



# Health-risk behaviour among residents in deprived neighbourhoods compared with those of the general population in Denmark: A cross-sectional study



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## ARTICLE INFO

### Keywords:

Health behavior  
Risk factors  
Neighborhood deprivation  
Socioeconomic status  
Health surveys

## ABSTRACT

This study compares health-risk behaviours (including the co-occurrence of health-risk behaviours) of residents in the deprived neighbourhoods with those of the general population of Denmark. It also examines associations between sociodemographic and socioeconomic characteristics and health-risk behaviours in deprived neighbourhoods in Denmark. Even after adjustment for socioeconomic characteristics there were large differences in health-risk behaviours between residents in deprived neighbourhoods and the general population. In the deprived neighbourhoods large sociodemographic and socioeconomic differences in health-risk behaviours were found among the residents. Our findings highlight the need for health promotion programmes targeting residents in deprived neighbourhoods.

## 1. Introduction

It is well known that individual socioeconomic status (SES) is associated with health, morbidity and mortality (Marmot and Wilkinson, 2006; Marmot, 2010) and that SES is one of the most influential determinants of health (Berkman, 2000). Despite increased attention to health inequalities in research and policies over the last decades, previous research has shown that socioeconomic health inequality has grown in recent decades (Mackenbach et al., 2015; Mackenbach et al., 2016). Reducing socioeconomic inequality in health is one of the greatest challenges for public health (Commission on Social Determinants of Health, 2008; World Health Organization, 2012). Therefore, it is important to study how policies and interventions can be made to reduce socioeconomic inequalities in health (WHO Health 21, 1999).

Health-risk behaviours such as unhealthy diet, smoking, excessive alcohol intake and physical inactivity are important risk factors for morbidity and mortality (Marmot and Wilkinson, 2006; Marmot, 2010; Diderichsen et al., 2012; Juel et al., 2008) and are mediating factors that explain a large part of the socioeconomic inequality in morbidity and mortality (Lakshman et al., 2010; Stimpson et al., 2007).

Furthermore, evidence has shown that persons who have four healthy behaviours (fruit and vegetable consumption of at least five servings a day, current non-smoker, moderate alcohol intake (1–14 units a week), and physical active) have on average a 14-year higher life expectancy than persons with no healthy behaviours (Khaw et al., 2008). Focusing on health-risk behaviours is thus essential in reducing the gap in life expectancy over the long term, because such behaviours are potentially modifiable through health promotion and intervention programmes (Diderichsen et al., 2012). Understanding why some people are unhealthier than others is therefore important in developing interventions to reduce socioeconomic inequalities in health.

Even though the risks of health-risk behaviour are well known, persons with lower SES are more likely to have unhealthy behaviour compared to persons with higher SES (Lynch et al., 1997; Stringhini et al., 2010). Whereas health behaviour ultimately is an individual choice, it seems unlikely that the consistently higher prevalence of unhealthy behaviour in lower socioeconomic groups is entirely determined by individual considerations. Over the past decades there has been a move towards a more ecological approach (Sallis and Owen, 2002) emphasizing that, besides individual factors, environmental factors also have an important effect on health behaviour. This has

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raised interest in the influence of the neighbourhood deprivation on individual health-risk behaviour (Diez Roux and Mair, 2010). Several studies have found evidence that residents of deprived neighbourhoods have higher rates of mortality and morbidity than residents of more affluent neighbourhoods, even after adjustment for individual-level sociodemographic and socioeconomic characteristics (compositional effect), thus indicating an independent influence of neighbourhood deprivation (contextual effect) on health (Pickett and Pearl, 2001; Riva et al., 2007; Kawachi and Berkman, 2003). In addition, research has shown an association between neighbourhood deprivation and health-risk behaviour (Lakshman et al., 2010; Pickett and Pearl, 2001). A systematic review (2015) has found an increased risk of smoking and physical inactivity in deprived neighbourhoods compared with non-deprived neighbourhoods (Algren et al., 2015). With regard to low fruit and vegetable consumption as well as high alcohol intake, the results are ambiguous, and no clear differences between deprived and non-deprived neighbourhoods were found in the reviewed studies (Algren et al., 2015). The majority of research in this field has been based on surveys from outside Scandinavia (predominantly the Netherlands, Australia, the US and the United Kingdom) (Algren et al., 2015). Despite the increase in research into individual health-risk behaviours in deprived neighbourhoods, little attention has been given to the co-occurrence of health-risk behaviours in deprived neighbourhoods compared with more privileged neighbourhoods (Halonen et al., 2012; Lawder et al., 2010).

Diez Roux and Mair's review summarizes (2001) several intermediate factors through which the social and physical environment of the neighbourhood can affect health-risk behaviour (Pickett and Pearl, 2001). The social environment of neighbourhoods is thus found to affect residents' health through factors relating to safety and violence, social relations/cohesion, norms and attitudes towards health behaviour, and social support. Residents can affect each other's health behaviour by exchanges of the norms, values and social sanctions practiced in the neighbourhood (Pickett and Pearl, 2001). The physical environment may also affect health behaviour through the built environment, aesthetic quality/natural spaces, quality of housing, and the availability of and access to healthy food and recreational facilities (Pickett and Pearl, 2001). Furthermore, the social and physical environment of the neighbourhoods may also affect health behaviour through mechanisms involving the experience of stress. Living in a deprived neighbourhood may itself be a source of stress (e.g., the quality of housing and overcrowding) and may lead residents to engage in coping behaviours involving smoking, drinking and unhealthy eating (Pickett and Pearl, 2001; Bak et al., 2012; Yang and Matthews, 2010; Shohaimi et al., 2003). The motivation for exercise may furthermore be limited by stressful conditions (Stimpson et al., 2007). Residents in

deprived neighbourhoods are therefore an important target group for promoting healthy behaviour.

Comparison of health-risk behaviours in deprived neighbourhoods and in the general population could identify those health-risk behaviours that need greatest attention in future health promotion programmes in deprived neighbourhoods, thereby supporting the development of effective public health interventions to reduce socioeconomic health inequality. Furthermore, research in the distribution of health-risk behaviour by sociodemographic and socioeconomic characteristics within deprived neighbourhoods would be valuable for developing targeted interventions for the most risk-prone residents.

The main aim of this study was to compare the health-risk behaviours (including the co-occurrence of health-risk behaviours) of residents in deprived neighbourhoods with those of the general population in Denmark. In addition, the study also aimed at analysing associations between sociodemographic and socioeconomic characteristics and health-risk behaviours in deprived neighbourhoods in Denmark. The results of this study will enable the identification of the health-risk behaviours to be addressed in future health promotion programmes in deprived neighbourhoods and of the target groups that should receive more attention in those programmes.

## 2. Materials and methods

### 2.1. Data materials

#### 2.1.1. Deprived Neighbourhood Health Profile Survey

The results concerning health-risk behaviour among residents in deprived neighbourhoods derived from data obtained in the cross-sectional *Deprived Neighbourhood Health Profile Survey* (DNHPS) and were provided by The Danish Health Authority. Data for the DNHPS were collected from January to March 2011 in 12 deprived neighbourhoods in the following municipalities in Denmark: Esbjerg, Herlev, Hjørring, Høje-Taastrup, Køge, Langeland, Lolland, Silkeborg, Struer, Svendborg, Thisted and Aalborg. The survey was part of a larger government-funded health-related intervention project in Denmark (The Danish Health Authority, 2010a). The 12 deprived neighbourhoods were selected by the Danish Health Authority based on a number of criteria (The Danish Health Authority, 2010b). The municipalities should for example provide evidence of the need and potential for health interventions in a relevant geographical bounded neighbourhood with a high proportion of less resourceful residents. No specific criteria regarding demographic or socioeconomic characteristics were specified. A “deprived neighbourhood” is defined here as a delimited residential area with a high proportion of adults with low SES characterized by indicators such as unemployment, low income, low

**Table 1**  
Overview of the 12 deprived neighbourhoods.

Municipality	Number of households in the neighbourhood	Number of residents aged 18 or older in the neighbourhood	Number of gross sample	Number of completed interviews
<b>Total</b>	<b>1255</b> (average)	<b>22,659</b>	<b>8835</b>	<b>5113</b>
Esbjerg	1690	2519	800	483
Herlev	1991	3025	800	427
Hjørring	575	777	888	372
Høje-Taastrup	963	1441	800	463
Køge	1110	1689	800	442
Langeland	1755	922	800	571
Lolland	203	828	226	134
Silkeborg	638	4615	675	408
Struer	1586	2957	800	560
Svendborg	741	2715	800	419
Thisted	617	303	646	407
Aalborg	3190	868	800	427

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