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ANNA-KARIN IVERT

ADOLESCENT MENTAL HEALTH AND UTILISATION OF PSYCHIATRIC CARE

The role of parental country of birth and neighbourhood of residence

MALMÖ HÖGSKOLA

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CONTENTS

ABSTRACT

The studies included in this thesis aim to illustrate different aspects of mental health and the utilisation of psychiatric care among Swedish children and adolescents, with the overarching aim being to improve the existing knowledge on how the neighbourhood of residence and parental country of birth influence adolescents' mental health and their pathways into and utilisation of psychiatric care.

The first study investigates referral pathways to child and adolescent psychiatric clinics, directing a special focus at how these pathways differ on the basis of parental country of birth and neighbourhood of residence. The results show that parental country of birth plays an important role in how children and adolescents are referred to the child and adolescent psychiatric sector. Children and adolescents with Swedish-born parents appear more often to have been referred by their families, whereas by comparison with children and adolescents with Swedish-born parents, those with foreign-born parents had more often than been referred by someone outside the family, such as the social services or their school. Neighbourhood of residence was found to play a significant role in relation to family referrals; children and adolescents living in neighbourhoods with low levels of socioeconomic deprivation were more likely to have been referred by their families by comparison with those from more deprived neighbourhoods.

The second study investigates how parental country of birth and individual gender are associated with the utilisation of psychiatric care. The findings from the study indicate that adolescents whose parents were born in middle- or low-income countries present lower levels of psychiatric outpatient care utilisation than those with Swedish-born parents. Initially, no associations

were found between parental country of birth and inpatient care. Following adjustment for socio-demographic variables, it was found that adolescents whose parents were born in low-income countries were also less likely to utilise inpatient care. Girls were more likely to have utilised psychiatric care, but controlling for possible interactions revealed that this was true primarily for girls with parents born in Sweden or other high-income countries.

In the third study, psychiatric care utilisation patterns are analysed in relation to the neighbourhood of residence. In part the aim was to investigate the validity of the neighbourhood when it comes to understanding variations in adolescents' utilisation of psychiatric care, but the study also examines whether neighbourhood socioeconomic deprivation is associated with individual variations in the utilisation of psychiatric care. The results indicate that the neighbourhood of residence has little influence on the utilisation of psychiatric care, only 1.6 % of the variance was found at the neighbourhood level. No clear association between the neighbourhood level of socioeconomic deprivation and levels of psychiatric care utilisation was found in the study.

The final study investigates how adolescents' perceptions of the social characteristics of their neighbourhood are related to their self-reported mental health, while controlling for the socioeconomic structure of the neighbourhood. The results show that adolescents' perceptions of their neighbourhood are associated with their self-reported mental health, particularly their perceptions of social disorder. However, these associations differ between girls and boys, and between adolescents with Swedish- and foreign-born parents.

In conclusion, the results presented in the thesis show that parental country of birth is an important factor when it comes to understanding differences in referral patterns and in the utilisation of psychiatric care. However, the role of the neighbourhood of residence appears to be more complex.

LIST OF PUBLICATIONS

This thesis is based on the following four studies. These studies will be referred to in the text by their Roman numerals:

I. Ivert, A-K., Svensson, R., Adler, H., Levander, S., Rydelius, P-A., Torstensson Levander, M. (2011) Pathways to child and adolescent psychiatric clinics: a multilevel study of the significance of ethnicity and neighbourhood social characteristics on source of referral. BMC *Child and Adolescent Psychiatry and Mental Health* 2011, *5*:6.

II. Ivert, A-K., Merlo, J., Svensson, R., Torstensson Levander, M. (2013) How are immigrant background and gender associated with the utilisation of psychiatric care among adolescents? *Social Psychiatry and Psychiatric Epidemiology*, *48*(5), 693-699.

III. Ivert, A-K., Torstensson Levander, M., Merlo J. Adolescents utilisation of psychiatric care, neighbourhoods and neighbourhood socioeconomic deprivation: A multilevel analysis (Submitted)

IV. Ivert A-K., Torstensson Levander, M. Adolescents perceptions of neighbourhood social characteristics –is there an association with mental health? (Submitted)

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Anna-Karin Ivert contributed to the above studies by designing the studies, performing the statistical analyses, analysing the results, and writing the manuscripts with support from the co-authors.

INTRODUCTION

One of the main goals of Swedish public health policy is to provide healthy living conditions during childhood and adolescence, and the overall health of Swedish children and adolescents is good. Over recent decades, however, mental health problems have increased among adolescents (e.g. Lager et al., 2012). One factor that is of importance for improving levels of mental health among children and adolescents is access to appropriate care, and the early identification and treatment of problems is important in order to prevent these problems from deteriorating. In Sweden, health care should be provided on equal terms and according to needs, regardless of background or place of residence (Prop. 2007/08:110). However, the social conditions under which children and adolescents live have been identified to play an important role for understanding diffrences in health and health related behaviours (CDSH, 2008), and neither mental health nor utilisation of care are equally distributed within the population. This motivated me to study how adolescents mental health and their utilisation of psychiatric care is related to the social contexts in which adolescents interact.

Over recent years, the international literature has, amongst other things, identified the social context of the neighbourhood of residence and (parental) country of birth as being important for understanding variations in adolescent mental health and in access to and the utilisation of psychiatric care. In the light of the increased levels of residential segregation along ethnic and socio-economic dimensions that have been witnessed in Swedish society over the past 20 years (National Board of Health and Welfare, 2010), and of the transformation of Sweden from a fairly homogenous society to one where almost 20 percent of children and adolescents are born abroad or have

foreign-born parents (Statistics Sweden, 2013), it is important to study how these factors are related to adolescent mental health in a Swedish context. This thesis consists of four individual studies that investigate different aspects of mental health and the utilisation of psychiatric care among Swedish children and adolescents. The overall aim of the thesis is to improve the existing knowledge on how the neighbourhood of residence and parental country of birth influence adolescents' mental health and also their pathways into and utilisation of psychiatric care.

The thesis was written within the framework of the research programme *The challenges of migration* (Migrationens utmaningar), which was initiated by Malmö University, the City of Malmö and Region Skåne (the county council in the south of Sweden). The aim of the research programme is to improve knowledge on the challenges associated with the increasing levels of ethnic heterogeneity in the south of Sweden, and particularly in the city of Malmö, and on how health care can be provided on equal terms to a heterogeneous population that will have different experiences, expectations, needs and attitudes in relation to health care (see Malmsten (2010) for a further description of the research programme).

The following pages will provide an overview of previous empirical findings and a theoretical framework for the interpretation of the results presented in the thesis.

BACKGROUND

Mental health problems among children and adolescents constitute an important public health issue that affects many children and adolescents. Over recent decades, several studies have shown that mental health problems among children and adolescents have increased in Sweden (Hagquist, 2009; Lager et al., 2012) as well as in many other European countries (e.g. Fombonne, 1998; Hagell, 2012; Sweeting, Young & West, 2009). According to the World Health Organisation (WHO), about 20 percent of the world's children and adolescents are estimated to suffer from mental health problems (WHO, 2013). In Sweden in 2009/2010, almost 30 percent of girls and 10 percent of boys in the 9th grade reported that they had felt depressed more than once a week during the last 6 months (Hjern, 2012a). The causes underlying the development of mental health problems are likely to be multifactorial (e.g. Patel et al., 2007; Verhulst & Koot, 1992), and risk and protective factors have been identified at different levels. For example, malnutrition has been identified as a risk factor at the biological level, social skills at the psychological level and family conflict, academic failure and community social disorganisation at a social level (for an overview see Patel et al., 2007).

Adolescence is an important risk period for the onset of mental health problems (Collishaw, 2012; Fombonne, 1998; WHO, 2013), and the prevalence of both internalising problems (e.g. emotional problems, depression and anxiety) and externalising problems (e.g. hyperactivity, attention disorders and antisocial behaviour) has been shown to increase during this period (Fombonne, 1998; Kim-Cohen et al., 2003). Suffering from mental health problems often has a significant impact on children's and adolescents' everyday lives, and affects their relationships with their families (e.g. Johnson,

Chen & Cohen, 2004.) and peers (e.g. Chen et al., 2009), their educational achievements (e.g. Gustafsson et al., 2010), and their physical health (e.g. Zwaanswijk et al., 2005). In addition, mental health problems during childhood and adolescence have been shown to be a major risk factor for mental health problems in adulthood (e.g. Wikrama et al., 2012; Rutter et al., 2006; Kim-Choen et al., 2003), as well as for a number of other adverse outcomes in adulthood, such as low socioeconomic and educational achievement, problems with intimate relationships and criminality (e.g. Jonsson et al., 2010; Jonsson et al., 2011; Moffitt & Caspi, 2001; van Oort et al., 2007a).

Access to and utilisation of care

Child and adolescent psychiatric disorders are in most cases treatable, but they often go undetected and therefore remain untreated (Ford, 2008; Patel et al., 2007). Access to psychiatric care may be an important determinant of mental health among children and adolescents. Access can be defined as the availability of health care resources (e.g. child and adolescent psychiatric clinics, physicians, psychologists, and so on) and is often discussed in relation to equity, i.e. equal access to care for those with an equal need for care (Oliver & Mossialos, 2004). However, in order to have an impact on children's and adolescents' health, the available health care resources also need to be utilised.

In order to better understand differences in the utilisation of mental health care, we need to understand what determines how and why children and adolescents are referred to psychiatric care. Verhulst & Koot (1992) presents a model intended to facilitate this understanding, in which the process leading to utilisation is conceptualised as a sequence of stages. The model points to the different "filters" that children and adolescents needs to pass in order to receive care. The model consists of five levels, with each level representing different populations of children and adolescents (the first level represent the community and the highest level represents children and adolescents in inpatient care), with the second-level population being selected from the members of the first-level population and so on. The different levels are separated from each other by a "filter" and in order to pass from one level to another it is necessary to pass through this filter. The filters represent the selection mechanisms that determine for whom care will be sought and at what level treatment will be given. For example, the first level may represent

parental problem recognition (for an extended explanation of the model see Verhulst & Koot (1992) and for the original model see Goldberg & Huxley 1980). In this thesis, it is primarily factors that influence the first filter, the recognition of illness behaviour, that are of interest. This is the filter that determines which children care is sought for. According to Verhulst & Koot (in addition to actual problems and available services), the recognition of children's or adolescents' behaviour as being problematic by parents (or other adults) is dependent on the latter group's awareness of the problem, their distress threshold and their educational level, beliefs and attitudes. Together these factors will affect which children will pass through the first filter and come to utilise mental health care services. These factors may in turn be dependent on the wider social contexts in which children and adolescents find themselves.

The point of departure for this thesis is the assumption that in order to better understand children's and adolescent mental health, as well as their utilisation of psychiatric care, it is important to study the characteristics of the wider social contexts of which children and adolescents are a part and in which they interact. In the thesis, the concepts of mental health and mental health care are discussed in generic terms, and the focus is directed at the broad picture rather than at specific problems, diagnoses or treatments.

The health and behaviour of children and adolescents is affected not only by individual characteristics but also by the social contexts in which they interact. The social environment in which children and adolescents interact consists of multiple social contexts of influence (cf. Bronfenbrenner, 1979). The most proximal context is the family, which is followed by contexts such as school, the peer-group and the neighbourhood, which all play an immediate role in young people's development. However, contexts such as culture and policy, which operate at a more distal level, will also influence children's and adolescents' everyday life. In the same way, the characteristics of these social contexts are also likely to influence children's and adolescents' health and health-related behaviours, as well as their attitudes to mental health and mental health care, and in consequence also their pathways into and their utilisation of mental health care services. These social contexts will also influence attitudes and behaviours among the adults who are part of these different contexts, i.e. parents, teachers, physicians etc.

The neighbourhood context

The study of neighbourhood effects on mental health goes back at least as far as the urban ecological studies of the classical Chicago School, where Faris and Dunham (1960) found that mental health problems at the neighbourhood level were highly correlated with levels of social problems and economic deprivation. Neighbourhoods with a high level of mental health problems also often had high levels of criminality, suicide and infant mortality. These ideas about the influence of the neighbourhood context on health-related problems were further developed during the 20th century.

The neighbourhood context can be thought of as small ecological units that are nested within lager ecological units such as cities, municipalities, counties and countries (e.g. Sampson, Morenoff, & Gannon-Rowley, 2002). One fundamental question in the field of neighbourhood effects studies is that of identifying appropriate boundaries for these neighbourhoods (e.g. Merlo et al., 2009; Diez-Roux & Mair, 2010). In the research on neighbourhood effects in general and on neighbourhood effects on health and health-related problems in particular, definitions of neighbourhoods are often based on geographical administrative boundaries such as census tracts or postcode areas. However, when discussing the neighbourhood as a social context, these administrative units are assumed to represent something more than just a geographical area in which an individual lives. They are assumed to represent an area with some level of cohesion, based on shared norms and values, among the individuals living there (and also other individuals that spend time in the area), and with boundaries that separate the area from other neighbourhoods.

The question of how to define and measure neighbourhoods has been the subject of considerable debate (MacIntyre et al., 2002; Merlo et al., 2009; Merlo, 2011; Reijneveld et al., 2000). The use of administrative boundaries has been questioned as regards how well these boundaries actually correspond to the way individuals conceptualise their neighbourhoods, or how they live their lives (MacIntyre et al., 2002; Sampson et al., 2002; Lupton, 2003; Merlo et al., 2009). If the individuals living in "neighbourhoods" do not identify with the definitions of the neighbourhoods that are employed in research, the explanatory power of these neighbourhoods will be modest. In addition, individuals are likely to be affected by, and to interact in, many different contexts (e.g. school, workplace etc.), and it may be difficult to separate the

effects of these different contexts (c.f. MacIntyre et al., 2002; Lupton, 2003). Consequently, a phenomenon that is thought to be a result of the neighbourhood context might actually be influenced by some other context, such as the social context of the school a child goes to for example. Furthermore, the appropriate operationalisation of relevant boundaries for the neighbourhood context might be different depending on the outcome and mechanisms under study (e.g. MacIntyre et al., 2002; Diez-Roux, 2001). For example, the influence of social cohesion may be better understood in relation to people's perceptions of their neighbourhood, whereas the influences of health care policy may be better explained at a higher level of contextual aggregation (Diez-Roux 2001).

It has been suggested that the neighbourhood is particularly important for children and adolescents, since they often spend a lot of time there,[1] and because they often go to school locally. The neighbourhood has therefore been hypothesised to be an important context for social development, a place in which networks are formed and where social skills and values about right and wrong are developed (e.g. Sampson et al., 2002; Earls & Carlson, 2001; Curtis et al., 2012). The influence of the neighbourhood context has been assumed by some authors to have a greater effect on younger children since, as a result of their limited action spaces, their exposure to the neighbourhood context is more uninfluenced by access to alternative contexts, whereas adolescents have larger action spaces and are thus exposed to a greater diversity of social contexts (Curtis et al., 2012; see also McCulloch & Joshi, 2001).

On the other hand, some argue that the neighbourhood context has a greater influence on adolescents, since they spend more unsupervised time in their neighbourhoods and are therefore more exposed to its contextual characteristics than are younger children, whose contacts with the neighbourhood are supervised and mediated by their parents (e.g. Allison et al., 1999). It has also been suggested that the neighbourhood context influences girls and boys differently as a result of social gender differences in experiences, attitudes and behaviours. For example, girls experience their neighbourhoods as unsafe more often than boys (e.g. Morrow, 2001), which

[1] Results from a study by Wikström et al. (2010) showed that adolescents spent almost 50 percent of their time awake in their neighbourhood of residence (home output area).

might result in their spending less time outside in their neighbourhood, and consequently in their being less exposed to risk factors at the neighbourhood level. On the other hand, the feeling of being unsafe might result in mental health problems. The influence of the neighbourhood context could differ between girls and boys as a result of differences in parents' attitudes regarding girls' and boys' activities in the neighbourhood (Curtis et al., 2012; Urban et al., 2009). Neighbourhood social characteristics may also affect children and adolescents from different ethnic groups differently as a result of factors such as discrimination or the ethnic composition of the neighbourhood (e.g. Fagg et al., 2006; Morrow, 2001).

Neighbourhood effects on mental health

A neighbourhood effect can be described as the influence of the characteristics of a local neighbourhood on factors such as the health, behaviours or attitudes of those who live, or spend time, in the neighbourhood.

In the study of neighbourhood effects on health related outcomes, two possible explanations have been suggested, a compositional and a contextual.[2] A compositional explanation of differences in mental health between neighbourhoods implies that individuals who are more vulnerable to developing mental health problems tend to live in certain neighbourhoods, that is, differences between neighbourhoods are due to the individuals living there. This explanation suggests that these individuals would be equally vulnerable to develop mental health problems wherever they lived.

However, in the research on neighbourhood effects on health and health-related behaviours it is the contextual explanation that constitutes the main focus of interest (e.g. Cummins et al., 2007; Diez-Roux & Mair, 2010; Kawachi & Berkman, 2003). In contrast to the compositional explanation, the contextual explanation implies that differences between neighbourhoods in levels of health-related problems are due to differences between the neighbourhoods per se, not between the people who live there.

[2] This distinction between composition and context has been called into question, and Cummins et al. (2007) have argued that it is somewhat artificial, noting that "people create places and places create people." and that the characteristics of individuals and the contexts in which they live are thus interrelated (see also MacIntyre et al., 2002; MacIntyre & Ellaway 2003).

Most research into neighbourhood effects on health-related problems is based on adult populations but there are also several studies, primarily from the US but also a number from European countries, that have investigated neighbourhood effects on the mental health of children and adolescents (e.g. Drukker et al., 2003; Leventhal & Brooks-Gunn, 2000; Reijneveld et al., 2010; Xue et al., 2005).[3] It has been suggested that the neighbourhood exerts an impact on children's and adolescents' mental health via a range of different factors, such as material or structural characteristics, social processes and *'stressful events' or social disorder* (cf. Curtis et al., 2012; Hagell et al., 2012).

Material and structural characteristics of the neighbourhood

The material or structural characteristics of the neighbourhood involve sociodemographic features such as poverty, educational level, residential stability and the ethnic composition of the residents, but also institutional resources (e.g. health care and schools) and the quality of environments (e.g. well maintained playgrounds, orderly and clean streets). A number of studies have found the neighbourhood level of socioeconomic deprivation to have an independent effect (after adjustment for individual/family poverty) on both internalising and externalising mental health problems among children and adolescents, with worse outcomes being found in neighbourhoods with high levels of deprivation (e.g. Xue et al., 2005; Levental & Brooks-Gunn 2000; Reijneveld et al., 2010; Kalff et al., 2001; Schneiders et al., 2003).[4] The ethnic composition of the neighbourhood has also been found to be associated with child and adolescent mental health. Fagg et al., (2006) showed that living in a neighbourhood with a moderate concentration of families belonging to the same ethnic minority may have a protective effect in relation to mental health, whereas high concentrations are associated with more negative outcomes. However, it has often been suggested that the observed association between the structural aspects of the neighbourhood and mental health is mediated by social processes within the neighbourhood.

[3] Most studies on neighbourhood effects have focused on urbanised areas, and less is known about the mechanisms linking neighbourhood characteristics and (mental) health in rural (or less urbanised) areas. However, studies comparing urban and rural areas have concluded that neighbourhood characteristics affect adolescents similarly in both urban and rural areas (Reijneveld et al., 2010; Eriksson et al., 2011).

[4] There are also contrasting findings showing that even though the level of mental health problems may vary between neighbourhoods, these differences need not be associated with neighbourhood socioeconomic deprivation (Fagg et al., 2006). This finding has been suggested to reflect differences in how neighbourhood deprivation is measured, and to point to the possibility that perceptions of the quality of the neighbourhood are associated with mental health problems, whereas independently measured indicators (based on official statistics for example) are not associated with mental health (Fagg et al., 2008).

Social processes

The social aspects of the neighbourhood refer to the processes that characterise the daily life in the neighbourhood, and which are often related to different dimensions of social capital.[5] Social capital generally refers to the presence (or lack) of social relations, networks, social cohesion, common values and organisation in the neighbourhood (for a further description of social capital see Coleman, 1988; Putnam, 1995). The neighbourhood level of social capital has been shown to affect children's and adolescents' mental health through factors such as collective efficacy (a combination of the residents' willingness and ability to exert informal social control and social cohesion) and intergenerational closure (Drukker et al., 2003; Xue et al., 2005; Sampson et al., 2002; Aneshensel & Sucoff, 1996). Informal social control (e.g. that the adults in the neighbourhood are aware of what the children and adolescents are up to), for example, might affect children's mental health via mechanisms such as neighbours correcting deviant behaviour. This intervention could have both a direct effect by preventing antisocial behaviour, and an indirect effect by providing children and adolescents with a sense of protection (Drukker et al., 2003; see also Sampson et al., 1999). Intergenerational closure and social networks in the neighbourhood can contribute to mental health via their impact on collective child rearing and on parents' opportunities to discuss their children's problems and to establish common norms. Adult-child closure has also been suggested to be a source of social support for children (e.g. Sampson et al., 1999).

The focus on social factors as a means of explaining differences in mental health between neighbourhoods has attracted criticism for implying that (mental) health problems are the result of the residents' own inability to create social capital, and for downplaying the importance of welfare policies and structural factors (e.g. Lynch et al., 2000a;2000b). This criticism underlines the importance of considering structural and social aspects simultaneously. Social aspects of the neighbourhood are often associated with structural and

[5] Social capital can be divided into 3 types; bonding, bridging and linking social capital. Bonding social capital refers to social ties found in horizontal, informal and strong social networks, i.e. relations among individuals who are similar, who have a shared social identity. Bridging social capital refers to social ties that cut across social groups. These ties are often characterized by weaker but more diverse connections. Finally, linking social capital refers to vertical social ties, e.g. the quality of the relations between individuals living in a neighbourhood and institutions or individuals with access to resources outside the community (For an extended discussion of the different types of social capital see for example Derose & Varda (2009).

material factors. Sampson et al. (1999) argue that social processes appear primarily to emerge in neighbourhoods that have reasonable levels of socioeconomic resources and residential stability.[6]

Stressful events and social disorder

Finally, neighbourhood factors related to stressful events or social disorder have also been found to be important in relation to adolescents' mental health (e.g. Sampson et al., 2002; Aneshensel & Sucoff, 1996; Fowler et al., 2009). Aneshensel and Sucoff (1996) found that perceptions of neighbourhood social disorder (criminality, violence, vandalism, drug dealing and police harassment) were strongly related to both internalising and externalising mental health problems. In a review of the literature, exposure to violence in the neighbourhood was found to have a negative effect on children's and adolescents' mental health, with the association being found among both victims and witnesses of violence as well as among those youths who had heard about violent events in their neighbourhoods (Fowler et al., 2009). There is a clear social gradient in exposure to social disorder. Children and adolescents living in socioeconomically deprived areas have been shown to experience higher levels of social disorder than their peers in more affluent neighbourhoods (e.g. Sampson et al., 2002; Aneshensel & Sucoff, 1996). Perceived social and physical disorder has also been hypothesised to be a mediator of the association between structural neighbourhood characteristics and mental health (e.g. Sampson & Raudenbush, 2004). Sampson and Raudenbush (2004) showed that perceived neighbourhood disorder was not necessarily associated with the objective level of disorder, and argued that it is the perceived significance of disorder that is associated with mental health-related outcomes and not the actual level of disorder.

[6] It is however important to acknowledge that collective efficacy, for example, is not synonymous with neighbourhood affluence, and collective efficacy has been hypothesized to have a stronger effect on children's behaviour in deprived areas (Odgers et al., 2009).

Neighbourhood effects on the utilisation of psychiatric care

Since health care should be provided according to needs, neighbourhood levels of the utilisation of mental health care should be similar to the prevalence of mental health problems in the neighbourhood. However, as was described in the model outlined by Verhulst & Koot (1992) and presented above, youths need to pass through a number of filters before they are able to utilise mental health services. In addition to the presence of mental health problems and access to care, factors such as knowledge and attitudes about mental health and health care may also affect utilisation levels. Research that focuses on how the neighbourhood context influences the utilisation of psychiatric care in particular is limited and the following discussion will therefore focus on access to care and the utilisation of health care in general, although the discussion does include a number of examples that relate specifically to psychiatric care.

As is the case with neighbourhood effects on mental health, both compositional and contextual aspects might explain neighbourhood variations in (mental) health care utilisation. Differences in the utilisation of (mental) health care between neighbourhoods might be explained by the fact that individuals with similar needs, knowledge and attitudes about health and health care utilisation tend to live in the same neighbourhoods as a result of socioeconomic or cultural factors (i.e. a compositional effect).

Differences might also be explained by the geographical proximity of a given neighbourhood to health care services. Individuals who have a longer distance to travel to health care also manifest lower levels of health care utilisation (e.g. Burström, 2011). Thus, access to and the utilisation of mental health care might also vary in relation to contextual features of the neighbourhood.

Neighbourhood socioeconomic deprivation and social capital have both been identified as important factors in relation to the explanation of neighbourhood differences in health care utilisation. Socioeconomic deprivation at the neighbourhood level has been linked to lower levels of access to community health clinics and specialised care (e.g. Kawachi & Berkman, 2000). A neighbourhood's level of social capital may influence the availability of health care services via neighbourhood residents working together to establish health care centres in underserved neighbourhoods. In addition, neighbourhood social networks have been identified as an important mechanism for the

dissemination of health-related information and for the adaptation of health-related norms and behaviours. Consequently, the social networks in a neighbourhood may be important to the understanding of differences in help-seeking behaviour (e.g. Derose & Varda, 2009; Kawachi & Berkman, 2000).

Depending on the norms and knowledge of the social networks in question, neighbourhood networks of this kind may either facilitate or decrease the utilisation of care. As regards the utilisation of child and adolescent psychiatric care, neighbourhood social characteristics may facilitate such utilisation if there is knowledge within the community about mental health, child and adolescent psychiatry and the treatment of deviant behaviour, and if the social norms of the neighbourhood state that mental health problems warrant the utilisation of mental health care (cf. Horwitz et al., 1985; Torstensson Levander, 2008). The structural and social characteristics of the neighbourhood may therefore be hypothesised to be important for children's and adolescents' utilisation of psychiatric care in part as a result of the way they determine the proximity and availability of health care resources in the neighbourhood, and through the way they condition individuals' opportunities to travel to care services, and in part through the knowledge and norms regarding mental health and psychiatric care that characterise a neighbourhood's social networks.

Ethnicity and country of birth

The other main focus of the thesis is the relationship between parental country of birth and adolescents' mental health and their utilisation of psychiatric care. If the neighbourhood of residence represents a specific context in which the individual interacts, ethnicity or foreign background might affect not only health but also access to and the utilisation of health care, as well as the accessibility of health care in almost all of the different contexts in which children and adolescents interact, from the family (e.g. in the form of understandings of mental health) to the policy level (e.g. in the form of discrimination or legislation).

Using foreign background or country of birth to classify the population into different subgroups may be beneficial for the purposes of identifying important health differences or inequalities, and may provide insights into aetiological issues. However, it could also result in over-emphasising the

importance of ethnicity or culture for the development of mental health problems, or in generating stereotypical assumptions about certain groups (cf. Bhopal, 1997; Dogra et al., 2012).

When the effects of country of birth are discussed, the discussion is often conducted in terms of ethnicity. Ethnicity is a complex concept that is difficult to define and measure, and migrant and ethnic minority children constitute a highly heterogeneous group with regard to country and culture of origin, reasons for migration, socioeconomic position etc. Ethnicity could be defined as the social group to which an individual belongs, and either identifies with or is identified with by others, and the concept of ethnicity often implies a shared origin or social background, shared culture and traditions and a common language or religion (Bhopal, 2007; National Board of Health and Welfare, 1999). However, most research employs much vaguer operationalisations. These operationalizations range from simple dichotomies (immigrant vs. non-immigrant) to more complex categorisations based on geographical or socioeconomic classifications of the country of birth, or the parents' country of birth (cf. Bhopal, 2007).

The diversity of operationalisations of ethnicity and foreign background makes it difficult to compare research results regarding the influence of these concepts on different outcomes. In addition, it is difficult to make comparisons across different countries. The ethnic composition of the population differs, as do reasons for migration (e.g. labour migrants vs. refugees) and the nature of the migrants' links to the country of immigration (e.g. immigration from former colonies to Great Britain vs. refugees with no former connection to the country of destination), and the social conditions experienced by immigrants or ethnic minorities differ from one society to another. In addition, any influence of ethnic minority status or immigrant background will differ at different times, in relation to both historical time and individual time. Being an immigrant in Sweden today will in many ways be different to what being an immigrant in Sweden was like fifty years ago, just as the individual experience of having a foreign background is likely to change over time.

In this thesis, foreign background is operationalised on the basis of parental country of birth in order to capture the diversity of the multicultural population, which is a result of international migration.

Differences in mental health

Differences in the conceptualisation of ethnicity, or immigrant/foreign background, as well as contextual differences between the host countries, make it difficult to compare or summarise results regarding associations between mental health and ethnicity or immigrant/foreign background. The next section nonetheless has the aim of discussing a number of findings and explanations regarding the association between ethnicity and/or (parental) country of birth and adolescent mental health.

A number of studies (using a variety of operationalisations of ethnicity or foreign background) have identified ethnic differences in adolescent mental health, with worse outcomes for adolescents from ethnic minorities (e.g. Murad et al., 2003; Reijneveld et al., 2005; Sagatun et al., 2008; van Oort et al., 2007b). Explanations for the higher levels of mental health problems found among immigrant and/or ethnic minority adolescents might be both cultural and structural, and the explanations are often not associated with ethnicity, or country of birth, per se. One explanation that has often been presented in relation to higher levels of mental health problems among children of foreign background focuses on experiences of stress associated with the migration process. This stress might relate to factors such as traumatic pre-migration experiences (e.g. exposure to violence) and the fact that migration is often associated with the loss of family and friends, as well as having to leave a familiar context. The stress might also be related to factors associated with arriving in a new country, however, such as uncertainty during the asylum process, and stresses associated with adjustment to a new cultural context with different routines and social norms (e.g. Berry, 1997; Fazel et al., 2012; Stansfeld et al., 2004; Stevens & Vollebergh, 2008).

A second explanation for the observed increased risk for mental health problems among children from ethnic minorities or with immigrant background is the stress associated with their situation, or social position, in the host society. Children and adolescents with immigrant background, or from ethnic minorities, more often grow up in stressful socio-economic

conditions than children from the majority population and more often live in deprived neighbourhoods, which may affect their mental health in a negative way. In addition, factors such as experiences of discrimination and marginalisation have also been suggested to be important for an understanding of ethnic disparities in mental health between children with different backgrounds (e.g. Jablonska et al., 2009; Stevens & Vollebergh, 2008; Virta, Sam & Westin, 2004; Wickrama & Bryant, 2003).

Further, factors associated with the child or adolescent's cultural background, or factors associated with a certain lifestyle shaped by the country of origin, have also been proposed as explanations for the increased risk of mental health problems among children and adolescents from ethnic minorities or with an immigrant background. These might, for example, take the form of social norms regarding acceptable and unacceptable behaviours, differences in thresholds for reporting mental health problems, and parenting styles that may produce negative outcomes (e.g. Stevens et al., 2003; Stevens & Vollebergh, 2008).

However, the results from previous research are inconsistent. Mental health problems have also been found to be less common among children and adolescents with an immigrant background (e.g. Goodman, Patel & Leon, 2010; Stansfeld et al., 2004). Just as culture has been proposed as an explanation for increased levels of mental health problems, cultural characteristics have also been put forward as an explanation for why some immigrant children present fewer mental health problems than their non-immigrant peers. Factors such as collectivistic family environments with high levels of support, family composition (i.e. two parent families), and lower levels of academic difficulties have been proposed as explanations for lower levels of mental health problems in certain ethnic groups (Goodman, Patel & Leon, 2010; Stansfeld et al., 2004;).

In addition, the theory of the "healthy migrant" has also been put forward as an explanation of lower levels of mental health problems among immigrants. This theory suggests that it is first and foremost strong and healthy individuals and families that manage to overcome the barriers associated with migration (e.g. Bhugra, 2004), and that as a consequence this group will present fewer (mental) health problems.

Findings are not only inconclusive between countries or studies, since the impact of migration on mental health also seems to vary depending on the informants used. Children, parents and teachers have been found to perceive and report levels of mental health problems differently. Vollebergh et al. (2005) found that while children with an immigrant background reported similar levels of mental health problems to those of their native peers, parents of immigrant background reported higher levels of internalizing problems among their children, while teachers in contrast reported lower levels of internalizing problems and higher levels of externalizing problems among children with an immigrant background (cf. Stevens et al., 2003). These discrepancies in the perception and recognition of problems might be of importance for referrals to and the utilisation of psychiatric care.

Differences in the utilisation of psychiatric care

Differences in observed levels of mental health might be a consequence of differences in access to care, differences in the level of acceptance of interventions and differences in the utilisation of psychiatric care. A number of studies have shown that children with an immigrant background and from ethnic minorities are less likely to use mental health care than children from the majority population (Elster et al., 2003; Gudiño et al., 2009; Verhulp et al., 2013). This is often assumed to reflect an unmet need for care among migrant and ethnic minority children.

As discussed earlier, recognition of mental health problems has theoretically been identified as the first step towards utilisation (e.g. Verhulst & Koot, 1992). If a behaviour is not identified as problematic or mental health-related, there is no need to seek care. The identification of mental health problems, both internalizing and externalizing, has been found to be lower among parents with an immigrant background (Roberts et al., 2005; Verhulp et al., 2013; Zwirs et al., 2006a), and this has been proposed as an explanation for lower levels of mental health care utilisation. Disparities in levels of problem identification have been explained by reference to differences in perceptions about what constitute normal and abnormal behaviours (Cauce et al., 2002), and parents' distress thresholds have been found to vary between ethnic groups (Bussing et al., 2003; Hackett & Hackett, 1993; Zwirs et al., 2006b).

However, the recognition of mental health problems is not enough by itself to lead to care utilisation, since the problem also needs to be viewed as warranting (mental health) care. The decision to seek help for children's and adolescents' mental health problems has been proposed to vary between ethnic groups depending on factors such as the stigmatisation associated with mental health problems, attitudes regarding how mental health problems should be handled and by whom (e.g. the health care sector or family and friends), and levels of confidence that the child/adolescent will benefit from mental health care (e.g. Cauce et al., 2002; Chavez et al., 2010; Ho et al., 2007; McMiller & Weisz, 1996). In addition, children's and adolescents' pathways to care, i.e. who makes the decision that care is needed, have been found to differ between ethnic groups (Skokauskas et al., 2010: Yeh et al., 2002).

When the decision to seek help is made, access to care is a potential obstacle that might influence levels of care utilisation. Access to and the accessibility of health care might differ between ethnic groups as a result of factors such as language or cultural barriers, which might affect levels of awareness about health care options and also how well health care concerns can be expressed. Differences in levels of access might also be produced by more structural factors, such as indirect financial costs and availability. Even if health care is free of charge, there may be costs associated with travel to health care centres, for example, and since immigrant and ethnic minority children more often live under financial stress, this might constitute more of an barrier for them than for children from the majority population(cf. Goddard & Smith, 2001; Burström, 2011).

Access to care, as well as the identification of problems requiring care and decisions to seek help, are also related to knowledge about mental health and to awareness about the health care system and its efficacy. Lower levels of mental health care utilisation might be a consequence of a lack of knowledge about the health care system among immigrant parents. However, knowledge is dynamic and the association between immigrant background and knowledge about, and confidence in, the health care system is likely to change over time in line with experience.[7] As was discussed in relation to the issue of

7 Knowledge and attitudes about mental health problems are of course likely to vary between different immigrant groups, and some groups will have an understanding that is closer to the host country's attitudes to mental health. A Dutch study showed that Surinamese parents and adolescents were more similar to Dutch parents and adolescents

neighbourhood effects on the utilisation of mental health care, the social network surrounding the child/adolescent and his or her family might be important to an understanding of differences in the utilisation of mental health care. The social network might be an important source for knowledge about both mental health and mental health care, and will in turn either facilitate or obstruct contacts with mental health care services (cf. Cauce et al., 2002).

Finally, differences in care utilisation may not reflect an unmet need for care at all, and morbidity may actually differ between groups. For example, Goodman et al. (2008) argue on the one hand that lower levels of psychiatric care utilisation among children and adolescents with an Indian background may be quite appropriate, since population-based studies show that they enjoy better mental health. On the other hand, Goodman et al. (ibid.) also note that there may be an unmet need for care among children and adolescents from Bangladesh, since their low levels of care utilisation are not reflected in the reporting of lower levels of mental health problems in population-based studies.

The Swedish context

Despite the increasing levels of segregation observed in Sweden over recent decades, and the attention these issues have attracted, Swedish studies of neighbourhood effects on children's and adolescents' (mental) health remain, to my knowledge, scarce. Results from a recent study, focusing on young people (aged 16-28), showed that the economic characteristics of the residential neighbourhood during adolescence played a significant role in predicting later hospital admissions for drug use and abuse (Sellström et al., 2011). Furthermore, Eriksson et al. (2011; 2012) found that adolescents' perceptions of neighbourhood social capital were significantly associated with their subjective well-being. Adolescents who perceived that their neighbourhoods were characterised by trust and safety also reported higher levels of well-being.

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with regard to both the identification of problems and the utilisation of mental health care than Turkish and Moroccan parents and adolescents. The authors suggest that this might be explained by the fact that Surinam is a former colony of the Netherlands, and that Surinamese immigrants will consequently be more familiar with the Dutch language and culture (Verhulp, Stevens, van de Schoot & Vollebergh, 2013).

Knowledge on how the social context constituted by the neighbourhood affects adolescents' access to and utilisation of mental health care in Sweden is limited. A recent study examining geographical differences in the utilisation of psychiatric care in the county of Stockholm found that utilisation levels differed between municipalities. However no conclusive pattern was found in relation to socioeconomic factors (Dalman, 2010). Among the adult population, both hospital admissions for mental health-related problems and prescriptions of psychiatric medication have been found to be associated with structural as well as social aspects of the neighbourhood (e.g. Chaix et al., 2006; Crump et al., 2011; Lofors & Sundquist, 2007; Sundquist & Ahlen, 2006), with higher levels of admissions and medication use in more deprived areas. Among adults, the lack of access to a regular doctor has been found to vary by municipality, with part of this variation being explained by the municipal level of social capital and by the administrative health care district (Lindström et al., 2006).

While the existing knowledge on how the neighbourhood context is related to children's and adolescents' mental health in a Swedish context is currently limited, we do know a little more about how parental country of birth is related to mental health among children and adolescents. Although it is likely that some of the mechanisms discussed above might be universal, findings from the international literature on ethnic differences in mental health cannot be directly generalised to a Swedish context, since the relationships between having a foreign background, or belonging to en ethnic minority, and levels of mental health and the utilisation of care are unlikely to be the same across different societies.

Just as in the international literature, the findings regarding children's and adolescents' mental health in a Swedish context are inconclusive. Both self-report and register-based studies have found the risk for mental health problems, measured in terms of self-harm, to be higher among adolescents with a foreign background (Jablonska et al., 2009; Landstedt & Gillander Gådin, 2011), although this risk has been found to be partly mediated by socioeconomic factors (Jablonska et al., 2009). However, there are also results from self-report studies that indicate no significant differences between children and adolescents with a foreign background and those with a Swedish background in relation to emotional and behavioural problems (Dekeyser et

al., 2011), or psychosomatic problems (Östberg, Alfven & Hjern, 2006). A recent Swedish survey among school children showed that foreign-born adolescents from Africa or Asia reported higher levels of mental health problems by comparison with Swedish-born adolescents (Hjern, 2012b). Then again, this same survey also showed that girls with foreign-born parents reported fewer mental health problems than girls with Swedish-born parents (Hjern, 2012b).

In summary, the knowledge on how factors such as parental country of birth and the neighbourhood of residence influence adolescent mental health in Swedish contexts is limited and inconclusive, and this is even more true with regard to the knowledge on how these factors influence young persons' contacts with the child and adolescent psychiatric sector. This thesis will not fill all of these gaps in the knowledge, but it will hopefully provide some new pieces to add to the puzzle.

AIMS

The overall aim of this thesis was to improve the knowledge on how the neighbourhood of residence and parental country of birth influence adolescent mental health and adolescents' pathways to and utilisation of psychiatric care.

The specific aims of the different studies were:

To examine whether children's and adolescents' pathways to child and adolescent psychiatric clinics vary by parental country of birth and neighbourhood of residence (Study I).

To investigate how parental country of birth and individual gender affect the utilisation of psychiatric care among adolescents (Study II).

To investigate the validity of the Swedish neighbourhoods as a geographical unit for the understanding of differences in adolescent mental health, and to examine whether neighbourhood socioeconomic deprivation is associated with individual variations in mental health problems (Study III).

To examine how adolescents' perceptions of the social characteristics of their neighbourhood are related to their mental health, and to investigate whether this relationship differs between girls and boys, or between adolescents with Swedish-born and foreign-born parents respectively (Study IV).

METHODS

The different papers are based on different data sources and investigate different mental health-related outcomes. Three of the papers are based on register data (Papers I, II & III), and one on survey data (Paper IV). All four studies are cross-sectional, which means that interpretations about causality should be made with caution. There follows a presentation of the data employed, and a description of the variables and statistical methods utilised in the different papers.

Data and populations

The data employed in Paper I are drawn from the child and adolescent psychiatric clinics in the county of Stockholm. These data include children born in 1989 or earlier who had contacts with the child and adolescent psychiatric sector that were concluded between 2003 and 2005. The total sample comprises approximately 7,600 children. The data include, amongst other things, information on the cause of referral, diagnoses (according to the DSM-IV), psychosocial stressors, the length and type of treatment, the source of the referral and residential neighbourhood. The study population in Paper I includes only those children and adolescents who had their first contact with child and adolescent psychiatric clinics in the year 2000 or later, and who were living in the municipality of Stockholm (n=2054). These data were gathered via the forms that the clinics are required to complete for each child/adolescent who attends a child and adolescent psychiatric clinic.

The data for Papers II and III are drawn from the Longitudinal Multilevel Analysis in Scania (LOMAS) database, which consists of anonymised information on all individuals living in Skåne, Sweden. LOMAS includes

information on, amongst other things, all health care expenditures, in- and out-patient and primary health care, as well as the use of psychotropic medication (dispensation at the pharmacy), demographics, socioeconomic characteristics and country of birth (individual and parents). The data in the LOMAS database are collected from Statistics Sweden (SCB), The National Board of Health and Welfare, and Region Skåne (the county council in the Scania region). The study population in Paper II consists of all girls and boys aged 13-18 years who were living in the county of Skåne in 2005 (n=92,203). In Paper III, the study population consists of all girls and boys aged 13-18 years who were living in the city of Malmö in 2005 (n= 17,729).

The data employed in Paper IV are drawn from the Malmö Individual and Neighbourhood Development Study (MINDS), which was initiated in 2007. MINDS is a longitudinal research project with the goal of following a sample of approximately 550 children born in 1995 and living in Malmö in 2007, from age 12 to age 21. The overall aim of the MINDS project is to contribute to a better understanding of the causes and prevention of young people's offending, but also to study how exposure to social settings affects other aspects of adolescent development and health. MINDS is modelled on the Peterborough Adolescent and Young Adult Development study, conducted at the Institute of Criminology, University of Cambridge (Wikström et al., 2012). The data used in Paper IV are drawn from the third wave of data collection carried out in 2011-2012, which included 483 adolescents.

Table 1 provides an overview of the designs, data and populations used in Papers I-IV.

Paper	Design	Type of data	Population
I	Cross-sectional	Register	2 054 (age 11-19)
II	Cross-sectional	Register	92 203 (age 13-18)
III	Cross-sectional	Register	17 729 (age 13-18)
IV	Cross-sectional	Survey	483 (age 16-17)

Description of variables

Outcome variables

In this thesis, mental health and mental health problems are conceptualised broadly. The thesis does not examine specific diagnoses (e.g. depression) or groups of problems (e.g. internalising problems), and the focus is instead directed at mental health problems and the utilisation of psychiatric care in general, and on how these variables differ on the basis of neighbourhood of residence and parental country of birth. Table 2 summarises the different measures employed in the thesis.

Source of referral (Paper I)

In order to investigate the pathways by which children and adolescents come into contact with child and adolescent psychiatric clinics, the source of the referrals to such clinics was assessed. Four different referral sources were identified in order to assess different pathways to care; family referrals (i.e. family members and self-referrals), social/legal agency referrals (i.e. social services, lawyers), school referrals (i.e. teachers, school health care staff, after school centres), and health/mental health referrals (i.e. general practitioners, child health care centres, adult psychiatric services). As a result of constraints in the data, it was not possible to determine which source had initially referred the child to the child and adolescent psychiatric sector, but rather only whether or not the child/adolescent had been referred by the various sources at any time. Just over 50 percent had only a single source of referral registered, and of these 90 percent were family referrals.

Utilisation of psychiatric care (Papers II & III)

One possible way to study the prevalence of mental health problems in the population is to examine the utilisation of psychiatric care.

In Paper II, the utilisation of psychiatric care was operationalised in terms of individual in- and outpatient psychiatric care expenditures in the course of 2005. In- and outpatient care were analysed separately in order to determine whether utilisation patterns differed in relation to the type of care received (i.e. in relation to the severity of problems). The measure of care utilisation was dichotomised into two groups; those who had utilised psychiatric care during the year and those who had not.

In Paper III, an additional variable was included in the utilisation measure in the form of the dispensation during the course of 2005 of psychotropic medication (defined as all drugs with Anatomic Therapeutic Chemical (ATC) classification codes starting with N05 or N06[8]). The inclusion of psychotropic medication was intended to capture not only adolescents who received treatment via the child and adolescent psychiatric care sector, but also those who received treatment from other sources, such as primary care provision. This group is likely to be quite small however (Dalman, Forsell & Magnusson, 2011). In Paper III, care utilisation was dichotomised into two groups; those adolescents who had utilised psychiatric care during the year and those who had not.

Self-reported mental health (Paper IV)
In contrast to the measures employed in Papers II and III, which examine the utilisation of psychiatric care, and consequently only include those adolescents who have received treatment for mental health problems, the outcome measure in Paper IV focuses on self-reported mental health. Self-reported mental health constitutes an important complement to register-based studies as a means of assessing the prevalence of mental health problems that are not registered by the health care sector.

In Paper IV the Strengths and Difficulties Questionnaire (SDQ) (Goodman, Meltzer & Bailey, 1998) was employed to measure self-reported mental health. This questionnaire consists of 25 items divided into five subscales (emotional symptoms, conduct problems, hyperactivity, peer problems and prosociality). The first four scales were summed to produce a total difficulties score (Cronbachs alpha .71, range 0-28) and this continuous variable was used as the outcome measure in the analysis. A high score on this variable indicates higher levels of mental health problems.[9]

[8] ATC code N05A –Antipsychotics, N05B –Anxiolytics, N05C –Hypnotics and sedatives, N06A –antidepressants, and N06B –Psychostimulants.
[9] The results from the SDQ are often used in the form of a dichotomy (based on a cut-off point at the 90th percentile) between those with and without significant mental health problems. This dichotomy has been shown to identify children and adolescents with mental health problems quite accurately, and it is correlated with clinically recognized psychiatric disorders (Goodman et al., 2000). Using the 90th percentile as cut-off resulted in a cut-off value of 19 which is in line with previous Swedish studies that have used the SDQ (e.g. Dekeyser et al., 2011; Lundh, Wångby-Lundh, & Bjärehed, 2008). We chose to use the total mental health difficulties score instead of the dichotomized version in order not to lose information on the variation found among those adolescents with less serious mental health problems.

Explanatory variables

Parental country of birth

As has been discussed above, foreign background and ethnicity are complex concepts that are difficult to measure and define. In this thesis, the categorisation is based on information about parental country of birth. Those children and adolescents both of whose parents were born abroad were categorised as having a foreign background (in line with the recommendations of Statistics Sweden (SCB, 2013)). This basic categorisation is then operationalised somewhat differently in the different papers, depending on the constraints associated with the different data sources employed.

In Paper I, children/adolescents with a foreign background were further categorised into subgroups based on their geographical origin: Nordic (other than Sweden), European (other than Nordic), Asian, South American, and African. These subgroups obviously contain important within-group heterogeneity, but it was not possible to create smaller, more homogenous groups since for some individuals, the available data refer only to the region of origin (e.g. "other Asian country").

In contrast to the geographical categorisation employed in Paper I, adolescents with a foreign background were categorised in Paper II on the basis of the World Bank Classification of Country Economies (World Bank,). The adolescents were grouped into four categories; one or both parents born in Sweden, both parents born in a high-income country, both parents born in an upper middle-income country, and both parents born in a lower middle-income/low-income country.[10]

Neighbourhood units

When studying neighbourhood effects on health, the identification of meaningful boundaries for the neighbourhoods is crucial. The size and definition of the relevant boundaries might vary depending on the processes by which the neighbourhood is thought to operate and on the outcome of interest (e.g. Diez-Roux, 2001; MacIntyre et al., 2002). In the studies included in this

[10] This economic categorisation in large part resembles a geographical categorisation, since more than 95 % of the African countries south of the Sahara and about 90 % of the Central Asian/Far Eastern countries were categorised as low-income economy countries. Almost 90 % of the western European countries were categorised as high-income economies.

thesis, the operationalisation of neighbourhoods is based on administrative boundaries. In quantitative studies of this kind, it is difficult to evaluate how accurately these administrative boundaries reflect individuals' perceptions of what constitute their neighbourhoods. The operationalisation of neighbourhoods differs between Studies I and III as a result of differences in the available information on the adolescents' neighbourhood of residence.

In Paper I neighbourhoods are defined as city districts (census tracts), and the municipality of Stockholm is divided into 132 such neighbourhoods. Only neighbourhoods that had at least 10 children/adolescents included in the child and adolescent psychiatric clinics data were included, which resulted in a final sample of 82 neighbourhoods being included in the study. The children/adolescents living in these 82 neighbourhoods represent 94 percent of the children/adolescents who attended child and adolescent psychiatric clinics in the municipality of Stockholm in the course of the period covered by the study. The children/adolescents who were excluded from the final sample do not differ from those who were included in the study with regard to source of referral or parental country of birth. The excluded neighbourhoods are for the most part sparsely populated neighbourhoods dominated by recreational areas and parks.

In paper III, neighbourhoods were defined as small-area market statistics (SAMS) areas. SAMS refers to small administrative area units with an average population of 1000 residents. The boundaries of the units are drawn so as to include similar types of housing, this implies that SAMS neighbourhoods are comparatively homogeneous regarding socioeconomic structure (Statistics Sweden, 2005). Initially, 315 neighbourhoods were represented in the data, although only neighbourhoods with more than 20 adolescents were included in the analysis, resulting in a final sample of 235 neighbourhoods, representing about 96 percent of the adolescents from the original sample. The excluded adolescents did not differ from those included with regard to either the utilisation of psychiatric care or individual characteristics.

Neighbourhood characteristics

The neighbourhood-level explanatory variable of interest in Papers I and III is the neighbourhood level of socioeconomic deprivation. To estimate the neighbourhood level of deprivation, we combined a number of variables

indicating the socioeconomic status of the neighbourhood into a single measure using factor analysis. The choice of variables included in the deprivation measured was inspired by previous research on neighbourhood effects on adolescent mental health (e.g. Schneiders et al., 2003; van der Linden et al., 2003). In Paper I, the neighbourhood deprivation measure was based on the proportion who are unemployed, the proportion with fewer than twelve years of education, the proportion of low income earners (below 120,000 SEK/year), and the proportion of high income earners (above 360,000 SEK/year). In Paper III, the measure of neighbourhood deprivation includes data on the proportion of people with a weighted family income less than the city median (i.e. 114,352 SEK), the proportion of people receiving social welfare benefits, the proportion who are unemployed and the proportion of people with fewer than twelve years of education.

In Paper IV, the neighbourhood measure of interest is focused on the social characteristics of the neighbourhood rather than on the structural characteristics examined Studies I and III. More precisely, the focus is directed at adolescents' perceptions of the social characteristics of their neighbourhood of residence. Three different scales were employed measuring perceptions of collective efficacy, of intergenerational closure and of the level of social disorder (cf. Wikström et al., 2012).[11] In contrast to neighbourhood socioeconomic deprivation, which might be interpreted as an objective measure, since it is measured independently of the subjects included in the study, this measure specifically aims to capture the adolescents' subjective views on their neighbourhoods in order to examine how these are related to mental health.

Control variables

A number of control variables were included in the different studies. Controlling for confounding variables is important in order to reduce the risk of misinterpreting the results because the effect of the explanatory variable on the outcome is confused by the omission of a variable that is associated with both the outcome and the explanatory variable. For example, socioeconomic differences have been proposed as an important variable to include in the analysis when investigating differences in health between ethnic groups (e.g.

[11] These scales were developed in the PADS + projects, and are based on the research tradition focusing on social capital (e.g. Coleman, 1988; Sampson, Raudenbush & Earls, 1997; Sampson, Morenoff & Earls, 1999).

Bhopal, 1997). The control variables included in each paper are summarised in Table 2.

Analytical strategy

Different statistical methods were used in the different papers depending on the research questions of interest and the types of data being analysed. A summary of the statistical methods employed in the papers can also be found in Table 2.

Multilevel logistic regression (Papers I & III)

Due to the binary nature of the outcome variables and the hierarchical structure of the data, with adolescents (first/individual level) being nested within neighbourhoods (second/contextual level), Papers I and III employed multilevel logistic regression analysis (Goldstein, 2003; Snijders & Bosker, 1999). The basic assumption of multilevel analysis is that factors that affect health (or some other outcome) are hypothesised to operate at both the individual level and the contextual level (e.g. neighbourhood level) (e.g. Subramanian, Jones & Duncan 2003). Multilevel analysis takes into account the possibility that individuals residing in the same area are more similar to each other in relation to their health or their health-related behaviours, than they are to individuals living in another area. The multilevel analysis also contributes to disentangling compositional and contextual effects.

The analyses in Papers I and III estimate a series of consecutive models. The first model is a so-called empty model, in which the probability of being referred to the psychiatric sector by a specific source (Paper I) or of utilising psychiatric care (Paper II) is only a function of the child's or adolescent's residential neighbourhood. This model shows the initial neighbourhood variance. In the following models, individual level and contextual level variables are included to examine how much of this initial variance is due to compositional and contextual effects respectively.

In the interpretation of the multilevel analysis, an important distinction is made between individual and specific contextual effects on the one hand and general contextual effects on the other (Merlo, 2011; Merlo et al., 2009).[12]

[12] In Paper I, specific effects are termed fixed effects and general effects are termed random effects.

The specific effects indicate the associations between individual and contextual variables and the outcome variable, while the general contextual effect indicates the degree to which the neighbourhoods studied explain individual differences in the outcome variable (i.e. the source of referral or the utilisation of psychiatric care). In Studies I and III, specific effects were estimated by calculating odds ratios (OR) with 95 percent confidence intervals (CI). The ORs in a multilevel logistic model are interpreted in the same way as in a single-level logistic regression.

General contextual effects are estimated by calculating the intra-class correlation (ICC). The ICC provides information on the proportion of the variance in the outcome that can be accounted for by the neighbourhood. If the ICC is small (close to zero), this indicates that the neighbourhood does not affect the outcome in any important way, whereas a larger ICC indicates that the neighbourhood context plays an important role in explaining individual differences in the outcome. The latent variable method was used to calculate the ICC as: neighbourhood variance/(neighbourhood variance $+\pi^2/3$) (Snijders & Bosker, 1999).

Logistic regression (Paper II)
In order to estimate how gender and parental country of birth are associated with the utilisation of psychiatric care, logistic regression analysis was employed. In- and outpatient care were analysed separately to examine whether the correlations differed in relation to the type of care received (i.e. in relation to the severity of problems). The initial models included only parental country of birth and gender, while a second model adjusted for age, family socioeconomic factors and the type of residential area. Odds ratios (OR) with 95% confidence intervals (CI) were estimated. In order to examine possible interaction effects, the effects of eight combinations of gender and parental country of birth on the utilisation of psychiatric care were analysed.

Multivariate linear regression (Paper IV)
In order to estimate the strength of the relationship between adolescents' perceptions of the social characteristics of their neighbourhoods and their self-reported mental health, a series of block-wise ordinary least square (OLS)-regressions were performed. Three models were fitted to examine the effects of neighbourhood deprivation and adolescent perceptions of collective efficacy,

intergenerational closure and social disorder on mental health, adjusting for gender and parental country of birth. Thereafter, three OLS regressions were fitted for girls and boys separately to examine whether the effects of deprivation and of perceptions of neighbourhood characteristics differed between boys and girls. Finally, the data were split by parental country of birth to analyse whether there were ethnic differences in the correlations between perceptions of neighbourhood characteristics and mental health.

Table 2 provides an overview of the measures and statistical methods employed in Papers I-IV.

Paper	Outcome variable	Explanatory variables	Control variables	Statistical method
I	Source of referral to CAP-care	Parental country of birth, neighbourhood level of deprivation	Age, gender, family structure	Multilevel logistic regression
II	Utilisation of psychiatric care	Parental country of birth, gender	Age, socioeconomic status, family structure, type of residential area	Logistic regression
III	Utilisation of psychiatric care and dispensation of psychotropic medication	Neighbourhood level of deprivation	Age, socioeconomic status, family structure, parental country of birth	Multilevel logistic regression
IV	Self-reported mental health	Perceptions of neighbourhood social characteristics	Gender, parental country of birth, neighbourhood level of deprivation[13]	Linear regression

Ethical considerations

Study I was approved by the Swedish Regional Ethical Review Board at Karolinska Institutet, Stockholm (Dnr. 2005/771-31). Studies II and III were approved by the Swedish Regional Ethical Review Board in Lund (Dnr. 532/2008 (237/2005)). Study IV was also approved by Swedish Regional Ethical Review Board in Lund (Dnr. 201/2007). None of the datasets employed contained any identifiable data, and the results are presented in a way that precludes the identification of individuals. For Study IV, informed

[13] In Paper IV, gender and ethnicity were also used as grouping variables to examine whether associations between perceptions of the neighbourhood and mental health differed between girls and boys, or between adolescents with different backgrounds.

written consent was obtained from both the adolescents participating in the study and their parents.

Conducting research on children and adolescents raises a number of ethical concerns, three of which will be briefly discussed below. A first concern regards the issue of asking about sensitive topics such as mental health. However, asking adolescents sensitive questions need not be harmful, as long as the integrity of the participants is respected, and provided they are told that their participation is voluntary and are assured that their answers will not be published in a way that would allow for the identification of their individual answers. In addition, it is important to include children's and adolescents' own experiences when investigating mental health-related issues (cf. Helweg-Larsen et al., 2004).

Secondly, the publication of research results might contribute to an (increased) stigmatisation of certain groups (Alderson 2004). The categorisation of children into different groups based on their own or their parents' country of birth might result in too much focus being directed at the importance of e.g. culture, when the real problem is structural. An additional consequence might be that children and adolescents with a certain background are identified as a "problem group" and as constituting a burden on society. On the other hand, considering parental country of birth in research about adolescents' mental health and their utilisation of psychiatric care might produce an increased awareness about inequalities in health and access to health care between groups and might serve as a stimulus to policy (cf. Bhopal, 1997). Dogra et al. (2012) point to the need for better knowledge on the prevalence of mental health problems among children and adolescents with an immigrant background, and for the development of methodologies to identify the needs of different ethnic groups. They argue that this type of knowledge is essential both for the identification of relevant risk factors and for the development of appropriate interventions to improve access to health care (if this is what is needed).

Finally, in the same way as the categorisation of children and adolescents based on their parental country of birth can lead to stigmatisation, the identification of certain neighbourhoods as problematic might result in the stigmatisation of these areas. Thus investigating neighbourhood effects and trying to

identify the relevant contextual boundaries that affect mental health, access to care and care utilisation is important in order to identify inequalities and mechanisms that affect individual development.

MAIN RESULTS

The following section contains a summary of the main results from the four studies included in this thesis. These studies aimed at analysing different aspects of how parental country of birth and neighbourhood of residence were associated with mental health problems and contacts with and the utilisation of psychiatric care.

Pathways to child and adolescent psychiatric clinics (Study I)[14]

The first study addressed the question of how children and adolescents are referred to child and adolescent psychiatric clinics, and whether these referral patterns differed by parental country of birth and neighbourhood of residence.

Most children and adolescents had been referred to the child and adolescent psychiatric sector by their families. However the multivariate analyses indicated that referral patterns varied by parental country of birth as well as by neighbourhood of residence.

The probability of ever having been referred to the child and adolescent psychiatric sector by the family was significantly lower for children and adolescents with a background in African countries or in a European country (other than Nordic), by comparison with that for children and adolescents with a Swedish background. These correlations remained following the inclusion of individual- and neighbourhood-level variables. Neighbourhood

[14] In Paper I there are errors in the tables. In Table 2, the 95 % CI for age is missing in Models III and IV. These should be 0.72-0,83 and 0.72-0.84 respectively. In table 2-5 the table text associated with the variance measure reads standard errors, this should be standard deviations (SD). In HLM (the software used in paper I) the chi-square test is used for significance testing.

socioeconomic deprivation was negatively associated with family referrals, i.e. children and adolescents living in less deprived neighbourhood were more often referred by their families. Children and adolescents with parents originating from a European (other than Nordic), African or Asian country were initially more likely to be referred by social/legal agencies. When individual- and neighbourhood-level variables were adjusted for, only children with an African background showed a higher probability of being referred by social/legal agencies by comparison with children and adolescents with a Swedish background. Referrals by social/legal agencies were positively associated with neighbourhood socioeconomic deprivation. School or health care referrals were more common among children and adolescents with parents from Asian or South American countries.

The multilevel analysis showed that the neighbourhood context was only relevant in relation to understanding differences in family referrals. Initially, in the empty model, 7.5 percent of the total variance in family referrals was found between neighbourhoods. Individual-level variables explained about 30 percent of this between-neighbourhood variance. Following the inclusion of neighbourhood-level socioeconomic deprivation, the between-neighbourhood variance disappeared. This indicates that that the differences in referral patterns between neighbourhoods can to a large extent be explained by the neighbourhood level of deprivation. However, an important caveat associated with the study is the fact that it was not possible to control for the individual-level socioeconomic situation. The large impact of neighbourhood socioeconomic deprivation might be an effect of individual socioeconomic circumstances, and the differences between neighbourhoods might be explained by composition rather than context.

The utilisation of psychiatric care (Studies II & III)

Studies II and III aimed to investigate the utilisation of psychiatric care in relation to parental country of birth and gender (Study II) and neighbourhood of residence (III). In both studies, approximately 5.5 percent of the study population had utilised psychiatric care during the year 2005.

Parental country of birth and the utilisation of psychiatric care

Parental country of birth was significantly associated with the utilisation of psychiatric outpatient care. Adolescents whose parents were born in middle-

or low-income countries had a lower probability of utilising psychiatric outpatient care than those with Swedish born parents. Initially, no comparable pattern was found for the utilisation of psychiatric inpatient care. However, following adjustment for socio-demographic variables, adolescents with parents born in low-income countries also had a lower probability of utilising inpatient care. This finding is difficult to interpret, but indicates that among adolescents with similar socioeconomic backgrounds, those adolescents with parents from low-income countries were less likely to utilise psychiatric care.

Rerunning the analysis employing a geographical categorisation of parental country of birth showed that adolescents whose parents were not from Western Europe or North America proved to have lower levels of psychiatric outpatient care utilisation. As regards inpatient care, only adolescents with parents born in Southern Europe showed lower levels of utilisation by comparison with adolescents with Swedish born parents.

In Paper III, the same pattern of lower levels of psychiatric care utilisation among adolescents with foreign born parents was found, with levels of care utilisation being lowest among adolescents with parents born in low-income countries.

In line with results from previous reports (Lager et al., 2012; Dalman, 2010), girls were more likely than boys to have utilised both in- and outpatient psychiatric care. However, after controlling for interactions between gender and parental country of birth, the analysis revealed that this was only true for girls whose parents were born in Sweden or other high-income countries.

Neighbourhood effects on the utilisation of psychiatric care

The neighbourhood of residence played a small but significant role in understanding the utilisation of psychiatric care, with 1.6 percent of the total variance in psychiatric care utilisation being found at the neighbourhood level. Following adjustment for individual and family variables, the between-neighbourhood variance was reduced by 90 percent, indicating that a substantial amount of the variance between neighbourhoods was due to compositional factors, i.e. to the characteristics of the adolescents living in the different neighbourhoods. Adjusting for neighbourhood socioeconomic deprivation resulted in a 37 percent reduction of the between-neighbourhood

variance. This small general contextual effect indicates that the neighbourhood context (at least when operationalised as SAMS-areas as in this study) has a limited role to play in explaining variations in adolescent psychiatric care utilisation.

The specific contextual effect showed that adolescents living in neighbourhoods with a medium level of deprivation were at higher risk of utilising psychiatric care (OR 1.22), although living in a neighbourhood with a high level of deprivation was not associated with the utilisation of psychiatric care.

Self-reported mental health (study IV)

The aim of the fourth study was to examine whether adolescents' perceptions of the social characteristics of their neighbourhoods were related to their mental health, and whether perceptions of the neighbourhood have an independent effect on mental health over and above that of the socioeconomic structure of the neighbourhoods in which the adolescents live.

Adolescents' perceptions of their neighbourhoods were correlated with their levels of mental health. This was particularly true for the perceived level of social disorder. Adolescents who perceived that their neighbourhood was characterised by a high level of social disorder reported higher levels of mental health problems. There was also an independent effect of neighbourhood deprivation on mental health. Adolescents living in neighbourhoods with higher objective levels of deprivation reported higher levels of mental health problems.

Gender differences

Fitting separate models for girls and boys showed different patterns of associations between perceptions of neighbourhood characteristics and mental health. For girls, it was only the perceived level of social disorder that was associated with mental health problems, whereas for boys, mental health problems were associated not only with perceived social disorder but also with perceptions of poor collective efficacy and of high objective levels of deprivation.

Differences between adolescents with a Swedish and a foreign background

Differences in patterns of associations were also found between adolescents with Swedish born parents and those whose parents were born in another country. For adolescents with a Swedish background, both objective neighbourhood socioeconomic deprivation and perceived collective efficacy were initially associated with mental health. These associations were reduced to insignificance however when perceived social disorder was included in the analysis. In the final model, the perceived level of social disorder was strongly associated with mental health problems. Among adolescents with foreign born parents, objective neighbourhood socioeconomic deprivation was initially associated with mental health. However, following the inclusion of perceived collective efficacy in the second model, this association was reduced to insignificance. In the final model, none of the included variables were significantly associated with mental health.

GENERAL DISCUSSION

The aim of this thesis was to improve the existing knowledge on how the neighbourhood of residence and parental country of birth are related to adolescent mental health, pathways to care and the utilisation of psychiatric care, in a Swedish context. The basic assumption that has constituted the point of departure for the thesis is that children and adolescents (and of course adults) exist and interact within a complex set of contexts, and that these contexts affect individual mental health and behaviour. Mental health and mental health care have been analysed in generic terms, and the focus is directed at the broad picture rather than at specific problems or diagnoses.

Interpretation of the results

The neighbourhood level of socioeconomic deprivation

With the increased levels of both economic and ethnic segregation that have been reported over recent decades (National Board of Health and Welfare, 2010), and the growing body of international literature that indicates contextual effects on health and health-related behaviours, one of the main focuses of the thesis has been to analyse different aspects of the neighbourhood context in relation to adolescents' mental health and their utilisation of psychiatric care.

The neighbourhood level of socioeconomic deprivation was found to be associated with adolescents' pathways to care. Children and adolescents living in neighbourhoods with a high level of deprivation were less likely to have been referred to psychiatric care by their families, and more likely to have been referred by social/legal agencies. Contrary to expectations, a high level of neighbourhood socioeconomic deprivation was not associated with the

individual utilisation of psychiatric care. Initially, levels of care utilisation appeared to be higher in neighbourhoods with a mid-level of deprivation, but following adjustment for individual level variables this association disappeared. This might indicate that accessibility varies depending on the level of deprivation, with families living in more deprived areas having less access to care. However, the mechanisms underlying these results need to be further elaborated before any conclusions can be drawn regarding accessibility (cf. Chow, Jaffee & Snowden, 2003).

Variation between neighbourhoods

When investigating neighbourhood effects on health and health-related behaviours, however, it is insufficient to only examine associations between neighbourhood characteristics and the outcome of interest. In addition, we also need to examine the variance that exists between neighbourhoods (cf. Merlo et al., 2009; Merlo, 2011). As regards referral pathways into child and adolescent psychiatric care, the neighbourhood context appears to play a significant role in relation to family referrals. About seven percent of the variance in family referrals was to be found between neighbourhoods. This indicates that factors that facilitate family referrals to the child and adolescent psychiatric sector might to some extent be clustered within neighbourhoods. These might be factors such as knowledge, attitudes and norms regarding mental health and how mental health-related problems should be handled. Consequently, the neighbourhood level might constitute a useful arena for interventions aiming at increasing accessibility by increasing knowledge and influencing health-related behaviours. Nevertheless, the greater part of the variance in family referrals is found at the individual level, and the fact that socioeconomic position could not be adjusted for, might conceal an important compositional effect.

In the search to identify a relevant context for understanding variations in adolescents' mental health, or at least in their utilisation of psychiatric care, the neighbourhood context does not seem to represent such a context (at least not when the neighbourhood is operationalised in terms of SAMS-areas). In Paper III, only approximately 1.6 percent of the variance in psychiatric care utilisation was found between neighbourhoods. Thus, adolescents are simultaneously exposed to a number of different contexts, and other contexts

might be more important for our understanding of variations in adolescent mental health and in their utilisation of psychiatric care.

The relatively small neighbourhood effects observed here, and the limited influence of neighbourhood deprivation on the utilisation of psychiatric care might indicate that even if levels of segregation have increased in Sweden over recent decades, these cannot be compared to the levels of segregation found in US society, for example. When interpreting neighbourhood effects on health, we also need to consider the broader spatial context in which neighbourhoods are situated. In the Swedish context, resource-poor areas are often relatively close to areas that are richer in resources, which might produce a positive "spill-over" effect on health-related outcomes (cf. Diez-Roux & Mair, 2010; Sampson, Morenoff & Earls, 1999). In addition, the Swedish health care system, with its aim of allocating resources on equal terms, might have a "buffering" effect in relation to neighbourhood effects on adolescent mental health.

If psychiatric care utilisation is interpreted as reflecting levels of mental health problems, the results from Paper III are in contrast with previous findings from this field, which have identified the neighbourhood of residence as being important for explaining variations in mental health problems (e.g. Fagg, et al., 2006; Xue et al., 2005). However, mental health care utilisation may not reflect the actual prevalence of mental health problems at the neighbourhood level. It is possible that there is a variation in the level of adolescents' mental health problems that is not shown in register data, and the lack of neighbourhood variation might rather reflect a unmet health care need.

Perceptions of neighbourhood characteristics

The final paper in the thesis applies a different approach to neighbourhood effects on adolescent mental health. In this study the focus was on adolescents' perceptions of their neighbourhoods. In line with the findings of previous research (e.g. Aneshensel & Sucoff, 1996; Meltzer et al., 2007), the results from this study showed that adolescents' perceptions of their neighbourhoods were associated with their self-reported mental health, and particularly their perceptions of neighbourhood disorder. Adolescents' perceptions of their neighbourhood are likely to interact with individual characteristics, that is, some individuals may be more sensitive to perceived disorder or low collective

efficacy than others. Estimating separate models for girls and boys, and for adolescents with Swedish and immigrant background respectively revealed that the patterns of associations between perceptions of neighbourhood characteristics and mental health differed both by gender and by parental country of birth. This indicates that associations between perceptions of neighbourhood characteristics and mental health are explained by different mechanisms in different groups of adolescents. For example, girls might be more prone to experience their neighbourhoods as unsafe, and adolescents with a foreign background might be more likely to perceive discrimination in the neighbourhood (e.g. Morrow, 2001). In addition, it has been suggested that children with mental health problems have more negative perceptions of their neighbourhoods (Fagg et al., 2008; Meltzer et al., 2007), and it is difficult to establish whether perceptions of the neighbourhood influence mental health or whether mental health influences perceptions of the neighbourhood. The longitudinal design of the MINDS-data will allow us to elaborate on this reciprocal relationship in forthcoming studies.

Parental country of birth

The other central theme of the thesis has been the association between parental country of birth and adolescents' mental health and their utilisation of psychiatric care. Parental country of birth proved to be an important factor for understanding both variations in pathways to care and patterns of care utilisation. The findings regarding differences in referral patterns between children with different backgrounds are in line with previous findings from the international literature (e.g. Messent & Murrell, 2003; Skokauskas et al., 2010; Yeh et al., 2002), as is the finding of lower levels of psychiatric care utilisation among adolescents with foreign-born parents (e.g. Goodman, Patel & Leon, 2008; Verhulp et al., 2013). There are several mechanisms that might explain these differences. The observed differences could be interpreted in terms of differences in attitudes to psychiatric care, or in tolerance thresholds regarding the types of problems that warrant seeking care. But the discrepancy could also indicate that Swedish-born parents have better knowledge of, and access to, available health care options, and that for them, as a consequence of their being familiar with the system, turning to the child and adolescent psychiatric sector is the accepted way of handling their child's or adolescent's mental health problems. These mechanisms may have greater influence on help-seeking behaviour in relation to mild and moderate problems, i.e.

problems that can be dealt with by the outpatient care system, and may thus explain both the observed differences in the utilisation of outpatient care, and the initial absence of differences in inpatient care (cf. Stein et al., 2003).

Children and adolescents with a foreign background (with the exception of children and adolescents from the Nordic countries) were more likely to have been referred to the child and adolescent psychiatric sector by external agencies, such as social services or school staff. This might indicate that the behaviour of children and adolescents with a foreign background is more likely to be labelled as deviant by adults in different contexts (cf. Stevens et al., 2003). However, the over-reporting of children and adolescents with foreign-born parents could also be a consequence of these children and adolescents being less likely to be referred by their families, and of their problems therefore being identified by adults outside the family.

The lower levels of psychiatric outpatient care utilisation found among adolescents with parents from middle- or low-income countries might of course be an indication that mental health problems are less common among these adolescents. This assumption is however challenged by the absence of differences found in relation to inpatient care in this thesis, and also by findings from previous Swedish register-based studies that have shown higher levels of hospital admissions for mental health-related problems among adolescents and young adults with a foreign background (Jablonska et al., 2009; Leão et al., 2005). The increased risk for mental health problems among young adults with an immigrant background has also been found in Swedish survey studies (Kosidou et al., 2012). This might obviously be a cohort or period effect, due to differences in vulnerability among adolescents with a foreign background born during different decades and with different migration histories, but it might also reflect an unmet health care need among adolescents whose parents come from middle- and low income countries. The hypothesis of an unmet health care need among adolescents with foreign born parents, and particularly among those with parents born in low-income countries, is supported by the results from a recent Swedish study investigating the use of psychotropic medication. In this study Van Leeuwen, Nilsson & Merlo (2012) found that, even after adjusting for needs, the use of psychotropic medication was lower among adolescents with mothers born in low-income countries.

Gender differences

Gender differences were found both in relation to self-reported mental health, and in relation to the utilisation of psychiatric care. The determinants of these differences are unclear. In the literature, it has amongst other things been suggested that girls are more affected than boys by factors such as demands on educational achievement and personal appearance, and that this might explain why girls experience, or report, worse mental health than boys (e.g. West & Sweeting, 2003). Gender differences in self-reported mental health and the utilisation of psychiatric care might also be a consequence of different expectation about how girls and boys should behave and deal with their problems. However, it was primarily girls with parents born in Sweden or other high-income economies who had higher levels of psychiatric care utilisation, and the same pattern was not found among girls with parents born in middle- and low-income countries. This is an interesting finding that needs to be further analysed and which might provide important information about significant protective factors among girls with a foreign background, or about unmet health care needs in this group.

Methodological considerations

The following section will discuss a number of general methodological issues that are important for the interpretation of the results presented in this thesis.

The cross-sectional design

The studies in this thesis are cross-sectional and which makes it difficult to draw conclusions regarding causality. The cross-sectional design is a more obvious problem in relation to the neighbourhood of residence than it is in relation to parental country of birth, which is stable over time.

The cross-sectional character of the data might be one explanation for the lack of neighbourhood effects on the utilisation of psychiatric care. It is likely that the social characteristics of the neighbourhood do not have an instantaneous impact on adolescents' mental health, but are instead dependent on stability over time (cf. MacIntyre et al., 2002), and might work over the course of generations (Sampson, Sharkey & Raudenbush, 2008). Sellström et al. (2011), for example, have shown that the neighbourhood of residence during adolescence played an important role in predicting hospital admissions for illicit drug use. Applying a longitudinal approach might modify the

conclusions in relation to both the validity of the neighbourhood context for understanding differences in mental health among adolescents and the influence of neighbourhood socioeconomic deprivation. However, two recent Swedish studies that have employed longitudinal data to address the effect on young adults' living conditions (i.e. unemployment, educational level, receiving social assistance and criminality)of growing up in a disadvantaged neighbourhood did not find any clear evidence of a neighbourhood effect (Brännström, 2012; Brännström & Rojas, 2012). Thus, these findings might not be valid in relation to health or well-being.

In addition, the study of the influence of parental country of birth might also benefit from the use of a longitudinal perspective. For example, the number of years that the parents have lived in Sweden could have been used as a proxy for knowledge about the health care system when studying the utilisation of psychiatric care. However, comparing first and second generation immigrants resulted in similar patterns for both groups with regard to both referral pathways and the utilisation of psychiatric care.

Operationalisation of central concepts

The broad approach employed in relation to mental health and the utilisation of mental health care may conceal important differences related to specific problems or diagnoses. Previous Swedish studies have for example identified an increased risk for hospital admissions among adolescents and young adults with a foreign background for problems such as self-harm (Jablonska et al., 2009), and for psychotic disorders among second-generation refugees (Leão et al., 2005). Certain types of mental health problems might also more be likely to be influenced by neighbourhood characteristics. Meltzer et al. (2007) found that perceptions of neighbourhood characteristics were strongly associated with emotional problems, and as was discussed above, Sellström et al. (2011) found that the economic characteristics of the neighbourhood were associated with hospital admissions for illicit drug use or abuse.

In Papers I and III, the neighbourhood context was operationalised using administrative boundaries, and it might be questioned whether these boundaries actually correspond to the way adolescents conceptualise their neighbourhoods. In Paper IV, a combination of administrative boundaries (to measure neighbourhood deprivation) and adolescents' own definitions of their

neighbourhood context (i.e. they were asked to describe an area within a short walking distance around their homes) was employed. It is likely that the approach used in Paper IV better captures the area that adolescents actually identify as their neighbourhood (cf. Spilsbury, Korbin & Coulton, 2009).

In addition, the different categorisations of children and adolescents according to country of birth used in the included studies might conceal difference in mental health as well as in utilisation of psychiatric care between different groups of children and adolescents.

Studying mental health using register-based data

One strength associated with the register-based data employed in this thesis is that they made it possible to analyse data on psychiatric in- and outpatient care and the prescription of psychotropic drugs relating to all adolescents residing in Skåne (Paper II) and Malmö (Paper III). The use of register-based data prevents biases that might result from self reporting. However, these data only provide information on which adolescents have received treatment for their mental health problems and not on actual levels of mental health problems in the population. Nevertheless, the registers provide important information on which adolescents actually utilise the psychiatric care sector, and if this distribution differs from the distribution of mental health problems found in self-report studies, then this may imply an unmet health care need in some segments of the population.

Representativity and validity

The data used in Study I contain information on all children and adolescents who had been registered by the child and adolescent psychiatric services in the municipality of Stockholm during the years covered by the study. One possible source of bias in these data is the fact that the information was originally gathered for administrative purposes, and the different clinicians who completed the information form may have done this somewhat differently. In these data, girls are overrepresented, and children and adolescents with a foreign background are underrepresented in relation to the general population of the same age in the municipality of Stockholm.

The register-based data in Papers II and III contain information on almost all adolescents who were resident in the county of Skåne/Malmö in 2005. The use

of these data, which are based on Swedish population registers, prevents sampling and selection biases.

The survey data used in Paper IV are not fully representative for the city of Malmö. There is something of an overrepresentation of adolescents from the more wealthy parts of the city and an underrepresentation from the more disadvantaged areas. Furthermore, adolescents with a foreign background are underrepresented in the sample. This may have affected the results and they should therefore be interpreted with some caution. It also means that the results need to be confirmed in additional studies.

FURTHER DIRECTIONS

When I started working on this thesis, I imagined that the knowledge base on mental health among adolescents with a foreign background would be much more substantial than it turned out to be. Following the years I have spent working on this thesis, my first recommendation for further research must be that we still need to improve the available knowledge on how different aspects of parental country of birth influence adolescent mental health. And it is perhaps even more important to improve the knowledge on the nature of care utilisation patterns in different population groups.

The results from the thesis indicate that there are important differences in the utilisation of psychiatric care depending on where an adolescent's parents were born, although the causes of these observed differences remain unknown. In a health care system like that of Sweden, which is based on equality of access to care, the utilisation of psychiatric care should reflect actual differences in mental health problems. However, if there are barriers (at the family or community level or in the organisation and accessibility of health care) that result in an unmet need for care, identifying these barriers constitutes an important focus for further research. At the same time, if there are actual differences in levels of mental health between children and adolescents based on their parents' country of birth, this also needs to be investigated further. There may be important protective factors that need to be identified in order to improve levels of mental health among other groups that are consistently identified as being at higher risk of developing mental health problems, e.g. girls with parents born in Sweden or other high-income countries.

Future studies should also try to disentangle the reasons why children's and adolescents' referral patterns vary in relation to parental country of birth. A better understanding of how and why, and by whom, children and adolescents are referred to child and adolescent psychiatric services may provide important clues for understanding why so many children and adolescents with mental health problems go undetected. This issue also needs to be addressed in relation to the neighbourhood context.

The characteristics of the neighbourhood may not be equally important for all adolescents. There may be interactions between individual-level characteristics (e.g. parental country of birth) and neighbourhood-level characteristics (e.g. the neighbourhood level of deprivation). This possible interaction might conceal neighbourhood effects so that the average effect of neighbourhood deprivation across all adolescents in the neighbourhood is small even though the effects for certain subgroups of adolescents are large (Ellen & Turner, 1997). This could be investigated by analysing cross-level interactions between variables at the individual level and the neighbourhood level, and should be addressed in future studies.

Adolescents are simultaneously involved in several contexts, such as the neighbourhood, school, or peer group. This implies that for a better understanding of variations in children's and adolescents' mental health or their utilisation of psychiatric care, the influence of different social contexts should be considered. This can be done by fitting cross-classified models, which would make it possible to account for influences from different contexts (Fielding & Goldstein, 2006). This would, for example, enable us to separate the effects on mental health of both the neighbourhood of residence and the school context.

In a society characterised by increasing ethnic heterogeneity, the findings from this thesis have important implications for those who work with children and adolescents in general and with mental health in particular. Professionals such as paediatricians, child psychiatrists, teachers or social workers need to be aware of the differences in referral patterns that exist between children and adolescents from different backgrounds, and also that these differences might be a sign of differences in access to care. In addition, the findings from this thesis should be taken in consideration when designing and organising

psychiatric care for children and adolescents. In line with the Swedish health care policy of distributing health care resources on equal terms and according to needs, this might involve the provision of easily accessible information about care for young people with mental health problems in different languages, but also ensuring that the location of psychiatric services makes them easily accessible. Information and location are crucial, both because the early detection of mental health problems constitutes an important step towards preventing severe problems later in life, and also because they will improve the lives of children and adolescents here and now.

The relatively small neighbourhood effects identified in this thesis might be interpreted in different ways. On the one hand, the finding could be regarded as being positive, and as indicating that the current level of segregation is not producing negative effects on children's and adolescents' levels of mental health, indicating that what is important is working to ensure that this effect remains small (cf. Mellgren, 2011). On the other hand, the finding might simply reflect the fact that administrative boundaries are not appropriate for discriminating between those children and adolescents who experience mental health problems and those who do not. As a result, social interventions directed at neighbourhoods defined in this way would have limited effect. Consequently, public health interventions directed to the whole city rather than to specific neighbourhoods might be more effective. Irrespective of the presence of independent neighbourhood effects, adolescents' perceptions of their neighbourhoods do appear to be related to their mental health, and this is an issue that might be addressed by improving the social characteristics of young people's everyday environments, and particularly the occurrence of social disorder. Here it is also important to acknowledge that the influence of perceived neighbourhood characteristics interacts with individual characteristics. For example, interventions intended to reduce social disorder may have a greater effect on overall mental health, since this appears to affect girls and boys similarly, whereas interventions aimed at improving collective efficacy will primarily produce an effect for boys.

Working with this thesis has raised more questions than it has provided answers, and there is much more work that needs to be done before any firm conclusions can be drawn regarding how the neighbourhood of residence or parental country of birth influence adolescents' mental health and their

utilisation of psychiatric care. However, what the thesis has shown is that there appear to be important differences in care utilisation patterns between children with different backgrounds, and the causes of these differences need to be identified in order to ensure that all children and adolescents have equal opportunities for healthy development.

POPLÄRVETENSKAPLIG SAMMANFATTNING

Ett av målen för det svenska folkhälsoarbetet är att främja hälsan bland barn och unga. Överlag mår barn och ungdomar i Sverige bra men under senare år har ett flertal undersökningar visat att den psykiska hälsa försämrats bland framförallt ungdomar. Det finns goda förutsättningar för att behandla och förebygga psykisk ohälsa genom tidiga insatser under uppväxten, en förutsättning för detta är dock att problemen uppmärksammas och att vården är tillgänglig för alla. Enligt FN:s konvention om Barnets rättigheter har alla barn rätt att åtnjuta bästa uppnåeliga hälsa. Alla barn har även rätt till sjukvård och rehabilitering och målet för den svenska hälso- och sjukvården är en god hälsa och en vård på lika villkor för hela befolkningen. Varken hälsa eller vårdanvändande är emellertid jämlikt fördelat över befolkningen. Detta väckte mitt intresse för att studera hur barns och ungdomars psykiska hälsa och användande av den barn- och ungdomspsykiatriska vården hänger samman med de sociala kontexter i vilka barn växer upp och lever sina liv.

Under senare år har den internationella litteraturen identifierat en rad sociala faktorer som hänger samman med barn och ungdomars psykiska hälsa och deras användande av psykiatrisk vård. Bland dessa är de sociala och ekonomiska förutsättningarna i det bostadsområde där barn och ungdomar växer upp. En annan faktor som lyfts fram som viktig för att förstå skillnader i hälsa är ursprung, med innebörden att skillnader i psykisk hälsa identifierats mellan barn födda i olika länder eller vars föräldrar är födda i ett annat land än det land där barnen växer upp. Med tanke på den ökade boendesegregation som präglat det svenska samhället under de senaste 20 åren, tillsammans med den förändring av den svenska befolkningen, från att ha varit relativt

homogen till att ungefär 20 procent av alla barn och ungdomar i Sverige idag har utländsk bakgrund, som ägt rum är det viktigt att studera hur bostadsområde och bakgrund hänger samman med psykisk ohälsa och vårdanvändning i en svensk kontext.

Den här avhandlingen består av fyra delstudier som på olika sätt belyser frågor om psykisk ohälsa och användande av den barn- och ungdomspsykiatriska vården (BUP). Det övergripande syftet var att öka kunskapen om hur bostadsområdet och föräldrarnas födelseland hänger samman med barns och ungdomars psykiska hälsa, samt hur de kommer i kontakt med och i vilken utsträckning de använder sig av BUP.

I den första delstudien undersöktes vem det är som tar initiativet till att barn och ungdomar kommer i kontakt med BUP, och om initiativtagarna skiljer sig åt mellan barn/ungdomar beroende på föräldrarnas födelseland eller mellan olika bostadsområden. I de allra flesta fall är det barnet/ungdomen själv eller familjen som tar initiativet till kontakten med BUP, men jämfört med barn/ungdomar med svenskfödda föräldrar verkar barn med utländsk bakgrund oftare komma i kontakt med BUP via någon utomstående så som skolpersonal eller socialtjänsten. Även bostadsområdet verkade till viss del hänga samman med vem som tog initiativet till kontakten med BUP, att det var familjen som tog initiativet till kontakten med BUP var vanligare i mer socioekonomiskt välmående områden jämfört med mer utsatta områden.

Den andra delstudien undersökte hur föräldrarnas födelseland hänger samman med ungdomars användande av öppen- respektive sluten psykiatrisk vård. Resultaten från den här studien visar att ungdomar vars föräldrar är födda i länder som enligt Världsbanken klassificeras som låg- eller mellaninkomst länder i lägre utsträckning återfanns inom den psykiatriska öppenvården jämfört med ungdomar vars föräldrar var födda i Sverige. Inledningsvis hittades inget liknande mönster avseende slutenvården, men efter att sociodemografiska variabler (familjens disponibla inkomst, utbildningsnivå, typ av familj, samt bostadsort) inkluderats i analysen visade det sig att ungdomar vars föräldrar var födda i låginkomstländer även i lägre utsträckning vårdades inom den psykiatriska slutenvården. Generellt var det vanligare att flickor behandlats inom psykiatrin än pojkar, men det gäller

företrädesvis flickor vars föräldrar är födda i Sverige eller i andra höginkomstländer.

I den tredje delstudien studerades i stället sambandet mellan bostadsområde och ungdomars användande av psykiatrisk vård, dels med syftet att undersöka om bostadsområdet var en relevant kontext för att förstå skillnader i vårdanvändning, dels för att se om det fanns något samband mellan områdets socioekonomiska struktur och användande av psykiatrisk vård. Resultaten visar att skillnaderna mellan olika bostadsområden var liten och att bostadsområdet därför kanske inte utgör en relevant kontext för att förstå variation i användande av psykiatrisk vård. Vidare verkade det inte finnas något tydligt samband mellan bostadsområdets socioekonomiska status och användandet av psykiatrisk vård bland ungdomar.

Den fjärde och sista delstudien syftade till att undersöka hur ungdomars uppfattningar av det egna bostadsområdet hänger samman med deras upplevda psykiska hälsa. Resultaten visar att upplevelsen av bostadsområdet hänger samman med ungdomars psykiska hälsa. Framförallt visade det sig att de ungdomar som upplever att deras bostadsområde präglas av olika typer av ordningsstörningar (bråk, berusade ungdomar, etc.) rapporterar högre nivåer av psykisk ohälsa. Sambandet mellan upplevelsen av bostadsområdet och den självrapporterade psykiska hälsan skiljde sig åt mellan flickor och pojkar, och mellan ungdomar vars föräldrar var födda i Sverige och de ungdomar vars föräldrar var födda i något annat land.

Sammanfattningsvis visar den här avhandlingen att föräldrars födelseland är en viktig faktor för att förstå skillnader i hur barn och ungdomar kommer i kontakt med barn och ungdomspsykiatrin, men även för att förstå skillnader i användandet av psykiatrisk vård. Dessa skillnader skulle kunna förklaras genom att psykisk ohälsa är vanligare i vissa grupper, en annan förklaring är att det finns ett otillfredsställt vårdbehov i dessa grupper. Bakgrunden till dessa skillnader måste dock studeras vidare för att försäkra att alla barn och ungdomar har samma möjligheter till en hälsosam utveckling.

När det gäller betydelsen av bostadsområdet är resultaten mer komplexa. Bostadsområdet förefaller ha betydelse för hur barn och ungdomar kommer i kontakt med barn- och ungdomspsykiatrin, men användandet av psykiatrisk

vård verkar inte i någon större utsträckning variera mellan olika områden. Att skillnaderna mellan områden är små skulle kunna förklaras med att de skillnader som finns mellan områden inte har någon negativ effekt på barns och ungdomars psykiska hälsa, men det skulle också kunna förklaras med att de indelningar mellan områden som använts i den här avhandlingen inte är lämpliga för att identifiera de områden som faktiskt påverkar ungdomars hälsa. Oavsett om det finns någon oberoende effekt av bostadsområdet på ungdomars psykiska hälsa eller användande av psykiatrisk vård så visar resultaten från den här avhandlingen att ungdomars upplevelser av bostadsområdet har betydelse för deras självrapporterade psykiska hälsa.

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