Psychological Medicine, 1997, **27**, 765–774.

The National Psychiatric Morbidity Surveys of Great Britain – strategy and methods

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ABSTRACT

Background. This paper describes the rationale and methodology of the first national psychiatric morbidity surveys to be carried out in Great Britain. The objectives of the surveys were to estimate the prevalence of psychiatric morbidity among adults aged 16–64 living in Great Britain; to identify the nature and extent of social disabilities associated with psychiatric morbidity; to describe the use of health and social services by people with psychiatric morbidity and to investigate the association between mental illness and potential environmental risk factors in a household sample.

Methods. Four separate surveys were carried out in order to meet the objectives; a private household sample ($N = 10108$), a sample of institutions caring for the mentally ill ($N = 1191$), a sample of homeless people ($N = 1166$), and a supplementary sample of patients with psychosis living in private households ($N = 350$). A two-stage assessment procedure was used, in which all subjects were given the Revised Clinical Interview Schedule (CIS-R) administered by lay interviewers to assess neurotic symptoms and disorders and a psychosis screen, including the Psychosis Screening Questionnaire. Those who were positive on the psychosis screen were then interviewed by psychiatrists using the SCAN (incorporating the tenth edition of the Present State Examination).

Conclusions. Large scale national surveys such as this augment the inadequate data on psychiatric morbidity that are routinely available and are, therefore, an important source of information upon which to base policy and generate aetiological hypotheses. These surveys provide a possible model for similar surveys in other countries.

INTRODUCTION

Psychiatric morbidity is a major source of ill health and the recent World Bank Report (World Development Report, 1993) has drawn attention to its public health impact and burden in terms of its high prevalence, associated social disability and use of health and social services throughout the developed and less developed world. However, the information available for those concerned with policy on mental illness is limited in scope and in geographical coverage. This paper describes a set of four surveys whose aims included the estimation of the prevalence of psychiatric morbidity and the use of health and social services in the community in Great Britain.

There are a number of reasons for carrying out large-scale community studies of psychiatric morbidity. First, effective policy needs to be based on epidemiology and the social and economic consequences of psychiatric morbidity. For example, information from community surveys can be used to assess the potential scope for public health interventions. From the perspective of public health it is also important to identify and describe persons with psychiatric symptoms that, although distressing, are not

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severe enough to meet internationally agreed diagnostic criteria. These common conditions are often important when considered in aggregate. Secondly, representative information in a geographical area is a desirable pre-requisite for planning health and social services. Community surveys can document the use of existing services and can estimate the extent of unmet needs and the services required to meet them. In general, prevalence estimates for specific psychiatric disorders in the survey of Great Britain were broadly similar to those found in previous large-scale or national surveys.

Thirdly, valid information on prevalence and associated factors of presumed causal importance allow aetiological hypotheses to be generated and tested, albeit with the limitations inherent in cross-sectional studies. Finally, by repeating community surveys, it is possible to monitor the health of the population and trends in disease, together with changes in potential risk factors.

Sources of information

There are well-documented difficulties with attempting to assess the presence of psychiatric disorder reliably and this severely limits the use of routine data in which standardized assessments are not usually used. England has four main sources of information on psychiatric disorder (Secretary of State for Health, 1992). In this respect it is probably similar to many other parts of the world and we, therefore, discuss these sources of information and their limitations.

1 Hospital admission and attendance data for psychiatry

In the UK diagnoses on discharge from psychiatric hospital are recorded but individuals are not linked to episodes, except in the former Oxford health region (Gill & Baldwin, 1987) and so the number of admissions does not correspond to the number of patients. Diagnoses are unstandardized but such data can be useful. For example, a recent decline in the incidence of schizophrenia has recently been described (Eagles & Whalley, 1985; Bebbington, 1987; Der *et al*. 1990), though interpretation is difficult in view of possible changes in diagnosis and admission policy. Admission statistics provide no data on patients, with less severe conditions, who are not admitted to hospital and even the more severely ill are increasingly being treated outside hospital. More recently in England, routine data have also been collected on the numbers of clients seen by community mental health nurses, and of those attending day centres and residential homes (Government Statistical Service, 1994, 1995*a*, *b*) but little clinical information is provided.

2 Local case registers

A number of areas around the world have set up local case registers providing data on patients contacting specialist psychiatric services. Seven areas of the UK have had such registers (Department of Health and Social Security, 1970). These overcome the problem common in national statistics of providing data only on admissions and on episodes rather than individuals. However, there is no standardization in the collection of diagnostic information and only those contacting the specialist psychiatric services are included.

3 Statistics of consultations in general practice

The main source of information from primary care in Great Britain is from the Morbidity Survey in General Practice (1992) (see McCormick *et al*. 1995). This survey was last carried out in 1991/2 in several hundred volunteer general practices; it has produced information on primary care consultations and episodes of illness as diagnosed by the GP. Even if this sample were representative of all primary care practices, which it is not, there is considerable diagnostic variation within general practice (Jenkins *et al*. 1988) and GPs only detect about half of the psychiatric morbidity among attenders. Studies that have used standardized assessments of psychiatric disorder within primary care have necessarily been small and located in unrepresentative practices. Consultation with a general practitioner is influenced by many factors in addition to the presence of psychiatric disorder (Goldberg & Huxley, 1992) and information is difficult to generalize to a household sample of the community.

4 Local community surveys

There is a long history of studies that describe and characterize the psychiatric morbidity seen

in the community using standardized assessments. The early studies used brief checklists of symptoms (e.g. Langner, 1962), but concerns were increasingly expressed about the validity of these measures and the lack of diagnostic information they supplied. The US–UK study (Cooper *et al.* 1972) saw a dramatic change in the development of standardized psychiatric assessments. The assessments were developed from the way in which clinical judgements were used in characterizing psychiatric disorder in the more severely ill patients treated in specialist settings (Wing *et al.* 1974). As the interviews were administered by specialists, the opportunities for mounting large-scale surveys were severely limited.

There have been a number of community surveys carried out in Great Britain but these have been limited in geographical and diagnostic coverage, and have made use of differing definitions, populations and methodologies (Taylor & Chave, 1964; Hare & Shaw, 1965; Brown *et al.* 1977; Brown & Harris, 1978; Cochrane & Stopes-Roe, 1980; Bebbington *et al.* 1981; Surtees *et al.* 1983). They have also been carried out over many years, which may have seen changes in prevalence of psychiatric disorder (Lewis & Wilkinson, 1993). It is, therefore, difficult and probably invalid to extrapolate their findings to the large areas that have not been surveyed or even to combine the results of those that have been carried out. Local surveys such as these cannot answer the need for nationally representative data.

Some surveys with a national coverage have used shorter questionnaires to elicit psychiatric symptoms, for example the General Health Questionnaire (Cox *et al.* 1987; Buck *et al.* 1994). Though the GHQ has good sensitivity and specificity for neurotic disorder, there are concerns about its validity in some groups (Stansfeld & Marmot, 1992; Lewis & Araya, 1995) and it provides little information to characterize psychiatric disorder or to provide diagnoses. These studies did not link data on psychiatric disorder to use of health or social services.

More recently, two large-scale studies have been carried out in the USA, using social survey interviewers; the Epidemiologic Catchment Area program (ECA) (Eaton & Kessler, 1985; Robins & Regier, 1991) and the National Comorbidity Survey (NCS) (Kessler *et al.* 1994). Only the NCS investigated a sample representative of the USA as a whole but there is no equivalent survey for Great Britain.

Planning the surveys

In England, as in many other nations, there is therefore very limited information on the prevalence of psychiatric disorder in the community. Routine statistics and small local surveys cannot provide nationally representative information and may be misleading if used as the basis of mental illness policy. The National Surveys of Psychiatric Morbidity were planned to meet this requirement.

In 1989, the Department of Health for England, in conjunction with the Office of Population Censuses and Surveys (OPCS), started the planning and development of this project. The Department of Health published the government's health strategy: 'The Health of the Nation' in 1992 (Secretary of State for Health, 1992) and this identified mental illness as one of the five key areas and provided political momentum. As a result in 1992 the Department of Health for England, in conjunction with the Scottish Home and Health Department and the Welsh Office, commissioned OPCS to carry out the work. Though there was a need for information on all age groups, studies of children and the elderly would have required different strategies for sampling and assessments. It was, therefore, decided to start with a study of those aged between 16 and 64 years. The surveys were coordinated by a steering group with representation from the Department of Health, from OPCS and epidemiologists from academic institutions in the UK.

Objectives of the surveys

The surveys were designed to meet the following five principal objectives.

1 To estimate the prevalence of psychiatric morbidity among adults aged 16–64 living in Great Britain. Prevalence rates were required for individual symptoms, for a general category of above-threshold disorder, and for ICD-10 psychiatric disorders.

2 To investigate associations between psychiatric disorders and especially between neurotic disorders and nicotine, alcohol, and drug use and dependence.

3 To identify the nature and extent of social disabilities associated with mental illness. Social disability here refers to the limitations in function and restrictions in activities within the various domains of housing, occupation, social relationships, finances, family, etc.

4 To describe the use of primary and secondary health services, private facilities, social services and voluntary services by people with psychiatric morbidity and to relate these to ICD-10 psychiatric disorders, symptoms and associated disabilities.

5 To investigate the association between psychiatric morbidity and recent life events, the experience of social support and socio-economic circumstances in a cross-sectional survey. This would allow a quantification of the public health importance of potential environmental causes of psychiatric disorder.

METHOD

Samples and sampling strategy

Four separate surveys were carried out in order to meet these objectives (Table 1).

1 Private household survey

The small users' Postcode Address Files (PAF) were chosen as the sampling frame for the first survey because it gives an accurate, up to date representation of private households in Great Britain and can, therefore, be used to produce precise, nationally representative prevalence rates. In the PAF, postal sectors were stratified by regional health authority and by the proportion in manual socio-economic groups as defined by the OPCS Classification of Occupations. Ninety delivery points within 200 postal sectors were selected yielding a sample of 18000 delivery points. This sample was designed to yield 10000 subjects. This survey is described in more detail in the accompanying paper (Jenkins *et al*. 1997).

2 Mental illness institutional survey

Many people with severe mental illness are also resident in institutions catering specifically for the mentally ill including hospitals and residential homes. It was, therefore, also necessary to survey those living in such institutions. The institutional survey required a separate sampling design. This was based on: (*a*) lists of hospitals and residential homes supplied to OPCS by the Government departments; and (*b*) lists of alternative forms and residential care (hostels, group homes, etc.) obtained by OPCS from health and local authorities. The institutions were selected randomly, stratified by institutional size. This component of the survey required a strategy for negotiating access to the establishments and the residents, and suitably modified questionnaires. Subjects living in institutions were eligible if they had spent at least 6 months in the institution. The data from the institutional survey can be combined with those from the household survey, in which subjects were excluded if they had been resident in an institution for more than 6 months. It was planned to interview 1200 subjects in 208 institutions.

Table 1. *Organization of the samples for the National Surveys of Psychiatric Morbidity. Subjects aged* 16–64 *from England, Scotland and Wales*

Survey	Sampling frame	Achieved sample size	Field work
1 Private household survey	Postcode Address File in 200 postal sectors	10108	April–September 1993
2 Institutional survey	(*a*) Hospitals and residential homes known to government departments	1192	April–July 1994
	(*b*) Residential homes known to health and local authorities		
3 Supplementary sample with known psychosis in private households	List provided by psychiatric teams and general practitioners in the postal sectors selected for household survey	350	October–December 1993
4 Survey of homeless	(*a*) Those temporarily housed in private sector leased accommodation	1100	July–August 1994
	(*b*) Hostels for the homeless		
	(*c*) Night shelters		
	(*d*) Those who had slept rough attending day centres for the homeless		

https://doi.org/10.1017/S003329179700531X Published online by Cambridge University Press

3 The supplementary sample of people with psychosis

Since functional psychosis is relatively uncommon in the community, it was decided to survey people with known psychosis living in households in order to provide additional information on the use of services by this group of patients. Community mental health teams and GPs in the same 200 postal sectors chosen for the household survey were approached for a listing of everyone with known psychosis. A random sample was then drawn and 350 subjects were interviewed.

4 The survey of homeless people

Lastly, there is a major concern that people with unmet housing needs, whether living in accommodation for the homeless or sleeping rough, have relatively high rates of psychiatric morbidity and so it was also important to conduct a separate survey of this group. There were four sampling frames. Lists of homeless people who had been temporarily housed in private sector leased accommodation were provided by local authorities. Hostels for the homeless were sampled, and a further sampling frame was a list of night shelters. People sleeping rough were identified via their contact with day centres and anyone aged 16–64 who had slept rough on at least one night in the previous week was eligible for the survey. Sampling frames for this survey were compiled from local authority housing department lists, local hostel and day centre directories, from lists of hostels run by national organizations and by snowballing to identify all day centres and night shelters.

Those subjects in private sector leased accommodation would also, in principle, have been eligible for inclusion in the household survey. Therefore, the prevalence data from this survey cannot be combined with that from the other surveys. Hostels catering specifically for the mentally ill were excluded to avoid overlap with the institutional survey described above. Overlap, therefore, does not occur for those subjects sampled through the hostels and night shelters, who would not have been included in the sampling frame for the household or institutional survey. Ninety-four hostels and 416 private sector leased accommodation addresses were selected from a sample of local authorities throughout Great Britain and all 32 day centres and 31 night shelters were included. A total of 1116 completed interviews was achieved.

Pilot studies

Pilot studies were carried out before all four of the surveys. For the household survey, a small team of experienced interviewers gained initial experience with the psychiatric assessment (see below) in a sample of general practice attenders screened using the GHQ. The main pilot for the household survey selected 122 addresses in 15 postal sectors yielding 1272 eligible adults. Five per cent of those identified could not be contacted and a further 9% refused to participate, leaving 1061 successfully completed interviews. The response rate of 83% was comparable to the highest response rates achieved in national samples, though a higher refusal rate would be expected in the main stage survey as the most experienced interviewers were used in the pilot. The pilot studies also checked the time taken to carry out the interview and respondents' comprehension of the questionnaires. Modifications to the questions were made on the basis of reports by the pilot interviewers.

Assessments

The decisions behind the choice of assessments and questionnaires for the household survey will be described, followed by the modifications employed in the other surveys.

Psychiatric disorder

It is widely acknowledged that assessments of medical conditions, including psychiatric disorder, must be standardized in community surveys. Standardization is the process of incorporating clinical assessment concepts in rules and its purpose is to reduce between-observer variation and to allow comparability within and between studies. Both are particularly important in a study using over 200 interviewers around Great Britain intending to produce normative data for the whole population and which may need to be re-assessed periodically, in future surveys, in order to monitor progress with the achievement of health goals. It is also important to contrast the needs of clinicians, for whom accuracy in the individual case is paramount with those of a researcher, for whom reducing

systematic error or bias also has a high priority. Reducing bias is one of the most important advantages of standardization.

Neurotic disorder

Respondents may vary in their comprehension and interpretation of questions about their mental state. However, in contrast to psychotic disorders, insight in neurotic disorders is rarely impaired to the extent that it seriously affects the validity of self-report. Using clinicians as interviewers might increase the validity of the assessments, but it is more practical and less expensive to carry out large scale community surveys using lay interviewers.

The Composite International Diagnostic Interview (CIDI) (Robins *et al.* 1988) has been developed recently, based upon the Diagnostic Interview Schedule (DIS). The DIS was originally designed for use by lay interviewers in the US Epidemiologic Catchment Area Project (Eaton & Kessler, 1985). Acceptable reliability has been demonstrated in clinically enriched samples (Wittchen, 1994). But in a general population survey poor agreement was demonstrated between lay administered DIS diagnoses and subsequent physician diagnoses (Anthony *et al.* 1985; Helzer *et al.* 1985). Apart from the difference between clinical and structured assessment other possible reasons for the observed disagreement between the DIS and clinical diagnoses could be the use of slightly different diagnostic criteria and delays before the second assessment (Anthony *et al.* 1985; Helzer *et al.* 1985; Robins, 1985). However, the main disadvantage of the DIS and its successor the CIDI is that it is a long, tedious and relatively unwieldy interview, using cumbersome stem questions to elicit psychopathology over the whole lifetime.

The Clinical Interview Schedule (Goldberg *et al.* 1970), which has been extensively used in primary care, occupational and community studies, has recently been revised (CIS-R; Lewis *et al.* 1992). The CIS-R is now designed for use by lay interviewers though it adopts a somewhat different approach from the CIDI. It enquires only about neurotic symptoms and limits detailed enquiry to the previous week on the grounds that memory for psychological symptoms, and thus the validity of responses, is best for a relatively short recent period. Subjects are also asked when the symptoms began in order to obtain a longitudinal view of symptoms and to enable ICD-10 diagnostic criteria to be used. The ICD-10 (World Health Organization, 1992) somatoform disorders (F45) and dissociative disorders (F44) are not covered by the CIS-R, on the grounds that these diagnoses require judgements about medical explanation for the physical symptoms. These are difficult for clinicians to make. It has not been demonstrated that such judgements can validly be made by lay interviewers. The full text of the CIS-R and ICD-10 algorithm can be found in Meltzer *et al.* (1995).

We chose the CIS-R administered by social survey interviewers to assess neurotic disorder for the following reasons.

(*a*) The objective was to measure the whole spectrum of psychiatric morbidity including neurotic symptoms that are below threshold for diagnostic criteria. The CIS-R can readily provide information on sub-threshold neurotic symptoms.

(*b*) The approach of the CIS-R towards questioning, asking about symptoms over the past week rather than the lifetime, seemed advantageous in increasing reliability and making the interview more acceptable to subjects.

(*c*) It was thought that the total length of the interview should be in the order of $1\frac{1}{2}$ hours. By using the CIS-R, which takes about half the time of the CIDI to administer, it was possible to increase the number of questions about the use of services and potential environmental causes and thus fulfil all the objectives of the survey.

(*d*) We wished to be able to compare the results with future surveys carried out in Great Britain. We, therefore, wanted to choose an assessment that was devised independently of current diagnostic criteria, in case the criteria had changed by the time a repeat survey was conducted. Again, the CIS-R appeared more suitable from this point of view as it is a 'bottom-up' interview that describes basic phenomena before proceeding to use them in classification.

The CIDI would have required considerable modification and testing to meet these criteria. Furthermore, the CIDI has seldom been used in its standard form in large-scale surveys (Wittchen, 1996), which undermines the case for choosing it in order to facilitate comparison with other surveys.

Identifying psychosis

A Psychosis Screening Questionnaire (PSQ) was specially developed for the survey, as we were not aware of a suitable pre-existing questionnaire. The PSQ comprised 12 questions that enquired about positive psychotic symptoms in the preceding 12 months and in preliminary testing in a clinical population it performed well, with a sensitivity of 97% and a specificity of 95% (Bebbington & Nayani, 1995). Even with a high sensitivity and specificity, the positive predictive value of a test becomes quite poor when the prevalence of a condition is low. A further difficulty which became apparent in the pilot study was that those with psychotic illnesses who were now in remission tended not to score on the PSQ as they were not currently experiencing psychotic symptoms. For example, in the pilot study of the institutional survey about 25% of subjects who were thought to have a mental illness were not detected by the PSQ. Subjects were, therefore, also selected for a second-stage interview if they were receiving anti-psychotic medication or if they had contact with any health care professional for a mental, nervous or emotional problem that the respondent reported had been labelled as a psychotic illness.

The Schedule for Clinical Assessment in Neuropsychiatry (SCAN) incorporates the tenth edition of the Present State Examination (PSE-10; Wing *et al*. 1990). It is designed to be used by trained psychiatrists as clinical judgements are required in order to match subjects' reported experiences with symptom concepts defined in a glossary. The PSE in its earlier versions has been used for many years to describe neurotic and psychotic symptoms in hospital and non-hospital populations (Wing *et al*. 1974). The tenth edition (PSE-10) is available in a computer-assisted application that permits direct data entry by the interviewer and access to the classificatory algorithm CATEGO-V. This in turn provides diagnoses in terms of ICD-10 (World Health Organization, 1992) and DSM-III-R (American Psychiatric Association, 1987). The interview has two parts. Part one covers anxiety, depressive, eating and bipolar disorders and substance abuse. Part two includes the psychotic disorders of interest to the survey (schizophrenia, schizoaffective and other delusional disorders). Its reliability and acceptability has been established in multicentre trials around the world (Wing *et al*. 1996).

For the second stage of identifying psychotic illness, we chose the SCAN to provide a 1-year prevalence. Every person who screened positive for psychosis was subsequently invited to be interviewed as soon as possible by the psychiatrists. In the household pilot survey, 154 of the 1061 completed interviews were cases of neurosis or of possible psychosis. One hundred and fifty recall interviews were requested of whom 134 agreed though 10% of these refused a SCAN and a further 36% could not be contacted within the time available to the interviewing psychiatrists.

Alcohol and drug use and dependence

The questionnaire administered by the interviewers included questions to assess the quantity of alcohol drunk and current and past smoking. All subjects were also given a self-completion questionnaire covering alcohol dependency and problems, drug taking, drug dependency and problems. Regular national surveys of alcohol and tobacco consumption are carried out as part of the General Health Survey (Office of Population Censuses and Surveys, 1992). Both of these quantity/frequency questionnaires were used to ensure comparability with previous national surveys. An additional section on binge drinking was adapted from Hilton (1987, 1991) along with 26 questions on loss of control, symptomatic behaviour and binge drinking, adapted from Caetano (1990). The section of the DIS covering drug use was included. Questions on volatile substance abuse, methylene-dioxymethamphetamine (MDMA) and injecting and sharing behaviour were also added.

A measure of alcohol dependence was created from adding up positive responses to 12 questions that focus on the three components of dependence: loss of control, symptomatic behaviour and binge drinking. Five questions in the survey measured drug dependence.

Social environment

A number of pilot studies were undertaken in order to evaluate questions and questionnaires that were brief enough and acceptable enough for application to a wide range of subjects. All subjects were given a brief questionnaire asking

about stressful life events (Brugha *et al*. 1985; Brugha & Cragg, 1990), social support (Brugha *et al*. 1987; Cox *et al*. 1987), social disability (Brewin & Wing, 1989), activities of daily living (Martin *et al*. 1988), education and employment (Office of Population Censuses and Surveys, 1990, 1992). The pilot study indicated that these questions could be asked of all respondents, thus allowing study of the associations between them and psychiatric disorder.

Use of services

All subjects were asked questions about long-standing illness and medication. Individuals who were at or above the threshold on the CIS-R (a score of 12 or more: Lewis *et al*. 1992) and those who were selected for a second interview because of suspected psychosis were asked further questions by the OPCS interviewers. This second questionnaire covered long-standing illness, medication and treatment, the use of health, social and voluntary care services, activities of daily living and informal care.

Modifications to the assessment procedure in the other surveys

The assessments described above were used in the household sample. The following modifications were made for the other three surveys.

Institutional survey

The CIS-R was asked of those who could be interviewed. Information on use of services, both inside and outside their institution, was asked of everyone. Proxy information was sought in those who could not cooperate with interview.

Supplementary sample

The interviewing procedure for this sample followed exactly the same procedure as in the private household survey. As all subjects had been identified because of a psychotic illness, all were approached for a SCAN interview. In the pilot for this survey, general practitioners had considerable difficulty in naming eligible patients; however, once identified there was only a 3% refusal rate for interview.

Homeless survey

In hostels and private sector leased accommodation a similar procedure and questionnaire was used as in the household survey, with the addition of a 12-item GHQ. Pilot studies indicated that a shorter questionnaire was needed for the sample from night shelters and day centres. The 12-item GHQ replaced the CIS-R and briefer questions on the social environment and use of services were included.

Publication and dissemination of data and procedures

The results of the surveys will be published as OPCS reports and as a parallel series of scientific papers describing the scientific background and performing additional analyses. The first three reports have been published (Meltzer *et al*. 1995, 1996*a*, *b*). The data will be archived in 1996 at the Economic and Social Research Council (ESRC) Data Archive at the University of Essex, and researchers will be encouraged to perform their own secondary analyses on the data.

CONCLUSION

The US National Comorbidity Survey (Kessler *et al*. 1994) is the only completed survey known to us that has attempted to determine the prevalence of psychiatric disorder in a representative sample of the population over a large geographical area. The approach we have adopted here has a number of differences from the US survey. First, we chose a two-stage design, in which neurotic disorder was defined using a highly structured questionnaire administered by lay interviewers, while psychotic disorders were defined using a standardized interview administered by psychiatrists but in those people who were positive on a psychosis screen. Secondly, we have also included a sample from institutions specializing in the long-term care of the mentally ill and a sample of homeless persons. Thirdly, we have laid great emphasis upon describing the use of services by those with psychiatric disorder in order to aid planning. Fourthly, we were interested in documenting the morbidity associated with individual neurotic symptoms and conditions that do not meet the current criteria for ICD-10 diagnoses.

The approach we have taken provides a possible model for conducting similar national surveys in other countries. We expect the results

of the surveys to provide an improved basis for policy, planning services and for studying the nature of psychiatric morbidity in the general population.

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