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Are neighbourhood inequalities in adult health explained by socio-economic and psychosocial determinants in adolescence and the subsequent life course in northern Sweden? A decomposition analysis

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ABSTRACT

This study explains neighbourhood deprivation inequalities in adult health for a northern Swedish cohort by examining the contribution of socio-economic and psychosocial determinants from adolescence (age 16), young adulthood (age 21) and midlife (age 42) to the disparity. Self-reported information from 873 participants was drawn from questionnaires, with complementary neighbourhood register data. The concentration index was used to estimate the inequality while decomposition analyses were run to attribute the disparity to its underlying determinants. The results suggest that socio-economic and psychosocial factors in midlife explain a substantial part, but also that the inequality can originate from conditions in adolescence and young adulthood.

1. Background

In recent years, three broad strands of social epidemiological literature – focusing on neighbourhoods, life course and inequalities, respectively – have developed without much direct conceptual, empirical or methodological integration. First, 'neighbourhood and health' research acknowledges that health is unevenly distributed across residential areas, but attempts to explain this inequality have focused primarily on concurrent circumstances in adulthood. Secondly, the 'life course perspective' states that adult health may also be affected by exposures during earlier life periods, but instead of focusing on circumstances to understand health disparities, this research has been mostly concerned with explaining overall population health. Thirdly, while 'social inequalities in health' have received much empirical attention, the focus in this field has been mostly directed towards health differences at the individual level (e.g. by income or education), with efforts to explain the disparity being largely contemporaneous. Ultimately, the present study merge lines of social epidemiological inquiry that have evolved chiefly in parallel during the last decades. As a result, it explores the issue of neighbourhood deprivation inequalities in adult health by examining the contribution of socio-economic and psychosocial determinants from adolescence, young adulthood and midlife to the disparity.

Following the increased interest in residential variations in ill-health, studies examining the so-called 'neighbourhood effects on health' have typically used cross-sectional data to explore whether the inequality could be attributed to the context of the area, either independently of or in combination with concurrent individual characteristics (Arcaya et al., 2016; Diez Roux and Mair, 2010; Oakes et al., 2015). Based on this research, the uneven distribution of health across differently deprived areas have been approached primarily from a contemporaneous perspective. As a result, the possibility that neighbourhood socio-economic inequalities in adult health (henceforth referred to as neighbourhood *deprivation* inequalities in health) can be explained by exposures during earlier life periods have so far been largely overlooked (Osypuk, 2013).

In contrast to the cross-sectional dominance of neighbourhood and health research, studies drawing upon the life course epidemiological approach (Ben-Shlomo and Kuh, 2002) acknowledge that the implications of daily living conditions are not always immediate, but can have effects on health that do not become visible until decades later (Lynch and Smith, 2005). Supporting this notion is research that indicate how individual (Agahi et al., 2014; Hyde et al., 2006) and contextual (Gustafsson, Bozorgmehr, Hammarström, & Sebastian, 2017) factors from the previous life course are important for self-reported health problems in adulthood. As explained by Diderichsen et al. (2001), however, the determinants *of health* and of *health inequalities* are not necessarily the same. As a result, contemporary life course research has

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typically focused on factors that may be helpful to understand – and ultimately improve – the health of the population, rather than those that can be used to reduce the disparities (Dahlgren and Whitehead, 2006).

In light of the growing awareness of social inequalities in health, the disproportionate concentration of ill-health among disadvantaged groups has nevertheless received attention in a parallel line of inquiry. Despite the fact that conceptual descriptions of this matter usually include both contextual and life course perspectives (Arcaya et al., 2015; Marmot et al., 2012; Solar and Irwin, 2010), there is a scarcity of empirical studies that integrate them simultaneously to explain the disparities. For example, most research in this field has focused on health differences by income or education, thereby overlooking the socio-economic inequalities in adult health that exist at higher contextual levels, such as between neighbourhoods (Macintyre and Ellaway, 2003). In addition, studies that attempt to identify conditions that underpin the inequalities with decomposition methods (e.g. Hosseinpoor et al., 2006; McGrail et al., 2009; Morasae et al., 2012; Sortsø et al., 2017) have, with few exceptions (see Mosquera, San Sebastian, Ivarsson, Weinehall, & Gustafsson, 2017) not applied a life course perspective. To our knowledge, none have used decomposition methods to explain neighbourhood deprivation inequalities in adult health.

To guide us in our attempt to empirically explore the uneven distribution of adult health between differently deprived neighbourhoods, the conceptual framework of the study is presented below.

1.1. Conceptual framework

When it comes to determinants of not only *health* but of *health inequalities*, a strong determinant of health can be expected to matter for a corresponding inequality in health to the extent the determinant is also i) unequally distributed across social groups (in our case neighbourhoods) and ii) sufficiently frequent to be able to make an impact on a population-level phenomenon such as health inequality. As clarified by Jokela (2015), explaining neighbourhood deprivation inequalities in adult health thus requires identifying conditions which influence people's health and simultaneously relates to their area of residence.

As emphasized in the social epidemiological literature, socio-economic circumstances (e.g. education, employment and income/financial resources) are essential in the development of ill-health and disease (Glymour et al., 2014). These factors are important because they affect people's cognitive and emotional skills (e.g. education) as well as their material living conditions and access to various health-enhancing resources (e.g. income and occupation) (Galobardes et al., 2006). In addition, socio-economic factors can also act indirectly on health through psychosocial pathways e.g. stress, lack of support and low control (Marmot, 2004).

Over and above being central determinants of health, socio-economic conditions also largely determine people's area of living. According to Hedman et al. (2011), households tend to sort themselves into different neighbourhoods based on their i) similarity to the other residents and/or ii) ability to 'choose' an area that fits preferences and needs – processes that are overall largely determined by socio-economic characteristics (Hedman and van Ham, 2012). When residing in a particular place, however, Popay et al. (2003) have identified psychosocial circumstances such as low control and feelings of isolation as pathways to poor health for people in deprived neighbourhoods.

Ultimately, socio-economic factors in adulthood can contribute to neighbourhood deprivation inequalities in adult health by influencing people's health and their area of residence, either independently of or indirectly through psychosocial conditions. In accordance with the life course approach, however, focusing only on concurrent factors in adulthood may be insufficient, because neither people's health nor their life chances are affected solely by contemporaneous circumstances (Kuh et al., 2003). Instead, adult outcomes can be attributed to experiences from earlier life periods through various processes, exemplified by formulations of the *life course models* within this field (Lynch and Smith, 2005). The *sensitive period model* suggests that exposures during specific periods of development e.g. childhood (Irwin et al., 2007) or adolescence (Sawyer et al., 2012) can have long-term effects that act independently of exposures later in life (Mishra et al., 2010). In contrast, the notion of *risk accumulation* states that the likelihood of poor adult outcomes increases as detrimental exposures accumulate over time (Kuh et al., 2003), indicating that exposures can either be sequentially linked (chain of risk) or simply co-occurring (cumulative risk) (Lynch and Smith, 2005).

Building on this framework, neighbourhood deprivation inequalities in adult health could be rooted in the socio-economic and psychosocial conditions people experience earlier in life, either independently of or through adult conditions. This aligns with research that suggest, for example, that family socio-economic conditions earlier in life are associated with both adult neighbourhood of residence (Gustafsson et al., 2013) and self-rated health (Hyde et al., 2006). The present study therefore examines the contribution of socio-economic and psychosocial factors from three life periods (adolescence, young adulthood and midlife) to neighbourhood deprivation inequalities in adult health.

1.2. Study context

In this paper, the issue of neighbourhood deprivation inequalities in adult health is studied for a group of adolescents who grew up in a northern Swedish municipality in the early 1980s and who have been followed throughout young adulthood in the mid-1980s up until middle age in 2007 (Hammarström & Janlert, 2012). While the participants initially lived in northern Sweden, some of them have nevertheless relocated to other parts of the country over time.

Historically, Sweden has been characterized by a strong welfare state with a focus on, for example, redistribution, a generous social security system and universal health care. Since this will possibly reduce the number of severely disadvantaged people, health inequalities could potentially be smaller in the present study than in other contexts. Despite this, however, income inequalities have increased markedly in Sweden since the early 1990s and become particularly widespread throughout the 2000s (OECD, 2011). In combination with an intensified re-commodification process during this period, the welfare system has been seriously eroded (Fritzell et al., 2014), which means that the current study is situated in what Raphael (2014) described as a 'declining welfare state'.

As an indicator of the participant's health, functional somatic symptoms (FSS) is used in the present study. FSS pertain to a clustering of physical complaints that cannot be confidently attributed to an organic disease (Kroenke, 2003). The reasons for using this indicator follow from the fact that FSS is usually seen as a response to chronic stress and states of negative affect (Schenk et al., 2017), and is thus largely affected by adverse life circumstances (Tak et al., 2015) including the socio-economic context of the neighbourhood (Gustafsson, Hammarström, & San Sebastian, 2015). In addition, it display a socio-economic gradient that may increase with age and which seems to be attributed to social and material inequalities from across the life course (San Sebastian, Hammarström, & Gustafsson, 2015).

2. Methods

2.1. Sample

The Northern Swedish Cohort provided prospective data collected five times (in 1981, 1983, 1986, 1995 and 2007) through self-administered questionnaires on all individuals who attended 9th grade in Luleå municipality in 1981 (Hammarström & Janlert, 2012). Out of the 1071 students still alive across the 26-year period, 94.3% participated in all follow-ups (n = 1010).

For the current study, information on the health complaints and