

H. Häfner

Epidemiology of schizophrenia. A thriving discipline at the turn of the century

In most developed countries the 20th century was accompanied by a radical change in mental health care policy. The old system characterised by large mental hospitals where great numbers of chronically mentally ill patients were kept over long periods of time was replaced by a new system of acute care provided by psychiatric units at general hospitals and of effective and comprehensive community care for chronic patients. To achieve this more or less drastic dehospitalisation programmes were carried out. The 20th century also saw the rise of psychiatric epidemiology. Though currently played less attention because of the predominance of neurobiology, epidemiology has grown into one of the basic sciences in psychiatry. It provides the tools for mental health services research, for evaluative studies and cost analysis of mental health care programmes, services and systems, for studies into the natural and treatment histories of diseases and for the assessment of morbid risks in populations. Epidemiology also provides the basis for estimating needs for treatment and their geographic and social distributions. Analytic epidemiology involves the study of risk factors and provides indicators of causal processes in the development and course of mental disorders.

A comprehensive overview of the 20th-century history of psychiatric epidemiology would not fit the scope of a Special Issue. At the beginning of a new century, however, we should cast at least a short glance at the disorder chiefly affected by the radical change in mental health care: schizophrenia. Schizophrenia was also the main research field of psychiatric epidemiology in the 20th century and the most successful one.

First steps towards a nascent epidemiology of schizophrenic disorders were the meticulous observations and

symptom descriptions provided by Emil Kraepelin, Karl Jaspers and Kurt Schneider and the disease concepts developed on those bases.

The elaboration of an internationally approved diagnostic classification system by the WHO (1974) (ICD-8) and later by the APA (1980) (DSM-III) laid the foundation for clear-cut descriptions of symptoms, diagnoses and case definitions as preconditions for precise assessments and comparisons of morbidity rates and other diagnosis-related information. Next, internationally applicable instruments and methods were developed. The trailblazer was the IPSS (WHO 1973), which brought forth the PSE interview and its computerised version, the CATEGO programme (Wing et al. 1974), for assessing symptoms and establishing objective syndromes and diagnoses. This transnational study was the first to produce comparable data on the symptoms of schizophrenic disorders and later also on their course and outcome. The DOSMeD study (Jablensky et al. 1992), involving a comparative analysis of the morbid risk for schizophrenia, also allowed comparisons of symptomatology and course between populations and countries. The latest analyses (Harrison et al. 2000) have also made progress in explaining the conspicuous difference in course and outcome between developed and developing countries.

Within the framework of the transnational WHO disability projects, first systematic and methodologically sound studies into the epidemiology of the long-term course and outcome of schizophrenia were conducted (an der Heiden et al. 1995, 1996, Wiersma et al. 1996, Mason et al. 1996, Harrison 2000, Jablensky this volume, an der Heiden & Häfner this volume). Their results obliterated the “process” paradigm of progressive deterioration (Kraepelin), according to which schizophrenia is characterised by social and cognitive decline, and gave birth to a static vulnerability model showing no discernible long-term trend in group means. These studies also confirmed similar findings on the course of the disorder reported from “clinical” studies (Bleuler 1972, Huber et al. 1979, 1980, Harding et al. 1987a, b, Breier et al. 1991, Marneros et al. 1991).

Recent advances in understanding the early course of

Prof. Dr. Dr. Dres. h. c. H. Häfner (✉)
Schizophrenia Research Unit
Central Institute of Mental Health
J5
68159 Mannheim, Germany
Tel: 06 21–1 70 37 26, Fax: 06 21–1 70 32 66
e-mail: hhaefner@as200.zi-mannheim.de

schizophrenia have been made by prospective research into the premorbid period preceding illness onset. Especially the Danish (Cannon & Mednick 1993, Parnas et al. 1993) and the New York high-risk studies (Erlenmeyer-Kimling et al. 1993) of offspring of schizophrenic mothers were the first to provide highly differentiated results, obtained by combined retrospective-prospective designs, on neurodevelopmental and psychological anomalies of children and adolescents later falling ill with schizophrenia. In the three large-scale birth cohort studies of the British and the Northern Finland population Jones and Isohanni (s. Jones & Tarrant this volume, Isohanni et al. this volume) conducted controlled prospective analyses of the developmental delays in and slight anomalies of neuromotor, cognitive, emotional and behavioural development in children and adolescents. They found strong evidence in support of the neurodevelopmental model of schizophrenia.

The Swedish (Malmberg et al. 1998) and the Israeli (Davidson et al. 1999) conscript studies yielded precise and generally valid information on cognitive and behavioural indicators of the psychosis risk in adolescents in the general population.

The onset of schizophrenia, the prodromal phase with a mean length of five years and the psychotic stage lasting for about one year before first contact were systematically studied in the population-based ABC first-episode sample (s. an der Heiden & Häfner this volume). The majority of schizophrenics, it turned out, are not born into socially disadvantaged conditions – the social causation hypothesis formulated along these lines long played a leading role in a methodologically underdeveloped social epidemiology (Clausen & Kohn 1959). Most of the social consequences of the disorder emerge in the early illness phase, long before the first treatment contact (Häfner et al. 1999). For this reason the results of epidemiological studies into the early illness course (Lieberman 1993) have led to worldwide efforts of early detection and intervention (McGorry et al. 1996, Cornblatt et al. 1998, McGlashan & Johannessen 1996, Klosterkötter et al. 1996) in a hope to ward off the disorder altogether or at least to alleviate its consequences.

As the way of dealing with Kraepelin's disease entity of schizophrenia became less deferential, the next step was to study the epidemiology of single psychotic phenomena or symptoms in the general population. The results reported from France (Verdoux et al. 1998), the Netherlands (van Os et al. 1997) and the USA (the ECA study: Robins & Regier 1991; and the Comorbidity Survey: Kessler et al. 1994) suggest that a more critical view of the categorical disease concept of schizophrenia is needed. In view of the considerable prevalence of delusions, hallucinations and other psychotic phenomena in the general population and the similarity of the age distributions of these symptoms to that of schizophrenic psychosis we cannot but from now on start to adopt dimensional concepts, no matter what consequences this might have for our theoretical edifice of schizophrenia and possibly of other mental disorders as well (van Os et al. 1999).

Finally, the establishment of population-based psychiatric case registers, mainly in Northern Europe, Great

Britain and the Netherlands – new data protection laws in Germany forced the Mannheim psychiatric case register to close – has opened up new perspectives in epidemiological research. Case registers allow the monitoring of care provision with the possibility of a continued evaluation of mental health services and systems (ten Horn et al. 1986). Register linkage expands the range of relationships that can be studied and, hence, substantially enhances the research value of psychiatric case registers as such. In this way it has become possible for example to study pre-, peri- and postnatal risk factors (Bennedsen et al. 2000, Jablensky et al. 2000), environmental factors, such as urban life (Mortensen et al. 1999, Marcelis et al. 2000, Löffler & Häfner 1999), comorbidity and long-term consequences of disorders. Some such results, e. g. an increase in the suicide, crime and substance-abuse rates of the mentally ill in parallel with the reduction of available psychiatric beds in Denmark, were reported by P. Munk-Jørgensen (1999).

The contributions to this volume are an attempt to highlight some of the most important results that have recently provided new insights into the epidemiology of schizophrenia. They throw light on selected fields of epidemiological schizophrenia research and the progress that was made by the turn of the century. In the 20th century the range of methodological and analytical tools available in psychiatric epidemiology was enormously expanded (Jablensky, this volume). Now we are faced with complex new issues and huge challenges. Epidemiological research into the frequency, distribution and course of abnormal brain morphology (Jones et al. 1994), already underway, and the dawning epidemiology of functional anomalies and brain processes will be developed further on the neurobiological and psychological level. Genetic epidemiology will deepen our knowledge of the familial and spontaneous occurrence of milder forms of the disorder and of the distribution and association of the underlying genes in families and populations (Lichtermann et al. this volume).

The epidemiology of risk factors and risk models will improve prognosis of the onset and course of schizophrenia and enhance chances of early intervention – perhaps also of preventing the disorder or its devastating consequences. Psychiatric epidemiology will be worth attention and promotion in the future no less than biological psychiatry is.

References

- APA (1980) American Psychiatric Association: Diagnostic and statistical manual of mental disorders. 3rd edn. Washington DC
- Bennedsen BE, Mortensen PB, Olesen AV (2000) Congenital malformations, stillbirths, and infant deaths among children of schizophrenic women. Abstract. *Schizophrenia Res* 41: 68
- Bleuler M (1972) Die schizophrenen Geistesstörungen im Lichte langjähriger Kranken- und Familiengeschichten. Thieme, Stuttgart
- Breier A, Schreiber JL, Dyer J, Pickar D (1991) National Institute of Mental Health longitudinal study of chronic schizophrenia: prognosis and predictors of outcome. *Arch Gen Psychiatry* 48: 239–246

- Cannon TC, Mednick SA (1993) The schizophrenia high risk project in Copenhagen: three decades of progress. *Acta Psychiatr Scand* (Suppl. 370): 33–47
- Clausen JA, Kohn ML (1959) Relation of schizophrenia to the social structure of a small city. In: Pasamanick B (ed) *Epidemiology of mental disorder*. AAAS Publisher, Washington, pp 69–86
- Cornblatt B, Obuchowski M, Schnur D, O'Brien JD (1998) Hillside study of risk and early detection in schizophrenia. *Br J Psychiatry* 172 (Suppl. 33), 26–32
- Davidson M, Reichenberg MA, Rabinowitz J, Weiser M, Kaplan Z, Mordehai M (1999) Behavioural and intellectual markers for schizophrenia in apparently healthy male adolescents. *Am J Psychiatry* 156: 1328–1335
- Erlenmeyer-Kimling L, Cornblatt BA, Rock D, Roberts S, Bell M, West A (1993) The New York high-risk project: anhedonia, attentional deviance, and psychopathology. *Schizophr Bull* 19: 141–153
- Häfner H, Löffler W, Maurer K, Hambrecht M, an der Heiden W (1999) Depression, negative symptoms, social stagnation and social decline in the early course of schizophrenia. *Acta Psychiatr Scand* 100: 105–118
- Harding CM, Brooks GW, Ashikaga T, Strauss JS, Breier A (1987a) The Vermont longitudinal study of persons with severe mental illness. II: Long-term outcome of subjects who retrospectively met DSM-II criteria for schizophrenia. *Am J Psychiatry* 144: 727–735
- Harding CM, Brooks GW, Ashikaga T, Strauss JS, Breier A (1987b) The Vermont longitudinal study of persons with severe mental illness. I: Methodology, study sample, and overall status 32 years later. *Am J Psychiatry* 144: 718–726
- Harrison G, Hopper K, Craig TJ, Laska E, Siegel C, Dube KC, Ganey K, Giel R, an der Heiden W, Janca A, Lee PWH, Leon CA, Malhotra S, Marsella AJ, Nakane Y, Sartorius N, Shen Y, Skoda C, Thara R, Tsirkin SJ, Varma VK, Walsh D, Wiersma D, Wynne L (2000) Recovery from psychotic illness: a 15- and 25-year international follow-up study. (in press)
- an der Heiden W, Krumm B, Müller S, Weber I, Biehl H, Schäfer M (1996) Eine prospektive Studie zum Langzeitverlauf schizophrener Psychosen: Ergebnisse der 14-Jahres-Katamnese. *Zeitschrift für Medizinische Psychologie* 5: 66–75
- an der Heiden W, Krumm B, Müller S, Weber I, Biehl H, Schäfer M (1995) Mannheimer Langzeitstudie der Schizophrenie. *Nervenarzt* 66: 820–827
- ten Horn GHMM, Giel R, Gulbinat WH, Henderson JH (eds) (1986) *Psychiatric case registers in public health*. Elsevier, Amsterdam
- Huber G, Gross G, Schüttler R (1979) *Schizophrenie*. Springer, Berlin
- Huber G, Gross G, Schüttler R, Linz M (1980) Longitudinal studies of schizophrenic patients. *Schizophrenia Bull* 6: 592–605
- Jablensky A, Sartorius N, Ernberg G, Anker M, Korten A, Cooper JE, Day R, Bertelsen A (1992) Schizophrenia: manifestations, incidence and course in different cultures. A World Health Organization ten-country study. *Psychological Medicine Monograph Suppl* 20. Cambridge University Press, Cambridge
- Jablensky A, Zubrick S, Morgan V, Bower C, Pindler T (2000) The offspring of women with schizophrenia and affective psychoses: a population study. Abstract. *Schizophrenia Res* 41: 8
- Jones PB, Harvey I, Lewis SW, Toone BK, van Os J, Williams M, Murray RM (1994) Cerebral ventricle dimensions as risk factors for schizophrenia and affective psychosis: an epidemiological approach. *Psychol Med* 24: 995–1011
- Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, Wittchen H-U, Kendler KS (1994) Lifetime and 18-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. *Arch Gen Psychiatry* 51: 8–20
- Klosterkötter J, Ebel H, Schultze-Lutter F, Steinmeyer EM (1996) Diagnostic validity of basic symptoms. *Eur Arch Psychiatry Clin Neurosci* 246: 147–154
- Lieberman JA (1993) Prediction of outcome in first-episode schizophrenia. *J Clin Psychiatry* 54 (Suppl) 13–17
- Löffler W, Häfner H (1999) Ecological pattern of first admitted schizophrenics in two German cities over 25 years. *Social Science and Medicine* 49: 93–108
- Malmberg A, Lewis G, David A, Allebeck P (1998) Premorbid adjustment and personality in people with schizophrenia. *Br J Psychiatry* 172: 308–313
- Marcelis M, Takei N, van Os J (2000) Urbanization and risk for schizophrenia: Does the effect operate before or around the time of illness onset? *Schizophrenia Res* 41 (Special Issue): 64–65
- Marneros A, Deister A, Rohde A (1991) *Affektive, schizoaffektive und schizophrene Psychosen. Eine Langzeitstudie*. Springer, Berlin Heidelberg New York
- Mason P, Harrison G, Glazebrook C, Medley I, Croudace T (1996) The course of schizophrenia over 13 years. A report from the International Study on Schizophrenia (ISOs) coordinated by the World Health Organization. *Br J Psychiatry* 169: 580–586
- McGlashan TH, Johannessen JO (1996) Early detection and intervention in schizophrenia. *Schizophr Bull* 22: 201–222
- McGorry PD, Edwards J, Mihalopoulos C, Harrigan SM, Jackson JH (1996) EPPIC: an evolving system of early detection and optimal management. *Schizophrenia Bull* 22: 305–26
- Mortensen P et al. (1999) Effects of family history and place and season of birth on the risk of schizophrenia. *The New England Journal of Medicine* 340: 603–608
- van Os J, Jones PB, Lewis G, Wadsworth M, Murray RM (1997) Developmental precursors of affective illness in a general population birth cohort. *Arch Gen Psychiatry* 54: 625–631
- van Os J, Verdoux H, Bijl R, Ravelli A (1999) Psychosis as an extreme of continuous variation in dimensions of psychopathology. In: Gattaz WF, Häfner H (eds) *Search for the causes of schizophrenia*, vol IV. Steinkopff, Darmstadt, Springer, Heidelberg, pp 59–79
- Munk-Jørgensen P (1999) Has deinstitutionalization gone too far? *Eur Arch Psychiatr Neurosci* 249, 136–143
- Parnas J, Cannon TD, Jacobsen B, Schulsinger H, Schulsinger F, Mednick SA (1993) Lifetime DSM-III-R diagnostic outcomes in offspring of schizophrenic mothers: results from the Copenhagen High-Risk Study. *Arch Gen Psychiatry* 50: 707–714
- Robins LN, Regier DA (eds) (1991) *Psychiatric disorders in America. The Epidemiologic Catchment Area Study*. The Free Press, New York
- Verdoux H, Maurice Tison S, Gay B, van Os J, Salamon R, Bourgeois ML (1998) A survey of delusional ideation in primary-care patients. *Psychol Med* 28: 127–134
- Wiersma D, Giel R, de Jong A, Nienhuis FJ, Slooff CJ (1996) Assessment of the need for care 15 years after onset of a Dutch cohort of patients with schizophrenia, and an international comparison. *Soc Psychiatry Psychiatr Epidemiol* 31: 114–121
- WHO – World Health Organization (1973) Report of the international pilot study of schizophrenia. Vol. 1. World Health Organization, Geneva
- WHO – World Health Organization (1974) Glossary of mental disorders and guide to their classification for use in conjunction with the International Classification of Diseases. 8th Revision. World Health Organization, Geneva
- Wing JK, Cooper JE, Sartorius N (1974) Measurement and classification of psychiatric symptoms: an instruction manual for the PSE and CATEGO program. Cambridge University Press, London