Health & Place 22 (2013) 82–89

Contents lists available at SciVerse ScienceDirect

Health & Place

journal homepage: www.elsevier.com/locate/healthplace

Who does well where? Exploring how self-rated health differs across diverse people and neighborhoods

Hannah Badland [a,*], Gavin Turrell [b], Billie Giles-Corti [a]

[a] McCaughey VicHealth Centre for Community Wellbeing, University of Melbourne, Melbourne, Level 5, 207 Bouverie Street, Carlton, VIC 3010, Australia
[b] School of Public Health and Social Work, Queensland University of Technology, Brisbane, Kelvin Grove Campus, Victoria Park Road, Kelvin Grove, QLD 4059, Australia

ARTICLE INFO

Article history:
Received 15 June 2012
Received in revised form
25 February 2013
Accepted 17 March 2013
Available online 6 April 2013

Keywords:
Inequalities
Adults
Multilevel modeling
HABITAT
Neighborhood disadvantage

ABSTRACT

This work establishes whether neighborhood disadvantage amplifies the impact of socioeconomic position (**SEP**) on a graded measure of self-rated health (**SRH**). SRH data were taken from 10,932 adults recruited across 200 Brisbane neighborhoods. After adjusting for demographics, those who lived in the most disadvantaged neighborhoods were more likely to report poor SRH than those living in the least disadvantaged neighborhoods (*OR*=2.67). Those with the lowest SEP and lived in the most advantaged neighborhoods had a similar probability of reporting excellent SRH as those with the highest SEP living in the most disadvantaged neighborhoods. This work highlights the importance of examining SEP and neighborhood-level disadvantage simultaneously when planning communities.

1. Introduction

The relationships between social inequalities and health outcomes is well established in developed countries; those who are socioeconomically disadvantaged or live in deprived neighborhoods experience higher levels of disease and die earlier compared with those more advantaged (Crombie et al., 2002; Strategic Review of Health Inequalities in England post-2010, 2010). This phenomenon manifests itself in part through compositional (individual-level) and contextual (area-level) exposures (Kawachi, 2002; Macintyre, 2007). Health and place-based research has established potential causal pathways between these exposures on health outcomes, supported by quantitative and qualitative evidence showing who you are and where you live are associated with health behaviors and outcomes (Torsheim et al., 2004; Franzini et al., 2005; Cummins et al., 2007; Chandola et al., 2003; Sacker et al., 2000, Wilkinson and Pickett, 2006; Giles-Corti and Donovan, 2003; Turrell and Mathers, 2001).

Using the deprivation amplification argument (Macintyre, 2007), compositional and contextual effects compound; that is, having a low socioeconomic position (**SEP**) and living in deprived areas expose individuals to double disadvantage. Conversely, there is a 'pulling-up' effect for those of low SEP residing in more advantaged areas. When matched by SEP, those living in less deprived areas have better health profiles than those living in more deprived areas (Cummins et al., 2007; Strategic Review of Health Inequalities in England post-2010, 2010). Earlier work suggests contextual factors have only a modest effect on explaining health outcomes when compared with compositional factors (Pickett and Pearl, 2001). More recent work using multilevel modeling, however, has further considered the complexities of health and place-based research, suggesting that the strength of associations between contextual factors and health outcomes is stronger than previously thought, but differs by the scale of administrative units applied (Giles-Corti et al., 2005), health outcomes examined, and measures of area-level exposure (Riva et al., 2007).

Self-rated health (**SRH**) is associated with overall mortality and morbidity across the socioeconomic spectrum (Burström and Fredlund, 2001; Kaplan and Camacho, 1983), and is influenced by both individual-level SEP and neighborhood disadvantage (Browning and Cagney, 2002; Kennedy et al., 1998; Torsheim et al., 2004; Franzini et al., 2005). Different SRH reference points are used differently by population groups; for example when asked about SRH, older adults are more likely to consider presence of chronic conditions, whereas those with higher education attainment are more likely to reflect on their general health status (Krause and Jay, 1994). However, a meta-analysis demonstrated the global measures of SRH accurately predict mortality after adjusting for functional status, depression, and co-morbidities (DeSalvo et al., 2006). Franzini et al. (2005) developed pathways for conceptualizing how neighborhood-level disadvantage (both physical and social aspects) contribute to SRH. Neighborhood-level

* Corresponding author. Tel.: +61 3 8344 0943; fax: +61 3 9348 2832.
E-mail addresses: hannah.badland@unimelb.edu.au (H. Badland), g.turrell@qut.edu.au (G. Turrell), billie.giles-corti@unimelb.edu.au (B. Giles-Corti).

1353-8292/$ - see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.healthplace.2013.03.006

disadvantage was associated with lower collective efficacy, trust, and social capital, and higher levels of social and physical disorder, fear of crime, and racism; demonstrating the relationship between neighborhood disadvantage and SRH is mediated by the social and physical characteristics of the area. Other work, using student data obtained from 22 countries, demonstrated additive, rather than interactive effects, of SEP and neighborhood-level disadvantage on SRH (Torsheim et al., 2004). When SEP was considered alone, the most deprived students were three times more likely to report poor SRH than the least deprived students. However, when SEP and neighborhood-level disadvantage were considered together, the most deprived students were eight times more likely to report poor SRH compared with the least deprived students (Torsheim et al., 2004). Together, this emphasizes the importance of studying the multilevel structure of disadvantage, and indeed whether there is a double disadvantage, when considering SRH.

The rationale for choosing specific indicators of SEP is often unjustified, and different measures are frequently treated as having the same conceptual underpinning and underlying constructs, despite empirical evidence suggesting otherwise (Dutton et al., 2005). Using multiple measures of SEP, such as education attainment and household income, has been suggested as a way of revealing different patterning of socioeconomic markers on health outcomes through diverse causal pathways (Geronimus and Bound, 2007). Furthermore, education attainment and household income have established unique and predictive contributions to SRH (Lantz et al., 2001). These two measures of SEP are appropriate for the 'baby boomer' population being investigated here (i.e., those born between 1946 and 1964), as most have attained their highest qualification and career advancement, therefore near maximum earning potential at the time of being studied.

As well as conceptual considerations, a further limitation of research using SRH as an outcome is that the measure is frequently collapsed into a dichotomy (poorer versus better SRH), despite being initially assessed on a three- or five-point scale (Power et al., 1998; Mackenbach et al., 1997; Rahkonen et al., 1995). Using this reductionist data treatment approach potentially obscures important patterns of SRH and results in a loss of information and statistical efficiency (Agresti, 1984). An approach that considers SRH in a more sensitive manner (i.e., using a multinomial rather than binomial outcome) contributes further to our understanding of the outcome as a continuum in relation to measures of disadvantage (Manor et al., 2000).

Taking into account this earlier work, we are interested in exploring how different exposures to disadvantage may result in inequalities for SRH in middle-aged adults, living in a relatively affluent country (Australia) (United Nations Development Program, 2011). We believe it reasonable to expect education attainment and household income to be independently, and differently associated with SRH, with the strength of these associations varying by neighborhood-level disadvantage. The first aim of this paper was to establish the multilevel relationship of disadvantage on categorical responses of SRH in middle-aged Australian adults. The second aim was to examine the association between two measures of SEP on categorical responses of SRH, and whether these differed across neighborhoods that varied by disadvantage. We explore whether double disadvantage exists for those with low SEP in the Australian context, and the protective effects, if any, that living in more affluent neighborhoods may provide. We unpack these relationships using multilevel approaches and finer-grained measures of SRH.

2. Methods

This research uses the 2007 survey data (wave I) of the HABITAT (*H*ow *A*reas in *B*risbane *I*nfluence Heal*th* *a*nd *A*ctivity) study. HABITAT is a longitudinal (2007–2011) study of 'baby boomer' women and men living in Brisbane, Australia. Detailed information about the study can be found elsewhere (Burton et al., 2009). HABITAT was granted ethical approval by The University Human Research Ethics Committee at the Queensland University of Technology (ID3967H).

2.1. Study areas

The Census Collection District (**CCD**) was the primary sampling unit. Containing approximately 200 households, these are the smallest administration units used by the Australian Bureau of Statistics to collect census data. For this study, the 1625 contiguous CCDs in Brisbane were ranked based on their Index of Relative Socioeconomic Disadvantage (**IRSD**) scores. Comprising of 17 attributes, the IRSD is a composite area-level measure reflecting, amongst other things, the proportion of low-income families, low educational attainment, and employment in unskilled occupations for those who reside in the CCD. The IRSD is an ecologic exposure derived by aggregating individual responses to questions asked on the national census form. When testing for an ecologic effect with aggregated exposure it is necessary to simultaneously model individual-level variables (e.g., income) and their neighborhood-level analogs (e.g., % of low income households) (Subramanian et al., 2007). As such, in line with previous work (Turrell et al., 2010), we included five individual-level controls in the multilevel analyses: age, sex, education attainment, household income, and employment status; each of which has an area-level analog represented in the IRSD.

2.2. Neighborhood-level measures

CCDs were divided into quintiles based on IRSD scores (quintile 1 (Q1)=most disadvantaged neighborhoods through to quintile 5 (Q5)=most advantaged neighborhoods). Forty CCDs were randomly selected within each quintile of neighborhood disadvantage, totaling 200 CCDs overall. The sampled CCDs reflected the non-sampled CCDs (Burton et al., 2009).

2.3. Participants

Households containing at least one person aged 40–65 years as at March 2007 within selected CCDs were identified through the Australian Electoral Commission. An average of 85 households per CCD was sampled using systematic without replacement probability proportional-to-size sampling. One person aged 40–65 years was randomly selected and invited to participate in the study from each of the 17,000 identified households. After excluding surveys that were subsequently deemed out-of-scope (e.g. deceased, left-address, too ill or disabled to participate) a total of 11,037 eligible and useable surveys were returned (68.5% response rate).

2.4. Individual-level measures

Individual-level data were collected using a structured self-administered mail survey during May–July 2007 (Dillman, 2000). The outcome measure of interest in this paper is SRH, where participants responded to the question: 'In general, would you say your health is?' Response options were: excellent, very good, good, fair, and poor. As has been done elsewhere (Ericksson et al., 2001), SRH was collapsed to excellent (excellent and very good), good (good), and poor (fair and poor).