Accepted Manuscript

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PII: S0277-9536(18)30104-7

DOI: 10.1016/j.socscimed.2018.03.011

Reference: SSM 11647

To appear in: *Social Science & Medicine*

Received Date: 3 October 2017

Revised Date: 2 March 2018

Accepted Date: 5 March 2018

Please cite this article as: Jonsson, K.R., Demireva, N., Does the ethno-religious diversity of a neighbourhood affect the perceived health of its residents?, *Social Science & Medicine* (2018), doi: 10.1016/j.socscimed.2018.03.011.

Does the ethno-religious diversity of a neighbourhood affect the perceived health of its residents?

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Abstract

Concerns about the diversification of Britain, and its impact on social capital and health are widely debated. The literature has however produced a fuzzy discourse, full of assumptions and claims that are rarely tested. We attempt to disentangle some of these assumptions by providing empirical evidence on the mediating and moderating influence of inter-ethnic conflict and contact, and examine whether they underlie the erosion of health among minorities and White British respondents residing in diverse local areas. Analyses were conducted using multilevel models that relied on geocoded data from a random stratified sample of adults 16-75 years collected in the 2009-2010 Citizenship Survey merged to small area aggregated statistics from the 2011 UK census. The final sample comprised of minorities (n=13,236) and White British (n= 15,021) residing in England. We find that local area deprivation matters much more for the health of minorities and Whites than diversity. Yet, residing in diverse areas can be problematic for Whites if it is accompanied by high levels of social distance measured by negative attitudes towards immigrants (β: 0.30, SE: 0.09). Greater contact among minorities [informal social interactions (ISI) (β:-0.04,SE:0.08)] diverse friendship network (DFN) (β:-0.04, SE:0.07) and civic engagement CE (β: 0.07, SE:0.10)] and Whites [ISI (β: -0.12, SE: 0.06), DFN (β: -0.05, SE:0.09) and CE (β:0.02, SE:0.10)], residing in more diverse areas appears to have no significant effect on health. The findings supported our hypothesis that residing in areas of greater diversity has a differential impact on minorities when compared to Whites. In particular, diversity appear to be more beneficial for minorities, especially newly arriving migrants. The effect of contact as measured by social capital is dwarfed in comparison to the effect of deprivation, underlying the importance for policy makers to tackle structural inequalities.

Keywords: ethnicity; self-rated health; social capital; diversity; neighbourhood; Conflict hypothesis; contact hypothesis; discrimination; England

Introduction

Immigrant societies are becoming increasingly diverse. In the last few years, the literature on the impact of this diversification has grown exponentially to become one of the most contested fields of social enquiry. The majority of research has focused on social cohesion as captured by generalized trust, that is to say, the placing of trust in strangers. For every study that claims that diversity is negatively associated with cohesion (Putnam 2007; Alesina and La Ferrara 2002) there are several which suggest that the observed relationship depends on local area socioeconomic disadvantage (Demireva and Heath 2014; Laurence 2009); on whether the research focuses on the US or Europe (Hooghe and Marks 2007), on types of trust (neighbourhood vs generalized trust (Laurence 2009)), on whether the researcher considers the impact of diversity on the majority or on ethnic minorities (Demireva and Heath 2015; Abascal and Baldassarri 2015). The latter is a particularly important point that gets often overlooked.

Similarly to the literature on trust, the debate surrounding health of minorities and White British has produced a fuzzy discourse full of assumptions and claims that are rarely tested. Policy reports focusing on the impacts of diversity on the White British invariably speak of strain on NHS resources and health sector shortages (Casey 2016). In contrast, the concern for minorities is that diversity exposes them to a growing presence of in-groupers and the harmful consequences of segregation and isolation (Phillips 2005).

Using data from the 2009-2010 Citizenship Survey we attempt to disentangle some of these assumptions by providing empirical evidence of whether inter-ethnic conflict or contact underlies the dynamic of self-rated health deterioration among ethnic minorities and White British respondents. More specifically, the aim of the present study is to examine: (1) if and by how much diversity influences heath perceptions among minorities and White British; (2) if health in diverse neighbourhoods are mediated and/or moderated by (a) conflict (b) contact

among minorities and White British and; (3) if there are generational differences in health after adjusting for the mediating and moderating potential of conflict and contact within diverse neighbourhoods.

Local area minority concentration

There are several ways in which local area minority concentration can influence the health of minority and majority groups. For instance, residential segregation has been linked to risk taking and unhealthy behaviours like smoking, early sexual debut and drinking which are all well documented factors, contributing to poor health (Turner 2009). If segregation coincides with deprivation, local problems can be further exacerbated by lack of support structures (Cantle 2011).

In contrast, the ethnic enclave literature has strongly encouraged migration researchers to consider the possibility of positive effects of co-ethnic concentration, especially in the initial stages of the migration process. The support of in-groupers can be crucial in providing advice and information about the availability of jobs; the housing and rental market (Alba and Foner 2016);and may protect and buffer individuals from the direct and indirect effects of racism, discrimination and intolerance (Bécares, Nazroo, and Stafford 2009).

At the same time, it can be argued that the ethnic enclave benefits are relevant for a very specific group of migrants, namely recently arriving migrants who lack transferable skills and who need time to adapt to the social situation and labour market of the receiving society (Friedberg 2000). Therefore, over time, the ethnic enclave benefits decline while those for diversity increase. This can reinforce the importance of bridging ties. Having social contact with the majority group may contribute to the reduction of psychosocial stressors through enhanced labour market outcomes and the introduction of diversified networks leading to different connections and information (Muttarak 2014). In practical terms, neighbourhoods

that lack in diversity may suffer from slow diffusion of knowledge about health promotion or access to local services, not to mention psychosocial processes relating to affective support and mutual respect.

Conflict vs Contact Theory

The literature on the impact of diversity on generalized trust has focused primarily on two theoretical frameworks – conflict and contact/social capital theory.

Conflict Theory

According to the conflict theory, contention over limited resources can dissuade people from engaging with out-groupers (a group with which one does not identify/share common bonds) (Blumer 1958). Neighbourhood scenarios in which people from different ethnicities come into close proximity can exacerbate social and group conflict which can take the form of a struggle over resources or power (realistic threat (Bobo 1988) , or over desired values (symbolic threat (Sears 1988). Inevitably, in such scenarios cohesion is more vulnerable and exposed to social evils (Putnam 2007; Laurence 2009; Sturgis et al. 2014)

The spatial mismatch theory (Fryer, Pager, and Spenkuch 2013; Wilson 1987) adds another dimension to the conflict framework. It claims that ethnic minorities are not randomly dispersed in different local areas, but due to long-term constraints, they concentrate in the most deprived areas. These areas are characterized by economic disadvantage; lack of employment prospects; lack of social mobility over time; higher crime rates; and for the purpose of this study; lack of integral social services, such as healthcare. That is to say, migrants and minorities are more likely to be found in deprived areas than the majority. Thus, deprivation, and the burden it induces on resources, is responsible for growing tensions rather than the mere presence of out-groupers. The UK research on trust and health shows that deprivation is an important predictor of both factors, but that it differs by ethnicity (Bécares

et al. 2011; Laurence 2009; Sturgis et al. 2011). After adjustment for deprivation, social capital increases among minorities but is reduced among the White British (Bécares et al. 2011) and the negative association between diversity and health is greatly reduced (Bécares et al. 2012). It is therefore important to consider the differential effect of diversity and that there may be different mechanisms driving the health of majority and minority members. Studies such as (Heath and Demireva 2014; Demireva and Heath 2015) suggest that whereas we can talk of potential negative impact of diversity on White British, diversity is a prerequisite for the integration of minority members..

Conflict in this study is interpreted as the local area deprivation, worry about crime, perception of experienced discrimination and negative attitudes towards immigrants (a measure of social distance). The first two are commonly used in the literature and have been shown to be important mediators of social trust (Sturgis et al. 2011; Putnam 2007). Social distance can also capture the extent of social divisions between groups.

Contact/social capital theory

Allport proposed that increased contact between individuals of different ethnicities would increase trust and solidarity through a reduction in 'ethnocentric attitudes' (Allport 1962). Whereas studies frequently capture the opportunity for inter-ethnic contact through diversity indices, many neglect to make a distinction between opportunity and actual contact. People may reside in diverse neighbourhoods; and yet nurture their in-group social relationship (bonding social capital), ignoring relationships with wider out-group members (bridging social capital) (Turner 2009, 8). Unlike previous research, we use actual measures of inter-ethnic contact.

Contact, conceived in this study as various measures of social capital, has been recognized as a producer and facilitator of health (Halpern 2005; Szreter and Woolcock

2004) at the individual and ecological level. Further, numerous studies have demonstrated significant associations between social capital and health outcomes such as, depression, hypertension, obesity, long-term illness, mortality and self-rated health (Kim and Kawachi 2006; Islam et al. 2006; Gilbert 2009; Veenstra et al. 2005).

Social capital, conceived as informal social interactions (ISI), diverse friendship networks (DFN) and civic engagement (CE) may encourage the sharing of information and encouraging participation, which in turn facilitates improved access to essential services impacting health. Further, we attempt to distinguish between the effects of bridging and bonding social capital. Bridging capital will be operationalized as friendships and social interactions (namely, the number of out-group friends and informal contacts that the respondent has); while bonding capital will be measured as associational bonding through different organizations. A similar approach has been adopted in Demireva and Heath (2015). This distinction is important since we want to take into account that people with similar ethno-religious backgrounds may be socially integrated within their own group but disintegrated across groups. A high level of bonding capital may have a negative impact at the neighbourhood level and in the wider society, but may have a positive effect on members of a particular group (Putnam 2007).

Hypotheses

In this study we will test several hypotheses:

Hypothesis 1. If diversity increases conflict between the majority and minority populations in Britain, we will observe a positive association between diversity and perceived bad health.

Hypothesis 2. If however, residing in diverse local areas reflects on a number of selective processes and constraints (apart from preferred proximity to family and co-ethnic support networks) such as the availability of cheap housing at the point of migration, when we control

for deprivation, this association will disappear. Accounting for a range of conflict measures at the individual level will attenuate the association and render it insignificant.

Hypothesis 3. If the positive association between diversity and perceived bad health is due to lack of important contact and social capital at the individual level (in other words, the leading of parallel lives), once we control for individual level social capital, the significance of the association will disappear.

Over and above these hypotheses, we also considered the possible moderating effects of deprivation and social capital, following previous research on the health of these groups through a series of interactions.

Material and Methods

Survey

The research draws upon data from two sources: The individual sample of adults, aged 16 and over were taken from the 2009/2010 and 2010/2011 Citizenship Survey (CS) and small area measures from the 2011 UK census.

The CS, was a face-to-face continuous cross sectional survey administered by the Department of Communities and Local Government (DCLG), from 2007 until its conclusion in March 2011. Participants for the survey were selected using a multistage random sample from England and Wales. The overarching aim of this survey was to gather evidence on community cohesion, ethnicity and faith, voluntary and civic renewal (Department for Communities and Local Government 2013).

Data from the 2011 UK census were linked to the CS using the participant's postcodes. Neighbourhoods/local areas was defined as a Middle Super Output Area (MSOAs). MSOAs have been created for administrative purposes by the Office of National Statistics and is a

part of the system used to monitor the social, economic and general living conditions in the UK. They have a minimum residential size of 5000 individuals and 2000 households with an average population size of 7,500 (ONS 2017). Permission to use the linked data was approved by the ethics committee of the data holder.

After the deletion of respondents older than 75 years old, individuals with missing information on the dependent variable, and residents of Wales because the deprivation measure was not comparable to that of England. The final sample was 28,257 respondents across 2,433 neighbourhoods, of these (n=13,236) were minorities and (n= 15,021) White British residing in England. The demographics of respondents in the final sample did not differ considerably by ethnicity; age; gender; and area deprivation from the initial sample.

Dependent variable

Our outcome variable is based on a single item question on individual perceptions of health. The health of respondents ranged from very good (1) to very bad (5), despite the categorical nature of this variable, it was modelled as a continuous variable, which means that higher positive coefficients indicate more negative health perceptions. This is in line with earlier discussions stating that ordinal variables with four or more categories may be reasonable treated as continuous (Bentler and Chou 1987; Snijders and Bosker 1999) and prior usage (Mansyur et al. 2008). In particular, Snijders and Bosker (1999), argued that outcome variables measured on ordinal scales of five categories or more can be treated as continuous, if it is reasonable to assume that level-1 variances are constant. Therefore, as an additional test, we collapsed self-rated health into a binary measure and used multilevel procedures for logistic models to compare the results of a few of the key models shown in this draft. This yielded similar, but less informative, results. We therefore opted to use the linear specification of the variable. In general, a single item measure of self-rated health has been

shown to be a robust measure of morbidity and mortality (Idler and Benyamini 1997; Schnittker and Bacak 2014).

Individual measures

We distinguish two groups of respondents: Black, Asians and other ethnic minorities (referred to as minorities) and White British. The measures are based on the respondent's self-reported ethnic identity, and was collapsed from 17 ethnic categories. A list of the ethnic categories may be found in supplementary appendix.

Several variables were included to control for the differing socioeconomic and demographic profiles of these groups. These factors might predispose individuals to live in particular neighbourhoods or to have a specific view of their health and as such contribute to both the within and between neighbourhood variations in health: age; gender; marital status; educational attainment; income and religiosity. Religiosity was measured by a single question asking respondents to indicate whether they were actively practicing their religion or not. We also used several variables specific for minorities, generational status and ethnicity.

Individual mediators tested in relation to the conflict hypothesis were: (1) *worry about crime* measured using a single question which asked respondents how worried they were of becoming a victim of crime? Responses provided were (i) very worried (ii) fairly worried (iii) not very worried, and (iv) not at all worried. This was recoded into a dichotomous measure, where 1 was an indication of individuals who were not worried; (2) *Perceived discrimination* was measured by asking respondents whether they felt that they were discriminated because of their race, religion or beliefs, and/or their colour. Respondents who perceived that they were discriminated due to at least one of these factors were coded as 1. All other respondents were coded as 0.

Social Capital was measured using the mean standardized score from three separate measures (coded so that higher scores reflected greater social capital): ISI, DFN, and CE. Through these measures we also attempt to distinguish between the effects of bridging and bonding social capital. Bridging is assessed by the level of IFI that occur among individuals across a range of public and private settings. We also included *DFN* to indicate the potential for bridging by assessing the heterogeneity of the respondent's network with respect to age, ethnicity, and religion. *CE* was used to account for associational membership and bonding capital by distinguishing individuals with associational membership in various political, voluntary, professional and recreational clubs from those without membership. A description of each measure is provided in Table 1.

[TABLE 1 ABOUT HERE]

Local area *measures*

Diversity was measured using a hybrid of two dimensions of individual level identity: ethnicity and religion, and aggregated at the MSOA level using data from the 2011 UK census. Although the current literature on the effects of diversity has largely been focused on the ethnic diversity, ethnicity has been shown to encompass several aspects of an individual's identity including race, culture, religion and nationality. Moreover, a recent examination of the dimensions of identity in the UK by Nandi and Platt (2014) suggests that most people hold multiple identities of which ethnicity and religion were the most common. The use of this hybrid definition of ethnicity brings us closer to both the individual and societal identification and sorting of each other. Thus, ethno-religious diversity was constructed based on the fractionalisation index (ELF):

$$ELF\,(j) = 1 - \sum_{i(j)}^{N(j)} \left[s_{i(j)} \right]^2 \qquad (1)$$

Where $S_{ij,}$ is the share of the group *i(i=1...N)* in neighbourhood *j*...

The index produces a single continuous score ranging from 0 to 1 and is based on the relative size of each group. The index is interpreted as the probability that two people chosen at random within a given area belong to different ethno-religious groups. Higher scores indicate greater local area diversity.

Deprivation was measured using the index of multiple deprivation (IMD) created by the DCLG. The IMD is a measure of relative socioeconomic deprivation that provides comparative information about the deprivation level in local areas across England. It is however not possible to state by how much deprivation levels differ across local areas. The IMD includes seven weighted measures of deprivation: economic (22.5%); employment (22.5%); health and disability (13.5%); education skills and training (13.5%); barriers to housing and services (9%); crime and disorder (9%); and the living environment (9%) (McLennan et al. 2011). The index has been coded as deciles, where 1 represents the least deprived 10% of areas and 10 represents the most deprived 10 %.

Attitudes towards immigrants was measured using responses to a single question on whether respondents thought that the current number of immigrants coming to Britain should be increased, reduced or whether it should remain the same. Responses ranging from (1) increased a lot to (5) reduced a lot. This measure was aggregated at MSOA level, with higher average scores representing greater negative attitudes towards immigrants.

Area level conflict was captured by deprivation and negative attitudes towards immigrants. A full description of the individual and area measures are presented in Table 2.

Analyses

We estimated multilevel multivariable linear models to allow for the simultaneous assessment of the effects of individual level characteristics and area level residential

clustering on perceived bad health. Fixed and random parameter estimates and their standard errors are implemented using Stata 13 (StataCorp 2013). Modelling proceeded in a sequential and stepwise manner in order to test the mediating and moderating effects of the conflict and contact on health for minorities and White British separately.

$$Y(\text{poor health perceptions}) = F(\beta_{0+}\beta age+\beta gender+\beta religiosity+ \beta marital\ status+ \beta education +\beta income+\beta generation\ [Model\ 1] + \beta lndiversity\ [Model2] +\beta lndeprivation\ [Model\ 3] +\beta ln diversity*\beta lndeprivation\ [Model\ 4] +\beta lnsocial\ capital\ [Model\ 5] +\beta lnsocial capital*diversity[Model\ 6] +\beta lnworry\ crime\ [Model\ 7] +\beta lndiscrimination\ [Model\ 8] +\beta lnnegative\ [Model\ 8]$$

Analysing the models separately for minorities and Whites allowed us to more accurately distinguish the effect of residing in a diverse neighbourhood, and to better explain the individual and neighbourhood factors that may have an impact on perceived health. Furthermore, modelling the effects of diversity separately was important given that for White British, growing diversity indicates a growing presence of minority out-groupers. For minorities, growing diversity is associated with less presence of co-ethnics, and it can be driven both through the presence of White British, and the presence of other migrant and minority groups.

Apart from age, all individual level characteristics were modelled as categorical variables. Local area diversity, deprivation and negative attitude towards immigrants were analysed as continuous variables.

Results

The descriptive results are provided in Table 2 whilst Tables 3-4 presents the coefficient (standard errors) for the main variables examined in this study separately for minorities and White British. Full model results are included in the supplementary appendix (SA2-SA5).

The majority of respondents across all neighbourhoods, both minorities and White British,

perceive their health as being very good (approximately 40% of the population). The results indicate however that the individual level factors we expect to be associated with perceived health differ among minorities and White British. For example, a lower proportion of minorities were worried about crime, they were more likely to be younger; single; male; low educated; with lower income but more religious. With regards to social capital, minorities had a more DFN and ISI but were less likely to participate in civic activities. Minorities and the White British also differed with regards to local area characteristics. A larger proportion of minorities resided in diverse but deprived areas but were less likely to have a negative perception of immigrants.

The results for the fixed effects (not shown, see SA2) indicated the individual level variables significantly associated with perceived health: age, men, marital status, education and income. Some noteworthy differences between minority and majority exist. Religiosity and being male were negatively associated with poor health reporting among minorities, but had the opposite effect on White British. Health reporting varied even among minorities, with Chinese and other Whites reporting good health whilst Asians reported poor health. The results of this model shows that most of the variation in health was at the individual level. The interclass correlation (ICC) indicated that approximately 3% and 5% of the variance among minorities and Whites respectively, may be attributed to differences between neigbourhoods. Across all the models tested, even after full adjustment, the neighbourhood ICC remains at approximately 3% for minorities but was slightly reduced for Whites to approximately 4%.

Turning our attention to the random effect, we find evidence of the mediating role of conflict over scarce resources for minorities and White British. In particular, when deprivation was assessed we find that among White British [β: 0.23, SE: 0.07], growing diversity is positively associated with perceived bad health (Table 3, Panel 1). This

association disappears once we control for deprivation [β: 0.06, SE: 0.07] of the local area. Similarly, an initial examination of the associations between health and diversity indicates greater negative health reporting [β: 0.20, SE: 0.06] among minorities. Like, White British it seems that deprivation matters the most for the health of minorities [β: 0.05, SE: 0.07] given that the effect of diversity disappears once we account for deprivation.

[TABLE 2 ABOUT HERE]

Three other models were tested sequentially to examine conflict as potential mediator of health in diverse neighbourhoods: worry about crime, negative attitudes towards immigrants and perceived discrimination (Table 3, Panel 2). Having little or no worry about crime was associated with more positive health for both groups. The effect was reduced among Whites when we interacted diversity with worry about crime, but the direction did not change. This suggests that White British respondents who reside in more diverse areas and do not worry about crime, report better health. Conversely, an increased social distance as signaled by negative attitudes towards immigrants was associated with bad health under conditions of growing diversity among White British. Discrimination among minorities [β: 0.29,SE:0.18] and White British [β:0.02, SE:0.62] was associated with perceived bad health as found in earlier studies (Bécares, Nazroo, and Stafford 2009) but this relationship was non-significant. Among minorities living in more diverse neighbourhoods, these effects were reversed [β: -0.19, SE: 0.23] although, they remained non-significant.

[TABLE 3 ABOUT HERE]

We then assessed the three social capital measures as potential mediators and moderators in relation to the contact hypothesis (Panel 3 & 4). Among White British, IFI and CE (bridging capital) had no considerable impact on health but DFN (bonding capital) had an effect. The results indicate that having less DFN was related to poorer health perceptions. None of the examined interaction effects were significant suggesting that social capital was not reinforced at particular levels of diversity.

[TABLE 4 ABOUT HERE]

Table 4 presents the results of models specifically related to minorities, we examined whether higher area level diversity influenced the health of minorities across generations. The results indicated that diversification of the local area predicts significantly better health among minorities across generations: first generation minorities, citizens [β:-0.10, SE:0.02] and non-citizens [β:-0.16,SE:0.02] when compared to second generation minorities. With the inclusion of deprivation these effects are slightly reduced but remain significant. We also examined generational differences in the effect of diversity and social capital on health through a series of interactions. These results demonstrated that although social capital did not moderate the health effects across generations, it significantly mediated these effects.

Discussion

The present study has sought to bring together several strands of literature through an examination of the effects of diversity and the influence of the conflict and contact/social capital theory on health perceptions in Britain. We have tested whether the proposed conflict and contact hypotheses had a similar health effect on ethnic minorities and White British given that the meaning the two groups ascribe to, and experience of diversity appear to differ significantly. We specifically aimed to: examine if and by how much diversity influenced heath perceptions among minorities and White British; and examined whether these

associations were mediated and/or moderated by (a) conflict (b) contact; and, examine whether there were generational differences in health perception after adjusting for the mediating and moderating potential of conflict and contact within diverse neighbourhoods.

Exploration of our first question, which examined whether diversity increased negative health reporting, we found in line with the results from earlier studies (Bécares et al. 2011), that diversity was associated with greater negative health reporting for minorities and White British. However, second research question on whether local area conflict mediated or moderated the effect of residing in diverse areas was shown to be dependent upon and reinforced by several individual and neighbourhood factors, namely, socioeconomic deprivation, worry about crime, negative attitudes towards immigrants and discrimination. Socioeconomic deprivation was shown to have the largest significant impact on the negative health reporting of minorities and their White British counterparts, although these effects are strongest for Whites. Similar empirical evidence have been found generally between deprivation and self-rated health (Verhaeghe and Tampubolon 2012; Stafford and Marmot 2003), and in particular by ethnicity (Bécares et al. 2012; Bécares et al. 2011). The results demonstrated further that the influence of diversity disappears once we control for the economic prosperity of the local area which signals that it is the concentration of minorities in more deprived areas that drives the relationship in accord with the postulates of spatial mismatch. Importantly, we do not observe any interaction effect between the two measures - that is to say, we do not find any evidence that White British respondents in more socioeconomically deprived areas are disproportionately negatively affected by diversity, which was the one of the main issues featured in the Brexit debate.

With regards to the other measures of conflict, our results demonstrated that worry about crime and negative perception of immigrants mitigated poor health among minorities and Whites. These effects were reversed in the face of higher diversity. Perceived discrimination

attenuated negative health effects in areas of greater diversity for minorities but exacerbated these effects among Whites. As it relates to minorities, these findings might possibly be explained by the fact that more diversity among this group is associated with an increase in co-ethnics, and this in turn reduces discrimination, which has been shown to impact the health of minorities negatively (Bécares, Nazroo, and Stafford 2009). Although, these effects were non-significant the pattern of the outcomes were as expected, and partly support the theory that conflict increases the negative effects of diversity. Overall, the results of the first research question suggests that diversity coupled with conflict is associated with negative health outcomes – an effect, pronounced among White British when compared to minorities.

Our second aim explored whether contact mediated and/or moderated the effect of residing in a diverse area on health perceptions, and examined if these effects were different for minorities and Whites. The findings showed that, different aspects of social capital had a differential impact on health, and that this varies by ethnicity. As an example, we found that having a less diverse friendship networks predicted poor health among Whites, while informal social interactions and civic engagement predicted better health (even if non-significant). In contrast, for minorities, more diverse friendship networks and greater civic engagement predicted had no effect on their health meanwhile informal social interactions predicted better health. These effects remain unchanged even within areas of higher areas of diversity.

These effects related to the possible negative effect of less diverse social network or that of civic engagement, is not completely unexpected given that several studies have demonstrated that social capital may have a negative side (McKenzie 2000; Portes 1998). Initially it may seem counterintuitive, that poor health is associated with less diverse networks, but, these may create tensions under conditions where people are competing for scarce resources; reduces an individual's possibility of gaining access to information and

457 resources that might be available if one had a more diverse network; and might lead to role
458 strain by placing excess demand on group members. Essentially, forming strong bonds
459 among similar others may exclude others, to the detriment of individuals who are a part of the
460 group and those who are not. Similarly, civic engagement, and the opportunities for
461 establishing bridging capital might be skewed toward Whites, and as such less likely to be
462 associated with better health among minorities. Earlier studies have shown that the
463 opportunities for civic engagement is lower for ethnic minorities, especially those that reside
464 in deprived neighbourhoods because their immediate focus is usually that of access to jobs,
465 housing and public services (Oliver and Mendelberg 2000; Bécares et al. 2011).

466 The third research question was aimed at examining generational differences in health
467 among minorities residing in diverse areas, and to explore whether these effects changed with
468 greater contact with the majority. In accordance with the predictions of the ethnic enclave
469 theory, the concentration of in-groupers seems to be positively associated with good health.
470 This relationship was attenuated once we accounted for deprivation. The finding that second
471 generation migrants reported more negative health than the first generation migrants, even
472 when compared to those first generation migrants who do not hold citizenship was an
473 important finding. It suggested that it was not diversity per se that impact health negatively
474 rather, it was the social and material conditions in which minorities find themselves. Further,
475 it might reflect the fact that first generation migrants perceive their situation as improved
476 although they are relatively less well-off than the majority. Rather than comparing
477 themselves with the White majority in the host country, they might be comparing themselves
478 to people in their home countries whilst for second generation migrants the comparison group
479 might be the majority.

480 Our study has several contributions. By estimating separate models for White British and
481 ethnic minorities, we were able to remove some of the confounding effect of ethnicity from

the models, given that diversity does not have a similar meaning for these groups. It also contributes to the growing literature asserting that diversity eroded health, without explicitly testing the effect of spatial proximity between minorities and the White majority. We have done this through a series of mediating/moderating models, which has examined the impact of diversity through measures investigating the effect of increased conflict and contact.

The specification of a multilevel model might be viewed as a one of the strengths of this work. A multilevel model allows for the estimation of individual level data while taking into account both the contextual and individual processes simultaneously. As such, we were able to take a step towards disentangling one limitation which has plagued the research on neighbourhood effects, that is how one separates the contextual effects (i.e. the effects tied to the physical and social characteristics of the neighbourhood) from compositional effects (i.e. the type of people who reside in the neighbourhood). Moreover, this model allows us to specify an error structure that takes into account the correlation of error terms within the various neighbourhoods and as such improve the precision in our estimates.

A criticism levelled at diversity studies, is the use of geographies of varying sizes and, therefore, in their potential diversity mix, and are thus incomparable (Dawkins 2008). MSOAs as the primary sampling unit in this study. Compared to wards, MSOAs are felt to be more appropriate for this analysis due to the fact that wards differ greatly in size, whereas the use of MSOAs of similar size seem appropriate as then local area units of similar size are compared (Demireva and Heath 2014). This should in theory take us closer to the capturing the effects of a neighbourhood.

A limitation is the fact that health perceptions might be endogenous to several subjective measures. If we take social capital as an example. Individuals with a more positive perspective, are likely to be more outgoing and consequently have a wider social network, more likely to participate in civic organization, be more trusting and generally more likely to

report better health. In turn, this could inflate the positive relationship between health and social capital measures (Halpern 2005). This is especially true for cross-sectional data, where directionality cannot be established, as such longitudinal data will be needed to tackle some of the findings from this study.

Another limitation which many studies of this type is subject to is the issue of residual confounding. However, by estimating separate models for White British and ethnic minorities, we were able to remove some of the confounding effect of ethnicity from the models, given that diversity does not have a similar meaning for these groups. However, there can be a number of other potential confounders that this study cannot hope to measure directly. Although, the public funding and administrative measures adopted at the individual local area may help to moderate the possible negative effects of diversity, there are a number of environmental stressors that this study does not capture. Yet, by providing control for individual and local neighbourhood characteristics we come close to understanding the interplay between individual and neighbourhood characteristics in relation to self-rated health outcomes

Conclusion and implications

In sum, the findings supported our hypothesis that living in more diverse local areas might be more beneficial for ethnic minorities, especially newly arriving migrants. It also highlighted the importance of considering the complexity of the relationship between local area composition–specifically the ethnic makeup, the psychosocial qualities and the level of material well-being. By distinguishing the mechanisms that can drive the health outcomes of majority and minorities we contribute to the literature on diversity and its impact on public health outcomes. Our research shows that we should be more skeptical as to the possible

negative implications of diversity. Public health programmes should aim to minimize stress for citizens embedded across various neighbourhoods and encourage healthy choices.

Given, the growing diversification taking place across the UK, it would easy to make this the scapegoat for all the issues we are being faced with. However, from a public policy and health perspective more effort is need to disentangle factors such as diversity, deprivation and social capital when examining health. And finally, although the finding that socioeconomic deprivation has a strong negative impact on health is by no means new, our main findings suggest that deprivation rather than ethnic diversity should be the focus of efforts to improve public health. Ethnic mixing is an important part of the integration story of many migrant and minority groups, and concerted efforts should be made by local governments to reduce social and economic inequality.

References

Abascal, Maria, and Delia Baldassarri. 2015. "Love Thy Neighbor? Ethnoracial Diversity and Trust Reexamined 1." *American journal of sociology* 121 (3):722-82.

Alba, Richard, and Nancy Foner. 2016. "Integration's challenges and opportunities in the Wealthy West." *Journal of Ethnic and Migration Studies* 42 (1):3-22.

Alesina, Alberto, and Eliana La Ferrara. 2002. "Who trusts others?" *Journal of public economics* 85 (2):207-34.

Allport, Gordon. 1962. "W. 1954. The nature of prejudice." *Reading: Addison-Wesley*.

Bécares, Laia, James Nazroo, Christo Albor, Tarani Chandola, and Mai Stafford. 2012. "Examining the differential association between self-rated health and area deprivation among white British and ethnic minority people in England." *Social Science & Medicine* 74 (4):616-24. doi: http://dx.doi.org/10.1016/j.socscimed.2011.11.007.

Bécares, Laia, James Nazroo, and Mai Stafford. 2009. "The buffering effects of ethnic density on experienced racism and health." *Health & place* 15 (3):700-8.

Bécares, Laia, Mai Stafford, James Laurence, and James Nazroo. 2011. "Composition, concentration and deprivation exploring their association with social cohesion among different ethnic groups in the UK." *Urban Studies* 48 (13):2771-87.

Bentler, Peter M, and Chih-Ping Chou. 1987. "Practical issues in structural modeling." *Sociological Methods & Research* 16 (1):78-117.

Blumer, Herbert. 1958. "Race prejudice as a sense of group position." *Pacific Sociological Review* 1 (1):3-7.

Bobo, Lawrence. 1988. "Group conflict, prejudice, and the paradox of contemporary racial attitudes." In *Eliminating racism*, 85-114. Springer.

Cantle, Ted. 2011. Cohesion and Integration: From 'multi'to 'inter'Culturalism. Paper presented at the Symposium international sur l'interculturalisme, Montreal.

Dawkins, Casey J. 2008. "Reflections on diversity and social capital: A critique of Robert D. Putnam's" E Pluyibus Unum: Diversity and Community in the Twenty-First Century The 2006 Johan Skytte Prize Lecture"." In.: ROUTLEDGE JOURNALS, TAYLOR & FRANCIS LTD 4 PARK SQUARE, MILTON PARK, ABINGDON OX14 4RN, OXFORDSHIRE, ENGLAND.

Demireva, Neli, and Anthony Heath. 2014. "Diversity and the civic spirit in British neighbourhoods: an investigation with MCDS and EMBES 2010 Data." *Sociology* 48 (4):643-62.

Demireva, Neli V, and Anthony Heath. 2015. "Informal, Associational Bonding and Associational Bridging: Which Ties Matter Most for Minority Involvement and Integration?" *Handbook of Research Methods and Applications in Social Capital*:126.

Department for Communities and Local Government, Ipsos MORI. 2013. "Citizenship Survey, 2009-2011: Secure Access. [data collection]." In.

Friedberg, Rachel M. 2000. "You can't take it with you? Immigrant assimilation and the portability of human capital." *Journal of Labor Economics* 18 (2):221-51.

Fryer, Roland G, Devah Pager, and Jörg L Spenkuch. 2013. "Racial disparities in job finding and offered wages." *The Journal of Law and Economics* 56 (3):633-89.

Gilbert, Keon Lamount. 2009. "A meta-analysis of social capital and health." University of Pittsburgh.

Halpern, David. 2005. "Social Capital (Cambridge: Polity)."

Heath, Anthony, and Neli Demireva. 2014. "Has multiculturalism failed in Britain?" *Ethnic and Racial Studies* 37 (1):161-80.

Hooghe, Liesbet, and Gary Marks. 2007. "Sources of Euroscepticism." *Acta Politica* 42 (2):119-27. doi: 10.1057/palgrave.ap.5500192.

Idler, Ellen L, and Yael Benyamini. 1997. "Self-rated health and mortality: a review of twenty-seven community studies." *Journal of Health and Social Behavior*:21-37.

Islam, M Kamrul, Juan Merlo, Ichiro Kawachi, Martin Lindström, and Ulf-G Gerdtham. 2006. "Social capital and health: Does egalitarianism matter? A literature review." *International journal for equity in health* 5 (1):3.

Kim, Daniel, and Ichiro Kawachi. 2006. "A multilevel analysis of key forms of community- and individual-level social capital as predictors of self-rated health in the United States." *Journal of Urban Health* 83 (5):813-26.

Laurence, James. 2009. "The effect of ethnic diversity and community disadvantage on social cohesion: A multi-level analysis of social capital and interethnic relations in UK communities." *European Sociological Review*:jcp057.

Mansyur, Carol, Benjamin C. Amick, Ronald B. Harrist, and Luisa Franzini. 2008. "Social capital, income inequality, and self-rated health in 45 countries." *Social Science & Medicine* 66 (1):43-56. doi: http://dx.doi.org/10.1016/j.socscimed.2007.08.015.

McKenzie, K. 2000. "Neighbourhood safety and mental health outcomes." In.

McLennan, D, H Barnes, M Noble, J Davies, E Garatt, and C Dibben. 2011. "The English Indices of Deprivation 2010: Technical Report. Department for Communities and Local Government." *London, UK*.

Muttarak, Raya. 2014. "Generation, ethnic and religious diversity in friendship choice: exploring interethnic close ties in Britain." *Ethnic and Racial Studies* 37 (1):71-98.

Nandi, Alita, and Lucinda Platt. 2014. "A note on ethnicity and identity among the UK born population in Understanding Society." In.: ISER Working Paper Series.

Oliver, J Eric, and Tali Mendelberg. 2000. "Reconsidering the environmental determinants of white racial attitudes." *American journal of political science*:574-89.

ONS. 2017. Office of National Statistics, Accessed June 30. https://www.ons.gov.uk/methodology/geography/ukgeographies/censusgeography#output-area-oa.

Phillips, T. . 2005. "After 7/7: Sleepwalking to segregation." In *22nd September 2005*. Speech given at the Manchester Council for Community Relations.

Portes, Alejandro. 1998. "Social capital: Its origins and applications in modern sociology." *Annual review of sociology* 24 (1):1-24.

Putnam, Robert D. 2007. "E pluribus unum: Diversity and community in the twenty-first century the 2006 Johan Skytte Prize Lecture." *Scandinavian political studies* 30 (2):137-74.

Schnittker, Jason, and Valerio Bacak. 2014. "The increasing predictive validity of self-rated health." *PloS one* 9 (1):e84933.

Sears, David O. 1988. "Symbolic racism." In *Eliminating racism*, 53-84. Springer.

Snijders, Tom, and Roel Bosker. 1999. "Multilevel analysis: An introduction to basic and applied multilevel analysis." In.: London: Sage.

Stafford, M., and M. Marmot. 2003. "Neighbourhood deprivation and health: does it affect us all equally?" *Int J Epidemiol* 32. doi: 10.1093/ije/dyg084.

StataCorp, LP. 2013. "Stata: release 13-statistical software." *College Station, TX*.

Sturgis, Patrick, Ian Brunton-Smith, Jouni Kuha, and Jonathan Jackson. 2014. "Ethnic diversity, segregation and the social cohesion of neighbourhoods in London." *Ethnic and Racial Studies* 37 (8):1286-309.

Sturgis, Patrick, Ian Brunton-Smith, Sanna Read, and Nick Allum. 2011. "Does ethnic diversity erode trust? Putnam's 'hunkering down'thesis reconsidered." *British Journal of Political Science* 41 (01):57-82.

Szreter, Simon, and Michael Woolcock. 2004. "Health by association? Social capital, social theory, and the political economy of public health." *International Journal of Epidemiology* 33 (4):650-67.

Turner, Margery Austin. 2009. "Promoting neighborhood diversity: Benefits, barriers, and strategies."

Veenstra, Gerry, Isaac Luginaah, Sarah Wakefield, Stephen Birch, John Eyles, and Susan Elliott. 2005. "Who you know, where you live: social capital, neighbourhood and health." *Social Science & Medicine* 60 (12):2799-818.

Verhaeghe, Pieter-Paul, and Gindo Tampubolon. 2012. "Individual social capital, neighbourhood deprivation, and self-rated health in England." *Social Science & Medicine* 75 (2):349-57. doi: https://doi.org/10.1016/j.socscimed.2012.02.057.

Wilson, William Julius. 1987. *The truly disadvantaged: The inner city, the underclass, and public policy*: University of Chicago Press.

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Table 1. Definition and description of survey items, and the corresponding measures of social capital.

Measure of social capital (cronbach's,alpha, mean and range)	Items	Survey responses
Informal social interactions (α=0.99) Mean(SD) 0.00 (0.99) Range (-3.05 to 0.33)		yes, no
	(a) How often have you have mixed with someone or a group of people on a more personal level through a conversation or some other form of personal interaction, for example at the shops, your work or a child's school, as well as meeting up with people to socialise, at least once a month in the past year?; (b) How often in the past year have you mixed socially with people from different ethnic and religious groups to yourself in an open public space and/or a public building while volunteering (formally or informally)?;	
	(c) Have you mixed socially with people from different groups or while doing unpaid work at least once a month in the past year (excluding mixing at home)	
Civic engagement (α= 0.64) Mean(SD) 0.00 (0.57) Range (-0.49/0.35)		Yes,no
	Whether participated in any civic participation activity in last 12m Whether participated in any civic participation (i.e. participated in a group making decisions regarding: local health services; regenerating the local area ;local crime problems; A tenants' group decision making committee;local education services; local services for young people; services in the local community) activity in last 12 months	
	Whether participated in any civic activism (i.e. participated in the community as a ;local councilor ; school governor; volunteer Special Constable; Magistrate) in past 12 months Whether gave voluntary help through employer scheme in last 12 months	
	Whether given any informal voluntary help in last 12 months Whether given any formal voluntary help in last 12 months; and	
Diverse friendship networks (α=0.59) Mean(SD) 0.00 (0.57) Range (-1.34/1.88)		(1) all the same (2) more than a half (3) about a half (4) or less than a half?
	What proportion of your friends are of the same ethnic group as you? What proportion of your friends are of the same religious group as you?	
	What proportion of your friends are of the same age group as you?	

*According to the rule of thumb. The Cronbach's alpha range from moderate to very good.

Table 2 Proportion, mean (SD) and range for the individual and neighbourhood measures included in the analysis. Results presented for the total sample and by ethnicity.

	Total sample (n=28,257)	**British Whites (n=15,021)**	**Ethnic minorities (n=13,236)**
Self-rated health			
Very good	0.40	0.39	0.41
bad	0.38	0.37	0.40
Fair	0.16	0.18	0.14
Good	0.04	0.05	0.04
Very bad	0.01	0.01	0.01
Age ***M(SD)***	43.20 (15.69)	48.25 (15.88)	38.65(14.04)
Male	0.47	0.46	0.48
Marital Status			
Single	0.33	0.29	0.36
Married	0.48	0.49	0.48
Separated/divorced	0.14	0.16	0.12
Widowed	0.05	0.07	0.03
Education			
College/University	0.07	0.10	0.04
A' level/GCSE	0.34	0.31	0.37
Foreign & Other qual	0.34	0.40	0.29
No Qualification	0.04	0.01	0.06
Income			
Under £5,000-£9,999	0.42	0.36	0.47
£10,000-£19,999	0.26	0.27	0.25
£20,000-£29,999	0.16	0.17	0.14
£30,000-£49,999	0.12	0.14	0.09
Ethnicity			
White	0.51	1.00	0.07
Asian	0.27		0.51
Black	0.13		0.25
Mixed	0.03		0.06
Chinese	0.01		0.02
Other	0.04		0.08
Generation & immigration status			
2nd gen EM	0.31		0.31
1st gen EM, non-citizens	0.26		0.26
1st gen EM, citizens	0.44		0.44
Crime: Not worried about crime	0.57	0.63	0.52
Religiosity: actively practicing	0.49	0.25	0.70
Perception of discrimination	0.03	0.01	0.06
Social capital			
Diverse friendship networks **M(SD) [range]**	0.00 (0.77) [-1.31,1.90]	-0.31 (0.65) [-1.24,1.90]	0.28(0.76)[-1.31,1.90]
Informal social interactions **M(SD) [range]**	0.00 (0.99) [-2.70,0.37]	-0.26 (1.24) [-2.70,3.70]	0.24(0.62)[-2.70,0.37)
Civic engagement **M(SD) [range]**	0.00(0.57) [-0.49,3.62]	0.08 (0.58) [-0.49,3.61]	-0.07(0.55)[-0.49,3.62)
Diversity **M(SD) [range]**	0.66 (0.19)[0.23,0.93)	0.52 (0.14)[0.23,0.93)	0.79(0.13)[0.23,0.93)
Deprivation **M(SD)[range]**	6.65 (2.89) [1-10]	5.34(2.88) [1-10]	7.82(2.33)[1-10]
Attitudes towards immigrants **M(SD) [range]**	4.54(0.88)[1-6]	5.08(0.73)[1-6]	4.06(0.71)[1-6]

Source: Citizenship Survey 2009-2010. Notes: EM= Ethnic Minorities

Table 3. Examination of local area conflict and contact hypotheses on health perceptions among Ethnic minorities and White British

Panel 1 Association between local area diversity, deprivation and health perceptions Ethnic minorities and White British																
	Whites								**Ethnic Minorities**							
	Model 1		**Model 2**		**Model 3**		**Model 4**		**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	b	**se**	**b**	**se**	**b**	**se**	**b**	**se**	**b**	**se**	**b**	**se**	**b**	**se**	**b**	**se**
Random Effects: Local Area																
Diversity			0.23***	0.065	0.06	0.07	0.23	0.17			0.20**	0.06	0.045	0.07	-0.19	0.17
Deprivation					0.04***	0.07	0.05***	0.01					0.026***	0.00	0.00	0.02
Diversity*deprivation							-0.03	0.02							0.03	0.02
Intercept	1.60***	0.04	1.47***	0.05	1.28***	0.06	1.20***	0.10	1.16***	0.04	1.02***	0.06	0.94***	0.06	1.10***	0.12
Variance components																
Level 2	0.170***	0.02	0.17***	0.02	0.15***	0.02	0.15***	0.02	0.14***	0.01	0.14***	0.01	0.13***	0.01	0.13***	0.01
Level 1	0.84***	0.01	0.84***	0.01	0.84***	0.01	0.84***	0.01	0.78***	0.01	0.78***	0.01	0.78***	0.01	0.78***	0.01
Panel 2 Conflict on local area diversity and deprivation on health perceptions																
	Whites								**Ethnic Minorities**							
	Model 1		**Model 2**		**Model 3**		**Model 4**		**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	b	**se**	**b**	**se**	**b**	**se**			**b**	**se**	**b**	**se**	b	**se**		
Conflict Mediators																
Not worried	-0.05	0.07							-0.05	0.09						
Not worried*diversity	-0.25*	0.12							-0.08	0.11						
Negative attitude immigrants			-0.15***	0.05							-0.06	0.06				
Negative attitude*diversity			0.30***	0.08							0.14	0.08				
Discrimination					0.12	0.37							0.29	0.18		
Discrimination *diversity					0.02	0.62							-0.19	0.23		
Random Effects: Local Area																
Diversity	0.16	0.10	-1.32***	0.38	0.05	0.07			0.07	0.09	-0.45	0.37	0.06	0.07		
Deprivation	0.04***	0.00	0.04***	0.00	0.04***	0.00			0.03***	0.00	0.03***	0.00	0.03***	0.00		
Intercept	1.35***	0.07	1.99***	0.23	1.28***	0.06			1.00***	0.08	1.12***	0.30	0.93***	0.06		
Variance components																
Level 2	0.14***	0.02	0.15***	0.02	0.15***	0.02			0.13***	0.01	0.13***	0.01	0.13***	0.01		
Level 1	0.84***	0.01	0.84***	0.01	0.84***	0.01			0.78***	0.01	0.78***	0.01	0.78***	0.01		
Panel 3 Social capital as mediator of local area diversity and deprivation on health																

	Model 1		Model 2		Model 3		Model 4		Model 1		Model 2		Model 3		Model 4	
	b	se	b	se	b	se	b	se	b	se	b	se	b	se	b	se
Social Capital																
DFN			0.09***	0.01							0.00	0.01				
ISI					-0.01	0.01							-0.05***	0.01		
CE							-0.02	0.01							0.00	0.01
Random Effects: Local Area																
Diversity	0.23***	0.07	-0.04	0.07	0.07	0.07	0.06	0.07	0.20**	0.06	0.04	0.07	0.06	0.07	0.05	0.07
Deprivation			0.04***	0.00	0.04***	0.00	0.04***	0.00			0.03***	0.00	0.03***	0.00	0.03***	0.00
Intercept	1.47***	0.05	1.38***	0.06	1.28***	0.055	1.28***	0.06	1.02***	0.06	0.96***	0.06	0.94***	0.06	0.94***	0.06
Variance components																
Level 2	0.17***	0.02	0.14***	0.02	0.15***	0.016	0.15***	0.02	0.14***	0.01	0.13***	0.01	0.13***	0.01	0.13***	0.01
Level 1	0.84***	0.01	0.83***	0.01	0.84***	0.006	0.84***	0.01	0.78***	0.01	0.78***	0.01	0.78***	0.01	0.78***	0.01

Panel 4 Social capital as moderator of local area diversity and deprivation on health

	Model 1		Model 2		Model 3		Model 4		Model 1		Model 2		Model 3		Model 4	
	b	se	b	se	b	se	b	se	b	se	b	se	b	se		
Social Capital																
DFN	0.12*	0.05							0.03	0.06						
DFN* diversity	-0.05	0.09							-0.04	0.07						
ISI			0.05	0.03							-0.02	0.06				
ISI* diversity			-0.12	0.06							-0.04	0.08				
CE					-0.03	0.05							-0.052	0.08		
CE * diversity					0.02	0.10							0.070	0.10		
Random Effects: Local Area																
Diversity	-0.05	0.07	0.07	0.07	0.06	0.07			0.04	0.07	0.06	0.07	0.05	0.07		
Deprivation	0.04***	0.00	0.04***	0.00	0.04***	0.00			0.03***	0.00	0.03***	0.00	0.03***	0.00		
Intercept	1.38***	0.06	1.28***	0.06	1.28***	0.06			0.95***	0.06	0.93***	0.06	0.94***	0.06		
Variance components																
Level 2	0.14***	0.02	0.15***	0.02	0.15***	0.02			0.13***	0.01	0.13***	0.01	0.13***	0.01		
Level 1	0.83***	0.01	0.84***	0.01	0.84***	0.01			0.78***	0.01	0.78***	0.01	0.78***	0.01		

Notes: *p<.05; **p<.01; ***p<.001. All models adjusted for age, sex, marital status, education, income and religiosity, models for ethnic minorities includes ethnicity.

Diverse friendship networks=DFN; Informal social interactions=ISI; Civic Engagement=CE.

Notes: Panel 1-4 corresponds to full tables presented in the supplementary appendix SA2-SA4 respectively.

Table 4 Generational differences: social capital as moderator of local area diversity and deprivation on health perceptions among ethnic minorities

	Model 1		Model 2		Model 3		Model 4		Model 5	
	b	**se**	**b**	**se**	**b**	**se**	**b**	**se**	**b**	**se**
Generation (ref.=2nd generation)										
1st generation EM, non-citizens	-0.16***	0.02	-0.15***	0.02	-0.14***	0.02	-0.16***	0.02	-0.15***	0.02
1st generation EM, citizens	-0.10***	0.02	-0.09***	0.02	-0.08***	0.02	-0.09***	0.02	-0.09***	0.02
Social Capital* Generation										
DFN					0.01	0.02				
1st gen EM, non-citizens * DFN					-0.01	0.03				
1st gen EM, citizens *DFN					-0.02	0.02				
ISI							-0.05	0.03		
1st gen EM, non-citizens *ISI							0.01	0.04		
1st gen EM, citizens* ISI							-0.01	0.03		
CE									0.01	0.02
1st gen EM, non-citizens *CE									0.02	0.04
1st gen EM, citizens* CE.									-0.04	0.03
Random Effects: Local Area										
Diversity	0.21***	0.06	0.07	0.07	0.06	0.07	0.08	0.07	0.07	0.07
Deprivation			0.02***	0.00	0.03***	0.01	0.02***	0.01	0.024***	0.00
Intercept	1.11***	0.06	1.04***	0.06	1.04***	0.06	1.03***	0.06	1.04***	0.06
Variance										
Level 2	0.14***	0.012	0.13***	0.01	0.12***	0.01	0.13***	0.01	0.13***	0.01
Level 1	0.78***	0.005	0.78***	0.01	0.78***	0.01	0.78***	0.01	0.78***	0.01

Note: *p<.05; **p<.01; ***p<.001. All models adjusted for age, sex, ethnicity, marital status, education, income and religiosity. Diverse friendship networks=DFN; Informal social interactions=ISI; Civic Engagement=CE; gen=Generation; EM= Ethnic Minorities

Research Highlights

- Tests the meaning of diversity for minorities and White British
- Tests bonding/bridging capital influence on health of minorities and White British
- Explicit test of contact/conflict as mechanisms underlying the erosion of social capital
- Generational differences in social capital among immigrants living in diverse communities
- Finds that deprivation matters much more for the health of minorities and Whites than diversity