

Understanding neighbourhood income poverty dynamics in England

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Abstract

This thesis advances the study of *neighbourhood income poverty dynamics* in England: neighbourhood change in low income areas; the dynamics of low income people within neighbourhoods; and the individual-level dynamics that drive aggregate neighbourhood change. The research questions ask whether income poor individuals are becoming more evenly spread across neighbourhoods in England, and what processes are associated with this change; what characterises poverty dynamics in disadvantaged neighbourhoods and what the implications are for area-based policy; and what demographic processes are associated with recent neighbourhood gentrification.

The research is conducted in an empirical quantitative framework using analysis of administrative, census and panel survey data. Poverty is operationalised as a relative poverty measure and Lower Layer Super Output Areas are used as proxies for neighbourhoods. The thesis makes several methodological contributions including using administrative data to study income poverty dynamics in neighbourhoods and using propensity score matching for researching neighbourhood change processes.

The findings show that the stability in the neighbourhood geography of poverty can mask some important dynamics. First, children and working age people living in low income households are becoming less concentrated in the highest poverty neighbourhoods; this is associated with the increasing propensity for low income households to be living in private rented housing. Second, the low income population living in deprived areas is shown to be highly dynamic. Deprived areas are characterised by a heightened risk of becoming poor and a higher risk of staying poor; but arguably the risk of becoming poor is more important in explaining high poverty rates. Third, in those neighbourhoods that have changed significantly there is stronger evidence that this proceeds via changes in the composition of inward migrants rather than an outward displacement of existing low income residents. A dynamic view of neighbourhood income poverty has the potential to improve the targeting and design of area-based initiatives, and provide a more nuanced picture of the nature of income poverty in disadvantaged areas.

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Abbreviations

Abbreviation	Term
ABI	Area-based initiative
chisq	chi-squared statistic
CLIF	Children in Low Income Families local measure
df	degrees of freedom
DWP	Department for Work and Pensions
HMRC	HM Revenue and Customs
HB	Housing Benefit
IMD	Index of Multiple Deprivation
ID	Indices of Deprivation
IDID	Indices of Deprivation Income Domain
LA	Local Authority
LSOA	Lower Layer Super Output Area
MSOA	Middle Layer Super Output Area
NS-SEC	National Statistics Socio-Economic Classification
ONS	Office for National Statistics
OECD	Organisation for Economic Co-operation and Development
TTWA	Travel to Work Area
UKHLS	UK Household Longitudinal Study

Data sources

Understanding Society, the UK Household Longitudinal Study, is an initiative funded by the Economic and Social Research Council and various Government Departments, with scientific leadership by the Institute for Social and Economic Research, University of Essex, and survey delivery by the National Centre for Social Research and TNS BMRB. The research data are distributed by the UK Data Service.

2001 and 2011 Census data is ©Crown copyright; it was accessed via the Nomis website and its excellent Census Table Finder tool. Data was also derived from: the English Indices of Deprivation 2004, 2007, 2010 and 2015, ©Crown copyright from the UK Ministry of Housing, Communities and Local Government; the Children in Low Income Families Local Measure from HMRC; and the Land Registry price paid dataset which contains HM Land Registry data ©Crown copyright and database right 2018.

1 Introduction

‘These neighbourhoods are still just as deprived as they were four years ago? We’ve put in thousands of pounds, run training courses, tried to improve employment opportunities. But people in those areas are still just as poor as ever. Nothing has changed.’ (Anon.)

This frustrated outburst by a senior manager in an English local authority (paraphrased by the author) was in reaction to the findings of the 2015 English Indices of Deprivation. The influential dataset had been used to show that relative to other areas in England, the local authority’s most deprived areas were still just as deprived as the previous iteration of the data had shown. How could it be, he wanted to know, that nothing had changed in these areas despite everything that had been done?

It is conversations like this that provoked interest in the topic of this thesis. In towns and cities across the UK change in many disadvantaged areas has been slow, with the same neighbourhoods remaining the poorest places from one point in time to the next. The disadvantage of these areas is stubborn despite targeted policies aimed at reducing the spatial inequality in social and economic outcomes. This can lead to an unwarranted inference that the problem of poverty in persistently poor *areas* is a problem of the persistently poor *people* who live there.

Several puzzles arise out of this characterisation. First, the nature of poverty in the UK has been changing in recent years. People who are poor are: increasingly likely to be children rather than older people; increasingly likely to live in private

rented rather than social rented housing; and more likely to be living in a working rather than a workless household. The spatial distribution of these populations are different, so why is it that the geography of income poverty does not appear to have changed? Second, the population experiencing poverty in the UK is found in national surveys to change quite rapidly. Approximately 40% of people income poor in one year are no longer income poor in the following year. Are the income poor population living in disadvantaged areas different, or are the assumptions of persistent poverty in the poorest areas wrong? Third, a limited number of neighbourhoods have seen significant change in recent years. What processes are occurring in these areas that make them different from the majority of places that do not change?

The puzzles are tackled in the thesis within a framework termed *neighbourhood income poverty dynamics*. This encompasses the dynamics of neighbourhood change: describing changes in the distribution of income poor people across neighbourhoods; and changes in neighbourhood status within a local residential hierarchy. It includes the dynamics of individual people: changes in residential neighbourhood and changes in poverty status; and how these individual changes can be aggregated as an important characteristic of neighbourhoods. Finally, it concerns the study of the individual-level dynamics that drive neighbourhood change. The main research questions are:

1. Are income poor individuals becoming more evenly distributed across residential neighbourhoods in all areas of England? How does this differ by area and by age group? What processes are associated with this change? (Chapter 4)
2. What characterises poverty dynamics in disadvantaged neighbourhoods? Are persistently poor individuals more likely to be concentrated in high deprivation neighbourhoods than individuals experiencing current poverty? Are there lower rates of poverty exit or higher rates of poverty entry in deprived compared to less deprived areas? (Chapters 5 and 6)
3. How stable is the population of poor individuals in high deprivation areas? How might this and other aspects of neighbourhood dynamics affect the efficacy of an area-based intervention? (Chapters 5 and 6)
4. In the post-recession period, when compared to non-gentrifying areas, were gentrifying areas associated with higher out-migration rates for income poor individuals, lower in-migration rates for income poor individuals, and/or differential rates of poverty entry and exit? (Chapter 7)

The thesis is based on four journal articles augmented by introduction, literature review, methodology and conclusion chapters, as required by the University examination regulations.

Chapter 2 discusses the existing literature pertaining to neighbourhood income poverty dynamics, highlighting the gaps in the literature that have led to the identification of the research questions outlined above. This chapter includes a discussion of the idea of poverty and how income poverty relates to this broader

concept; the contemporary incidence of income poverty in England; and how the character of poverty is changing. A discussion of the theoretical mechanisms and the empirical findings related to the neighbourhood distribution of poverty points to the first research question: whether the changing nature of poverty is changing its spatial distribution, and which theoretical drivers are empirically associated with such changes. The literature on individual dynamics is reviewed, focusing on poverty dynamics (i.e. changes in income poverty status over time) and residential mobility, leading to the identification of the second research question: do poverty dynamics vary by neighbourhood deprivation level? The neighbourhood as a site for anti-poverty policy is then discussed, with particular reference to area-based initiatives and the way that neighbourhood dynamics in deprived areas are often framed as a social problem. The third research question asks: what do neighbourhood dynamics mean for the implementation and efficacy of area-based initiatives? The penultimate section of chapter 2 reviews the literature on neighbourhood change and gentrification, and reveals a research gap in investigating the full range of processes that could be implicated in the gentrification of English neighbourhoods.

Chapter 3 focuses on the foundational methodological decisions of the study that are not discussed in the methodology sections of the four papers: the quantitative approach, measuring income poverty, operationalising neighbourhood and the merits of various potential data sources. The ethics of using *unconsented data* for research are also discussed.

Chapter 4 (the first of the four articles) focuses on the question of whether the changing nature of poverty since 2005, particularly the significant shift of low income households into private rented housing, has resulted in a change in its

spatial distribution at neighbourhood level. Using aggregated neighbourhood data disaggregated by age group and multilevel models, I find evidence that there has been a shift of low income households away from the highest poverty areas driven in part by the shift to private rented housing. This paper has been published in *Environment and Planning A: Economy and Space* (Fransham, 2018).

Chapter 5 makes novel use of administrative data from housing benefit claims to study poverty dynamics at a local level. Using the city of Oxford as a case study area, in this paper I show substantial turnover in the population of low income households claiming housing benefit in the city over a four-year period. This paper was presented at the 2017 annual conferences of the *British Society for Population Studies* and the *Administrative Data Research Network*, and has been published in *Applied Spatial Analysis and Policy* (Fransham, 2017).

Chapter 6 broadens out this view of poverty dynamics at neighbourhood level, using panel data from the UK Household Longitudinal Study (UKHLS) to empirically examine the nature of poverty dynamics by neighbourhood deprivation level. This paper considers the history of area-based initiatives, the way that neighbourhood dynamics have been conceived as one reason for their disappointing performance, and how understanding the dynamics of the target population (here, income poor individuals) could assist in the design and implementation of future initiatives. This paper was presented at the 2018 annual conferences of the *Social Policy Association* and the *Royal Geographical Society* and has been submitted to the *Journal of Social Policy*.

Chapter 7 (the final journal article) investigates multiple demographic processes that could be underlying the phenomenon of gentrification in English neighbourhoods. In this paper I introduce a number of methodological

innovations: a multi-indicator gentrification index; propensity score matching of gentrifying and non-gentrifying areas; and the use of UKHLS for studying gentrification. This paper has been presented at the *British Society for Population Studies* annual conference 2018 and has been submitted to *Population, Space and Place*.

Chapter 8 draws together the findings from chapters 4 to 7, relating them back to the literature from which the research questions emerged. It offers a reflection on the body of research in this thesis and suggests pathways along which future research could be conducted.

2 Literature

2.1 The concept of poverty

The concept of poverty, and the very idea of its existence in high income countries such as the United Kingdom, is highly contested. Yet in popular discourse, media and government circles it is often very simply equated with a measure of income; as Paul Spicker puts it, ‘*the understanding of poverty has come to be dominated by the methods we use to measure it*’ (Spicker, 2014: 232). It is argued in this thesis that income poverty is a powerful indicator of poverty itself, but it is important to discuss why income poverty as a measure is not the same as poverty the concept. Lister (2004) distinguishes between concepts, definitions and measures of poverty, though acknowledges that in practice there is some overlap between them. Here the focus is on concepts and definitions, leaving a discussion of measures to chapter 3.

A major reason for disagreement is that the label *poverty* carries not just descriptive but normative power; that is, if poverty is identified as existing, it demands that something be done to alleviate it (Lansley and Mack, 2015: 3). Its definition contains within it the seeds of the desirability, scope and nature of policy action to be taken. The first fissure in the discussion of poverty is the difference between *absolute* and *relative* definitions. Under an absolute definition of poverty, someone is poor if they are unable to meet their basic physical

needs for food, water and shelter¹. It is this definition that was used in the pioneering study of Rowntree (1901) in York at the end of the 19th century. The Conservative government of the 1980s adopted this approach, banning the use of the word ‘poverty’; Conservative politician Keith Joseph proposed that ‘*a family is poor if it does not have enough to eat*’ (Joseph and Sumption, 1979) and argued that very little poverty existed in 1980s Britain. This view is prevalent today: having had irate feedback from viewers, the BBC journalist Mark Easton argues that the word ‘poverty’ is so divisive that the interests of low income families would better be served by abandoning use of the term in contemporary public discourse².

The normative power of the word poverty begs the question: are we, as a society, satisfied if people have enough to eat but no more? For the answer to many, the answer is no - human beings should be able to participate fully in their society, and the resources required to participate fully vary according to the time and place concerned. This is the concept of relative poverty; its most common expression derives from Peter Townsend’s *Poverty in the United Kingdom*:

‘Individuals, families and groups in the population can be said to be in poverty when they lack resources to obtain the type of diet, participate in the activities and have the living conditions and amenities which are customary, or at least widely encouraged and approved, in the societies in which they belong.’ (Townsend, 1979: 31)

Townsend’s definition was built on to develop the idea of multiple deprivation, with deprivation being a broader concept of a lack of valued goods. Poverty is seen as the lack of resources that would enable a person to secure certain goods;

¹Though even under this definition there is debate about what ‘basic physical needs’ are - does it include clothing? How much, and of what quality?

²Views expressed at a meeting of the Royal Statistical Society on 10 February 2015 - video at <https://www.statslife.org.uk/features/2088-report-from-the-poverty-and-deprivation-statistics-for-action-conference>. Accessed 5 September 2018.

deprivation is the lack of those goods themselves. Townsend's definition retains at its heart a concept of insufficiency of material resources, but asserts that the level of resources required should be set with respect to the society in which a person lives. Lister (2004: 8) argues for a distinction between the 'material core' of unacceptable hardship and the relational or symbolic aspects of poverty such as stigma, othering, shame, powerlessness and indignity. A powerful literature has recently emerged showing the corrosive impact of shame on the everyday experiences of people living in poverty (Walker, 2014).

The capability approach of Sen (1999) can be seen as a way to reconcile absolute and relative conceptions of poverty. He argues that poverty is the inability to perform certain functions that individuals have reason to value - so-called *capabilities*. Examples might include the ability to secure food and shelter, or to participate in the cultural life of society. These capabilities are absolute, but the resources required to realise them are relative to particular societies. The freedom to exercise these capabilities is the goal of human development, not necessarily an increase in material resources that are merely instruments to achieve capabilities. In this paradigm, poverty is the deprivation of capabilities.

Sen's neat philosophical resolution raises conceptual and pragmatic issues. Does it make sense to describe poverty as capability deprivation, in cases where capability deprivation is caused by factors other than low income (e.g. the illness of a wealthy person)? Townsend, in an exchange of articles with Sen, argued that Sen's formulation ignored the structural causes of poverty (Sen, 1983; Townsend, 1985). Lister (2004) has noted that it can be used to justify a policy stance opposed to raising incomes. There are difficulties in operationalising the measure too: how to choose and measure a set of capabilities, for instance (Hick, 2014).

This thesis argues that absolute poverty measures are too narrow: the goal of society in promoting the welfare of its citizens should extend beyond ensuring they have enough to eat. Sen’s formulation is a valuable contribution to thinking more broadly about the goals of human development, but it can arguably stretch beyond the lack of material resources that intuitively lies at the heart of the concept of poverty. Consequently this thesis relies on Townsend’s relative poverty approach, utilising a more concise definition: poverty is the ‘*inability to participate [in society] owing to a lack of resources*’ (Nolan and Whelan, 1996: 188). In section 3.2 competing approaches to operationalising such a definition of poverty are discussed.

2.2 The prevalence of poverty in England today

The period covered by this study, 2005 to 2015, has been a tumultuous time politically, economically and socially. The New Labour government oversaw a period of unbroken economic growth from 1997, along with strong population growth driven in part by young Eastern European migrants arriving from new European Union member states (Falkingham and Champion, 2016: 2-4). There was a growing housing crisis in which the cost of housing rose faster than wages, housing became an investment opportunity for thousands of amateur private landlords, housebuilding continued to be below that required and, crucially, housing became more unequally distributed (Dorling, 2014; Tunstall, 2015). There was growing concern about a polarising job market (Goos and Manning, 2007), with insecure, low paid, low wage jobs for those at the bottom (Stewart, 2007) and a political and economic elite stretching away from the rest of society (Dorling, 2015).

Precipitated by the banking crisis exemplified by the collapse of Northern Rock in 2007, the long period of economic growth was broken by the 2008/09 Great Recession. Concerns have since grown about ‘secular stagnation’ (Storm, 2017) - the prospect of a long period of very low economic growth. Following the recession, real terms working-age household incomes in the UK have stagnated (Hood and Waters, 2017), caused in large part by the lowest rate of pay growth for 200 years (Clarke et al., 2017). The vote to leave the European Union in June 2016 has prompted further economic uncertainty and brought the UK’s social divides into sharp relief (Taylor-Gooby, 2017).

Official income poverty rates for children, working age people and pensionable age people are based upon a poverty line set at 60% of median income before housing costs (see section 3.2). They show that for the whole population, relative income poverty rates were falling slightly before the recession, rose during the recession, then fell for a period up until 2013/14 when they began to rise again (DWP, 2017b). The fortunes of different age groups are quite different. Child poverty rates mirrored that of the whole population, but remained above the total population rate. Pensioner poverty rates fell very sharply, making pensioners less likely than the rest of the population to experience poverty. Working age poverty rates hardly changed at all during this period.

These trends in poverty are inextricably linked to government policy. The New Labour government significantly increased the generosity of tax transfers to families with children and pensionable aged people. As a percentage of the contemporary poverty line, the state minimum income level rose from 83% to 96% for a pensioner couple between 1997/98 and 2010/11; from 67% to 78% for a couple with two children; but fell from 60% to 48% for a working age couple

without children (Hills, De Agostini, et al., 2016: 23). Alongside increasing the generosity of cash benefits, New Labour promoted employment as one of its primary anti-poverty policies, increasing the attractiveness of low paid work through a minimum wage and in-work tax credits, with tighter conditions for claiming out of work benefits (Dickens, 2011). In the immediate aftermath of the recession, cash benefits continued to be uprated in line with inflation. As a consequence there was greater income protection for those on the lowest incomes: median real income fell by more than 1% between 2007/08 and 2010/11, but rose by 4% among the lowest income decile households (Hills et al., 2015).

One of the stated policy goals of the coalition government formed between the Conservatives and the Liberal Democrats in 2010 was to eliminate the gap between government spending and tax receipts by the end of 2015 (Taylor-Gooby, 2012). The major part (80%) was to be achieved by government spending cuts rather than tax rises (Hills, Lupton, et al., 2016), soon labelled ‘austerity’ policies and identified by some as an opportunistic attempt to ‘roll back the state’ in a way that Margaret Thatcher envisaged but never achieved (Taylor-Gooby, 2012). While spending on health, education and pensions were relatively protected, heavy cuts fell on other areas including local government spending and cash benefits for working age people (Lupton, 2015). This included capping rises to below the level of inflation from April 2013 and freezing them in cash terms from April 2016 onwards; a cap of £26,000 on the total amount of benefits that could be claimed per year (reduced to £20,000 in 2016); restrictions on housing benefit including the ‘bedroom tax’; and an increase in the tax credit withdrawal rate (Hills, De Agostini, et al., 2016: 17). Effectively the government decided to expose children’s living standards to austerity policies while shielding older people by increasing the

value of the state pension (Hills, Lupton, et al., 2016). Child poverty has begun to rise, and is forecast to increase by three percentage points between 2014/15 and 2021/22 as a consequence of these and other policies (Hood and Waters, 2017).

There has been concern also about the intensity and depth of poverty over this period. Single and family homelessness has risen steeply since 2010, driven by the inability of families to maintain a private sector housing tenancy (Fransham and Dorling, 2018). There has been an increase in the use of sanctions (the withdrawal of cash benefits for sometimes minor infringements of conditions) against working age benefit claimants (Webster, 2016). This has been linked to a rise in the provision and use of emergency foodbanks (Loopstra et al., 2018), as has the roll-out of the new Universal Credit which entails a six-week wait before benefits are paid out. It would be difficult for Keith Joseph to maintain that everyone in Britain today has enough to eat (O’Connell, 2018). More worrying still, improvements in UK-wide mortality rates have stalled since 2010 (Fransham and Dorling, 2017; Loopstra et al., 2016).

As a consequence of social change and government policy, the nature of income poverty in the UK has changed over the last 20 years. Pensioners are now less likely than the general population to experience poverty (DWP, 2017b), the successful outcome of successive governments’ decisions to increase the value of benefits paid to pensioners. Children are still more likely to experience poverty than the general population and this is increasingly the case. There has been something of a compression of the lower end of the income distribution; households at the lower end of the income distribution are becoming more like those in the middle in terms of housing tenure, employment and benefit income (Belfield et al., 2016: 53). Children in poverty are more likely to be in a working

than a workless household, and are just as likely to be living in private rented housing as in social housing (Tinson et al., 2016). The UK has a high rate of poverty caused by low work intensity i.e. working part-time hours (Bradshaw and Main, 2016; Hick and Lanau, 2017). On the other hand, poverty remains highly gendered: lone parent households, the majority of which are headed by women, are disproportionately affected by poverty (Pantazis and Ruspini, 2006); as are disabled people and people from Bangladeshi, Pakistani and Black ethnic groups (Garner and Bhattacharyya, 2011). Poverty also has an intimate relationship with place, to be explored in the following section.

2.3 Poverty and the neighbourhood

There is a long history of studying poverty and place in Britain, from the 19th century studies of Booth and Rowntree that were used to shape the early welfare state (Rowntree, 1901), to the postwar case studies of East London (Young and Willmott, 1957) and Nottingham (Coates and Silburn, 1970). Lister (2004: 69-72) argues that poverty has a geography in three ways: the spatial distribution of poor individuals ('people poverty'), the character of disadvantaged places ('place poverty') and the lived experience of poverty in the neighbourhood. Accordingly, studies of poverty and place include large-scale quantitative studies of the spatial distribution of poor individuals across an entire nation (Cloeke et al., 1995; Coates and Rawstron, 1971; Dorling et al., 2007; Gambaro et al., 2015; Martin, 1995; Norman, 2010; Smith, 1977; Smith et al., 2015; Tunstall, 2016) or the statistical association between place characteristics and poverty (e.g. Buck, 2001; McCulloch, 2001); and small-scale community studies that use qualitative or mixed-methods

approaches to explore the nature of disadvantaged places and the lived experience of poverty within them (Hanley, 2007; Lupton, 2003b; Massey and Allen, 1995; Tunstall and Coulter, 2006).

Despite the long interest in the geography of poverty, there remains an ambivalence about what it can offer. Wills and Linneker (2014) state that *‘it is difficult to determine the extent to which spatial location causes rather than reflects the uneven distribution of wealth that has its causes elsewhere’*, and for Philo (1995), *‘the causes of poverty “in place” derive from many different sources and locations beyond that place’*. In essence, the debate is whether the spatial distribution of poverty within neighbourhoods is simply a reflection of broader structural inequalities, or whether place actually causes poverty.

For Cheshire (2009), the sorting of households into neighbourhoods by income is the spatial expression of economic inequality. Concentrating on processes operating in the private housing market, he concludes that *‘poor people are priced into deprived neighborhoods because they are poor’*. Desirable aspects of neighbourhoods - low crime, good services, physical environment - are factored in to the price of housing. Higher income households are able to spend more of their income on those neighbourhood attributes that they value, pricing out lower income households. In the UK the allocation of social housing (publicly-owned housing also known as council housing) to families in high social need also has a neighbourhood sorting effect (Smith et al., 2001), as large portions of this stock were built as large single-tenure estates segregated from other tenure types (Meen et al., 2005: 20). In this perspective the concentration of low income households in the most deprived areas is a consequence of the unequal distribution of resources, not a cause.

The idea that neighbourhood causes poverty can be understood under the broad concept of ‘area effects’, the idea that living in a particular area has a causal influence on social outcomes (van Ham and Manley, 2012). This theory proposes that the same individual would have different outcomes depending upon the neighbourhood they live in; and in this case, that living in a disadvantaged area results in worse social outcomes. Galster (2012) suggests four categories of mechanisms by which neighbourhood effects are theorised to operate: geographical, social-interactional, institutional, and environmental.

Geographical mechanisms include ‘spatial mismatch’ in the labour market (Kasarda, 1989): lack of accessible employment opportunities of sufficient volume and type, driving high unemployment and leading to income poverty. This can be caused by the spatially differentiated impact of industrial restructuring, where neighbourhoods decline due to the loss of industries upon which they had previously relied. This has occurred in areas that have lost thousands of jobs due to the decline of employment in mining and manufacturing (Halsey, 1995). If accessible job opportunities are primarily in low-paid employment, in-work poverty can be a significant issue (Wills and Linneker, 2014). Poor transport links between deprived neighbourhoods and employment opportunities can exacerbate this (Joshi, 2001). Neighbourhood effects can also be generated where the quality of public services is spatially differentiated and determined by residence, such as state schools (Cheshire, 2009) and primary health care (Gulliford, 2002).

Social interactional mechanisms include the impact of social networks and social control. Some have argued that cultural norms in high poverty neighbourhoods are different from mainstream norms, engendering a ‘culture of poverty’ (Murray,

1996) or a ‘cycle of deprivation’ (Joseph and Sumption, 1979) in which poverty is passed on deterministically from generation to generation. The Working Neighbourhoods Fund launched by the New Labour government in 2006 aimed to tackle a ‘culture of worklessness’ in identified areas (Griggs et al., 2008). Wilson (1987) argued that industrial restructuring, high unemployment and middle-class flight from US inner cities had resulted in declining social control and rising social disorder. Others have argued that people living in high unemployment areas are cut off from the informal social networks through which employment opportunities can arise (He, 2007).

Institutional mechanisms include the stigmatisation faced by people living in poor areas and the discriminatory decisions made by local actors. Some researchers have found that people living in poorer areas of a city face discrimination in employment opportunities (Dewson et al., 2007), though this is a contested finding (Tunstall et al., 2012). People living in poor areas often face a ‘poverty premium’ in paying for basic services such as motor insurance and home insurance (Davies et al., 2016) and financial services can be restricted in those areas (Dean and Hastings, 2000). Environmental factors can include poor access to outdoor recreational spaces, higher crime rates and exposure to toxins that damage health (Tunstall et al., 2015).

Empirical evidence for causal neighbourhood effects on poverty is limited and partial, and arguably hampered by the focus upon simple statistical associations rather than causal mechanisms (van Ham and Manley, 2012). McCulloch (2001) found little evidence for area effects on poverty, using electoral wards as neighbourhood proxies; Buck (2001) found some evidence of an association with the likelihood of becoming poor; and Bolster et al. (2007) found evidence for an

area effect on income at enumeration district level, but unexpectedly found some evidence of a positive relationship between income growth and deprivation. There are methodological difficulties with robustly identifying neighbourhood effects. These studies all use regression models that essentially compare the outcomes of individuals that are identical with respect to the observed characteristics included in the model. It is possible that individuals in different areas differ with respect to unobserved characteristics; in this case the ‘area effects’ identified are simply ‘selection effects’ that result from systematic differences between individuals living in different areas. Other methodological challenges include satisfactorily characterising the neighbourhood in terms of boundary, scale and area processes linked to the outcome of interest (Burrows and Bradshaw, 2001; Lupton, 2003a; Mitchell, 2001). More robust evidence derives from a recent US study that exploited the differing exposures to neighbourhoods between siblings whose family moved area (Chetty and Hendren, 2017). This study found a statistically significant relationship between neighbourhood affluence and income; but as the relationship between poverty and neighbourhood in the US is very different to the UK, straightforward translations of these findings should not be made.

Running in parallel to these theories and empirical studies is a debate over whether poor neighbourhoods are functional parts of the social and economic system, or dysfunctional, isolated social systems cleaved off from the rest of society. To what extent are poorer areas in the UK ‘dumping grounds’ for excess labour (Wacquant, 2008) or are they functionally integrated into a wider economy which requires a supply of low-paid, insecure workers? Low income areas can be considered as examples of *specialised neighbourhoods* (Cheshire, 2009) that provide support networks and services to particular population

groups (Arbaci and Rae, 2013). Far from being a negative influence, these areas can be considered a positive source of welfare (Cheshire, 2009). Robson et al. (2009) show that many deprived neighbourhoods can be empirically shown to be functionally linked to other areas in the local neighbourhood hierarchy, though they also find examples of neighbourhoods that are more isolated. For those who subscribe to the notion of deprived areas as engendering cultures of poverty, worklessness and benefit dependency, poor neighbourhoods envelop their residents in negative influences that perpetuate individual disadvantage (Murray, 1996).

The sceptical view of geographical poverty studies is that labelling areas as deprived, and promoting a theory that poverty is caused by factors within neighbourhoods, displaces the focus away from the structural causes of poverty (Slater, 2013). Some have argued that if area effects exist they are very small compared to social, economic and demographic factors (Mitchell, 2001), and that while concentrated poverty is viewed as a problem, the issue of concentrated affluence is rarely discussed (Dorling, 2018). As Wills and Linneker (2014) put it, *‘Rather than focusing on mobilising the resources that already exist in any location to tackle the structural injustices that cause poverty, geographers can be vulnerable to mis-diagnosing the problem and mis-prescribing solutions’*.

All these theories and perspectives are brought to bear in the question of what - if anything - should be done to alleviate poverty and deprivation in disadvantaged neighbourhoods, discussed in section 2.6.

2.4 The contemporary spatial distribution of poverty in England

The spatial distribution of poverty is characterised by divides between north and south, rural and urban, and within urban areas, between affluent and poor neighbourhoods (Dorling, 2011; Norman, 2016). At a smaller spatial scale, the location of low income neighbourhoods has been shown to be persistent over time. Dorling et al. (2000) showed that the highest poverty areas of inner London were highly persistent over nearly a century. Tunstall (2016) showed that during New Labour's period of intense investment in neighbourhood renewal, large changes in relative neighbourhood socio-economic position were rare; and the official estimates of area deprivation reveal a similar pattern (Smith et al., 2015). In the early 2000s, though most disadvantaged areas saw little change in poverty levels there were nonetheless some areas which experienced significant change (Gambaro et al., 2015). Using the broader Index of Multiple Deprivation, Smith et al. (2015) found that the small areas which have been consistently ranked among the 1% most deprived areas in England over each of the Index updates (2015, 2010, 2007 and 2004) are geographically concentrated in the North West of England, with none in London.

As poverty and inequality increased dramatically during the 1980s (Brewer et al., 2009), so the fortunes of areas became increasingly polarised. Dorling et al. (2007) found a persistent geography of poverty at a relatively coarse scale over the period 1970-2000, but discovered a pattern of increasing spatial polarisation by income which began in the 1980s but was still evident in the 2000s. Over a shorter period 1991-2001, others have observed a reduction in poverty due to

worklessness as economic conditions improved, but evidence of persistent spatial inequality (Norman, 2010), increased spatial polarisation, and worsening health (Lupton and Berube, 2005).

This trend towards increasing spatial polarisation by income appears to have recently reversed. Trends have been observed towards the deconcentration and decentralisation of poor households, particularly in London (Fenton, 2016; Hanna and Bosetti, 2015; Lupton and Fitzgerald, 2015). Parts of inner East London, found by Dorling et al. (2000) to have been persistently poor for at least a century, experienced striking declines in relative deprivation levels between 2008 and 2012 according to the English Indices of Deprivation (Leeser, 2016). Bailey and Minton (2017) studied the largest 25 British cities between 2001 and 2012 and found that income poverty has been suburbanising in all these cities, moving away from the inner city and becoming more evenly distributed.

This evidence suggests that, in those cities which have been studied, the lowest income households have become less likely to reside in the highest poverty areas. This is of interest when one considers the potential role of area effects, and also in identifying where poor individuals live to target them in area-based interventions (section 2.6). In England what has not been established is whether this dispersal phenomenon exists beyond the major cities, and if so what factors might be driving it. The literature on the changing nature of poverty (section 2.2) would suggest that the increasing tendency for low income households to be living in private rented rather than social rented housing (Tinson et al., 2016), and the renewed enthusiasm for inner-city living among middle income individuals (Rae, 2012) could be implicated in these patterns. The literature review in chapter 4 provides a theoretical framework for evaluating these changes.

Gap 1: Are income poor individuals becoming more evenly distributed by residential neighbourhood in all areas of England? How does this differ by area and by age group? What processes are associated with this change?

2.5 Neighbourhood poverty dynamics

All too often the population of poor individuals within a neighbourhood is considered to be a static, persistent population (Finney, 2013). This can fuel the idea of poor areas being the spatial manifestation of the ‘underclass’, with all the stigma that entails. In reality ‘*neighbourhoods are not rigid containers for a fixed group of people*’ (Bailey et al., 2013): aggregate poverty levels that can be stable over time obscure a great deal of change among individuals (Hochstenbach, 2016). This includes the movement of residents in and out of poverty (poverty dynamics), the movement of residents in and out of the area (residential mobility) and demographic change (births and deaths). This section considers the impact of poverty dynamics and residential mobility on the low income population within a neighbourhood. The combined effect of these processes is termed here *neighbourhood poverty dynamics*.

Poverty dynamics

Poverty dynamics is the study of how an individual’s poverty status changes over time. Addison et al. (2009) suggest four important reasons for paying attention to poverty dynamics: the need to prioritise the persistently poor over transient poverty; to inform better policymaking with an understanding of the underlying processes; to make the link between duration and depth of poverty; and to

understand household strategies for coping with poverty. It has been argued that point-in-time measures underestimate the extent of people experiencing poverty, and misunderstands the nature of it (Smith & Middleton, 2007).

In the UK the study of income poverty dynamics has been spearheaded by Stephen Jenkins using data from the longitudinal British Household Panel Survey (Jenkins, 2011). It is considered of such policy relevance that poverty dynamics measures are now produced as official statistics by the UK government (DWP, 2010, 2017d). When first revealed these findings were a great surprise to many who had become used to the rhetoric of the ‘welfare dependent underclass’:

‘Discussion about poverty is often based on the assumption that figures for households on low income describe a static group of people trapped in poverty unable to escape and getting poorer. However, this picture has been blown apart by recent studies. They show that the people in the lowest income category are not the same individuals as were in last year, still less fifteen years ago’ (Peter Lilley MP, 1996 speech; cited by Hills, 1998: 52)

This is from a senior Conservative politician who was Secretary of State for Social Security at the time. The central findings were that, far from comprising a static group, every year around 40% of income poor individuals exited poverty, and 10% of not income poor individuals entered poverty (Jenkins, 2011). Over a four-year period, around one-third of the population experienced income poverty, while around one-tenth of the population were income poor for at least three out of four years (‘persistently poor’). After four years, only one in five poor individuals had not experienced poverty exit, but around 10% of poor individuals were persistently poor for eight years or more. The majority of exits from poverty were caused by an increase in labour market earnings (Jenkins, 2011: 258), but other influences were important too. Demographic events - partnering, separation, the arrival or departure of children - were responsible for around 20% of poverty exits and

40% of poverty entries. For lone parents, poverty exits were driven to a greater extent by repartnering and rises in benefit income. The research identified similar groups to be at risk of poverty as cross-sectional poverty measures (Burgess and Propper, 2002: 86) - lone parent and single pensioner households were found to spend longer in poverty than other household types. Despite the prevalence of poverty exit, poverty recurrence was a great risk: the chances of poverty entry were found to be much higher for someone who had previously been poor compared to someone who had not.

There is a related literature about how the dynamics of welfare benefit recipients. Hills (2014a) notes that the discussion of state-funded welfare is broken down into *us* and a mythical *them*:

‘We are law-abiding and pay large amounts into a system that supports a stagnant population of them, who are either on the fiddle or are sitting around idly when there is actually plenty of work available’ (Hills, 2014a: 250)

Yet he finds that on average and over the life course, most people receive welfare benefits - cash and in-kind - close to the value of what they put in (*ibid.*: 268). Roantree and Shaw (2018) find that over a longer term 18 year perspective there is much less redistribution and a greater incidence of welfare benefit receipt than cross-sectional analyses imply.

One of the questions that arises from these findings is how to normatively assess poverty dynamics: is it better or worse that there is a large amount of recurrent rather than persistent poverty? Peter Lilley, in the speech quoted above, used the findings as evidence of social mobility in Britain i.e. a weak relationship between poverty and future prospects. This is a simplistic view; the reality is that *‘people who start poor are more likely to end poor, and people who start rich are more*

likely to end rich' (Hills, 2014a: 254). Daly (2011) notes that poverty dynamics can be used as evidence that income poverty is not as widespread or as concerning as cross-sectional statistics suggest, and can be used to deny policy action to alleviate it. Alternatively, it can be viewed as showing that more people are affected by income poverty than previously thought (Todd, 2014: 342). Jenkins notes that while a high degree of poverty exit means less poverty persistence, it also means more uncertainty in incomes which could damage individual welfare (Jenkins, 2011: 4-5).

Residential mobility

The residential composition of neighbourhoods is constantly changing due to the moves of individuals in and out. It is a relatively common experience, with 12% of the UK population moving home each year (Office for National Statistics, 2014) though there is evidence that this rate is declining (Champion, 2016). Most residential moves are over short distances (Fielding, 2012: 3), the motivation for which is related to neighbourhood preference and the housing market (Jivraj, 2013: 186). Longer-distances moves, which are rarer and more common among highly-skilled individuals, are often related to employment opportunities (Champion et al., 1998: 86). It is commonly observed to be selective, in that people who move in to neighbourhoods typically have similar characteristics to the existing residents (Norman et al., 2005).

Numerous social science theories have been developed to account for the observed patterns of human migration. The most famous early example is the geographer Ravenstein, who in the late 19th century set out his 'laws of migration' (Ravenstein, 1885), which included that most migration is over short distances and most migrants are young adults rather than families. The life course model

of migration is now the dominant framework for understanding mobility patterns (Champion et al., 1998). Less a theory than an observed regularity, this explains that the propensity to migrate is strongly linked to position in the life course. Young children are more likely to be mobile than school-age children, whose families tend to resist moving to maintain stability of school provision. Young, single adults tend to be relatively mobile, moving for higher education and employment opportunities, but become less mobile as they become older, form long-term relationships and have children of their own. Older adults become more mobile after retirement as they move away from their previous employment towards other attractions such as grandchildren and the sea (Dorling, 2011), and again in older age as they need formally or informally provided care.

Levels of migration (or *residential mobility*) in deprived neighbourhoods often attract normative assessment. High levels of mobility in disadvantaged neighbourhoods are sometimes seen to be a cause of poverty: high levels of population turnover leading to low social capital and high social disorder (Wilson, 1987). They can also be observed to be a consequence of poverty, where people on low incomes are unable to sustain the tenancies on their home (Desmond, 2016), or more advantaged residents move on as soon as possible (Bailey and Livingston, 2007). Low levels of mobility can be cast in the same light: low population turnover means high ‘bonding capital’ but weak ‘bridging capital’ (Butler and Robson, 2001) i.e. concern that low mobility neighbourhoods become insular and cut off from other opportunities, causing higher rates of poverty. The mobility levels of disadvantaged neighbourhoods seem destined to be pathologised regardless of what they are.

Empirically, levels of residential mobility have been found to be only weakly related to levels of deprivation, being almost entirely explained by the age structure of the neighbourhood (Bailey and Livingston, 2007). Neighbourhoods can operate as a ‘demographic escalator’: younger adults at the start of their working lives tend to move to cheaper (and often more deprived) areas, and move up the neighbourhood hierarchy as their incomes increase with age (Champion et al., 1998).

Empirical studies of neighbourhood poverty dynamics

The stability of the neighbourhood low income population matters for individual wellbeing, for policy and research. Low levels of income and residential mobility can have both positive and negative implications (Beatty et al., 2009: 6; Jenkins, 2011: 116). For example, a highly stable population of low income households within a neighbourhood may lead to concern over long-term, persistent poverty and material deprivation, although with a stable population social support networks may be relatively strong (Arbaci and Rae, 2013: 475). Conversely a residentially mobile but persistently poor population could be at higher risk of both material deprivation and weaker social networks.

UK research into the twin processes of residential mobility and poverty dynamics within neighbourhoods is limited, hampered by the lack of income data in the decennial Census, the limited availability of longitudinal administrative data and, until recently, the lack of neighbourhood identifiers in longitudinal panel surveys (Bailey et al., 2013). This is in contrast to other countries, where researchers have studied neighbourhood dynamics using geographically-referenced household panel surveys (US: Cooke, 2010; Massey et al., 1994) or population register data (Hochstenbach and Van Gent, 2015 in the Netherlands).

Ignoring for a moment the role of residential mobility, stable poverty levels at neighbourhood level require balanced flows of poverty entry and poverty exit. For areas with higher poverty levels than the national average, this implies that there must be higher levels of poverty entry and/or lower levels of poverty exit. Although research has investigated the relationship between poverty dynamics and area deprivation at individual level (Bolster et al., 2007; Buck, 2001; McCulloch, 2001), there appears not to have been research that has documented the aggregate poverty dynamics in high poverty UK neighbourhoods. The degree of residential mobility of the low income population within these areas would also influence the degree of turnover in the population.

The few investigations of UK neighbourhood poverty dynamics have used longitudinal administrative data records from individuals or families claiming means-tested cash benefits, either as an interesting group in their own right or as an attempt to understand broader patterns of the whole income poor population. An early example is Noble et al. (1998), a small case study of a single town that observed moves of lone mothers on and off Income Support benefit between 1993 and 1997. They found that after four years, only 20% of lone mothers had an uninterrupted claim for Income Support, and at the end of the period 43% of lone parents who were claiming in 1993 were claiming in 1997 (disregarding any periods of not claiming). Barnes et al. (2011) used claims for out-of-work benefits to assess whether the out-migration of people who gained employment explained persistently high neighbourhood worklessness between 2003 and 2007. They found little evidence to support this, but did find high levels of residential mobility, with around one quarter of persistently workless individuals leaving the neighbourhood over the four-year period. Jivraj (2013) used data on schoolchildren in households claiming means-tested benefits

to explore the drivers of neighbourhood change, finding substantial turnover in the population of children living in low income households. Yet despite the availability of household longitudinal data to assess neighbourhood poverty dynamics and exhortations to conduct such studies (Bailey et al., 2013; Jivraj, 2013: 199), these studies have not yet been conducted.

Gap 2: What characterises poverty dynamics in disadvantaged neighbourhoods? Are persistently poor individuals more likely to be concentrated in high poverty neighbourhoods than individuals experiencing current poverty? Are there lower rates of poverty exit or higher rates of poverty entry in deprived compared to less deprived areas?

2.6 Neighbourhood poverty dynamics and area-based initiatives

Area-based initiatives (ABIs), time-limited policy interventions delivered within a specified geographic area at various scales (Lupton and Turok, 2004), have been a feature of the UK policy landscape for over 80 years. Possibly the earliest area-based interventions were initiated by the 1934 Special Areas Act, in which commissioners were appointed in the highest unemployment areas (including South Wales and Tyneside) to promote local economic development. Between the 1960s and 2010 area-based initiatives have been fairly constantly employed, but their emphasis has switched over time between a focus on purely economic

goals - re-engaging the unemployed with the labour market - and encompassing broader social outcomes including health, education and housing (Durose and Rees, 2012; Lupton and Turok, 2004).

The neighbourhood assumed a special position in New Labour policy, the Blair government of 1997 adopting the Single Regeneration Budget's emphasis on social ABIs through the New Deal for Communities, Education and Health Action Zones and the National Strategy for Neighbourhood Renewal. New Labour's enthusiasm for area-based policy waned over the coming years and the pendulum swung once again, with more emphasis placed upon local economic growth and connecting people in deprived areas with the opportunities thus created (Lupton, Fenton, et al., 2013). The decline in popularity under New Labour was partly a search for something new to distinguish Brown's government from that of Blair, but also a loss of faith as they apparently failed to deliver the high expectations that had been set for them (Durose and Rees, 2012). The incoming coalition government discontinued neighbourhood renewal programmes in favour of the 'Big Society' approach in which civil society was expected to fill the gap previously filled by state funded interventions (Lupton and Fitzgerald, 2015).

Neighbourhood policy currently has a much lower profile: central government has promoted a framework of neighbourhood plans and community rights under the 'Big Society' banner with minimal funding (Crisp et al., 2015), but local government bodies still target funding and services on the most deprived local areas. The swinging pendulum of policy fashions suggests it will not be long before areas and neighbourhoods become a focus of policy once more.

Area-based initiatives have been justified on a variety of grounds. This includes placing inherently area-based services in close proximity to the highest concentration of need, and generating community involvement and empowerment, harnessing local expertise and knowledge to tackle local problems (Smith, 1999). Political motivations are evident: politicians are accountable to an electorate within a certain territory, and will where possible seek to attract resources and services to those areas. A political imperative derives from the moral case for directing more resources towards those areas with visibly the highest need (Durose and Rees, 2012). There is an argument based on spatial social justice and equitable distribution of the social wage: where access to certain services is based on residential location, as is the case with health and education services, there is a case for ensuring that the services available are as equitably provided as possible (Lupton, 2013).

Another justification is the use of geographic areas to target poor individuals. This rationale has been argued against by a number of authors, notably Peter Townsend:

‘However we are to define economically or socially deprived areas, unless we include nearly half the areas of the country, there will be more poor persons or poor children living outside than inside them ... [and] within all or nearly all deprived priority areas, there will be more persons who are not deprived than there are deprived’ (Townsend, 1979: 560)

These two assertions were empirically evaluated by Tunstall and Lupton (2003), using measures of coverage (the proportion of the target population reached) and efficiency (the proportion of area population who are in the intended target population). They found that area targeting resulted in better coverage than

critics had assumed, particularly for some sub-groups including children; however they also found that area targeting was relatively inefficient in that it benefited many people outside the intended target population.

Townsend's argument implicitly assumes that '*poor persons or poor children*' comprise a static group, but the findings of poverty dynamics research tell us otherwise. If we are more concerned about persistently poor people, is it possible that this group are more concentrated in disadvantaged areas than are people who are currently poor? On the other hand, is it possible that a much larger proportion of a disadvantaged area's population has a recent history of poverty, and therefore a much larger proportion of the area's population could be considered legitimate targets for an area-based intervention? If so, a dynamic perspective would offer a stronger justification for the use of area-based initiatives; these empirical questions are unanswered in the literature.

Area-based initiatives are also justified on the basis of the existence of area effects, as people living in the most deprived areas require additional assistance to improve social outcomes, over and above other people with similar disadvantages (van Ham and Manley, 2012). A dynamic perspective enquires whether the likelihood of poverty entry, poverty exit or poverty persistence is associated with residential neighbourhood. This was assessed by Buck (2001) using non-experimental methods, using electoral wards as neighbourhoods. This paper found significant associations between area deprivation and poverty dynamics, controlling for a range of individual characteristics. The strongest associations were typically found at the most local scales. No more recent work has been conducting using the more satisfactory 'Lower Super Output Area' geography (see chapter 3) now used as the basis for area targeting.

One of the reasons that neighbourhood policy has fallen out of fashion is its perceived inability to meet the high expectations set for it (Durose and Rees, 2012). Lupton and Crisp (2018: 210) argue that New Labour's neighbourhood policy had some successes in its original terms, but these '*ameliorative outcomes around improving neighbourhood conditions [were] eventually reassessed as failure through the lens of transformative objectives around wholesale economic regeneration*'. Looked at another way, there is evidence of success in addressing aspects of 'place poverty' - reducing levels of crime, improving housing and improving the public realm (Amion Consulting, 2010; Crisp et al., 2015; Durose and Rees, 2012; Lawless, 2012; Muscat, 2010) - but less evidence of improvement in tackling 'people poverty': worklessness, health, education and poverty (Crisp et al., 2015; Griggs et al., 2008; Hincks and Robson, 2010; Wilson, 2013). Lupton, Fenton, et al. (2013) report that the gap between the most and least deprived neighbourhoods did narrow on some indicators - worklessness, cancer mortality and educational attainment - but that large gaps remained.

There are two reasons why a dynamic perspective may improve the efficacy of neighbourhood policy. First, neighbourhoods are frequently viewed as a '*static concept with a relatively stable, monolithic community*' (Bailey and Pill, 2011: 939), but as concern grew in the mid-2000s that neighbourhood initiatives were not being as effective as was hoped, the finger was pointed at policy-induced neighbourhood dynamics. The studies of Bailey and Livingston (2007), investigating the relationship between area deprivation and population turnover, and Barnes et al. (2011), investigating whether the benefits of neighbourhood policy were 'leaking out' of areas, are examples of this. There has been no work that has investigated the more straightforward question of how

quickly the neighbourhood population of income poor individuals changes as a result of moves out of the area and in-situ changes in poverty status. This is fundamental to the design of neighbourhood policy, as:

‘The appropriateness of an area intervention is [also] affected by how long people remain in one place, and in the deprived states identified in a particular snapshot’ (Joshi, 2001: 1351)

Second, the implicit theory of change of many area-based initiatives is that a decrease in worklessness and an increase in education levels will lead to a rise in income, therefore reducing material poverty, for example the ‘culture of worklessness’ posited by the 2006 Working Neighbourhoods Pilots (Griggs et al., 2008). As noted in section 2.5, there are two reasons why aggregate levels of poverty may be so high in the poorest neighbourhoods: it could be a consequence of low poverty exit (i.e. high poverty persistence), or it could be due to high poverty entry (implying high levels of recurrent poverty). This is highly pertinent to the design of ABIs: do they principally need to promote poverty exit, or prevent poverty entry?

Gap 3: How stable is the population of poor individuals in deprived areas? How might this and other aspects of neighbourhood dynamics affect the efficacy of an area-based intervention?

2.7 The neighbourhood dynamics of gentrification

Poverty dynamics, residential mobility and neighbourhood change are at the heart of one of the most contentious issues within the topic of neighbourhood dynamics: gentrification and displacement. The nub of the argument is whether

gentrification is a benign process that brings benefits to the existing community, partly through the amelioration of area effects (Freeman, 2005; van Ham and Manley, 2012); or whether it is a wholly negative experience that forcibly displaces working class residents from their homes, breaking up communities (Lees, 2008; Slater, 2009). As the popularity of inner-city living grows among an enlarged group of young, affluent professionals (Rae, 2013) concerns over the potential for displacement have grown, alongside a concern that this may be behind the increasing ‘suburbanisation’ of poverty (Bailey and Minton, 2017). As well as market processes, the state has been accused of actively pursuing the displacement of lower income households through changes to housing benefit rules (Hamnett, 2010) and the demolition of social housing to make way for private housing developments (Lees and Ferreri, 2016).

The definition of gentrification is contested, though there is broad agreement that it involves a change in composition and position in the neighbourhood hierarchy (Fenton, 2016: 7; Slater, 2009: 294), for example:

‘a class-based phenomenon whereby lower-status neighbourhoods change to higher-status ones’ (Freeman et al., 2016: 2803)

Still less agreement exists over the measurement of gentrification and the processes via which gentrification occurs. Theoretically three dynamic processes (in-situ change, demographic change, net migration) could cause gentrification (Hochstenbach and Van Gent, 2015). The most controversial debate in gentrification centres upon neighbourhood out-migration: the extent to which existing residents are involuntarily displaced from their homes. This clearly takes place in those state-led regeneration schemes that involve the demolition of existing social housing. A number of quantitative studies have shown little relationship between gentrification and outward migration of lower income

residents. The most recent UK study (Freeman et al., 2016) found no robust relationship between neighbourhood out migration, gentrification and household income or class over the period 2001-2009 using the British Household Panel Survey. US studies have reported similar findings (Ellen and Regan, 2011; Freeman, 2005; McKinnish et al., 2010; Vigdor et al., 2002). As an alternative explanation, Hamnett (2003) has proposed that in a time of social change during which the middle-class has expanded substantially, much gentrification can be explained by the demographic ‘replacement’ of working class residents with middle class residents.

The passionate debate around the displacement effects of gentrification has meant there has been less attention to neighbourhood in-migration. As population turnover is significant in most neighbourhood areas (Bailey and Livingston, 2007), neighbourhoods maintain a stable composition not due to a static population, but due to a balance in the composition of people leaving and people arriving. This balance could be changed - and neighbourhood change induced - by a change in the composition of in-migrants, rather than a change in out-migration.

These different processes have yet to be examined comprehensively in the literature on the UK. Existing quantitative gentrification research studies the period before the 2008/09 Great Recession, since when such processes may have intensified: the stagnation of household incomes and restrictions on housing benefit may have made it more difficult for lower income households to access or remain in gentrifying neighbourhoods.

Gap 4: In the post-recession period, when compared to non-gentrifying areas, were gentrifying areas associated with higher out-migration rates for income poor individuals, lower in-migration rates for income poor individuals, and/or differential rates of poverty entry and exit?

3 Methodology

This chapter outlines the foundational methodological decisions made to answer the research questions identified in chapter 2: how to measure *poverty*; how to operationalise *neighbourhood*; the choice of data sources; and ethics of using *unconsented data* for research. The key methodological contributions of the research are left for discussion in the papers that comprise the remainder of the thesis: decomposing a change in rates between changes in the numerator and changes in the denominator (chapter 4); using administrative data on housing benefit claims for the longitudinal study of income poverty in neighbourhoods (chapter 5); using multilevel models and aggregate data in concert to understand poverty dynamics (chapter 6); constructing a multi-indicator gentrification index (chapter 7); and using propensity score matching for geographical research (chapter 7).

3.1 Methodological approach

The research questions are answered using a quantitative empirical approach. Although this study uses individual-level longitudinal data, the individual is not the primary object of study in this research. Individual-level outcomes are subject to a large number of random influences and biographical events that are not accounted for (Davey Smith, 2011). The interest is in population-level differences between groups of individuals (Goldthorpe, 2016) such as people living in certain family or neighbourhood types.

The research is based in a view that the social world is to some degree socially constructed, but that objective methods can be used to measure relationships between social phenomena. The concept of relative poverty – having insufficient material resources to fully participate in society – is bound up with normative ideas about what a minimum level of participation in society ought to be. There is no objective state of ‘poverty’ that exists independent of human observations; it is a contested and debated consequence of judgements about what a minimum level of material resources in a given society might be. Once a definition of minimum resources has been arrived at, it is possible to objectively quantify resources and link them to other phenomena, and for independent researchers to reproduce these results.

The research relies upon the statistical analysis of secondary data, and ‘*statistics are a social product*’ (Simpson and Dorling, 1999: 414). The ability to answer certain questions can be dependent on the availability of data, which is in turn dependent on a series of decisions about funding, collection, interpretation and presentation (*ibid.*: 415-416). Some have argued that the analysis of large-scale quantitative data is fundamentally oppressive, as ‘*power is its precondition*’ (Burawoy, 1998); an alternative view, adopted here, is that secondary analysis of government data sources can reveal findings that are profoundly challenging to government power (Goldthorpe, 2007). With modern computing power, digital storage capabilities, freedom of information legislation and increasingly open data, the possibilities for the lone analyst to challenge the machinery of government have never been greater.

Nevertheless, in empirical quantitative research the researcher is not independent of the final research product. The researcher's cultural background and life experiences influence the identification of research questions, the decisions about how to define and operationalise concepts, how to interpret the data as findings and, crucially, how to interpret that information as knowledge that influences our understanding of the world. Just as 'the map is not the territory', so a statistical finding is a representation and simplification of reality, not reality itself; and a product of an interaction between the socially produced statistics and the interpretive practices of the researcher. These complexities have been used as justifications for the wholesale abandonment of quantitative research. The approach here is: to be transparent about questions, methods and interpretations; to be aware that research findings and interpretations are inevitably limited by the researcher's standpoint; and be prepared to accept and respond to the perspectives of others.

3.2 Income as an indicator of relative poverty

As discussed in the previous chapter, this thesis relies on a relative poverty concept, utilising the definition of Nolan and Whelan (1996: 188): the '*inability to participate [in society] owing to a lack of resources*'. In order to advance the research we must settle upon a method to decide who is poor and who is not. This is crucial, for 'the understanding of poverty has come to be dominated by the methods we use to measure it' (Spicker, 2014: 232).

Ringen (1988) makes a distinction between *direct* and *indirect* measures of poverty. A direct poverty measure uses indicators of material deprivation: does a person have access to the material resources that allow them to participate in

society, for example enough food and adequate clothing? An indirect measure indicates whether a person has sufficient command over economic resources to acquire the material resources necessary: for example do they have sufficient income to buy enough food and adequate clothing? Gordon (2006) suggests that the measurement of deprivation is easier than the measurement of income; Jenkins (2011) disagrees, arguing that there are major difficulties in choosing and combining deprivation indicators. It is possible to combine the two: Ringen (1988) argues that poverty is ‘*characterised by both a low standard of consumption and a low level of income*’, and Gordon (2006) visually describes how poverty is defined by the interaction of income and living standards over time.

Direct measures can be divided between those that rely on an *expert* approach, and those that rely on a *consensual* approach. As the name suggests, the expert approach relies upon academic researchers or others to identify a list of deprivations that indicate poverty. An example is the work of Peter Townsend (Townsend, 1979) who identified 12 material deprivation items that indicated poverty. The Poverty and Social Exclusion Survey (PSE; Lansley and Mack, 2015) adopts a consensual approach. Focus groups and surveys are used to ask a representative sample of the population what they believe are the minimum necessities in today’s society (*ibid.*: 16-25) and another survey estimates how many people are without these necessities. The point at which multiple deprivations appear to be associated with a markedly increased risk of associated problems identifies a poverty threshold. In the 2012 PSE Survey people with three or more deprivations were considered to be in ‘deprivation poverty’ (*ibid.*: 46-50). A subset of the PSE deprivation questions are used as the official material deprivation indicator in UK government statistics (McKay and Collard, 2003). The combination of indicators is complex: it uses a *prevalence weighting approach*,

in which deprivations are weighted according to the proportion of families who have access to those items i.e. it gives greater weight to necessities that are most commonly available. Each deprivation is weighted and summed, with scores from 0-100; individuals in families with deprivation scores greater than 25 are considered materially deprived (DWP, 2017a).

Income is the most commonly used indirect measure of poverty. Again, these can be split between expert and consensual approaches. The most common ‘expert’ definition is that a person is income poor if they live in a household whose income is below 60% of the contemporary national median household income. This is the common definition in use in the European Union (Atkinson et al., 2002). There are a number of methodological issues with this measure. The choice of threshold is key: why not 50% below the median, or 70%? The threshold is somewhat arbitrary (Gordon, 2006). How to take into account housing costs is key: measuring incomes before housing costs ignores the differential housing costs faced by households living in different parts of the country; but measuring incomes after housing costs fails to account for the contribution that housing makes to living standards. For example, a wealthy person could be identified as poor because they rent a large mansion (Berthoud and Zantomio, 2008).

Households are used as the ‘unit of account’ i.e. the level at which incomes are assessed, as there is typically income sharing within the household. Children, whose income is usually close to zero, would all be assessed as in poverty otherwise. Using the household as the unit of account assumes that each individual has equal access to the household’s resources: there is evidence that women often have less access to the economic resources of the household than men (Berthoud and Zantomio, 2008). There is also the question of how to account for the fact

that larger households require larger incomes to meet their needs. This is usually achieved by the use of household equivalence scales (DWP, 2017a) but the choice of scale is again somewhat arbitrary.

Some (but not all) of these issues are sidestepped by the use of a consensual approach to setting an income poverty line, the *budget standards* approach which in the UK is used to set the Joseph Rowntree Foundation's *Minimum Income Standard* (Hirsch, 2015). Though it does not claim to be a measure of poverty, it is clearly related as participants are asked to consider '*a minimum standard of living...necessary to participate in society*' (*ibid.*: 8). Focus groups of particular demographic groups are asked to agree on the material needs necessary; these items are costed by experts and presented as a minimum income. This typically arrives at much larger incomes than the official poverty line for working age households: in 2012/13 the Minimum Income Standard for a lone parent with one child was around 90% of median income (*ibid.*: 17).

Poverty is a complex concept (section 2.1) and its measurement is clearly no less difficult. On balance - and partly informed by the availability of data (section 3.4) - this research uses the official measure of relative income poverty. The viable alternatives are material deprivation indicators and a higher poverty line set by the Minimum Income Standard. For the former, the choice of deprivation items, their weighting and combination presents a challenge to the initial appeal of their transparency and direct relation to the concept of poverty, which is complicated further when considering how to measure the changing deprivation of individuals over time. The Minimum Income Standard is not explicitly a measure of poverty; moreover it is only calculated for a small number of household types so cannot be applied to the whole population.

On the other hand, income is a transparent measure that is directly influenced by government policy on tax and transfers; it also has clear causal relations to social outcomes of interest (Jenkins, 2011: 26-27). It is limited by the exclusion of non-cash incomes which contribute to an individual's living standards (Barr, 2012: 102-106), but remains a powerful indicator of command over the resources necessary to participate in a commodified society. In recognition of the alternative measures of poverty, and the fact that income is a measure that imperfectly captures the concept, the phrases *income poverty* and *income poor* are deliberately used throughout the thesis. The final chapter (section 8.2) discusses the impact of this methodological choice on the findings.

Current income is assessed at the household or family level and is measured after taxes and transfers (i.e. cash benefits). Household incomes are equivalised using the modified OECD scale to account for the greater material needs of larger families. An individual is defined as income poor if they live in a household with equivalised income below 60% of the national median equivalised household income (DWP, 2017b). Any deviations from this method are discussed in chapters 4 to 7.

3.3 Operationalising ‘neighbourhood’

Conducting a large-scale quantitative study of poverty dynamics in neighbourhoods requires a working operationalising of this vague concept. Whereas smaller scale case studies can adopt flexible approaches towards the definition of a neighbourhood (Lupton, 2003a), a quantitative study that relies on secondary data analysis is restricted to a limited number of pre-defined neighbourhood boundaries.

Prior to 2001, electoral wards (areas used to elect local government representatives) and enumeration districts (used for the collection of census statistics) were used as proxies for neighbourhood in quantitative studies. The former were unsatisfactory as they varied enormously in population size from fewer than 1,000 to over 30,000 residents (Calder and Watson, 2005); the latter were not ideal because they were designed for the purposes of collecting statistics, not reporting on them.¹ The boundaries of these areas were also subject to change, making it difficult to track areas over time.

As the neighbourhood became an increasing focus of public policy under New Labour (Durose and Rees, 2012) the demand grew for statistics that could support the implementation and monitoring of such policies. Consequently the Office for National Statistics developed *output areas* that were used as the lowest geography for 2001 Census statistics in England and Wales (Martin et al., 2001), then *lower layer* and *middle layer super output areas* (LSOAs/MSOAs) that were aggregations of the smaller output areas, published in 2004. These areas were designed to be of consistent population size and relatively socially homogenous (Calder and Watson, 2005). In 2001 the LSOAs had a mean population of 1,519 and a standard deviation of 200 (Noble et al., 2006). The LSOAs were initially used for the production of the 2004 English Indices of Deprivation (ODPM, 2004) but subsequently for a very wide range of data published on a dedicated *Neighbourhood Statistics* website (now defunct). Similar areas were created for Scotland (*Data Zones*) and Northern Ireland.

¹‘Output areas. Introduction to Output Areas - the building block of Census geography’ <https://www.ons.gov.uk/census/2001censusandearlier/dataandproducts/outputgeography/outputareas>. Accessed 5 September 2018.

The choice of a particular set of neighbourhood boundaries for analysis raises the question of the modifiable areal unit problem (MAUP) - that findings based on spatially aggregated data can be influenced by the precise boundaries used and the scale at which the aggregation is conducted (Jivraj, 2013: 186-188; Openshaw, 1983). The relative social homogeneity of these areas is designed to reduce the boundary selection effect of the MAUP.

The nature of the data available for this study (section 3.4) means that there is a straightforward choice between using LSOAs or MSOAs (or some other aggregation of LSOAs) as proxies for neighbourhood areas. The difference between these areas is one of scale: in 2011 the LSOAs had between 1,000 and 3,000 residents; MSOAs are approximately five times the size, having between 3,000 and 15,000 residents.² As scale increases, the area is likely to become less homogenous.

In common with many studies (van Ham et al., 2013: 3), this research pragmatically utilises Lower Super Output Areas (LSOAs) as neighbourhood areas. It is recognised that this is only one way to define a neighbourhood (Lupton, 2003a), and may not concur with other definitions of ‘natural’ neighbourhoods, though the development of LSOAs is surely a step forward from the widely varying electoral wards used for earlier studies. Another reason for using LSOAs is that they are directly relevant to policy: the neighbourhoods targeted by area-based interventions are typically defined by the boundary of one or more LSOAs. The findings of this thesis therefore relate to neighbourhoods as defined by LSOAs; this is discussed further in the concluding chapter.

²‘Super Output Area’ <http://webarchive.nationalarchives.gov.uk/20160106001702/http://www.ons.gov.uk/ons/guide-method/geography/beginner-s-guide/census/super-output-areas-soas-/index.html>. Accessed 5 September 2018.

Maintaining stable boundaries was a key rationale for designing output areas as a statistical geography, but population changes mean that there were a small number of boundary changes between the 2001 and 2011 LSOAs. Most of the LSOAs that altered were either split into two or more new LSOAs (where population had increased) or multiple LSOAs were merged into one (where population had decreased). This affects some of the analysis in chapters 4 and 7. For the affected analyses, aggregated statistics were used to compare areas over time. For a LSOA that was split, this was handled by comparing the population in 2001 with the sum of populations in the 2011 split LSOAs. The same operation in reverse was conducted for merged LSOAs.

3.4 Measuring income poverty dynamics in neighbourhoods: the available data sources

The research questions for this thesis require data sources that can perform two functions: first, to characterise the spatial distribution of income poverty at neighbourhood level and how this has changed; second, to observe the incomes of individuals within households and how their place of residence and poverty status changes over time. There are three principal data sources that can potentially achieve this: Census data, survey data and administrative data.

3.4.1 Measuring poverty at small area level

A study of low income within neighbourhoods would ideally utilise a data source with full population coverage from a Census or a population register; however the England & Wales censuses do not include income data and no population register exists. Using Census data, proxy indicators of deprivation have been used to

identify the most disadvantaged areas. Examples of these include z-scores (1981 Census), the 1991 Index of Local Conditions, the 1998 Index of Local Deprivation, the Jarman Underprivileged Area Index and the Carstairs Index (DoH, 2002). These measures can appear quite crude: the Carstairs Index, for example, includes just four variables: unemployment, no access to a car, non-home ownership and household overcrowding. It is not clear that these deprivations are all related to lack of resources: not owning a car, for example, could be a positive choice by an affluent professional living in London with little parking. Other measures are more strongly related to income poverty however, Williamson (2015) arguing that the percentage of the population not in professional occupations is an efficient estimator of area poverty. Census data is also used in the Index of Multiple Deprivation (Smith et al., 2015) that is used to identify multiply deprived areas across the domains of income, employment, housing and services, crime, health, education and living environment, though its income indicator is based upon administrative data. Indices that are based on numerous aggregate indicators can potentially fall foul of the ecological fallacy (Marshall, 2016: 308). Just because an area has a large proportion of people experiencing individual deprivations does not necessarily mean that it has a large proportion of people experiencing multiple deprivation. Another drawback of Census-based indicators is that they can only be updated once every ten years.

The spatial distribution of income poverty can be estimated by surveys via small area estimation methods including microsimulation (Anderson, 2007) and regression models (Dorling et al., 2007). The Family Resources Survey (FRS) is the main survey used in the UK to estimate the number of individuals living below the poverty line. The FRS had a sample of 19,000 households in 2015/16 (DWP, 2017a), an average sample of around one household per two Lower Super

Output Areas (though the sample is geographically clustered) - too small to generate reliable estimates. The Office for National Statistics have generated small area estimates of income poverty at Middle Super Output Area level using administrative data and Census data as dependent variables in a regression model (Fry, 2011). The major drawback of this approach is that the confidence intervals around such estimates can be quite wide, making change over time difficult to detect.

Proxy measures using government administrative data have developed from estimates using claims for a single welfare benefit (Noble and Smith, 1996) into the income domain of the Indices of Deprivation (Smith et al., 2015) which utilises data from multiple benefit types to capture both in and out of work poverty. In the Indices of Deprivation income domain (IDID), the number of people living in poverty is estimated as the sum of adults and children in families in which a claim is made for either (i) one of four means-tested out-of-work welfare benefits, or (ii) in-work tax credits, where the equivalised household income is below 60% of the national median income (the usual definition of the contemporary poverty line). The Children in Low Income Families Local Measure (CLIF) uses a very similar method to estimate the number of children in families with incomes below the poverty line (HMRC, 2014). Their disadvantage is lacking full coverage of the population of interest: not all low income families will be eligible for benefits, and not all those eligible will make a claim. If the relationship between income poverty and benefit claim rates is constant, this presents little problem - but spatial or temporal variations could affect the conclusions drawn from such indicators (Bradshaw and Richardson, 2007). Reassuringly, benefit take-up rates have been stable over the period of this research (HMRC, 2012). IDID and CLIF measures are published at LSOA level; the IDID has been published with time

points of 2001, 2005, 2008 and 2012, and CLIF has been published annually from 2006 to 2014. Work has also begun at the Office for National Statistics to develop small area estimates of income from a broader range of administrative data sources (out of work benefits, tax credits and income tax records) though this is still at an early stage (Office for National Statistics, 2016b).

To measure the changing spatial distribution of income poverty at neighbourhood level, this study uses administrative data estimates from the IDID and CLIF measures. Census-based estimates have an uncertain link to income poverty and can only be updated every ten years; survey-based estimates have wide confidence intervals that make trends over time difficult to ascertain. By contrast, administrative data estimates are updated annually or every few years, are direct indicators of income and have much smaller levels of uncertainty.

3.4.2 Observing individual poverty transitions and residential mobility

The UK Censuses feed in to the Office for National Statistics Longitudinal Study (ONS LS), a panel study that is used to track Census respondents over time. Starting in 1971, Census respondents born on one of four selected days of the year are entered into the ONS LS. Their responses from the 1971, 1981, 1991, 2001 and 2011 Census are linked over time, and also linked to administrative data on births, deaths and cancer registrations. Although this rich data source can be used to track residential mobility over time, it cannot be used to track changes in poverty status as the Census does not collect income data.

Longitudinal panel surveys are the primary means by which the trajectory of individuals and households over time - including poverty dynamics - are studied (Jenkins, 2011). They have also been used to understand the interaction between

poverty and neighbourhood (Buck, 2001; Cooke, 2010; Gramlich et al., 1992; McCulloch, 2001; Quillian, 1999). Neighbourhood identifiers are available in *Understanding Society*, the UK Household Longitudinal Study (UKHLS), which opens up this avenue of research in the UK (University of Essex Institute of Economic and Social Research et al., 2016). The UKHLS sample is around eight times larger than its predecessor the British Household Panel Survey, making robust analysis at neighbourhood level more possible.

A stratified, clustered, longitudinal survey of 40,000 individuals in UK households that began in 2009 (Knies, 2016; University of Essex Institute of Economic and Social Research et al., 2016), data is collected via annual interviews which cover a broad range of topics including demographics, income, employment, life satisfaction and health. Initial respondents to UKHLS have been shown to be geographically representative of the national population in terms of neighbourhood deprivation and demographics (Petersen and Rabe, 2013). Longitudinal weights are utilised to account for differential rates of response among the initial sample and attrition from the sample over time.

Even in an annual survey of the same respondents, the collection of income data is complicated (Knies, 2016: 82-91). Respondents are asked about their income in the last month, and so an implicit assumption is made that last month's income is a good indicator of income in the twelve months between interview waves. Assessing household income requires all members of the household to provide a response to the income questions; where some data is missing, it is necessary to impute the missing values. UKHLS interview waves take place over two calendar years, meaning that reported income from different households in a single wave

can be two years apart. It is necessary to adjust for inflation to compare incomes within the same interview wave. In the analysis that follows, incomes are adjusted using an inflation dataset provided by the Office for National Statistics.³

One concern about measuring income over time is the effect of measurement error, from household misreporting and the imputation process. If income measurements are randomly distributed around the ‘true’ income, this may mean that observed changes in income are an artefact of measurement error rather than true changes in income (Worts et al., 2010). However Jenkins (2011) finds that measurement error is not distributed as an independent random variable but is positively correlated over time i.e. overreporting of income in this interview is associated with overreporting of income in the last interview, reducing any bias in estimates of income mobility.

Another concern arises over the phenomenon whereby responses to panel questions vary in their quality over time. Fisher (2016) finds that there was an artefactual rise in self-reported income between the first and second UKHLS interviews, postulated to be a result of ‘dependent interviewing’ (where respondents are reminded of a previous answer) and reduced concerns about sharing sensitive information (Fisher, 2016).

Individual record-level administrative data can also be used for longitudinal research. Examples of this include Barnes et al. (2011) who used data on out-of-work benefits to track worklessness over time, Noble and Smith (1996) using Income Support claims and Jivraj (2013) using claims for free school meals. It is an opportune time to explore the use of administrative data as storage and computing power no longer present a bar to using very large datasets. There

³‘DWP deflators request’. <https://www.ons.gov.uk/economy/inflationandpriceindices/adhocs/005567dwpdeflatorsrequest>. Accessed 5 September 2018.

is increasing state investment in this area, including the Administrative Data Research Network that has been established to facilitate access to administrative data for researchers. The Office for National Statistics is exploring the possibility of using administrative data to replace the traditional population census, with a full test to be conducted alongside the 2021 Census.

The appeal of administrative data for geographically-referenced longitudinal study is the full population coverage it potentially offers, and the fact they are not affected by growing levels of survey non-response (Hand, 2018). There are a number of challenges though: data quality can be variable between data items and over time; data sources that appear to have full population coverage can have important aspects of non-representativeness; linking between different datasets can potentially introduce error; and anonymising records while retaining their usefulness for research can be difficult (Hand, 2018). Another challenge can be successfully negotiating access to that data and addressing ethical and privacy concerns (section 3.5).

The thesis largely uses UKHLS, *Understanding Society*, for the longitudinal study of poverty status and residential neighbourhood. The ONS LS does not contain the income data we require, and no comprehensive administrative data source on income is yet available. Chapter 5 uses a local government administrative dataset on housing benefit for Oxford as an alternative; this approach could be advanced with greater access to government-held data.

3.5 Is analysing unconsented data an ethical research activity?

Most of the data sources used in this thesis are publicly-available aggregated data or fully anonymised survey microdata, for which no ethics approval is required. The exception is the record-level housing benefit data that forms the basis of chapter 5. Access to the data was negotiated with Oxford City Council, subject to a data sharing agreement and ethics approval from the departmental research ethics committee (reference SOGE 17 1A-7). Data such as this, where individuals have not given explicit consent to be involved in a research study, is sometimes described as *unconsented data*⁴. The analysis involved the details of approximately 20,000 families, many of whom no longer lived in the area. It would be prohibitive to seek consent from such a large number of families, and impossible in many cases where current contact details are unknown.

As pressure mounts to make better use of ‘big data’, the use of unconsented data is a significant area of debate. Attitudinal surveys show there is broad public support for sharing anonymised data for publicly-funded research (Royal Statistical Society, 2014). The Social Research Association’s ethical guidelines (Social Research Association, 2003: 26) note that secondary data analysis can reduce the burden on potential research participants and maximise the value of pre-existing data. Lessof (2009) argues that in these cases the ethics turn on whether ‘*an individual’s health, interests or confidentiality could be affected negatively*’; i.e. whether there are ‘unanticipated consequences for the original data subject’ (Social Research Association, 2003: 27). In the case of this research,

⁴‘What about accessing non-consented data?’ <http://www.esrc.ac.uk/funding/guidance-for-applicants/research-ethics/frequently-raised-questions/what-about-accessing-non-consented-data/>. Accessed 04/03/2016.

there are no potential risks to the health or interests of individuals whose data was analysed. Individuals cannot be identified from the research outputs, which have been published with reference to statistical disclosure guidelines (GSS, 2014).

4 Increasing evenness in the neighbourhood distribution of income poverty in England 2005-2014: age differences and the influence of private rented housing¹

Abstract

A recent change in the geography of poverty in Britain has been reported: it appears to be becoming more evenly distributed in major cities, such that low income individuals are less likely to be living in the highest poverty areas. Studying all local authority areas in England between 2005 and 2014, this paper finds that this phenomenon is strongly differentiated by age group and local authority type. Poverty amongst children and working age people is becoming more evenly distributed in almost all local authority types, with the largest changes occurring in the most urban areas. The change is strongly associated with the increasing proportion of low income households living in private sector housing. Conversely, there is evidence of an increasing residential concentration of poverty at older ages. The paper also proposes a method for decomposing a change in rates between

¹This paper has been published in *Environment and Planning A: Economy and Space* (Fransham, 2018).

changes in the numerator and changes in the denominator. It concludes by discussing the implications of these findings for area effects, area-based initiatives and gentrification by displacement.

4.1 Introduction

Previous studies have shown that the neighbourhood geography of poverty is relatively stable, with many high poverty neighbourhoods being highly persistent over time. However a recent change in the geography of poverty has been reported: it appears to be becoming more evenly distributed in major British cities, such that low income individuals are less likely to be living in the highest poverty areas (section 4.2). This paper contributes to the literature by reviewing the evidence on drivers of this phenomenon, and empirically establishing whether it is occurring outside the major cities and for all age groups. The identified theoretical drivers are tested, in the course of which a method is proposed to decompose a change in rates between changes in the numerator and changes in the denominator.

A theoretical review of neighbourhood sorting by income and evidence of the changing composition of income poor individuals suggest five processes by which income poverty is becoming more evenly distributed (section 4.2): the large and recent increase in the proportion of low income households living in private rented housing; the desegregation of social rented housing; a dilution effect induced by urban private housing development; the displacement of low income households in a process of gentrification; and, in the opposite direction, increased concentration from the uneven spatial impact of the Great Recession and austerity. Three indices of distributional evenness are used to describe the changes in income poverty

distribution by local authority (LA) supergroup type and age, and hierarchical linear models are used to examine the associations with the identified drivers (section 4.3).

The findings confirm the results of previous studies that income poverty is becoming more evenly distributed, and show that this is differentiated by age group and local authority type (section 4.4). Amongst children, poverty became more evenly distributed in all LA types though the greatest changes occurred in the most urban. For working age people, the increase in evenness was smaller and there was no evidence of change in the most rural LA types. For both age groups, there was a very strong association between an increasingly even distribution of poverty and an increase in the proportion of low income households living in private sector housing. There was also evidence of an association with the declining segregation of social housing. There were also associations with population dilution and displacement indicators, with the latter appearing to be the stronger influence. For older people, there was evidence of declining evenness i.e. an increasing residential concentration of poverty at older ages, though the magnitude of this change was much smaller than for the younger age groups. The paper concludes by discussing the implications of these findings for area effects, area-based initiatives and gentrification by displacement (section 4.5).

4.2 The spatial distribution of income poverty: evidence, theory and drivers

The tendency for low income households to reside in particular neighbourhoods is a long established phenomenon. Studies have illustrated that the location of these low income neighbourhoods is relatively persistent over time in the UK,

including Dorling et al. (2000) who showed the persistence of neighbourhood poverty over nearly a century in inner London. More recently Tunstall (2016) showed that during New Labour's period of intense investment in neighbourhood renewal, large changes in relative neighbourhood socio-economic position were rare; and the official estimates of area deprivation reveal a similar pattern (Smith et al., 2015).

Nevertheless, evidence of change in the geography of poverty is now appearing. Trends have been observed towards deconcentration and decentralisation of poor households, particularly in London (Fenton, 2016; Hanna and Bosetti, 2015; Lupton, Vizard, et al., 2013) but also in other European cities (Hochstenbach and Musterd, 2017; Kavanagh et al., 2016). Parts of inner East London experienced striking declines in relative deprivation levels between 2008 and 2012 according to the English Indices of Deprivation (Leeser, 2016). Bailey and Minton (2017) studied the largest 25 British cities between 2001 and 2012 and found that income poverty has been suburbanising in all these cities, moving away from the inner city and becoming more evenly distributed.

This evidence suggests that, in those cities which have been studied, the lowest income households have become less likely to reside in the highest poverty areas. Such a shift would be of interest to both policy and research in terms of exposure to 'area effects' (Manley et al., 2013), the efficiency of 'area-based initiatives' in reaching low income households (Batey et al., 2008: 123) and the potential for residential displacement of low income households (Slater, 2009). In England what has not been established is whether this dispersal phenomenon exists beyond the major cities, and if so what factors might be driving it.

The spatial pattern of residential location is the result of individual household choices made under constraints (Meen et al., 2005). Choices are the expression of preferences including urban/rural location, proximity to family and friends, access to preferred schools, housing type, proximity to jobs, physical environment and local services (Cheshire, 2009). The most significant constraints are the availability of public housing (known as social or council housing in the UK) and the price of housing in the private market (either owned or rented). How do these constrained choices result in residential sorting of the population by income in the UK? The first sorting mechanism is the filtering of households into publicly-subsidised social housing or the private housing market. Large portions of social housing were built as large single-tenure estates in the 1960s and 1970s, which means that social housing is substantially segregated from other housing tenures (Meen et al., 2005: 20). Families who live in social housing are more likely to be in income poverty than families in private housing; consequently the physical location of social housing results in a degree of income poverty segregation. Additional sorting mechanisms operate in the private housing market. Cheshire (2009) shows how residential stratification by income is the spatial expression of economic inequality. Desirable aspects of neighbourhoods - low crime, good services, physical environment - are factored in to the price of housing. Higher income households are able to spend more of their income on those neighbourhood attributes that they value, pricing out lower income households.

If these are the mechanisms by which income poverty becomes unequally distributed, what has changed to alter its spatial distribution? First, there has been a dramatic shift in the composition of income poor individuals by housing tenure. In 2004/05 around one in six income poor individuals was living in the private rented sector; by 2014/15 this had risen to one in three, with reductions

in the proportion living in social housing (Tinson et al., 2016: 10). This shift is confined to working age households: just 11% of income poor pensioners lived in private rented housing in 2014/15 (DWP, 2017b). This would lead us to expect an increasingly even distribution of income poverty amongst working age income poor households, given that private rented housing is more dispersed than social housing. Even if low cost private rented housing is likely to be spatially concentrated in certain neighbourhoods, prospective tenants have greater choice over location than in the social housing system.

Second, it is possible that the location of social housing is changing, to become less segregated from other tenure types. Mixed community policies advocated by the Labour government in the 2000s (Lupton, Fenton, et al., 2013), mean that new social housing is more likely to be constructed as part of mixed-tenure housing developments than the homogeneous postwar council housing estates. More radical schemes have demolished existing social housing, replacing it with mixed-tenure developments (Hochstenbach, 2016). These have been highly controversial amid claims of ‘social cleansing’ by urban local authorities. This would reduce the poverty segregation effect of social housing.

Third, the location of new private housing could be inducing a population dilution effect. There has been an increasing preference for urban living amongst young, more affluent professionals. The age at which women have their first child has been steadily increasing and consequently the number of young, childless adults with leisure time, disposable income and a preference for urban living has been increasing (Bailey and Minton, 2017). Rae (2013) has found that inner urban growth made a major contribution to the rapid population increase of England’s largest cities in the period between 2001 and 2011. This growth was driven

largely by private city centre housing developments and therefore amounted to an influx of higher-income residents in a process described as the '*re-imagining of the city for the middle classes*' (Rae, 2013: 97). Studying the same time period, Lupton, Vizard, et al. (2013) found that the poorest neighbourhoods in Inner West and Inner East London experienced the largest increase in households, inducing a dilution effect such that '*poverty rates dropped quite dramatically in the poorest neighbourhoods*' (Lupton, Vizard, et al., 2013: 37). Thus income poverty segregation could have been reduced by higher-income residents moving in to new developments built alongside existing lower-income communities.

Fourth, low income households could be being displaced from private rented housing in a process of gentrification (Slater, 2009). According to the theory expounded by Cheshire (2009), we would expect the increased preference for urban living to be capitalised in the market such that private housing rents and purchase prices would rise. Consequently lower income households would eventually be priced out of private housing in the most highly prized neighbourhoods. This effect may have been compounded by reforms to housing benefit, a cash transfer paid to low income households to subsidise the cost of renting their home. In 2008 the maximum housing benefit paid to private sector tenants was restricted to the median rent in the 'broad rental market area' (BRMA), rather than being paid with reference to the actual rent. The BRMAs are relatively large areas, encompassing whole cities or indeed whole counties (153 BRMAs cover the whole of England). Consequently, a private tenant whose rent was raised above the BRMA median rent would either have to move to a cheaper area or find the additional rent themselves. In 2011 the maximum housing benefit was reduced to

the 30th centile of rents in the BRMA, and further reforms followed in 2013. The increased exposure of low income households to market fluctuations in rental costs may have contributed to the change in spatial location that has been observed.

Fifth, the spatial impacts of the Great Recession and subsequent austerity policies might lead us to expect a higher concentration of poverty. Following the 2008/09 recession unemployment rose most in those areas which already had high levels of poverty and worklessness (Lupton and Fitzgerald, 2015: 27). The austerity programme introduced by the coalition government after 2010 introduced significant public spending cuts which fell hardest in the poorest areas (Beatty and Fothergill, 2013). Therefore we might expect that, in those areas hit hardest economically by the recession, that the dispersal effects outlined above may be offset by increasing income poverty concentration caused by the recession.

4.3 Aims and methods

The existing literature has established a trend towards the increasingly even distribution of income poor individuals in British cities, but not whether this is occurring across the whole of England. Relatively little work has been done to identify the processes that are involved in this increasingly even distribution. The literature suggests that the compositional shift of working age low income households to private rented housing may be implicated in the increasing degree of evenness. If so, we would expect different patterns to emerge for working age households compared to pensionable age households, which have not experienced the same tenure shift.

The main questions addressed by this study are:

- Are income poor individuals are becoming more evenly distributed by residence in all areas of England?
- How does this differ subnationally, by local authority area type, and between age groups?
- Is the compositional shift to private rented housing associated with increasing evenness? What other processes are associated with this change?

4.3.1 Describing the distributional evenness of income poverty across English neighbourhoods

This paper uses the income domain of the English Indices of Deprivation (Smith et al., 2015) and the Children in Low Income Families Local Measure (HMRC, 2014), proxy indicators of relative income poverty based upon receipt of means-tested welfare benefits. These are both official estimates published by the UK central government. In the Indices of Deprivation income domain (IDID), the number of people living in poverty is estimated as the sum of adults and children in families in which a claim is made for either (i) one of four means-tested out-of-work welfare benefits, or (ii) in-work tax credits, where the equivalised household income is below 60% of the national median income (the usual definition of the contemporary poverty line). The Children in Low Income Families Local Measure (CLIF) uses a very similar method to estimate the number of children in families with incomes below the poverty line. Although these are indirect measures of the *‘inability to participate [in society] owing to a lack of resources’* (Nolan and Whelan, 1996: 188), low income is a powerful indicator of command over the resources necessary to participate in a commodified society. Spatial or temporal variations in rates of claim for the relevant state cash benefits could affect the conclusions drawn from such indicators (Bradshaw and Richardson, 2007), but

benefit take-up rates have been stable over the period of this research (HMRC, 2012). The very significant advantage of these income poverty estimates is the small spatial areas for which they are available.

The estimates are published periodically as proportions of the population in English Lower Super Output Areas (LSOAs). LSOAs are a statistical geography designed for outputs from the England & Wales censuses to be of similar population size and as socially homogeneous as possible. LSOAs are used here as proxies for neighbourhoods; they had a median ‘usually resident population’ of 1,572 residents in 2012. The IDID is published every three to four years, with the latest iterations referring to 2005, 2008 and 2012; the 2001 IDID indicator is not used due to the significant change to tax credits that occurred in 2003. The CLIF measure has been published annually between 2006 and 2014. The IDID proportions are published separately for children under 16 years and adults aged 60 years and over; and hence it can also be calculated for people aged 16 to 59 years. The CLIF measure is used in addition to the IDID measure as it is published annually, so allows more detailed observation of trends than the three points of the IDID. At various points in discussion the term ‘high poverty areas’ is used to refer to those areas which have the highest proportions of the population living on incomes below the poverty line, as determined by the IDID and/or CLIF measures.

The researcher who wishes to quantify residential segregation is confronted with a large number of possible measures and a voluminous literature. The aim of this paper is to measure the extent to which income poor populations in England have become more or less evenly distributed, with a particular focus on the extent to which low income individuals are likely to live in high poverty neighbourhoods.

This is the concept of population evenness, one of five dimensions of segregation defined by Massey and Denton (1988). We must also ask whether our measure needs to incorporate the clustering dimension i.e. whether it should be sensitive to spatial patterning of neighbourhoods exemplified by the ‘checkerboard problem’ (Dawkins, 2007). The research questions are confined to the under- or over-representation of poverty within neighbourhoods, not the spatial patterning between neighbourhoods. Therefore an aspatial measure of unevenness is appropriate, rather than one of the available global or local spatial measures that simultaneously measure evenness and clustering (Reardon and O’Sullivan, 2004). From Massey and Denton (1988), the principal measures to be considered are the Index of Dissimilarity D , the Gini coefficient G and the Atkinson index A .

These three indices have their own advantages and disadvantages. The Index of Dissimilarity sometimes violates the transfer principle (James and Taeuber, 1985), that a transfer of poor individuals from a higher poverty area to a lower poverty area should cause the index to decrease. If poverty levels at the higher end reduce, we would wish our chosen measure to reflect this. Atkinson (1970) illustrates that different measures of unevenness are implicitly related to different social welfare priorities, showing that the Gini coefficient puts somewhat greater weight upon inequality shifts in the middle of the distribution. His eponymous index incorporates a parameter that varies the weight placed upon different parts of the distribution. Values less than 0.5 place greater weight on the lower end of the distribution; values greater than 0.5 place greater weight on the upper end (Massey and Denton, 1988). As our interest is principally in the upper end of the distribution, we follow other studies (Iceland et al., 2002) in calculating an Atkinson index with parameter 0.9, denoted A_9 . This index is less readily interpretable, both due to unfamiliarity and because its value depends

upon the additional parameter (Massey and Denton, 1988). By contrast, the Index of Dissimilarity and the Gini coefficient are both very well established in the empirical literature (Catney, 2015; Dawkins, 2007) and so are at least more interpretable due to familiarity, as well as having well known intuitive interpretations. Consequently all three indices are used in the descriptive analysis, with correlation coefficients reported to describe the relationships between them.

Finally, a spatial scale must be chosen within which to analyse changes in population evenness. Local authority (LA) areas are an analysis unit of interest, as English local authorities are responsible for driving neighbourhood policy and housing policy. The disadvantage of these units is that local authority areas are so heterogenous in nature that comparisons between them are difficult. Some are largely rural areas (Cornwall) whereas others are a small part of a large urban area (London Borough of Islington). To address this heterogeneity, the analysis of evenness by local authority areas is broken down by the Office for National Statistics Local Authority Classification. This uses socio-economic and geographical features of local authority areas to classify them into one of seven ‘supergroup’ types. 324 local authority areas are used in the analysis: City of London and Isles of Scilly are excluded due to their very small resident populations.

4.3.2 Modelling the change in poverty evenness

To incorporate local authority heterogeneity, changes in the evenness indices for each local authority between 2005 and 2012 are modelled using a two-level hierarchical linear model (also known as a multilevel model), with each local authority being a member of a local authority supergroup type. Modelling is conducted separately for each age group. The hierarchical model effectively

partitions the dependent variable variance between that due to variance between different local authority types, and that due to variance within local authority types. One advantage of a hierarchical linear model is that the effect of being in a particular supergroup type can itself be modelled by the explanatory variables. This feature will be utilised in the analysis, in which variables are first included at local authority level then tested for inclusion at the local authority supergroup level. In order to facilitate comparison, change in D between 2005 and 2012 according to the IDID indicator is used as the dependent variable for each age group. Models developed for the G and $A9$ indices gave similar findings.

Five hypothesised mechanisms for a change in evenness of poverty are proposed in section 4.2 and these are captured in four explanatory variables. An indicator of the change in low income households living in private rented housing was constructed using data from the 2001 and 2011 England & Wales Censuses; the only other source of data on tenure is national social surveys which are unsuitable for providing local authority estimates. The indicator spans 2001-2011 rather than the study period 2005-2012; however national data suggests that most of the compositional shift in tenure occurred since 2005 (DWP, 2016a). The Census does not collect information about income, and therefore the social class of the ‘household reference person’ was used as a proxy indicator for household income. The lowest income households were identified as those in the three lowest social classes on the National Statistics Socio-economic Classification (‘Semi-routine occupations’, ‘Routine occupations’ and ‘Never worked and long-term unemployed’). Ideally this would be broken down by age group in addition, but the relevant table is not available from the 2001 Census. The

percentage point difference in the proportion of these households living in private rented housing in each local authority area was calculated from tables CS046 (2001 Census) and LC4605EW (2011).

Change in the distributional evenness of social housing was evaluated by calculating evenness indices (D , G , $A9$) for each local authority using estimates of social housing stock by LSOA from the 2001 and 2011 Censuses. The data was derived from tables KS018 (2001 Census) and KS402EW (2011). In the models the evenness index matched that used for the dependent variable.

A population dilution indicator is next proposed. Consider the poverty rates in an area at two times points: r_0 and r_1 . These rates are derived from the number of people in poverty (n_0 , n_1) and the total population at each time point (T_0 , T_1). The ratio of the two rates is then

$$\frac{r_1}{r_0} = \frac{n_1/T_1}{n_0/T_0}$$

A reduction in the rate of poverty can be caused by a population dilution effect. This occurs where the number of people in poverty is unchanged ($n_0 = n_1$) but the total population grows ($T_1 > T_0$). In this case the ratio between the two rates reduces to T_0/T_1 . This ratio is positive and right-skewed, as for $T_1 > T_0$ it falls between 0 and 1, but for $T_0 > T_1$ it lies between 1 and infinity. Therefore we ought to follow best practice for modelling positive-only variables and take logarithms before analysis. The dilution indicator therefore becomes

$$dilution = \log\left(\frac{T_0}{T_1}\right)$$

A reduction in the rate of poverty can also be caused by a change in the number of people in poverty, and in the pure case this occurs where there has been no change in the population denominator ($T_0 = T_1$). In this case the ratio between the two rates becomes n_1/n_0 . Again, we should take logarithms of this positive quantity arriving at

$$displacement = \log\left(\frac{n_1}{n_0}\right)$$

This displacement indicator can also be used as a measure of poverty concentration i.e. an increase in distributional unevenness that occurs due to the absolute number of people in poverty *increasing*. Returning to our original ratio between the poverty rates and taking logarithms we can now see, using the algebraic rules of logarithms (i.e. $\log(AB) = \log A + \log B$), that

$$\log\left(\frac{r_1}{r_0}\right) = \log\left(\frac{n_1/T_1}{n_0/T_0}\right) = \log\left(\frac{n_1}{n_0}\right) + \log\left(\frac{T_0}{T_1}\right) = dilution + displacement$$

The dilution and displacement indicators therefore decompose changes in the rate of poverty between changes in the total population (dilution) and changes in the absolute number of people who are poor (displacement). The interest here lies in whether dilution or displacement of income poor households is occurring in the highest poverty areas within local authorities, driving an increase in distributional evenness. Therefore the dilution and displacement indicators are calculated for the top fifth of highest poverty areas within each local authority area, separately for each age group. Where dilution has occurred we would expect $\log(T_0/T_1)$ to be negative, and associated with a fall in the evenness index; where displacement has occurred we would expect $\log(n_1/n_0)$ to also be negative and associated with a fall

in evenness index. In the case where recession or austerity has caused an increase in the number of poor individuals, $\log(n_1/n_0)$ would be positive and associated with an increase in evenness indices. Therefore in the model we expect a positive coefficient between these indicators and the change in evenness. We can expect that there may be correlation between the independent variables in the model. For example, a shift to lower income households living in private rented housing may cause an effect that would also be measured by the displacement indicator, and a similar effect may occur for changing locations of social housing.

Figure 4.1 shows the distribution of the independent variables in the model, with standard deviations in brackets. It shows that within most local authorities there has been an increase in lower income households living in private rented housing and that there has been an increase in the distributional evenness of social housing. The dilution indicators for all age groups show that in the majority of local authority areas there has been a dilution effect. The displacement indicators are more mixed; for income poor individuals of working age there is more evidence of a concentrating effect; for older people and children more local authorities have seen a displacement effect. In the models, the dilution and displacement indicators were scaled to have zero mean and a standard deviation of 1; other variables were left on their original scale. In local authority areas that already had a high degree of distributional evenness at the beginning of the observation period the change in evenness should be expected to be more limited. Therefore the initial value of evenness at 2005 is also included in the modelling.

A number of goodness of fit measures are used to evaluate the models. The statistical significance of individual coefficients is evaluated by means of t-values (i.e. the coefficient divided by its standard error). Values greater than 2 indicate

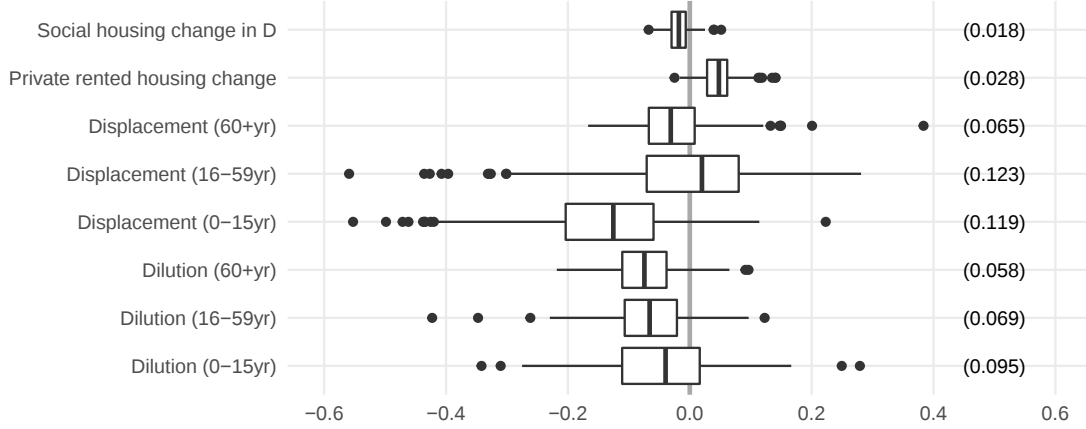


Figure 4.1: Distribution of independent variables (standard deviations shown in brackets)

statistical significance at the 95% level. Decreases in the Bayesian Information Criterion (BIC), a transformation of the log likelihood that penalises model complexity, is used to indicate improvements in the model, as are likelihood ratio tests of nested models. Explained variance is calculated according to a method proposed by Snijders and Bosker (2012). This is the reduction in total residual variance (i.e. the sum of variances at both levels) in the proposed model compared to the empty model with group structure only. The importance of group structure is evaluated in the empty model using the intra-class correlation coefficient (the ratio of between-group variance to total variance).

4.4 Findings

4.4.1 Children

Figure 4.2 shows how the three evenness indices have changed for child poverty between 2006 and 2014, based upon the CLIF indicator, by local authority supergroup. Though they are at different levels with $G > D > A9$, the three indices are very closely related. The linear correlations between the measures are

greater than 0.99 and the correlations between the three measures of change over the period are greater than 0.92. All local authority area types show evidence of an increasingly even distribution of child poverty, though there are differences between areas types in the initial level of unevenness and the degree of change over time.

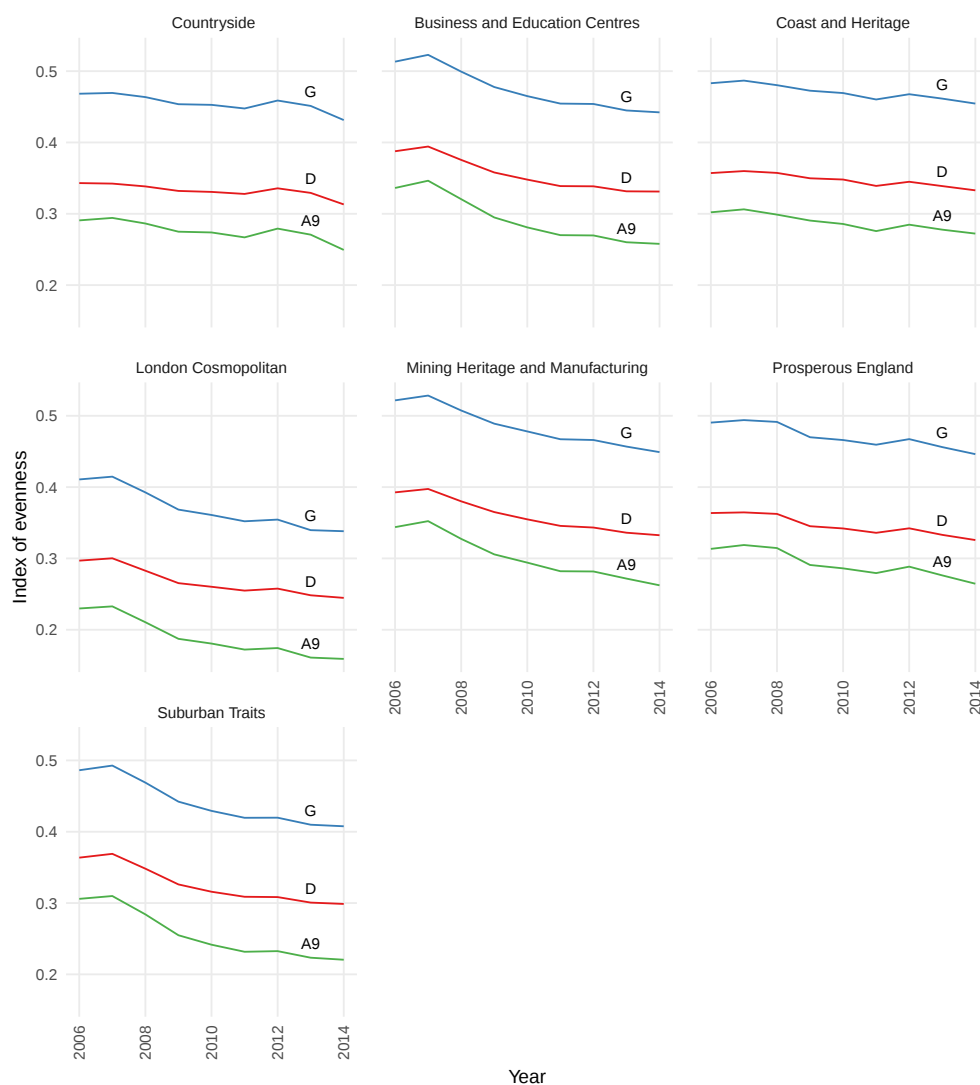


Figure 4.2: Evenness measures for CLIF child poverty indicator within LSOAs by English local authority supergroup 2005-2014

The seven local authority supergroups can be categorised according to their starting level of distributional evenness, focusing here on the Index of Dissimilarity *D*. The London cosmopolitan group of local authorities had the lowest initial

level of D at 0.30. Local authority areas in the types ‘Coast and Heritage’, ‘Countryside’, ‘Prosperous England’ and ‘Suburban Traits’ had initial values of D between 0.34 and 0.36. The most uneven distribution of child poverty was found in ‘Business and Education Centres’ and ‘Mining Heritage and Manufacturing’ which both had initial D values of 0.39.

The evenness indices decreased most in the more urban local authority types. In ‘London Cosmopolitan’ local authority areas D fell to 0.24 which was still the lowest of all LA supergroup types. In the ‘Business and Education Centres’, ‘Mining Heritage and Manufacturing’ and ‘Suburban Traits’ supergroup types D fell between 0.06 and 0.07. The lowest declines in D were in the most rural supergroup types - ‘Prosperous England’, ‘Countryside’ and ‘Coast and Heritage’. Due to these different rates of change, by 2014 evenness measured by D in ‘Business and Education Centres’ and ‘Mining Heritage and Manufacturing’ local authority types was 0.33, very similar to that in ‘Prosperous England’ and ‘Coast and Heritage’ local authorities. Very similar conclusions are drawn from an inspection of the other two indices, G and $A9$, and from the similar but temporally coarser IDID indicator. It is interesting to note that the evenness indices continued to decline in 2013 and 2014. These data points are unavailable for working age and pensionable age people.

Table 4.1 shows the results from a hierarchical linear model of the change in evenness as measured by D between 2005 and 2012 using the IDID indicator. Given the differences in trend by local authority type we would expect the group structure to be important. This is indeed the case: the intra-class correlation in

Table 4.1: Hierarchical linear model of change in D 2005-2012 for children

	Model 1	Model 2	Model 3
(intercept)	-0.041*** (-4.956)	0.029*** (3.684)	0.075*** (6.976)
Private rented housing change		-0.450*** (-6.290)	-0.351*** (-6.182)
P.R. housing change (group mean)		-0.966*** (-5.660)	-0.373* (-2.065)
D in 2005			-0.212*** (-10.639)
Social housing change in D			0.185* (2.497)
Dilution indicator			0.010*** (6.426)
Displacement indicator			0.016*** (11.204)
Variance(x10 ³): LA supergroup	0.457	0.017	0.028
Variance(x10 ³): residual	0.978	0.873	0.497
Intra-class correlation	0.318		
Propn explained variance		0.380	0.634
BIC	-1288	-1330	-1485
Log Likelihood	652	679	768
Number of observations	324	324	324
Number of groups	7	7	7

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; t-values shown in brackets; variance transformed for readability

model 1 (the empty model with no independent variables) is 0.32, showing that around a third of the variance exists between local authority types and two-thirds within them.

Model 2 includes the change in private rented tenure amongst lower NS-SeC households - as independent variables at both LA supergroup and individual LA levels. The coefficients on these variables are highly statistically significant in the model ($p < 0.001$). The direction of the relationship is as theoretically expected from section 4.2: D decreased more in those areas which had larger increases in the proportion of lower NS-SeC households in private rented housing. This relatively simple model explains 38% of the dependent variable's variance, and

explains almost all the variance between LA supergroup types. The BIC criterion decreases, showing an improvement in the model, and a likelihood ratio test comparing models 1 and 2 also shows that the model 2 predictors are highly significant ($\text{chisq}=53.5$, $\text{df}=2$, $p<0.001$).

Model 3 retains the model 2 explanatory variables and adds the initial value of D at 2005, the change in evenness of social housing, the dilution indicator and the displacement indicator. The coefficients for these indicators are statistically significant and the direction of the relationships is as theoretically expected. The proportion of explained variance increases to 63.4%, the BIC decreases compared to model 2 and a likelihood ratio test comparing the nested models 2 and 3 shows that these additional variables are statistically significant ($\text{chisq}=178.4$, $\text{df}=4$, $p<0.001$). The coefficient on the private rented variable is attenuated in model 3 compared to model 2, which may be due to correlation between explanatory variables. Social housing evenness and the dilution indicator were statistically significant at the group level, but explained only 2% additional variance so were omitted to keep the final model relatively parsimonious. The coefficient on the displacement indicator is larger than the dilution indicator coefficient, suggesting that an absolute decline in the number of poor children in the highest poverty areas has had a larger influence than dilution through population growth.

4.4.2 Working age people

For the sake of brevity, the charts and table for working age people are not included here as they illustrate similar patterns to those for children; the full set of material is provided as supplementary information. The values of D in 2005 by local authority type are similar to those for children in both magnitude and rank order. It fell in most local authority types, but by less than for children and with no

change in ‘Countryside’ and ‘Coast and Heritage’ LA supergroups. A hierarchical linear model with the change in private rented housing as independent variable explains 24.7% of the dependent variable’s variance, and the full model explains 63.4% (coincidentally, the same as the full model for children). The coefficients are all statistically significant and in the theoretically expected direction, with the displacement indicator appearing more important than the dilution indicator.

4.4.3 Older people

Figure 4.3 shows the evenness indices in 2005, 2008 and 2012 for the older age IDID indicator. The indices are in the same order as for other age groups ($G > D > A9$) and are closely correlated with each other. The smallest correlation between the three measures is 0.98 and the smallest correlation of change over the period (between D and $A9$) is 0.83. Change over time is more limited than the two younger age groups but with evidence of an increase in the indices. Again, change in D is focused on in the discussion below.

The highest values of D are again found in ‘Business and Education Centres’ and ‘Mining Heritage and Manufacturing’ local authority types, though these are lower than the younger age groups at 0.31 and 0.30 respectively. ‘London cosmopolitan’ local authority areas do not stand out as having a particularly low value of D ; ‘Countryside’ LAs have the lowest value in 2005 at 0.23.

All area types have an increase in D , but the change over the period is smaller than other age groups and less differentiated between local authority types. The increase ranges from 0.008 (‘Countryside’) to 0.017 (‘London cosmopolitan’), with the most urban areas having the largest change. For most area types the greater

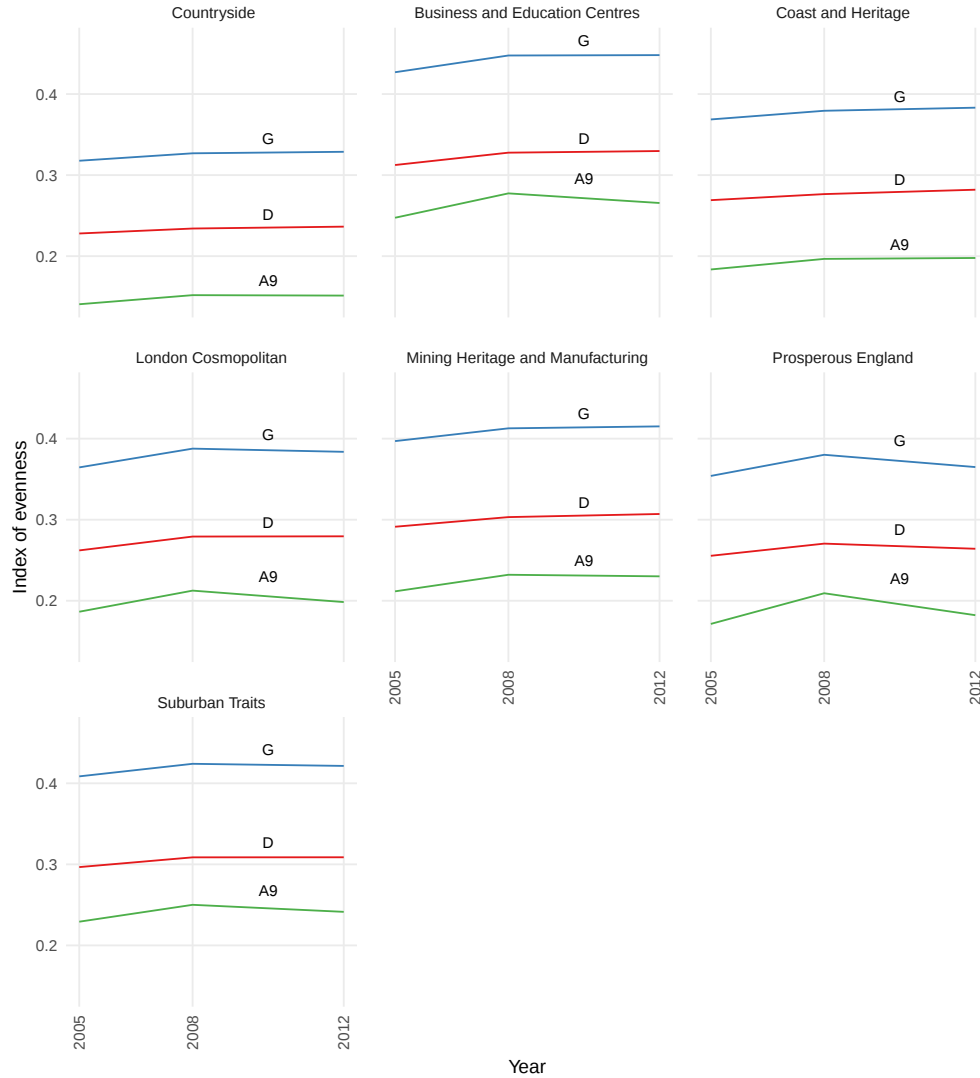


Figure 4.3: Evenness measures for older age IDID indicator within LSOAs by local authority supergroup 2005-2012

part of this change occurs between 2005 and 2008. No changes in rank order occur as a result of the increases between 2005 and 2012. Again, similar findings are reached by inspecting the other two indices.

Table 4.2 shows the results from hierarchical linear models of the change in D between 2005 and 2012 for the older age IDID indicator. Given the smaller differentiation between local authority types amongst this age group we would

Table 4.2: Hierarchical linear model of change in D 2005-2012 for older people

	Model 1	Model 2	Model 3
(intercept)	0.013*** (6.475)	0.002 (0.335)	0.019*** (4.230)
Private rented housing change		0.023 (0.654)	
P.R. housing change (group mean)		0.196 (1.957)	
<i>D</i> in 2005			-0.038* (-2.289)
Social housing change in <i>D</i>			-0.128** (-3.137)
Dilution indicator			0.006*** (7.255)
Displacement indicator			0.007*** (9.503)
Variance(x10 ³): LA supergroup	0.021	0.008	0.009
Variance(x10 ³): residual	0.211	0.212	0.157
Intra-class correlation	0.090		
Propn explained variance		0.053	0.284
BIC	-1794	-1786	-1869
Log Likelihood	905	908	955
Number of observations	324	324	324
Number of groups	7	7	7

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; t-values shown in brackets; variance transformed for readability

expect the group structure in the model to be less important. The intra-class correlation in the empty model 1 shows that this is the case: just 9% of the variation in the dependent variable is between local authority types.

Model 2 includes the change in lower NS-SeC households in private rented housing. Theoretically we do not expect a relationship with change in private rented housing at this age group, but it is explored here to confirm this expectation. Neither coefficient is statistically significant at the 5% level. The BIC increases, indicating a poor model fit, and the model explains just 5.3% of the variance. A likelihood ratio test indicates that this model is not an improvement on the empty model 1 (chisq=4.1, df=2, p=0.127).

Model 3 excludes the private renting variable, adding the other four explanatory variables. All additional variables are statistically significant (with at least $p < 0.01$). The relationships with the dilution and displacement indicators are in the theoretically expected direction, but the relationship with change in social housing evenness is in the opposite direction. No variables were found to be statistically significant at the LA supergroup level. The BIC decreases and the model now explains 28.4% of the variance. A likelihood ratio test indicates that model 3 is an improvement over the empty model 1 ($\chi^2 = 99$, $df = 4$, $p < 0.001$). The relative size of the coefficients suggest that increasing unevenness has been influenced by a growth in the absolute number of poor older individuals in the highest poverty areas and a loss of total population in those areas.

4.5 Discussion and conclusions

These results confirm the increasingly even distribution of income poverty observed in other studies of British cities. It also shows that these patterns, while stronger in the most urban English local authority areas, are not confined to them, and that there is clear differentiation by age group. For children, the evenness indices declined in all local authority supergroup types, the greatest falls being in the more urban local authority types. For working age people the falls in evenness indices were smaller than for children. There was no decline in the indices in the most rural local authority types and again the greatest falls occurred in the most urban. For both these age groups, the increase in evenness was associated with an increasing proportion of lower income households living in private rented housing. This variable alone accounted for a large proportion of the variation in evenness change. Increasing evenness was also associated with higher initial levels of unevenness, an increasingly even distribution of social

housing, and dilution and displacement processes in the highest poverty areas. The relative size of model coefficients suggest that an absolute fall in the number of income poor individuals in high poverty areas had a greater influence than a dilution effect through total population growth, though both processes appear to be important.

For older people, the findings are rather different. Initial values of evenness indices were much lower than for the younger age groups. All local authority types had an increase in the evenness indices between 2005 and 2012, though the change was small compared to the younger age groups. There was no relationship between private rented housing and evenness indices for pensionable age poverty evenness, as expected from the theoretical discussion and literature review. Increasing evenness was associated with dilution and displacement processes in the highest poverty areas, but these effects were much smaller than for the younger age groups.

The study also found that the three evenness indices used - the Index of Dissimilarity, the Gini coefficient and the Atkinson index - were very closely correlated and gave broadly similar results, despite their different properties. This suggests that the changes in evenness reported are happening across the whole distribution, rather than just in the highest or lowest poverty areas. The study covers a relatively short period of time, with three data points for working age and pensionable age populations; however the annual time series derived from the CLIF child poverty indicator suggests that there has been a smooth increase in evenness over time that has continued up until 2014, the latest data point available. Although the explanatory variables derived from the Census do not exactly match the time span of the study, there are significant associations with the change in evenness.

The results of the modelling, plus the different patterns of distributional evenness by age group, suggest that increasing propensity for working age low income households to be living in private rented housing is heavily implicated in the increasingly even distribution of income poverty in England over the period 2005-2014. This may be a consequence of choices by low income households to rent their home in lower poverty neighbourhoods, or a mechanical result of the lower segregation of private rented compared to social rented housing. Alternatively it may be the result of gentrification by displacement (Slater, 2009): low income households being priced out of rented housing in urban neighbourhoods newly popular with a growing population of young, childless, higher income professionals. There is also evidence that lower income households are becoming more residentially dispersed as social housing is becoming less segregated from other types of housing, through mixed tenure developments or the siting of new build private housing near existing social housing.

It has been proposed by many researchers that outcomes for low income individuals living in high poverty areas are worse as a consequence of the neighbourhood they live in i.e. that there are 'area effects'. Do the findings of this research mean that area effects are reducing as mixed income neighbourhoods become an increasing reality? If area effects operate through peer networks there is a possible impact, though residence is but one place where people spend their time. The existence of within-neighbourhood or even within-building segregation would limit this, such as 'poor doors' in mixed-tenure buildings which provide separate entrances for private rented and social rented housing (Crossley, 2017: 38). If area effects operate via the quality of services and amenities, there may be positive benefits via an increase in 'middle-class voice' and reduced territorial stigmatisation. On the other hand, Cheshire (2009) argues forcefully

that high poverty areas can be viewed as ‘specialised neighbourhoods’ that create welfare by providing low cost housing, services and support networks, and that mixed communities destroy this welfare. It may well be the case that mixed communities destroy certain types of social welfare but create others. More research could be conducted to understand these welfare gains and losses, both through quantitative ‘natural experiments’ and qualitative case studies.

‘Area-based initiatives’ targeted on high poverty areas have been used to ameliorate area effects, and also to target low income individuals. At the start of the period covered by this study approximately £1.5 billion was being spent annually on policies targeted at the ‘most deprived’ neighbourhoods (Lupton, Fenton, et al., 2013: 15), but this was cut by the 2010 coalition government and replaced with a ‘new localism’ (Collins, 2016) in which local authorities were left to determine (and fund) neighbourhood policy. Area-based initiatives continue to be employed by local actors, but if income poverty becomes more dispersed these initiatives will be less effective means of reaching low income individuals. The shift of low income households into private rented housing means that as well as increased dispersal, the location of low cost housing and therefore low income households can shift more quickly. Area targeting is typically undertaken using the Indices of Deprivation, now six years old; in the absence of up-to-date official statistics, local bodies must utilise their own sources of evidence to ascertain contemporaneous spatial patterns of poverty.

The impact on area effects and the efficiency of area-based initiatives depend upon whether the trend towards an increasingly even distribution of income poverty is permanent or simply a transitional phase. Bailey and Minton (2017) show that poverty has become a more suburban phenomenon in Britain, and asks whether

the increasingly even distribution of poverty is a temporary phase as low income households become displaced from newly-popular inner city locations, and low cost housing becomes situated in the suburbs.

This study does not provide incontrovertible evidence that lower income households are being displaced by higher income households. The displacement indicator used in the modelling shows that increasing distributional evenness is associated with an absolute decline in the number of low income individuals living in high poverty areas. This certainly could be caused by displacement of low income households, but it could also be caused by in-situ changes in the risk of low income. Bailey (2012) reports that whilst selective migration is often assumed to be the dominant force in neighbourhood change, in-situ changes can also be important. Households at the lower end of the income distribution are becoming more like those in the middle in terms of tenure, employment and benefit income (Belfield et al., 2016: 53); it could therefore be the risk of poverty that is becoming more spatially dispersed, rather than the movement of individuals themselves.

5 Income and population dynamics in deprived neighbourhoods: measuring the poverty turnover rate using administrative data¹

Abstract

Many studies of neighbourhood deprivation have confirmed that there is more continuity than change in the geography of deprivation. This stable geography can lead to an unwarranted inference that the households living on low incomes in these areas comprise a relatively static population. This paper develops the use of administrative data for the longitudinal observation of low income families in small areas, which is underdeveloped despite the widespread use of administrative data in the cross-sectional measurement of neighbourhood deprivation. An empirical measure of local poverty dynamics - the poverty turnover rate - is introduced, and created for small areas using housing benefit data for the city of Oxford between 2010 and 2014. A high turnover of poor families is observed and the poverty turnover rate is able to identify small areas with higher and lower turnover rates than the average for the city. The high turnover rates discovered in this study suggest that in this city it is primarily the flows of people in and out of the area, and in and out of low income, that maintains

¹This paper was presented at the 2017 annual conferences of the *British Society for Population Studies* and the *Administrative Data Research Network*, and has been published in *Applied Spatial Analysis and Policy* (Fransham, 2017).

the concentration of poor families, rather than a static population of poor families. This approach can be used to provide a richer understanding of the population and income dynamics that underpin stability and change in the geography of poverty, of use to regeneration policy and the academic studies of gentrification, health inequalities and neighbourhood effects.

5.1 Introduction

‘Because we have been in this position for the last five years anyway it’s going to be a case of people thinking “Oh well, what has changed?” We just get on it with it.’

Secretary of the Jaywick Forum, quoted in the East Anglian Daily Times, 30 September 2015 (Lodge, 2015)

In September 2015 the seaside resort of Jaywick became the focus of UK national news attention after being labelled the most deprived area of the country according to the English Indices of Deprivation. Most media coverage highlighted the fact that Jaywick had also been identified as the most deprived area five years earlier, in the 2010 Indices of Deprivation. In August 2016 Paisley, a town seven miles west of Glasgow, was identified as home to the most deprived Scottish neighbourhood according to the Scottish Index of Multiple Deprivation - an unwanted title that had also been bestowed upon it in 2012.

This relatively unchanging geography of deprivation is not limited to those few areas identified as being the very most deprived. Up and down the UK, in small coastal towns and major cities, the observation in most places is that there is more continuity than change in the geography of deprivation and poverty. This stable geography, confirmed in a variety of studies, can lead to an unwarranted inference

that the families who experience low income within a given area comprise a static group, despite national longitudinal evidence showing high turnover amongst poor families (section 5.2).

This paper develops an empirical measure of turnover amongst poor families in small neighbourhood areas - the *poverty turnover rate* - using administrative data from housing benefit claims (section 5.3). The city of Oxford is used as a case study area between 2010 and 2014. The measure is strongly correlated with the official cross-sectional small area estimates and performs particularly well for working age families (section 5.4.1).

Far from finding a large static population of poor families, the housing benefit measure reveals a high flow of families. The flows observed are a combination of two processes: residential mobility in and out of the city, and income mobility in and out of low income. In 2010 there were 8,820 families living in rented homes on incomes below the poverty line in Oxford and, in line with post-recession national trends, this number fell to 8,190 families in 2014 (section 5.4.2). However, only 4,900 of these 8,190 families (60%) had been among the population of poor Oxford families four years earlier. The remaining 3,290 families (40%) had become new members of the population of poor Oxford families - through entering poverty and/or by moving in to the area. A higher probability of leaving the population of poor Oxford families was associated with living in a privately rented home, claiming a work-related welfare benefit, being a lone parent and having an adult in employment.

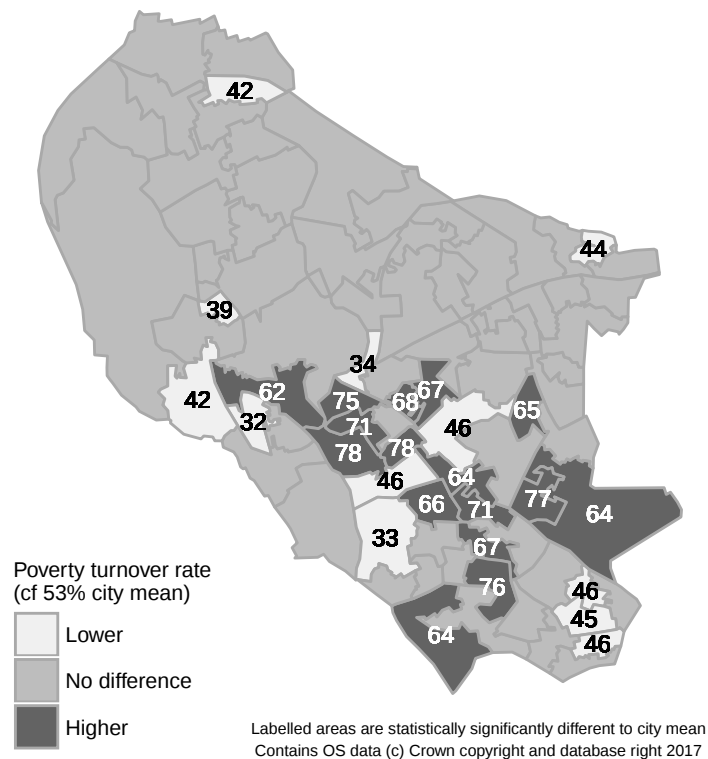


Figure 5.1: Poverty turnover rate by LSOA (per cent) 2010-2014, Oxford

The poverty turnover rate identifies neighbourhood areas with higher and lower turnover rates than the average for the city (section 5.4.3). This is primarily due to the differing composition of families by tenure within those areas - high turnover rate areas having high concentrations of private rented housing.

The high poverty turnover rates discovered in this study illustrate that it is the flows of people in and out of an area, and in and out of low income, that maintains the concentration of poor families in this city, rather than a static population of stubbornly poor families. However the dominant cause of these flows - residential mobility or income mobility - cannot be disentangled (section 5.5). To the extent that these flows are indicative of high levels of poverty exit - as highlighted by Jenkins (2011) - it reminds anti-poverty policymakers to focus as much on poverty

(re-)entry as focusing on getting people out of poverty. To the extent that it reflects high levels of residential mobility amongst persistently poor families, it points to the need to improve security of housing tenure to facilitate the development and maintenance of social networks.

The approach outlined in this paper develops the potential for using administrative data in the longitudinal measurement of poverty and deprivation at small, neighbourhood level. This potential has thus far been under-realised, despite the established use of administrative data for cross-sectional measures. The approach can be used to provide a richer understanding of the population and income dynamics that underpin stability and change in the geography of poverty, of use to regeneration policy and the academic studies of gentrification, health inequalities and neighbourhood effects. As a complement to the existing small area poverty estimates, it could be used by funding agencies to target area-based funding and initiatives at areas of high poverty persistence where currently poor families may be more likely to suffer long-term material deprivation.

5.2 Motivation: why study poverty dynamics in small areas?

The study of poverty dynamics is about understanding the experience of income poverty over time. Many measures of poverty are cross-sectional - they count the number of people living on an income below a poverty line at a given point in time. Studies of poverty dynamics take time into account, such as the length of time a family has been poor for. Policymakers might be less concerned if poverty is only a short-term experience which is more easily coped with; more concerned if poverty is persistent within families over a long period.

Neighbourhood-level cross-sectional indicators of poverty are widely used in UK social policy and research. Three broad classes of approach have emerged: proxy indicators based upon decennial Census socio-economic data (Carstairs and Morris, 1990; Williamson, 2015); proxy indicators based upon receipt of means-tested benefits (Gambaro et al., 2015; Smith et al., 2015); and small area estimation via regression models or micro-simulation (Anderson, 2007; Dorling et al., 2007; Fry, 2011). UK government bodies now regularly produce two measures of income poverty for neighbourhood areas in England: the income domain of the English Indices of Deprivation (Smith et al., 2015), with similar versions for Scotland, Wales and Northern Ireland; and the Children in Low Income Families Local Measure (HMRC, 2014).

Cross-sectional estimates of the population experiencing poverty in a given neighbourhood at a certain point in time reveal that the geography of poverty is relatively stable - the poorest areas at one time point tend to be the poorest areas at another (Gambaro et al., 2015; Smith et al., 2015; Tunstall, 2016). This can lead to an inference that within a given neighbourhood the population who experience poverty is a static group. National evidence shows that in fact there is a high degree of turnover in the population of poor families (DWP, 2010; Office for National Statistics, 2016a). Summarising UK poverty dynamics over the period 1991-2006, Jenkins (2011) shows that every year around 40% of poor people left poverty while around 10% of non-poor people entered poverty.

Whilst there is good national evidence, there is little or no subnational evidence illustrating this phenomenon. The argument for local evidence is two-fold. First, national evidence is not always trusted by local policymakers, who can believe (rightly or wrongly) their area is idiosyncratic. Second, at a subnational level the

turnover in the population of poor families is a function of two processes - the degree of income mobility in and out of poverty, and the degree of residential mobility in and out of the area. Residential mobility is a relatively common experience, with around 11% of people moving each year (Robson et al., 2009). Mobility rates are strongly linked to position in the life course, with young adults most likely to move home (Champion et al., 1998) but there is little evidence that population turnover varies by area deprivation (Bailey and Livingston, 2007).

The notion of a static local population of poor families is problematic first because it supports the myth of a ‘welfare dependent underclass’ (Hills, 2014b) who are persistently out of work and claiming state support. This can stigmatise those who claim welfare support and those who live in predominantly low income areas. It may also contribute to decreasing levels of support for a state welfare safety net.

Second, stable levels of poverty in an area over time can be represented to local policy makers as evidence of a stubborn, static population of poor families who require intervention to raise their incomes from employment. The degree to which this is true is likely to vary between neighbourhoods. Information about the population and income dynamics which maintain and change the characteristics of areas is generally not available to policy makers; if made available, it could be used to tailor policy interventions to places according to the dynamics at play (Addison et al., 2009; Bossert et al., 2012).

Third, cross-sectional poverty measures do not capture the depth of material deprivation in an area that may result from poverty persistence within families. Cross-sectional indicators of poverty do not correlate directly with indicators of material deprivation (Belfield et al., 2016: 74-76), partly because families

experiencing poverty for a short spell can use savings or other assets to maintain their living standards (Gordon, 2006: 41). Two areas with the same level of cross-sectional poverty may have very different levels of material deprivation if one has high levels of poverty persistence, the other high levels of turnover. A considerable amount of funding has been directed using the English Indices of Deprivation and its counterparts, and this may be better prioritised with a complementary measure of poverty dynamics.

Although increasing attention is now being paid to poverty dynamics (DWP, 2010; Jenkins, 2011; Smith and Middleton, 2007), its study within small neighbourhood areas is not well advanced - despite the potential of administrative data to support longitudinal studies (Smith et al., 2004). This paper is inspired in large part by Barnes et al. (2011), a rare small area longitudinal study which used administrative data to explore the dynamics of unemployment in high-worklessness neighbourhoods. Conducted over the period 2004-2007, this study found that there was little evidence to support the hypothesis that persistently high levels of worklessness observed in some neighbourhood areas were caused by the propensity for people gaining employment to leave these areas. Approximately one-third of people gaining employment left the area, the remainder staying. It also found that flows of workless families in and out of these areas were a significant factor at around 25% of all families over the period, larger than the flow of 15% who entered employment. Noble et al. (1998), another study in the limited canon, tracked claims for Income Support (a low income cash transfer) amongst lone parents claiming housing benefit in one town over 1993 to 1997, finding that just 20% had uninterrupted claims over a four year period. However, recurrent spells of claiming Income Support meant that

43% of lone parents who were claiming in 1993 were also claiming in 1997. Half of lone parents in the study had Income Support claims lasting for two years or less.

This paper complements the existing evidence by using poverty status as an outcome variable at neighbourhood level, providing substantive findings for one city as well as outlining a method that could be applied in other areas using similar data.

5.3 Method: Using administrative data to measure local poverty dynamics

5.3.1 Aims of this study

This paper explores the construction and utility of a *dynamic* local poverty measure, as a complement to the cross-sectional, *static* measures that are currently available. It utilises administrative data about low income families claiming support for paying their housing costs (housing benefit). The principal research questions are:

- Can housing benefit data be used to construct a small area indicator of income poverty that is consistent with official estimates?
- How much turnover is there in the population of poor families claiming housing benefit? How do turnover rates differ by family type?
- At sub-city level, is there variation between neighbourhoods in the rate of turnover among poor families?

The subsections of section 5.4 answer these questions in turn. This study does not aim to generalise the substantive findings for Oxford to other English cities - rather the aim is to develop a method that could be used to answer these questions in other localities, given access to the same or similar data. The analysis in this paper has been coded in the statistical language R (R Core Team, 2016) and has been made available so that researchers may reproduce the analysis using their own data². It is also hoped that in future this method may be utilised on a dataset with national coverage.

5.3.2 Data: housing benefit claims in Oxford city

The study of poverty dynamics requires a panel dataset that records income for individual families, linked longitudinally over several time points. This paper uses housing benefit data for the city of Oxford; the study area is briefly described in section 5.3.4. Housing benefit is a cash transfer (or ‘benefit’) paid in the UK to low income families in order to subsidise their housing costs. Approximately one-fifth of all UK families claim housing benefit, which amounts to 76% of those who are eligible to claim it (DWP, 2016b).

A successful claim for housing benefit is subject to certain eligibility criteria, which restricts the coverage of this dataset. First, it is payable only to families who rent their home, either from a private landlord or in the social sector. It therefore excludes families who own their home, who in the UK comprise around half of poor families (DWP, 2016a).

²The code is available at <https://github.com/mfransham/2017-09-SHBE-analysis>.

Second, families must have an income low enough to be deemed to require support with housing costs. Families claiming one of four means-tested benefits are automatically eligible for housing benefit and receive the maximum eligible amount. These are referred to as ‘passport’ benefits and include: income-based Jobseeker’s Allowance (JSA), paid to working-age unemployed individuals; income-based Employment and Support Allowance (ESA), paid to working age people unable to work through illness or disability; Income Support (IS), paid to carers and lone parents with young children; and Pension Credit Guarantee (PC), paid to low income pensionable-age people. If families are not claiming one of these benefits the eligible income threshold depends upon age, family composition and whether there are family members with a disability. Some income sources, such as child maintenance paid by a former partner, are disregarded. Third, there are restrictions on assets. Families are ineligible for housing benefit if they have assets or property valued at over £16,000.

During the period of this study housing benefit reforms have reduced the maximum amount that families can claim towards their housing costs. In April 2008 the amount that could be claimed for privately rented housing was restricted to the median rent in the local housing market; in April 2011 this was reduced to the 30th centile rent. In April 2013 the ‘bedroom tax’ was introduced for social housing tenants. Those deemed to be underoccupying their home have their housing benefit reduced by 14% if they have one spare room or 25% if they have two or more spare rooms. At the same time the ‘benefit cap’ restricted the total amount of state welfare benefits that could be claimed by a workless family to £26,000 per year, which was reduced to £20,000 in November 2016. Any payments over the threshold are clawed back by reducing the amount of housing benefit paid.

The study period has also witnessed an increase in welfare conditionality, the requirement for claimants of state support to meet certain behavioural conditions (Webster, 2016). For claimants of JSA (unemployment benefit) this may include attending appointments with advisors or completing a certain number of job applications. Sanctions can be applied if these conditions are not met, which can include a complete withdrawal of JSA for up to three years. These sanctions do not apply to housing benefit however.

The significant gaps in the coverage of the housing benefit dataset are therefore poor families who own their home, and poor families who rent but do not claim the housing benefit for which they are eligible. The exclusion of home-owners disproportionately affects the pensionable age poor, 85% of whom owned their own home in 2014/15, compared to around 40% of those at younger ages (DWP, 2016a). It is therefore to be expected that a poverty indicator based upon housing benefit data will cover significantly fewer poor older people than proxy measures based on administrative data includes home-owners (see section 5.4.1).

Analysis of take-up rates for housing benefit (DWP, 2016b) shows that claim rates are lower for working age people (76%) than pensioners (85%), lower amongst private renters (66%) than social renters (88%), lower for couples with children (61%) than other working age family types (80%), and lower for in-work (55%) than out-of-work (~95%) families. Analysis by Jenkins (2011) of annual poverty exit rates suggests that working age people, couples with children and families in work would have high rates of poverty exit; their lower representation in the housing benefit dataset may therefore lead to higher observed levels of poverty persistence than would be the case otherwise.

The coverage of this dataset means that once a family ceases their housing benefit claim no further observations of income or residential location are available. It is also geographically limited - families who move out of the local authority area are no longer included in the data. Further discussion of these limitations and their implications for interpreting the findings is contained in section 5.5.

These limitations notwithstanding, housing benefit data has several advantages over other administrative sources of family income. It contains all the information about family income and composition that are used in official small area estimates of poverty in a single dataset, rather than needing to link several datasets. Being related to support for housing, the address data is near complete. The accuracy and completeness of addresses is often a significant shortcoming of UK administrative data sources - for example, Barnes et al. (2011) found that 40% of address data in their source was missing for people who found employment. Housing benefit data is available via local authorities for relatively small geographic areas, making small case studies such as this one viable. Although its coverage is limited to low income families who rent their homes and claim state support for their housing costs, this is an interesting group of study in itself, given the higher risk of poverty and precarity amongst renting families.

Access to housing benefit data for July 2010, August 2012 and July 2014 was secured from Oxford City Council. A four-year period of study was chosen because this is the typical interval between releases of the official Indices of Deprivation dataset.

Access to the data was subject to institutional research ethics approval and a data sharing agreement with the local authority. Names were pseudonymised to remove identifying information whilst preserving the ability to link datasets

over time. After matching procedures were completed (section 5.3.8), dates of birth were replaced with age categories and addresses replaced with 2011 Lower Super Output Area (LSOA) codes by linking postcodes to the National Statistics Postcode Directory (see section 5.3.3).

5.3.3 Spatial resolution

The analysis in this paper is conducted at two spatial scales - Oxford local authority area and its constituent neighbourhoods, for which Lower Layer Super Output Areas are used as proxy.

Oxford local authority (LA) is one of 326 local authority districts in England. LAs are elected bodies responsible for delivering a varying set of public services within their geographical area including housing, leisure services, public health, waste collection and economic development. They are also responsible for administering certain state welfare benefits including housing benefit, the data used in this study.

Lower Layer Super Output Areas (LSOAs) are the neighbourhood unit of analysis in this study. These are small areas constructed for the production of statistical outputs, designed to contain an average population of 1,500 residents and to be as socially homogenous as possible. These are broadly neighbourhood-sized in scale, though they do not necessarily conform to natural neighbourhoods as they may be understood by residents. They have been chosen for comparability with the existing official statistics, which are also produced at LSOA level, and because addresses are easily mapped in to LSOAs by means of the National Statistics Postcode Directory. There are 83 LSOAs in Oxford.

5.3.4 The study area

Oxford is a city in southern England, UK, with a resident population of 160,000. It is well known around the world for the University of Oxford's 'dreaming spires' and honey-coloured stone buildings, but it has a parallel history as a car manufacturing town. Oxford's motor industry began in 1913 and at its height employed 30,000 people, now reduced to a workforce of 4,000. Oxford has three large peripheral suburbs built as social housing estates, which feature among the 20% most deprived neighbourhoods in England according to the English Indices of Deprivation. Oxford has a child poverty rate which is similar to the England average, but in these outlying areas up to 45% of children grow up in poor families (Oxford City Council, 2015). Housing in the city is notoriously expensive, Oxford being frequently named the least affordable city in the UK (Centre for Cities, 2017).

5.3.5 Unit of analysis

Income poverty is analysed at the family level, the same level at which housing benefit eligibility is assessed. The terminology employed by official statistics is used here to distinguish between *households* and *families*. A family consists of a single person or a couple living in a relationship, plus any dependent children. A household is a group of people living at the same address, sharing living or cooking facilities. A household may therefore consist of one or more families. The term *benefit unit* is also sometimes used when referring to claimants of welfare benefits - it has the same definition as family, which is the term used in this study.

In this analysis pensionable age families are defined as those where all adults are aged 65 years or over. Families were defined as ‘parents’ where there were one or more dependent children in the family; dependent children are those aged under 16 years or aged under 20 years and in full-time education.

5.3.6 Calculating the income poverty indicator

The analysis uses the standard definition of income poverty - families whose equivalised income is below 60% of the national median income, calculated here before housing costs. This is the definition used by existing official estimates (see section 5.4.1), employed to ensure comparability. Section 5.5.2 considers how these findings might differ if poverty were measured after housing costs. Administrative data from benefit claims does not contain information about all family income sources - it includes only those which are required to assess eligibility for the benefits in question. As a consequence, the Department for Work & Pensions creates a bespoke poverty line for the official small area estimates which takes into account only those income sources used for the calculation of benefit eligibility (see HMRC, 2014 for further details). This poverty line is updated each year. The housing dataset contains these same income sources, so the same bespoke poverty line is used in this study.

As in the official estimates, any family claiming one of the four ‘passport’ benefits (section 5.3.2) was assumed to have an income below the poverty line. Families not claiming one of these benefits had their total taxable income summed and then equivalised according to the OECD scale in order to account for the larger incomes required by larger families (see below). Those families whose income fell below the specially-constructed poverty line were identified as being poor families in that year.

In order to identify transitions of family incomes below to just above the poverty line, a ‘near poor’ status is also used in section 5.4.2. This is defined as families who have incomes between 60% and 80% of national median income.

5.3.7 Income equivalisation

Family incomes are equivalised in order to take account of the greater resources that larger families require to meet their needs. As with the official estimates, this study uses the OECD modified equivalence scale which takes a family of two adults as its reference point. Under this scheme each family has an equivalence score calculated by assigning contributing values to each member of the family. The first adult counts as 0.67; any subsequent adults or children aged 14 and above count 0.33 each; and children under 14 years count as 0.2 each. Thus a family of two adults and two children under 10 years would have an equivalence score of $0.67 + 0.33 + 0.2 + 0.2 = 1.4$. The family’s actual income is divided by the equivalence score to arrive at the family’s equivalised income.

5.3.8 Matching procedures

Family records were linked over time in order to track changes in poverty status. The variables available for matching in the housing benefit dataset were limited to housing benefit claim number, National Insurance (NI) number, name and date of birth. NI number, name and date of birth were available for the main claimant and, where applicable, their partner. Records were linked at family level using deterministic matching methods using (in order of application): housing benefit claim number; claimant NI number; surname and date of birth; and claimant NI number to partner NI number (and vice-versa). A series of matching methods were employed so that families who changed their housing benefit claim number

would still be linked in subsequent time periods. As an example of matching rates, 9,390 of the 12,240 records in the 2010 file (77%) were matched to records in the 2012 file. The majority of matches were made on the housing benefit claim number.

5.4 Findings

The following three subsections address the three main research questions set out in section 5.3.1. Section 5.4.1 compares the housing benefit estimates of income poverty to the two available official estimates, in terms of coverage and spatial distribution. Section 5.4.2 quantifies the degree of turnover among poor families by type over the period 2010 to 2014, and conducts exploratory regression analysis to identify the factors that predict leaving the population of poor Oxford housing benefit families. Section 5.4.3 explores whether poverty turnover rates differ between neighbourhoods within the city.

Analysis was carried out in R version 3.4.3 (2017-11-30) (R Core Team, 2016) with particular use of packages dplyr (Wickham et al., 2017), ggplot2 (Wickham and Chang, 2016) and riverplot (Weiner, 2017). Numbers reported in text and tables have been rounded to the nearest 10 in order to guard against statistical disclosure. Any percentages reported are based upon the underlying unrounded numbers.

5.4.1 The housing benefit indicator of poverty is strongly correlated with official small area estimates

This section validates the housing benefit poverty indicator, finding it strongly correlates with the two existing official estimates for areas of England. First, the estimated number of people living on low incomes is compared between the housing benefit indicator and the English Indices of Deprivation; second, this is compared over the period 2010-2014 with the Children in Low Income Families measure for children only; third, the spatial distribution of the housing benefit and Indices of Deprivation measures is compared. Before these analyses are presented, the existing official estimates are briefly described.

The existing official proxy indicators of income poverty in small areas are the income domain of the English Indices of Deprivation (Smith et al., 2015) and the Children in Low Income Families Local Measure (HMRC, 2014). The two measures use very similar methods and this study replicates them with housing benefit data (section 5.3.6). In the Indices of Deprivation income domain (IDID), the number of people living in poverty is estimated as the sum of adults and children in families in which a claim is made for either (i) one of the four ‘passport’ benefits, or (ii) in-work tax credits, where equivalised income is below 60% of national median income. It is published at LSOA level for all ages, broken down into children and older people (60 years plus). As a result the rate for working age people (16 to 59 years) can also be calculated. The 2015 English Indices of Deprivation refers to a time point of August 2012; earlier iterations cover August 2005 and August 2008, and so fall outside the study period considered here. The Children in Low Income Families Local Measure (CLIF) uses a very

Table 5.1: Estimated numbers in poverty August 2012 by age group, Oxford - Indices of Deprivation income domain (IDID) compared to housing benefit (HB)

Age group	IDID	HB	Coverage (%)
Children	5,220	5,050	96.7
Working age	8,440	7,560	89.6
Pensioners	3,330	2,100	63.2
All ages	16,990	14,710	86.6

similar method to estimate the number of children in families with incomes below the poverty line. This measure has been published annually covering the period 2006 to 2014 with an August reference point (HMRC, 2014).

Both the official estimates and the housing benefit indicator underestimate the population of poor families because they do not include those poor families who are eligible for but not claiming means-tested benefits or tax credits. There may also be some income poor families who are ineligible for these benefits - for example, those with low incomes but savings above the allowed threshold. However it is expected that these two official estimates would be better proxy measures of income poverty than the housing benefit indicator as they cover owner-occupiers as well as renters. As noted in section 5.3.2 the largest impact will be upon the coverage of poor pensionable age people as they are most likely to be owner-occupiers.

Table 5.1 shows the estimated number of people living in income poor families in Oxford in August 2012 according to the IDID and HB indicators, by age group. As expected, the coverage of the HB indicator compared to IDID is lowest for pensionable age people at 63.2%. Given that national figures suggest around 40% of working age poor families live as owner-occupiers, the coverage of the HB indicator for children (96.7%) and working age people (89.6%) is surprisingly high.

As expected, the HB estimates for children in poor families in 2010, 2012 and 2014 are lower than the official estimates from the CLIF measure (Figure 5.2). However the two estimates are consistently related, showing a fall over time; the coverage of the HB indicator relative to the CLIF measures is reasonably constant from 89% in 2010 to 91% in 2014.

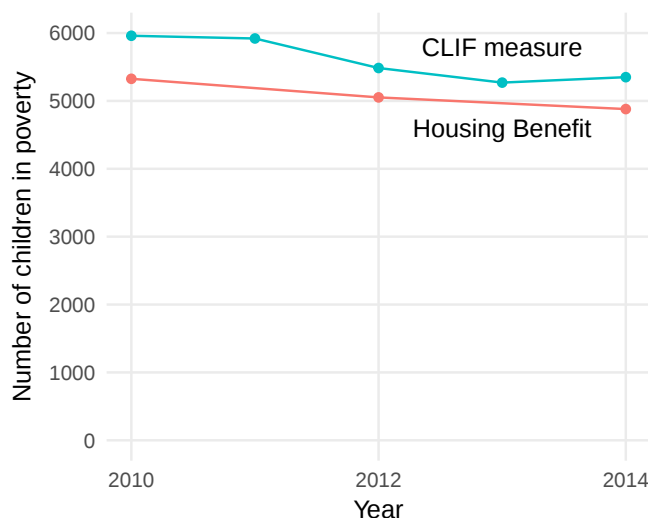


Figure 5.2: Numbers of children in poverty in Oxford 2010-2014, CLIF and HB measures

The HB and IDID estimates are highly correlated at LSOA level, with R^2 values ranging from 0.87 for older people to 0.98 for children. Figure 5.3 plots the estimates of the number of individuals living in families below the poverty line from the August 2012 IDID estimate against the HB estimate, for each of the 83 Lower Super Output Areas in Oxford and by age group. The estimates show a very close correlation across all age groups but particularly for children and working age people.

This analysis establishes that the housing benefit estimates are highly correlated with the official estimates at small area level, resulting in very similar spatial distributions of poverty. They have much higher coverage of working age adults and children than of older, pensionable age adults. Given that the HB estimate

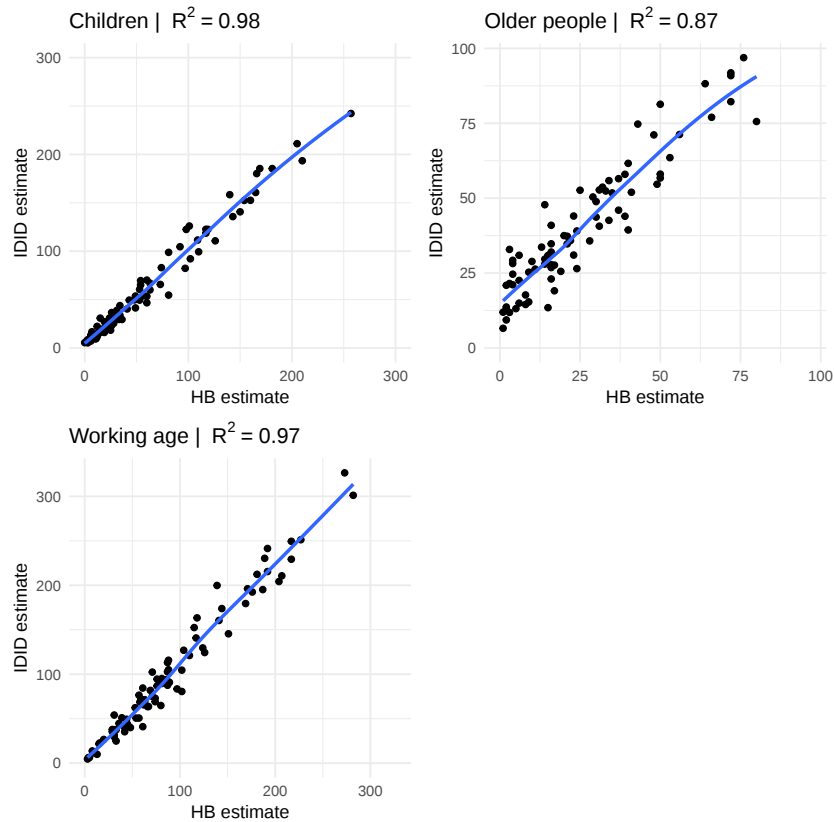


Figure 5.3: Numbers in poverty by age group for Oxford LSOAs 2012, ID income domain vs housing benefit. Lines show smoothed means

excludes poor families who own their homes the coverage and correlation is higher than might be expected. This is probably a consequence of the relatively low take-up of means-tested benefits by poor families who own their own home, but possibly also a result of the large private rented sector in the study area. This is discussed further in section 5.5.1.

5.4.2 Turnover rates of poor families in Oxford 2010-2014

Having validated that the housing benefit estimates provide a similar picture of income poverty to the official estimates, the remaining analysis focuses solely on the longitudinal housing benefit data to explore how it can be used to improve our understanding of poverty in small areas. The aggregate change in number of

poor housing benefit families 2010-2014 is first explored. Poverty turnover rates by family type are examined, and a Sankey diagram is employed to explore the status of families leaving poverty. Logistic regression analysis is used to identify the factors associated with leaving the population of poor families in Oxford.

In 2010 there were 10,690 families in Oxford claiming housing benefit, 8,820 who were income poor according to the method in section 5.3.6 - comprising 83% of the total. In 2014 there were 10,840 families claiming housing benefit, 8,190 who were poor - 76% of the total. Over the period the total number of poor housing benefit families therefore fell by 7%. Figure 5.4 shows that the largest absolute fall was amongst single working age people, but proportionately the largest falls were observed amongst lone parents (15%) and couple pensioners (28%). The fall in poor lone parent families was partly offset by a rise in poor couple parent families of 10%.

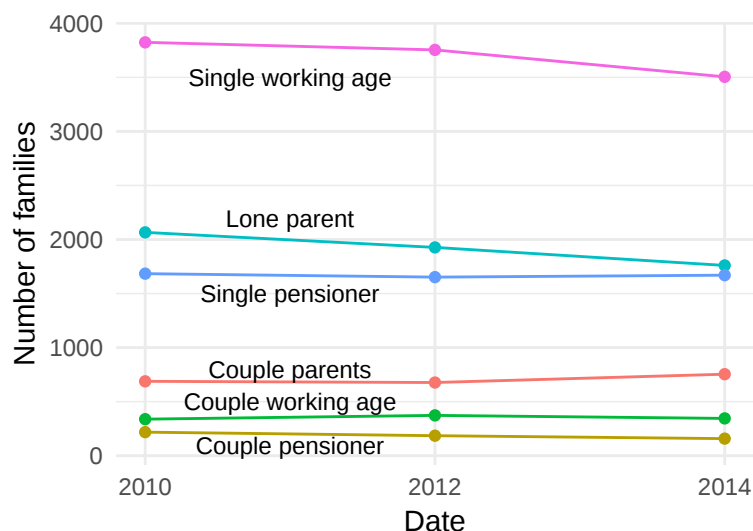


Figure 5.4: Number of housing benefit families in poverty, Oxford 2010-2014

Linking housing benefit over time enables a study of the dynamics underpinning these cross-sectional, aggregate measures of poverty. Table 5.2 shows an initial analysis of these dynamics by family type in Oxford. The first column ('In poverty

2010') shows the number of housing benefit families in income poverty in 2010 across the whole of the city. The second and third columns show the number of these families who were still poor in 2012 ('Still in poverty 2012') and 2014 ('Still in poverty 2014'). The fourth column presents a persistence rate over the period 2010-2014 - defined here as the proportion of the 2010 poor housing benefit families who were still poor and in Oxford in 2014. The fifth column introduces the principal measure of poverty dynamics used in this paper - the *poverty turnover rate*, which is defined as the proportion of families at one time point who were no longer poor families *in this geographic locality* at a later time point (here, 2010 to 2014). It is therefore also 100 minus the poverty persistence rate for the same period.

Table 5.2: Poverty persistence and turnover 2010-2014, people in housing benefit families, Oxford

				Poverty Persistence	Poverty Turnover
	In poverty	Still in poverty	Still in poverty	rate	Rate
Family type 2010	2010	2012	2014	2010-2014 (%)	2010-2014 (%)
Couple pensioner	220	180	150	69.3	30.7
Couple working age	340	260	230	67.5	32.5
Single pensioner	1,680	1,320	1,050	62.4	37.6
Single working age	3,820	2,590	2,120	55.4	44.6
Lone parent	2,070	1,420	1,020	49.6	50.4
Couple parents	690	440	330	48.1	51.9
All families	8,820	6,200	4,900	55.6	44.4

Turnover rates are lower for older families - working age couples without children, couple pensioner and single pensioner families - where around two-thirds of families who were poor in 2010 were still in 2014. Persistence rates are lower for younger families - single working age, lone parents and couple parents - where only half of the families who were poor in 2010 were still poor in 2014. Over a four-year period, there was considerable turnover in the population of poor housing benefit families in Oxford.

Jenkins (2011: 225) calculated annual poverty exit rates for a similar set of household types over the period 1999-2005 using data from the British Household Panel Survey. The pattern of exit rates has some similarity to the turnover rates observed in table 5.2 in that pensionable-age households had the lowest exit rates and couples with children had the highest exit rates. However Jenkins found lower exit rates for lone parent compared to couple parent families, whereas this study shows little difference between them. It is possible that the difference between the two studies is explained by differences in residential mobility rates. There have been changes in Income Support eligibility for lone parents since Jenkins' study which may also have affected exit rates - further discussion of this is included in section 5.5.1.

The transitions of families - changes in income status over time, and flows on and off housing benefit - can be inspected visually by means of the Sankey diagram in Figure 5.5. This diagram can be thought of as a series of stacked bar charts for different points in time, connected by lines which show the flow of families from one status to another between time periods. Poor housing benefit families are shown at the bottom, 'near poor' families (income between 60% and 80% median) are the second category, then 'not poor' families (income greater than 80%

median income). The top of the diagram is obscured, representing the unobserved population who are not claiming housing benefit in Oxford. Claimants flow in and out of this population, but its total size is unknown (potentially representing the rest of the UK population). The width of the lines between points is proportional to the number of families changing or maintaining their status between time points (2010 to 2012 to 2014, left to right).

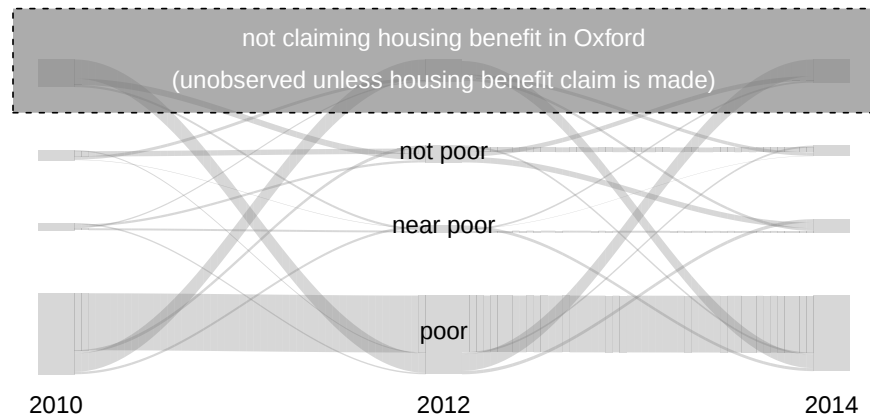


Figure 5.5: Sankey diagram showing all Oxford families claiming housing benefit in 2010, 2012 and/or 2014; changes in income status and flows on/off housing benefit are shown

The largest flows in and out of poverty in the Sankey chart are of families beginning and ending a housing benefit claim. The diagram also shows that the number of ‘near poor’ families nearly doubled from 770 in 2012 to 1,490 in 2014 as a result of a flow of families who were ‘not poor’ moving to the ‘near poor’ group between 2012 and 2014. This means that a growing number of housing benefit families had incomes which did not keep pace with median income growth over this period.

The aggregate rates of poverty turnover by family type in table 5.2 may partly reflect the composition of these different groups in terms of other factors that are associated with poverty exit and/or residential mobility. In the following analysis, logistic regression is used to explore the association of characteristics recorded

in the housing benefit data (the explanatory variables) with the probability of leaving the population of poor Oxford housing benefit families 2010-2014 (the outcome variable).

The explanatory variables included in the logistic regression are: tenancy, with higher rates of residential mobility being expected amongst private sector tenants; type of ‘passport’ benefit received, which may be related to the likelihood of gaining employment and therefore exiting poverty; family type, which is associated with poverty exit and residential mobility; gender, which is associated with residential mobility (Beatty et al., 2009); and employment in the family, which is associated with poverty exit (for residential mobility see Champion et al., 1998; for associations of these factors with poverty exit see Jenkins, 2011).

The first column of table 5.3 shows the results from this logistic regression with main effects considered only. The second column is a more complex model that includes interactions between ‘passport’ benefit and tenancy, ‘passport’ benefit and family type, and tenancy and family type. Introducing interactions between these categorical variables introduces another 38 coefficients. Only a few of these were found to be statistically significant in the model, and so for brevity only these are reported in table 5.3. In the text that follows, statistically significant results from the second model are discussed.

Amongst families poor in 2010, a higher probability of leaving the population of poor HB families - and conversely a lower probability of poverty persistence - was associated with living in a privately rented home, claiming a work-related welfare benefit, being a lone parent, having a male main claimant and having an adult in employment.

Table 5.3: Logistic regression predicting exit from the population of poor Oxford HB families 2010-2014 - model coefficients with 95 per cent confidence intervals

	Main effects	Main effects plus interactions
Constant	0.13 [−0.15; 0.42]	−0.47 [−0.97; 0.04]
Tenancy (reference: Private sector)		
Social rented	−0.86* [−0.96; −0.75]	−0.55* [−0.95; −0.16]
Other	−0.33* [−0.65; −0.00]	−0.15 [−2.34; 2.05]
Benefit (ref: Income Support)		
Pension Credit (GC)	−0.09 [−0.27; 0.09]	−1.58* [−3.11; −0.05]
JSA (IB)	0.78* [0.63; 0.92]	1.51* [1.04; 1.98]
No other benefit	0.57* [0.42; 0.71]	1.08* [0.57; 1.59]
ESA (IB)	0.37* [0.15; 0.59]	0.75 [−0.00; 1.50]
Family type (ref: Couple parents)		
Couple, pensioners	−0.09 [−0.45; 0.27]	−0.35 [−3.09; 2.40]
Couple, working age	−0.37* [−0.67; −0.07]	−0.53 [−1.41; 0.35]
Lone parent	0.52* [0.33; 0.72]	0.94* [0.49; 1.40]
Single pensioner	0.42* [0.19; 0.65]	0.25 [−0.79; 1.28]
Single working age	−0.05 [−0.23; 0.13]	0.38 [−0.06; 0.81]
Gender (ref: Female)		
Male	0.15* [0.05; 0.26]	0.18* [0.07; 0.28]
Employment (ref: Employed)		
Unemployed	−0.42* [−0.66; −0.18]	−0.31* [−0.57; −0.05]
Interactions		
Social rented x no other benefit		−0.34* [−0.63; −0.04]
JSA(IB) x lone parent		−1.39* [−1.92; −0.85]
No other benefit x lone parent		−0.59* [−1.13; −0.05]
ESA (IB) x lone parent		−1.55* [−2.39; −0.70]
JSA (IB) x single working age		−0.54* [−1.00; −0.08]
Social rented x single working age		−0.41* [−0.79; −0.02]
AIC	11220.62	11145.33
BIC	11319.80	11492.47
Log Likelihood	−5596.31	−5523.66
Deviance	11192.62	11047.33
Num. obs.	8818	8818

* indicates statistical significance at 95 per cent level. For brevity, only significant interactions are shown.

By tenancy, social tenants were less likely to leave the city's population of poor housing benefit families than private tenants. Differences in residential mobility would lead us to expect this result: social tenancies tend to be 'tenancies for life' whereas private rented tenants have very little security of tenure. Families in social housing may also be less likely to escape poverty by raising their incomes. Social tenancies are offered to families in highest social need and many are therefore likely to have greater barriers to raising their incomes.

By benefit claimed, lower turnover rates were predicted by families claiming Income Support or Pension Credit (Guarantee). The latter is claimed by low income pensionable age people, who are less likely to seek work and see their income rise. The highest turnover rates were predicted for claimants of income-based Jobseeker's Allowance (JSA(IB)) - an unemployment benefit. Statistics from the Department for Work & Pensions (via www.nomisweb.co.uk) show that the number of people claiming JSA declined from 2,550 in August 2010 to 1,040 in August 2014. Although eligibility criteria also altered over this period, some of this fall was also likely to due to rising employment levels, suggesting a rise in flows out of poverty due to finding work (for national evidence see Belfield et al., 2016).

The only significant association amongst family types was for lone parents, who were more likely than couple parents to leave the local population of poor families. This is mediated by the interaction terms in the second model, which indicate that this effect is strongest for lone parents claiming Income Support. The potential for this finding to be driven by recent changes in Income Support eligibility is explored in section 5.5.1.

This analysis demonstrates that, underlying a relatively static headline cross-sectional figure for the number of individuals living in families below the poverty line, there was considerable turnover in that population. Around half the population of poor working age families turned over in the four year period 2010-2014, and around a third of pensionable age families. These relatively high levels of turnover have potential implications for the way that local authorities and other organisations seek to improve the circumstances of low income families in their areas. These turnover rates may also differ by neighbourhood, which could lend itself to variation in the policies which are employed - a question to which this paper now turns.

5.4.3 The spatial variation in local poverty dynamics

This subsection examines the question of whether there is variation in poverty turnover rates within the city by neighbourhood area. In this section, the poverty turnover rates are a measure of the churn of poor families within individual neighbourhood areas. Consequently, higher turnover rates are expected than those observed in section 5.4.2 as moves between different neighbourhoods within the city also contribute. Using this method the average poverty turnover rate for Oxford is 53%, compared to 44% in table 5.2. First, a funnel plot is used to identify areas which have significantly high or low turnover rates compared to the Oxford average; second, regression analysis is used to explore the area factors associated with these differential rates.

Figure 5.6 plots poverty turnover rates calculated analogously to table 5.2. The denominator of the rate is the number of housing benefit families poor in the neighbourhood in 2010; the numerator is the number of housing benefit families still poor and still living in the neighbourhood in 2014. The solid line shows the

Oxford average whilst the curved lines forming the funnel show the region within which 95% of the rates would fall if the underlying turnover rates were all equal to the city average. The expected variance of the turnover rate varies with the number of families poor in 2010 as this is the effective sample size for estimation.

A significant proportion of the estimated poverty turnover rates fall outside the lines on the funnel plot - and many more than the four (83 LSOAs x 5%) that would be expected from the assumption of equal underlying turnover rates. Therefore there is statistically significant variation in the poverty turnover rates measured at neighbourhood level in Oxford between 2010 and 2014.

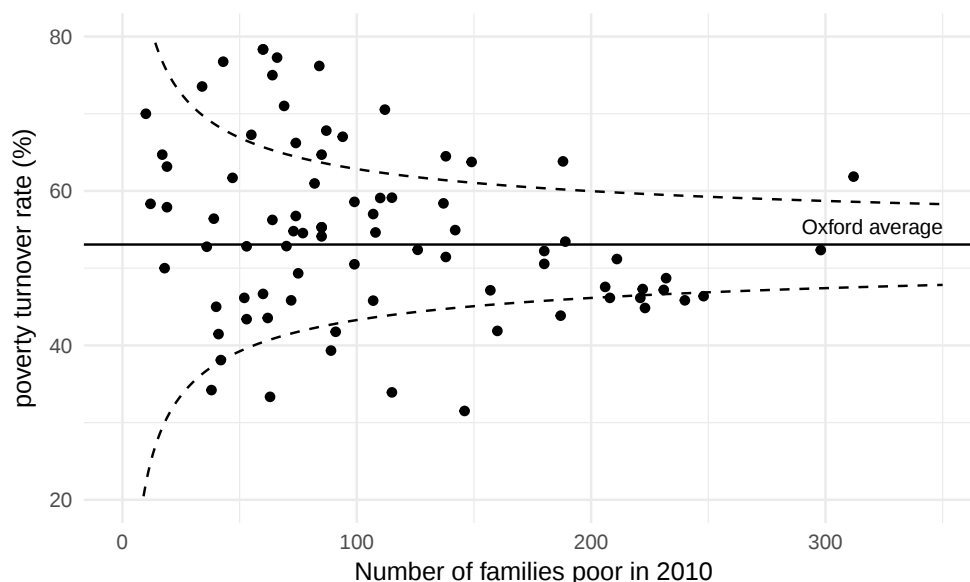


Figure 5.6: Funnel plot of poverty turnover rates by LSOA, 2010-2014 with 95 per cent confidence intervals

The map in Figure 5.1 plots the high and low turnover rates on a map of Oxford by LSOA³. With local knowledge, an inspection of this map reveals that the lowest turnover rates are areas with high concentrations of social rented housing, the high turnover rate areas being areas of high private rented housing.

³An interactive version of Figure 5.1 is available at <https://mfransham.github.io/2017-09-Oxf-pov-turnover-map/>.

In order to confirm whether the differential rates of turnover are driven by the composition of housing benefit families in those areas, a weighted linear regression was conducted with poverty turnover rate as the dependent variable. Observations were weighted by the total number of poor families in 2010. The initial model contained the same main effects as the individual-level model in section 5.4.2 (expressed as proportions of the population in the area) and was reduced by backward stepwise selection.

The final model in table 5.4 is a rather simpler model than the individual-level model in section 5.4.2. Around 60% of the variation in LSOA turnover rates is explained by the private/social rented split of housing benefit families in the area and the type of benefit claimed by housing benefit families (split between Income Support, Pension Credit and JSA/ESA/no other benefit). A 40 percentage point higher proportion of social housing is associated with around 10 percentage point lower turnover rates; a 40 percentage point higher proportion of families claiming JSA, ESA or no other benefit is associated with around 10 percentage point higher turnover rates. Regression diagnostics (not shown) indicate that an area in the city centre is an outlier for which the model does not fit well. This is an area with a number of temporary hostels for single homeless people resulting in a high turnover rate in an area with a large amount of social rented housing.

The high poverty turnover rates discovered above raises a question - is this simply due to the migration of persistently poor families within the city? This factor explains only a small proportion of the picture. Over the study period 4,680 poor Oxford housing benefit families left the neighbourhood population of poor families

Table 5.4: Linear weighted regression predicting poverty turnover rate by LSOA

Constant	0.66* [0.52; 0.80]
Social housing tenants	-0.24* [-0.32; -0.16]
Pension Credit claimants	-0.27* [-0.44; -0.11]
Claiming JSA, ESA or no other benefit	0.26* [0.04; 0.48]
R ²	0.62
Adj. R ²	0.61
Num. obs.	83
RMSE	0.64

* 0 outside the confidence interval

either through leaving poverty or leaving the area. Of these 1,130 were due to persistently poor families moving to another LSOA - accounting for just under a quarter of the neighbourhood-level poverty turnover rate.

This analysis reveals a high rate of turnover among the population of poor families in all Oxford LSOAs, driven by income mobility out of poverty and residential mobility out of the area. The highest poverty turnover rates were found in areas with a high proportion of private renting. However, even in the area with the lowest turnover rate one-third of poor families in 2010 were not among that area's population of poor families in 2014, and for most areas it was around one half. These high rates of turnover underly a relative static geography of poverty presented by the official cross-sectional estimates.

5.5 Discussion

5.5.1 Summary and policy implications

As set out in section 5.3.1, this study has: (i) explored whether housing benefit can be used to create an income poverty indicator that is consistent with official small area estimates; (ii) described the level of turnover in the population of poor families covered by the indicator and the characteristics associated with turnover; and (iii) explored the sub-city variation in poverty turnover rates. Section 5.4.1 found that the numbers of individuals estimated by the HB indicator to be living in families below the poverty line was similar in magnitude to the official estimates for children and working age people, but significantly smaller for older people. It also found that the HB indicator described a very similar spatial distribution across LSOAs to the official estimates.

The similarity of the HB indicator and official estimates is surprising, given that around 40% of poor working age families own their home and are therefore excluded from the housing benefit indicator. This is probably a consequence of two factors. First, it is an empirical reminder of a finding of Bradshaw and Richardson (2007) when exploring spatial variation in the take-up of means-tested benefits: compared to renting families, owner-occupiers substantially underclaim the benefits to which they are entitled. This means official estimates based on means-tested benefit data that ostensibly include owner-occupiers in estimates of the prevalence of income poverty in fact substantially exclude them. This is also a limitation of the housing benefit indicator used in this study, but one could argue that at least owner-occupiers are transparently excluded from its scope.

Second, this could also be an artefact of the large private rented sector in the study area, which may mean that owner-occupiers make up a smaller proportion of poor families than average.

Section 5.4.2 found that of Oxford housing benefit families poor in 2010, 44% were no longer amongst the population of poor Oxford families in 2014. By family type, higher turnover rates were observed amongst families with children, lower turnover rates amongst pensionable age families. Analysed at individual level, a higher probability of leaving the population of poor HB families was associated with living in a privately rented home, claiming a work-related welfare benefit, being a lone parent, having a male main claimant and having an adult in employment.

The existing literature does not offer (to the author's knowledge) any direct comparison to the findings in this paper. However, they are broadly in line with what one might expect from other studies. Jenkins (2011) has found similar patterns of poverty exit to those described in section 5.4.2. Noble et al. (1998) found that 43% of Income Support claimants at the start of a four-year period had a claim at the end of it. Barnes et al. (2011), though focused on high workless areas - not a definition that would apply to any Oxford neighbourhoods - found that 25% of persistently workless families moved over a four-year period. Private renting is associated with higher residential mobility (Champion et al., 1998) and employment within the family is associated with higher poverty exit (Jenkins, 2011), both therefore predicting the higher poverty turnover rates associated with these characteristics.

There are four explanations for flows out of the population of poor families - income mobility out of poverty, residential mobility out of the area, persistently poor families ceasing housing benefit claims and mortality of housing benefit

claimants. The interpretation of this study rests on the fact that these first two flows are the most important, and the second two are relatively unimportant. The findings would be compromised if a significant proportion of the poverty turnover observed was attributable to the third of these flows, poor families remaining poor and in Oxford but leaving housing benefit. One possible cause of this could be declining claim rates because of the benefit reforms described in section 5.3.2. If this had been the case a decline in national take-up rates would be expected, but the available evidence suggests this has not occurred. The latest estimates of benefit take-up suggest that 76% of eligible working-age families claimed housing benefit in 2014/15, with no statistically significant change since 2009/10 (DWP, 2016b).

Another cause for this kind of flow could be workless housing benefit families ceasing their claim upon gaining employment, even if their income is still low enough to be eligible. There is more evidence for this: housing benefit take-up rates amongst eligible workless families were 95% in 2012/13, but only 55% amongst eligible in-work families. An order-of-magnitude approximation suggests that this phenomenon is likely to account for only a small proportion of the flows of poor families off housing benefit. Among the 7,000 working age families poor in 2010 there were just under 4,000 families who were still poor in 2014. A little under 300 of these 4,000 families had gained employment by 2014 but still had incomes below the poverty line (and were still claiming housing benefit). Based on the 50% take-up figure amongst in-work families we might expect a similar number of persistently poor families to have gained employment but no longer be claiming housing benefit. If so, this would amount to just 300 of the 3,000 observed flows off housing benefit.

The fourth of these flows, mortality, is most significant for single-person older families; approximately 16% of over 65s in Oxford would be expected to die over a four-year period (author's calculation from ONS mortality data).

It is therefore argued that flows attributable to income mobility and residential mobility are the dominant cause of the observed poverty turnover patterns. However the interrelation of these two processes cannot be disentangled, so the observation that - for example - around half of poor Oxford families with children 'turned over' in a four-year period requires careful interpretation. Any policy implications to be drawn require similar care.

The flows out of the population of poor Oxford housing benefit families could be one of three types - and imply three possible 'counter-flows' of new arrivals into the poor population. Two of these flows are associated with poverty exit - a family raises their income out of poverty, either staying in the area or leaving it. The third of these flows is persistently poor families leaving an area - potentially combining persistent poverty with loss of social networks, employment opportunities etc. (Beatty et al., 2009).

Without observing the destination of these off-flows it is difficult to qualitatively evaluate the high levels of poverty turnover. To the extent that these flows are indicative of high levels of poverty exit - as highlighted by Stephen Jenkins' research - it reminds anti-poverty policymakers to focus as much on poverty (re-)entry as focusing on getting people out of poverty. To the extent that it reflects high levels of residential mobility amongst persistently poor families, it points to the need to improve security of housing tenure to facilitate the development and maintenance of social networks.

Section 5.4.2 finds that lone parents claiming Income Support (IS) had a raised probability of leaving the population of poor housing benefit families. Over the period of this study Income Support for lone parents has been subject to increasing eligibility restrictions. In 2008 it was restricted to lone parents whose youngest child was under 12 years, to under 7 years in 2010, and in 2011 to under 5 years. Lone parents no longer eligible for Income Support but not employed full-time are moved on to Jobseeker's Allowance and required to actively seek work as a condition of receiving the benefit. National evaluation showed that whilst the majority of lone parents who lost eligibility for Income Support in 2011 moved on to a different out-of-work benefit, a quarter found employment (Coleman and Riley, 2012), though there was no counterfactual estimate of the number who would have gained employment without the policy change. The higher poverty turnover rate for lone parents claiming Income Support could be explained by increased employment amongst those lone parents who lost eligibility to IS during this period. This was certainly the stated objective of the policy. It could also be due to increased residential mobility amongst this group, perhaps caused by withdrawal of means-tested benefits in cases where lone parents were unable or did not wish to search for work as required. Again, without observing the destination of these off-flows (and providing counterfactual estimates) it is difficult to safely interpret this finding.

Section 5.4.3 shows that there are neighbourhood areas with statistically significantly low and high poverty turnover rates, ranging from 32% to 78%. The variation in rates is substantially explained by the composition of poor housing benefit families in each area, namely the split between private and social

rented housing, and the types of ‘passport’ benefit claimed. Areas with higher proportions of families in social rented housing are associated with lower poverty turnover rates.

During the New Labour years 1997-2010 substantial amounts of funding were directed towards the ‘most deprived’ areas of England (Lupton, Fenton, et al., 2013). In a spirit of ‘new localism’ area policy is now locally determined (Lupton and Fitzgerald, 2015) and although most central government funding has now ceased, some local bodies continue to employ area-based initiatives to tackle local deprivation. In Oxford such work has and continues to be focused on those social housing estates which feature among the 20% most deprived areas according to the English Indices of Deprivation. Despite loss of social housing stock to the ‘right to buy’ initiative, these estates still have high concentrations of social housing and consequently have among the lowest poverty turnover rates in the city. This research provides empirical evidence to the designers of area-based initiatives about the level of turnover in the local population of poor families. This means that for many families, support provided by such initiatives may be relatively short-term and need to be designed accordingly. There will also remain a minority of stable residents who are persistently or chronically poor over long periods, for whom support may need to be more intensive and/or longer term.

5.5.2 Limitations

As noted in section 5.3.4, the study area is an unusual local authority area, with a very high student population, poor housing affordability and a large private rented sector. This begs the question to what extent this method and the substantive findings are generalisable to other areas.

Section 5.4.1 found that, for children and working age people in particular, the HB indicator resulted in similar coverage and spatial distribution to the official estimates. This was surprising given the exclusion of owner-occupying poor families from the indicator. Oxford has a very large private rented sector and poor housing affordability; these two factors combined may mean that (i) renters account for a higher-than-average proportion of poor families, and (ii) in the face of high housing costs, low income families are more likely to claim the housing benefit to which they are entitled. However it is plausible that this method would also work in areas with cheaper housing and a smaller private rented sector, given the large proportion of renting families who do claim housing benefit (whether poor or not) and the low coverage of owner-occupiers by official estimates. It is an empirical question whether a housing benefit indicator in an area with a smaller private rented sector would be so similar to the official estimates.

A related question is how housing unaffordability and the large rental sector in Oxford might have influenced the substantive findings. The poverty turnover rates observed in this study are in line with what might be expected from previous studies in terms of their order of magnitude. One might expect the turnover rates in Oxford to be elevated due to high housing affordability pushing low income families out of the city, and a larger than average private rented sector would raise residential mobility rates. This would be interesting to explore with a national dataset (see section 5.5.3).

This study replicates the official estimates' method for classifying the poverty status of families, which employs a 'before housing costs' definition (section 5.3.6). An 'after housing costs' definition might raise the overall estimates of poverty in Oxford, given the relatively high housing costs. It may also increase poverty depth,

the gap between family income and the poverty line. Under such a measure the HB indicator may reveal lower levels of turnover, as those families raising their income from ‘poor’ to ‘near poor’ are no longer classified as escaping poverty.

The high turnover rates revealed in this study beg another question: are those people who are no longer poor likely to experience another spell of poverty soon afterwards? The short time period and limited data points in this study mean that this question cannot be answered. In his review of poverty dynamics evidence, Jenkins (2011) found that (looking at those currently not poor) poverty re-entry rates for those who had been poor the year before were 35%, compared to an entry rate of 6% for those who were not poor the year before (*ibid.*: 225). Thus poverty re-entry and recurrence is an important part of the picture when understanding poverty dynamics.

5.5.3 Further work

Three pieces of further work are identified here: extending the current method over a wider geographic area; using a wider range of administrative data sources; and utilising household panel survey data.

As noted above, the interpretation of findings is limited by the fact that off-flows could be due to residential mobility or income mobility, and the two cannot be disentangled. Extending the geographic scope of the dataset would mean that residential mobility within the population of housing benefit families could be observed, and by implication income mobility could be inferred. Given that most residential moves are over short distances (Fielding, 2012: 3), a dataset with coverage into the four local authority areas surrounding Oxford may be able to achieve this. A dataset with national coverage would provide yet more robust

estimates of the relative importance of income mobility and residential mobility. This would also enable comparison of poverty turnover rates within and between local labour market areas.

In this study, poor families are only observable whilst they are claiming housing benefit. Other studies, including Barnes et al. (2011), have used a wider range of benefit and tax data to ensure a broader coverage of observations. A greater depth of information could potentially be achieved by linking the housing benefit data to other local sources of information such as council tax data to observe residential mobility rates. The Office for National Statistics have recently produced small area experimental estimates of income based upon administrative records from welfare benefits and tax payments (Office for National Statistics, 2016b). These have the benefit of capturing a broader population including those who are not claiming any welfare benefits, though some people are still likely to be hidden from these data sources. As this develops, it may be possible to utilise these data sources for the longitudinal study of poverty within small areas. The introduction of Universal Credit may offer research opportunities insofar as it will cover a broader population than any one of the benefits currently in place, and will cover both in-work and out-of-work benefits. Universal Credit has suffered long delays in its introduction however, so the timescale for the realisation of this potential is unpredictable.

Finally, panel data from the UK Household Longitudinal Study could be used, in a similar way to Jenkins (2011), to unpick the relative contributions of income mobility and residential mobility in driving poverty turnover rates. It could also potentially be used to explore local correlates of these rates including housing affordability and labour market conditions.

5.6 Conclusion

This study has explored the use of longitudinally-linked housing benefit data to measure poverty dynamics in the neighbourhoods of an English local authority area. The *poverty turnover rate* measure for working age families, which covers low income families who rent their homes and claim state support for their housing costs, closely correlates with and has similar coverage to official small area estimates which use a wider range of means-tested benefits. The measure indicates a high turnover of poor families within the four year period 2010-2014, with a higher probability of turnover associated with living in a privately rented home, claiming a work-related welfare benefit, being a lone parent and having an adult in employment. The poverty turnover rate is able to identify neighbourhoods with higher and lower turnover rates than the average for the city. This is primarily due to the differing composition of families by tenure within those areas - high turnover rate areas having high concentrations of private rented housing. The higher turnover rates associated with families in private rented housing could be a function of higher rates of poverty exit and/or higher rates of residential mobility.

In many places the geography of poverty is relatively stable over time - the areas which have high concentrations of poor families tend to be unchanging from one decade to the next. The stigmatising inference that this identifies the location of a persistently poor, welfare-dependent underclass is the spatial manifestation of the myth which John Hills has argued against in his book *Good Times, Bad Times: The Welfare Myth of Them and Us* (Hills, 2014a). To use the terms of Tunstall (2016) some - perhaps many - neighbourhoods which are apparently slothful in the rate at which cross-sectional poverty rates change are, in fact, highly dynamic

under the surface. The high turnover rates observed in this study speak not of a static population of poor families, but of people moving in and out of poverty and in and out of poor areas over time.

6 Neighbourhood income poverty dynamics in England 2010-2014: the implications for area-based anti-poverty initiatives¹

Abstract

Neighbourhood policies directed at areas of high social deprivation have shrivelled since the 2010 coalition government withdrew funding. These policies have traditionally been targeted and designed using cross-sectional ‘snapshot’ measures of social deprivation. This paper considers how the longitudinal analysis of poverty could inform the rationale for and design of neighbourhood-based policy. Exploiting a ‘policy off’ period and a new data source, this research uses data from the UK Household Longitudinal Study from 2010-11 to 2013-14 with neighbourhood identifiers, investigating the spatial distribution of persistent compared to current poverty, and estimating poverty entrance and exit rates by neighbourhood deprivation decile. Individuals living in the highest deprivation areas were three times more likely than those living in lower poverty areas to enter poverty in a given year. By comparison, the relative difference between areas in poverty exit rates was smaller. A majority of the population in the highest deprivation decile was found to have experienced income poverty at least once in a four-year period.

¹This paper was presented at the 2018 annual conferences of the *Social Policy Association* and the *Royal Geographical Society* and has been submitted to the *Journal of Social Policy*.

Area-based policy is often focused on promoting poverty exit, but these findings suggest that preventing poverty entry should be given greater priority in high deprivation neighbourhoods.

6.1 Introduction

‘The outlook for poverty is bleak’ according to the Institute for Fiscal Studies (Hood and Waters, 2017), a body not known for its hyperbole. In the immediate aftermath of the 2008/09 recession the poorest households had their income protected by the uprating of welfare benefits with inflation (Hills et al., 2015), but since 2013 the value of income protection for low income households has been steadily eroded under the banner of ‘austerity’ policies (Hills, De Agostini, et al., 2016: 17). An increase in the use of benefit sanctions (Webster, 2016) has led to concerns about the growing depth and intensity of poverty as manifest in the increasing use of emergency foodbanks (Loopstra et al., 2018). Deep spending cuts were made to other parts of government activity, notably to local government.

One of the victims of austerity measures has been neighbourhood-based initiatives. The New Labour government made neighbourhoods a key site for policy interventions, boldly stating in the 2001 National Strategy for Neighbourhood Renewal that ‘*within 10-20 years, no-one should be seriously disadvantaged by where they live*’ (Durose and Rees, 2012), and by the mid 2000s approximately £1.5 billion was being spent annually on policies targeted at the ‘most deprived’ neighbourhoods (Lupton, Fenton, et al., 2013: 15). These programmes were cut by the 2010 coalition government and replaced with a ‘new localism’ (Collins, 2016) in which local authorities were left to determine (and fund) neighbourhood policy.

Although the coalition government was the final nail in the coffin of this iteration of neighbourhood policy, its demise had arguably been coming since the advent of Gordon Brown’s administration in 2007 that shifted the emphasis to local economic growth and connecting people in deprived areas with the opportunities created from that growth (Lupton and Fitzgerald, 2015). A variety of reasons have been posited for the decline of neighbourhood-based interventions, but one of these is arguably the perceived failure to reach the high expectations that were set (Durose and Rees, 2012). Lupton and Crisp (2018) argue that the policies achieved some successes in terms of their original *ameliorative* social aims, but this was recast as a failure to meet later *transformative* economic objectives.

Using a new source of data on longitudinal incomes at neighbourhood level during the ‘policy off’ period (Tunstall, 2016) of the coalition government, this paper examines neighbourhood income poverty dynamics - the dynamics of the income poor population within neighbourhoods - and considers how a dynamic perspective could inform the rationale for and design of future neighbourhood-based policy.

6.2 Background

6.2.1 Area-based initiatives in the UK

Area-based initiatives (ABIs) have been a feature of the UK policy landscape for 50 years. ABIs are time-limited policy interventions delivered within a specified geographic area identified as having high social need, with an aim to improve outcomes for the population living in that area (Lupton and Turok, 2004). They can be aimed at different geographic scales, from whole cities to small neighbourhoods, but it is the latter on which we focus here. ABIs have been a constant feature of the UK policy landscape since the 1960s Urban Programme,

followed by the economically-focused Thatcher government's Inner City Task Forces and Urban Programme, and the Major government's Single Regeneration Budget that encompassed broader social goals (Durose and Rees, 2012; Lupton and Turok, 2004).

The neighbourhood assumed a special position in New Labour policy, the Blair government of 1997 adopting the Single Regeneration Budget's emphasis on social ABIs through the New Deal for Communities (NDC), Action Zones (for Education, Employment and Health) and the National Strategy for Neighbourhood Renewal (NSNR), all driven by a central Neighbourhood Renewal Unit. These embraced physical and social regeneration, with outcomes for areas and the people living within them, and community participation as a key plank of the approach (Lupton, Fenton, et al., 2013). There was an emphasis on supply-side labour market policy - equipping people with the skills to secure employment in the labour market - and investing in key services and infrastructure. Areas selected for funding under the NSNR and NDC were those with high levels of deprivation according to the Index of Multiple Deprivation, a neighbourhood-level measure developed specifically for the task of identifying the most deprived areas (Smith et al., 2015).

New Labour's enthusiasm for area-based policy waned over the ensuing years. Following the advent of the Brown administration in 2007, the Neighbourhood Renewal Unit was wound down and the Neighbourhood Renewal Fund became the Working Neighbourhoods Fund (Durose and Rees, 2012). In 2010 the incoming coalition government discontinued neighbourhood renewal programmes in favour of the 'Big Society' approach in which civil society was expected to fill the gap

left by state funded interventions (Crisp et al., 2015). Area-based interventions are still much in use by local governments to target funding and services on the most deprived local areas², but within much constrained budgets.

6.2.2 The rationale for area-based initiatives

Area-based initiatives have been justified on a variety of grounds (Smith, 1999), but two rationales are examined here: targeting poor individuals and tackling area effects. ABIs are justified on the basis that they are an effective way of targeting low income people for assistance i.e. that the concentration of poverty is such that a sufficiently large number of people can be reached by employing policies in a relatively small number of areas. This has been argued against empirically by a number of authors (McLoone, 2001; Spicker, 2001), but most famously by Peter Townsend who stated:

‘However we are to define economically or socially deprived areas, unless we include nearly half the areas of the country, there will be more poor persons or poor children living outside than inside them... [and] within all or nearly all deprived priority areas, there will be more persons who are not deprived than there are deprived’ (Townsend, 1979: 560)

In the second half of this quote, Townsend provides an additional argument against ABIs: that the majority of people who live in the poorest areas are not themselves poor, and therefore the benefits of ABIs ‘leak out’ to people who should not benefit from them. These two questions were empirically evaluated by Tunstall and Lupton (2003), using measures of coverage (the proportion of the target population reached) and efficiency (the proportion of area population who are in the intended target population). They found that area targeting resulted in better

²See for example ‘Brighter Futures in Banbury’: <https://www.cherwell.gov.uk/info/118/communities/483/brighter-futures-in-banbury>. Accessed 5 July 2018.

coverage than critics had assumed, particularly for some sub-groups including children; however they also found that area targeting was relatively inefficient in that it benefited many people outside the intended target population.

Research into poverty dynamics suggests alternative perspectives on these objections to ABIs. This shows empirically that people experiencing income poverty are not, as cross-sectional data might lead one to think, a static group (Jenkins, 2011). Every year around 4 in 10 poor individuals in the UK leave poverty, and 1 in 10 non-poor individuals become income poor (*ibid.*). Around half of the people income poor in any one year can be considered ‘persistently poor’ (income poor for at least three out of four years; DWP, 2017d), and it may be these individuals that are the intended beneficiaries of a neighbourhood intervention. If persistently poor individuals are more heavily concentrated in the most deprived areas, neighbourhood interventions may reach a greater proportion of the intended target population than coverage measures based on current poverty would suggest.

The dynamics of income poor individuals also means that over a four year period, twice as many people are affected by income poverty as are poor in any one year (DWP, 2017d). If income poverty in deprived neighbourhoods is as dynamic as in other areas, a majority of the population may have been income poor at some point in the recent past. For policy that is concerned with reaching people who are at risk of future income poverty as well as those who are currently income poor, the benefits of neighbourhood-based policies would be directed towards a smaller proportion of unintended beneficiaries than static measures suggest. These are both empirical questions that are yet to be evaluated in the literature.

Another justification for ABIs is the existence of ‘area effects’: the theory that where somebody lives has a direct causal effect on social, health and economic outcomes over and above their individual characteristics. Galster (2012) categorises the various proposed mechanisms for area effects into four groups: geographical (e.g. distance from suitable employment opportunities); institutional (e.g. stigmatisation; discrimination by private services); environmental (crime, violence, physical environment); and social-interactive (social networks, social control, relative deprivation, collective socialisation, peer effects). Suffice to say there is a very large literature about area effects (e.g. Chetty and Hendren, 2017; Johnston et al., 2005; Slater, 2013) that is bedevilled by methodological difficulties (Lupton, 2003a) but it remains a powerful and influential theory.

Under the theory of area effects, neighbourhood interventions are justified because people living in the most deprived areas require additional assistance to improve social outcomes, over and above other people with similar disadvantages (van Ham and Manley, 2012). From the point of view of income poverty dynamics, the question is whether people living in deprived areas are more likely to enter poverty or more likely to be persistently poor, compared to similar people living in other areas. Buck (2001), using BHPS data from the 1990s and using electoral wards as neighbourhoods, found that across a range of measures of area deprivation individuals living in more deprived areas were more likely to enter poverty and less likely to exit poverty than people living in less deprived areas. No more recent work has been conducted at the ‘Lower Super Output Area’ (LSOA) level now commonly used to delineate neighbourhoods for area-based targeting.

6.2.3 The efficacy of neighbourhood-based initiatives and the role of neighbourhood dynamics

New Labour's neighbourhood policy, and the New Deal for Communities (NDC) in particular, set out both 'place-based' and 'people-based' objectives. The NDC's place-based objectives included reducing levels of crime, improving housing and improving the public realm; evaluations have generally concurred that the interventions were successful in meeting these goals (Amion Consulting, 2010; Crisp et al., 2015; Durose and Rees, 2012; Lawless, 2012; Muscat, 2010). On the other hand, there was less evidence of improvement in people-based measures: worklessness, health and education (Hincks and Robson, 2010; Wilson, 2013). Lupton, Fenton, et al. (2013) report that the gap between the most and least deprived neighbourhoods did narrow on some indicators - worklessness, cancer mortality and educational attainment - but that large gaps remained. Crisp et al. (2015) found no evidence that ABIs were successful in reducing income poverty.

Neighbourhoods are frequently viewed as a 'static concept with a relatively stable, monolithic community' (Bailey and Pill, 2011: 939), but as concern grew in the mid-2000s that neighbourhood initiatives were not being as effective as was hoped, the finger was pointed at policy-induced neighbourhood dynamics. The most comprehensive study of this was by Barnes et al. (2011), using longitudinal data on out-of-work benefit claims to test whether people who gained employment moved out of high worklessness neighbourhoods i.e. that the benefits of neighbourhood interventions 'leaked out' of the target areas. They found little evidence of this (*ibid.*: 41), finding instead that the flows of workless households in and out were a more significant factor - one quarter left their area

over a three-year period from 2004 to 2007. Turnover in the target population could limit the efficacy of area-based initiatives if individuals benefit for relatively short periods (Joshi, 2001).

The implicit theory of change of many area-based initiatives is that a decrease in worklessness and an increase in education levels will lead to a rise in income, therefore reducing material poverty. The Working Neighbourhoods Pilots funded from 2006, for example, were informed by the theory of a ‘culture of worklessness’ in highly deprived areas (Griggs et al., 2008) and promoted poverty exit via employment as a route to decreasing aggregate levels of poverty. The central finding of Jenkins (2011) that the income poor population is highly dynamic means that there are two reasons why aggregate levels of poverty may be so high in high poverty neighbourhoods: it could be a consequence of low poverty exit (i.e. high poverty persistence), or it could be due to high poverty entry (implying high levels of recurrent poverty). This is highly pertinent to the design of ABIs: do they principally need to promote poverty exit, or prevent poverty entry?

6.3 Study aims, data and methods

The aims of this paper are to describe the dynamics of income poverty within neighbourhoods in England, and to examine the implications for future area-based policy. The time period since the 2010 coalition government is examined, both pragmatically as this is when a major new data source - *Understanding Society* - became available - and from a policy point of view as this is when there was essentially a ‘policy off’ period for neighbourhood policy in England. This allows us to examine neighbourhood income poverty dynamics in the absence of major government neighbourhood schemes.

The research questions addressed by this paper are:

- Are persistently poor individuals more likely to be concentrated in high deprivation neighbourhoods than individuals experiencing current poverty? Are people living in high deprivation neighbourhoods more likely than not to be poor at some point within a short time frame? Does this offer an additional justification for targeting individuals by area?
- Conditional on population composition, are people living in high poverty areas less likely to exit poverty, or more likely to enter it? Does this justify extra efforts to promote poverty exit or prevent poverty entry in the most deprived areas?
- How stable is the population of poor individuals in deprived areas over the typical lifetime of an area-based intervention? How might this affect its efficacy?
- Are there lower rates of poverty exit or higher rates of poverty entry in deprived compared to less deprived areas? Should promoting poverty exit be the main objective of area-based initiatives?

6.3.1 Data

Longitudinal household microdata is sourced from the UK Household Longitudinal Study (UKHLS), also known as *Understanding Society* (University of Essex Institute of Economic and Social Research et al., 2016). UKHLS consists of a stratified and clustered random sample of 40,000 UK households that began in 2009 (Knies, 2016). Initial respondents to UKHLS have been shown to be geographically representative of the national population in terms of

neighbourhood deprivation and demographics (Petersen and Rabe, 2013). Longitudinal weights are provided to account for differential rates of response among the initial sample and attrition from the sample over time.

This study utilises data from households in England at waves 2 to 5 of UKHLS. In common with other recent studies (DWP, 2017c: 19) this research does not use poverty transitions observed between the first two waves. This is due to an artefactual rise in self-reported income between the first and second UKHLS interviews, postulated to be a result of ‘dependent interviewing’ (where respondents are reminded of a previous answer) and reduced concerns about sharing sensitive information (Fisher, 2016). Household interviews within each wave take place over a two-year window, although each household is interviewed on an annual basis. This means that interviews in wave 2 took place in 2010 or 2011 and interviews in wave 5 took place in 2013 or 2014.

An individual is classified as being in income poverty if the net equivalised income of their household is below 60% of the median, the commonly used definition of the income poverty line (DWP, 2017b). Net income is income from all sources including government transfers, net of direct taxes (variable *w_hhnetinc3* in UKHLS) and before housing costs. Household income is equivalised according to the modified OECD scale in order to account for the higher income required by larger households to secure adequate living standards. Household incomes are calculated in January 2015 prices using a price deflator calculated by the Office for National Statistics that includes mortgage interest payments, rent and dwelling insurance. The methods described above are identical to those utilised

in the production of official poverty dynamics estimates, and it has been verified that this study reproduces the official published estimates of poverty persistence by demographic group (DWP, 2017d).

In common with many studies (van Ham et al., 2013: 3), this research pragmatically utilises Lower Super Output Areas (LSOAs) as proxies for neighbourhood areas; these are areas used for the production of official statistics in England and Wales containing an average of 1,500 residents. The LSOA of residence for each household in UKHLS is available on Special Licence conditions from the UK Data Archive. This is the lowest available geography at which to study the effect of neighbourhood income poverty. LSOAs are typically used to define the boundaries of neighbourhoods subject to area-based interventions, making analysis at this scale directly relevant to policy.

6.3.2 Analytical approach

The first research question is answered by estimating the distribution of currently poor individuals by deprivation decile, comparing this to the distribution of persistently poor and ‘ever poor’ individuals (see below). Using the 2015 English Index of Multiple Deprivation (IMD) that measures area deprivation across seven domains (Smith et al., 2015), each of the 32,844 LSOAs in England is assigned to a deprivation decile - the highest deprivation neighbourhoods in decile 1, the lowest deprivation neighbourhoods in decile 10. UKHLS responses are aggregated and analysed according to the deprivation decile of the LSOA the respondent lives in. The findings present analysis for individuals living in each of the top four highest deprivation deciles compared to the combined six deciles of lowest deprivation.

Three binary indicators are calculated for each UKHLS individual: ‘current poverty’, ‘ever poor’ and ‘persistent poverty’. ‘Current poverty’ is set to 1 for individuals living in income poor households at wave 5 of UKHLS; ‘ever poor’ includes individuals who lived in an income poor household for at least one of the four observation waves; ‘persistent poverty’ includes individuals who lived in an income poor household in at least three of the four observed waves, the definition used in official statistics (DWP, 2017c). The proportion of the household population in each category is then calculated by deprivation decile, using longitudinal weights to correct for unequal sampling probability and sample attrition. In the text throughout, 95% confidence intervals adjusted for sample stratification and clustering are presented in brackets after the point estimate.

In the second part of the analysis, individual poverty transitions are modelled using a dynamic random effects probit model (Cappellari and Jenkins, 2009; Jenkins, 2011: 330-358), using a ‘cross-classified’ specification (Snijders and Bosker, 2012) to account for clustering within sampling units and neighbourhoods. Poverty status at year t is modelled conditional on poverty status at year $t-1$, which enables the determinants of poverty entry and exit to be estimated simultaneously. The covariates included in the model are those known to be associated with poverty dynamics (Jenkins, 2011) plus the independent variable of interest: the neighbourhood poverty rate, derived from the income domain of the English Indices of Deprivation 2015. As in Cappellari and Jenkins (2004), the sample is restricted to working age people (aged 18-65 years) and not in full-time education. The sample includes those individuals who provided a response to the survey at each wave between wave 1 and wave 5. Predicted probabilities of

poverty persistence and entry for individuals with a range of characteristics are presented in the findings; further detail of the model specification and the full table of model results are supplied as supplementary material.

The third part of the analysis estimates the turnover in the population of poor individuals by area deprivation. The population of poor individuals at wave 2 is broken down according to their status in wave 5 i.e. whether they are still living in an income poor household or not, and whether they are living in the same area or not, giving a four-fold categorisation. Finally, annual poverty exit and entry rates are calculated by deprivation decile. The exit rate is the proportion of the population in income poor households at year $t-1$ who were no longer in income poor households at year t . The entry rate is the proportion of population not living in income poor households at $t-1$ who were living in income poor households at t . Households are assigned according to the deprivation decile at $t-1$. Annual rates were averaged over the three pairs of adjacent waves observed in this study, weighted using UKHLS longitudinal weights.

The analysis was coded in R version 3.4.3 (R Core Team, 2016) with use of packages `survey` (Lumley, 2010) and `lme4` (Bates et al., 2017) for weighted survey analysis and estimating the dynamic random effects model.

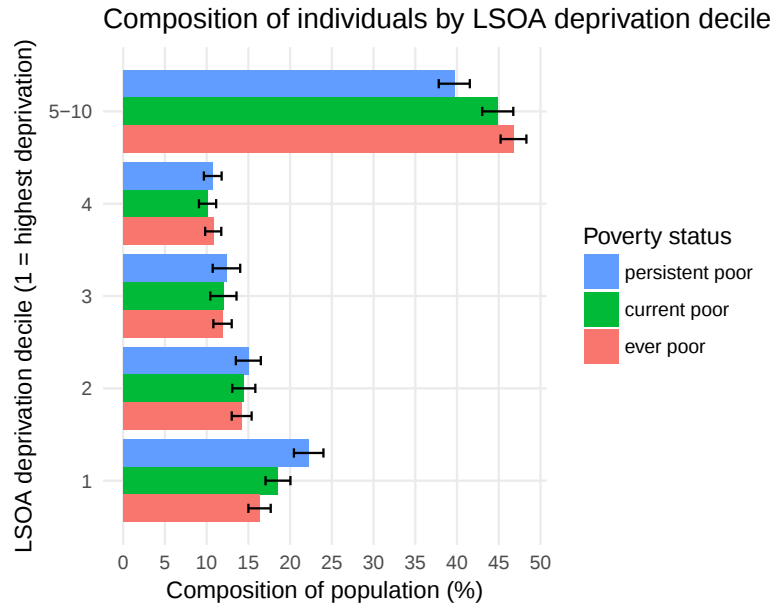


Figure 6.1: Composition of persistent, current and ever poor populations by LSOA deprivation decile

6.4 Findings

6.4.1 The neighbourhood distribution of current and persistent income poverty

Figures 6.1 and 6.2 present the weighted survey estimates of individuals who were categorised as being ‘current poor’, ‘persistently poor’ or ‘ever poor’. The two charts show the composition of individuals by LSOA deprivation decile (the percentage of people in each category who lived in these LSOAs) and the risk of each status within each deprivation decile (the percentage of people living in these LSOAs who had each of the poverty statuses).

The three bars at the bottom of figure 6.1 chart show the probability of living in the most deprived 10% of LSOAs, given each type of poverty status. Of those who were income poor in 2013/14, 18.5% (17.1-20.0) lived in the most

deprived LSOAs, compared to 22.2% (20.5-24.0) of persistently poor individuals i.e. persistently poor people were more likely to be living in the most deprived LSOAs, a statistically significant difference. Fewer ‘ever poor’ than currently poor individuals lived in the most deprived LSOAs - 16.3% (15.0-17.7) - but the overlapping confidence intervals suggest this may not be a statistically significant difference. This pattern does not exist for the next most deprived LSOAs in decile 2: there are no statistically significant differences between the percentages of currently poor, persistently poor and ever poor individuals in these areas. This is also the case for deciles 3 and 4. In the 60% least deprived LSOAs the pattern for the most deprived decile of areas is mirrored: 44.9% (43.0-46.7) of currently poor individuals lived in these areas, but a smaller proportion of persistently poor people lived in these areas - 39.7% (37.8-41.5). Again, there was no difference in the proportion of ‘ever poor’ and currently poor individuals living in the least deprived areas.

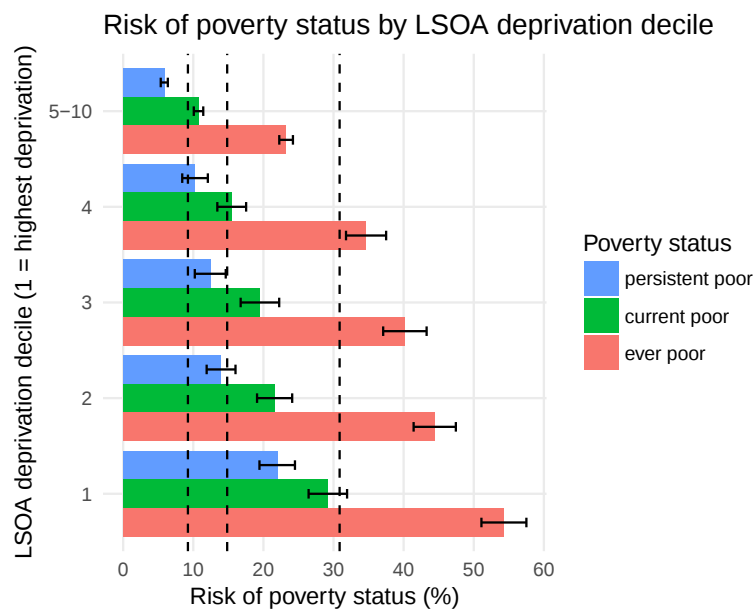


Figure 6.2: Risk of persistent, current and ever poor status by LSOA deprivation decile

Figure 6.2 shows the risk of individuals having one of the three poverty statuses at wave 5 (2013/14), by LSOA deprivation decile. The vertical dotted lines on this chart show the proportion of the total population with each status (from left to right: persistent poverty, current poverty, ever poor). The bottom three bars show these figures for the most deprived 10% of LSOAs. In these areas 29.2% (26.4-31.9) were income poor in the most recent observation, but a majority of the population - 54.3% (51.1-57.5) had experienced income poverty at least once in the four year observation period. 22.0% (19.4-24.5) of people living in the most deprived areas were observed as being persistently poor. As expected from the compositional analysis, the ratio of persistent to current poverty is higher in the most deprived decile LSOAs (0.75) than in the least deprived deciles (0.55).

6.4.2 Modelling the association between poverty dynamics and neighbourhood poverty

Figures 6.3 and 6.4 present predicted probabilities of poverty persistence and entry for individuals with a range of characteristics (the full set of model results is supplied as supplementary material). The base predictions are for a 25 year-old White European female lone parent with one child under two years and one of primary school age, not working, with below A-level qualifications, living in social housing, who was observed as being income poor in the first wave of the panel, living in a neighbourhood with a moderately high income poverty rate of 25%.

The dotted line on figure 6.3 shows that if observed as income poor in year $t - 1$ the probability of an individual with these characteristics still being income poor in year t is 0.59. The points plotted on the chart show the predicted probabilities if one of these base characteristics changes; the line plotted between the point and the dotted line indicates the size of this effect. Raising the income poverty rate of

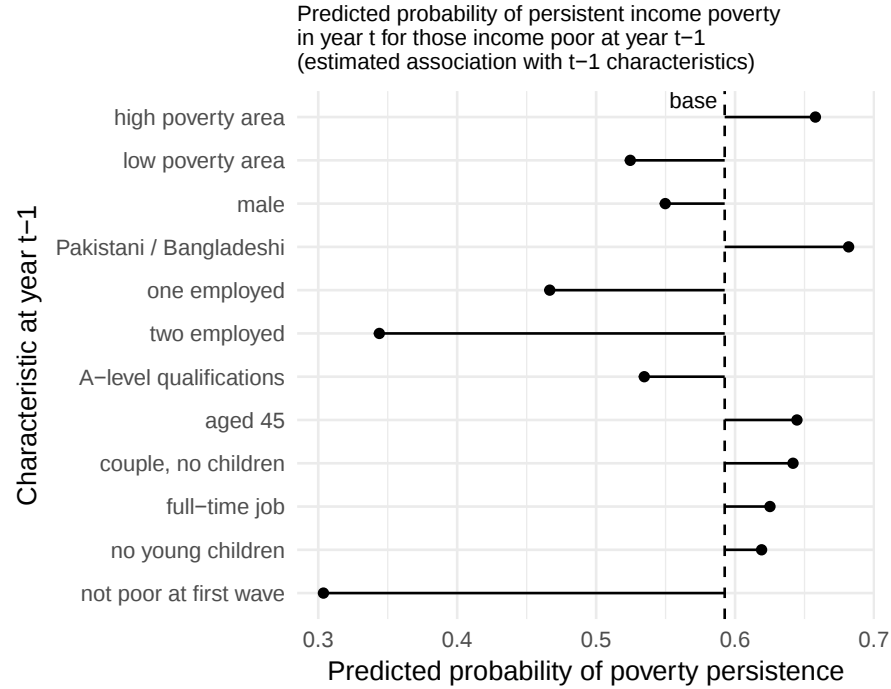


Figure 6.3: Estimated association between selected characteristics and poverty persistence

the neighbourhood to 40% increases the probability of poverty persistence to 0.66 whereas decreasing the neighbourhood income poverty rate to 10% reduces the probability of poverty persistence to 0.52. This is the same order of magnitude as many of the other effects: having a household reference person of Pakistani or Bangladeshi ethnic group raises the probability of poverty persistence to 0.68; having A-level qualifications reduces it to 0.53. The effect of having one earner in the household is much larger, reducing the predicted probability of poverty persistence to 0.47. Not being poor in the first wave almost halves the probability of poverty persistence to 0.3, emphasising the importance of previous experiences of poverty on future prospects.

Similarly, figure 6.4 shows the effect of changing the characteristics in the base prediction of poverty entry by year t , for an individual observed as not income poor at year $t - 1$. For an individual with the characteristics described above,

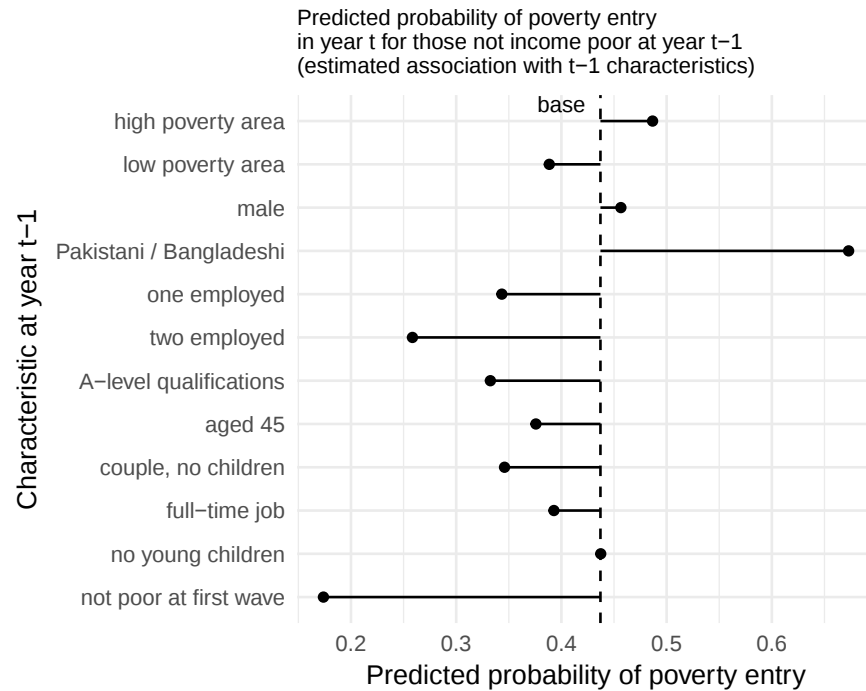


Figure 6.4: Estimated association between selected characteristics and poverty entry

the estimated probability of poverty entry over one year is 0.44. For those in a higher poverty area the probability of poverty entry increases to 0.49; for those in a lower poverty area it decreases to 0.39. Many other covariates have larger effects: having a household reference person of Pakistani or Bangladeshi origin increases the probability of poverty entry to 0.67; having one person employed or A-level qualifications reduces it to 0.34 and 0.33 respectively. Again, not being observed as income poor at the first wave in the series has a dramatic impact, reducing the probability of poverty entry to 0.17.

6.4.3 Turnover in the neighbourhood income poor population

Figure 6.5 shows the poverty status and neighbourhood location in 2013-14 (UKHLS wave 5) of people who were income poor in 2010-11 (wave 2), by the deprivation decile of the LSOA they were living in at 2010-11. It describes two

outcomes: whether or not they were still living in the same LSOA, and whether or not they were still income poor. These two outcomes comprise a four-fold classification.

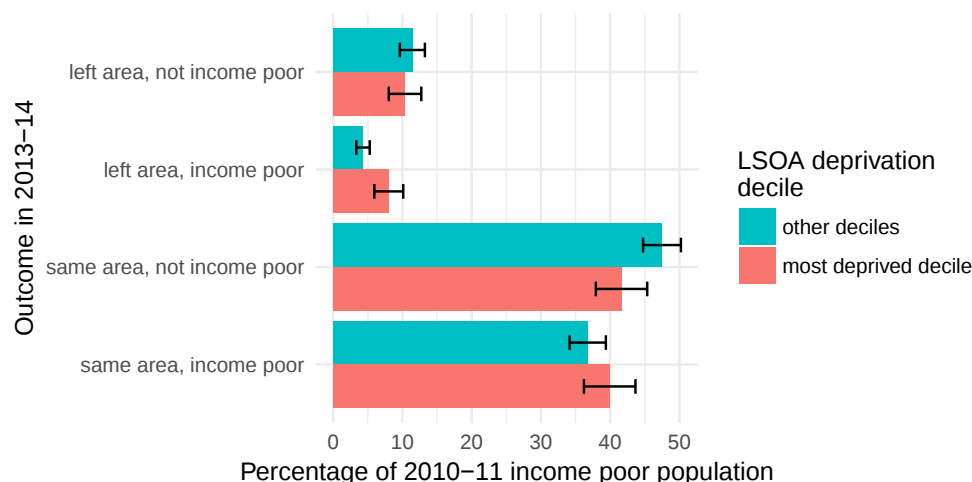


Figure 6.5: Poverty status and neighbourhood location in 2013-14 of people who were income poor in 2010-11

In the highest deprivation decile of LSOAs, just 39.9% (36.2-43.7) of the neighbourhood income poor population in 2010-11 were income poor and living in the same neighbourhood in 2013-14. Most of the remainder of the population, 41.6% (37.9-45.4), were still living in the neighbourhood but no longer income poor. Around two in ten of the original income poor population had left the area, split roughly equally between those who were income poor in 2013-14 - 8% (5.9-10.1) - and those who were not - 10.4% (8-12.7). Averaged over all such neighbourhoods, the turnover in the neighbourhood population of income poor individuals was therefore principally determined by poverty exit rather than the rate of migration out of the neighbourhood. While there was a lot of turnover in this population over a short period, most of it occurred within the area. There is no statistically significant difference between the most deprived decile LSOAs

and other LSOAs in the proportion of income poor individuals who are still income poor and living in the same area three years later: 39.9% (36.2-43.7) compared to 36.8% (34.1-39.4) respectively.

Given that a large proportion of the previously income poor population remain in the area, a key question is whether the exits from poverty are meaningful transitions that are likely to result in an increase in material wellbeing, or simply small income changes just above or below the poverty line. Analysing the distance of poverty exits we find that the median increase in income associated with a poverty exit is 0.53 (0.51-0.55) of the value of the poverty line. The poverty line for a household with one adult and two primary school aged children was £1,329 per month in 2013-14, so the median increase in income associated with poverty exit was £703, a large enough increase in income to make a significant contribution to improved material living standards. There was no statistically significant difference between areas in the median income increase associated with poverty exit. Just 14.2% (12.9-15.5) of poverty exits involved small changes in income (defined here as 20% of the value of the poverty line). The median income after a poverty exit was 1.3 (1.28-1.31) multiples of the poverty line; for the same family composition as above this is an income of £395 per month above the poverty line. There was a (just) statistically significant difference between the most deprived quintile and other areas in terms of income outcome after poverty exit of 0.06 of the poverty line (£75 per month).

6.4.4 Poverty exit and entry rates by neighbourhood deprivation decile

Figure 6.6 shows the weighted survey estimates of average annual poverty entry and exit rates by LSOA deprivation decile. The chart on the left of figure 6.6 shows the average entry rates by deprivation decile, showing a graduated increase from an entry rate of 5.7% (5.3-6.0) in the least deprived areas to 15.7% (14.1-17.3) in the most deprived areas. Each of the deciles 1 to 4 has a statistically significantly higher poverty entry rate than the least deprived areas. In relative terms the annual risk of entry into income poverty is almost three times higher in the highest deprivation areas compared to the lowest deprivation areas.

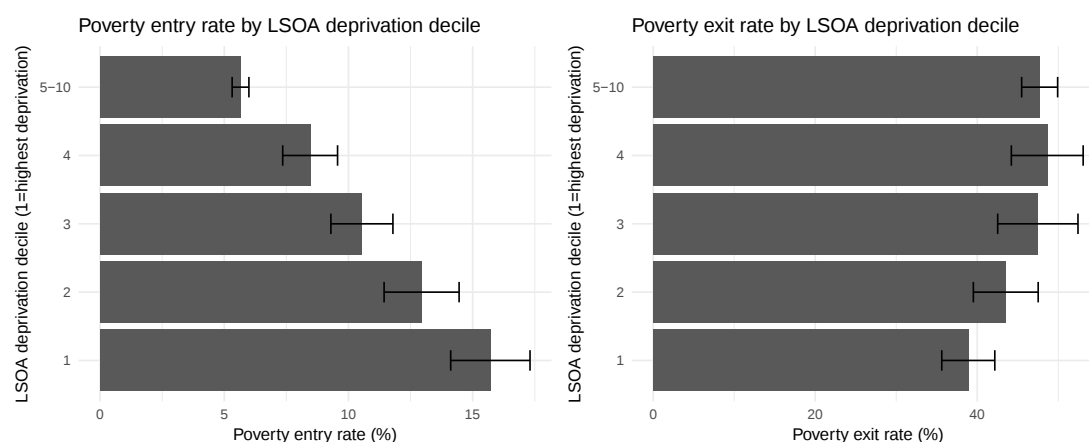


Figure 6.6: One-year poverty entry and exit rate by LSOA poverty decile

As for poverty exit rates, the right hand side chart shows there is much less differentiation between neighbourhood poverty deciles. The poverty exit rate in the least deprived areas is 47.7% (45.5-49.9); in deciles 2 to 4 the confidence intervals substantially overlap this estimate suggesting there is no statistically significant difference between the areas. There is a significant difference in the most deprived decile of areas in which the poverty exit rate was 38.9% (35.6-42.2). In relative terms this difference is much smaller (1.2 compared to nearly 3).

6.5 Discussion

The findings show that there is a clear relationship between area deprivation and individual poverty dynamics. Persistently poor people (income poor for at least three out of four years) are more likely to live in the highest deprivation decile of areas than people who are observed as currently income poor (22% vs 19%). While around 30% of people living in the highest deprivation neighbourhoods were income poor in 2013/14, the majority had been income poor at some point in the previous four years. Controlling for factors known to be associated with poverty dynamics, working age individuals living in higher poverty neighbourhoods were more likely to enter poverty, and more likely to be persistently poor. For poverty persistence the size of this association was similar to the association with individual demographic characteristics, though smaller than the effect of employment and past history of income poverty. For poverty entry the size of the association was smaller than most demographic characteristics.

Only 40% of the income poor population in 2010-11 were still income poor and living in the same area three years later; there was no difference between areas in this respect. Analysed at aggregate level (i.e. not controlling for population composition), individuals living in the most deprived areas were three times more likely than those living in low deprivation areas to enter poverty in a given year, and this was strongly differentiated across the spectrum of deprivation deciles. By comparison, the relative difference between areas in poverty exit rates was much smaller.

While these findings suggest the population of income poor individuals in English neighbourhoods between 2010 and 2014 was highly dynamic, we might ask whether this finding is generalisable to other time periods. To the author’s knowledge this is the first empirical study of this kind, so no easy comparisons are available. National poverty dynamics measures from the mid-1990s and 2010s (DWP, 2017d; Jenkins, 2011) show that poverty entry and exit rates have been remarkably stable with changes in poverty being driven by small changes in exit and entry rates; the same may be true at neighbourhood level. There is likely to be heterogeneity between areas: some areas may indeed consist of a more stable, persistently poor population. Ideally we would wish to study the very most deprived areas to explore this - the 1% of areas with the highest deprivation levels, for example - but the sample size of UKHLS does not allow this.

These findings strengthen the case for area-based initiatives. In respect of coverage, an area-based initiative aimed at the 20% highest deprivation LSOAs would cover 33% of currently income poor individuals; and 37% of persistently poor individuals. Though statistically significant, this increase in coverage is arguably of limited practical significance. In respect of efficiency, an initiative aimed at currently poor individuals in the highest deprivation decile would ‘leak out’ to around 70% of the population not income poor; but aimed at people with a recent history of poverty would find the majority of the population to be intended beneficiaries.

Less support is found here for justifying area-based initiatives on the basis of area effects. This analysis suggests that the contextual effect of neighbourhood poverty levels is of lower significance compared to the combined effect of known individual risk factors. The associations presented here cannot be given a causal

interpretation, because the differences by area could be explained by unobserved characteristics of individuals and households that are related to both poverty dynamics and area of residence. Nevertheless, they can plausibly be interpreted as an upper limit on any causal area effects that exist. There may of course be other neighbourhood characteristics that would exhibit a stronger association, there may be other scales at which area effects operate, and there may be heterogeneous associations by individual characteristics (Lupton, 2003a).

Many area-based initiatives - and many anti-poverty initiatives in general - target currently poor individuals or households in order to promote poverty exit, either by re-engagement with employment or broader social interventions. These findings cast doubt upon such a strategy, and suggest that policy focused on deprived areas would be better targeted on preventing poverty entry. In the highest deprivation decile areas approximately 70 of every 100 residents are not income poor in a given year, and around 11 become income poor by the following year; around 30 residents are income poor and 11 exit poverty by the following year. If interventions were successful in bringing poverty exit and entry rates in line with the lowest deprivation areas this would result in 2-3 more people exiting poverty each year, but 7 fewer people entering poverty. There is greater scope for reducing the incidence of income poverty by intervening to alter the risk of poverty entry rather than focusing on poverty exit.

Neighbourhood initiatives aimed at the income poor population face targeting a constantly changing target group. The majority (60%) of the original population of income poor individuals were no longer among that population just three years later, though most were still living in the same area. This challenges the notion of a stagnant 'welfare-dependent underclass' (Hills, 2014a) and the consequent

area-based stigma that people in the most deprived areas face. For the design of area-based initiatives, this provides additional support for targeting the wider population of people with a recent history of poverty in order to prevent recurrence, or at least mitigate its effects. Focusing only on the shifting population of those currently poor must limit the efficacy of any longer-term strategy to reduce the incidence of poverty.

In conclusion, what characterises high deprivation areas is not a high degree of poverty persistence, but a high risk of poverty entry i.e. a risk of recurrent poverty that is spread over the majority of the population. The dynamics of the target population in target neighbourhood(s) should be carefully considered in order to judge how successful an area-based initiative targeting individuals is likely to be. In this case - where individuals in income poverty are viewed as the target population and reducing income poverty is the objective - we can see that the target population is highly dynamic, that any area effects on poverty dynamics are small compared to socio-demographic factors, and that preventing adverse outcomes can be more important than ameliorating them when they occur.

Further work could use administrative data on longitudinal household incomes (from tax records and welfare benefit claims, see Office for National Statistics, 2016b) to investigate neighbourhood poverty dynamics for individual neighbourhoods (see Fransham, 2017 for an example), to examine heterogeneity within the highest poverty areas in terms of their dynamics. This fine-grained data could be used to tailor area-based interventions according to the dynamic patterns within them. More work could be done using UKHLS data to examine other dynamics, for example the dynamics of material deprivation or of worklessness. Once the earlier British Household Panel Study is harmonised with

UKHLS, trends in neighbourhood dynamics from 1991 to the present could be measured to investigate whether the patterns observed here are idiosyncratic to this period. An analysis of the causes of poverty entry by area deprivation could inform policies designed to prevent poverty entry and recurrence.

7 Neighbourhood gentrification, displacement and poverty dynamics in post-recession England¹

Abstract

A recent ‘return to the city’ by middle-class professionals in England has resulted in the growth of concerns about gentrification via the involuntary displacement of traditional working class communities. Despite these concerns, relatively little quantitative research has been undertaken to evaluate the different demographic processes that could lead to the change in neighbourhood composition that characterises gentrification. This paper adopts a number of innovative methodological approaches: a combination of six indicators measured relative to the local housing market area to measure changes in neighbourhood status, and matching methods to select a comparison group of neighbourhoods. It uses data from the UK Household Longitudinal Study to observe residential mobility and poverty dynamics. The tentative finding is that the dominant process in gentrification was the changing composition of in-migrants to neighbourhood areas rather than a change in those who left. In the period 2010-2014 gentrifying areas had lower in-migration rates of income poor individuals than non-gentrifying comparison areas, and higher

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in-migration rates of not income poor individuals. There was no difference in out-migration rates. The statistical significance of this finding, however, was not robust to alternative methods of identifying gentrifying areas. The paper concludes by arguing that the data source used is insufficiently large to detect the size of effect, and that robust identification may require a larger data source.

7.1 Introduction

With a ‘return to the city’ in the last 20 years increasing the population of young professionals living in central urban areas (Rae, 2013), accompanied by observations that poverty appears to be coming increasingly ‘suburbanised’ (Bailey and Minton, 2017), concerns have grown about the ill-effects of gentrification on traditional working class communities in England. Despite these concerns relatively little quantitative research has observed the different demographic processes that cause a change in neighbourhood composition, one of the characteristic features of gentrification. This paper builds on Freeman et al. (2016), adopting a number of innovative methodological approaches to observe three different processes that could be causing gentrification: a change in the composition of out-migrants from neighbourhoods; a change in the composition of in-migrants; and *in-situ* changes.

7.2 Gentrification and displacement: definitions and empirical findings

Since Ruth Glass coined the term gentrification over 60 years ago (Glass, 1964), a large literature has developed which has explored the nature, causes, processes and consequences of the phenomenon. The ‘classic’ gentrification that Ruth Glass wrote about was characterised by middle-class households moving in to upgrade old, rundown housing in inner-city urban areas, changing the tenure of housing from rented to owner-occupied and the composition of the area from working-class to middle-class (Lees et al., 2008: 10-30). Many scholars have sought to broaden out the term to include new-build housing in previously working-class areas (Davidson and Lees, 2010), rural and suburban areas, gentrification via the rental market, and state-led rather than market-led processes (Hochstenbach, 2016). This makes gentrification ‘*a slippery term*’ (Lees et al., 2008: 3) with multiple competing definitions. However many take a broad view of the nature and location of phenomena that can be termed gentrification:

‘a class-based phenomenon whereby lower-status neighbourhoods change to higher-status ones’ (Freeman et al., 2016: 2803)

‘the transformation of a working-class or vacant area of a city into middle-class residential and/or commercial use’ (Slater, 2009: 294)

‘changes in the composition and character of urban localities in favour of newer residents with more resources and at the expense of existing residents with fewer resources’ (Fenton, 2016: 7)

Gentrification can be viewed positively, as a way to improve disadvantaged neighbourhoods by attracting investment and the spending power of higher income residents (Freeman, 2005), reduce vacancy rates, increase local tax revenues thereby increasing public investment, reduce suburban sprawl and

increase social mix (Atkinson and Bridge, 2005: 5). It can also be viewed negatively as a source of community resentment and cause of population loss in other areas (*ibid.*). Central to the critical view of gentrification is the concern that it necessarily involves the involuntary *displacement* of lower-income households from gentrifying areas that they previously called home (Slater, 2009). Ruth Glass' original work is the classic exposition of this:

‘one by one, many of the working class quarters of London have been invaded by the middle classes...once this process of “gentrification” starts in a district it goes on rapidly until all or most of the original working class occupiers are displaced and the social character of the district is changed’ (Glass, 1964)

Gentrification researchers have elaborated upon this simple idea of ‘displacement’, Marcuse (1985) distinguishing between *direct displacement* and indirect, *exclusionary displacement*. Direct displacement occurs where households are involuntarily displaced from the gentrifying area where they currently live, for example through unaffordable rent increases or eviction. Contemporary concerns are exemplified by the Heygate estate in South London, a social housing estate demolished to be replaced in part by high-cost private housing (Lees and Ferreri, 2016). Exclusionary displacement occurs where households are prevented from living in gentrifying areas where they would have previously sought housing. Direct displacement is thus characterised by a change in the composition of outward migrants; exclusionary displacement is characterised by a change in the composition of inward migrants.

Neighbourhood composition can change via three mechanisms (Hochstenbach, 2016): migration patterns, *in-situ* changes (e.g. rising income or changing occupation) and demographic change (e.g. the ageing-out of working class residents). It has been asserted that gentrification can provide better employment

opportunities for existing residents, promoting upward *in-situ* mobility (Vigdor et al., 2002). Noting the generational shift from working-class to middle-class occupations Hamnett (2003) has proposed that gentrification has principally occurred by a benign demographic replacement of the older working class with a younger middle class.

Operationalised measurements of gentrification vary, frequently driven by the availability of data as much as theoretical concerns. Ruth Glass used change in housing tenure from rental to owner occupied to identify gentrification in London. As the middle class is typically associated with professional occupations, changing occupational structure within neighbourhoods is a common measure (Atkinson, 2000; Freeman et al., 2016; Hamnett, 2003). Gentrification is associated with an increase in house prices and rents so these are also used as indicators (Freeman, 2005; Hamnett, 2003); and an increase in household incomes is also associated with more affluent residents, as an ‘indicator of position in class relations’ (Fenton, 2016: 9) so measures of income (Ellen and Regan, 2011; McKinnish et al., 2010) or the prevalence of income poverty (Fenton, 2016) have been used. In a study of residential choice in US cities, Clark and Rivers (2013) use a combination of housing tenure, housing value, poverty and lone parenthood to measure neighbourhood status. These measures differ according to whether they measure absolute change or relative change (e.g. in rank position); and for those that use relative change, whether changes are measured relative to the entire nation or a smaller subregion.

A number of quantitative studies have shown little relationship between gentrification and outward migration (direct displacement) of lower income residents. The most recent UK study (Freeman et al., 2016) found no robust

relationship between neighbourhood out migration, gentrification and household income or class over the period 2001-2009 using the British Household Panel Survey. Similar findings have been reported in studies of the United States (Ellen and Regan, 2011; Freeman, 2005; McKinnish et al., 2010; Vigdor et al., 2002). Slater (2009) has suggested that these quantitative studies fail to take into account all possible displacement mechanisms and ignore household coping strategies.

The passionate debate around the direct displacement effects of gentrification (or lack thereof) has meant there has been less empirical research studying other possible processes. Relatively little attention has been paid to neighbourhood in-migration, or exclusionary displacement. As population turnover is significant in most neighbourhood areas (Bailey and Livingston, 2007), the difference between a gentrifying and non-gentrifying neighbourhood could be the composition of in-migrants, not a change in out-migration. In a study of US neighbourhoods, Freeman (2005) found that '*in-movers rather than out-movers are the driving force behind neighborhood change in gentrifying neighborhoods*'. Hochstenbach and Van Gent (2015) used Dutch population register data to examine the relative importance of different processes in gentrifying neighbourhoods of Amsterdam and Rotterdam. They found that residential mobility is much greater in magnitude than *in-situ* changes or demographic processes, but has small net effects that mostly reproduce neighbourhood composition (*ibid.*: 1497). They also found that different processes dominated in different types of gentrifying neighbourhoods in the same city - there was no single gentrification process.

These different processes have yet to be examined in the literature on the UK. Existing quantitative gentrification research studies the period before the 2008/09 Great Recession, since when such processes may have intensified: household incomes have stagnated (Hood and Waters, 2017), more low income households live in private rented housing (Tinson et al., 2016) and state subsidies for home rental costs have been restricted (Hills, De Agostini, et al., 2016), such that it may have become more difficult for lower income households to access or remain in gentrifying neighbourhoods (Hamnett, 2010).

This paper builds upon the contribution of Freeman et al. (2016), who analysed out-migration rates in order to measure displacement of lower income individuals from gentrifying areas in England and Wales in the period 2001-2009. They found no robust relationship between out-migration rates for low income or working class individuals and gentrification, but did not examine the contribution of in-migration rates or *in-situ* changes. Their study identifies gentrifying areas as those that changed relative to others in England measured by a single indicator (occupational class) over the period 2001-2011, and used longitudinal household survey data 2001-2009 to measure this. Their study is potentially hampered by the fact they may have been measuring the process before gentrification had occurred, as neighbourhood change could have occurred towards the end of the intercensal period. Freeman et al. (2016) use random effects models to estimate the ‘effect’ of gentrification at an individual level, controlling for other factors associated with migration. They do not examine aggregate processes i.e. whether taken together, the migration patterns of individuals in gentrifying and non-gentrifying areas are similar. Finally, they compare gentrifying areas to all ‘non-gentrifying’ areas, without establishing whether these areas are truly comparable. This paper seeks to build on their work by addressing some of these limitations.

7.3 Study aims, data and methods

This study addresses three research questions. Between 2010 and 2014, when compared to non-gentrifying areas, were gentrifying areas associated with:

- higher out-migration rates for income poor individuals?
- lower in-migration rates for income poor individuals?
- higher rates of poverty exit, or lower rates of poverty entry?

7.3.1 Measuring neighbourhood status and gentrification

This paper broadly follows the approach of Freeman et al. (2016), treating gentrification as a class-based phenomenon involving neighbourhood transformation from lower to higher status in the residential hierarchy. Accepting this definition, the analyst has decisions to make about how to measure such a concept. Three questions raise their head immediately: how to define neighbourhoods; within what reference area the status of that neighbourhood should be measured; and by what observables should status be determined.

The study pragmatically utilises Lower Super Output Areas (LSOAs) as proxies for neighbourhood, in common with many studies (van Ham et al., 2013: 3). There are 32,844 LSOAs, used for the production of official statistics in England, that contained an average of 1,500 residents in 2001. The boundaries of these areas are relatively stable; they were first defined using data from the 2001 Census and redefined following the 2011 Census, but 95% of areas had the same boundaries between the two sets. Most of the changes were made by either splitting 2001 LSOAs into two or more, or merging two or more 2001 LSOAs into one. For areas that altered between 2001 and 2011, comparison has been made between larger

amalgamated areas that have the same boundaries over time (e.g. an 2001 LSOA that was split in 2011 is compared to the aggregated data for all the split 2011 LSOAs).

If the concept of a neighbourhood hierarchy is accepted, within what reference frame should neighbourhood status be assessed? The approach of Freeman et al. (2016) is to assess neighbourhood status with reference to all other neighbourhoods in England. It is questionable, however, whether it makes sense to assess the status of a neighbourhood in London with reference to one in Leeds, some 200 miles away. Given that most residential moves are within short distances (Fielding, 2012) it is argued here that a more satisfactory approach is to assess neighbourhood status within a local housing market area. In this paper these are approximated by 2011 Travel to Work Areas (TTWAs), areas defined by 2011 Census data such that the majority of people who work in the TTWA also live in it, and vice-versa. There are 149 TTWAs in England.

Six different indicators are used to measure neighbourhood (LSOA) status within the local housing market area (TTWA) in 2001 and 2011. Six indicators are used so that the measure is more robust to measurement error in any one of them. Three are indicators of low status: the income poverty rate, the proportion of people living in social rented housing and the proportion of adults in the lowest occupational classes. Three are indicators of high status: housing prices, the proportion of people living in owner-occupied housing and the proportion of adults in the highest occupational classes. Each LSOA is ranked within the TTWA according to the six indicators. Ranks are scaled from 0 (lowest status) to 1

(highest status). The average rank across the six indicators is used as a composite index of neighbourhood status in 2001 and 2011; it is a simple task to compute the change in status between the two time points.

Income poverty estimates are taken from the income domain of the English Indices of Deprivation 2004 and 2015 (Smith et al., 2015) with reference points of August 2001 and August 2012 respectively. Tenure and occupational class (NS-SeC) are derived from the 2001 and 2011 Censuses. The lowest occupational classes include routine and manual occupations; the highest occupational classes include higher managerial, administrative and professional occupations. The median house price within each LSOA was calculated for 2000-2002 and 2010-2012 using record-level ‘price paid’ data published by the UK Land Registry and the National Statistics Postcode Lookup file. Some of these measures were changed between the two time points: the state cash benefits upon which the Indices of Deprivation income domain is based changed over time; the Standard Occupational Classification (SOC) which forms the basis of NS-SeC also changed. Computing changes in rank rather than change in an absolute measure means that the status index is more robust to changes in these underlying measures, as well as enabling an assessment of status with reference to other local neighbourhoods.

This approach provides an indicator of neighbourhood rank within the local housing market area in 2001 and 2011, and consequently the change in rank over that period. Finally, the question arises of how to identify ‘gentrifying’ areas from these measures. Our definition demands that gentrifying areas should have initially been ‘low status’, and that they should be increasing their status. From an empirical point of view, there are trade-offs to be made in the choice of cutoff points for defining ‘low status’ and ‘increased status’. In order to identify the

largest possible differences between areas, we may wish to focus on the lowest status areas that have increased their status by a large amount. This may be counterproductive however, as it may result in a very small sample size which is unable to robustly establish differences between area types. On the other hand, focusing on higher status areas that have increased their status by a smaller amount may reduce the difference between area types, making any such difference harder to detect in the sample. There is a trade-off between maximising the likely difference by focusing on a small population, and keeping the population large enough to minimise the uncertainty in the estimates.

To illustrate the main results, gentrifying areas are identified as those that were in the bottom 40% of neighbourhood ranks in 2001, and of these areas, were among the 10% of areas that had increased their rank the most between 2001 and 2011. In the results section below a number of different cutoff points are utilised to explore the sensitivity of the findings to different definitions of ‘gentrifying’.

7.3.2 Selecting comparison ‘non-gentrifying’ areas

Having described a method for selecting gentrifying areas, it is necessary to select ‘non-gentrifying’ areas in order to compare migration patterns and poverty dynamics between them. One approach is to use all areas that began as lower status neighbourhoods but did not increase rank over time. The difficulty is that there is considerable heterogeneity within this large group of lower status neighbourhoods, making the comparison with gentrifying areas less meaningful. Rather, our comparison group should ideally consist of those areas that appear similar to gentrifying neighbourhoods, the only difference being their history of status change.

This paper uses a matching algorithm to select a comparison group of non-gentrifying neighbourhoods, implemented by the R package MatchIt (Ho et al., 2007). Matching is often used in quasi-experimental designs to select a ‘control’ group of subjects to compare to some ‘treatment’ group, aiming to achieve ‘covariate balance’ i.e. similarity in the observed covariates that may be related to the outcome of interest. There are a number of different approaches to achieving covariate balance (Morgan and Winship, 2014), but a ‘nearest neighbour’ approach is used in this study having been compared to alternative approaches available in MatchIt. This involves calculating a ‘propensity score’ for each LSOA, which is the probability of the LSOA being included in the group of ‘gentrifying’ neighbourhoods. The propensity score is calculated from a logistic regression model with gentrification status as the dependent variable and the observed characteristics (the six neighbourhood status variables plus age structure and TTWA) as predictors. These predictors are all measured in 2011, thus identifying a comparison group of neighbourhoods that, in 2011, were identical to gentrifying neighbourhoods with respect to these observed characteristics. The nearest neighbour algorithm selects the n non-gentrifying LSOAs that have the closest propensity score to each gentrifying LSOA. The value of n was set in order to achieve a total sample of approximately 20% of all LSOAs in England; consequently it varies with different values of the cutoff points described above.

Covariate balance is assessed by comparing the means of each covariate, conducting t-tests and calculating the ‘standardised bias’. For each covariate the standardised bias is calculated as the difference in means between the gentrifying and comparison areas, divided by the pooled standard deviation (Eggers and

Hainmueller, 2009). The average standardised bias is the mean across all covariates. These measures are compared before and after matching, to examine the degree to which the matching algorithm improves covariate balance.

7.3.3 Measuring residential mobility and poverty dynamics

Residential moves and changes in poverty status are observed via longitudinal household microdata sourced from the UK Household Longitudinal Study (UKHLS), also known as *Understanding Society* (University of Essex Institute of Economic and Social Research et al., 2016). UKHLS consists of a stratified and clustered random sample of 40,000 UK households that began in 2009 (Knies, 2016). Initial respondents to UKHLS have been shown to be geographically representative of the national population in terms of neighbourhood deprivation and demographics (Petersen and Rabe, 2013). The LSOA of residence for each UKHLS household at each interview was accessed on Special Licence conditions from the UK Data Archive.

This study utilises data from households in England at waves 2 to 5 of UKHLS. The interviews in each wave of UKHLS are conducted over two years, so wave 2 includes interviews conducted in 2010-11 and wave 5 covers interviews in 2013-14. Data from wave 1 is excluded for two reasons: first, the time point of interviews (2009-10) is before neighbourhood gentrification is observed to have been taking place (2011). Second, other studies (DWP, 2017c: 19) have discarded poverty transitions between the first two waves due to an artefactual rise in self-reported income between the first and second UKHLS interviews. This is postulated to be a result of ‘dependent interviewing’ (where respondents are reminded of a previous answer) and reduced concerns about sharing sensitive information (Fisher, 2016).

Data from waves 6 and 7 of UKHLS are currently available, but these were excluded to keep the observation window (2010-2014) close to the time when gentrification was observed to have taken place (2011).

Poverty is defined here in relative terms as the ‘*inability to participate [in society] owing to a lack of resources*’ (Nolan and Whelan, 1996: 188) and operationalised by means of a relative income poverty measure. An individual is classified as being in income poverty if the net equivalised income of their household is below 60% of the median household income, the commonly used definition of the income poverty line (DWP, 2017b). Net income is income from all sources including government transfers, net of direct taxes (variable *w_hhnetinc3* in UKHLS) and before housing costs. Household income is equivalised according to the modified OECD scale in order to account for the higher income required by larger households to secure adequate living standards. Household incomes are calculated in January 2015 prices using a price deflator provided by the Office for National Statistics.

Only individuals with positive longitudinal weights at wave 5 are included in the study i.e. people who provided a survey response at each of the first five waves. The weights are used to adjust the estimates for panel attrition and differential sampling probabilities. People aged 66 years and over were excluded from the sample on the basis that people of pensionable age have rather different patterns of residential mobility and income dynamics from people in working age households. The UKHLS data was analysed using the R package *survey* (Lumley, 2010) which applies weights and adjusts standard errors for clustering and stratification of the sample.

7.3.4 Observing processes in gentrifying and non-gentrifying areas

Having acquired the data described above it is a simple task to identify when individuals move LSOA between waves, or when they enter or exit poverty. The question is, how to use this data to describe the processes operating in the gentrifying and matched comparison areas? One approach to this (utilised by Freeman et al., 2016) is to analyse the data at the level of individuals, describing the association (or more ambitiously, the causal relation) between migration rates and gentrification, using regression models to control for individual characteristics. If we are interested in neighbourhood processes, we do not wish to control for individual characteristics - we wish to understand who is moving in and out of areas, leaving in any compositional effects, to understand what processes may be causing the neighbourhood composition to change.

The approach in this paper is to observe residential moves and poverty transitions at an aggregate level. UKHLS respondents living in gentrifying LSOAs are treated as being representative of the population living in such LSOAs (after using sample weights); respondents living in matched comparison areas are similarly treated as being representative of the population living in those neighbourhoods. Outward migration is estimated by selecting all those living in gentrifying or matched comparison areas in year $t=0$, and calculating the proportion who had moved out of the area by year $t=1$. Estimates are broken down by area type and poverty status at $t=0$ to enable comparisons. Inward migration is estimated by selecting all those living in gentrifying or matched comparison areas in year $t=1$, and calculating the proportion who had moved in to the area in the year

Table 7.1: Linear correlation between six neighbourhood status indicators measured in 2011, all LSOAs in England

	Poverty	Professional	Routine	House prices	Owner occ.	Social rent
Poverty	1.00					
Professional	0.78	1.00				
Routine	0.85	0.90	1.00			
House prices	0.73	0.79	0.82	1.00		
Owner occ.	0.80	0.56	0.57	0.55	1.00	
Social rent	0.83	0.62	0.66	0.51	0.83	1

before. Poverty entrance and exit is calculated in an analogous fashion, using the UKHLS sample living in gentrifying or matched comparison areas in year $t=0$ and comparing their poverty status one year later.

95% confidence intervals are constructed in order to evaluate the statistical significance of differences between groups. Mutually exclusive confidence intervals are a conservative test of statistical significance (Schenker and Gentleman, 2001); Lumley (2010: 31) recommends an F test of bivariate association which is implemented in the *survey* package and reported in the text. The analysis was conducted in R version 3.4.3 (R Core Team, 2016).

7.4 Results

7.4.1 Gentrifying and non-gentrifying matched areas

The first step in constructing the index of neighbourhood status in 2001 and 2011, and consequently the index of neighbourhood change, was to rank each LSOA within its parent Travel to Work Area according to each of the six indicators. Table 7.1 shows the linear correlation between these indicators in 2011 for all 32,844 LSOAs in England. There is a very strong correlation between the income poverty rank and the other five indicator ranks of between 0.73 and 0.85. The

lowest correlations are between the median house price and the indicators of tenure and occupation, but still moderately strong at between 0.51 and 0.57. In general the indicator ranks appear to be well correlated, such that in combination we would expect them to be measuring the same concept.

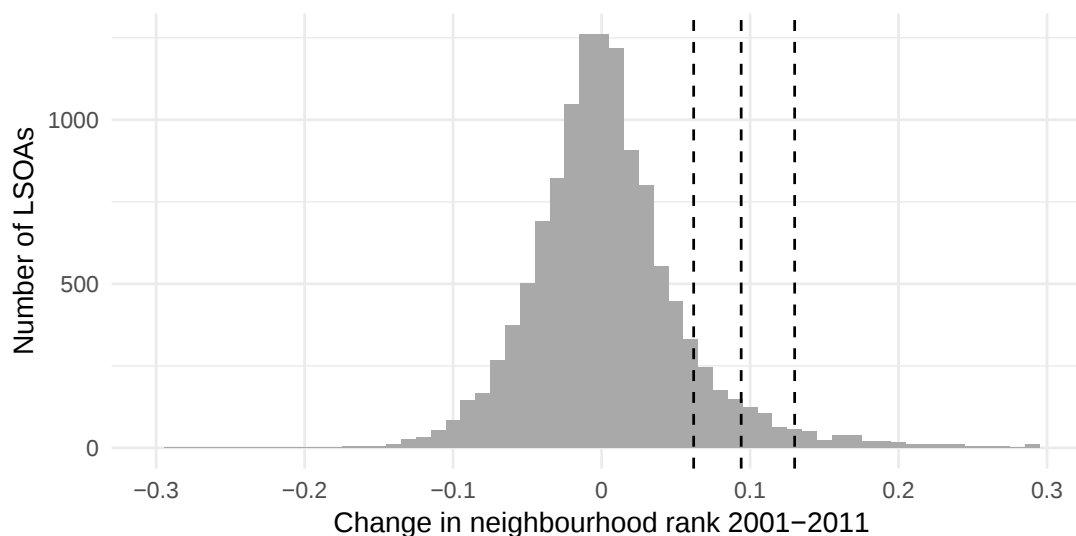


Figure 7.1: Distribution of neighbourhood rank change 2001-2011, for LSOAs in bottom four deciles in 2001

The index of neighbourhood change, constructed by taking the difference in average neighbourhood rank between 2001 and 2011, is illustrated in figure 7.1 for those LSOAs that were in the bottom four deciles of the neighbourhood ranking in 2001. The mean change was 0.003 with a standard deviation of 0.054. There is a right skew to the distribution, with 106 LSOAs having large increases in rank of over 0.2. The chart illustrates the 90, 95 and 97.5 centile cutoffs at rank changes of 0.062, 0.094 and 0.130 respectively. These cutoffs are used to identify ‘gentrifying’ areas in various different definitions used in the sensitivity tests below. The base case used in the following analysis identifies gentrifying areas as the 40% lowest status areas in 2011 that had the 10% largest increase in rank between 2001 and 2011. This equates to $32,844 \times 0.4 \times 0.1 = 1,314$ ‘gentrifying’ LSOAs.

Table 7.2: Means of matching characteristics in 2011 for gentrifying areas, matched comparison areas and unmatched comparison areas

Variable	Gentrifying areas	Matched comp.	Unmatched comp.	t-tests
Poverty	20.8	21.2	24.7	0.21
Professional occupations	25.0	24.6	19.3	0.24
Routine occupations	43.0	43.8	51.3	0.05
House prices	181000	182100	136300	0.75
Owner occupation	45.4	45.6	47.0	0.78
Social rented	30.4	30.7	33.3	0.65
Neighbourhood rank	0.34	0.33	0.21	0.01
Aged 0-15	20.1	20.5	21.2	0.03
Aged 16-24	14.5	14.3	12.9	0.31
Aged 25-44	33.0	32.6	28.8	0.2

Table 7.2 shows the results of using the Matchit nearest neighbour algorithm to find a matched comparison group of non-gentrifying LSOAs. Each gentrifying LSOA was matched with four non-gentrifying LSOAs to generate a large enough sample for subsequent analysis. The gentrifying and matched comparison areas are compared to an unmatched comparison group, those LSOAs that were in the bottom four deciles of neighbourhood rank in 2001 but did not increase their rank more than the defined cutoff. The table shows the means of the variables on which the areas were matched and p-values from t-tests for significant differences in means between the matched and unmatched comparison groups.

The unmatched comparison group is particularly different to the gentrifying areas on some characteristics: higher poverty rates, a lower proportion of people in professional occupations, a higher proportion in routine occupations, lower house prices and a lower proportion of people aged 16 to 44 years. The matched comparison group improves on these significantly, with very small differences remaining on all variables. Most of the t-tests show non-significant differences between the gentrifying and matched comparison areas. The t-tests for the

neighbourhood rank in 2011 and proportion of people aged 0 to 15 years do indicate statistically significant differences, though the differences in means are very small at 0.01 and 0.4% respectively. Whether these statistically significant differences are of practical significance to the results is discussed later. The average standardised bias is 0.36 in the unmatched sample and 0.03 in the matched sample (a full plot is provided as supplementary material).

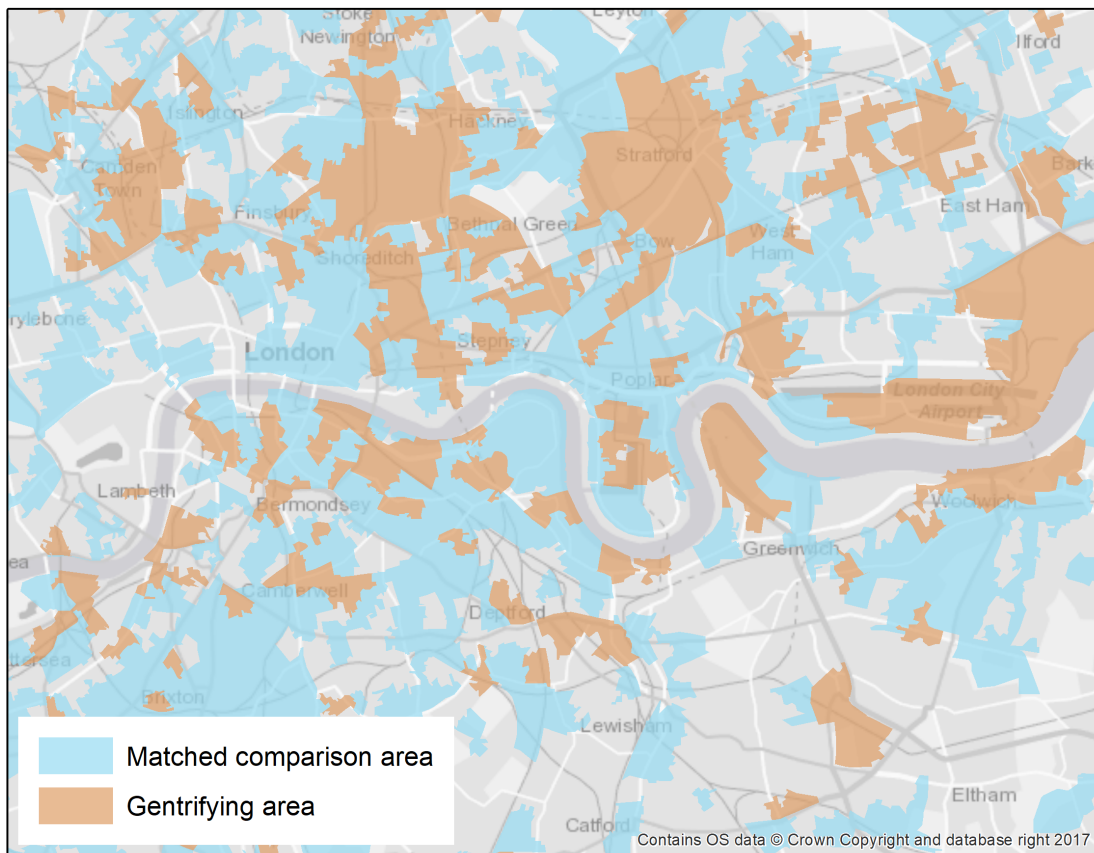


Figure 7.2: Gentrifying areas 2001-2011 and matched comparison areas, central London

Figure 7.2 shows a map of central London with gentrifying areas marked in orange and the matched comparison areas marked in blue. Broadly speaking the map describes the pattern one would expect. The largest area of gentrification is around the Olympic park in Stratford, with additional areas of gentrification around Hackney, Shoreditch and Camden. The map also illustrates that matched

comparison areas are drawn from nearby places, increasing confidence about the plausibility of the matching process. Additional analysis (not shown) shows that the proportion of LSOAs in each Travel to Work Area is similar for gentrifying and matched comparison areas (TTWA was also included in the matching algorithm).

7.4.2 Neighbourhood migration rates

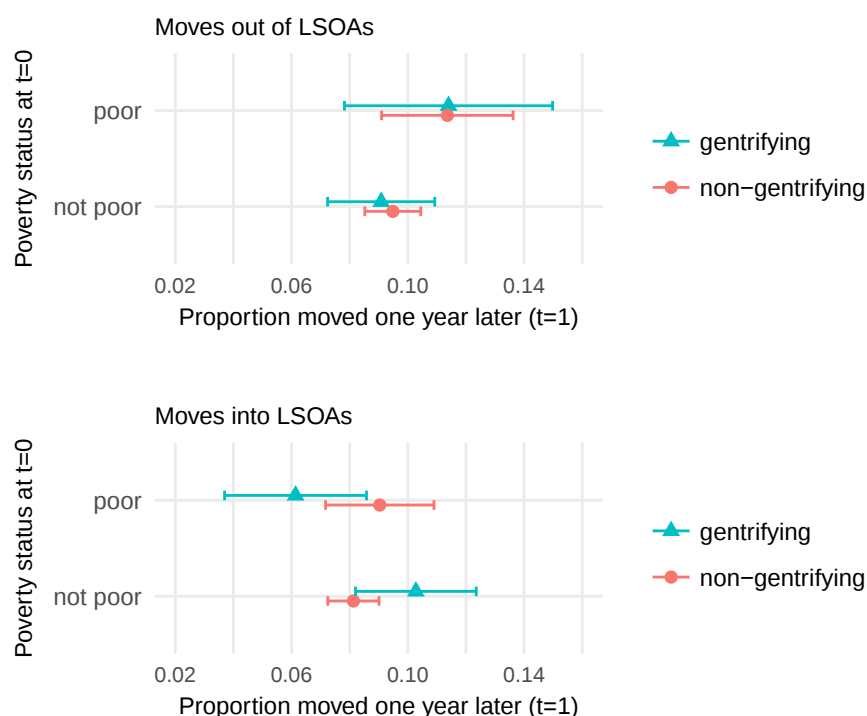


Figure 7.3: One-year migration rates into and out of gentrifying and matched comparison areas, by poverty status in previous year

Figure 7.3 shows the average annual proportion of people who moved out of and into the matched sample of LSOAs between 2010 and 2014, by area type (gentrifying / non-gentrifying) and poverty status in the previous year (income poor / not income poor). There was a higher rate of outward mobility among income poor individuals compared to not income poor individuals. There was no

difference between areas: income poor individuals were no more likely to move out of gentrifying than non-gentrifying areas. Similarly, there was no difference for not income poor individuals.

Some differences are evident in inward migration. Income poor people were less likely to move into gentrifying LSOAs than non-gentrifying comparison areas; and not income poor people were more likely to move into gentrifying LSOAs than matched comparison areas. F-tests of association indicate that the association between in-migration and gentrification for income poor individuals is not statistically significant at the 95% level ($F(1|292)=3.01$, $p=0.084$). The association between in-migration and gentrification for not income poor individuals is statistically significant ($F(1|782)=4.08$, $p=0.044$): not income poor individuals have a higher in-migration rate to gentrifying areas compared to the matched comparison areas.

Figure 7.4 shows how these results vary according to different cutoffs used to identify gentrifying LSOAs. The base case reported above is in the middle of the charts, labelled (0.4, 0.1): areas in the bottom four deciles in 2001 that were in the 10% of areas with the largest increase in neighbourhood rank. The case labelled (0.3, 0.025) identifies areas in the bottom three deciles in 2001 that were in the 2.5% of areas with the largest increase in neighbourhood rank. The figure plots the point estimate of the difference in migration rates between gentrifying and non-gentrifying areas, alongside a p-value for the F-test of association.

The different cutoffs make no difference to the conclusions drawn with respect to outward migration. The difference in migration rates for both income poor and not income poor individuals appear fairly randomly scattered about zero, and none of the F-tests of association are significant at the 95% level.

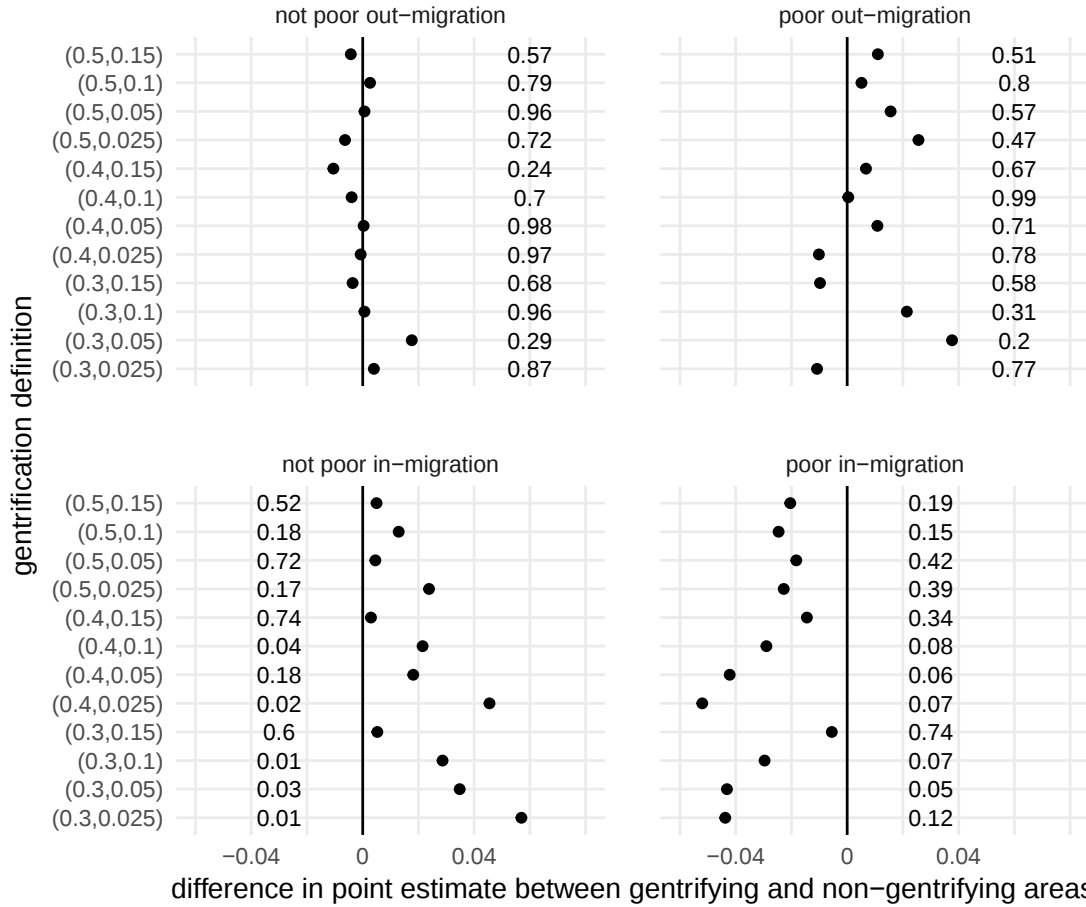


Figure 7.4: Sensitivity analysis: point estimate and p-value for difference in migration patterns between gentrifying and non-gentrifying areas, for different gentrification definitions

The results for inward migration are quite different. All of the differences for income poor individuals show lower migration into gentrifying than non-gentrifying areas; and for not income poor individuals, all the differences show higher migration into gentrifying than non-gentrifying areas. Five of the 12 p-values for not income poor individuals are statistically significant at the 95% level, as is one of the p-values for income poor individuals. Within each set of results defined by the rank in 2001, the point estimate of the difference appears to increase as the gentrification definition becomes more narrowly focused on areas with the largest status increase.

Two possible reasons for this pattern are plausible. It could be that those areas which have had the largest increases in rank also have the largest difference in inward migration patterns, so focusing on these areas increases the estimate. On the other hand, it could be an artefact of the matching algorithm. As the number of gentrifying LSOAs decreases, it becomes more difficult to find sufficient close matches to gain a large enough total sample of LSOAs. For example, the average standardised bias for the base case matched sample is (as reported above) 0.03, but it rises to 0.09 and 0.17 for cutoffs of the highest 5% and 2.5% of rank rises respectively. The increasing difference in migration rates could therefore be due to increased difference in the characteristics of the comparison group.

7.4.3 Poverty dynamics in neighbourhoods

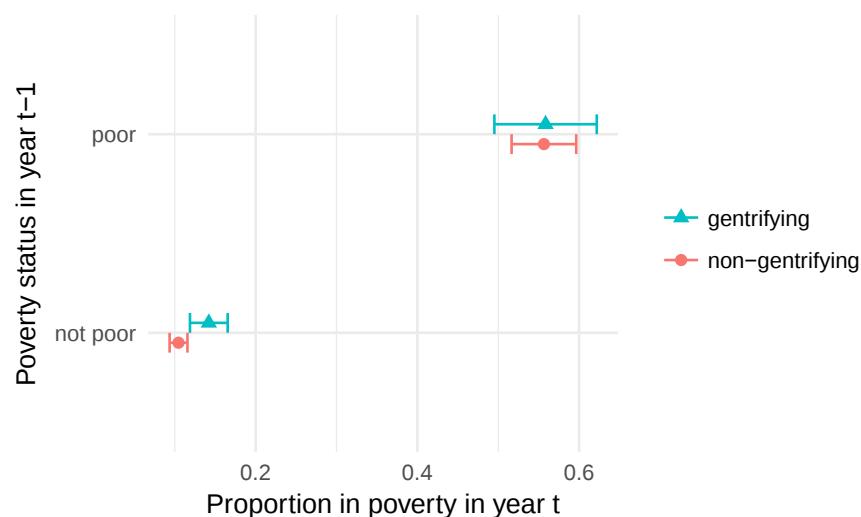


Figure 7.5: One-year poverty dynamics in gentrifying and matched comparison areas

Figure 7.5 shows the proportion of people in income poverty in year t by area type and poverty status in year t-1, averaged over 2010-2014. The upper set of bars shows the proportion of people income poor in one year who were still in poverty the following year. There was no difference in one year poverty persistence between people who were living in gentrifying compared to non-gentrifying areas.

The lower set of bars shows the proportion of people not income poor in one year who were income poor the following year i.e. rates of annual poverty entry. This indicates that people who lived in gentrifying areas were more likely to enter poverty in any given year (0.142, CI 0.119-0.165) than people living in non-gentrifying areas (0.105, CI 0.094-0.116). An F-test of association shows that this is highly statistically significant ($F(1|786)=9.45$, $p=0.002$).

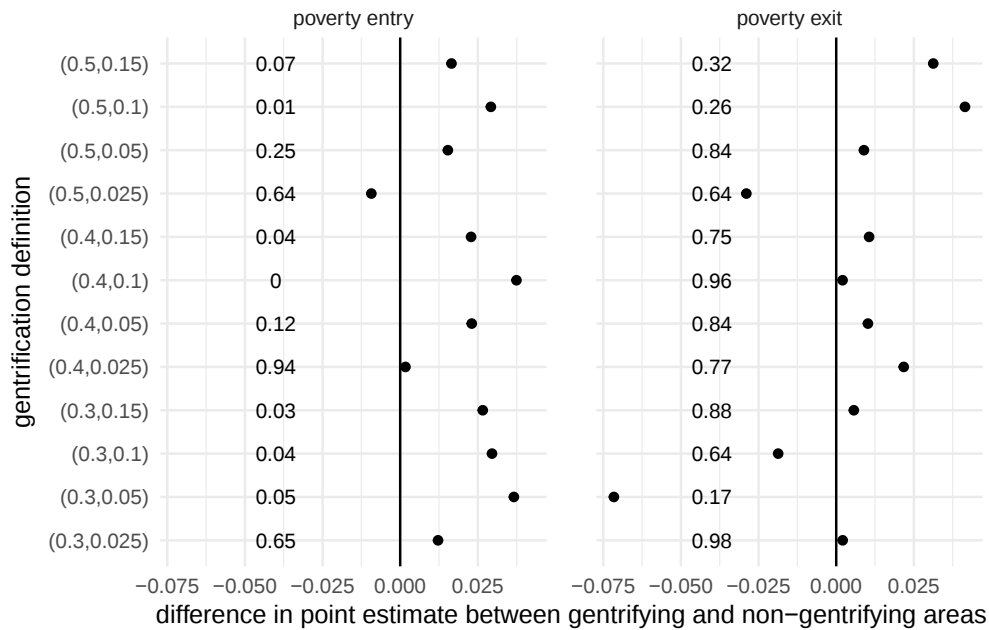


Figure 7.6: Poverty dynamics sensitivity analysis: point estimate and p-value for difference in poverty entry and exit rates between gentrifying and non-gentrifying areas, for different gentrification definitions

Figure 7.6 shows how these findings are affected by changes to the cutoffs used to define gentrification, the analogous analysis to that undertaken for migration rates. The findings with respect to poverty persistence are unaltered - none of the differences in poverty persistence between gentrifying and matched comparison areas are statistically significant. The story is different for poverty entry; of the 5%/10%/15% definitions, 6 of 9 estimates are statistically significant. The p-values for estimates where gentrification is defined by the 2.5% of areas with the largest change in rank are very large, which may be due to the small sample

sizes involved. There appears to be some evidence of higher poverty entry rates in gentrifying areas, but this conclusion is sensitive to the choice of gentrifying areas.

7.5 Discussion and conclusion

Using a variety of definitions, this paper identifies a set of neighbourhoods that between 2001 and 2011 had increased their rank in the local neighbourhood hierarchy, and compares these neighbourhoods to areas that were similar in 2011 but had not changed in status over this time. Using data from the UK Household Longitudinal Study, it compares demographic processes in these two sets of areas with the aim of establishing what it is in these areas that causes one to change in composition over time, the other to remain relatively stable. Three processes are examined: rates of in-migration into these areas by income poverty status, rates of out migration and rates of poverty entry and poverty persistence. If an area is changing in rank over time in such a way that the proportion of poor people in one set of areas is declining, this could be caused by a higher rate of migration of poor individuals out of these areas (*direct displacement*), a lower rate of in-migration of poor individuals into these areas (*exclusionary displacement*), or a higher rate of *in-situ* poverty exit.

This paper suggests that, of these possible processes, there is strongest evidence for a difference in the composition of incomers to an area. The analysis shows that the principal difference between gentrifying and non-gentrifying areas is not higher out-migration of low income individuals from gentrifying areas, but lower in-migration of low income individuals to gentrifying areas. The direction of this relationship is in the theoretically expected direction, but the statistical

significance of the result is not robust to different ways of defining gentrifying areas. Using a different methodology, a different dataset and a different time period, this study replicates the result of Freeman et al. (2016) that there is no evidence of direct displacement of low income individuals from gentrifying areas. It does, however, support the possibility of exclusionary displacement. The study cannot robustly make this conclusion, as the statistical significance of the findings are sensitive to the arbitrary cutoffs used to define gentrifying areas.

One possible conclusion is that there is trade-off between standard error and effect size that cannot be resolved with the size of the UKHLS sample. The effect size can be increased by focusing on a small number of areas that have changed a lot; but this in turn increases the standard error. Alternatively, the standard error can be decreased by increasing the number of areas to observe, but this reduces the effect size. Also, the smaller the number of areas, the larger the matching ratio has to be in order to get a large enough sample, which reduces the quality of the match. Applying the methods used in this paper to a larger dataset, from the England & Wales Census or an administrative data source, may be able to robustly detect the migration patterns that are suggested here. This is regrettably not straightforward: the Census was rejected as a data source for this study as it does not contain income data; and while administrative data sources are extremely promising, the infrastructure to provide population-wide longitudinal research data on household income and residential mobility does not yet exist.

The unexpected finding of this paper is the evidence that poverty entry rates may be higher in gentrifying than non-gentrifying areas. This is in the opposite direction to that theoretically expected: if an area is climbing in neighbourhood

status, and income poverty is falling, we might expect net poverty reduction *in-situ* (via lower rates of poverty entry or higher rates of poverty exit) to be involved. In the base case for analysis, areas identified as gentrifying in 2011 had an average income poverty rate of 21%, whereas in 2001 it had been 27% (for matched comparison areas it was 21% and 22%). It is possible that labour markets in and near gentrifying areas have greater insecurity, consequently leading to greater rates of poverty entry; or that the residents who remain during the process of gentrification are more vulnerable to poverty entry than those in comparable non-gentrifying areas.

One of the limitations of this study is that it assumes that the processes that occurred in gentrifying areas between 2001 and 2011 were still occurring in the observation window 2010-2014. It is possible that direct displacement had taken place earlier in the gentrification process, and therefore was unobserved by this study. In addition, the results presented here are an average over all processes in all gentrifying areas: it is likely that such processes are heterogenous, leaving open the possibility that while the dominant average process is exclusionary displacement, direct displacement does occur in some places at some times. Similarly, this paper examines a particular window of time, a historically atypical period of post-recession stagnation in household incomes; the findings could plausibly be different in other periods. Replicating the method in this paper using data from the British Household Panel Survey from 1991 to 2008 may be able to illuminate this question.

This paper makes a number of methodological contributions including the application of the UKHLS to the study of gentrification processes and the use of matching methods to compare processes between areas. One question to

ask is whether sample attrition from the UKHLS - the progressive loss of the sample over time due to non-response - is likely to bias the findings of this paper, particularly given that sample attrition can be associated with moving home. This bias would occur if income poor people moving into gentrifying areas were more likely to leave the UKHLS sample than people moving in to non-gentrifying areas (controlling for demographic observables related to attrition); and if not income poor people moving into gentrifying areas were less likely to leave the UKHLS sample than people moving into non-gentrifying areas. It is difficult to imagine plausible scenarios as to why these patterns would explain the tentative findings described above.

Another question to ask is whether the imperfect matching of areas could influence the results. In the base case presented above, two of the t-tests for difference in means were statistically significant, though in practical terms the differences were very small - the matched comparison group had 0.01 lower mean neighbourhood rank in 2011 and 0.4 percentage points higher mean proportion of 0 to 15 year-olds. Poverty entry rates are higher in higher poverty areas, so if anything this may have slightly reduced the difference between gentrifying and non-gentrifying areas rather than increased it. A higher proportion of 0 to 15 years olds (and consequently a lower proportion of over 45 year-olds) would suggest a slightly higher rate of mobility in non-gentrifying areas, though we would expect this difference in both inward and outward migration - the fact that differences are only evident in one of these flows suggests that the impact of slightly different age structures is relatively small.

It is often asserted (Slater, 2009) that direct displacement - the involuntary displacement of people from their homes - is the most egregious aspect of gentrification. If it could robustly be shown that gentrification typically proceeds via exclusionary displacement, does this mean we do not need to be concerned about its negative effects? First, this is a tentative finding that is not robustly proven; and second, even if it were it only suggests that exclusionary displacement is the dominant process, not the only one. There are well-documented cases of the direct displacement of existing residents in regeneration areas, the Heygate Estate in London being an example (Lees, 2014). The detailed data required to conduct quantitative case studies of such areas is not readily available, but should be made so. Third, exclusionary displacement may have an impact on people who in the absence of gentrification may have moved to gentrifying areas, and upon those long-term residents who remain. This study leaves open the question of where people who are not moving to gentrifying areas are moving to instead. It may be that these people are displaced to areas that are further from labour market opportunities and/or have poorer services and amenities. For long-term residents who remain, gentrification may lead to services and facilities being targeted at higher-income individuals, leading to an erosion of the facilities for people living on lower incomes. There may also be an erosion of the support derived from social networks of people in similar situations, upon which all of us rely.

In summary, of the three processes that could be implicated in gentrification, this study suggests that it is the changing composition of incomers that is the likely dominant cause of compositional change (exclusionary displacement), rather than the increased exit of existing lower income residents (direct displacement). The statistical significance of these indicative findings was sensitive to the arbitrary

cutoffs used to define gentrifying areas, however, and robustly identifying the differences in migration patterns may require a larger data source than that used here.

8 Conclusions

This chapter offers a synthesis of the findings from chapters 4 to 7, bringing the threads back together from where we started in chapter 1. It closes with a reflection on this body of research followed by some future research directions that could be taken.

8.1 Understanding neighbourhood income poverty dynamics in England

This thesis has sought to advance the study of *neighbourhood income poverty dynamics* in England: neighbourhood change in low income areas; the dynamics of low income people within neighbourhoods; and the individual dynamics that drive neighbourhood change. It was motivated by the observed stability in the neighbourhood geography of poverty in the face of area-based policy, alongside the knowledge from national studies that the population of poor individuals is highly dynamic and that the nature of poverty has been changing.

The main research questions were:

1. Are income poor individuals becoming more evenly distributed across residential neighbourhoods in all areas of England? How does this differ by area and by age group? What processes are associated with this change?
2. What characterises poverty dynamics in disadvantaged neighbourhoods? Are persistently poor individuals more likely to be concentrated in high deprivation neighbourhoods than individuals experiencing current poverty? Are there lower rates of poverty exit or higher rates of poverty entry in deprived compared to less deprived areas?
3. How stable is the population of poor individuals in high deprivation areas? How might this and other aspects of neighbourhood dynamics affect the efficacy of an area-based intervention?
4. In the post-recession period, when compared to non-gentrifying areas, were gentrifying areas associated with higher out-migration rates for income poor individuals, lower in-migration rates for income poor individuals, and/or differential rates of poverty entry and exit?

The questions were answered in an empirical quantitative framework via the analysis of secondary data: a combination of aggregated administrative data, aggregated Census data, record-level administrative data and household panel survey data from the UK Household Longitudinal Study. Poverty was operationalised as a relative income poverty measure and Lower Layer Super Output Areas were pragmatically used as proxies for neighbourhoods. The thesis makes a number of methodological contributions to the literature: proposing a method to decompose a change in rates between changes in the numerator and

changes in the denominator (chapter 4); using administrative data on housing benefit claims for the longitudinal study of income poverty in neighbourhoods (chapter 5); using multilevel models and aggregate data in concert to understand poverty dynamics (chapter 6); constructing a multi-indicator gentrification index (chapter 7); and using propensity score matching for geographical research (chapter 7).

Chapter 4 shows that children and working age poor individuals have become more evenly distributed by residential neighbourhood between 2005 and 2014; no such pattern is evident for older people, who became marginally more concentrated. Increasing evenness is largely associated with the higher propensity for low income households to live in private rented housing, but also the desegregation of social housing, the dilution of existing low income populations by population growth (possibly by new inner city developments) and an absolute reduction in the number of low income individuals living in the highest poverty areas.

Chapter 5 advances the use of UK administrative data for the study of poverty dynamics in small areas. It shows that of Oxford housing benefit claimants in 2010, 44% were no longer among the population of poor Oxford families in 2014. Although the coverage of the data is limited to those families claiming housing benefit in Oxford, an analysis of possible reasons suggests that residential mobility and income mobility are the dominant causes of this off-flow - a claim made more plausible by the similarities to the findings of chapter 6. There is substantial variation in the 'poverty turnover rate' in Oxford LSOAs from 32% to 78%, largely explained by the composition of housing benefit families in the area by tenure and type of other benefits claimed.

Chapter 6 shows that persistently poor people are more likely to live in the highest deprivation decile areas than people who are observed as currently income poor, though this difference is relatively small (22% vs 19%). It also finds that over half of people living in the highest deprivation areas have experienced poverty at least once in the past four years.

Controlling for factors associated with poverty dynamics, working age individuals living in higher poverty neighbourhoods were more likely to enter poverty, and more likely to be persistently poor. For poverty persistence the size of this association was similar to the association with individual demographic characteristics, though smaller than the effect of employment and past history of income poverty. For poverty entry the size of the association was smaller than most demographic characteristics. Analysed at aggregate level, individuals living in high poverty areas were three times more likely than those living in low poverty areas to enter poverty in a given year; by contrast, there was a smaller difference between areas in poverty exit rates. Only 40% of the income poor population in 2010-11 were still income poor and living in the same area in 2013-14, with no difference between areas.

Chapter 7 explores three possible processes associated with neighbourhood gentrification: rates of in-migration into areas by poverty status, rates of out-migration and in-situ changes in poverty status. It finds that there is strongest evidence for in-migration, or *exclusionary displacement*, as the dominant process by which neighbourhood gentrification occurs. The difference between areas that were changing and those that were not was found to be a difference in the people who were arriving in the area, not a difference in the people who were leaving: in gentrifying areas there was no elevated rate

of neighbourhood exit for income poor people, but there was a lower rate of neighbourhood entry for income poor people. The statistical significance of this result, however, is not robust to different cutoffs used to define gentrifying areas; the conclusion of the study is that a larger data source is required to answer this question definitively.

Though the findings of poverty dynamics research made waves when they were first released (section 2.5), arguably they have failed to make appreciable impacts on policy (Smith and Middleton, 2007). It is argued that they identify the same target groups as cross-sectional research, have opaque links to policy action (Burgess and Propper, 2002) and can undermine the case for action to tackle poverty (Daly, 2011). How does this research on neighbourhood income poverty dynamics stack up against these criticisms? First, the aggregate findings from UKHLS in chapter 6 does identify a similar set of areas as disadvantaged whether viewing poverty from a snapshot or dynamic perspective. It does, however, strengthen the case for targeting such areas, reducing concerns about neighbourhood initiatives ‘leaking out’ to unintended beneficiaries - if the target population includes people who have a recent experience of poverty and are therefore at heightened risk of poverty recurrence. On the other hand, chapter 4 shows that income poverty among working age people is becoming less spatially concentrated and potentially more mobile, undermining one of the rationales for area-based targeting. Chapter 5 opens up the possibility of identifying heterogeneous neighbourhood dynamics and potentially targeting subsets of disadvantaged areas with different interventions: if the policy concern is alleviating persistent poverty, a dynamic perspective may identify a different set of areas than a cross-sectional snapshot.

Second, this approach offers some perspectives on the design as well as the targeting of future neighbourhood policy. The findings show that - on average - it is preventing poverty entry and recurrence rather than promoting poverty exit that could potentially have a greater impact upon neighbourhood poverty levels. It also suggests that there is a minority of poor individuals who experience more persistent poverty, for whom different interventions may be appropriate. This is not a new argument (Gardiner and Hills, 1999) but these patterns have not previously been examined in disadvantaged neighbourhoods, where the population of poor individuals is often assumed to be static. The findings also show a high degree of turnover in the income poor population in disadvantaged areas, and propose that the dynamics of target populations should be carefully considered in any area-based interventions that have ‘people-based’ objectives.

Third, does the observation of a high turnover in the population of income poor individuals in disadvantaged neighbourhoods undermine the case for tackling poverty? Clearly some think so: the findings of chapter 5 were presented to an audience of policymakers in Oxford; the reaction of one was to flip the findings on its head - rather than saying that 44% of income poor individuals were no longer among the income poor population four years later, to say that it was shocking that four years later 56% of income poor individuals were still stuck in poverty. Clearly it is viewed as simpler to generate sympathy and interest by portraying people as ‘stuck’ in poverty. These narratives do people who experience poverty a disservice: they support stigmatising stereotypes, undermining the case for tackling poverty, and support policies that have erroneous assumptions.

In the introduction to Noble et al. (1998) the authors note that the time dimension in poverty is often neglected. Why is that still the case 20 years later and with 25 years of longitudinal household data on incomes? One explanation is that it challenges dominant political narratives on poverty. From the left, the concern is that focusing on poverty dynamics undermines the case for poverty reduction - if the poor are going to be better off next year anyway, what is the problem? From the right, poverty dynamics undermines the ‘welfare dependency’ rhetoric - if the dominant experience of poverty is one of recurrence rather than persistence, how can arguments about ‘welfare scroungers’ be used to justify reductions in state spending? Despite the work of Jenkins (2011), Hills (2014a) and others, left and right portray poverty as primarily a static, permanent, long-term condition. In the long-term, both do damage to the interests of people who experience poverty for short, long, or recurrent periods.

Relatedly, this research speaks to whether we think of disadvantaged areas as functional parts of the local labour and housing market, or dysfunctional areas cleaved off from the rest of society. This research clearly shows that - again, on average - disadvantaged areas can be thought of as functional parts of the local economic system. As chapter 5 concludes, they are not the spatial location of the ‘welfare-dependent underclass’ but areas that are highly dynamic in terms of the population experiencing poverty at any given point in time. If poverty is recurrent rather than persistent, and today’s non-poor individuals are at risk of becoming tomorrow’s people in poverty, this speaks to a characteristic of the economic system rather than a phenomenon that can be blamed upon those people who happen to find themselves experiencing poverty today.

Large-scale quantitative studies like chapter 7 have been accused of denying the experience of displacement by gentrification (Slater, 2009) that is reported in smaller scale qualitative case studies (Lees, 2014). The research presented here cannot and should not be used to deny that the direct displacement of lower income households can occur in the process of gentrification. First, the findings are suggestive that in-migration rather than out-migration is the dominant process in gentrification, but these are not robustly proven. Second, it suggests that in-migration is the dominant process and not the only one - as with other findings based on UKHLS data, there is the potential for substantial heterogeneity in neighbourhood dynamics. Finally, direct displacement may occur at different parts of the process not captured by the relatively short observation window used here.

Even if gentrification typically proceeds via the exclusion of new low income residents rather than the displacement of existing low income residents, there are still potential concerns about its impact. Mobile low income households may have to locate in areas that are further from labour market opportunities and have poorer services. Existing residents who remain may find that services and facilities become targeted at higher-income individuals. There is also the possibility - not explored here - that gentrification may cause greater within-neighbourhood mobility as tenancies become more precarious, and that lower income households live in overcrowded housing in order to maintain a foothold in the area.

Chapter 1 opened with a paraphrased quote from a senior manager in local government, frustrated about the apparent lack of change in disadvantaged areas that had been the target of numerous area-based interventions. On reflection from this research, the response to this would now be two-fold. First, that the Index of

Multiple Deprivation, upon which the observations were based, is in large part a cross-sectional measure of population composition: income poverty, worklessness, health and educational qualifications. This means that it only captures to a limited extent those place-based changes such as improvements in housing and the local environment that have been shown to be a success of neighbourhood policy (Lawless, 2012; Lupton, Fenton, et al., 2013). Second, the findings of the research echo this conclusion from a study of neighbourhood poverty in the United States:

‘it is clearly wrong to think that because poor urban areas change their shape slowly, the same people are living there year after year. Like molecules, individuals in these slowly changing areas are moving around quite rapidly’ (Gramlich et al., 1992)

Although it is often said that ‘the poor are always with us’, this is not really true - poverty is always with us, but the people affected by it change quite rapidly. For a local authority policymaker, this means (i) shifting the emphasis towards preventing poverty (re-)entry rather than solely upon poverty exit, (ii) recognising the highly dynamic nature of the local population who experience poverty at any given point and designing services that can support rapid changes, (iii) supporting the needs of the minority who are likely to live in persistent poverty, and (iv) examining the broader economic structures that cause people to cycle in and out of poverty. It also means developing research methods that can identify local patterns of neighbourhood poverty dynamics. These lessons could be transferred to national policy as well (see Gardiner and Hills, 1999).

8.2 Learning from experience: a reflection on the research

On reflection, the art of academic research is as much about what you choose not to do as what you choose to do. Any given topic of research, any given research question, presents myriad possibilities in pursuit of its exploration. The reflective researcher sees in his or her own work a particular journey taken through a complex landscape, which begs the questions: was it the right route? What other routes should be explored in future? This section briefly considers how the key methodological decisions taken (chapter 3) impact on the findings presented above.

The first decision taken was to approach the research questions by means of a large-scale quantitative study rather than a qualitative or mixed-method approach. This decision limited the ability to define neighbourhoods flexibly as qualitative studies are able to do. It also means that there are limits to the extent to which findings are generalisable to individual places. Qualitative case studies are criticised on the basis that their findings cannot be generalised beyond the boundaries of the case study area (i.e. they have *internal* but not *external* validity). A large scale quantitative study such as this one is limited in the opposite fashion: while it can make broad claims about the average processes or associations in neighbourhoods with certain characteristics, the probability of heterogeneity between neighbourhoods means that the findings of a large-scale quantitative study cannot be directly applied to a single area. For individual people, within individual neighbourhoods, and unique labour market contexts, there is likely to be considerable variability. Restricted to a national survey, there are limitations about what one can say about the processes in these individual places - and quantitative researchers must remember this, not least those who

are geographers. Quantitative researchers are sometimes tempted to make broad statements such as ‘area effects don’t exist’ or ‘area-based initiatives don’t work’. For the findings that are based upon national data, this study attempts to avoid this pitfall by drawing boundaries around the conclusions that can be drawn by speaking of average processes. That said, the use of local administrative data in chapter 5 is a potential way to overcome these limitations, and to integrate qualitative community studies with quantitative analysis.

The study uses income rather than material deprivation as an indicator of poverty (section 3.2). It would be interesting to replicate this study of neighbourhood income poverty dynamics with a study of deprivation dynamics. Material deprivation and income poverty tend to move together (Berthoud et al., 2004), but the strength of this association may be mediated by area disadvantage. This may be the case, for example, if people living in disadvantaged areas are more likely to be in debt due to financial exclusion. The income poverty measure chosen was *before housing costs* (BHC) rather than *after housing costs* (AHC). This was chosen to include the contribution of housing towards living standards. Using AHC measures could offer a different perspective on some of the patterns described here due to the large geographical variation in housing costs. For example, someone facing very high housing costs in a gentrifying area of London may be more vulnerable to displacement than someone facing lower housing costs in a gentrifying area of Sheffield.

The findings of this research relate to neighbourhoods as defined by Lower Super Output Areas (LSOAs). Quantitative studies are inevitably confined to some fairly fixed definition of neighbourhood which are not necessarily ideal proxies for neighbourhood (Lupton, 2003a) and do not offer the definitional flexibility of

qualitative community studies. One approach would have been to use Middle Layer Super Output Areas (MSOAs), aggregations of around five LSOAs, as larger-scale neighbourhood proxies. This would have come at the cost of area homogeneity (larger areas are less likely to be homogenous) and relevance to policy (as LSOA boundaries typically define the target areas for neighbourhood interventions). A study of the patterns at different scales could be illuminating: as Flowerdew et al. (2008) suggests ‘*the effect of neighbourhood conditions should be looked at using several different ways to define neighbourhoods*’.

Finally, there is a question of how generalisable are the findings from this particular time period. The increasingly even distribution of income poor individuals is a relatively new phenomenon, but it seems the increasing use of private rented rather than social rented housing is unlikely to be reversed in the current policy climate, so we may expect this increasing evenness to continue. The time period covered includes one of the longest periods of household income stagnation on record (Hood and Waters, 2017) so one might expect this to impact on dynamic patterns; yet the patterns observed by Jenkins (2011) in the mid-1990s are remarkably similar to those reported by the official statistics in the 2010s (DWP, 2017d).

8.3 Next steps: a research agenda for exploring these issues further

One of the findings of this research is that income poor individuals are becoming more evenly distributed among neighbourhood areas (as defined by LSOAs), associated with an increased use of private rented housing by low income households, the desegregation of social housing and affluent incomers arriving in

new inner city developments. Section 4.5 raises the possibility that this increasing degree of mixing between income poor and not income poor individuals could destroy certain types of social welfare but create others. Ascertaining whether this is the case is beyond the scope of this study: this could be approached by qualitative community studies of areas that have experienced increasing mixing of households by income; or by quantitative natural experiments.

Section 4.5 also speculates whether this increasing evenness is a stage on the way to increasing segregation of poor households in the suburbs. Ongoing work to monitor the evenness and suburbanisation of poverty could be conducted as updated data is released. The next iteration of the English Indices of Deprivation upon which chapter 4 is based is due to be published in 2019, so the opportunity to explore this will arise very shortly.

There is great potential for building upon the small scale study of chapter 5 to use administrative data for the longitudinal study of neighbourhood income poverty dynamics. The Office for National Statistics has begun producing small area experimental estimates of income based upon administrative records from welfare benefits and tax payments (Office for National Statistics, 2016b). As the UK administrative data system develops, it may be possible to construct a longitudinal dataset with near full population coverage that avoids the censoring problems associated with the housing benefit dataset. Regrettably the infrastructure to provide population-wide longitudinal research data on household income and residential mobility does not yet exist. If available, it could be used to examine heterogeneity between disadvantaged areas in terms of their dynamics, and to tailor area-based interventions according to dynamic as well as cross-sectional characteristics.

The research has found that a ‘dilution’ process is contributing to the more even distribution of income poverty (chapter 4) and that there is no evidence for increased out-migration of low income households from gentrifying areas (chapter 7). One unanswered question is whether gentrification is partly proceeding by forcing lower income households to live in overcrowded housing, making the ‘dilution’ process less benign; and whether there are higher rates of within-neighbourhood residential mobility in gentrifying areas as housing for low income households becomes more precarious. These could both be explored with the datasets used in this thesis.

There is scope for using the UKHLS to examine the dynamics of material deprivation at neighbourhood level, as a complement to this study of income poverty. It would also be possible to use other area correlates to explore dynamics: for example, one might expect the level of worklessness in a neighbourhood or the local labour market area to influence poverty dynamics. Once the British Household Panel Study income data is harmonised with UKHLS, it would be possible to explore trends in these dynamics going back to 1991, to explore the question of whether neighbourhood dynamics in the post-recession period are unusual.

Definitively answering the research question about processes in gentrifying areas requires a larger dataset than UKHLS. A longitudinal administrative data source on incomes would be an appropriate tool to answer this question, which would also be able to detect different processes operating in different areas (as illustrated in chapter 5). In the absence of such a source, it may be possible to use the 2011

Census microdata to answer this question. As the England & Wales Census does not collect income data, this would require modelling of income poverty status based upon individual and household characteristics captured by the Census.

Appendix A Supplementary material - Increasing evenness in the neighbourhood distribution of income poverty in England 2005-2014: age differences and the influence of private rented housing

Supplement to section 4.4.2

Figure A.1 shows the evenness measures for the working age IDID indicator in 2005, 2008 and 2012 by local authority classification. The levels of the measures are in the same order as for child poverty with $G > D > A9$. By eye the three measures appear to be closely related; the smallest linear correlation of the measures is 0.98 and the smallest correlation of change over the period is 0.92. For most local authority types the evenness indices have decreased over the period, with some differentiation between types. In the discussion below the value of D is focused upon for brevity, but the same conclusions are reached by inspecting the other two indices.

The values of D in 2005 by local authority type are very similar to those for children both in magnitude and rank order. The highest values of D are in ‘Business and Education Centres’ and ‘Mining Heritage and Manufacturing’ at 0.40 and 0.39 respectively; the lowest is 0.31 in ‘London Cosmopolitan’. There was no fall in D in the most rural local authority types (‘Countryside’ and ‘Coast and Heritage’) and a small fall of 0.02 in ‘Prosperous England’ local authority areas. In the other four more urban local authority types D fell between 0.04 and 0.05. In 2012 ‘Business and Education Centres’ and ‘Mining Heritage and Manufacturing’ still have the highest values of D , but now closely followed by ‘Coast and Heritage’.

Table A.1 shows the results from hierarchical linear models of the change in D over the period 2005 to 2012. The intra-class coefficient in the empty model 1 is 0.25, indicating that the group structure of the model is important, but less so than in the child poverty model.

Model 2 includes just the change in low NS-SeC households in private rented housing as explanatory variables for both local authority and local authority type. The two coefficients are statistically significant and the direction of the relationship is as theoretically expected. This model explains 24.7% of the dependent variable’s variance. The BIC is smaller than model 1 and a likelihood ratio test shows that model 2 is an improvement on model 1 (chisq=35.5, df=2, $p<0.001$)

Model 3 adds the initial value of D , the change in D for social housing, the dilution indicator and the displacement indicator. The coefficients on all variables are statistically significant with at least $p<0.01$ and the direction of the relationships is as theoretically expected. The average change in D for social housing within

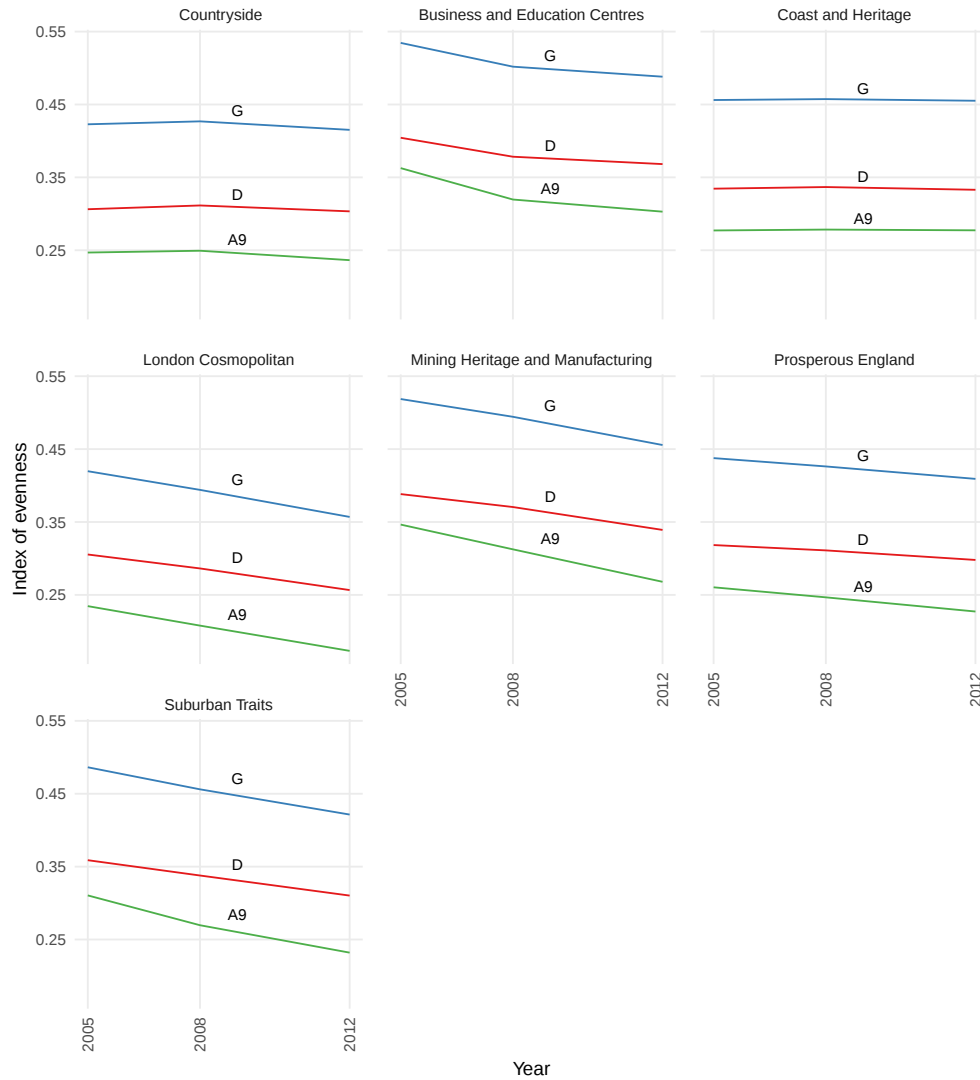


Figure A.1: Evenness measures for working age IDID indicator within LSOAs by local authority supergroup 2005-2012

the local authority supergroup type was also found to be statistically significant. This model explains 63.4% of the variance in the dependent variable. The BIC is smaller than model 2 and the likelihood ratio test indicates that the model fit is improved ($\chi^2=215.8$, $df=5$, $p<0.001$). As with the child poverty model, the relative size of coefficients suggests that a reduction in the absolute number of poor individuals living in high poverty areas is a greater driver of distributional evenness than the dilution effect.

Table A.1: Hierarchical linear model of change in D 2005-2012 for working age people

	Model 1	Model 2	Model 3
(intercept)	-0.023*** (-3.978)	0.020 (1.792)	0.108*** (13.477)
Private rented housing change		-0.312*** (-5.348)	-0.217*** (-4.851)
P.R. housing change (group mean)		-0.551* (-2.488)	-0.509*** (-5.121)
D in 2005			-0.209*** (-12.315)
Social housing change in D			0.162** (2.734)
S.H. change in D (group mean)			1.626*** (6.996)
Dilution indicator			0.005*** (5.054)
Displacement indicator			0.013*** (12.011)
Variance(x10 ³): LA supergroup	0.210	0.054	0.000
Variance(x10 ³): residual	0.635	0.583	0.309
Intra-class correlation	0.249		
Propn explained variance		0.247	0.634
BIC	-1430	-1454	-1641
Log Likelihood	724	741	849
Number of observations	324	324	324
Number of groups	7	7	7

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; t-values shown in brackets; variance transformed for readability

Appendix B Supplementary material - Neighbourhood income poverty dynamics in England 2010-2014: the implications for area-based anti-poverty initiatives

Supplement to section 6.3.2

In the second part of the analysis, individual poverty transitions are modelled using a dynamic random effects probit model adjusted to account for the hierarchical nature of the data. These models are commonly used to model transitions between states in longitudinal data (Cappellari and Jenkins, 2009). Rather than modelling the full set of observations over time, these models assume that (in this case) poverty status at time t is determined only by poverty status (and any additional covariates) at time $t-1$ (and not poverty status at time $t-2$ etc.). It has been shown that these models draw very similar conclusions about UK poverty dynamics to models such as hazard regression that model the full set of longitudinal observations (Jenkins, 2011: 330-358).

Following a specification by Cappellari and Jenkins (2009), the model estimates the latent propensity p_{it}^* of an individual i to be living in an income poor household at time t , conditional on a vector of covariates z_{it-1} as

$$p_{it}^* = ((P_{it-1})\gamma_1' + (1 - P_{it-1})\gamma_2')z_{it-1} + \tau_i + \eta_{it}$$

where P_{it-1} is poverty status at $t - 1$. γ_1 is a vector of coefficients that estimates the propensity to be persistently poor over the observation window (i.e. $P_{it-1} = P_{it} = 1$). γ_2 estimates the propensity for poverty entry over observation window ($P_{it-1} = 0, P_{it} = 1$). In this way the model utilises the full sample of data to simultaneously model poverty entry and exit. τ_i is an individual random effect and η_{it} is a normally-distributed error term. Poverty status at wave 1 is included as an additional covariate to account for the ‘initial conditions problem’, the series of unobserved poverty transitions that occurred before the start of the study (Jenkins, 2011). In order to account for the correlation of observations with sampling clusters and within LSOAs, random effects are modelled at each of these levels, using a ‘cross-classified’ model (Snijders and Bosker, 2012).

With the model set up as described above, poverty status at t is modelled conditional on poverty status at $t-1$, which enables the determinants of poverty entry and exit to be estimated simultaneously. The covariates included in the model are those known to be associated with poverty dynamics (Jenkins, 2011) plus the independent variable of interest: the neighbourhood poverty rate, derived from the income domain of the English Indices of Deprivation 2015. As in Cappellari and Jenkins (2004), the sample is restricted to working age people (aged 18-65 years) and not in full-time education. The sample includes those individuals who provided a response to the survey at each wave between wave 1 and wave 5. The model coefficients are difficult to interpret in terms of the size

of their effect as the model covariates are measured on different scales. In order to illustrate the effect more intuitively the paper presents predicted probabilities of poverty persistence and entry for individuals with a range of characteristics.

Supplement to section 6.4.2

Table B.1 shows the estimated coefficients from the dynamic random effects probit model that models poverty at time t conditional on poverty at time $t-1$. The first column is the list of covariates in the model, which refer variously to the individual, the household reference person (HRP), the household and the neighbourhood (LSOA). The second column shows the estimated coefficient for being poor at time t conditional on being poor at time $t-1$. Coefficients greater than zero indicate a greater propensity for poverty persistence (or conversely, a lower propensity for poverty exit) among the population of income poor individuals over a one year period¹. The fourth column shows the estimated coefficients conditional on not being poor at time $t-1$. Coefficients greater than zero in this column indicate a greater propensity for poverty entry over a one year period. Each coefficient is accompanied by the absolute value of the t ratio, the ratio of the underlying model coefficient to its estimated standard error. As a rule of thumb, values of $|t|$ greater than 2 indicate that the coefficient is statistically significant at the 95% level.

In this study the covariate of interest is the neighbourhood income poverty rate. The coefficients are greater than zero, indicating that higher neighbourhood poverty rates are associated with higher rates of poverty persistence and higher

¹Reference categories for categorical variables in the model are: male individual; male household reference person (HRP); highest qualification of HRP below A-levels; HRP not working; HRP of white ethnic group; lone parent household; living in owner-occupied housing; not income poor at wave 1.

rates of poverty entry, when controlling for individual factors known to be associated with poverty dynamics. The t ratios, both greater than 5, show that these effects are highly statistically significant.

Table B.1: Model estimates of poverty status at t, conditional on poverty status at t-1

Covariate (measured at t-1)	Poor at t-1	t	Not poor at t-1	t
Neighbourhood income poverty	0.0115	5.815	0.00833	5.42
Female	0.109	3.711	-0.04915	2.429
Age	-0.0291	0.248	-0.28007	3.522
Age squared	0.1444	1.153	0.20853	2.481
HRP age	-0.2162	1.837	0.4092	4.749
HRP age squared	0.0935	0.787	-0.42072	4.938
HRP female	0.0651	1.609	-0.13696	5.097
A-levels	-0.1471	3.796	-0.27467	10.58
Full-time job	0.0849	1.659	-0.11348	3.533
Part-time job	0.3173	5.652	0.17993	4.684
Indian	0.2882	3.251	0.27048	4.306
Pakistani/Bangladeshi	0.2385	3.565	0.6065	10.49
Chinese	0.8198	3.107	0.11921	0.648
Black Caribbean	-0.0204	0.194	0.17029	2.279
Black African	0.2565	2.665	0.21063	2.959
Black other	0.5284	1.524	-0.0809	0.267
Other ethnic group	0.1951	2.267	0.09777	1.572
Couple working age, no children	0.1289	1.576	-0.2379	3.99
Other household type	0.0976	1.733	-0.0733	1.545
Children aged 0-2	0.0816	1.495	0.01869	0.483
Children aged 3-4	-0.0681	1.222	0.08509	2.209
Children aged 5-11	-0.1507	3.327	-0.01941	0.632
Children aged 12-15	0.119	2.465	0.08844	2.679
Social rented housing	0.0272	0.569	0.27558	7.847
Private rented housing	0.0697	1.233	0.11262	3.037
Number employed	-0.3179	11.405	-0.2449	15.138
Poverty status at wave 1	0.7478	19.625	0.78072	24.143
Log likelihood		-18,046.33		
Number of observations		61,821		
Number of persons		25,546		
Number of LSOAs		10,414		
Number of sampling clusters		4,375		

Appendix C Supplementary material - Neighbourhood gentrification, displacement and poverty dynamics in post-recession England

Supplementary to section 7.4.1

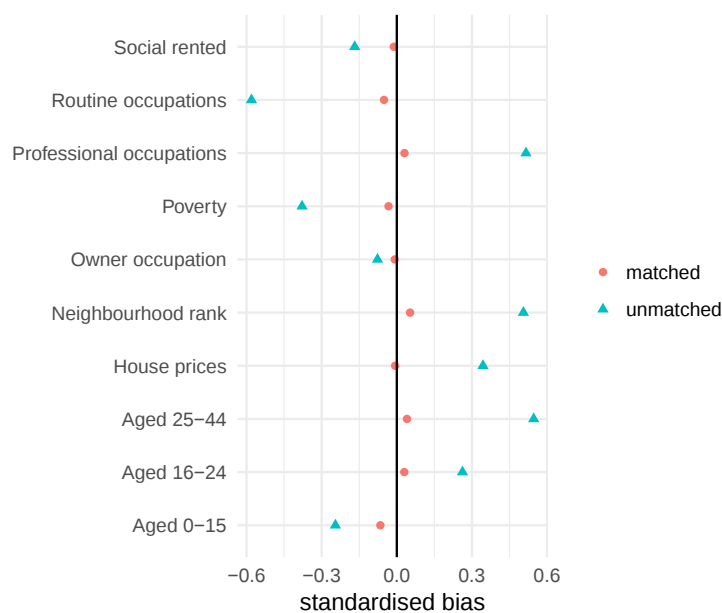


Figure C.1: Standardised bias for matching covariates

Figure C.1 plots the standardised bias for the matched and unmatched samples of LSOAs. Points to the right of zero indicate that the means are larger in the gentrifying areas; points to the left indicate that the means are larger in the comparison areas. Ideally the matching process would result in zero bias across

all matching variables. The plot shows that the matching process significantly reduces the bias across all variables, though some small bias remains. The average standardised bias is 0.36 in the unmatched sample and 0.03 in the matched sample.

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