

Chapter 12

General Discussion

This chapter presents the main findings for the research questions formulated in Chapter 1. In addition, it discusses the results and methodological strengths and limitations. Finally, it sets out theoretical considerations, as well as the implications for public health and for future research.

12.1 Main Findings

12.1.1 Part 1: Urban-rural differences in psychiatric morbidity

12.1.1.1 Is degree of urbanization related to the prevalence of psychiatric disorders? (Question 1, Chapters 2-4)

Two urban-rural comparisons of prevalence data in the Netherlands and Germany (Chapters 2 and 3 respectively) showed significant urban-rural differences in total rates of psychiatric disorders, mood disorders, and anxiety. Rates for substance abuse varied significantly in the Netherlands but not in Germany. In the Netherlands, prevalence rates for one or more disorders were 77% higher in the most urbanized category of municipalities compared to the least urbanized category of five categories, while in Germany rates were 37% higher. Although German data showed that gender, age, marital status and social class play a significant role, urbanization also remained significantly related to prevalence rates after correction for these factors. In the Netherlands, rates adjusted for comparable variables also varied significantly according to urbanization.

A pooled analysis of data from 20 international studies (Chapter 4) showed that total prevalence rates for the total of all disorders are on average 38% higher in urban areas compared to rural areas. The urban rates for the separate categories of mood disorders and anxiety disorders were 39% and 21% higher respectively. Rates for dependence were not significantly higher. Total prevalence rates and prevalence rates for mood disorders adjusted for various confounders were significantly higher for urban areas (+21% and +28% respectively).

12.1.1.2 Is degree of urbanization related to psychiatric admission rates? (Question 2, Chapters 5-8)

Three studies of urban-rural differences in admission rates found significant relations between urbanization and total admission rates (Chapters 5 and 7), as

well as for rates for schizophrenia (Chapter 6), and affective psychoses, organic psychoses, other psychoses, and neurotic and personality disorders (Chapter 7). The total admission rate in the most urbanized category of municipalities was two times the rate found in the least urbanized category (Chapter 5). The relative number of *people* admitted was more than two and a half times the rate found in the least urbanized category. Admission rates for schizophrenia were studied separately (Chapter 6). It was found that, in the 15-34 year age group, men from the most urbanized municipalities were admitted 4.9 times more often with a diagnosis of schizophrenia than men from the least urbanized municipalities. The rate was 3.8 times higher for women in that age group. In the 35-54 year age group, the multiples were 5.7 and 4.5 for men and women, and 2.8 and 2.4 respectively in the 55 years and older group. In addition to these main results from admission studies, it was not only found that urbanization was significantly related to admission rates; municipality income distribution and mortality rates were also related to admission rates (Chapter 5). Other risk models found that individual civil status was strongly related to the risk for admission in general, and also to admission for specific diagnostic groups (Chapter 7). Another additional finding concerning admissions for schizophrenia was that re-admission rates and length of stay were not related to urbanization (Chapter 6).

12.1.2 Part 2: Inner-city differences in psychiatric morbidity

12.1.2.1 Are neighbourhood characteristics related to depression symptom levels when controlled for individual characteristics? (Question 3, Chapter 9)

In a study linking individual characteristics of elderly to neighbourhood data (Chapter 9), a univariate analysis showed that some neighbourhood variables were related to depression symptom level scores. However, in a multilevel model, only individual variables were significantly related to depression symptom level scores.

12.1.2.2 Are neighbourhood characteristics related to psychiatric admission rates? (Question 4, Chapters 10-11)

Two factors were derived from a set of neighbourhood demographic variables: socio-economic deprivation and housing quality. They were both significantly related to neighbourhood admission rates (Pearson correlations of .48 and -.41 respectively; Chapter 10). After adjustment for sex, age and marital status, housing quality was no longer significantly related but socio-economic deprivation remained a significant factor. It was also found that social deprivation was negatively related to mean neighbourhood length of stay and was positively related to the neighbourhood proportion of re-admissions.

In the second paper (Chapter 11), socio-economic deprivation was significantly related to admission rates for the separate diagnostic groups of schizophrenia, other psychotic disorders, neurotic disorders and total rates of disorders. The most deprived neighbourhoods (divided into four categories) had a 73% higher rate of admissions on average compared to affluent neighbourhoods. Admission rates for schizophrenia, other psychotic disorders, and neurotic disorders were 141%, 62% and 100% higher respectively. There were no significant differences for affective psychoses, organic psychoses and personality disorders.

Length of admission was positively related to socio-economic deprivation for affective disorders, other psychotic disorders, and the total of all disorders. The re-admission rate was negatively related to socio-economic deprivation for total rates of disorder.

In summary, the first main finding is that total prevalence rates and admission rates are related to urbanization (Chapters 2-8). Although, sex, age and civil status in particular affect the relation with urbanization, the relation remained significant after adjustment. This main finding also applies to many of the diagnostic subcategories.

The second main finding is that individual depression symptom level data for older inhabitants are not related to neighbourhood-level census statistics after individual risk factors have been accounted for (Chapter 9). However, neighbourhood levels of social deprivation, and the census variables related to this concept, were positively related to neighbourhood admission rates (Chapters 10-11).

12.2 Comments on the results

12.2.1 Comparisons with other findings

Our meta-analysis of urban-rural differences in psychiatric disorders was the first ever to pool survey data about urban-rural comparisons (Chapter 4). This pooled analysis provided numerical confirmation of what was found in earlier reviews on this subject (Dohrenwend & Dohrenwend, 1974; Mueller, 1981; Neff, 1983; Webb, 1984; Verheij, 1996; Marsella, 1998). When looking at the three studies in the pooled analysis for the Netherlands, there is a remarkable difference in findings between our Nemesis study (Chapter 2) and the Eseméd 2000 study results (Kovess-Masfety et al., 2005) comprising Germany, Italy, France, Spain, Belgium and the Netherlands. Our Nemesis study showed an urban-rural odds ratio of 1.77 (1.46-2.14) for any disorder in the Netherlands while the odds ratio in the Eseméd study was 1.27 (0.66-2.43). We assume that both the difference in sample sizes used and the way the urban-rural comparison was operationalized account for the difference in the findings. Our study had 7076 respondents and

the Dutch part of Eseméd comprised only 2371 respondents. Furthermore, the way 'urban' was compared with 'rural' differed. In our study we compared the most urbanized of five categories (n=1242, 18% of the total group) with the least urbanized category (n=1185, 17%). In Eseméd, the rural section contained only 5% (n=119) of the total study group based on community population size, and it was compared with the remaining 95% (n=2252). This rather skewed distribution of 5% / 95% was used to correspond to the level of urbanization in the other countries covered by Eseméd. As the contrast between the rural 5% and the rest of 95% is less sharp than our comparison of 'not urbanized' with 'very urbanized', it is not surprising that the Eseméd odds ratio is lower. Furthermore, the low number of cases in the rural group (n=119) explains the large confidence interval found in Eseméd (1.27 (0.66-2.43)).

Our result for Germany (Chapter 3; 1.57 (1.27-1.95)) can also be compared to the Eseméd result for Germany (1.31 (0.99-1.72)). In this case, the comparison in Eseméd was also less pronounced, as mentioned earlier during the discussion of the Nemesis study in the Netherlands. In chapter 3 the most urbanized German category (n=1169) was compared with the least urbanized category (n=614) of a total of five categories. In Eseméd, the entire study sample was divided into an urban group comprising 2382 cases and a rural group of 1173 cases. In these cases, the larger contrast in the urban-rural comparison found in chapter 3 explains the higher odds ratio found in Nemesis.

Our urban-rural comparisons of total admission figures (Chapters 5 and 7) were comparable to an earlier nationwide Dutch study (van Weerden-Dijkstra & Giel, 1975) and also to smaller area studies (van de Water, 1988; Sytema, 1991). Our urban-rural studies were the first to use the address density measure of urbanization in psychiatric epidemiology (den Dulk et al., 1992) which is still used by Statistics Netherlands. Our results are also comparable to findings in other countries (Thornicroft et al., 1993; Sundquist et al., 2004).

The outcome of our study of admission rates for schizophrenia (Chapter 6) was comparable to the study by Sytema (1991) in the Dutch province of Drenthe. There were various comparable studies in other countries (Widerlöv et al., 1989; Torrey & Bowler, 1990; Lewis et al., 1992; Thornicroft et al., 1993; Sundquist et al., 2004).

Two of our ecological neighbourhood studies (Chapters 10-11) showed quite strong relationships between neighbourhood deprivation and psychiatric admission rates, and this finding concurs with several other Dutch (Bosma, 1975; Verdonk, 1979; Hamers & Romme, 1990; Gunther et al., 1993) and international studies (Klusmann & Angermeyer, 1987; Giggs & Cooper, 1987; Thornicroft, 1991; Burgess et al., 1992; Jarman et al., 1992; Harrison et al., 1995; Boardman et al., 1997). However, our neighbourhood study of depression symptom scores for

elderly inhabitants (Chapter 9) did not show a significant neighbourhood effect. This was in agreement with a number of comparable studies among the elderly (Walters et al., 2004; Hybels et al., 2006; Aneshensel et al., 2007). The study differed from the two other neighbourhood studies in this thesis since multilevel analysis was used, and the other two were correlational studies. Incidentally, several comparable multilevel neighbourhood studies among the elderly have found neighbourhood effects that are independent of individual factors (Ostir et al., 2003; Muramatsu, 2003; Kubzansky et al., 2005). Despite this fact, the possibility cannot be disregarded that our two correlational neighbourhood studies would have shown less pronounced neighbourhood effects, or that there would even have been no effect, if correction for individual factors had been possible. It is also important to take into account that the elderly are a subgroup of the neighbourhood population for which, in our case, depression scores were not related to general neighbourhood characteristics. As the elderly are a relatively small subgroup, we think it is inappropriate to extrapolate the finding for the elderly that the neighbourhood has no effect, and to apply it the total population of Amsterdam involved in the other two neighbourhood studies.

12.2.2 Filters between prevalence of psychiatric disorders and use of mental health facilities

We studied admission rates as well as prevalence rates from survey studies. How does mental health care use relate to the prevalence of psychiatric disorders? We found that 0.16% of the population is admitted annually to a psychiatric hospital in the Netherlands (Dekker et al., 1994). On the other hand, 23.5% of the population suffer from one or more DSM disorders annually (Bijl et al., 1998). These two measures can be seen as the extremes of a continuum. Utilization rates are influenced by, among other things, referral patterns, distance to facilities, and help-seeking behaviour (Keatinge, 1987; Goldberg & Huxley, 1992). Nemesis reported that, of the group of 23.5% who had one or more disorders in the past year, 34% received treatment for their mental health problem (Bijl & Ravelli, 2000). Fifteen per cent received out-patient mental health care. It was found that the proportion of prevalent cases using mental health care was the same in urban areas and rural areas. It was also found that, of people diagnosed with disorder(s), 17% felt that they needed professional help, but did not seek it. This group is half as big as the group of people with disorder(s) receiving any professional help (34%).

It is clear that there are differences between countries in the use of care by people with psychiatric illnesses. From a multi-country study of health care utilization that included the Nemesis data (Wang et al., 2007), it can be concluded that, while 32% of psychiatric cases in the Netherlands had some kind of treatment for their illness, 32% received care in Germany. For the USA, this figure was 22%.

On the other hand, there was a difference between Germany, the Netherlands and the USA in the treatment of mild psychiatric illnesses (30%, 13% and 11% respectively). A difference between the USA, the Netherlands and Germany was found in the treatment of serious psychiatric illnesses. In the USA, 37% were treated compared to 66% and 67% in the Netherlands and Germany respectively. In summary, it is clear that the percentage of mental health care use is well below the prevalence of psychiatric disorders. In addition, the numbers of people with psychiatric illnesses receiving care differs between countries, probably in relation to the quality and size of the mental health system.

A discussion of the prevalence of disorders in relation to the use of psychiatric services, and more specific urban-rural differences in use, would be incomplete without a discussion of Jarvis's law (Joseph & Philips, 1984). This law states that admission rates calculated on the basis of admissions to / registrations with a particular facility are inversely related to the distance to that facility. Accordingly, the lower density of facilities and the associated increase in the average distance to facilities could provide a partial explanation for lower use in rural areas. In New Zealand (Hall, 1988), Tasmania (Davey & Giles, 1979) and Canada (Dear, 1978), this effect was confirmed for the use of psychiatric facilities; in Australia, distances to facilities only played a role when they were very large (Stampfer et al., 1984). In other studies, the link was only weak (Dear, 1976). It has been claimed that referral patterns influence the strength of this 'distance decay effect' (Joseph, 1979). First-line care providers are thought to be less likely to refer patients to institutions when the institutions are further away. Another factor that is thought to influence the strength of the distance effect is the diagnosis (Joseph and Boeckh, 1981). It has been claimed that the effect is stronger for less severe disorders and weaker for severe disorders such as schizophrenia.

12.3 Methodological considerations

12.3.1 The concepts 'urban' and 'rural'

Generally, 'urban' refers to large conglomerates of people, usually in a relatively small area, resulting in a relatively high population density. The word 'relatively' makes it clear that what is 'urban' in some countries according to the national statistical institution or study definitions may be defined as almost 'rural' in another country. Although urban and rural are relative measures, the meaning of which has changed over time and will continue to do so, it is remarkable that Torrey & Bowler (1990) could show that, at least in the US, urban-rural differences in rates of psychiatric disorders remained stable between 1880 and 1963.

12.3.2 Measuring urbanization

Generally, psychiatric epidemiology lacks a uniform approach to measuring urbanization. Population density is a frequently used measure (Weich et al., 2006). Categories are also established in the basis of the population of areas/municipalities (Andrews et al., 2001). In some studies, interviewers assessed the level of urbanization of the area where the interviewees lived (Lewis & Booth, 1994; Paykell et al., 2000). Other studies formed categories on the basis of demographic characteristics (Kessler et al., 1994; Kringlen et al., 2006). The five-category urban-rural classification in our studies in the Netherlands is based on the concentration of addresses, a measure developed by Statistics Netherlands (den Dulk et al., 1992). 'Concentration of addresses' is a measure of human activity, including industrial activity. It is based on the number of addresses surrounding each address. The main difference between this measure and 'simple' population density is that, if an urban municipality has large areas with woods or industry for instance, the mean address density is affected less than population density would be. It might be said that address density is closer to the living experience of the inhabitant.

12.3.3 Operationalization of the urban-rural comparison

A point of discussion is whether the initial number of categories of urbanization used can influence the outcome of the comparison. One could argue that a comparison of the extremes of five categories of urbanization (highly rural versus highly urban) will result in a significant difference sooner than a comparison of a straightforward dichotomy consisting of urban and rural areas. This rule will apply to studies covering large connected areas (countries, for example). However, 'twin studies' (Webb, 1984) compare two selected areas - one urban and one rural. When one selects a typically rural area and compares it to a metropolitan area, it is reasonable to expect that the initial differences in degree of urbanization are probably greater than between the extremes of a division of urbanization into five categories for a whole country. After all, 'urban' and 'rural' are relative concepts which will generally be operationalized differently in different studies.

The benefit of the use of five categories of urbanization applied to a whole country is that it allows us to see if there is a general urban-rural gradient in rates. A gradient of this kind would indicate a dose-response relationship, which is one of the conditions for postulating a causal relationship (Weed et al., 1997).

12.3.4 The 'ecological fallacy'

When interpreting results about correlations between aggregated neighbourhood demographic data and neighbourhood admission rates, it is important to take into

account the 'ecological fallacy' (Morgenstern, 1982). This term refers to the fact that findings on an aggregated level cannot be transferred directly to the individual or group level. If the neighbourhood proportion of unemployed inhabitants is significantly correlated to the admission figure, it cannot be concluded that the risk of admission is higher for the individual unemployed person. The proportion of unemployed inhabitants should be used as a 'proxy' for the risk of admission.

12.3.5 Limitations of the data

There were some limitations to the data used in this thesis. In the area of admission rates, data for the psychiatric units of General Hospitals (PAAZ) could not be used due to the fact that it was not possible to compute person-based admission rates (Chapter 5) or first admissions (Chapter 6). In addition, the civil status of the admitted persons was not known for these admissions (Chapter 7).

The Nemesis population survey (Bijl et al., 1998; Chapter 2) excluded homeless people from the sample, as well as people resident in psychiatric hospitals. We therefore expect prevalence rates for schizophrenia in particular to be underestimated. Since we expect rates for schizophrenia to be higher in urban areas, this results in a slight underestimation of the urban-rural difference.

12.4 Theoretical explanations of the findings

12.4.1 Explaining inner-city and urban-rural differences

To explain inner-city and urban-rural variations in psychiatric morbidity, there are two main theoretical concepts, which originated from the early ecological research of schizophrenia (Faris & Dunham, 1939) and from the Chicago School of Sociology (Park & Burgess, 1925): the drift hypothesis and the breeder hypothesis. The drift hypothesis assumes, on the one hand, that sick and vulnerable people are more or less doomed to remain in socially unstable, deprived neighbourhoods, while better-off people move away (this is also known as the 'social residue' theory; Freeman & Alpert, 1986; Freeman, 1994). On the other hand, socially deprived neighbourhoods can also exert a 'pull' on sick and vulnerable people, since they move to the areas where social control is less strict and there is more tolerance of deviant behaviour. The drift hypothesis also refers to the phenomenon that psychiatrically ill people tend to drift down the social ladder ('downward social drift') or are not able to climb it. These vulnerable people therefore become concentrated in socially deprived areas. This theory is also known as the social selection theory (Dunham, 1965). Evidence about drift processes is sparse (Levy & Rowitz, 1971; Dauncey et al., 1993; Verheij, 1998; Moorin et al., 2006). Levy & Rowitz, for instance (1973), did compare the distribution of first admission rates

and re-admission rates. While first admissions were distributed randomly over Chicago, re-admissions were concentrated in the city centre, which predominantly comprised poor neighbourhoods. This showed at least that people suffering from schizophrenia seem to 'drift' towards poorer areas. This study produced indirect evidence for the drift hypothesis. Direct evidence is hard to find due to the difficulties in designing this kind of study. Furthermore, the drift hypothesis does not seem to apply to all disorders since Faris and Dunham (1939), as well as Giggs and Cooper (1987), found a fairly even distribution for manic depressive disorders.

The second theory used to explain urban-rural and inner-city variations in psychiatric morbidity is the breeder hypothesis, which is also known as the 'social causation hypothesis' or 'environment stress theory' (Durkheim, 1897; Park & Burgess, 1925; Faris & Dunham, 1939). This hypothesis assumes that various environmental factors can cause illness. These can be physical factors (air pollution, small housing, population density, noise), and also social factors (life events, social isolation, crime). A lot of the stress factors mentioned above are more common in urbanized areas (Freeman, 1984; Maas et al., 2006). A prominent proponent of the effect of social stressors on well-being was the Chicago School of Sociology (Park & Burgess, 1925). The main concepts used were social disorganization and anomie (Durkheim, 1897), which are the virtual counterparts of the concept of social cohesion which is frequently studied nowadays (Kawachi et al., 1999; Drukker, 2004). Based on this general theory of neighbourhood social processes, Faris & Dunham (1939) proclaimed that, specifically, social isolation was a causative factor for schizophrenia. Drukker and van Os (2003) found that perceived social capital mediated the association between social deprivation and quality of life. Another remarkable finding was that residential instability appeared to provide protection against the negative effects of neighbourhood poverty on quality of life (Drukker et al., 2005), while this factor is more often found as a risk factor (Jarman, 1984). Social capital, which can be seen as a 'breeder factor', may be a factor alongside various other factors, and this may explain inner-city (Kirkbride et al., 2008; Stafford et al., 2008) and urban-rural variations in mental health.

Schizophrenia research has found several possible causal perinatal factors that are more prevalent in highly populated areas, and also in socially deprived areas. Examples are: infectious diseases, obstetric complications, and malnutrition (Marcelis et al., 1998; Murray & Fearon, 1999; Boydell & Murray, 2003).

An interesting finding relating to the interaction between individuals and the environment is the 'minority effect'. This effect is the fact that minority groups within neighbourhoods, such as singles (van Os et al., 2000) or ethnic groups (Boydell et al., 2001; Veling et al., 2008) have a higher risk of schizophrenia when they make up a smaller proportion of the neighbourhood population. However, it

remains unclear whether the higher risk associated with the ethnic density effect is really due to minority status. It is also possible that there is some unknown reason why some subgroups do not cluster with people of the same ethnic group.

We found that the urban-rural difference in the prevalence of psychiatric disorders persists after control for various confounders (Chapter 2). Our result shows a gradient from rural to urban in cross-sectional datasets. However, we have not been able to control the urban-rural effect for place of birth and duration of exposure to urban influences (the latter factor is affected by migration). Using data from the Danish Psychiatric Central Register, Pedersen and Mortensen (2001, 2006) were able to control for the length of exposure to urban and rural living circumstances. First, it was shown there was a dose-response relationship between exposure to an urban setting prior to the 15th birthday and the individual risk of admission for schizophrenia (Pedersen & Mortensen, 2001). More recently, it was found that urban risk is at least partly rooted in the family (Pedersen & Mortensen, 2006). If the nearest older sibling is born in the urban area, the risk of the younger sibling living his/her first 15 years of life in the rural area (after the family moves) is higher than for someone with a nearest older sibling also born in the rural area. In summary, urban effects seem to persist in the offspring born to a family after a move to a rural area.

Turning to psychosis, there is another confirmation of the urban effect. Van Os et al. (2003, 2004) found that the risk for people with familial susceptibility to psychosis was higher in cities, suggesting a synergy or gene-environment interaction. When social and cognitive functioning were used as a proxy for genetic susceptibility, the same effect was found (Weiser et al., 2007).

Urbanization is a concept that everyone clearly understands, but which is not easy to define. The concept of urbanization is also quite widespread in epidemiological literature. However, in terms of content, urbanization is often reduced to a 'black box'. As the literature described above shows, progress is being made in terms of describing the content of the box with respect to mental health (see also Caracci, 2008). There are strong indications that perinatal factors are important determinants of the risk of schizophrenia later in life. The importance of these factors is higher when there is a familial susceptibility. There is quite strong evidence that both physical and social environmental factors are important determinants of the development of psychiatric disorders in general.

12.5 Implications for public health

12.5.1 *Is current care capacity in line with our findings?*

We found a 77% increase in the prevalence of disorders in the population of very highly urbanized areas (Chapter 2). We even found a 100% increase in the admission ratios for the same areas (Chapter 5). It emerged that there was a considerable level of correspondence between admission ratios in the city of Amsterdam and levels of neighbourhood deprivation (Chapters 10-11). These findings indicate that there is an increased demand for psychiatric facilities in the large cities, particularly in deprived areas. With respect to the implications for public health, the first question that arises is whether the current psychiatric facilities correspond to our findings in terms of the prevalence of disorders.

Before looking at this question, we will first provide a sketch of developments in capacity and the associated regulations. In the early 1990s, cuts began to be made in the number of in-patient beds in psychiatric institutions in the cities. At the time, the standard for in-patient capacity in the Netherlands was 1.1 beds per 10,000 inhabitants, plus a small supplement of 6% for the four major cities (Wet Ziekenhuisvoorzieningen, 1991). At that point, this standard resulted in excess bed capacity in the cities, which need to be cut back further. The human resources budget for the out-patient care provided by the Regional institutes for out-patient mental health care in the Netherlands (*Riagg's*) was determined on the basis of the number of inhabitants and a weighting for the level of urbanization. While the standards set for in-patient capacity scarcely took the variations in demand for care into account, the major reduction in admission capacity resulted over the course of the years in bottlenecks in the cities. Levels of nuisance caused by psychiatric patients increased. These problems were also links to patients' right to self-determination, which led to a situation in which compulsory admissions were only used as the last resort. There was public demand for psychiatric patients to be taken 'off the streets', both to reduce levels of nuisance and so as not to abandon these people to their fate. Against this background, it was a fortunate coincidence that the Ministry of Health decided in 2000 that capacity should be based in the future on 'demonstrable demand' for care (College Bouw Ziekenhuisvoorzieningen, 2000). As early as 2002, there were plans for a number of capacity expansion operations in the cities in order to deal with bottlenecks in emergency care (College Bouw Ziekenhuisvoorzieningen, 2002). For example, in 2005, the 'Tijdelijke Opname-Afdeling' (Temporary Admissions Department - TOA) was established in Amsterdam, improving the admissions flow to emergency care and making temporary transfers outside the city redundant (Mulder et al., 2005). Capacity for the small group of clients with severe behaviour disorders, who require major efforts from the psychiatric services, are planned for Amsterdam. Waiting-list funding in recent years can also be seen against the background

of demand-driven care. The increase in the number of compulsory admissions in recent years is also being monitored by the building authorities in order to anticipate an increase in demand for admissions. This brief historical sketch shows how, in recent years, a situation had arisen in which, by contrast with the 1990s, in-patient capacity was adapted in the light of proven additional demand. The recent transfer of facilities provided by the Exceptional Medical Expenses Act to the domain of the Health Insurance Act constitutes a threat to this situation. Insurers must obtain compensation for additional costs, such as those required in cities, through national risk-spread arrangements. The additional costs for psychiatric services in the cities will probably have to be defended again in this new constellation. The findings of this thesis could perhaps serve as a prelude to that discussion.

The large number of filters (help-seeking behaviour, referral patterns, distance, available services) between the prevalence of disorders and the psychiatric facility use (Goldberg & Huxley, 1992) make it difficult to compare these variables. In addition, not a lot is known about the possible variations in the effects of the filters associated with levels of urbanization. However, it has been found that the proportion of prevalent cases using mental health care in urban areas matched the proportion in rural areas (Bijl & Ravelli, 2000). Nevertheless, despite the difficulty, I would like to continue with a comparison of prevalence and treatment capacity. The Heijnen report (2006) used Zorgis – a national database of mental health care utilization data – to compare psychiatric service use by people in Amsterdam with the Dutch average. This comparison bears some resemblance to our rural-urban comparison. The report makes comparisons of care consumption expressed in money terms and is therefore a good approach for a comparison of capacity. Psychiatric care use per 1000 inhabitants in Amsterdam was 47% higher than the national average. This corresponds to the prevalence rates in Nemesis (Chapter 2). It should be pointed out that a more detailed analysis actually showed that 37.5% of the population in Amsterdam suffers from one or more psychiatric disorders annually (Spijker et al., 2001). On the basis of Zorgis, it could also be concluded that Amsterdam has more clients in relative terms and, within that population, a relatively large number of clients with severe problems. This corresponds to the Nemesis finding that comorbidity is more prevalent in urban areas (Chapter 2). Despite the fact that the problems are more severe on average, costs per client in Amsterdam are equal to the national average. This is explained in the report by the strong emphasis on out-patient care for the group of clients in Amsterdam with severe problems who are generally provided with chronic care. Heijnen therefore postulates that the Amsterdam mental health services are ‘a miracle of efficiency’ (Heijnen, 2006). It might be pointed out that Amsterdam also has a large number of self-employed people whose care consumption is not included in the Zorgis figures used in the report. Despite the high level of out-patient care in

Amsterdam, the shift to this option for the chronic group of clients in Amsterdam would still not appear to have come to an end. Recently, a study report about the chronically care-dependent group of clients in Amsterdam (Theunissen et al., 2008) stated that the number of clients in chronic out-patient care between 1 January 2000 and 1 January 2005 increased from 1605 to 2782. Despite this major increase in the capacity for this type of care, there are still waiting lists, the existence of which means that the quality of city emergency care in particular is always under pressure.

In short, it is fair to say that surplus use in absolute terms in Amsterdam corresponds to the higher prevalence of disorders there. However, this surplus use remains limited because care for the relatively large group of clients with severe disorders has been transferred to out-patient facilities more than elsewhere.

12.5.2 Use of the limited available psychiatric services

As far as we know on the basis of the above, the city of Amsterdam - which is exemplary for municipalities with high levels of urbanization and the presence of deprived areas - has an efficient approach to the use of its available psychiatric services capacity, which is limited by definition. In recent years, the development of collaboration between secondary psychiatric services and primary care has contributed to the enhancement of efficiency. Whereas standard prevention only was used previously as a way of preventing severe disorders or secondary treatment, clients are now seen by psychiatric staff when they contact family doctors. This means that disorders are identified earlier so that referral to secondary treatment is generally unnecessary. This means, in turn, that intake to secondary treatment also becomes more efficient; in principle, secondary treatment facilities only receive clients with symptoms that have proven impossible to treat in primary care. The presence of psychiatric and professionals in primary care also means that psychiatric services have a wider reach. In this way, it is possible to reduce the percentage of people who have been found to have a disorder, and who have not received care even though they do need it.

12.5.3 Service allocation based on degree of urbanization?

We found that urbanization is a factor that determines both admission rates and prevalence rates, even after correction for a range of other factors (Chapters 2-7). This means that urbanization is a relatively robust indicator of both prevalence and admission. In addition, at the neighbourhood level, we found that socio-economic deprivation was a robust indicator of admissions (Chapters 10-11). It can therefore be argued that urbanization, and neighbourhood socio-economic deprivation, can be used for service allocation. In an investigation into possible indicators for the allocation of mental health funds, Bijl & Franchimont (1995) mentioned

urbanization and living situation as possible indicators. However, they emphasized that, as outcome measures, prevalence or utilization are in themselves too limited to model mental health needs. They proposed going beyond the use of prevalence figures ('normative need') and utilization figures ('expressed need'). They argued in favour of obtaining figures about 'felt need' as well. Nemesis included these three measures, making it possible to work out a model for fund allocation as proposed by Bijl and Franchimont (1995). Incidentally, one could consider deriving expressed need from the Zorgis figures, that cover virtually all Dutch psychiatric care use. Given the current initiatives with respect to spreading risk, an approach of this kind could prove interesting. In conclusion, it is reasonable to conclude on the basis of our findings that socio-economic deprivation and level of urbanization are good candidates as indicators for the allocation of resources.

12.5.4 Improving mental health in deprived neighbourhoods

We found that socio-economically deprived neighbourhoods have higher rates of psychiatric admissions (Chapters 10-11). In the light of the social-stress theory that the living environment influences mental health, one way to reduce mental illness is to start neighbourhood development projects to improve living conditions, thereby enhancing social cohesion so that mental health will improve subsequently. Halpern (1995) conducted a longitudinal study of the consequences of improvements in their neighbourhood in Eastlake. Over the course of two years, the physical conditions in this deprived area were improved, after which social cohesion was found to have increased significantly. There was also significantly less anxiety and depression. This effect was explained in part with reference to the enhancement of the social network, which was in turn a consequence of the increased sense of community. Another similar study was conducted by Dalgard and Tambs (1997) in Oslo, Norway, who showed that improved neighbourhood living conditions resulted in improved levels of mental health.

One should, incidentally, make a distinction between neighbourhood projects that are mainly focused on improving housing, and projects that focus on improving the well-being and the living conditions of the inhabitants. The first category are generally the result of a realisation that the neighbourhood is going downhill (with increasing nuisance and crime levels). Development projects of this kind generally result in a lot of people being forced out of the area, often moving to other poorer areas because they cannot afford the rent once the housing has been improved. This is the main criticism of the Nicis Institute of the approach adopted by the Dutch minister, Vogelaar, to problem areas: the problems are simply moved along (Slob et al., 2008). The resulting question is: does the neighbourhood improve or do the people inhabiting the neighbourhood improve? Although, in practice, this distinction will not be as straightforward as it appears, politicians should think about who benefits from projects of this kind (Rogers et al., 2008).

12.6 Implications for future research

In the area of utilization, we reported on urban-rural differences in admission figures (Chapters 5-7). In addition to this analysis, we discussed figures about total mental health use from a report on utilization data (Heijnen, 2006). This report compared Amsterdam with the Netherlands as a whole. The Zorgis dataset used, which contained the Dutch mental health utilization figures for 2001-2005, may result in a number of studies in addition to those in this thesis. Replications of our urban-rural admission studies can be performed using this dataset. Subsequently, these data about total mental health utilization could be compared to the prevalence rates found in the Nemesis survey, leading to an urban-rural comparison between expressed need and normative need. An analysis of this kind could include variations associated with gender, age, living situation, ethnicity and diagnosis. Furthermore, treatment characteristics such as duration of episodes, drop-out rates, and re-admission rates could be studied.

The Nemesis survey (Bijl et al., 1998) also studied the level of social support. This makes it possible to study differences in social support according to degree of urbanization. On the basis of the literature, we would expect to find that levels of social support are negatively related to levels of urbanization. Social isolation was already mentioned by Faris & Dunham (1939) as a cause of schizophrenia.

Turning to the explanation of the 'urban factor', there is a lot of research targeting the physical and social environment, and relatively little attention for the role of personal choice. One of the few examples in the drift theory is the hypothesis that schizophrenic patients in particular prefer to live in anonymous areas. Secondly, the social residue hypothesis, which is also part of the drift hypothesis, refers to the fact that relatively well-to-do people are able to move out of socio-economically deprived neighbourhoods, leaving behind a growing concentration of poor people. Marsella (1998) advocates paying more attention to personality features that are associated with rural or urban life. The focus in that case would be on the preferences of people with particular personality traits and the ability to perform well in the specific living environment. The relationship between personality traits and urbanization could constitute an interesting psychological approach to urban-rural differences.

The urban-rural comparisons for the Netherlands presented in this thesis (Chapters 2,5-7), are based on five categories of address density at the municipality level derived from Statistics Netherlands. Fortunately, in the last few years, this measure has not only been calculated at the municipality level, but also at the neighbourhood level (and even for two sub-levels in larger municipalities). This increase in detail is an opportunity to determine the level of urbanization more accurately.

As pointed out above, improvements in social cohesion may have an indirect positive effect on mental health in neighbourhoods. Longitudinal studies of this

subject are relatively scarce (Halpern, 1995; Dalgard & Tambs, 1997). Since the relation between socio-economic deprivation and social cohesion on the one hand, and the prevalence of mental health problems on the other, has been established in the Netherlands (Bosma, 1975; Verdonk, 1979; Hamers & Romme, 1990; Gunther et al., 1993), the next step would be to explore whether improvements in neighbourhood social cohesion could improve the mental health of the people living there, as has been found in other countries.

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