The interplay between neighbourhood characteristics: The health impact of changes in social cohesion, disorder and unsafety feelings

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ABSTRACT

This study examined how the health of Dutch residents in 2012 was influenced by changes in neighbourhood social cohesion, disorder, and unsafety feelings between 2009 and 2011. Multilevel regression analyses on repeated cross-sectional survey data included 43,635 respondents living in 2100 areas. Deteriorating social cohesion and unsafety feelings were negatively associated with general health, while improvement in social cohesion was associated with better general health of the population. When the interplay of neighbourhood features was considered, deteriorating neighbourhood safety appeared decisive for health, i.e. improving social cohesion did not mitigate the health effect of deteriorating neighbourhood safety. Our results show it is important to take concurrent interactions between neighbourhood features into account when examining their health impact.

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1. Introduction

Studies from various countries have reported that social neighbourhood features, such as social networks, social capital, cohesion, informal social control, disorder, and unsafety feelings affect people′s health (Sampson, 2012; Kim, 2010; Diez Roux, 2001; Diez Roux and Mair, 2010; Macintyre et al., 2002). Living in cohesive neighbourhoods and in neighbourhoods with much social capital has been found beneficial for both physical and mental health (Hawe and Schiell, 2000; Kawachi et al., 2008; Diez Roux and Mair, 2010). Living in areas that are unsafe and with high levels of crime and disorder has been associated with worse health (Lorenc et al., 2012; Stafford et al., 2007; Ziersch, 2011).

Theories originating in criminology and sociology describe the interconnectedness of these so-called neighbourhood processes of organisation (e.g. social cohesion, social capital) and disorganisation (e.g. disorder, crime, unsafety feelings) (Sampson and Groves, 1989; Sampson, 2012; Hardyns and Pauwels, 2010). The social disorganisation theory, for example, elaborates on the interplay between social cohesion, disorder and unsafety feelings in

neighbourhoods (Sampson and Groves, 1989; Sampson, 2012; Sampson et al., 1997; Markowitz et al., 2001). In contrast to this theory, so far most public health studies examining the elements described in the social disorganization theory have focused on features in isolation, thereby not taking into account other, interrelated social neighbourhood characteristics and how the interplay between all relevant social neighbourhood characteristics may impact health (Kim, 2010; Scarborough et al., 2010; Pampalon et al., 2007; Echeverria et al., 2008; Steptoe and Feldman, 2001; Baum et al., 2009; Bjornstrom et al., 2013; Ross and Mirowsky, 2001). This could result in incorrect conclusions about the relevance of specific neighbourhood characteristics for health. Furthermore, most previous studies addressing the health impact of social neighbourhood characteristics have a cross-sectional study design, thereby hindering conclusions concerning the causality of the relations reported (Diez Roux and Mair, 2010). Longitudinal studies can provide more information about the temporal relationship between characteristics, which can help in formulating causal conclusions concerning the health effects of neighbourhood characteristics.

Residents living in more urban neighbourhoods and in neighbourhoods with a low socioeconomic status (SES) might be more susceptible to the health consequences of negative changes in

social cohesion, disorder or unsafety feelings, because of the presence of other undesirable area characteristics that can harm their health (i.e. poor housing, traffic unsafety, less green space, more air pollution and noise). Moreover, in low SES neighbourhoods the characteristics of the residents themselves may reinforce this susceptibility further (Kruize et al., 2014). Studies have reported that individuals with a lower socioeconomic status receive less social support and may use less effective coping strategies to address stressful events than individuals with a high SES (Taylor and Seeman, 1999). For instance, avoidant coping strategies, activities that keep people from directly addressing the stressful events (e.g. by drinking), seem to increase when SES decreases (Taylor and Seeman, 1999). Moreover, chronic stress appears greater among those in a lower social position (Baum et al., 1999). This may intensify the detrimental health impact of undesirable changes in social cohesion, disorder and unsafety.

This study assesses the simultaneous health impact of processes of organization (social cohesion), and processes of disorganization (physical disorder, social disorder, and unsafety feelings) in Dutch neighbourhoods. We examine the health impact of *changes over time* in social cohesion, physical disorder, social disorder, and unsafety feelings. This type of knowledge can help to gain more insight into the potential of neighbourhood-based public health interventions. The study has four specific aims:

- First, to examine how the changes in each social neighbourhood characteristic are related to health, univariate and multivariate, in order to assess the independent contribution of the social neighbourhood characteristics on health. Because previous research found indications that improving and deteriorating neighbourhood factors might be related to health differently (Jongeneel-Grimen et al., 2013), we investigate the health impact of improvements separately from deteriorations.
- Second, to identify neighbourhood patterns of change in social cohesion, physical disorder, social disorder, and unsafety feelings, in order to determine which patterns of change occur in the areas in reality.
- Third, to assess how the interplay of the four neighbourhood characteristics impacts the health of the residents, by examining the relation between the patterns of neighbourhood change and health.
- Finally, to examine if the health impact of changes in the social neighbourhood features differs by the SES or urbanicity level of the area. This way we want to assess whether there are differences between areas in the susceptibility to the health consequences of changes in the social neighbourhood features.

2. Method

2.1. Data

This study is based on secondary analyses of repeated cross-sectional data from existing nationwide datasets. We used separate datasets to obtain individual health information and the information about the area characteristics.

The health data and individual characteristics were obtained from repeated cross-sectional Dutch Housing Surveys (WoON) conducted in 2009 and 2012 by Statistics Netherlands (CBS). WoON is a nationwide, triennial survey of non-institutionalized adults, aged 18 years and older. Data were collected through telephone, Internet and face-to-face interviews. In total, 78,000 respondents completed the survey in 2009 (response rate 58%) and 69,330 in 2012 (response rate 63%).

Repeated cross-sectional data on safety, disorder and social cohesion were derived from the Dutch Integral Safety Monitor

conducted in 2009 and 2011 (*Integrale Veiligheidsmonitor*) by Statistics Netherlands (CBS). The Safety Monitor IVM 2009 contained 198,122 respondents aged 15 years and older (response rate 40%). IVM 2011 contained 223,944 respondents of 15 years and older (response rate 43%). Respondents were excluded when they were younger than 18 years, had missing data on the area characteristics studied, or when the four-digit postal code was missing. A total remained of 112,880 respondents in 2009 and 122,663 respondents in 2011. The neighbourhood data from IVM was aggregated to the four-digit postal code area, using ecometrics and combined with WoON 2012 using the four-digit postal code.

Additional neighbourhood level data concerning the urbanicity level of the postal code areas and the socio-economic status of the areas in 2006 were derived from Statistics Netherlands (CBS) and The Netherlands Institute for Social Research (SCP) respectively.

2.2. Study population

We selected respondents from the WoON 2012 survey who had lived at their current address since 2009 in order to examine the health effect of exposure to safety issues measured in the Dutch Integral Safety Monitor of 2009 and 2011 ($n=48.734$ in $n=3310$ postal code areas). Next, respondents living in areas with data on safety, disorder and social cohesion in both 2009 and 2011 were selected ($n=47,061$ in $n=2766$ postal code areas). Finally, respondents living in areas from which the socio-economic status score was available (only for areas with over 100 inhabitants) and with data on general health in 2009 (areas where at least one respondent participated in WoON 2009) were selected. In total, 43,635 adults living in 2100 four-digit postal code areas (52% of the Dutch postal code areas) were included in the analyses (mean of 20.8 observations per area).

3. Measures

3.1. Self-rated health

Self-rated health was measured by the single question: 'In general, how do you rate your health?' Using a 5-point Likert-scale, answers ranged from 'very good' to 'very bad'. We dichotomized the answers into (very) good general health (0) versus less than good or poor general health (1). Self-rated general health has consistently proven to be an independent predictor of mortality (Idler and Benyamin, 1997) and morbidity (Simon et al., 2005).

3.2. Area characteristics

3.2.1. Social cohesion

Respondents were asked whether they agreed with the following statements: "The people in this neighbourhood hardly know one another" (reversed), "the people in this neighbourhood are friendly to one another", "I live in a cosy neighbourhood with much solidarity", "I have a lot of contact with other neighbours", and "I feel at home with the people living in this neighbourhood". Answers ranged on a 5-point Likert scale from totally disagree to totally agree. A higher score indicated more social cohesion. Cronbach's alpha of the five items was 0.85 in both years, indicating good reliability.

3.2.2. Physical disorder

Respondents were asked whether they judged the following five items to occur "never", "sometimes" or "often": vandalism of cars, graffiti on walls and buildings, demolition of phone booths and bus -/ tram shelters, dog faeces on the street, and street litter. A higher score indicated more physical disorder. Cronbach's alpha