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Social exclusion and well-being among older adults in rural and urban areas

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A B S T R A C T

Background: Social exclusion (SE) is a process that limits participation in society across life domains, and is associated with poor quality of life. Neighbourhood exclusion has been identified as particularly important for older adults. This paper examines the association between SE and well-being in older adults from urban and rural areas, focusing on neighbourhood exclusion.

Methods: Using a cross-sectional survey design with a stratified sampling frame, participants (aged 65 +) from rural (n = 628) and urban (n = 627) areas of Barnsley, United Kingdom, completed a questionnaire containing indicators of five SE domains: civic activity, material resources, social relationships, services and neighbourhood. Sequential multiple regression models were developed for 1) total sample; 2) rural areas; and 3) urban areas, with well-being regressed on SE indicators after controlling for self-reported health.

Results: SE indicators explained 13.4% of the variance in well-being in the total sample (of which neighbourhood exclusion explained 1.2%); corresponding figures for the rural model were 13.8% (3.8%) and for the urban model 18.0% (1.7%); the addition of neighbourhood exclusion significantly improved all three models. Five SE indicators were significant in the rural model, compared with seven in the urban model, with four common to both.

Discussion: Neighbourhood exclusion explained more variance in well-being in rural than urban areas, whereas exclusion from services explained more variance in urban than rural areas. Area characteristics and the role of neighbourhood should be considered in policy initiatives to reduce SE and promote well-being.

1. Introduction

Social exclusion is a process that limits individuals' potential to participate in society and is associated with poor health and poor quality of life (Barnes, Blom, Cox, Lessof, & Walker, 2006; Becker & Boreham, 2009). Combatting social exclusion is a key target in European policy (European Commission, 2013), and the concept has been adopted by the United Nations (United Nations, 2010) and the World Health Organization (Popay et al., 2008). In this article, data from a community study of social exclusion in older adults in rural and urban areas is used to explore the association between social exclusion and well-being.

1.1. Theoretical framework

While many definitions of social exclusion exist in the research literature and in policy documents (see e.g. Council of European Union, 2004; Levitas et al., 2007; Burchardt, Le Grand, & Piachaud, 2002) it is possible to identify key elements common to most. Social exclusion is

seen as a process rather than a static condition, and is normative in that exclusion relates to those activities that are seen as standard within a given society (Percy-Smith, 2000; Silver & Miller, 2003; Walsh, Scharf, & Keating, 2017). Social exclusion is also seen as multidimensional, in that the activities from which an individual can be excluded are located in various life domains (Burchardt et al., 2002). With regard to the social exclusion of older adults, a group at particular risk of exclusion (European Commission, 2011), the life domains of social interaction, civic engagement, and material resources are commonly identified (Van Regenmortel et al., 2016; Walsh et al., 2017). Research involving older adults has also considered access to services, such as the post office, the chemist, health and social care services, and transport (Van Regenmortel et al., 2016; Walsh et al., 2017).

While a substantial body of research has focused on production activity (exclusion from the labour market), this form of exclusion is of limited relevance for retired older adults. Instead, exclusion from neighbourhood has been suggested as of significance, since older adults spend more time in their neighbourhood than younger adults and are often strongly attached to their neighbourhood due to long residency

(Scharf, Phillipson, & Smith, 2005). Work on place attachment has demonstrated the importance of a sense of belonging for older adults, which is argued to foster the maintenance of competence and control over space, and to enhance physical comfort and well-being (see Marcus in Peace, Wahl, Mollenkopf, & Oswald, 2007; Peace, Holland, & Kellaher, 2005; Gilleard, Hyde, & Higgs, 2007). Other research that recognises the significance of neighbourhood relates to 'ageing in place', which explores the connection between older adults' preferences for living in their own homes as long as possible with the analysis of social policy that increasingly emphasises community-based care for older adults despite high levels of frailty among clients (Smith, 2009; Gardner, 2011). Within social exclusion research the operationalisation of neighbourhood exclusion has primarily involved measuring older adults' perceptions of their neighbourhood, although the indicators used demonstrate considerable diversity as they encompass measures of feeling part of or connected to the local area, enjoyment of living in the area, satisfaction with the neighbourhood, feelings of security, the trustworthiness and friendliness of people in the area, and whether there are people in the area who would help in times of trouble (see e.g. Barnes et al., 2006, Van Regenmortel et al., 2018, Miranti & Yu, 2015; Scharf et al., 2005; Tong & Lai, 2016). Beyond the assessment of subjective perceptions, there has been a focus in social exclusion research on measuring the physical environment and analysing how objective features of a neighbourhood can contribute to the inclusion or exclusion of older adults, although such research rarely draws on established theoretical frameworks developed within environmental gerontology (for an overview, see Van Regenmortel et al., 2016).

Although it has been argued that the neighbourhood is particularly important to older adults, there is a lack of research on how neighbourhood exclusion is related to other domains of social exclusion, and the research that does exist is inconclusive. For example, one study has found neighbourhood exclusion was associated with a higher risk of exclusion from material resources and from social relations (Scharf et al., 2005), while another study has found associations between neighbourhood exclusion and exclusion from financial products (cf. material resources) and from services (Barnes et al., 2006).

1.2. Previous research on social exclusion in older adults

A key focus of social exclusion research has been on how exclusion operates within different environments, recognising that urban or rural contexts may influence the manifestation of the exclusion process for older adults. For example, there are studies that have examined old age exclusion in rural areas (e.g. Walsh, O'Shea, Scharf, & Shucksmith, 2014; Noble, Smith, & Lally, 2009; Scharf & Bartlam, 2008; Dwyer & Hardill, 2011; Milbourne & Doheny, 2012; Warburton, Scharf, & Walsh, 2017) and urban areas, particularly deprived urban areas (e.g. Scharf et al., 2005; Smith, 2009; Buffel, Phillipson, & Scharf, 2013; Tong & Lai, 2016; Burns, Lavoie, & Rose, 2012). Two studies from England have shown that older adults living in urban areas are more likely to experience social exclusion on several domains, known as multiple exclusion, than older adults living in rural areas (Barnes et al., 2006; Becker & Boreham, 2009). By contrast, a European study found that social exclusion was more prevalent in rural than urban areas (Spoor, Tasciotti, & Peleah, 2014). However, overall there have been few studies that compare social exclusion in rural and urban areas, while the majority of research has used qualitative methods. In order to enhance the understanding of how social exclusion manifests in rural and urban areas, more research is needed that uses quantitative methods and which makes direct comparison between areas.

Another key issue is to what extent social exclusion and its different domains are associated with health and well-being. The European study mentioned previously (Spoor et al., 2014), which demonstrated that social exclusion was more common in rural than urban areas nevertheless found that life satisfaction was higher in rural areas. The authors suggest that this may be due to the rural population having greater

resilience to the effects of exclusion. A national study in England found that self-reported health was associated with five out of seven domains of exclusion (Barnes et al., 2006), while a study of deprived urban areas in England reported that self-reported health and well-being were associated with each of five domains of social exclusion (Scharf et al., 2005). Studies from Japan and China have presented rather different findings, identifying individual domains associated with mortality or health (Saito, Kondo, Kondo, Ojima, & Hirai, 2012; Tong & Lai, 2016).

It should be noted, though, that there is no consensus regarding the conceptual relationship between social exclusion and health. While health has been examined as both a risk factor for and an outcome of exclusion (Sacker, Ross, MacLeaod, Netuveli, & Windle, 2017), it has also been considered as a domain social exclusion (Levitas et al., 2007). However, conceptually it is difficult to argue that individuals can be excluded from health, as opposed to excluded from resources that sustain health.

Finally, studies have demonstrated an association between well-being and neighbourhood characteristics and perceptions (Elliott, Gale, Parsons, Kuh, & Team, 2014; Toma, Hamer, & Shankar, 2015, see also Winterton et al., 2016). However, it remains unclear to what extent neighbourhood exclusion is of significance for outcomes such as health and well-being relative to exclusion from other domains. The nature of neighbourhood will also likely vary with its rural or urban character, meaning that the effect of neighbourhood exclusion on well-being may differ between rural and urban areas. This article seeks to address these knowledge gaps.

1.3. The present study

This article draws on data from the Barnsley Social Exclusion in Old Age Study, a community study that explored the nature of social exclusion among older adults in the metropolitan borough of Barnsley, United Kingdom (U.K.), a borough that covers both rural and urban areas (see Dahlberg & McKee, 2016, 2014). The main research questions are:

1 Is the level of social exclusion higher in rural or urban areas?
2 What indicators of social exclusion are associated with well-being in rural and urban areas?
3 Is neighbourhood exclusion significantly associated with well-being in rural and urban areas after controlling for the effects of other domains of exclusion?

2. Materials and method

2.1. Design

The study was a cross-sectional survey, conducted in 2008, using random probability sampling within a stratified sampling frame. The electoral register of Barnsley metropolitan borough was used to generate a list of households (including supported accommodation) that were stratified into rural or urban households on the basis of the profile of the ward in which they were located. Households were then randomly sampled from within the rural and urban lists. A sample of $N = 1200$ older adults was targeted (one participant recruited per household where one or more older adults were resident; equal number of participants in rural and urban areas) to ensure adequate statistical power for various sub-group analyses.

2.2. Study setting

Barnsley metropolitan borough (hereafter Barnsley) is situated in Northern England and has a population of just over 200 000. According to the U.K. national rural-urban classification (Local Area Districts; Defra, 2005), Barnsley (as a whole) is classified as "significant rural", a classification that includes districts that have more than 37 000 people

or 26–50% of the population in rural settlements and which applies to 53 districts, with a total of 6.4 million people or 13.4% of the U.K. population.

Traditionally, the urban area of Barnsley was built around the coal mining industry, which in the beginning of the 1980s employed 22% of all workers in Barnsley (but only 3.4% of workers in rural areas of Barnsley; U.K. Census, 1981). As a post-industrial area, Barnsley is characterised by certain features (population size, and distribution of age, gender, ethnicity, health status, employment status and/or housing) that it shares with several other post-industrial areas of the U.K (Census, 2001). The last of the collieries closed in 1994, leaving the urban areas of Barnsley deprived in many respects including material needs, skill levels and access to services (Noble et al., 2009). By comparison, the rural area of Barnsley is more affluent and at the time of the study had employment rates in line with the U.K. as a whole (Beale & McInnes, 2008).

2.3. Participants

Potential participants were considered ineligible if they were under 65 years of age, or if their physical and/or mental health was too poor to allow them to complete an interview or respond to questions reliably. In total, 1255 older adults participated, drawn from 11,035 households. The response rate was 68.1%, with no significant difference between urban and rural areas. At the time data collection was carried out, people aged 75 or over constituted 45.8% of the Barnsley population aged 65 or over, with women comprising 58.2% of all people aged 65 years and over, and 63.3% of all people aged 75 years and over (U.K. Census, 2001). By comparison, in our study people aged 75 or over constituted 51.7% of respondents, with women comprising 61.8% of all respondents, and 65.3% of all respondents aged 75 years and over. Thus, in terms of age and gender, the sample achieved was a good representation of the study population.

2.4. Materials

Items and instruments were selected for inclusion in a questionnaire on the basis of their reliability and validity in the older population, their previous successful use in comparable studies, and, given the potential frailty of some respondents, their brevity. Where no satisfactory item or instrument was found, a new item or series of items was developed by the research team.

2.4.1. Demographic characteristics

The questionnaire contained standard items on age, years at current address, gender, civil status, and educational attainment. Area of residence was coded *rural* (1), *urban* (2).

2.4.2. Self-rated health

This variable was assessed via the item: 'In general, would you say your health is…' measured on a five-point scale (*excellent* (1) to *very poor* (5); European Social Survey, 2004). This variable is henceforth labelled 'poor self-reported health' due to the direction of scoring.

2.4.3. Psychological well-being

This variable was measured using the World Health Organisation-5 Well-being Index (WHO-5; World Health Organization, 1998; scale range 0–25 (high score = high well-being); sample Cronbach's α = .87).

2.4.4. Social exclusion

Five domains of social exclusion were considered: civic activities, material resources, social relations, services, and neighbourhood. Three indicators were measured within each domain, with some items combined together into a single indicator or scale.

2.4.4.1. Exclusion from civic activities.
A measure of civic non-engagement was derived from a series of questions on civic activity (Stockholm University, 1998, The Institute for Fiscal Studies, undated). If participants had indicated that they had, within the previous year, engaged in voluntary work, and/or attended a meeting of a political party, trade union or political activism group, and/or taken part in a meeting of a tenants' group, a residents' group and/or a community group, they were coded 0 (*civic engagement*); otherwise, they were coded 1 (*no civic engagement*).

Non-voting behaviour was measured by one item that asked whether or not the participant had voted in the previous general election (Stockholm University, 1998), coded as 0 (*voter*) and 1 (*non-voter*).

A measure of low competence for civic participation was derived from two items. The first asked participants if they knew how to write a letter to appeal a decision made by a government authority (Stockholm University, 1998), the second asked if they knew how to contact their local councillor; both coded 0 (*no or don't know*) and 1 (*yes*). The items were summed and participants' total score subtracted from 3 to produce a scale with range 1–3, high scores indicating low competence for civic participation (α = .60, satisfactory for a two-item scale).

2.4.4.2. Exclusion from material resources.
Income discomfort was measured by an item asking participants how they felt about their present household income (European Social Survey, 2004), assessed on a 5-point scale from 1 (*very comfortable on present income*) to 5 (*very difficult on present income*).

Non-homeownership was measured by asking participants in what way they occupied their current accommodation: *owner occupied* (coded 0), *renting* or *living rent-free* (both coded 1) (National Statistics, 2003).

Participants were asked if they were prevented from doing the things that they wanted to do by each of thirteen factors, with response options *a significant problem*, *a slight problem*, and *not a problem* (coded 2, 1, 0 respectively). One factor, 'activities are too expensive', was used as a measure of low financial resources.

2.4.4.3. Exclusion from social relations.
Non-cohabitation was determined by an item that asked participants if they lived (shared a household) with anyone, with response options 1 (*living alone*) and 0 (*living with someone*).

From a series of items asking how often participants met and spent time with a range of people (The Institute for Fiscal Studies, undated) one was used to measure low contact with friends, coded 3 (*yearly contact or less or doesn't have relationship*), 2 (*between monthly contact and a few times a year*), 1 (*at least weekly contact*), and 0 (*daily contact*).

As previously described, participants were asked if they were prevented from doing the things that they wanted to do by each of thirteen factors. One factor, 'nobody to accompany me', was used as a measure of low social resources, with response options *a significant problem*, *a slight problem*, and *not a problem*, (coded 2, 1, 0 respectively).

2.4.4.4. Exclusion from services.
Participants were asked if, in the past year, they had experienced any problems accessing medical care services, personal care services, or practical support. This provided a measure of poor access to care, with participants who reported experiencing a problem for any care service coded 2 (*actual problem*), any remaining participants who expected to experience a problem or didn't know coded 1 (*perceived problem*) and those remaining participants who had not experienced a problem nor expected to experience a problem coded 0 (*no problem*).

Poor access to amenities was measured by asking participants how easy or difficult it would be for them to get to: a bank; the local shops; a post office; a supermarket; a chemist (The Institute for Fiscal Studies, undated). Response options for all items ranged from 1 (*very easy*) to 5 (*very difficult*). The five items were summed, producing a scale, range 5–25, with high scores indicating poor access to amenities (α = .94).

Participants were asked to indicate their agreement, from 1 (*agree*)

to 5 (*disagree*), with the statements that local public transport was: reliable; infrequent; and had routes that served the participant well. The three items were recoded where appropriate to indicate disagreement with a positive statement, then summed to form a scale, range 3–15, with high scores indicating poor public transport (α = .74).

2.4.4.5. Exclusion from neighbourhood. Respondents were asked to what extent they agreed, on a scale from *strongly agree* (1) to *strongly disagree* (5), with each of 12 statements about their local neighbourhood, defined as 'within 20 min' walk or about a mile from home'. Items were sourced from a variety of measures of perceptions of neighbourhood or community (Barnes et al., 2006; Office of the Deputy Prime Minister, 2006; Scharf et al., 2005), examples of which are 'I feel really part of this area'; 'Vandalism and graffiti are a big problem in this area'. Scale development occurred for the 12 items, with data reduction through principle components analysis and subsequent component reliability internal consistency analyses with item trial removal. Two summative subscales of neighbourhood were developed: Neighbourhood Alienation (5 items, α = .70) and Neighbourhood Threat (5 items, α = .79), see Appendix A. An item that did not load on either subscale, 'If I was away or something happened to me at home, I don't think any of the neighbours would notice for quite a while', was reverse coded as a measure of neighbourhood indifference.

2.5. Procedure

Upon selection, a household was sent a letter presenting the purpose of the study. An interviewer subsequently visited the address to establish whether anybody in the household was 65 years or older and, if so, whether this person was willing to participate in an interview. The interviews, during which the study questionnaire was completed, lasted on average 50 min.

2.6. Data analysis

Data were analysed using the IBM Statistical Package for Social Science (SPSS) v. 24.0 for Windows.

Following descriptive analysis of the study variables, bivariate analysis was performed to identify associations between rural/urban area and demographic characteristics, self-reported health and well-being; and among indicators within each social exclusion domain and between the indicators and rural/urban area, self-reported health and well-being. Three models were developed using sequential multiple regression to determine prediction of well-being (dependent variable, DV) by social exclusion indicators (independent variables; IVs): model 1, total sample; model 2, rural sample; model 3, urban sample. IVs were entered in blocks, with order of entry as required to answer our third research question. Due to the theorised link between social exclusion and health, and the well-established association between health and well-being (e.g. Diener & Chan, 2011), poor self-reported health was included in all models as a control IV. Educational attainment was also included in the rural and urban models as a control IV, since bivariate analysis indicated a significant association between rural/urban area and educational attainment (see Results, below). All IVs in the model were coded/scored so higher values reflected greater social exclusion (social exclusion indicators) or an expected positive association with social exclusion (poor self-reported health and low educational attainment). The DV was scored so higher scores reflected greater well-being.

For model 1, urban/rural area was entered as the first block, poor self-reported health as the second block, indicators of the social exclusion domains civic activity, material resources, social relations and services as the third block, and indicators of neighbourhood exclusion as the final block. For models 2 and 3, poor self-reported health and low educational attainment were entered as the first block, indicators of the social exclusion domains civic activity, material resources, social

Table 1
Participants' Demographic Characteristics (*N* = 1255).

Characteristic	(n), M (SD), range
Age	(1250) 75.7 (7.29), 65-101
Years at current address	(1251) 25.1 (17.2) 0-80
Place of residence:	n (%)
Supported Accommodation	73 (6.5)
Rural	628 (50.0)
Urban	627 (50.0)
Gender:	
Women	776 (61.8)
Men	479 (38.2)
Civil status:	
Married or cohabiting	557 (44.6)
Divorced/separated/never married	148 (11.8)
Widowed	545 (43.6)
Educational attainment:	
No formal qualifications	931 (74.2)
School or post-school qualifications	324 (25.8)

relations and services as the second block, and indicators of neighbourhood exclusion as the final block. Assumptions for multivariable analysis, including normality, linearity, homoscedasticity of residuals and multicollinearity, were examined and found to be met. For information on the removal of multivariable outliers, see model descriptions in the Results section. Level of significance was set at $p < .05$. No adjustment to experimental alpha was made for multiple testing, and so note should be taken of the potential for inflated Type I error rate.

3. Results

3.1. Descriptive analyses

Participants' demographic characteristics are summarized in Table 1. The average age of the participants was 75.7 years, and they had lived an average of 25.1 years at their current address. The majority of participants were women (61.8%), while a substantial minority were widowed (43.6%). Over two thirds of the participants had no formal educational qualifications (74.2%). The mean score on poor self-rated health was 3.14 ($SD = 0.91$, range 1–5; $n = 1237$), while the mean score on the WHO-5 Well-being Index was 14.33 ($SD = 6.41$, range 0–25; $n = 1243$).

Responses to the indicators for the five social exclusion domains are presented in Table 2. A substantial majority (82.2%) had no civic engagement, although conversely a similar majority (81.5%) voted in the last general election. The mean score for low competence for civic participation was below the scale mid-point ($M = 1.63$). The majority of participants were homeowners (58.4%), while the mean scores for income discomfort ($M = 2.61$) and low financial resources ($M = 0.45$) were both below their respective scale midpoints. A slight majority (51.0%) of participants lived alone, while the mean scores for low contact with friends ($M = 1.28$) and low social resources ($M = 0.29$) were both below their respective scale midpoints. Similarly, the mean scores for all three indicators of services and all three indicators of neighbourhood were below their respective scale midpoints.

3.2. Bivariate analyses

There was no association between rural/urban area and age, years at current address, and gender. There was a weak association between rural/urban area and civil status ($V = .07$, $p = .048$), with widowed participants represented in rural areas to a greater extent than expected, and correspondingly married/cohabiting and divorced/separated/never married participants represented to a greater extent in urban areas. There was also an association between rural/urban area and educational level ($\varphi(1244) = -.28$, $p < .001$), with higher

Table 2
Participants' responses to social exclusion indicators.

Social Exclusion Domain	
Civic activity:	n (%)
Civic non-engagement	
Civic engagement	222 (17.8)
No civic engagement	1025 (82.2)
Non-voting behaviour	
Voter	1015 (81.5)
Non-voter	230 (18.5)
	n, M (SD, range)
Low competence for civic participation	1246, 1.63 (0.77, 1-3)
Material resources:	n (%)
Non-homeownership	
Owner-occupier	728 (58.4)
Renting/Living rent-free	518 (41.6)
	n, M (SD, range)
Income discomfort	1241, 2.61 (0.84, 1-5)
Low financial resources	1243, 0.45 (0.65, 0-2)
Social relations:	n (%)
Non-cohabitation	
Living with someone	614 (49.0)
Living alone	639 (51.0)
	n, M (SD, range)
Low contact with friends	1255, 1.28 (0.79, 0-3)
Low social resources	1247, 0.29 (0.62, 0-2)
Services:	n, M (SD, range)
Poor access to care	1255, 0.40 (0.66, 0-2)
Poor access to amenities	1255, 9.72 (4.87, 5-25)
Poor public transport	1227, 8.17 (2.58, 3-15)
Neighbourhood exclusion:	n, M (SD, range)
Neighbourhood alienation	1238, 6.54 (2.70, 1-21)
Neighbourhood threat	1230, 8.99 (4.15, 1-21)
Neighbourhood indifference	1250, 2.40 (1.17, 1-5)

educational attainment associated with rural areas. Participants in rural areas compared to those in urban areas had better self-reported health ($t(1228.70) = -2.28$, $p = .023$) and poorer well-being ($t(1235) = -2.34$, $p = .019$), while poor self-reported health and well-being were strongly negatively correlated ($r(1221) = -.56$, p < .001).

Given the obtained association between rural/urban area and educational attainment and the often observed association between educational attainment and well-being (Read, Grundy, & Foverskov, 2016), it was decided that educational attainment should be controlled for in the sequential regression models of well-being within urban and rural areas.

Table 3 presents the bivariate associations among the three indicators within each social exclusion domain, and between each indicator and rural/urban area, well-being, and self-reported health. The bivariate associations between each indicator and well-being and self-reported health are also presented separately for the rural and urban samples.

The bivariate associations among indicators within each domain were almost all significant and positive, ranging from .12 (the associations between being non-voting behaviour and low civic engagement, and between poor public transport and poor access to care) to .42 (the association between income discomfort and low financial resources). The one exception to this pattern was the negative association between non-cohabitation and low contact with friends ($r_{pb}(1251) = -.08$, p = .007).

Ten out of the fifteen social exclusion indicators had significant associations with rural/urban area, the pattern of associations varying with social exclusion domain. There were significant negative associations for all three indicators of exclusion from services and for the social relations exclusion indicator low contact with friends ($r_{pb}(1253) = -.10$, p = .001), demonstrating higher levels of exclusion on these indicators in rural areas. By contrast, there were significant positive associations for all three indicators of exclusion from material resources, two of the indicators of neighbourhood exclusion

(neighbourhood alienation ($r_{pb}(1236) = .15$, p < .001) and neighbourhood threat ($r_{pb}(1228) = .50$, p < .001)), and for exclusion on the civic activity indicator low civic engagement ($\varphi(1245) = .16$, p < .001), demonstrating higher levels of exclusion on these indicators in urban areas.

Almost all of the social exclusion indicators were significantly negatively associated with well-being, the only exception being neighbourhood threat, which had a non-significant association ($r(1217) = .02$, p = .40). Similarly, almost all of the social exclusion indicators were significantly positively associated with poor self-reported health, the only exception being non-cohabitation, which had a non-significant association ($r_{pb}(1233) = .05$, p = .11).

A general pattern emerged in which the associations between social exclusion indicators and poor self-reported health and well-being were stronger in urban than rural areas. Within civic activity, this pattern was clearest for low competence for civic participation (well-being: rural $r(616) = -.17$, p < .001, urban $r(616) = -.24$, p < .001; poor self-reported health rural $r(610) = .10$, p < .05, urban ($r(615) = .22$, p < .001). Similarly, for material resources, income discomfort and lack of financial resources both had stronger associations with well-being and poor self-reported health in urban than rural areas, although for non-homeownership this was noticeable only for well-being (well-being: rural $r_{pb}(616) = -.07$, p = .079, urban $r_{pb}(614) = -.17$, p < .001; poor self-reported health: rural $r(610) = .15$, p < .001, urban $r(614) = .17$, p < .001). Of the three indicators within social relations, only non-cohabitation failed to demonstrate the dominant pattern of associations. Instead, non-cohabitation had a stronger association with well-being in rural than urban areas, while its associations with poor self-reported health were non-significant for both areas (well-being: rural $r_{pb}(617) = -.12$, p < .001, urban $r_{pb}(620) = -.05$, p = .222). For services, poor access to care and poor access to amenities both had stronger associations with well-being and poor self-reported health in urban than rural areas, although for poor public transport this was only true for well-being (well-being: rural $r(605) = -.14$, p = .001, urban $r(609) = -.22$, p < .001; poor self-reported health: rural $r(606) = .09$, p < .05, urban $r(610) = .10$, p < .05).

The general pattern of stronger associations within urban than rural areas was not found within the domain of exclusion from neighbourhood. Of the three indicators, neighbourhood threat and neighbourhood indifference demonstrated stronger associations with both well-being and poor self-reported health in rural than urban areas, although this was most apparent for the associations with well-being. However, while neighbourhood alienation had its strongest association with well-being in rural areas, its strongest association with poor self-reported health was in urban areas (well-being: urban $r(615) = -.25$, p < .001, rural $r(609) = -.31$, p < .001; poor self-reported health: urban $r(614) = .23$, p < .001, rural $r(604) = .16$, p < .001).

3.3. Multivariable analyses

Tables 4–6 display the unstandardized regression coefficients (B), standard error of B, standardized regression coefficients (β) and significance (p) for each IV after entry of all IVs in sequential multiple regression models predicting well-being.

Due to listwise deletion of missing values and the deletion of six multivariable outliers (Mahalanobis distance < .001) for model 1 (whole sample, Table 4), model $n = 1133$. R was significantly different from zero at the end of each step. After Step 4, with all IVs in the equation, $R = .68$, $F(17, 1115) = 54.84$, p < .001.

After Step 1, with area of residence included, $R^2 = .005$, $R^2_{adj} = .004$, $F_{inc}(1, 1131) = 5.57$, $p = .018$. After Step 2, with poor self-reported health added, $R^2 = .321$, $R^2_{adj} = .320$, $F_{inc}(1, 1130) = 525.35$, p < .001. After Step 3, with social exclusion indicators for the domains of civic activity, material resources, social relations and services added, $R^2 = .443$, $R^2_{adj} = .436$, $F_{inc}(12, 1118) = 20.45$, p < .001. After Step 4, with social exclusion indicators for neighbourhood exclusion added,

Table 3

Bivariate associations among social exclusion domain indicators and with rural/urban area, WHO-5 (well-being), and poor self-reported health.

Variable:	1	2	Area (urban)	Total sample		Rural		Urban	
				Well-being	Poor SRH	Well-being	Poor SRH	Well-being	Poor SRH
Social exclusion domain:									
Civic activity									
1.Civic non-engagement	–	–	.16***	−.09**	.11***	−.11**	.12**	−.10*	.14**
2.Non-voting behaviour	.12***	–	.01	−.12***	.14***	−.14**	.11**	−.11**	.12**
3.Low competence for civic participation	.18***	.19***	.03	−.21***	.16***	−.17***	.10*	−.24***	.22***
Material resources									
1.Income discomfort	–	–	.15***	−.20***	.22***	−14**	.13**	−.29***	.30***
2.Non-homeownership	.18***	–	.10***	−.11***	.16***	−.07	.15***	−.17***	.17***
3.Low financial resources	.42***	.16***	.14***	−.13***	.14***	−.08*	.02	−.19***	.22***
Social relations									
1. Non-cohabitation	–	–	.03	−.08**	.05	−.12**	.07	−.05	.02
2. Low contact with friends	−.08**	–	−.10**	−.18***	.12***	−.15***	.11**	−.21***	.14**
3. Low social resources	.24***	.14***	−.05	−.34***	.21***	−.27***	.16***	−.41***	.27***
Services									
1.Poor access to care	–	–	−.13***	−.24***	.11***	−.13**	.03	−.35***	.21***
2.Poor access to amenities	.23***	–	−.10***	−.38***	.29***	−.27***	.25***	−.50***	.35***
3.Poor public transport	.12***	.23***	−.10***	−.18***	.09**	−.14**	.09*	−.22***	.10*
Neighbourhood exclusion									
1.Neighbourhood alienation	–	–	.15***	−.26***	.21***	−.31***	.16***	−.25***	.23***
2.Neighbourhood threat	.40***	–	.50***	.02	.11***	−.18***	.11**	.08	.08*
3.Neighbourhood indifference	.27***	.18**	.01	−.12***	.07**	−.26***	.12**	.02	.04

Note: *n* for each bivariate association will vary due to missing cases. Well-being measured by WHO-5 Well-being Index.
Key: SRH = self-reported health.
  * p < .05.
  ** p < .01.
  *** p < .001.

Table 4

Sequential multiple regression of well-being on area of residence, poor self-reported health and social exclusion indicators (n = 1133).

Variable	B	SE B	β	p
Area of residence (urban)	.39	.336	.03	.251
Poor self-reported health	−3.07	.169	−.44	.000
Low civic engagement	−.01	.393	−.00	.978
Non-voting behaviour	−.13	.376	−.01	.728
Low competence for civic participation	−.55	.198	−.07	.005
Income discomfort	−.60	.192	−.08	.002
Non-homeownership	−.00	.304	.00	.997
Low financial resources	.17	.251	.02	.511
Non-cohabitation	−.14	.304	−.01	.646
Low contact with friends	−.08	.192	−.01	.678
Low social resources	−1.70	.267	−.16	.000
Poor access to care	−.78	.228	−.08	.001
Poor access to amenities	−.17	.034	−.12	.000
Poor public transport	−.20	.058	−.08	.000
Neighbourhood alienation	−.26	.061	−.12	.000
Neighbourhood threat	.15	.046	.10	.001
Neighbourhood indifference	−.18	.129	−.03	.156

R^2 = .019 for Step 1; ΔR^2 = .316 for Step 2; ΔR^2 = .122 for Step 3; ΔR^2 = .012 for Step 4 (ps < .05).

R^2 = .455, R^2_{adj} = .447, F_{inc}(3, 1115) = 8.46, p < .001. Thus, there was a significant increment in R^2 at each step in the model.

Nine IVs were significant in the final model of well-being: poor self-reported health (semi-partial correlation: sr^2 = .161), low competence for civic participation (sr^2 = .004), income discomfort (sr^2 = .005), low social resources (sr^2 = .020), poor access to care (sr^2 = .006), poor access to amenities (sr^2 = .011), poor public transport (sr^2 = .006), neighbourhood alienation (sr^2 = .007) and neighbourhood threat (sr^2 = .005).

Comparison of the analyses in Tables 3 and 4 indicate that, while neighbourhood threat had a non-significant association with well-being at the bivariate level (r = .02), in the multivariable model this association was significant ($β$ = .10), demonstrating the presence of a suppressor variable. Through trial runs of the model with rotated IV

Table 5

Sequential multiple regression of well-being on poor self-reported health, low educational attainment, and social exclusion indicators in rural areas (n = 558).

Variable	B	SE B	β	p
Poor self-reported health	−3.06	.250	−.43	.000
Low educational attainment	−.37	.484	−.03	.444
Low civic engagement	.17	.538	.01	.755
Non-voting behaviour	−.61	.558	−.04	.277
Low competence for civic participation	−.48	.297	−.06	.124
Income discomfort	−.26	.275	−.03	.351
Non-homeownership	.64	.470	.05	.176
Low financial resources	−.10	.371	−.01	.802
Non-cohabitation	−.23	.460	−.02	.613
Low contact with friends	−.15	.270	−.02	.585
Low social resources	−1.64	.379	−.16	.000
Poor access to care	−.26	.316	−.03	.421
Poor access to amenities	−.10	.045	−.09	.021
Poor public transport	−.20	.089	−.08	.024
Neighbourhood alienation	−.22	.095	−.10	.018
Neighbourhood threat	−.12	.100	−.04	.242
Neighbourhood indifference	−.72	.197	−.13	.000

R^2 = .276 for Step 1; ΔR^2 = .100 for Step 2; ΔR^2 = .038 for Step 3 (ps < .05).

removal, neighbourhood alienation was identified as the variable most responsible for the suppression effect: with neighbourhood alienation removed from the model, the beta weight for the association between neighbourhood threat and well-being was reduced and became non-significant ($β$ = .05).

Due to listwise deletion of missing values and the deletion of an additional multivariable outlier (Mahalanobis distance < .001) for model 2 (rural sample, Table 5), model n = 558. R was significantly different from zero at the end of each step. After Step 3, with all IVs in the equation, R = .64, F(17, 540) = 22.36, p < .001.

After Step 1, with poor self-reported health and low educational attainment added, R^2 = .276, R^2_{adj} = .273, F_{inc}(2, 555) = 105.67, p < .001. After Step 2, with social exclusion indicators for the domains of civic activity, material resources, social relations and services added,

Table 6
Sequential multiple regression of well-being on poor self-reported health, low educational attainment and social exclusion indicators in urban areas (n = 567).

Variable	B	SE B	β	p
Poor self-reported health	−2.93	.230	−.42	.000
Low educational attainment	.69	.586	.04	.238
Low civic engagement	−.52	.616	−.03	.403
Non-voting behaviour	.60	.501	.04	.233
Low competence for civic participation	−.46	.271	−.05	.091
Income discomfort	−.92	.265	−.12	.001
Non-homeownership	−.62	.392	−.05	.117
Low financial resources	.29	.336	.03	.393
Non-cohabitation	.03	.399	.00	.948
Low contact with friends	−.12	.276	−.01	.665
Low social resources	−1.70	.380	−.15	.000
Poor access to care	−1.40	.334	−.13	.000
Poor access to amenities	−.28	.053	−.18	.000
Poor public transport	−.14	.075	−.06	.072
Neighbourhood alienation	−.20	.079	−.09	.011
Neighbourhood threat	.17	.052	.12	.002
Neighbourhood indifference	.41	.171	.07	.017

$R^2 = .363$ for Step 1; $\Delta R^2 = .163$ for Step 2; $\Delta R^2 = .017$ for Step 3 ($ps < .05$).

$R^2 = .376$, $R^2_{adj} = .359$, $F_{inc}(12, 543) = 7.23$, $p < .001$. After Step 3, with social exclusion indicators for neighbourhood exclusion added, $R^2 = .413$, $R^2_{adj} = .395$, $F_{inc}(3, 540) = 11.52$, $p < .001$. Thus, there was a significant increment in R^2 at each step in the model.

Six IVs were significant in the final model of well-being: poor self-reported health ($sr^2 = .163$), low social resources ($sr^2 = .020$), poor access to amenities ($sr^2 = .006$), poor public transport ($sr^2 = .006$), neighbourhood alienation ($sr^2 = .006$) and neighbourhood indifference ($sr^2 = .014$).

Due to listwise deletion of missing values and the deletion of three additional multivariable outliers (Mahalanobis distance < .001) for model 3 (urban sample, Table 6), model $n = 567$. R was significantly different from zero at the end of each step. After Step 3, with all IVs in the equation, $R = .74$, $F(17, 549) = 38.71$, $p < .001$.

After Step 1, with poor self-reported health and low educational attainment added, $R^2 = .365$, $R^2_{adj} = .363$, $F_{inc}(2, 564) = 162.36$, $p < .001$. After Step 2, with social exclusion indicators for the domains of civic activity, material resources, social relations and services added, $R^2 = .529$, $R^2_{adj} = .517$, $F_{inc}(12, 552) = 15.94$, $p < .001$. After Step 3, with social exclusion indicators for neighbourhood exclusion added, $R^2 = .545$, $R^2_{adj} = .531$, $F_{inc}(3, 549) = 6.65$, $p < .001$. Thus, there was a significant increment in R^2 at each step in the model.

Eight IVs were significant in the final model of well-being: poor self-reported health ($sr^2 = .134$), income discomfort ($sr^2 = .010$), low social resources ($sr^2 = .017$), poor access to care ($sr^2 = .015$), poor access to amenities ($sr^2 = .023$), neighbourhood alienation ($sr^2 = .005$), neighbourhood threat ($sr^2 = .007$), and neighbourhood indifference ($sr^2 = .005$).

Comparison of the analyses for urban areas presented in Tables 3 and 6 indicated that while both neighbourhood threat and neighbourhood indifference had non-significant associations with well-being at the bivariate level ($r = .08$; $r = .02$), in the multivariable model their respective associations were significant ($\beta = .12$; $\beta = .07$), demonstrating the presence of a suppressor variable. Through trial runs of the model with rotated IV removal, neighbourhood alienation was identified as the variable most responsible for the suppression effect on neighbourhood threat: with neighbourhood alienation removed from the model, the beta weight for the association between neighbourhood threat and well-being was reduced to the level of the bivariate association ($\beta = .08$), although it remained significant ($p = .021$). However, the beta weight for the association between neighbourhood indifference and well-being was unchanged. Further trial runs of the model identified low social resources as the variable most responsible

for the suppression effect on neighbourhood indifference: with both neighbourhood alienation and low social resources removed from the model, the beta weight for the association between neighbourhood indifference and well-being was reduced ($\beta = .05$) and became non-significant ($p = .074$).

4. Discussion

Based on a cross-sectional survey of older adults living in a U.K. metropolitan borough with both rural and urban areas, this study examined the relationship between different domains of social exclusion and well-being with a particular focus on neighbourhood.

The first research question was whether social exclusion was greater in rural or urban areas. Ten out of fifteen social exclusion indictors were significantly associated with rural/urban area, with four associations reflecting higher levels of social exclusion in rural areas and six reflecting higher levels in urban areas. Living in a rural area was associated with all three indicators of exclusion from services and low contacts with friends. Previous research has found that living in a rural areas was associated with exclusion from services, social relationships, and social participation (Barnes et al., 2006; Walsh, O'Shea, Scharf, & Murray, 2012). Such findings are understandable when issues such as population density and the sustainability of private and public services are considered. It has previously been argued that older adults in rural areas may be particularly vulnerable to social isolation and that this may be partly due to an out-migration of younger people from rural areas (Moffatt & Glasgow, 2009; Scharf & Bartlam, 2008).

Living in an urban area was associated with all three indicators of exclusion from material resources, civic non-engagement, and two indicators of neighbourhood exclusion, that is, neighbourhood alienation and neighbourhood threat. The higher risk of exclusion from material resources in urban areas is in contrast with previous research, which found that the risk of poverty in later life is greater in rural areas (see Moffatt & Glasgow, 2009). Such contrasting findings may be due to the post-industrial and relatively deprived character of the urban areas in our study, which may also have contributed to a higher level of neighbourhood exclusion in the urban areas. However, Barnes and colleagues also found that neighbourhood exclusion was associated with living in urban areas (Barnes et al., 2006).

It is worth noting that a third of our social exclusion indicators was not significantly associated with rural/urban area, with only one out of three indicators in each of the civic activity and social relations domains being significant. Taken together, this suggests that it is important to consider the rural/urban distinction when seeking to understand social exclusion levels and processes, but that its relevance and importance varies across exclusion domains.

Our second research question asked what indicators of social exclusion are associated with well-being in older adults in rural and urban areas. With the exception of neighbourhood threat, all social exclusion indicators across all five domains were negatively associated with well-being in our bivariate analyses. This is in line with previous research (e.g. Becker & Boreham, 2009; Scharf et al., 2005).

In the multivariate models for rural and urban samples, social exclusion explained more variance in well-being in the urban than rural model. This was also reflected in the number of significant exclusion indicators, with seven significant indicators in the urban model compared to five in the rural model. The separate models had in common that low social resources, poor access to amenities and neighbourhood alienation were negatively associated with well-being. In the rural model, low social resources explained the highest proportion of unique variance in well-being, while poor public transport was significant in the rural but not in the urban model. Previous research has shown that non-drivers are more likely to report poor well-being and that problems with public transport are particularly pronounced in rural areas (Luiu, Tight, & Burrow, 2017, cf. Scharf & Bartlam, 2008; Warburton et al., 2017). Conversely, income discomfort and poor access to care

contributed to low well-being in the urban but not in the rural model.

Neighbourhood alienation was negatively associated with well-being in both rural and urban areas, while neighbourhood indifference was negatively associated with well-being in rural areas. The surprising positive associations between neighbourhood threat and indifference and well-being in urban areas were reduced or became non-significant with the removal of suppressor variables from the urban model.

Interestingly, our data show that social exclusion sometimes has its strongest association with well-being in areas where the level of social exclusion is relatively low. For example, exclusion from services was higher among people living in rural areas, but poor access to care and poor access to amenities both had their strongest associations with well-being in urban areas in both bivariate and multivariable analyses. Conversely, neighbourhood alienation and neighbourhood threat had their strongest associations with well-being in rural areas in bivariate analyses, even though such exclusion on these indicators was higher in urban areas. These findings echo those of the European study (Spoor et al., 2014) that found that life satisfaction was higher in rural areas although social exclusion was more common in rural than urban areas. Social exclusion has been described as a process preventing people from participating in activities seen as standard in the society in which they live, and thus differences between rural and urban areas in the strength of the association between social exclusion and well-being could be due to divergent normative expectations in rural and urban areas, for example regarding access to services or neighbourhood inclusion.

Our final research question concerned whether indicators of neighbourhood exclusion would explain additional variance in well-being once other social exclusion indicators had been included in the models. This study shows that the addition of neighbourhood exclusion indicators at the final step of the analyses significantly increased the amount of explained variance in well-being for all models. While there have been strong theoretical arguments and qualitative evidence for the consideration of neighbourhood in research on social exclusion of older adults (e.g. Scharf et al., 2005; Walsh et al., 2012), this study provides novel quantitative evidence of the unique contribution of neighbourhood exclusion to well-being in older adults.

4.1. Strengths and limitations of the study

As would be expected of a community study, our study was carried out in a delimited geographical area. As described above, Barnsley can be classified in ways that connect it to other areas of the UK with which it shares key demographic and geographic characteristics. In particular, its post-industrial character will be reflected in our results. Our findings should therefore be generalised with great caution to the general population of older adults in the U.K. (and indeed with greater caution to other countries), and require replication in research that samples older adults from other areas and communities with a different demographic and geographic profile.

A major strength of this study is its scope. The study is able to address important issues relating to social exclusion, such as the relative contribution of different domains of social exclusion to well-being, the significance of neighbourhood exclusion for older adults, and the manifestation of social exclusion in urban and rural areas. Further strengths of the study include its use of random probability sampling within a stratified sampling frame, a good response rate, and a sample that is a good representation by age and gender of the study population.

There is a need for further attention to methodological issues in social exclusion research, as there is no consensus on how to measure social exclusion, and debate continues over the domains that constitute social exclusion. Our study focused on those domains that at present are arguably standard for social exclusion research on older adults, but there are strong arguments that other domains are worth evaluating and future research could explore the impact such domains have on the exclusion and well-being of older adults (for an overview of different operationalisations of social exclusion, see Van Regenmortel et al.,

2016). Some of the indicators of social exclusion used in this study were relatively insensitive, restricting potential associations with other variables, and it can be argued that some indicators were not optimal measures of social exclusion. For example, the measure of low competence for civic activity might better be regarded as a measure of risk of exclusion, i.e., indicating the individual's perceived competence to engage in civic activity rather than their actual level of engagement.

There is also a need to further develop conceptualisations and measurement of neighbourhood exclusion. In the present study we considered neighbourhood alienation, threat and indifference, whereas other studies have focused on, for example, the physical environment, level of deprivation (Gale, Dennison, Cooper, & Sayer, 2011), or older adults' use of public spaces (Nosowska, McKee, & Dahlberg, 2014). While our study hopefully highlights the importance of combining older adults' micro-level perceptions of their neighbourhoods with the meso-level conceptualisation of environments as rural or urban, we recognise that the broad categorisation of areas in our study as urban or rural represents a great simplification of the diversity of living environments that exist (cf. Warburton et al., 2017); that many environmental characteristics are common to both urban and rural areas although prevalent to different degrees, while other characteristics are almost definitively urban or rural. There is presently a lack of research that combines an assessment of micro-level perceptions of the environment with a more nuanced and detailed analysis of meso-level social and physical environmental factors, for example through small-area analysis and more sophisticated representations of neighbourhood and community that combine subjective and objective representations.

A final limitation of the present study is its cross-sectional design, which means that the causal direction of the associations between social exclusion indicators and well-being cannot be determined. Although it is likely that social exclusion has a negative effect on well-being, the effect could be argued to work in the opposite direction, i.e., low well-being may be a causal factor in why some people become marginalised in society.

5. Conclusions

This study provides valuable insights into the relationship between social exclusion in rural and urban areas and well-being in older adults. It also demonstrates the significance of neighbourhood for understanding the relationship between social exclusion and well-being in later life. This has policy implications, since initiatives to tackle social exclusion to date have emphasised the urban environment rather than neighbourhood exclusion (Moffatt & Glasgow, 2009).

Our study also indicates that social exclusion sometimes has its strongest association with well-being in areas where the level of social exclusion is relatively low. An implication of this finding is that policy that directs interventions to areas in which social exclusion among older adults is likely to be high, i.e., deprived urban areas (such as the World Health Organization's goal to develop age-friendly cities (World Health Organization, 2007)) will not necessarily achieve significant improvements in well-being in later life. Our findings challenge simplistic notions regarding the relationship between social exclusion and well-being, and suggest that the rural or urban nature of an area and the important role of neighbourhood must be fully considered in any policy initiative to tackle social exclusion and promote well-being in older adults.

Conflict of interests statement

The authors have no conflict of interest to declare.

in collaboration between Age Concern Barnsley (ACB) and Sheffield Hallam University (SHU). SHU Faculty Research Ethics Committee (FREC), Faculty of Development and Society, provided ethical approval. Phil Wormald at ACB; Tamsin-Bowers Brown, Maria Burton, Rachel Ibbotson, Dot Biggin, Martin Hyde and interviewers at SHU contributed to the research.

Appendix A. Scale items for Exclusion from neighbourhood

Subscale: Neighbourhood Alienation

I feel really part of this area (reverse scored)
I often feel lonely living in this area
If you were in trouble, there are lots of people in this area who would help you (reverse scored)
This area is a good place to grow old in (reverse scored)
I know most of my neighbours (reverse scored)

Subscale: Neighbourhood Threat

Vandalism and graffiti are a big problem in this area
Most people in this area can be trusted (reverse scored)
People would be afraid to walk alone in this area after dark
People in this area will take advantage of you
This area is kept very clean (reverse scored).

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