Abstract  Objective The aims of this study are three-fold: to depict characteristics of homeless at discharge from a psychiatric hospital; to describe the utilisation of inpatient care and treatment measures during hospitalisation; and to analyse to what extent psychiatric disorders and clinical variables contribute to the risk for homelessness at discharge.  Methods  Based on case register data we analysed all 28,204 people consecutively referred in 1996–2001 to psychiatric hospitals of a well-defined catchment area in Switzerland.  Results  1% (N = 269) of all admissions were homeless at discharge (mean age: 32.0 years; women: 27.9%). Compared to other psychiatric inpatients, we found among the homeless more males, more people with younger age and lower education. Regarding treatment measures during the inpatient stay, homeless received less often psychopharmacotherapy, ergotherapy and physiotherapy, but more vocational training, occupational therapy and support by social workers. There was no difference between homeless and others regarding compulsory medication or seclusion. Homeless had a shorter length of inpatient stay. Risk factors for being homeless at discharge were: being homeless at admission, not living in a relationship, having a multiple substance abuse or a dual diagnosis, low clinical improvement during inpatient treatment and discharge against medical advice.  Discussion  To prevent homelessness at discharge, it is important to consider all independent contributors, i.e. the living situation before admission, health care inequalities during inpatient treatment (care received, low clinical improvement, discharge planning) and psychopathology.

Key words  homelessness · mental disorder · treatment · health care inequalities · service use

Introduction

Homelessness has become a serious public health problem over the last few decades, especially due to the high prevalence of psychiatric and somatic morbidity and the subsequently increased mortality of those affected (Fichter and Quadflieg 2003; Munoz et al. 2002; Salize et al. 2002). Nevertheless, health care provision for homeless people has been repeatedly regarded as inadequate (Rössler et al. 1994; Snyder and Eisner 2004). Despite the considerable range of somatic and psychiatric problems, homeless people do not undergo regular medical treatment. If they use the health care system, they mostly turn up in emergency rooms of general or psychiatric hospitals (Herrman et al. 1989). Thus, it is recommended to scrutinize health care utilisation of homeless people in either setting.

Studies on homeless people have some limitations so far: they focused either on the prevalence of mental disorders including the assessment of conspicuous behaviour, e.g. violence, or the needs for care of these people (Koffman and Fulop 1999; Kovess and Mangin 1999; Livesi et al. 2003; Rosenheck and Seibyl 1998; Salize et al. 2001a, 2001b). The largest part of research is provided by Anglo-American countries whose results may not be entirely relevant for European countries due to different contextual backgrounds, e.g. incomparable (mental) health care systems. Most health care systems in Europe are based on societal solidarity for the ill and disabled. Furthermore, most studies do not describe an entire catchment area, but one particular in- or outpatient service mostly in an urban area (e.g. Caton et al. 2000; Fichter et al. 1996; Jenkins et al. 2003; Kovess, Mangin 1999; Munoz et al. 2002; Salize et al. 2002). Moreover, the majority of these analyses focus a limited time period, e.g. one single day (Koffman, Fulop 1999; Rosenheck, Seibyl 1998). Some of them give exclusive attention to
men (e.g. Fichter et al. 1996; Fichter and Quadflieg 2001; Fichter, Quadflieg 2003) or women (Greifenhagen and Fichter 1997).

Only few studies have investigated psychiatric inpatient treatment of homeless people (Ash et al. 2003; Herman et al. 1998; Koffman, Fulop 1999; Rosenheck, Seibyl 1998). This is surprising because inpatient treatment is one of the rare occasions when homeless people are in contact with the health care system (Herman et al. 1989). Although most of these analyses focus on inpatient utilisation, none of them describes the type of inpatient care or the living situation of these people at discharge. Finally, none of them concentrates on gender differences.

To overcome some of these shortcomings we analysed data from a psychiatric case register. We used these inpatient data because hospitalisation is generally seen as an indicator of a serious illness. The sample includes all psychiatric inpatient admissions in 1996–2001 in the Canton of Zurich/Switzerland. This catchment area covers a mixed urban-rural area of 1.2m population comprising one sixth of the Swiss general population. Homelessness at discharge was defined as being without a permanent accommodation at discharge. Based on this inpatient sample over an extended time period we want to

- Depict socio-demographic and clinical characteristics of homeless at discharge from a psychiatric hospital as compared to people with permanent accommodation, focusing on gender differences;
- Describe the utilisation of inpatient care and treatment measures during hospitalisation provided to these people;
- Analyse to what extent psychiatric disorders and clinical characteristics contribute to the risk factors for homelessness at discharge.

### Methods

#### Catchment area and central psychiatric register

The Canton Zurich covers a mixed urban-rural area with a population of 1.2m, which is about one sixth of the Swiss general population. All mental health services in the Canton report detailed information about diagnostic, treatment-related and socio-demographic characteristics of all their patients to the central psychiatric register (PSYREC 2004a). The hospital physicians in charge are responsible for the documentation on their respective patients. Data are collected based on standard forms to be completed at admission and discharge. All measures are defined in a comprehensive manual that is provided to the hospital physicians responsible for the documentation (for further details including instructions to clinicians: see PSYREC 2004b).

All data of this analysis derive from this central psychiatric register (PSYREC 2004a). The measures below are part of this documentation system.

The sample includes all 28,204 patients aged 18 years and over who were admitted to a psychiatric hospital between January 1, 1996 and December 31, 2001 in the Canton Zurich/Switzerland. Of these consecutive referrals, all first inpatient admissions within the time interval studied were included in this analysis. 21,390 (75.8 %) of the patients had not been previously admitted. First admissions were divided from readmissions by means of computerised record linkage on the basis of 18 defined match criteria (for more details, see Christen et al. 2003).

#### Measures

Socio-demographic characteristics (gender, age, marital status, education, main source of income, nationality) were analysed. To refer to the patients’ current place of residence, postal codes were aggregated into three broad categories: urban (large cities with > 100,000 inhabitants), suburban (> 10,000 inhabitants) and rural (< 10,000 inhabitants) communities (Lay et al. 2005). Living situation at admission and at discharge was assessed as follows: Homelessness at admission was defined as ‘being without own accommodation in the half year previous to psychiatric inpatient admission’. All those who were classified as homeless at discharge who were neither discharged home nor referred to another institution, but stated to live rough after inpatient treatment.

Clinical variables included psychiatric diagnosis based on ICD-10 diagnostic criteria (World Health Organisation 1993). For the regression analysis, we considered whether a given patient has had one or more diagnoses. To be classified in the dual diagnosis group, a patient had to be diagnosed as suffering from both a substance use disorder (ICD-10, F1) and any other psychiatric disorder. Furthermore, the severity of the disorder at admission (ratings included in the documentation system, ranging from 0 (no disorder) to 6 (very serious disorder)), the legal basis of admission (voluntary vs. compulsory) and the number of previous admissions (first vs. readmission, lifetime) were analysed. Furthermore, a variety of therapeutic measures during inpatient stay (e.g. psychotherapy, psychopharmacotherapy including compulsory medication, seclusion, vocational training etc.; see Table 1) was assessed. The length of inpatient stay (index episode), the improvement of clinical symptomatology during inpatient treatment (7-point range scaling from +3 (markedly improved) to -3 (markedly deteriorated)) and the discharge situation (i.e. regular discharge, discharge against medical advise, absconding from the ward etc.) were examined. Finally, the intervals between discharge and readmission for those with further admissions as well as the total days as inpatient in 1996–2001 were calculated.

#### Statistical analyses

To analyse risk factors for being homeless, multiple logistic regression analysis was applied with living situation after discharge from a psychiatric hospital (homeless vs. other situation) as dependent variable. Because the risk of homelessness significantly varies with demographic factors such as age, gender, educational level, urbanicity, marital status and living situation at admission, we controlled for these variables. In order to evaluate the extent to which clinical characteristics of the inpatient treatment contribute to the risk of homelessness, we used a stepwise procedure in which variables were fitted in stages. We first included the ‘type of psychiatric disorder’ in the model. Psychiatric diagnoses were grouped into 9 categories (8 categories of Fx-diagnoses without an additional F1-diagnosis, and a further category indicating a dual diagnosis). Diagnostic categories are mutually exclusive. Psychotic disorder (F2) was used as the reference category. In a second step, further patient characteristics and measures of the inpatient treatment (Swiss vs. foreign nationality; first admission vs. readmission; severity of disorder; improvement of clinical symptomatology; regular vs. nonregular discharge situation) were considered for inclusion. Odds ratios and their 95% confidence intervals are presented; the confidence intervals are calculated from Wald statistics. Based on the subset of risk factors included in the final model, discriminant analysis was used to evaluate the ability to predict homelessness correctly by the model. All statistical analyses were carried out using the SPSS 11.5 software package.