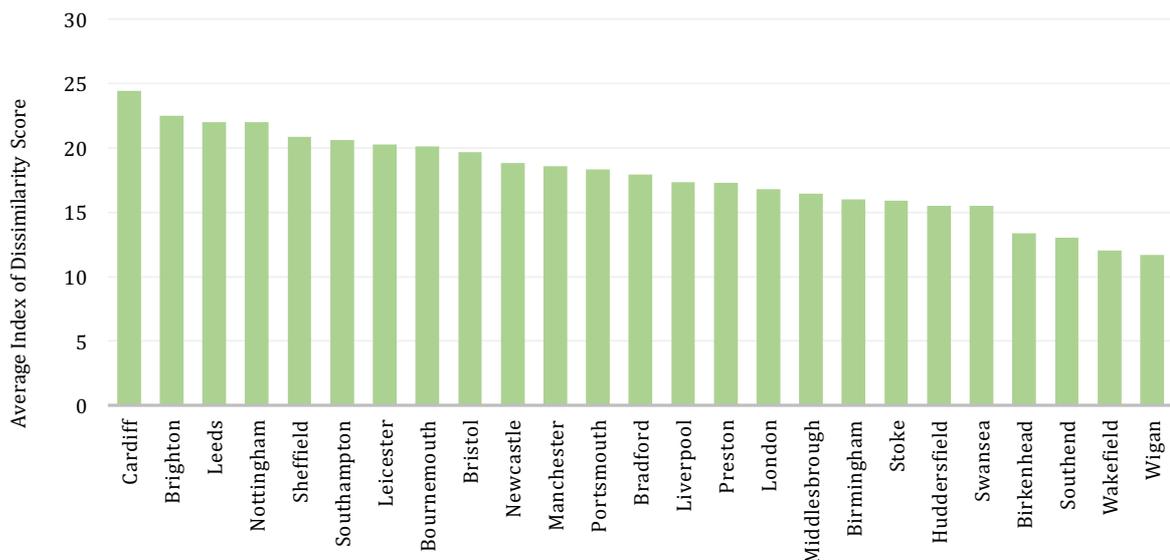


Fig.15 Average Index of Dissimilarity scores for children, young adults and retirees combined, 2014 (higher score = more segregation)

A ranking of how more- or less-segregated each of the 25 cities is can be calculated by working out the Index of Dissimilarity score for each of the three age groups being studied against the rest of each city's population (for example, this measures how evenly distributed over-65s are among all under-65s, rather than just children or young adults), and then averaging the scores for all three age groups. This found that Cardiff and Brighton are the two most-segregated urban areas, as almost a quarter of the population would need to move in order to eliminate age segregation, whereas Wigan was the least-segregated city as its average Index score was only slightly over 10. Leeds, Nottingham and Sheffield were the three cities where age-segregation



had increased the most since 1991 (by roughly 6% in all three cities), whereas Southend was the only PUA which experienced a very slight fall (-0.7%).

Interestingly, this analysis also revealed that the level of overall segregation experienced by these different age groups varied significantly from city to city (Fig.16). While children experience roughly the same (low) level of segregation in all of them, the way it affects young adults and retirees is much more distinct: in the most-segregated cities young adults tend to be much more segregated than any other group, whereas retirees tend to be much more segregated than either of the other groups in the cities where the overall level of segregation is relatively low.

How segregated are the different age groups in each city?

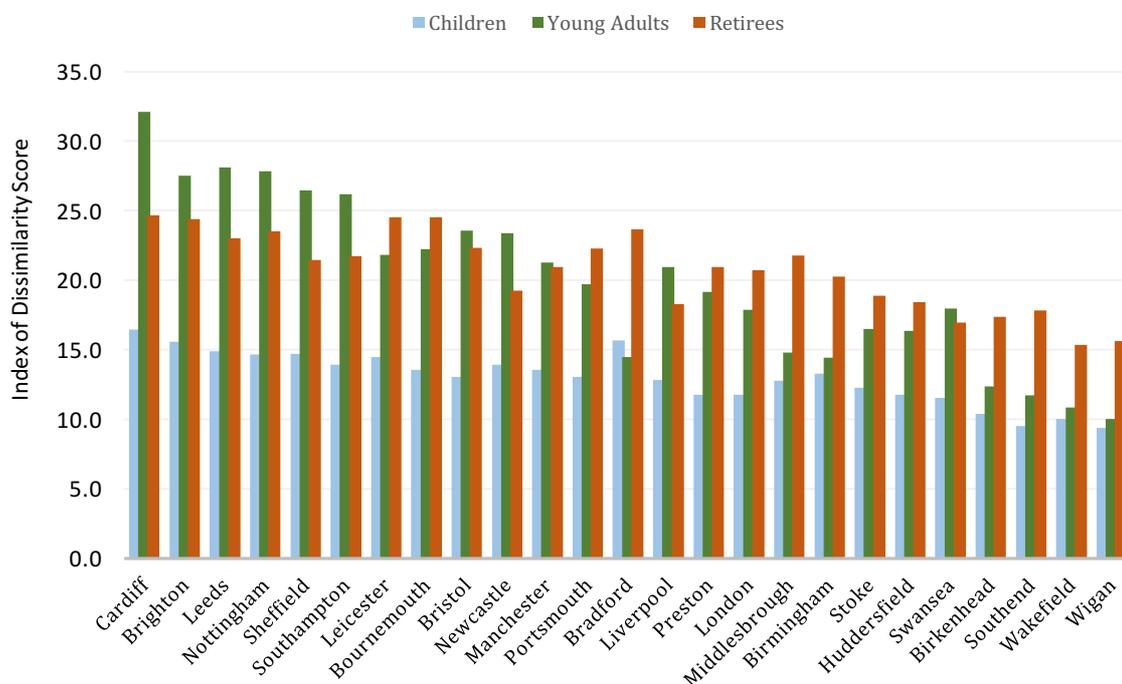


Fig.16 Individual Index of Dissimilarity scores for children, young adults and retirees, 2014 (higher score = more segregation)

These patterns of age segregation are clearly visible on maps showing the median ages of different neighbourhoods in the two most age-segregated cities, Cardiff and Brighton (see opposite). Both cities clearly have a core area in which young people are concentrated, identified by the dark red shading in Figs. 17 and 18, which is surrounded by outlying neighbourhoods where the median ages are much older, shown in green. It's possible to speculate on some of the causes of this phenomenon in both cities. In Cardiff the most youthful neighbourhoods are clustered around Cardiff Bay, an area which has been heavily regenerated over the past 20 years with large amounts of new housing alongside a concerted effort to rebrand it as a fashionable place to live, both of which would make it appeal to young people. In Brighton the most youthful neighbourhoods are clustered along the A270 corridor which connects the seafront with the suburb of Falmer where both Brighton and Sussex Universities have campuses, which re-emphasizes the point from earlier that

one of the drivers of this phenomenon has been the growth of the student population. As Figs. 19 and 20 demonstrate, the picture for both cities in 1991 was significantly more mixed, with parts of these core neighbourhoods having higher median ages than is the case today.

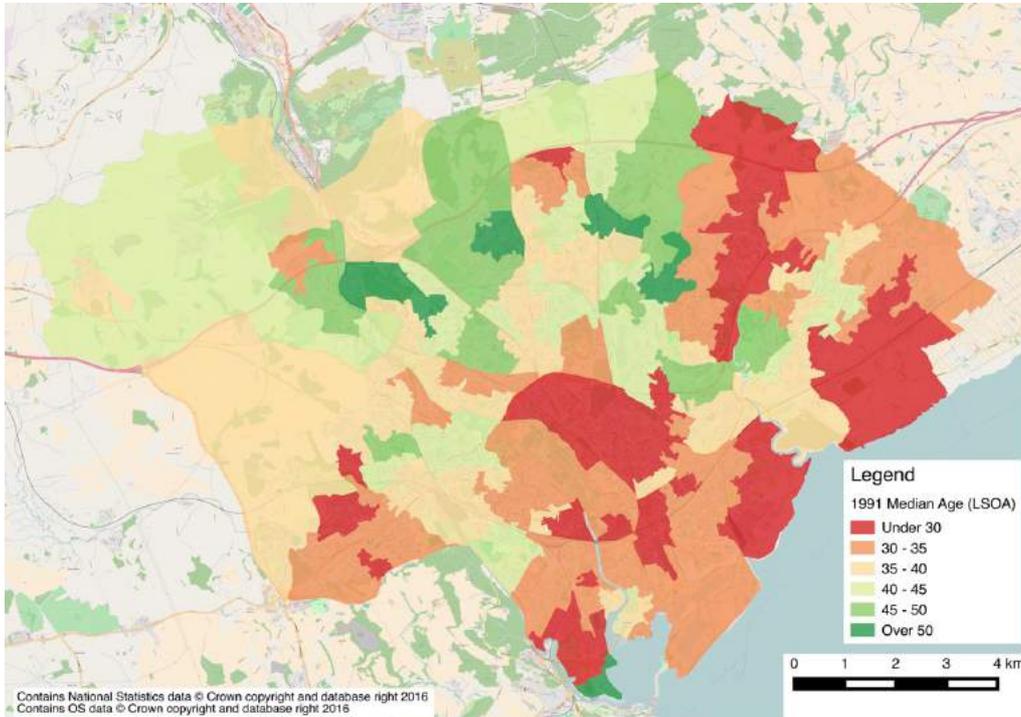


Fig. 19 Map of Cardiff showing median ages by LSOA in 1991

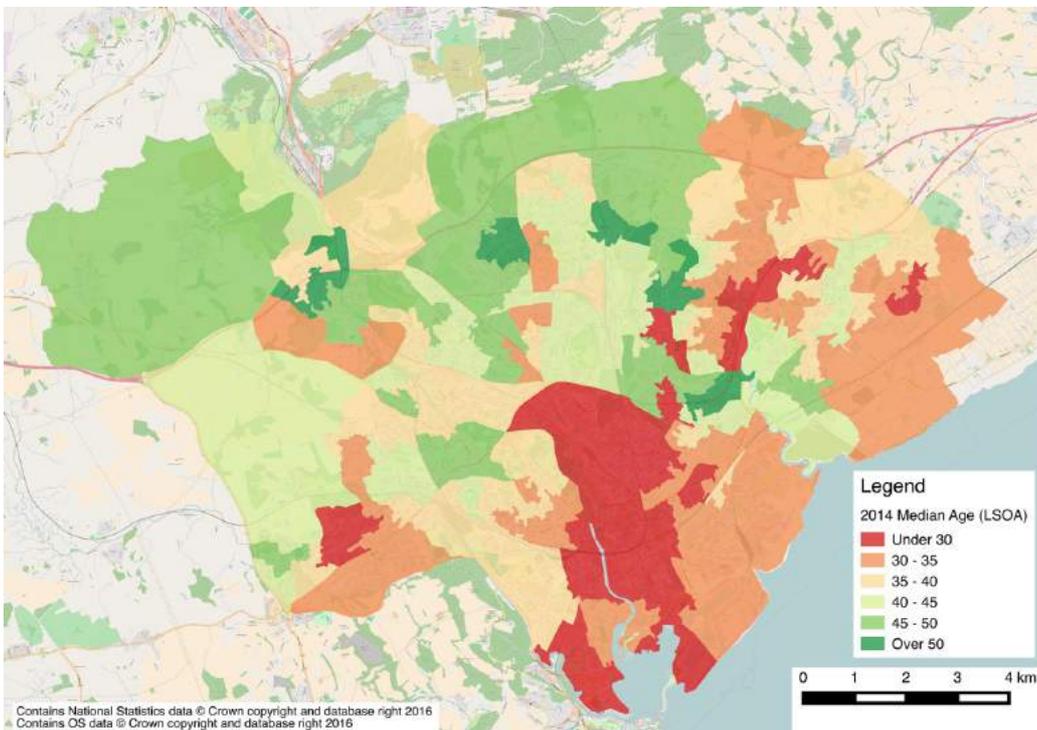


Fig. 17 Map of Cardiff showing median ages by LSOA in 2014

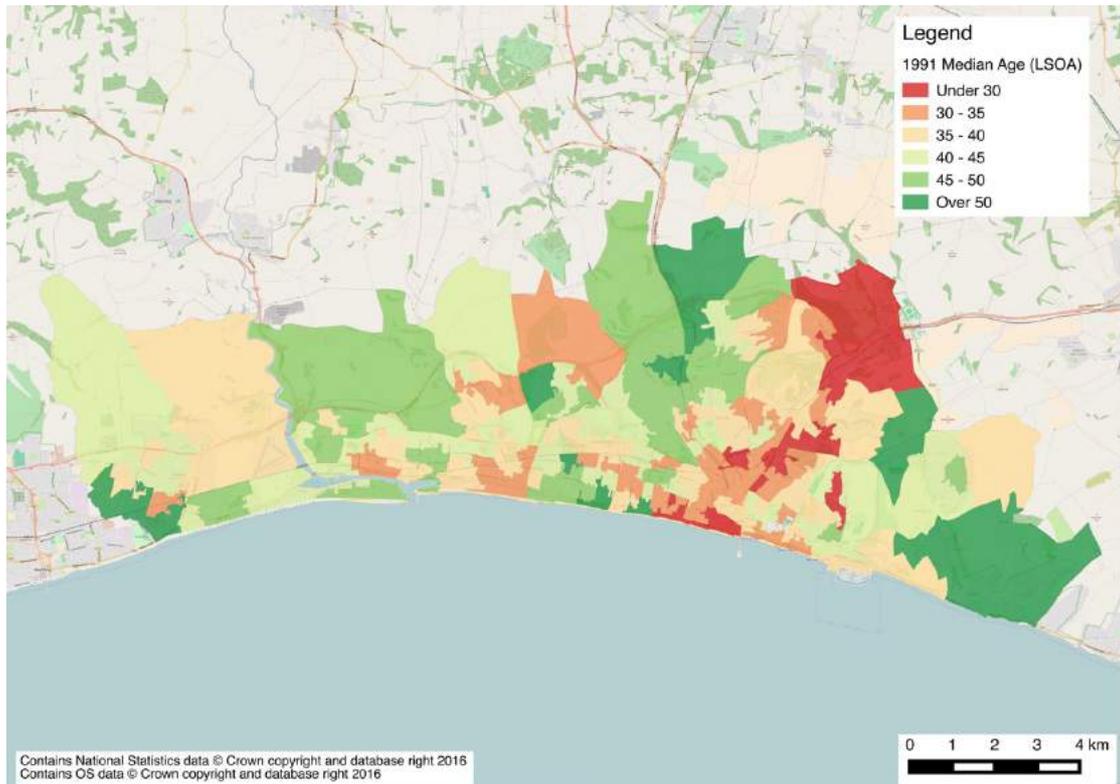


Fig.20 Map of Brighton showing median ages by LSOA in 1991

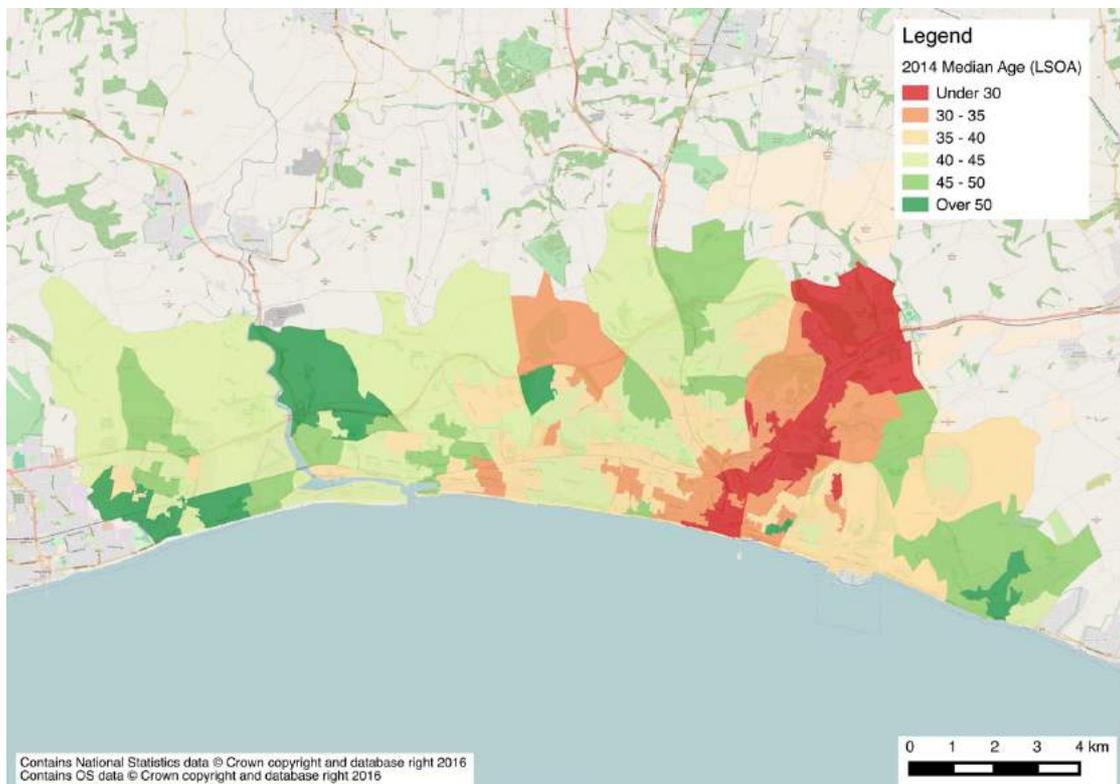


Fig.18 Map of Brighton showing median ages by LSOA in 2014



4. Conclusions and recommendations

This analysis has demonstrated that age segregation is an important and growing phenomenon in England and Wales at both the macro- (between rural and urban areas) and micro-scales (between individual neighbourhoods within large cities). Age segregation is not a benign process: it has a number of negative consequences for broader society, which include weakening the bonds between the generations through reduced social contact, making it harder for members of different generations to provide care for each other, and leaving areas which are dominated by young people politically marginalized.

As was shown in the Introduction, segregation is usually a consequence of housing-related issues. The fact that age segregation has increased most dramatically among young adults during a period when they have become much more likely to rent housing instead of getting on the property ladder (and for more young people to rent privately while they are university students) suggests that age segregation is being driven by the problems in the UK housing market. As the particularly extreme examples of Cardiff and Brighton demonstrate, young people are becoming increasingly concentrated in city centre neighbourhoods, where they are much more likely to become renters rather than owner-occupiers, while suburbs and outlying settlements are ageing because young people can't afford to move to them in the way they once did. Meanwhile, the flow of young people towards the big cities, and away from rural areas, appears to be intensifying, threatening to undermine the future viability of rural communities.

As the process of age segregation is so intimately connected to such big societal challenges as the housing crisis and the growing economic imbalance between rural and urban areas, these bigger problems will have to be addressed in order to ameliorate it. To some extent age segregation can be explained by individuals expressing their personal preferences over where to live, so it can never be eliminated entirely, but the fact that it is on the increase needs addressing by policy makers.

Although solving the housing crisis and fixing the UK's economic imbalances are clearly beyond the scope of this paper, IF recommends the following measures which should result in genuinely mixed-aged communities being created:

1) Encourage downsizing-in-situ

As IF has previously argued,⁴¹ an enormous amount of new housing units could potentially be unlocked by making it much easier for people living in large homes to subdivide them without having to get planning permission. Another benefit of this approach is that it would enable older people who want to downsize, but who are too attached to their existing communities to move away to “downsize-in-situ” – for example, by subdividing the top storey of their home into a one-bedroom flat which

⁴¹ Kingman, D. (2016) *Unlocking England's Hidden Homes* London: IF



they could rent or sell to a younger occupant(s). One of the by-products of this would be to increase the level of age-mixing within the communities where it takes place, as the majority of subdivided homes would belong to older people, while the people occupying the new units would predominantly be much younger.

2) Make downsizing in cities easier

Not every older person who has a large home will want to downsize-in-situ, but IF's research into downsizing has shown that many older city-dwellers would like to have the option of downsizing into smaller properties which are close to where they already live.⁴² Unfortunately, the type of accommodation which is suitable for older downsizers often isn't available in cities, so they are effectively forced to move to rural areas which worsens age segregation. Therefore encouraging planners to focus on the development of downsizing accommodation in cities would help to address this problem, an outcome which could be achieved by including explicit policies on downsizing within local plans and enabling private developers to provide older peoples' housing under Section 106 agreements.

3) Target mixed-aged communities

Planners could also target the creation of mixed-age communities by making it a specific objective of their local plans, and trying to ensure that new developments contain a wide mix of housing types and a variety of tenures which are likely to facilitate mixed-age communities. In particular, they should try to avoid new developments from being occupied by only one age group, as unfortunately seems likely to happen with initiatives which target specific age groups, such as Starter Homes.

⁴² Leach, J. (2012) *Understanding Downsizing* London: IF



Appendix: In-depth methodology

How was macro-level age segregation measured?

Measuring age segregation at the macro level involved trying to find out whether there were significant differences between the age profiles of rural and urban areas. As this required an official definition of “rural” and “urban” that could be used to classify which category different places belonged to, the 2011 ONS rural-urban classification of middle layer super output areas (MSOAs) (census-based geographical units containing 5,000–10,000 individuals) was employed (shown in Fig.1). MSOAs were chosen as the appropriate geographical scale of analysis for answering this question because they are small enough to demonstrate the population characteristics of individual local communities, but not so small that the volume of data required to look at every MSOA in the country would become unmanageable. The ONS 2011 Rural-Urban Classification for Small Area Geographies (RUC) was based on Output Areas (OAs) (geographical units that have a recommended size of 100 resident people, made by amalgamating adjacent postcode areas) which are the smallest geographical level at which census data are produced. If the majority of the population of an OA lived in a settlement containing over 10,000 people, that was classified as “urban”, while all other OAs were classified as “rural”. The much larger MSOAs were then assigned to one of these two categories on the basis of which one the majority of their constituent OAs belonged to. They were then allocated to one of the subgroups within the rural and urban categories on the basis of their population density (using a methodology which is explained in the user guide) to arrive at the 8 overall classification groups shown in the table below:

MSOA Class	Number	Percentage (%)
Urban: Major Conurbation	2,399	33.3
Urban: Minor Conurbation	249	3.5
Urban: City and Town	3,206	44.5
Urban: City and Town in a Sparse Setting	21	0.3
Rural: Town and Fringe	645	9.0
Rural: Town and Fringe in a Sparse Setting	29	0.4
Rural: Village and Dispersed	566	7.9
Rural: Village and Dispersed in a Sparse Setting	86	1.2

It is important to note that the RUC is subject to a certain amount of change over time; for example, if an MSOA that was previously rural is developed for housing it would switch to the urban classification the next time the RUC is revised. This means that the macro-level analysis which looks at how the median ages of the different classifications have aged since 1991 should be interpreted with a degree of caution, as it's likely that a certain proportion of the MSOAs would not have had the same RUC in 1991 as they did in 2011 (and the nature of some may have changed between 2011 and 2014). However, the 2011 RUC was used for the following reasons: it was the most recent one available; there was no equivalent system which pre-dated the 2001 census; and as the population estimates which were being used



were based on holding the 2011 census MSOA boundaries constant over time (see “Population Estimates”), using the RUC that had been designed to apply to these boundaries was likely to produce the most accurate results. Additionally, when the ONS revised the 2001 RUC to create the 2011 RUC following the 2011 census, only 2.6% of OAs were affected, which suggests that the rate of change over time is very slow. For more information about the 2011 RUC, please consult the ONS user guide.

How was micro-level age segregation measured?

Measuring age segregation at the micro level involved analysing whether the patterns of how different age groups are distributed across the neighbourhoods which make up large cities is different from what you would expect to see if these groups were distributed evenly (for example, in a city where 20% of the whole population was under 18, under-18s would be evenly distributed if they made up 20% of the population in each individual neighbourhood). As the grain of individual neighbourhoods is quite small, this analysis required a finer level of detail than was used at the macro level; therefore age profile population estimates for lower layer super output areas (LSOAs) (subdivisions of MSOAs containing only 1,000–3,000 individuals) were used instead of MSOAs as a means of obtaining neighbourhood-level data on the age profile of the population. Three established techniques which were originally developed for measuring racial segregation in American cities were used to measure the extent of micro-level segregation between different neighbourhoods in the 25 largest cities in England and Wales.⁴³ Their formulae are shown below:

The Index of Dissimilarity

This measures what share of members of Group A would need to move from their current neighbourhood for them to be evenly distributed among Group B, expressed as a number between zero and one hundred. Its formula is:

$$100 \times 0.5 \times \text{SUM}((a_i/A)-(b_i/B))$$

a_i and b_i represent the population of a particular age group living in a given LSOA, while A and B represent the population of those age groups that live in the relevant Primary Urban Area (PUA) as a whole. The first part of the equation produces a score for each individual neighbourhood, which is then summed together, halved and multiplied by a hundred to give a segregation score for the urban area as a whole.

The Index of Isolation

This measures the percentage of Group A’s neighbours who belong to the same group. Its formula is:

$$\text{SUM}((a_i/A)*(a_i/t_i))$$

⁴³ Iceland, J. and Weinberg, D.H. (2002) *Racial and Ethnic Residential Segregation in the United States: 1980–2000* Suitland, Maryland: US Census Bureau



a_i and A again represent the population of a particular group which lives in a given LSOA and the city as a whole respectively, but t_i represents the total population of the LSOA. The multiplication is performed on each LSOA that makes up a given city, and then the scores for each neighbourhood are summed to produce an overall value for the whole city.

The Index of Exposure

This measures the percentage of one group's neighbours within a given city who are made up of another group. Its formula is:

$$\text{SUM}((a_i/A)*(b_i/t_i))$$

Once again, a_i and b_i represent the populations of two different groups who live in each LSOA, while A is the population of that group for the whole PUA and t_i is the total population of each LSOA. The multiplication is performed on each LSOA that makes up a given city, and then the scores for each neighbourhood are summed to produce an overall value for the whole city.

Population estimates

Calculating the segregation indices shown on the previous page required both estimates of the population of the city for which they are being calculated as a whole broken down by age as well as corresponding estimates for each of its constituent neighbourhoods. As explained in the outline methodology, this project defined the 25 largest cities by population in England and Wales on the basis of their "Primary Urban Areas" (PUAs). PUAs are a way of defining the boundaries of cities, developed by the Centre for Cities, which attempts to capture their whole "built-up" area.⁴⁴ They achieve this by amalgamating neighbouring local authority areas which are judged to belong to the same urban area, using the methodology devised by Coombes and Wymer (2015).⁴⁵ For example, Birmingham's PUA is defined as the area covered by the adjoining local authorities (LAs) of Dudley, Birmingham, Sandwell, Solihull, Walsall and Wolverhampton (shown in Fig.21, alongside the built-up area established by the 2011 census for comparison).

Using this method of defining cities made finding population data for both the city and neighborhood level straightforward because the boundaries of OAs and LSOAs are designed so that they "nest" within local authority boundaries (as Fig.21 demonstrates in the case of Birmingham PUA). Therefore, for each PUA, obtaining population estimates was a case of isolating the relevant LSOAs which comprise the local authorities that make up each one, and summing them to generate population estimates for each PUA as a whole. As Fig.19 indicates, this method of working out a city's boundaries does not necessarily align perfectly with its real built-up area, but it does enable a far better match to be achieved between the data and a city's real urban footprint than would be the case if only the areas covered by individual local authorities (such as Birmingham City Council) were being used instead.

⁴⁴ Centre for Cities (2014) *Primary Urban Areas: Spatial definitions* London: Centre for Cities

⁴⁵ Coombes, M. and Wymer, C. (2015) *Updating the definition of Primary Urban Areas* Newcastle: University of Newcastle

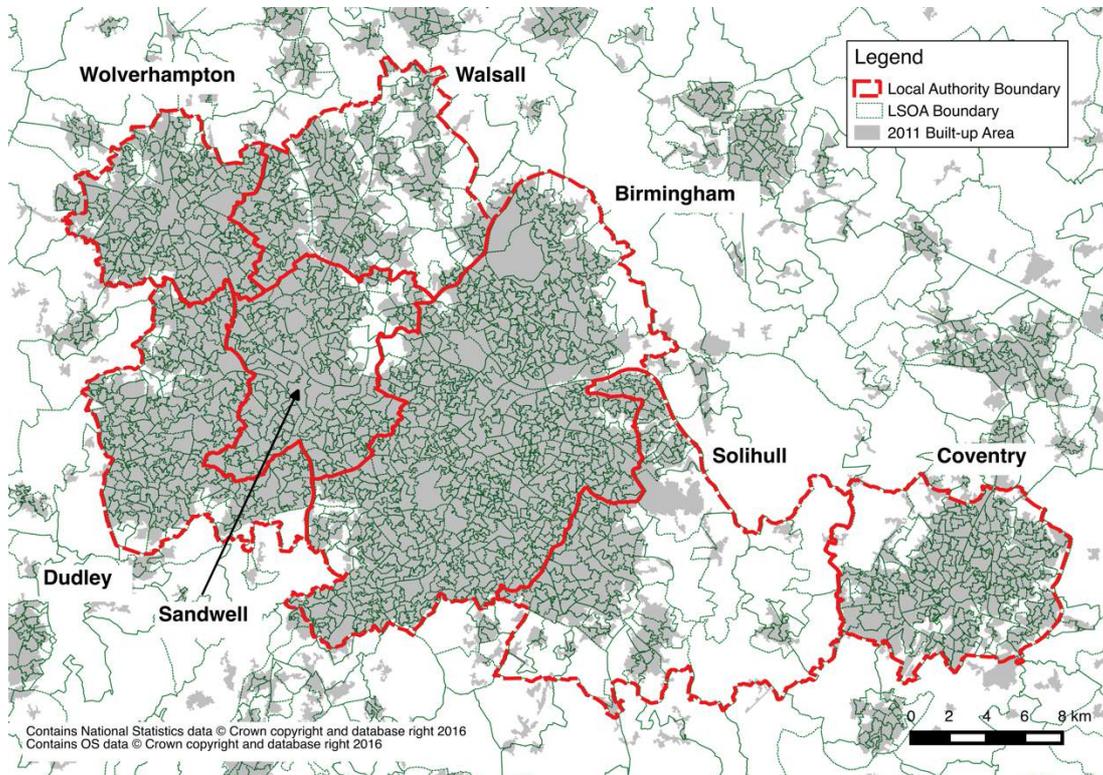


Fig.21 Map showing Birmingham PUA, which has been subdivided into its constituent LAs and LSOAs

However, the need to have neighbourhood-level population estimates presented a significant problem when it came to investigating how patterns of age segregation have altered over time. It was the ambition of this project to analyse data from four historic points: 1991, 2001, 2011 (as these were the last three Census years) and 2014 (as this was the most recent year for which small-area data were available), in order to create a time series for the segregation indices that would span almost 25 years. However, boundaries change over time: local authority boundaries are periodically revised, and population estimates for LSOAs and MSOAs which match the 2011 boundaries are only available going back to 2001. Therefore it was necessary to find a means of adapting small area data from the 1991 census (when the smallest geographical unit employed was enumeration districts, which have nothing in common with the OA-based system that was adopted following the 2001 census) in order to produce the desired time series. This problem was solved with the assistance of Professor Paul Norman of the University of Leeds School of Geography, who had independently produced a time series of population estimates by five-year age group for the 2011 local authority boundaries, 2011 MSOAs and 2011 LSOAs spanning the period from 1971 to 2011, which he kindly gave his permission for the author to use in this project. The methodology behind these is outlined in the following papers:



- Norman, P.; Rees, P. and Boyle, P. (2003) “Achieving data compatibility over space and time: creating consistent geographical zones” *International Journal of Population Geography* 9(5): 365–86
- Norman, P.; Simpson, L. and Sabater, A. (2008) “Estimating with confidence and hindsight: new UK small area population estimates for 1991” *Population, Space and Place* 14(5): 449–72
- Rees, P.; Norman, P. and Brown, D. (2004) “A framework for progressively improving small area population estimates” *Journal of the Royal Statistical Society A* Vol. 167 Part 1: 5–36

The fact that historic data have been adapted to fit the 2011 census boundaries means that a degree of caution needs to be exercised when interpreting the historical comparisons within this report. A particular concern is that some neighbourhoods will have experienced enormous increases in their populations, for example if they went from being previously undeveloped rural land to being developed for housing, which may make it appear as though their age profile got dramatically older or younger. Uncertainty over this effect was one of the main reasons why the historical comparison could not be extended any further back into the past; however, the fact that the built environment changes quite slowly and unevenly over time means that this should only have had a fairly small impact on the picture of age segregation as a whole.

Median Ages

Throughout this project, median ages were used as the main means of providing a snapshot of a given LSOA or MSOA’s age profile. However, as the population estimates provided by Prof. Norman were divided into five-year age groups rather than single years of age (in order to improve their accuracy), the author had to estimate the median ages from them. This was achieved by the following method:

1. The median person within each MSOA/LSOA was identified by dividing its total population by two;
2. The five-year age group containing the median person was identified using cumulative frequency;
3. A formula was used to estimate where the median person’s age would fall within the median five-year age group: $L + ((n/2)-B)/G*w$, in which L was the lower age boundary of the median age group, n was the total number of people in each MSOA/LSOA, B was the cumulative frequency of the age groups before the median age group, G was the frequency of the median age group, and w was the width of the age group.