Prevalence, treatment, and associated disability of mental disorders in four provinces in China during 2001–05: an epidemiological survey

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Summary

Background In China and other middle-income countries, neuropsychiatric conditions are the most important cause of ill health in men and women, but efforts to scale up mental health services have been hampered by the absence of high-quality, country-specific data for the prevalence, treatment, and associated disability of different types of mental disorders. We therefore estimated these variables from a series of epidemiological studies that were done in four provinces in China.

Methods We used multistage stratified random sampling methods to identify 96 urban and 267 rural primary sampling sites in four provinces of China; the sampling frame of 113 million individuals aged 18 years or older included 12% of the adult population in China. 63 004 individuals, identified with simple random selection methods at the sampling sites, were screened with an expanded version of the General Health Questionnaire and 16 577 were administered a Chinese version of the Structured Clinical Interview for Diagnostic and Statistical Manual (DSM)-IV axis I disorders by a psychiatrist.

Findings The adjusted 1-month prevalence of any mental disorder was 17·5% (95% CI 16·6–18·5). The prevalence of mood disorders was 6·1% (5·7–6·6), anxiety disorders was 5·6% (5·0–6·3), substance abuse disorders was 5·9% (5·3–6·5), and psychotic disorders was 1·0% (0·8–1·1). Mood disorders and anxiety disorders were more prevalent in women than in men, and in individuals 40 years and older than in those younger than 40 years. Alcohol use disorders were 48 times more prevalent in men than in women. Rural residents were more likely to have depressive disorders and alcohol dependence than were urban residents. Among individuals with a diagnosable mental illness, 24% were moderately or severely disabled by their illness, 8% had ever sought professional help, and 5% had ever seen a mental health professional.

Interpretation Substantial differences between our results and prevalence, disability, and treatment rate estimates used in the analysis of global burden of disease for China draw attention to the need for low-income and middle-income countries to do detailed, country-specific situation analyses before they scale up mental health services.

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Introduction

The 1996 publication of the global burden of disease reports[1,2] triggered a change in the thinking of international mental health advocates because it emphasised the importance of neuropsychiatric conditions to the overall health of countries in a way that had not been done previously. An estimated 14% of total global burden of disease and about a third of total adult disability are attributable to neuropsychiatric conditions.[3] The burden of neuropsychiatric conditions in low-income and middle-income countries accounts for an estimated three-quarters of the global burden for these conditions. In middle-income countries (including China)—where the disease burden attributable to these conditions exceeds that for infectious, cardiovascular, or neoplastic diseases—neuropsychiatric disorders are already the most important causes of illness in men and women.

Reallocation of social and health resources to address these changed priorities has been a slow and difficult process, particularly in low-income and middle-income countries where resources are scarce and individuals with mental illnesses are stigmatised. *The Lancet* Series[4] on Global Mental Health gave new momentum to the efforts of mental health advocates to promote a rational and equitable distribution of health resources, and stimulated the development of two major international initiatives: the movement for Global Mental Health[5] and the WHO Mental Health Gap Action Program.[6] The main goal of these initiatives is to promote a scaling up of mental health services in low-income and middle-income countries.[6,7]

Despite a broad similarity in the challenges encountered by proponents of mental health in different low-income and middle-income countries, generic, cross-national prescriptions are unlikely to be useful. Plans to improve the recognition of mental disorders and the provision of services to people who are mentally ill in any particular country have to fit together perfectly with the historical provision of services in the country and with the

Panel 1: **Research sites and sampling procedures**

Shandong province

- Survey was done from November, 2004, to March, 2005.
- With a population of 92·5 million and a gross domestic product (GDP) of $US2430 per person per year in 2005, Shandong is the second largest and seventh richest province of 31 provinces and independent municipalities in mainland China.
- The 17 prefectures in the province were divided into five strata on the basis of socioeconomic characteristics, and then one prefecture was randomly selected (proportional to the size of the prefecture) in each stratum. In each of the selected prefectures, four neighbourhoods from two urban wards of one city district and 12 villages from six townships (towns and associated villages) in three counties were randomly selected proportional to size. 300 households were selected by simple random methods at each of the 80 primary sampling sites and one resident was randomly selected from those who were 18 years or older in the household. Overall, from the sampling frame of 68·7 million individuals aged 18 years or older, 23 984 were identified and 22 718 (94·7%) were screened.

Qingdao (Shandong province)

- Survey was done from July, 2005, to September, 2005.
- Qingdao is one of the prefectures in Shandong that was not selected in the province-wide study (above). It has a population of 8·2 million and a GDP of $4013 per person per year.
- The seven urban districts and five rural counties in the Qingdao prefecture were classified into two urban and two rural strata on the basis of socioeconomic characteristics. One urban district or rural county was randomly selected from each stratum. Four neighbourhoods from two wards in each identified district and four villages from two townships in each identified county were selected by simple random methods. In each of the 16 primary sampling sites, 300 households were selected by simple random methods and one resident of each selected household was randomly selected from residents who were 18 years or older. Overall, from the sampling frame of 6·1 million individuals aged 18 years or older, 4800 were identified and 4776 (99·5%) were screened.

Zhejiang province

- Survey was done from September, 2001, to December, 2001.
- Zhejiang is a densely populated coastal province of China with a population of 49 million (ranked tenth) and a GDP of $3350 per person per year (ranked fourth) in 2005.
- The 11 cities and 63 counties in the province were divided into two urban and three rural strata on the basis of socioeconomic conditions. 42 neighbourhoods in 20 urban districts from four cities, and 100 villages in 50 rural townships from ten counties were randomly selected proportional to size. In the final stage of sampling, 1250 individuals aged 15 years or older were identified in each of the four the cities and 1000 were identified in each of the ten counties. The number of individuals selected in a specific neighbourhood or village was proportional to the size of the community. At each of the 142 primary sampling sites, simple random selection methods were used to identify target individuals from the computerised registry of residents in the community. 758 people younger than 18 years were excluded from this analysis and 3205 who were no longer living at the specified address were replaced with individuals of the same sex and similar age (+/–2 years) who were identified with random methods. Overall, from the sampling frame of 38·0 million individuals aged 18 years or older, 14 410 were identified and 14 083 (97·7%) were screened. For details of methods see Shi and colleagues.[8]

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socioeconomic and political changes that are in progress within that country. Thus the first step in the scale up of mental health services is to do comprehensive country-specific analyses of the perceived needs, available resources, and potential barriers for mental health care. For most low-income and middle-income countries, the global burden of disease estimates of prevalence, disability, and treatment rates for mental disorders are based on projections, expert opinion, and poor quality or isolated studies, so an important component of the analysis of the country-specific situation is to validate and update these estimates. We estimated these variables from a series of epidemiological studies with a combined sampling frame of 113 million adults—12% of China's adult population—that were done in four provinces in China.

Methods

Sample selection and first-stage screening

We used a two-stage screening process to define the prevalence and characteristics of mental disorders in Shandong, Zhejiang, and Qinghai provinces, and in a prefecture of Gansu province (Tianshui prefecture). We identified 363 primary sampling sites in the four provinces using multistage stratified random sampling methods (panel 1; figure). 66 554 individuals aged 18 years or older were identified with simple random selection methods in these sites, and 63 004 (95%) completed the first-stage screening assessment. Compared with those who completed the screening process, individuals who did not complete this process (n=3550) were younger (mean age 42·1 years [SD 15·5]

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Qinghai province

- Survey was done from March, 2005, to December, 2005.
- Qinghai is a sparsely populated, poor province on the Qinghai–Tibet plateau (mean elevation 3000 m) with a population of 5·4 million (ranked 30th); 44% of individuals belong to non-Han minority groups. GDP is $1215 per person per year (ranked 22nd).
- Qinghai has one urban region, one agricultural region, and six pastoral regions. Simple random selection methods were used to identify two urban districts, six wards, and 14 neighbourhoods from the urban region; two counties, six townships, and 27 villages from the agricultural region; and four counties, seven townships, and 17 villages from two randomly selected pastoral regions. The number of individuals selected at each primary sampling site was proportional to the size of the population in urban, rural, and pastoral regions, and the size of the population at the site. At each of 58 primary sampling sites, households were selected with simple random methods and one resident of each selected household was randomly selected from residents aged 18 years or older. From the sampling frame of 3·7 million individuals aged 18 years or older, 12 001 were identified and 11 178 (93·1%) were screened.

Tianshui (Gansu province)

- Survey was done from March, 2005, to November, 2005.
- Tianshui is one of 12 prefectures in Gansu, which is a poor province in northwest China. It has a population of 3·1 million and a GDP of $506 per person per year.
- Tianshui has two urban districts and five rural counties. One rural county was excluded because it was a minority region where individuals did not speak Mandarin Chinese. 12 neighbourhoods from five urban wards and 55 villages from 20 rural townships were randomly selected proportional to size. Simple random methods were used to select 2000 urban households and 10 000 rural households from the identified neighbourhoods and villages, and one resident aged 18 years or older was randomly selected from each household. Overall, from the sampling frame of 2·3 million individuals aged 18 years or older, 11 359 were identified and 10 249 (90·2%) were screened.

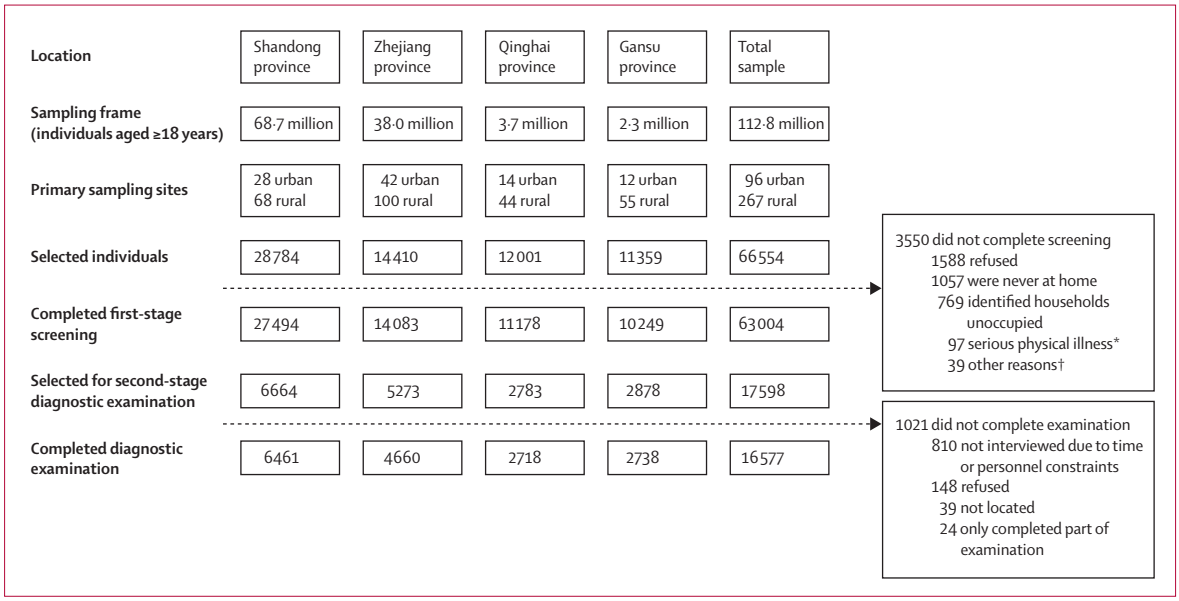

Figure: **Survey profile**
*Preventing participation in the screening interview. †Mainly communication problems related to local dialects or difficulties in speaking and hearing.

vs 44·8 years [15·1], p<0·0001) and more likely to be men (2369 [67%] of 3546 *vs* 30730 [49%] of 63 004, p<0·0001). However, location of residence (urban *vs* rural) did not differ significantly between those who did and did not complete the interview (p=0·9202).

Respondents provided oral (in Zhejiang) or written (in other sites) informed consent to participate in the study before the interviews. The local institutional review board at each research site provided ethics approval for the study.

We used a screening instrument that was extensively pilot tested at the research sites; it included detailed demographic information about respondents, the 12-item General Health Questionnaire[9] (GHQ;

	Total	High risk	Moderate risk	Low risk	Adjusted prevalence (per 100 000; 95% CI)*
Valid GHQ screening assessments	63 004 (100%)	10 815 (17%)	10 599 (17%)	41 590 (66%)	..
Administered SCID	16 577 (26%)	9966 (92%)	2693 (25%)	3918 (9%)	..
DSM IV axis I diagnoses					
Any diagnosis†	6352 (38%)	5539 (56%)	536 (20%)	277 (7%)	17 503 (16 593–18 452)
Mood disorders	2670 (16%)	2459 (25%)	175 (6%)	36 (<1%)	6136 (5720–6580)
Bipolar I disorder	34 (<1%)	29 (<1%)	3 (<1%)	2 (<1%)	99 (57–173)
Bipolar II disorder	15 (<1%)	14 (<1%)	1 (<1%)	0	26 (15–44)
Other bipolar disorders	28 (<1%)	24 (<1%)	4 (<1%)	0	76 (40–143)
Major depressive disorder	1034 (6%)	994 (10%)	33 (1%)	7 (<1%)	2066 (1845–2312)
Dysthymic disorder	857 (5%)	776 (8%)	61 (2%)	20 (<1%)	2032 (1790–2304)
Mood disorder NOS	808 (5%)	721 (7%)	78 (3%)	9 (<1%)	2045 (1788–2338)
Anxiety disorders	2183 (13%)	1924 (19%)	208 (8%)	51 (1%)	5628 (5015–6312)
Panic disorder	72 (<1%)	67 (<1%)	4 (<1%)	1 (<1%)	127 (90–181)
Agoraphobia without panic	13 (<1%)	11 (<1%)	2 (<1%)	0	32 (15–67)
Social phobia	34 (<1%)	27 (<1%)	5 (<1%)	2 (<1%)	175 (94–326)
Specific phobias	128 (<1%)	102 (1%)	16 (<1%)	10 (<1%)	540 (376–774)
Obsessive-compulsive disorder	48 (<1%)	47 (<1%)	1 (<1%)	0	84 (60–117)
Post-traumatic stress disorder	96 (<1%)	88 (<1%)	6 (<1%)	2 (<1%)	195 (144–265)
Generalised anxiety disorder	651 (4%)	598 (6%)	49 (2%)	4 (<1%)	1316 (1105–1567)
Anxiety disorder NOS	1200 (7%)	1038 (10%)	130 (5%)	32 (<1%)	3304 (2739–3981)
Substance use disorders	1480 (9%)	1126 (11%)	162 (6%)	192 (5%)	5886 (5321–6506)
Alcohol use disorders	1444 (9%)	1092 (11%)	161 (6%)	191 (5%)	5813 (5249–6432)
Alcohol abuse	630 (4%)	399 (4%)	92 (3%)	139 (4%)	3472 (3014–3997)
Alcohol dependence	814 (5%)	693 (7%)	69 (3%)	52 (1%)	2340 (2024–2705)
Sedative/hypnotic/anxiolytic drug use disorders	30 (<1%)	28 (<1%)	1 (<1%)	1 (<1%)	67 (33–135)
Cocaine use disorders	1 (<1%)	1 (<1%)	0	0	2 (0–13)
Other substance use disorders	5 (<1%)	5 (<1%)	0	0	4 (2–10)
Psychotic disorders	397 (2%)	383 (4%)	10 (<1%)	4 (<1%)	951 (793–1140)
Schizophrenia	327 (2%)	319 (3%)	6 (<1%)	2 (<1%)	781 (639–953)
Schizophreniform disorder	12 (<1%)	11 (<1%)	0	1 (<1%)	37 (15–89)
Schizoaffective disorder	13 (<1%)	13 (<1%)	0	0	20 (10–40)
Delusional disorder	16 (<1%)	12 (<1%)	3 (<1%)	1 (<1%)	51 (27–95)
Brief psychotic disorder	3 (<1%)	3 (<1%)	0	0	3 (1–13)
Psychotic disorder NOS	26 (<1%)	25 (<1%)	1 (<1%)	0	59 (36–96)
Organic mental disorders†	133 (<1%)	129 (1%)	4 (<1%)	0	238 (180–313)
Mood disorder due to GMC	52 (<1%)	51 (<1%)	1 (<1%)	0	99 (57–170)
Substance-induced mood disorder	10 (<1%)	10 (<1%)	0	0	15 (7–31)
Anxiety disorder due to GMC	63 (<1%)	60 (<1%)	3 (<1%)	0	92 (65–130)
Substance-induced anxiety disorder	5 (<1%)	5 (<1%)	0	0	7 (3–17)
Psychotic disorder due to GMC	12 (<1%)	12 (<1%)	0	0	35 (19–67)
Substance-induced psychotic disorder	2 (<1%)	2 (<1%)	0	0	4 (1–19)

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previously validated in China[10]) and four to eight additional items that assessed the presence of other risk factors for mental illness. These items were self-report of very poor physical health; very poor psychological health; frequent obsessive thoughts or compulsive behaviours (not assessed in Zhejiang); frequent restriction of behaviour because of phobia(s) (not assessed in Zhejiang); frequent feelings of extreme nervousness or anxiety (not assessed in Zhejiang); social problems due to drinking (not assessed in Zhejiang); any previous treatment for psychological problems; and previous suicidal ideation or behaviour.

All respondents were classified into three risk strata for mental illness. Those included in the high-risk stratum had a GHQ score of at least 4 (on a 0–12 point scale), had any of the eight risk factors, or could not complete the screening process because of psychological problems. Individuals with moderate risk had no risk

	Total	High risk	Moderate risk	Low risk	Adjusted prevalence (per 100 000; 95% CI)*
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Other mental disorders	153 (<1%)	140 (1%)	11 (<1%)	2 (<1%)	310 (237–407)
Somatisation disorder	13 (<1%)	13 (<1%)	0	0	28 (15–54)
Pain disorder	87 (<1%)	79 (<1%)	6 (<1%)	2 (<1%)	182 (122–271)
Somatoform disorder NOS	26 (<1%)	24 (<1%)	2 (<1%)	0	56 (32–97)
Hypochondriasis	8 (<1%)	7 (<1%)	1 (<1%)	0	27 (8–86)
Adjustment disorder	14 (<1%)	11 (<1%)	3 (<1%)	0	24 (12–48)
Other DSM-IV diagnoses not in SCID‡	5 (<1%)	5 (<1%)	0	0	9 (2–36)
After removal of NOS categories					
Any DSM-IV axis I diagnosis†	4765 (29%)	4173 (42%)	350 (13%)	242 (6%)	13 252 (12 445–14 103)
Mood disorders	1866 (11%)	1741 (17%)	98 (4%)	27 (<1%)	4119 (3776–4492)
Anxiety disorders	1007 (6%)	909 (9%)	79 (3%)	19 (<1%)	2379 (2067–2736)
Psychotic disorders	371 (2%)	358 (4%)	9 (<1%)	4 (<1%)	892 (741–1073)
Other mental disorders	127 (<1%)	116 (1%)	9 (<1%)	2 (<1%)	255 (188–346)

Data are number (%), unless otherwise indicated. All diagnoses were taken into consideration for individuals with more than one diagnosis. DSM=Diagnostic and Statistical Manual. GMC=general medical condition. GHQ=General Health Questionnaire. NOS=not otherwise specified. SCID=Structured Clinical Interview for DSM-IV diagnoses. *Data adjusted for sampling design and clustering, and poststratified to the sampling frame. †Does not include mental retardation or dementia. ‡Includes three cases of acute stress disorder, one case of conversion disorder, and one case of primary insomnia.

Table 1: **1-month prevalence of mental disorders in a sample of 63 004 individuals aged 18 years or older from Shandong, Zhejiang, Qinghai, and Gansu provinces in China**

factors and had a GHQ score of 1–3. Those with low risk had no risk factors and had a GHQ score of 0. On the basis of these classifications, 10 815 (17%) of 63 004 respondents had a high risk, 10 599 (17%) had a moderate risk, and 41590 (66%) had a low risk. The screening interviews (mean 25 min [SD 9]) were done face-to-face in respondents' homes by 170 psychiatric nurses who had been trained for 7–10 days before the main study started.

A random selection of 6717 (11%) of 63 004 assessments were repeated by a masked interviewer 4·9 days (SD 3·2) after the initial assessment; the concordance between interviewers on the classification of individuals into the three risk strata was excellent (weighted κ=0·839).

Second-stage diagnostic assessment

All high-risk individuals and a random selection of those at moderate and low risk were assigned to complete the second-stage diagnostic assessment with the Chinese translation of the Structured Clinical Interview for Diagnostic and Statistical Manual (DSM)-IV-TR axis 1 disorders (SCID),[11] which has been shown to be reliable and valid in China.[12] This interview (administered by psychiatrists in this study) includes all common diagnoses in the fourth edition of DSM.[13] It allows the inclusion of not otherwise specified (NOS) categories of illness for individuals who have clinically significant symptoms combined with social dysfunction but do not meet full criteria for a specific disorder (which is fairly common in China). Multiple current (1 month) and lifetime diagnoses ranked according to clinical importance can be recorded in this interview. Unlike fully structured diagnostic interviews, SCID allows interviewers to rephrase the questions if respondents do not understand the standard questions (a common problem in China because of the many regional dialects). For example, secondary questions for individuals who do not understand the standard question for depression include: during the last month have you felt emotionally constricted, gloomy (dejected), unhappy (downhearted), negative, pessimistic, or that it was tough to get through the day?

More than 60% of Chinese men older than 25 years are smokers,[14] so we chose not to regard nicotine addiction as a mental illness. At all sites except Zhejiang, SCID was expanded to include assessment of mental retardation and dementia. Respondents with long-standing cognitive or memory problems were assessed with the mini-mental status examination[15] and those with scores below normal for their educational level and who met other DSM-IV criteria were given the corresponding diagnosis. The level of dysfunction in the previous month resulting from mental illness was assessed with the Global Assessment of Functioning[16] (GAF) scale; the score (0–100) was converted to a disability weight ((100-GAF score)/100) and people with a disability weight of 0·40 or greater were classified as moderately to severely disabled. Those who met criteria for any mental disorder were asked to provide detailed information about previous treatment (if any).

Overall, 17 598 (28%) of 63 004 individuals who were screened were assigned to complete the second-stage diagnostic assessment with SCID, and 16577 (94%) completed SCID. Age, years of schooling, sex, or location of residence (urban *vs* rural) did not differ significantly between individuals who completed and did not complete this assessment (p values were 0·151, 0·372, 0·468, and

	Adjusted rate (95% CI)		Adjusted men:women odds ratio (95% CI)	p value
	Men (n=30 730)	Women (n=32 274)		
Any current DSM-IV axis I disorder*	20·08% (18·77–21·45)	14·84% (13·79–15·96)	1·44 (1·29–1·61)	<0·0001
Mood disorders	5·04% (4·49–5·66)	7·27% (6·66–7·93)	0·68 (0·58–0·79)	<0·0001
Major depressive disorder	1·55% (1·29–1·85)	2·60% (2·28–2·97)	0·59 (0·47–0·73)	<0·0001
Dysthymic disorder	1·52% (1·25–1·86)	2·56% (2·19–2·99)	0·59 (0·46–0·76)	<0·0001
Mood disorder NOS	1·88% (1·55–2·28)	2·22% (1·90–2·59)	0·84 (0·67–1·06)	0·1442
Anxiety disorders	4·06% (3·37–4·88)	7·25% (6·44–8·16)	0·54 (0·44–0·66)	<0·0001
Generalised anxiety disorder	0·74% (0·61–0·91)	1·91% (1·52–2·39)	0·38 (0·29–0·52)	<0·0001
Anxiety disorder NOS	2·80% (2·16–3·62)	3·82% (3·21–4·55)	0·72 (0·58–0·90)	0·0035
Substance abuse disorders	11·26% (10·18–12·44)	0·33% (0·22–0·50)	37·90 (25·36–56·62)	<0·0001
Alcohol abuse	6·69% (5·82–7·68)	0·15% (0·08–0·26)	48·70 (28·18–84·15)	<0·0001
Alcohol dependence	4·52% (3·90–5·24)	0·09% (0·04–0·18)	53·57 (26·10–109·98)	<0·0001
Psychotic disorders	0·97% (0·75–1·25)	0·93% (0·76–1·14)	1·04 (0·78–1·40)	0·7826
Schizophrenia	0·82% (0·62–1·07)	0·74% (0·58–0·94)	1·11 (0·80–1·52)	0·5396
Organic mental disorders*	0·30% (0·21–0·44)	0·17% (0·12–0·24)	1·80 (1·10–2·96)	0·0187
Other mental disorders†	0·13% (0·08–0·22)	0·49% (0·36–0·68)	0·27 (0·15–0·50)	<0·0001
Any disorder excluding NOS categories*	16·50% (15·30–17·78)	9·89% (9·04–10·82)	1·80 (1·59–2·03)	<0·0001

Data were adjusted for design factors and clustering, and poststratified to the sampling frame. All diagnoses were taken into consideration for individuals with more than one diagnosis. DSM=Diagnostic and Statistical Manual. NOS=not otherwise specified. *Does not include mental retardation or dementia. †Includes somatoform disorders, pain disorders, hypochondriasis, adjustment disorder, and DSM-IV axis I diagnoses not in Structured Clinical Interview for DSM-IV diagnoses.

Table 2: **Comparison of the prevalence of main groups of mental disorders and the most common specific disorders in a sample of 63 004 men and women aged 18 years or older from Shandong, Zhejiang, Qinghai, and Gansu provinces in China**

0·132, respectively). The interview (mean 43 min [SD 13]) was administered face-to-face in respondents' homes by 148 attending psychiatrists who had received training for 14–21 days in the use of the interview and who were unaware of the result of the first-stage screening. A random selection of 2579 (16%) SCID assessments were repeated by a masked interviewer 2·8 days (SD 3·6) after the initial examination. Of these, 64 (2%) were discordant for the main current diagnosis, 72 (3%) for main lifetime diagnosis, 85 (3%) for any current diagnosis, and 103 (4%) for any lifetime diagnosis. The κ values for any current or lifetime diagnosis and for the main groupings of diagnoses (mood, psychotic, anxiety, substance abuse, organic, and other disorders) ranged from 0·937 to 0·981. In the event of a disagreement, a team of researchers reviewed the case to establish the final diagnosis. The inter-rater reliability of the disability weight measure was excellent (intraclass correlation 0·884).

Statistical analysis

Results of participants who completed the SCID assessment were weighted up to project to the total number of individuals in each research site. Within each cluster (neighbourhood or village), the initial weight for each of the three risk strata was the number of individuals in the population that the cluster represented, multiplied by the proportion of people screened in the cluster who were in the specified risk strata, divided by the number of completed SCID interviews in the strata (ie, the inverse of the sampling fraction). This weight was further adjusted to reduce the effect of extreme weights; those greater than 2 SD above the average weight were cut off at 2 SD above the mean.We obtained poststratification weights for each research site so that the final weights accounted for the location of residence (urban or rural) and for the age (five age ranges) by sex distribution of individuals aged 18 years and older in each sampling frame. Post-stratification weights for Shandong and Qingdao prefecture (a part of Shandong that was not selected for inclusion in the provincial study) were adjusted to ensure that their combined weights indicated the total population of Shandong aged 18 years or older (without duplication).

Poststratification weights were used in the analysis. The complex survey procedures in SPSS (version 15.0) were used to estimate the prevalence of mental disorders, disability associated with each type of disorder, proportion of individuals who sought care, and the respective SEs and CIs. SEs—estimated with Taylor series linearisation—were adjusted for unequal sampling fractions within each risk stratum and for possible homogeneity within each cluster (96 urban neighbourhoods and 267 rural villages). Binary and multinomial logistic regression models within the complex survey module were used to compare rates by sex, urban versus rural residence, and age group.

Role of the funding source

The sponsor had no role in the design, execution, data analysis, or writing up of the study. The corresponding

	Adjusted rate (95% CI)		Adjusted rural:urban odds ratio (95% CI)	p value
	Rural (n=46 060)	Urban (n=16 944)		
Any current DSM-IV axis I disorder*	17·71% (16·72–18·75)	16·90% (14·85–19·17)	1·06 (0·89–1·25)	0·5177
Mood disorders	6·30% (5·82–6·81)	5·66% (4·80–6·68)	1·12 (0·92–1·36)	0·2631
Major depressive disorder	2·24% (1·96–2·56)	1·57% (1·29–1·91)	1·44 (1·12–1·84)	0·0042
Dysthymic disorder	2·21% (1·92–2·54)	1·52% (1·16–1·99)	1·46 (1·07–2·00)	0·0171
Mood disorder NOS	1·86% (1·58–2·19)	2·58% (2·05–3·24)	0·72 (0·53–0·96)	0·0253
Anxiety disorders	5·20% (4·57–5·92)	6·86% (5·42–8·65)	0·74 (0·56–1·00)	0·0474
Generalised anxiety disorder	1·19% (0·95–1·48)	1·69% (1·21–2·37)	0·70 (0·45–1·08)	0·1036
Anxiety disorder NOS	2·92% (2·35–3·61)	4·43% (3·04–6·41)	0·65 (0·41–1·03)	0·0662
Substance abuse disorders	6·11% (5·44–6·86)	5·24% (4·15–6·59)	1·18 (0·89–1·56)	0·2553
Alcohol abuse	3·44% (2·87–4·13)	3·56% (2·61–4·84)	0·97 (0·64–1·45)	0·8630
Alcohol dependence	2·61% (2·20–3·08)	1·57% (1·19–2·07)	1·68 (1·19–2·37)	0·0032
Psychotic disorders	0·99% (0·81–1·21)	0·83% (0·54–1·29)	1·19 (0·72–1·96)	0·4882
Schizophrenia	0·80% (0·64–1·00)	0·72% (0·45–1·17)	1·11 (0·64–1·91)	0·7090
Organic mental disorders*	0·26% (0·19–0·36)	0·17% (0·11–0·26)	1·59 (0·91–2·77)	0·0978
Other mental disorders†	0·36% (0·27–0·49)	0·15% (0·08–0·27)	2·41 (1·22–4·76)	0·0088
Any disorder excluding NOS categories*	13·87% (12·92–14·87)	11·46% (9·96–13·16)	1·24 (1·04–1·49)	0·0184

Data were adjusted for design factors and clustering, and poststratified to the sampling frame. All diagnoses were taken into consideration for individuals with more than one diagnosis. DSM=Diagnostic and Statistical Manual. NOS=not otherwise specified. *Does not include mental retardation or dementia. †Includes somatoform disorders, pain disorders, hypochondriasis, adjustment disorder, and DSM-IV axis I diagnoses not in the Structured Clinical Interview for DSM-IV diagnoses.

Table 3: **Comparison of the prevalence of main groups of mental disorders and the most common specific disorders in a sample of 63 004 individuals aged 18 years or older in rural versus urban areas in Shandong, Zhejiang, Qinghai, and Gansu provinces in China**

author had full access to all study data and had final responsibility for the decision to submit for publication.

Results

63 004 individuals were screened: 32 274 (51%) were women, 46 060 (73%) lived in rural communities, mean age was 44·8 years (SD 15·1), they had a mean of 6·3 years (4·3) of formal education, 52 148 (83%) were married, 2969 (6%) belonged to a non-Han minority group, and median income was US$322 (IQR 151–605) per person per year. 8736 (53%) of 16 577 individuals who completed the SCID diagnostic assessment were women, 11 830 (71%) lived in rural communities, mean age was 47·3 years (SD 15·2), they had a mean of 5·9 years (4·4) of formal education, 13 307 (80%) were married at the time, 813 (5%) belonged to a non-Han minority group, and median income was $322 (IQR 151–605) per person per year.

After adjustment for design factors and potential clustering effects, and poststratification to the sampling frame, the 1-month prevalence of any DSM-IV axis I mental disorder was 17·5% (95% CI 16·6–18·5); when NOS disorders were excluded, the adjusted prevalence declined to 13·3% (12·4–14·1; table 1). The 1-month prevalence of any diagnosis at the five sites ranged from 15·4% (14·1–16·7) in Zhejiang to 19·1% (17·1–20·9) in Shandong. Only eight specific disorders had a prevalence greater than 0·5% (in descending order): alcohol abuse, anxiety disorder NOS, alcohol dependence (independent of alcohol abuse), major depressive disorder, mood disorder NOS, dysthymic disorder, generalised anxiety disorder, and schizophrenia. 467 (58%) of 808 patients with mood disorder NOS met criteria for minor depression as defined by DSM-IV (ie, two to four of nine symptoms of depression lasting for ≥2 weeks); the adjusted prevalence was 1·1% (1·0–1·3).

760 (12%) of 6325 individuals with a current diagnosis of a mental disorder had two or more concurrent diagnoses (adjusted proportion 10%). 476 (63%) of these had concurrent mood and anxiety disorders (the most common diagnostic combination was mood disorder NOS and anxiety disorder NOS) and 88 (12%) had alcohol use disorders with either mood or anxiety disorders. The lifetime prevalence of any DSM-IV axis I disorder was 20·0% (95% CI 19·1–21·1); this prevalence declined to 15·8% (14·9–16·7) after exclusion of the NOS categories. The prevalence of mental retardation and dementia in three of four provinces (excluding Zhejiang where these diagnoses were not assessed) were 0·59% (0·43–0·81) and 0·11% (0·08–0·16), respectively.

Mood and anxiety disorders were more common in women than in men, but alcohol use disorders were much more prevalent in men than in women, so the overall rate of mental disorders was substantially higher in men than in women (20% *vs* 15%; table 2). Individuals living in rural areas had higher rates of major depressive disorder, dysthymia, alcohol dependence, and other mental disorders (including somatoform disorders, adjustment disorder, and hypochondriasis; table 3) than

	Adjusted rate (95% CI)			Group comparisons*
	18–39 years (Y; n=26 196)	40–54 years (M; n=20 555)	≥55 years (O; n=16 253)	
Any current DSM-IV axis I disorder†	12·51% (11·45–13·65)	23·23% (21·51–25·05)	24·04% (22·25–25·92)	O,M>Y
Mood disorders	3·85% (3·35–4·43)	7·72% (6·85–8·70)	10·56% (9·49–11·74)	O>M>Y
Major depressive disorder	1·15% (0·89–1·47)	2·72% (2·30–3·20)	3·82% (3·32–4·39)	O>M>Y
Dysthymic disorder	1·04% (0·79–1·38)	2·74% (2·26–3·32)	3·91% (3·27–4·68)	O>M>Y
Mood disorder NOS	1·57% (1·25–1·96)	2·36% (1·95–2·85)	3·00% (2·39–3·75)	O,M>Y
Anxiety disorders	4·03% (3·40–4·78)	7·27% (6·18–8·54)	7·97% (6·81–9·31)	O,M>Y
Generalised anxiety disorder	0·66% (0·47–0·92)	2·13% (1·69–2·68)	2·10% (1·63–2·70)	M,O>Y
Anxiety disorder NOS	2·49% (1·96–3·16)	3·98% (3·10–5·10)	4·72% (3·73–5·95)	O,M>Y
Substance abuse disorders	4·64% (3·87–5·56)	8·48% (7·43–9·67)	5·90% (4·97–7·00)	M>O,Y
Alcohol abuse	3·95% (3·24–4·81)	3·92% (3·21–4·78)	1·46% (0·95–2·26)	Y,M>O
Alcohol dependence	0·68% (0·48–0·97)	4·53% (3·74–5·48)	4·10% (3·34–5·03)	M,O>Y
Psychotic disorders	1·00% (0·77–1·29)	0·99% (0·76–1·27)	0·77% (0·57–1·02)	NS
Schizophrenia	0·86% (0·66–1·12)	0·78% (0·60–1·02)	0·55% (0·40–0·76)	Y>O
Organic mental disorders†	0·05% (0·03–0·10)	0·31% (0·22–0·44)	0·68% (0·43–1·06)	O>M>Y
Other mental disorders‡	0·12% (0·07–0·19)	0·62% 0·41–0·96)	0·43% (0·28– 0·67)	M,O>Y
Any disorder excluding NOS categories†	9·32% (8·36–10·38)	18·05% (16·60–19·59)	17·99% (16·41–19·68)	M,O>Y

Data were adjusted for design factors and clustering, and poststratified to the sampling frame. All diagnoses were taken into consideration for individuals with more than one diagnosis. DSM=Diagnostic and Statistical Manual. NOS=not otherwise specified. NS=not significant. *Significant differences (p<0·05) are shown. †Does not include mental retardation or dementia. ‡Includes somatoform disorders, pain disorders, hypochondriasis, adjustment disorder, and DSM-IV axis I diagnoses not in Structured Clinical Interview for DSM-IV diagnoses.

Table 4: **Comparison of the prevalence of main groups of mental disorders and the most common specific disorders by age group in a sample of 63 004 individuals from Shandong, Zhejiang, Qinghai, and Gansu provinces in China**

did those living in urban areas. Residents in urban areas had higher rates of NOS disorders, so after exclusion of these conditions the overall prevalence of mental disorders was higher in rural than in urban communities. In three provinces where mental retardation was assessed, prevalences in rural and urban areas were 0·69% (95% CI 0·49–0·97) and 0·27% (0·13–0·53), respectively (odds ratio 2·61 [1·20–5·70]).

With the exception of alcohol abuse and schizophrenia, the prevalence of mental disorders was much lower in young adults (aged 18–39 years) than in middle-aged adults (40–54 years) or older adults (≥55 years; table 4). Older adults were more likely than were middle-aged or young adults to have mood disorders or organic mental disorders. Middle-aged adults were more likely to have substance (mainly alcohol) abuse disorders. The prevalences of mental retardation in young, middle-age, and older adults living in the three provinces were 0·82% (95% CI 0·54–1·22), 0·40% (0·28–0·59), and 0·17% (0·07–0·37), respectively; the prevalences of dementia were 0·01% (0–0·04), 0·02% (0·01–0·12), and 0·51% (0·35–0·74), respectively. Young adults had the highest rates of mental retardation (p=0·0002) and older adults had the highest rates of dementia (p<0·0001).

The mean disability weight (based on the GAF score) in individuals with a diagnosis of a mental disorder was 0·289 (95% CI 0·282–0·297). 24% had moderate to severe disability during the previous month due to the illness (disability weight ≥0·40); this proportion varied from 4% for people with substance use disorders to 85% for those with psychotic disorders (table 5). After adjustment for differences in diagnostic groups, increased disability was associated with female sex, increased age, low family income, no medical insurance, presence of more than one current diagnosis, presence of non-NOS diagnoses, and residence in Gansu province.

More than 70% of patients with psychotic disorders had received professional help at some time in the past, but more than 88% of individuals with non-psychotic mental disorders had never received any type of professional help for psychological problems (table 5). 10% of patients who had never received professional help had obtained help from family, friends, or (rarely) local shamans or monks. 41% of individuals who had received professional help had only been treated by non-mental health professionals, mainly physicians who practice western medicine or traditional Chinese medicine. 70% of patients treated by mental health professionals (mainly psychiatrists) at some time in the past had at least one psychiatric hospital admission but only 45% had been treated in the previous 6 months. After adjustment for diagnostic groups, the mean disability weight was higher in people who had been treated by a mental health professional than in those who had not (0·352 *vs* 0·285, p<0·0001). 3% of patients with a current diagnosis had at least one previous psychiatric hospital admission. The proportion of individuals with a previous hospital admission varied

	Disability			Care seeking								
	N	Mild	Moderate to severe	All individuals			Individuals with mild disability (disability weight <0·40)			Individuals with moderate to severe disability (disability weight ≥0·40)		
				Never sought help	Only saw non-mental health professional*	Ever saw mental health professional†	Never sought help	Only saw non-mental health professional*	Ever saw mental health professional†	Never sought help	Only saw non-mental health professional*	Ever saw mental health professional†
Diagnostic group												
Any diagnosis‡	6322	75·9%	24·1%	91·8%	3·4%	4·9%	96·3%	2·4%	1·3%	77·6%	6·3%	16·1%
Mood disorders	2657	61·1 %	38·9%	91·7%	4·9%	3·4%	94·6%	4·1%	1·3%	87·1%	6·2%	6·7%
Anxiety disorders	2177	77·7%	22·3%	93·9%	3·2%	2·9%	95·5%	3·2%	1·3%	88·0%	3·5%	8·5%
Substance abuse disorders	1477	96·0%	4·0%	98·8%	0·8%	0·4%	99·1%	0·6%	0·3%	90·9%	6·3%	2·8%
Psychotic disorders	387	14·6%	85·4%	27·6%	12·0%	60·4%	43·9%	14·2%	41·9%	24·8%	11·7%	63·5%
Organic mental disorders‡	132	34·7%	65·3%	88·4%	6·0%	5·7%	89·0%	7·3%	3·7%	88·1%	5·3%	6·7%
Other disorders§	153	59·4%	40·6%	90·7%	6·0%	3·2%	88·3%	6·9%	4·8%	94·2%	4·8%	0·9%
Number of DSM-IV diagnoses												
1	5567	78·4%	21·6%	92·3%	3·1%	4·6%	96·5%	2·3%	1·3%	77·2%	6·1%	16·7%
>1	755	53·9%	46·1%	87·0%	5·7%	7·2%	93·6%	4·5%	1·8%	79·3%	7·2%	13·5%
Type of diagnosis												
Only NOS	1581	90·3%	9·7%	95·4%	3·0%	1·6%	95·9%	2·8%	1·3%	90·1%	4·9%	4·9%
≥1 non-NOS	4741	71·3%	28·7%	90·6%	3·5%	5·9%	96·4%	2·3%	1·3%	76·2%	6·5%	17·3%
Medical insurance status												
None	3798	73·2%	26·8%	90·2%	3·8%	5·9%	95·7%	2·8%	1·5%	75·3%	6·7%	18·0%
Any kind	2514	80·2%	19·8%	94·4%	2·4%	3·1%	97·3%	1·7%	1·0%	82·9%	5·4%	11·7%
Sex												
Men	3179	83·1%	16·9%	93·7%	2·2%	4·1%	98·0%	1·4%	0·6%	72·7%	6·4%	20·9%
Women	3143	65·8%	34·2%	89·0%	5·0%	6·0%	93·2%	4·3%	2·5%	81·0%	6·3%	12·8%
Age group (years)												
18–39	1586	80·7%	19·3%	89·9%	3·2%	6·9%	96·6%	1·9%	1·5%	61·6%	8·7%	29·7%
40–54	2526	75·8%	24·2%	93·1%	3·2%	3·7%	96·5%	2·4%	1·1%	82·5%	5·8%	11·6%
≥55	2210	68·9%	31·1%	92·8%	3·8%	3·4%	95·3%	3·5%	1·3%	87·4%	4·6%	8·0%
Community												
Urban	1886	77·8%	22·2%	92·7%	2·3%	5·0%	96·2%	2·2%	1·5%	80·3%	2·6%	17·2%
Rural	4436	75·3%	24·7%	91·5%	3·7%	4·8%	96·3%	2·5%	1·2%	76·8%	7·4%	15·8%
Mean per person family income												
Below median	3268	72·9%	27·1%	91·6%	3·6%	4·8%	96·8%	2·1%	1·1%	77·5%	7·7%	14·8%
Above median	3050	79·2%	20·8%	92·1%	3·0%	4·9%	95·8%	2·6%	1·5%	77·8%	4·2%	18·0%
Province of residence												
Shandong	3159	74·5%	25·5%	90·2%	2·6%	7·2%	96·8%	1·9%	1·3%	70·9%	4·6%	24·5%
Zhejiang	1243	78·9%	21·1%	90·7%	6·2%	3·1%	92·6%	5·5%	1·9%	83·5%	9·0%	7·5%
Qinghai	820	85·4%	14·6%	98·0%	1·2%	0·8%	99·4%	0·2%	0·4%	89·4%	7·1%	3·5%
Gansu (Tianshui prefecture)	1100	65·4%	34·6%	91·2%	3·4%	5·4%	97·1%	1·5%	1·4%	79·9%	6·9%	13·2%

Numbers of cases provided are unweighted but percentages are adjusted for design factors and clustering, and poststratified to the sampling frame. 30 (<1%) of 6352 individuals with a current diagnosis did not have information about care seeking or the level of disability so were not included in this analysis. NOS=not otherwise specified. *Mainly non-psychiatric physicians practising western medicine or traditional Chinese medicine. †Mainly psychiatrists and (in some cities) psychologists. ‡Does not include mental retardation or dementia. §Includes somatoform disorders, pain disorders, hypochondriasis, adjustment disorder, and DSM-IV axis I diagnoses not in the Structured Clinical Interview for DSM-IV diagnoses.

Table 5: **Characteristics of individuals (≥18 years) with current Diagnostic and Statistical Manual (DSM)-IV diagnoses and mild or moderate to severe disability due to their illness, and lifetime rates of care seeking for psychological problems in those with different levels of disability**

from 0·1% for those with substance abuse disorders to 49% for those with psychotic disorders.

More individuals who were moderately to severely disabled by their mental illness sought care than did those with mild disability, but even in this subgroup only 22% had ever sought professional care, 16% had ever received care from a mental health professional, and 12% had ever been admitted to a psychiatric hospital (table 5). After adjustment for diagnostic group differences in patients with moderate to severe disability, treatment by a mental health professional was much more common in those individuals who had a non-NOS diagnosis (*vs* those

Panel 2: Challenges to scaling up mental health services in China

On the basis of analyses done by WHO,[34] the combined category of neuropsychiatric conditions and suicide accounted for more than 20% of total burden of illness in China in 2004, making it the most important category of illness or injury in men and women. But only 2·35% of the government's health budget is spent on mental health and less than 15% of the population had health insurance that covered psychiatric disorders.[35] Several barriers will need to be overcome to redress this inequitable (and irrational) allocation of health resources:[36]

- Available services are concentrated in urban-based specialty psychiatric hospitals so most rural areas have little or no access to mental health services.
- Present economic incentives encourage psychiatric hospitals to maintain high occupancy, hence there is no motivation to provide high-quality outpatient or community-based care that would reduce admission rates.
- General physicians and primary-care health workers have little or no training in mental health so they are unable (and often unwilling) to provide basic psychiatric services, undermining attempts to provide community-based services.
- Absence of knowledge about mental illness and negative attitudes about the mentally ill prevent many sufferers from seeking needed care.
- The traditional mental health-care system—focused on individuals with psychotic disorders—is not adequately equipped to provide counselling services for patients with depression and other less severe psychological problems, and services for children, individuals with substance abuse disorders, or elderly people.
- Absence of training programmes and career pathways for clinical psychologists, psychiatric social workers, occupational therapists, and other non-medical professionals makes development of multidisciplinary approaches to the care of individuals with mental illness difficult.
- Difficulty in coordination of activities and funding of the many ministries and agencies that need to be involved undermines attempts to integrate public promotion, monitoring activities, clinical services, and social support services.
- The overall quality of epidemiological and clinical research in mental health is poor, so researchers are unable to provide policy makers with useful information.
- Despite 20 years of effort there is no national mental health law.

with only NOS diagnoses), were young adults (age 18–39 years *vs* ≥40 years), had a per person family income greater than the median, and lived in Shandong province. A previous admission to a psychiatric hospital was much more common in men, young adults, individuals with incomes greater than the median, and those from Shandong. Unexpectedly, medical insurance status (any *vs* none) and urban versus rural residence were not significantly associated with treatment by a mental health professional or in a psychiatric hospital.

Discussion

The prevalence of at least one current mental disorder in adults was greater than 17% in 2001–05. The overall prevalence declined to 13% when the NOS disorders were excluded. Mood disorders and anxiety disorders—the most prevalent types—were more common in women than in men, but the overall prevalence of mental disorders was higher in men because of their much higher prevalence of alcohol use disorders. About a quarter of individuals who met diagnostic criteria for a mental disorder were moderately to severely disabled by their illness, but less than a fifth of these ever sought any type of professional help for their condition.

Although we identified a large sample from four geographically and economically diverse provinces that was representative of 12% of China's adult population, the extent to which this sample is nationally representative is uncertain. We did not include children, or consider personality disorders and neurological conditions (eg, epilepsy, migraine), so the study does not encompass the full range of neuropsychiatric conditions. Culture-specific diagnoses were not included because these conditions often overlap with universal mental disorders and are uncommon in their pure form—eg, only 15 of 16 577 individuals who completed the SCID assessment met International Classification of Diseases-10 research criteria for neurasthenia,[17] which excludes cases meeting criteria for specific mood, panic, or generalised anxiety disorders. Data were gathered during 4 years (2001–05), and the sampling procedures used across the five research sites had minor variations. However, the diagnostic procedures were identical, participation rates were high, inter-rater reliability was excellent, and (with the possible exception of alcohol use disorders[18,19]) evidence did not suggest rapid changes in the prevalence of mental disorders during the 4 years so these differences were not expected to have a major effect on the reported results. Practical considerations—the short time spent at each primary sampling site—reduced the time interval for assessment of inter-rater reliability of the SCID and, thus, might have increased our estimates of reliability.

DSM-IV diagnostic categories and criteria are widely used in clinical and research work in China but culture-specific ways of experiencing and manifesting psychological symptoms might make these categories and criteria less valid in China than in other countries. In our study, we minimised this potential problem by using a semistructured interview administered by clinicians (who were familiar with the local cultural context), allowing the questions to be rephrased and the use of

NOS categories. The high proportion of all anxiety disorders in the NOS category suggested that clinicians' follow-up questions for anxiety disorders (used if the respondent did not fully understand the standard SCID questions) were not as effective as those for mood disorders, possibly because clinicians in China have less experience with patients suffering from anxiety disorders. Further refinement of the follow-up questions might reduce the prevalence of the anxiety NOS category and result in increased rates of specific anxiety disorders. The small difference between point prevalence and lifetime prevalence of any mental disorder (17% *vs* 20%) might be because interviewers are less diligent in asking about previous conditions than they are about current conditions. Another possible explanation is that fear of stigmatisation might make Chinese individuals more likely than individuals from other cultures to deny (or forget) transient psychological conditions that happened in the past.

The prevalence of mental disorders in our study is similar to the 16·2% reported in a 2004 province-wide study in Hebei (n=20 716)[20] in which the methods used were identical to those in our study. The 1-month prevalence after exclusion of NOS diagnoses in our study is similar to the 15·4% reported in a US study[21] and to 13·2% reported in an Australian study,[22] but lower than the 1-year prevalence of 27% reported in a meta-analysis of European studies.[23] Prevalences in our study are substantially higher than those reported in other studies[24–28] done in China from 1982 to 2004 in which different methods were used and the reported overall prevalences of mental disorders were from 1·1% to 9·1%. We believe the main reasons for the higher rates in our study are use of a wide range of diagnoses (particularly the NOS diagnoses) and a psychiatrist-administered semistructured interview that allowed the standard SCID questions about symptoms to be rephrased if respondents were uncertain about the meaning of the initial question (which can happen when respondents with different educational levels and regional dialects are interviewed).

There are several reasons for inclusion of subsyndromal conditions and use of a semistructured format in epidemiological studies of mental disorders. Diagnosis made on the basis of a specific number or duration of symptoms and on the presence of associated functional impairment is often an artificial dichotomisation of continuous phenomena that is insensitive to variations in the psychosocial effects of symptoms. Many patients experience anxiety, dysphoria, and other negative emotional states as overlapping continua, and the distress and disability associated with symptoms depend on context, sex, and culture. Inclusion of NOS categories and use of flexible, semistructured questions about symptoms, distress, and disability make the development of a more nuanced definition of a case of mental illness possible. Mental disorders show substantial variation in intensity over time; inclusion of NOS categories identifies patients who have partly undergone remission and would otherwise be excluded. Without clear biological markers for mental disorders, diagnoses are made on the basis of information provided by the target individuals and their associates. Therefore highly structured questions might exclude individuals with debilitating conditions who—because of education, language, culture, or other reasons—experience or express negative states in non-traditional ways. In China, the addition of culturally sensitive questions substantially increases the reported prevalence of depression, and individuals with NOS subsyndromal depression have a greatly increased risk of suicide compared with those without any depressive symptoms.[29] In studies[30,31] done in other countries, subsyndromal symptoms predict onset of full-criteria disorders and early intervention can prevent the occurrence of the more serious full-criteria disorder. Exclusion of these individuals in epidemiological studies leads to an underestimation of the health burden due to neuropsychiatric conditions, and makes the assessment of the margins between health and illness, and between different classes of disorders, difficult. We believe our semistructured, clinician-administered interview with the inclusion of NOS categories generates more valid results than the highly structured, lay interviewer-administered method used in the WHO World Mental Health Survey,[28] but direct comparison trials of the two methods in different settings would be needed to test this hypothesis.

Several important differences between our findings and estimates used in the global burden of disease analysis for China[1] draw attention to the need for low-income and middle-income countries to recompute the disability-adjusted life years for neuropsychiatric conditions with detailed, up to date, country-specific epidemiological data. The prevalence of alcohol use disorders in our study is much higher than the 1990 prevalence estimate used in the global burden of disease study for individuals aged 18 years or older in China (5813 per 100 000 *vs* 660 per 100 000); this difference might indicate increasing rates of alcohol abuse in China as disposable income has increased with economic reforms.[18,19] The most common specific anxiety disorder (generalised anxiety disorder) in our study and the second most common specific mood disorder (dysthymia) were not included in the analysis of the global burden of disease. The 1-month prevalence of several other specific anxiety disorders (panic, post-traumatic stress, and obsessive-compulsive disorders) are much lower in our study than the point prevalence estimates used in the global burden of disease study, but the untreated disability weights for these disorders are substantially higher than the corresponding disability weights used in the analysis of global burden of disease (which are estimated using

person trade-off methods[2]). Perhaps only the severe forms meet full diagnostic criteria in China and the forms that are not severe are captured by the anxiety NOS category. The global burden of disease estimates for the treatment rates of schizophrenia, bipolar disorder, and obsessive-compulsive disorder in China (based on expert opinion[2]) are much lower than those reported in our study (30% *vs* 69%, 5% *vs* 19%, and 0 *vs* 21%, respectively). For almost all disorders, the disability weights of treated cases in our study are higher than those for untreated cases because patients with severe disorders are more likely to seek treatment; however, in the analysis of global burden of disease, lower disability weights are used for treated cases than for untreated cases when the disability-adjusted life years associated with each disorder are estimated.

Elucidation of the detailed epidemiology of mental disorders is only one component of the country-specific situation analysis that should precede the scale up of mental health services in low-income and middle-income countries recommended by international mental health advocates.[7] The low treatment rates for non-psychotic disorders identified in this study—which are common to most of these countries[6]—are the result of the interaction of several factors that can vary according to county, demographic group, and diagnosis: sufferers being unaware that the problem is an illness that can be treated; low perceived social or occupational disability associated with the condition (eg, alcohol abuse); unwillingness to seek help for psychological problems for fear of stigmatisation; perceived (or actual) ineffectiveness of available services; and inaccessibility of services due to cost, distance, or other factors. Scale-up of services without understanding and effectively addressing the many factors that restrict service use is unlikely to substantially improve mental health in low-income and middle-income countries.

Effective promotion of mental health in these countries also requires a detailed appreciation of the history of political, social, economic, and health system changes in the country or region.[32] Projection of our results to all of China suggests that 173 million adults in the country have a mental disorder and 158 million of these have never received any type of professional help for their condition. A major redistribution of societal and health resources is needed to address a problem of this size and will only happen with the active participation (or, at least, concordance) of powerful political, economic, social, and professional stakeholders in the community. Social changes over the past 25 years in China have gradually increased recognition of the importance of mental health, and the pronounced economic improvements in the country have made allocation of additional resources to mental health possible. But translation of this increased recognition into improved access, comprehensiveness, and quality of services for individuals who are mentally ill is a long-term process that will require resolution of several longstanding challenges, some of which are common across low-income and middle-income countries,[33] and some of which are unique to China (panel 2).

Contributors

MRP did the analysis. All authors participated in the preparation and discussions of the revisions of the report, and have seen and approved the final version of the report.

Conflicts of interest

We declare that we have no conflicts of interest.

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