

# Mental, neurological and substance abuse disorders: Strategies towards a systems approach

GURURAJ G. \*, GIRISH N. \*, ISAAC M.K. †

Mental health has gained recognition as a major public health problem only in recent years. The National Mental Health Programme (NMHP) is being expanded to 100 districts from the existing 27 districts. This study estimates the burden of mental disorders, identifies causal mechanisms and lists the possible intervention strategies.

Mental disorders constitute a wide spectrum ranging from mild anxiety states to very severe forms of behavioural and thought abnormalities. The causes of mental disorders are varied and complex in nature, and vary from condition to condition. Despite newer technological understanding, the enigma of the causation of mental disorders continues as a complex interaction of the brain, mind and milieu.

Although India has a vast network of community health

centres and primary health centres along with a rapidly growing private sector, there is a severe shortage of trained mental health professionals. Delivering cost-effective and meaningful mental health services in India requires reorientation and reorganization of existing health systems.

This report has been developed based on secondary data from available sources along with an in-depth review of existing databases in the Indian region. Only core disorders have been addressed in this report. The ICD-10 system of classification has been used. Suicide has not been included; it has been covered under the Injury Report of the Commission. Similarly, tobacco use is covered in a separate section of the report. Only epilepsy and dementia have been included under neurological disorders.

## PART I

### The burden and impact of mental disorders—the global scenario

Mental and behavioural disorders account for 12% of the global burden of disease. The WHO, in its *World Health Report 2001* has drawn attention to the fact that of the nearly 45 crore estimated to be suffering from mental and behavioural disorders globally, 'only a small minority' are adequately cared for. The spending in terms of the country's mental health budget does not exceed 1% of the total health expenditure. The global prevalence of mental and behavioural disorders among the adult population is estimated to be 10% and contributed to four of the ten leading causes of disability, with one in four families suffering the burden. Depression, anxiety and alcohol use were the commonest disorders in a primary care setting, contributing to nearly 20% of the caseload. It is estimated that by 2020, 15% of the disability-adjusted life-years (DALYs) lost would be due

to mental and behavioural disorders, up from 10% in 1990 and 12% in 2000 (for details about disability-adjusted life-years [DALYs], please visit [http://www.worldbank.org/html/extdr/hnp/hddflash/workp/wp\\_00068.html](http://www.worldbank.org/html/extdr/hnp/hddflash/workp/wp_00068.html)). The lifetime prevalence of developing one or more mental and behavioural disorders is estimated to be 25%. At the global level, considering the years lived with disability, unipolar depression stands out prominently. Putting together all neuropsychiatric conditions, the proportional contribution to the total years lived with disability was 23.7% (males: 24.2%, females: 24.9%). The burden is 40% if the most productive age group (15–44 years) is considered (WHO 2001). The poor, the homeless, the unemployed and persons with low education are at higher risk (Francisco 2004). Three areas of concern have been identified: (i) the real burden of mental and behavioural disorders, (ii) the human, social and economic costs of these, and (iii) the need for dismantling barriers in the provision of adequate services (WHO 2001).

---

Departments of Epidemiology\* and Psychiatry†  
National Institute of Mental Health and Neuro Sciences  
Bangalore 560029  
e-mail: guru@nimhans.kar.nic.in

## Measuring the burden of mental disorders

### Psychiatric epidemiology in India

Psychiatric epidemiology as a branch of psychiatry and public health investigates how mental disorders are distributed in the population and extends to identifying possible causes and measuring the impact of interventions. Dr Dube undertook the first major survey of psychiatric problems in 1961 at Agra, India (Dube 1970). This is considered a watershed event in the development of psychiatric epidemiology in India. The key feature of studies undertaken during 1960–80 was that they were descriptive, population-based studies of psychiatric morbidity in several parts of India. These studies dispelled several myths (Murthy 1987a). The studies undertaken in the late 1980s and during the 1990s focused on specific disorders in specific populations and in specific settings. There have been large-scale epidemiological studies in large populations on specific problems with methodological advancements focusing on issues of case definition, screening, diagnosis and classification (ICMR 1987, WHO and MOHFW 2003). Since the 1990s, the studies with their improved methodologies focused on new and emerging problems. This period saw a greater need for organizing services across the country and also established the incidence, course and outcome of schizophrenia as well as evaluation of interventions in mental health care. ‘... the period between 1950 and 2000 has witnessed tremendous growth of the discipline (psychiatric epidemiology) across the country with studies getting more and more refined and advancing clearly’ (Gururaj *et al.* 2004). The recent publication *Mental Health—an Indian perspective 1946 to 2003* provides an overview of the major developments in post-Independent India (Agarwal 2004). Indian psychiatric epidemiological studies (focusing on all mental disorders) can be broadly classified as cross-sectional studies, interval studies, longitudinal studies, studies adopting the case-control approach, systematic reviews and meta-analysis (only one).

### Total prevalence of major mental disorders

Several policy-making bodies in India have arrived at an estimate of their own, the precise basis of which is not clearly known. As early as 1911, Overbeck and Wright estimated the prevalence to be 26–28/1000 for the Indian population. Subsequently, the mental health advisory committee of India estimated the prevalence to be 2% of the total population (Chandrashekar and Isaac 1999).

Following the path-breaking effort by Dube in Agra, the majority of the classical Indian psychiatric epidemiology studies in the past four decades focused on general psychiatric morbidity in small-to-medium populations. The population samples were more often convenient samples. Chandrashekar and Isaac (1999) reviewing these studies reveal the wide variation in prevalence rates; ranging from 10–370/1000

population in different parts of the country. The reasons for this wide variation are several: factors such as selection of the study population (urban/rural/tribal); choice of method (door-to-door or hospital-based, two- or three-stage survey); case identification methods (layperson, trained health personnel, clinical psychologist, psychiatrist); different screening instruments (symptom checklists with different numbers; use of different standardized survey instruments; questionnaires; interview schedules [both structured and unstructured]); case ascertainment methods (use of different gold standards); different and unspecified case definitions and use of inappropriate statistical procedures. The individual studies along with select details are listed in Appendix 1.

Two recent studies have attempted to generate all-India prevalence rates. Reddy and Chandrashekar (1998) in a meta-analysis reported the total prevalence to be 58/1000 (confidence interval [CI] 55.7–60.7) with 48.9/1000 for the rural population and 80.6/1000 for the urban population. Ganguli (2000), reviewing major Indian studies, computed the total rate to be 73/1000 (range: 18–207). These studies utilized different inclusion and exclusion criteria and hence the number and type of studies included are not the same. Reddy and Chandrashekar (1998) reanalysed the original numbers from community-based studies undertaken as a door-to-door survey. A major limitation with this study is that different study designs with differing instruments were included. Ganguli (2000), computing the prevalence rates from region-representative major Indian studies, however, does not provide the basis for the computation. The two studies thus provide two different all-India prevalence rates (58/1000 population and 73/1000 population). This difference persists with the rural and urban rates. The difference in the rural-urban rates stands out prominently in the meta-analysis.

The prevalence rates (Appendix 1) across the regions of the north and east are similar, as are the rates in the south and west of India. Though the combined rates for the south are not available, they could be inferred from the individual urban and rural rates.

The only available longitudinal study (for all disorders) is over a one-year period (Nandi *et al.* 1976). This is thoroughly inadequate to document a change in mental morbidity. In such a situation, interval studies provide us with some insights with respect to the changing trend of the burden. Nandi *et al.* observed that there was no significant increase in the prevalence of total mental morbidity during 1972–1982 (Nandi *et al.* 1986) or 1972–1992 (Nandi *et al.* 2000). It was either decreasing or was ‘stable’. Raghurami Reddy observed that there was no change in the total prevalence rate (Reddy *et al.* 1994). The worst-case scenario in this case would be assuming stable rates or a near-constant prevalence rate over the period of time. This finding is further corroborated when the trends of individual disorders such as schizophrenia also report static prevalence rates (Murthy 1999). Thus, it could be summarized that: despite a near-static prevalence rate over a period of time, the

number of people requiring mental health care would increase with a corresponding increase in the population.

Interestingly, Ganguli (2000) found a minor difference between overall rural and urban rates. When comparing the three sets of paired studies, it was observed that urban rates increased by a factor of 1.6 (range: 1.4–1.9), which implies that for every 100 rural persons with any mental disorder, there are 157 urban persons with a mental disorder. However, after computation, the difference in the final rates for rural and urban areas was 3.5 per 1000 population. Contrary to the above line of thinking by Ganguli, in the meta-analysis, the rural–urban differences noted by Reddy and Chandrashekar (1998) are striking, to the extent that urban rates (79.1/1000) are twice that of rural rates (37.1/1000 population).

In summary, the range of prevalence rates for major mental disorders from the available epidemiological literature is very wide. While extrapolating from one good study is inappropriate for deriving national estimates, pooling from a few incomparable studies is also incorrect. Hence, for purposes of estimating the number of persons with any mental and behavioural disorder in India, a median conservative estimate of 65/1000 population has been utilized. This estimate is the median value derived from the two studies of Reddy *et al.* (1998) and Ganguli (2000). Rates are higher in females by approximately 20%–25%. The overall individual burden for urban and rural areas cannot be estimated with the available studies. However, it may be surmised that the number of people affected with any mental and behavioural disorder from rural areas would be higher, corresponding to the proportion of the population living in these areas. Better estimates for age, sex and place of residence may be made after completion of the ongoing Indian component of the World Mental Health Survey (WHO and MOHFW 2003).

## Schizophrenia

Schizophrenia has been recorded in Indian history nearly 3300 years back by Charaka (Rajkumar 1987). The major studies pertaining to schizophrenia from India are the International Pilot Study of Schizophrenia and Determinants on the outcome of severe mental disorders in India (WHO 1975; Jablensky 1995). The first large-scale study on prevalence and service evaluation was undertaken by ICMR–DST in four centres of India—Bangalore, Baroda, Calcutta and Patiala (ICMR 1987). More recently, longitudinal studies and those investigating the course and outcome have been undertaken in the country (ICMR–SOFACOS 1988; ICMR–SOFPU 1990).

### Prevalence

Beginning with the first epidemiological study by Govindaswamy during 1958–59 (Govindaswamy *et al.* 1959), several researchers have examined the prevalence

and sociodemographic correlates of schizophrenia. The prevalence (Table 1) varied from 1.1 to 4.3 for schizophrenia in particular. The Chennai study, covering a large population of 101,229, observed the prevalence to be 2.5/1000 (Padmavathi *et al.* 1987). From an all-India perspective, the ICMR multicentre study (ICMR 1987) undertaken across four different regions of the India provides better methodological and research vigour (combined methods of case identification). The prevalence rate for schizophrenia varied from 1.8/1000 in Bangalore to 3.1/1000 in Patiala. The meta-analysis by Reddy and Chandrashekar (1998) estimated the prevalence of schizophrenia to be 2.7 (2.2–3.3)/1000 population, while Ganguli computed the prevalence to be 2.5 (1.1–14.2)/1000 population (Ganguli 2000). Against this backdrop, a rate of 3/1000 has been taken as the all-India prevalence of schizophrenia, the range being 2–3/1000 population.

The evidence for the prevalence in urban and rural areas is contrasting. The meta-analysis reports an urban preponderance (U: 2.9, R: 2.6 per 1000 population) while the systematic analysis reports a rural dominance (R: 3.6, U: 2.5 per 1000 population). The age–sex distribution reveals that men are affected more often compared with women. Rates ranging from 2.3 to 21.3 have been reported in males. Elnagar *et al.* (1971) observed higher rates among women (5.8). The pooled study indicates higher rates among women (3.2 as compared to 2.3 among men).

### Incidence

The incidence of schizophrenia was estimated to be 4.6/10,000 population in urban and rural parts of Chandigarh (Wig *et al.* 1993). Nandi *et al.* (1976) noticed an incidence rate of 9.3/10,000 and Rajkumar *et al.* (1993) a rate of 3.5/10,000. Wig *et al.* (1993) found the highest incidence among rural males and females in the age group of 50–54 years. A crude incidence rate of 4/10,000 can be adopted for estimating the burden of schizophrenia in India.

### Course and outcome

Under the aegis of the International Pilot Study of Schizophrenia, Dube *et al.* (1984) reported that 56% of the cases initially included were normal at the end of two years and the proportion rose to 67% over the 5 years of follow-up. At the end of the 13-year follow-up, 13% continued to suffer from the disease without remission. They conclude that the 'prospect of recovery is not as bleak as is generally believed'. In addition, they reported a higher mortality rate and also found that it was due to suicide alone. In the full version of the study, the International Study of Schizophrenia, Harrison *et al.* (2001) reported that a more favourable long-term outcome was achieved across the countries in a significant proportion and conclude that 'early intervention' programmes should be initiated to achieve the desirable objectives. Sharma *et al.* (1998) and Thara (2004b) reported

**Table 1.** Prevalence rates of schizophrenia in Indian studies

Author and year	Place	Sample size	Crude rate per 1000 population
<b>All India</b>			
Reddy and Chandrashekar 1998	Combined	33,572	2.7 (R-2.6, U-2.9)
Ganguli 2000	Combined	NA	2.5 (R-3.6, U-2.5)
<b>East</b>			
Nandi <i>et al.</i> 1992	Combined	1,424	1.5 (M-0; F-3.1)
Elnagar <i>et al.</i> 1971	Rural	1,383	4.33 (M-2.7 ; F-5.8)
Nandi <i>et al.</i> 1975	Rural	1,060	2.8
ICMR (Calcutta) 1987	Rural	34,582	2.05
Nandi <i>et al.</i> 2000	Rural	3,488	3.0
Nandi <i>et al.</i> 2000	Rural	2,183	4.0
<b>North</b>			
Dube 1970	Combined	29,468	2.17 (M-2.4; F-1.9)
Thacore <i>et al.</i> 1975	Urban	2,696	1.9
Sethi <i>et al.</i> 1972	Rural	2,691	1.1
Murthy <i>et al.</i> 1978	Rural	2,500	2.0
Sachdeva <i>et al.</i> 1986	Rural	1,989	2.0 (M-2; F-2)
ICMR (Patiala) 1987	Rural	36,595	3.09
<b>South</b>			
Vergheese <i>et al.</i> 1973	Rural	26,039	2.6
Mehta <i>et al.</i> 1985	Rural	5,941	1.9 (M-2; F-1.7)
ICMR (Bangalore) 1987	Rural	35,548	1.83
Gopinath 1968	Rural	423	7.1
Shaji <i>et al.</i> 1995	Rural	1,094	3.6 (M-3, F-4)
Surya <i>et al.</i> 1962	Urban	2,731	1.5
Premarajan <i>et al.</i> 1993	Urban	1,115	2.5 (M-0; F-5.2)
Padmavathi <i>et al.</i> 1987	Urban	101,229	2.5 (M-2.9; F-2.1)
Vimala <i>et al.</i> 1998	Rural	32,000	1.9 (M-2; F-3)
<b>West</b>			
Shah <i>et al.</i> 1980	Urban	2,712	1.5
ICMR (Baroda rate) 1987	Rural	39,655	1.77
Sharma <i>et al.</i> 2001	Combined	4,022	14.2 (M-21.3; F-7.3)

Note: The male- and female-specific rates are given in brackets

that schizophrenics from India stand a better chance of recovery as they are 'more socially integrated'. Though studies from India have demonstrated that the course of the illness was more favourable, with a short duration of illness indicating better prognosis, the major problem is the huge treatment gap. In the *Country Report on Schizophrenia*, Murthy (1999) reviewed the burden of schizophrenia and observed that males were more disabled than females, drug compliance was significantly associated with all aspects of disability, home care was better than hospital care in reducing the burden and the quality of life was better among those who were employed and literate. Further, the urban population perceived a higher burden, and the major needs of patients and families were employment and vocational rehabilitation, while psychosocial rehabilitation and accommodation were a lesser priority.

Thara and Srinivasan (1998) examined the impact of medication alone and a combination of medication and psychosocial intervention on schizophrenics with moderate disability. They concluded in their one-year study that along with medication, psychosocial intervention brought about a significant improvement in work-related areas, under-

activity, social withdrawal and participation in family life. Gururaj and Isaac (2004) observe that the better course and outcome of schizophrenia in the Indian region can be attributed to several factors such as low expressed emotions among relatives, greater tolerance, better quality of social support and lower expectations from patients. High attrition rates, related partly to greater mortality among schizophrenics, pose difficulty in inferring favourable outcomes. In addition, unlike in developed countries, multiple sources of care (psychiatric pluralism) in developing countries such as India is said to contribute to better outcomes (Halliburton 2004).

## Mood disorders

ICD-10 classifies mood disorders into: manic episode, depressive episode, bipolar disorder, recurrent depressive disorder, persistent mood disorder and other mood disorder. In earlier classificatory systems and in different epidemiological studies, bipolar affective disorder and manic episode were distinctly clubbed together as against depressive disorder.

This differential classification is the basis for many

uncertainties in rates in reviews of past epidemiological studies. For example, unipolar depression or depressive episode is known to be the fourth-leading cause of the global DALYs lost in all ages and both sexes for the year 1998 (WHO 2001). Earlier studies report lower prevalence rates. The key reasons were underreporting of the episodes of depression, focus on priority mental disorders (which did not include depression), the different 'screening' instruments used, selective reporting of manic psychoses, sociocultural context of reporting mild to even moderate depressive episodes. A review of the available epidemiological studies related to mood disorders has to contend with these differing observations. To maintain uniformity, the prevalence of all types of mood disorders have been combined and include mania, manic depression and depression.

The different community-based studies on mood disorders are given in Table 2. The prevalence rate of mood disorders varies from study to study, region to region and from author to author. The crude prevalence rates per 1000 population vary from as low as 0.5 to as high as 78 in different studies

across regions, with different rates being reported by various authors. Studies from northern India reveal that the combined rates vary from 1.3 to 4.7, while rural and urban rates vary from 1.5 to 13, and 1.9 to 6.1/1000, respectively. The southern region reports rural rates of 0.5–3 and an urban rate of 20. The eastern parts of India report the highest rate; the rural rates being in the range of 2.9–78 and the urban rate being 43. The reasons for these variations are not clear. On a national basis, Ganguli (2000) computes the rural and urban rates to be 34/1000 and 37/1000, respectively, while Reddy and Chandrashekar (1998) estimate it to be 11/1000 and 18/1000, respectively.

The incidence study of depression by Nandi *et al.* (1976) undertaken in a rural area between 1972 and 1973 estimated the rates to be 4.63/1000 population. The same authors reporting in 1986 reveal that nearly 5% of the healthy cohort of 1972 had developed depression in the 10-year interval and the difference between the overall prevalence rates in the 10-year interval was greater in 1982 (37.7 in 1972 and 53.3 in 1982), greater by a factor of 1.5 in 1972

**Table 2.** Crude prevalence rates and gender-specific rates of mood disorders

Author and year	Place	Sample	Crude rate/1000	Rates in males	Rates in females
Reddy and Chandrashekar 1998	All India	NA	12.3 (Urban: 17.9; Rural: 11)	9.1	15.6
Ganguli 2000	All India	NA	34 (Urban: 37, Rural: 34)	NM	NM
<b>East</b>					
Nandi <i>et al.</i> 1992	West Bengal (combined)	1,424	21	26	43
Elnagar <i>et al.</i> 1971	West Bengal (rural)	1,383	2.9	1.4	4.4
Nandi <i>et al.</i> 1975	West Bengal (rural)	1,060	37.74	18	22
Nandi <i>et al.</i> 1978	West Bengal (rural)	1,259	25.4	16.8	34.8
Nandi <i>et al.</i> 1979	West Bengal (rural)	3,718	37.4	24.8	50.5
ICMR 1987	Calcutta (rural)	34,582	3.9	NM	NM
Nandi <i>et al.</i> 1992	West Bengal (rural)	653	25	12	38
Nandi <i>et al.</i> 2000	West Bengal (rural)	3,488	78	NM	NM
Nandi <i>et al.</i> 2000	West Bengal (rural)	2,183	51	NM	NM
Banerjee <i>et al.</i> 1986	West Bengal (urban)	771	42.8	38.55	47.12
<b>North</b>					
Sethi and Gupta 1970	Lucknow (combined)	8,583	4.7 (Urban: 6.1, Rural: 1.5)	NM	NM
Dube 1970	Agra (combined)	29,468	1.26	1	1.56
Sachdeva <i>et al.</i> 1986	Faridkot, Haryana (rural)	1,989	13	15	12
ICMR 1987	Patiala (rural)	36,595	5.5	NM	NM
Thacore <i>et al.</i> 1975	Lucknow (urban)	2,696	1.9	NM	NM
<b>South</b>					
Mehta <i>et al.</i> 1985	Vellore (rural)	5,941	1.5	0.3	2.7
ICMR 1987	Bangalore (rural)	35,548	1.35	NM	NM
Shaji <i>et al.</i> 1995	Kerala (rural)	1,094	3	2	4
Verghese <i>et al.</i> 1973	Vellore (urban)	26,039	0.5	NM	NM
Premarajan <i>et al.</i> 1993	Pondicherry (urban)	1,115	20.2	4.9	36.4
<b>West</b>					
Sharma <i>et al.</i> 2001	Goa (combined)	4,022	12.4	15.9	9.3
ICMR 1987	Baroda (rural)	39,655	0.9	NM	NM
Shah <i>et al.</i> 1980	Ahmedabad (urban)	2,712	14.8	NM	NM

NM: not mentioned

and 53.3 in 1982 (Nandi *et al.* 1986). The rate in 1992 in the same population was estimated to be 74/1000 (Nandi *et al.* 2000). This definite increase in the occurrence of mood disorders is evident and should be considered for the larger implications of planning service delivery.

The rates of mood disorders were higher in urban areas compared with rural areas (18 v. 11) as reported by Reddy and Chandrashekar (1998). Higher rates were also noticed for individual disorders of mania, manic depression and depression. The highest differences were noticed for depression. The sex differences indicate higher rates among women (16 v. 9) with a ratio of 2:1. Similar observations are noticed for manic depression and depression, with opposite results for mania (1.2 v. 0.1). Studying postpartum depression in rural Vellore, Chandran *et al.* (2002) report the incidence to be 11%.

Health facility-based studies have been undertaken in different settings which include primary health centre, tertiary teaching hospital, private psychiatric clinic or psychiatric outpatient department. The proportion of cases range from 20% to 43% of all cases seen. Thus, it could be said nearly one-third of the patients seeking help from a health care facility have depressive symptoms (Gururaj *et al.* 2005). However, it may be noted that depressive symptoms are routinely not enquired about by the treating/managing professional. These missed opportunities are of greater significance with respect to depression as a whole. Patel *et al.* (2002); emphasizing the need for integrating the mental health components into the ongoing maternal and child health services, in their prospective study examined 270 mothers, 6–8 weeks after delivery and found that 23% fulfilled the criteria for postnatal depression. Further, 22% of them continued to have depressive symptoms at the end of 6 months; 8% had developed depression during the puerperium. Overall, 14% of the study group continued to have symptoms of chronic depression till 6 months after delivery.

### Common mental disorders

Common mental disorders (CMDs) are a functional clinical classification of the group of disorders that describe the 'deeper psychological distress states' of an individual. They include anxiety disorders, somatoform disorders, dissociative disorders, phobia and depression. The classification of CMDs for primary health care according to ICD-10 includes depression, phobic disorder, panic disorder, generalized anxiety, mixed anxiety and depression, adjustment disorder, dissociative disorder, unexplained somatic symptoms, neurasthenia and sleep problems. The patients usually present with clearly defined symptoms or somatic complaints: 'some patients may admit to having emotional symptoms' (Patel *et al.* 1998).

The occurrence of CMD has ranged between 13% and 50% in primary care settings to as high as 49% to 57% in

**Table 3.** Common mental disorders in Indian studies

Author and year	Remarks
Harding <i>et al.</i> 1980	12.7% of patients in a primary care setting in India
Bagadia <i>et al.</i> 1985	57% scored high on GHQ in hospital OPD
Shyamsundar <i>et al.</i> 1986	36% among general practitioners
Sen 1987	50% in 3 PHC outpatient departments
Bhatia <i>et al.</i> 1989	49% neurotic in surgical OPD
Puri 1995	22% complained of depressed mood from 100 diagnosed depressives
Kishore <i>et al.</i> 1996	42% in a PHC in Haryana
Patel 1998	47% of the 97% with somatic complaints had biomedically defined CMD
Amin <i>et al.</i> 1998	21% depressives in a health clinic
Nambi <i>et al.</i> 2002	44% among those who had unexplained somatic symptoms
Pothen <i>et al.</i> 2003	34% in the primary care system
Gururaj <i>et al.</i> 2004	Overall prevalence 13% in the community study of 10,168 individuals

GHQ: General Health Questionnaire; OPD: outpatient department; PHC: primary health centre

hospital settings (Table 3). Patel *et al.* (1998) report that among 97% of the subjects presenting with a somatic complaint, 46.5% of them had a biomedically defined CMD; of these, 51% attributed it to a psychological illness. WHO estimated a global point prevalence of unipolar depression to be 1.9% among men and 3.2% among women (WHO 2001). Reddy and Chandrashekar (1998) estimated the overall prevalence of neuroses to be 0.69%. As a group, CMDs range between 12.7% and 57% of outpatient attendance. Considering these data, a conservative estimate of 2% is considered for purposes of calculating the burden.

### Substance abuse

#### Alcohol

The use of psychotropic substances, especially alcohol, has been the focus of sanction or otherwise in different cultures and has also varied over a period of time. The Vedic scriptures of Indian origin have documented the use of *soma-sura* (intoxicating beverages) as early as 2000–800 BC in India. Even the ancient Indian texts of Charaka and Sushruta (around AD 300) make distinctions between normal and excessive drinking. These texts and scriptures also identified the harmful effects of drinking (Isaac 1998). Alcohol was referred to as an evil, yet 'glamorized and accepted' by certain classes. The market-oriented policies of successive governments pertaining to production–distribution–availability, including permitting advertisements of alcohol have been implicated in greater use of alcohol in Indian communities (Lal and Singh 1978, Benegal *et al.* 2000).

During the past two decades, alcohol-related psychiatric problems have been studied in psychiatric morbidity surveys in general and specific populations. The findings from various

**Table 4.** Community-based studies of alcohol use

Author and year	Place	Sample size	Screening instrument	Crude rate per 1000	Remarks: Focus of enquiry on
Gopinath 1968	Rural community	423	Survey questionnaire	2.36	Alcoholism
Elnagar <i>et al.</i> 1971	Rural community	1,383	3-stage survey	10.84	Alcohol and drug addiction
Verghese <i>et al.</i> 1973	Urban community	2,904	Mental health item sheet	4.8	Chronic alcoholism
Thacore 1975	Urban community	2,696	Prepared schedule	19	Habitual excessive drinking
Lal <i>et al.</i> 1978	Urban community	6,699	QFI		Alcohol users
Mohan <i>et al.</i> 2001	Urban community	6,004	Structured questionnaire	30	
Ponnudrai <i>et al.</i> 1991	Urban community	2,334	MAST		Suffering from alcoholism
Premarajan 1993	Urban community	1,115	IPSS	34.5	Alcohol dependence
				(M-66%)	
Hazarika <i>et al.</i> 2000	Urban community	312	Not mentioned	365	Alcohol users
				(M-40%, F-33%)	
Sharma <i>et al.</i> 2001	Urban community	4,022	RPES	1	Alcohol dependence
Meena <i>et al.</i> 2002	Urban community	142,000	WHO questionnaire	198	Alcohol users
Mohan <i>et al.</i> 2002*	Urban community	10,312	Structured questionnaire	59	Alcohol users
Chaturvedi <i>et al.</i> 2004	Urban community	5,135	Pretested questionnaire	300	Substance abuse
Varma <i>et al.</i> 1980	Urban + rural community	1,031	Structured questionnaire	237	Alcohol users
				(M-41%)	
Gururaj <i>et al.</i> 2004a	Rural, semi-rural, slum and urban community	10,168	Structured questionnaire	90	Alcohol users
Adityanjee <i>et al.</i> 1989	Urban hospital	352	MAST, CAGE	3	Alcohol-related problems
Satija <i>et al.</i> 1997	Urban hospital	349	ASI, MAST and AUDIT	146	Alcohol users
Vohra <i>et al.</i> 2003	Urban hospital	30	SCID	117	Alcohol dependence

\*This is an incidence study and the rates are incidence rates, all other rates are prevalence rates

studies (Table 4) reveal that the reported prevalence of alcoholism varies widely, ranging between 1 and 550/1000, and is dependent on the definition adopted and/or screening instrument used. Bang and Bang (1991) in 104 villages of the Gadchiroli district of Maharashtra, observed that nearly 100,000 men consumed alcohol, of whom one-fifth were addicts.

The head of the household survey undertaken by Mohan *et al.* (1992) in Delhi is more robust when compared with other epidemiological studies. The study reported that 26% of residents in urban slums were substance abusers, the majority involving alcohol. In a recent survey of 32,400 people in and around Bangalore, 1.2% of men were found to suffer from alcohol dependence syndrome (ICMR-CAR-CMH 1990). The meta-analysis by Reddy and Chandrashekar (1998) revealed an overall prevalence of 6.9/1000 for India with urban and rural rates of 5.8 and 7.3/1000 population. The rates among men and women were 11.9 and 1.7, respectively. In a community-based study (Gururaj *et al.* 2004) in 4 areas—rural, semi-rural, slum and urban—habitual alcohol users accounted for 9%. Specific population surveys of alcohol use that have been carried out in India include populations such as school students, industrial workers and medical personnel, and ranged between 10% and 60% (Gururaj *et al.* 2005).

Gururaj and Isaac (2004) observe that 'in accordance with the growth of consumption of alcohol all over the country, the hospital admission rates due to the adverse effects of alcohol consumption are also increasing. Several

studies indicate that nearly 20%–30% of hospital admissions are due to alcohol-related problems (direct or indirect) in health care settings'. An estimate by Anand (2000) placed the burden due to alcohol as the 'numero uno' among all non-communicable disorders. The estimate of the numbers who consume alcohol in the country was 8.9 crore with an assumption that 17% of males use alcohol and 0.85% of them are dependent on it. The prevalence of alcohol use among women was estimated to be 0.5%.

The masking of the societal and family impact of alcohol use is obvious in earlier studies. Long-term alcohol consumption is linked to a wide variety of social (family disruption, marital disharmony, impact on children, deprivation of the family, work absenteeism, growing rates of crime and violence, etc.) and health (cirrhosis of the liver, road traffic injuries, suicides, etc.) problems. The immediate effects of alcohol consumption include greater incidence of injuries to self and also to others (WHO 2003). In a comparison study of alcohol users versus non-users (Gururaj *et al.* 2004), it was observed that for an alcohol user, the health status of the family and self is worse, they sustain more injuries and inflict more harm to themselves, beat and abuse the wife-children-parents, have a disastrous family life, they are found deficient in managing financial resources (both personal and family), have greater problems in the workplace and face increasing psychological problems. It is suggested that the prevalence rates of alcohol use be utilized for purposes of arriving at the burden.

## Drug abuse

Channabasavanna (1989), reviewing the use of drugs in India, lists nine groups of drugs being used in India (*Cannabis* and its products; tranquilizers [hypnotics and sedatives]; barbiturates; amphetamines; hallucinogens; other narcotic drugs like opium, pethidine, morphine, heroin and cocaine; tobacco; alcohol and pain killers). In the earliest available epidemiological study, Elnager *et al.* (1971) reported the prevalence of drug abuse to be 2/1000. Several studies, while evaluating drug abuse, revealed the rates to vary from 1% to 52% based on different methodologies. Ahmed and Sen (1998), using the WHO questionnaire, arrived at a prevalence rate of 52% in Delhi, using DSM-III-R as the diagnostic instrument, Mohan *et al.* (2002), Satija *et al.* (1997) reported prevalence rates of 3% and 27% among the Delhi urban community and Jaipur industrial workers, respectively.

The United Nations office on drugs and crime and the Ministry of Social Justice and Empowerment, Government of India, 2004 has recently completed a report of the extent, pattern and trends of drug abuse in India. Triangulating the different methodologies, the study has attempted to provide a realistic picture of the extent, pattern and trends of drug abuse in the country. Four different approaches have been utilized: National Household Survey (two-stage stratified random sample through probability proportional to size), Rapid Assessment Survey of Drug abuse (the non-random sample, key informant interviews and focus group discussions), Drug Abuse Monitoring Systems (DAMS) and focused thematic discussions. According to the national household survey, the current one-month period use for alcohol, cannabis and opiates were 21.4%, 3%, and 0.7%, respectively. Other drug abuse was reported by 3.7%. Applying the prevalence estimates to the population figures of 2001, the report estimates and projects that there are 6.25 crore alcohol users, 87 lakh cannabis users and 20 lakh opiate users in the country. These numbers, when applied to the total Indian population of 102.7 crore of 2001, provide prevalence rates of 60/1000, 8/1000 and 2/1000 population, respectively. Dependent users were 17% for alcohol, 26% for cannabis and 22% for opiates. The rate from this methodologically better study has been used to arrive at the national burden.

## Child and adolescent mental health problems

Children and adolescents form nearly 37% of the total population of India (Census 2001: <http://censusindia.net>). The entire gamut of childhood and adolescent disorders can be broadly grouped into two: (i) Mental retardation (disorders of psychological development), and (ii) behavioural and emotional disorders, with the onset in childhood and adolescence. The available general community surveys have not utilized the necessary specific tools for addressing the disorders of children and adolescents. The specific surveys

for childhood have used different instruments, which makes it difficult to compare them. Adding to the problems in these surveys are the different age groups covered, differing sizes of the population and the setting of the study—urban, rural, combined. School-based studies do not provide true prevalence rates as the denominator is difficult to define. In addition, school-based studies obviously do not cover 'out-of-school' children. The result is that the morbidity among this group is left untouched. Because of the huge school drop-out rates in primary school (Government of India 2004), the estimates from school-based surveys reflect only a portion of the total burden of mental and behavioural disorders in all children. Despite this, these estimates would provide 'guidelines for planning both community- and school-based services'.

## Mental retardation

Mental retardation (MR) has been defined as the 'sub-average general intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behaviour'. It can be defined in combination or in isolation with measurement of intelligence, neurological functioning, social adaptation and behavioural competence (Kiely 1987). From a public health point of view, the continued occurrence of mental retardation due to a potentially preventable cause such as iodine deficiency disorder reflects the extent of impact of the ongoing programme. Early and appropriate planned comprehensive interventions in this group is the need of the hour.

Most of the Indian epidemiological studies have included MR in their ambit (Table 5). A review of Indian studies on mental retardation by Prabhu (1987) revealed that the prevalence rates vary from 0.22 to 32.7/1000 population. Madhavan (1987), in a collective review, found the rates to vary from 3.4/1000 to 30/1000 in India. Gupta and Sethi (1970) in a population-based survey in Uttar Pradesh reported a prevalence of 2.1% among 500 rural and 1000 urban households surveyed. Severe MR was present in 1.5%. Specific surveys in schoolgoing children have shown a prevalence of 2.91–20.6/1000 (Bhola and Kapur 2003). Reddy and Chandrashekar (1998) established a weighted prevalence rate of 6.9/1000 based on a meta-analytical approach, with a higher occurrence among males. The urban and rural rates were found to be 8.9 and 6.4/1000, respectively. Ganguli (2000) in a review of 10 studies observed a prevalence rate of 3.7 and 9/1000, respectively. Srinath and Girimaji (1999) in a review of child and adolescent mental health problems in India conclude that 2% and 0.5% of children in India suffer from mild and severe forms of MR, respectively. The National Sample Survey Organization in its 58th round estimated that there are nearly 10 lakh children who are disabled due to MR (NSSO 2003). Despite the fact that the Survey may have picked up only the moderate–severe forms of the disorder, these pan-country authoritative

**Table 5.** Community-based studies reporting mental retardation (combined, rural and urban)

Author and year	Place	Sample size	Crude rate/1000
Prabhu <i>et al.</i> 1985	Review	Not applicable	(2 crore)
Ganguli 2000	Combined	Not applicable	5.3
Reddy and Chandra-shekar 1998	Meta-analysis	33,572	6.9
Gupta <i>et al.</i> 1970	Combined	1,500	23.3
Gupta and Sethi 1970	Combined	8,583	23.3
Dube 1970	Combined	29,468	3.7
Verghese <i>et al.</i> 1973	Combined	26,039	3.2
Surya <i>et al.</i> 1962	Urban	2,731	0.07
Thacore <i>et al.</i> 1975	Urban	2,696	14
Shah <i>et al.</i> 1980	Urban	2,712	1.8
Banerjee 1986	Urban	771	2.59
Gopinath 1968	Urban	423	4.72
Premarajan <i>et al.</i> 1993	Urban	1,115	18.3
Elnagar <i>et al.</i> 1971	Rural	1,383	1.4
Nandi <i>et al.</i> 1973	Rural	2,250	8.1
Nandi <i>et al.</i> 1975	Rural	1,060	2.83
Murthy <i>et al.</i> 1978	Rural	2,500	0.28
Nandi <i>et al.</i> 1979	Rural	3,718	7
Naryanan 1981	Rural	6,708	78.4
Subrahmanya 1983	Rural	1,498	27.4
Mehta <i>et al.</i> 1985	Rural	5,941	3.2
Sachdev <i>et al.</i> 1986	Rural	1,989	2.51
Shaji 1995	Rural	1,094	2.84
Nandi <i>et al.</i> 2000	Rural (1992)	3,488	12.33
Nandi <i>et al.</i> 2000	Rural (1972)	2,183	8.7

estimates spell out greater numbers than the guesstimates relied on earlier.

### Child and adolescent mental health problems

Several population-based/hospital-based/specific children-based epidemiological studies have been completed in India (excluding MR). Bhola and Kapur (2003) in their review identified and listed 55 epidemiological studies (both community-based and school-based) during the period 1964–2002. Compared to adult epidemiological surveys, studies on children are much more difficult due to problems in definition of deviance, emotion and perception, understanding disability by parents, teachers and interviewers, and measurement issues.

Reviewing the studies on mental health problems in children, Kapur (1993) observed that community surveys identified only severe problems such as enuresis, stuttering, sleep disorders, MR and epilepsy. The prevalence of child

mental health problems from earlier studies in different populations varied from 7 to 172/1000 children (Seshadri 1993). Srinath and Girimaji (1999) in their review on childhood psychiatric and emotional problems report that the prevalence ranges from 25 to 356/1000 in field studies. Bhola and Kapur (2003), however, note the range to be 5/1000 to 294/1000. Mental retardation, epilepsy and enuresis are reported as highly prevalent disorders in community-based studies. The 23 school-based studies listed during the period 1978–2002 identified enuresis, MR, conduct disorders and attention deficit hyperactivity disorder (ADHD) as being the most prevalent. In general, it has been realized that schoolgoing children report higher psychological disturbances; urban children report more problems compared to rural children; boys report more problems than girls. Scholastic backwardness has been a major problem in the Indian region. It was thus concluded that scholastic and learning-related problems of children need to be examined simultaneously with mental health problems.

To overcome the lacunae arising from methodological issues, the Indian Council of Medical Research (ICMR) undertook a study in Bangalore and Lucknow during 1997 (ICMR 2001). Adopting a two-stage survey and using standardized instruments for different age groups (Child behavior check list; Rutter teacher's questionnaire; Diagnostic interview schedule for parents and teachers (DISC); Parents interview schedule; Children's global assessment scale; Intelligence assessment; Assessment of felt treatment needs; Physical examination), the prevalence of child and adolescent disorders in this study was observed to be 12.8% in 1–16-year-old children. These recent figures from ICMR of 128/1000 have been taken to be the prevalence estimates for child mental health care services.

### Geriatric mental health problems

With the changing demographic scenario declining mortality has led to an increase in the elderly population. From being 6.5% of the total population in 1981, the elderly constituted 8% of the total population in 2001. In absolute numbers, it means a jump from 5.2 crore in 1981 to 8.3 crore in 2001 (<http://censusindia.net>). The problems of the 60+ years age group are manifold. Rao (1997) found that visual and locomotor problems were the two prominent symptoms and 8.4% had symptoms related to mental distress. The results from general community epidemiological surveys can be misleading as they do not specifically target the elderly to arrive at estimates of prevalence. A wide range of estimates (per 1000 age-specific population) ranging from 22 to 333 has been observed (Gururaj *et al.* 2005). Shaji *et al.* (1995) reporting from Kerala on the prevalence of priority mental disorders reported it to be 95/1000 population. Nandi *et al.* (1997) reported an astonishing 61% of their study subjects to have been 'mentally ill'. The higher rate from recent surveys is probably due to studying

priority disorders in a rapidly greying population. Estimates from community-based studies are further hampered by the non-recognition of mental illness of the elderly while reporting diseases. In addition, the diagnosis of the presence of a mental illness may be at the institution where care is being sought, thus resulting in much of the underreporting from community-based surveys. The meta-analysis of Reddy and Chandrashekhar (1998) estimated the prevalence to be 31/1000 among the 60+ years age group. As noted earlier, the common problems of the elderly are affective disorders and organic brain syndromes. Affective disorders as a whole have been covered under mood disorders and also under common mental disorders, hence the following paragraphs cover the major cause of organic brain syndrome—dementia.

### Dementia

Dementia is defined as the 'global deterioration of the individual's intellectual, emotional and cognitive faculties in a state of impaired consciousness' (Roth 1980). This has to be chiefly differentiated from the impairment of memory and intellect, which happens as part of the normal ageing process. The diagnosis of dementia is made with demonstrable evidence of impairment of memory and/or intellectual functioning, the severity of which interferes with normal social or occupational functioning. Dementia of Alzheimer type (DAT) contributes to 60% of all dementias affecting people over the age of 60 years, while a number of other conditions are responsible for non-Alzheimer dementia (Rao 1997), chief among them being multi-infarct dementia (Jha and Patel 2004).

Geriatric psychiatric epidemiological studies focusing on dementia have been few and limited in India. The prevalence of dementia was found to be 3.5% in rural Thirupur (Rajkumar *et al.* 1997), 3.4% in Thiruvaniyoor in Kerala (Shaji *et al.* 1996), 1.07% among those 65+ years of age (Chandra *et al.* 1998). Vas *et al.* (2001) in their multistage survey in Bombay found the prevalence of dementia to be less than reported elsewhere: 0.43% for those over 40 years and 2.44% for those over 65 years of age. Alzheimer disease was found in 1.5% of those over the age of 65 years. The ratio of DAT to vascular dementia was found to be 2:1. This finding is of interest as the latter is preventable. Shaji *et al.* (1996) reported similar findings from their study in Kerala. Geriatric mental health problems are assumed to be present among 31/1000 population who are above 60 years based on a meta-analysis study (Reddy and Chandrashekar 1998) or 2.48/1000

population of all ages. For the present report, specific rates of dementia are assumed to be 1.9% in the 65+ years age group (or 1.52/1000 population of all ages), derived from the median value of the rates from the two community-based studies on dementia.

### Epilepsy

Epilepsy is considered to be the most common disorder of the brain and one of the oldest recorded medical conditions. During the 1960s and 1970s, epilepsy was regarded as a mental and behavioural problem and included as part of mental morbidity surveys. The sample sizes for different studies varied between 423 and 102,557. In addition, the difficulties in comparing different studies are primarily due to differing case definitions. The overall rates range between 2.2 and 11.9/1000 population (Gururaj *et al.* 2005). Urban and rural differences have been clearly documented in the largest ever Indian community-based neurological study in Bangalore. The rural rates were nearly twice that of the urban rates; females were more affected than males (Gourie Devi *et al.* 2004). Those less than 20 years of age constituted 38% of the total cases. Preventable causes such as birth trauma, infections and head injuries contributed to the majority of epilepsy among children. WHO (2001b) estimated that 'India alone has approximately 80–100 lakh people suffering from epilepsy'. For the purposes of estimation in this report, an estimate of 9/1000 has been utilized, which is similar to the rate from the large sample Bangalore Urban Rural Neurological problem study.

### Psychiatric morbidity among the disaster afflicted

In the Indian context, the mental health needs of the disaster afflicted is an emerging area. Unpublished reports estimate the prevalence of post-traumatic stress to be as high as 56% among survivors of a disaster (Orissa cyclone) 6 months after the event (Sekar K, personal communication). It is estimated that the rates for psychopathology increase by about 20%–40% in the period after the disaster (Murthy 2000). These rates are twice those for common mental disorders. Systematic efforts undertaken after the Bhopal gas tragedy, earthquake in Maharashtra and Gujarat, the Orissa supercyclone and the recent tsunami tragedy have led to the conclusion that disaster mental health is an area that needs immediate attention.

### Burden of mental, neurological and substance use disorders in India, 2000–2015

*To make calculations less cumbersome, the different estimates which had specific subgroups have been computed to make them applicable to the population of all ages and both sexes. For example, the prevalence rates for dementia are 19 per 1000 in the 65+ years age group and 1.52 per 1000 population of all age groups.*

- The prevalence of major mental and behavioural disorders at any given point of time was estimated as 65/1000 population in all ages and both sexes based on the average value of two pooled studies (Reddy and Chandrashekhara 1998; and Ganguli 2000) (57/1000 and 73/1000, respectively).
- The prevalence of schizophrenia has been considered as 3/1000 for all ages and both sexes.
- Considering the wide range in the prevalence rate of mood disorders, a range of 12/1000 (lower) and 21/1000 (upper), a median value of 16/1000 population (all ages and both sexes) has been used for calculating the burden.
- Most of the studies on CMDs were done in a health facility setting, which makes it difficult to make realistic estimates. A conservative estimate of 2% has been used based on the meta-analysis study of Reddy and Chandrashekhara (1998) and WHO estimates.
- The prevalence rate for alcohol, cannabis and opiate use in the community-based representative National Household Survey was 214/1000, 30/1000 and 7/1000, respectively. Seventeen per cent of alcohol users, 26% of cannabis users and 22% of opiate users were classified as dependent users based on ICD-10, the median value being 22%. The rates when applied to the total population of all ages and both sexes would be current alcohol users—60/1000, cannabis—8/1000 and opiates—2/1000 population. Based on a 17% dependency rate among current alcohol users, an alcohol dependency rate of

1% of all ages and both sexes is obtained.

- Estimates for MR are based on the 58th Round of the National Sample Survey. During the survey year of 2002, 994,600 persons in India suffered from MR. Based on this, the rate of MR in India would be 9.5/10,000 population of all ages, or 1/1000 population (all ages, both sexes).
- Child and adolescent mental health problems are estimated at 128/1000 child population (1–16 years) based on the methodologically better WHO study, or 43/1000 population of all ages.
- Geriatric mental health problems are assumed to be present among 31/1000 population above 60 years based on a meta-analysis study or 2.48/1000 population of all ages. Specific rates of dementia are 19/1000 in the 65+ years age group or 1.52/1000 population of all ages.
- The prevalence rate for epilepsy varies from 2 to 11/1000 population. A conservative estimate of 9/1000, similar to the rate from the large sample Bangalore Urban Rural Neurological problem study has been utilized for estimation.

For the year 2001, an estimated 6.7 crore people with major mental disorders, 2.05 crore with CMDs and 1.02 crore with alcohol dependency problems required services in India. Table 6 provides the all-India projections for 2005, 2010 and 2015. In the absence of trend studies and available interval studies indicating no change in the prevalence of overall mental and neurological morbidity, the same prevalence rates were used for different reference years to the population of respective States. Although the rates are steady, the numbers would swell and definitely have an impact on the provision of health services. The States with a high burden of mental problems (more than 50 lakh cases) are: UP, Maharashtra, Bihar, West Bengal and AP.

**Table 6.** All-India estimates of mental, select neurological and substance use disorders

Type of mental and behavioural disorder	Prevalence*	2001	2005	2010	2015
All-India population (in lakh) <sup>1</sup>		10,280	10,760	11,620	12,450
Major mental/behavioural disorders	65	66,859,671	70,000,710	75,548,395	80,978,755
Schizophrenia	3	3,085,831	3,230,802	3,486,849	3,737,481
Mood disorders	16	16,457,765	17,230,944	18,596,528	19,933,232
Cannabis users	8	8,228,883	8,615,472	9,298,264	9,966,616
Opiate users	2	2,057,221	2,153,868	2,324,566	2,491,654
Mental retardation	1	1,028,610	1,076,934	1,162,283	1,245,827
Child and adolescent disorders	43	25,509,536	26,707,963	28,824,618	30,896,510
Geriatric disorders	3	2,550,954	2,670,796	2,882,462	3,089,651
Dementia	2	1,563,488	1,636,940	1,766,670	1,893,657
Epilepsy	9	9,257,493	9,692,406	10,460,547	11,212,443
Common mental disorders	20	20,572,207	21,538,680	23,245,660	24,916,540
Alcohol users	60	61,716,620	64,616,040	69,736,980	74,749,620
Alcohol dependency†	10	10,286,103	10,769,340	11,622,830	12,458,270

\*Rate per 1000 population all ages and both sexes. Rates after adjusting to the age distribution. The numbers do not add up as the estimates have been arrived at from individual or pooled or representative studies. Please see the text for basis of these estimates.

†This group does not include hazardous alcohol users, whose number would be approximately 24 crore.

<sup>1</sup>Source: Population of India, 2001 (www.Censusindia.net)

## PART II

### Causation of mental disorders: The enigma continues...

*'... social constructs regarding mechanism of symptoms have special meanings in relation to the shared belief of a community about the nature of an illness'*

—MURPHY 1964

#### The premise and the paradigm

The causes of mental illness are complex, varied, differing from condition to condition and influenced by several sociodemographic and biological attributes. The previous century witnessed major advances in treatment despite an elusive aetiological–pathological–physiological process (Mitchell and Pavlavic 2000). Reviewing the recent advances, Kessler (2000) found that the problems encountered in psychiatric epidemiology were in 'conceptualizing and measuring mental disorders' and pointed out the need to focus on modifiable risk factors rather than on broad, non-specific risk markers.

Developments in the past few decades laid a firm foundation for a biological basis of mental disorders along with the then prevalent behavioural theories of causation of mental disorders. The neurotransmitter basis for many of the mental disorders has been extensively documented and the putative pathways have also been identified. Neuroimmunology, dynamic neuroimaging and genetic studies (twin studies, sibling studies, family studies and association studies) have added newer possibilities for the causation of mental disorders (Vyas and Ahuja 1999). Many of these different hypotheses of the causation of mental disorders are still in the investigative/trial stage.

The different hypotheses for the causation of mental disorders were broadly identified as belonging either to Nature (biological) or Nurture (environmental including sociocultural). With increasing research, it has become evident that mental illnesses are due to a complex interaction of social (including economic, environmental), psychological and biological factors (Fig. 1) and have a differential impact on the prevalence, onset and course of mental and behavioural disorders. It may be noted that a strict classification into biological, psychological and social factors poses a 'formidable barrier' to the 'true understanding' of mental and behavioural disorders (WHO 2001). Hence, Rose (2001) called for a non-dichotomizing developmental approach to identify causation: 'both the genome and envirome are abstraction of the continuous dialectic'. This point is further illustrated when one considers the directions taken by research in the causation, onset, course and outcome of schizophrenia (Walker *et al.* 2004). Eisenberg (2004), critiquing the euphoria of the genetic model, celebrates the success of social psychiatry: 'genes set the boundaries of the possible; environment parses out the actual.' Hyman (2000) observes

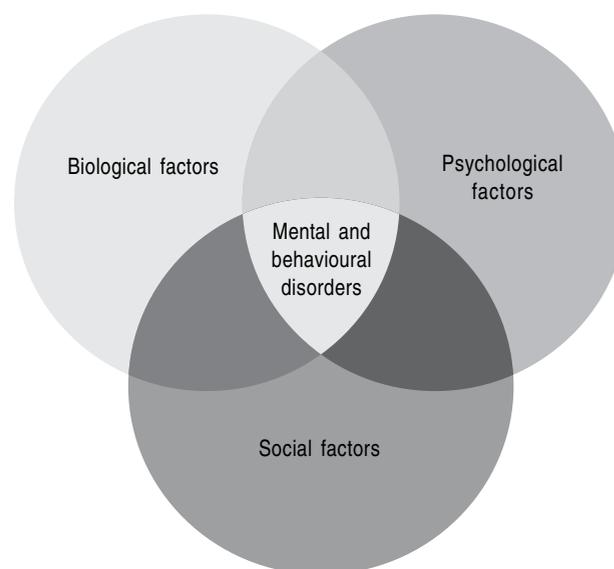


Fig. 1 Factors for the causation of mental disorders

Source: WHO 2001

that the proposal of 'symptom clusters, course of illness, family history and treatment history' turning ('coalescing') into a relatively simple diagnostic category is 'frayed'. In the backdrop of new research to link molecules, milieu and the mind, Murthy (2005) observes that the emerging evidence has an 'important implication for the role of mental health professionals' who need to recognize the bio–psycho–social approach in the practice of psychiatry. While the public health approach identifies causes amenable to cost-effective interventions on the larger population base (WHO 2001), an alternate approach, the risk concept, has also been utilized in recent years (WHO 2005). The *World Health Report* lists the key determinants of mental health to be poverty (and its associated conditions of unemployment, low educational attainment, deprivation, homelessness), gender, age, conflicts and disasters, major physical diseases, family and environmental factors (WHO 2001).

#### Causation in the Indian region

Well-designed, population-based analytical studies on the causation of mental disorders are lacking in India. Complex methodological issues have further added to the existing problems in undertaking research. A review of the current research efforts in the country reveals that there has been a gradual shift and progress in identifying the social, demographic and cultural correlates of disorders (Gururaj and Isaac 2004). The epidemiological enquiries undertaken in India have primarily focused on arriving at the extent of morbidity; recent studies which have demonstrated more methodological rigour (identifying the sociodemographic

correlates) permit the identification of 'at-risk' groups or subpopulations. Apart from this, the different variables studied include: age, gender, sex, place of dwelling, education, occupation, income, religion, migration, marital status, caste, type of family (nuclear, non-nuclear). While no clear conclusions can be drawn based on these data, certain pointers emerge related to 'at risk' groups and have led to formation of some hypotheses.

- **Age and sex distribution:** In the study by Dube (1970), the age of onset of any mental illness was 15–24 years, with two-thirds of the cases being in the 15–55 years age group, except for mental deficiency which was among children. There was a female preponderance in the ratio of males to females (1:3); in addition, the age at onset was significantly higher for females for all mental disorders. The ICMR study on severe mental morbidity revealed divergent results, with the 60+ years age group having a greater proportion of morbidity, except in Bangalore where two peaks at the extremes of the adult age group (15–19 years and 40–59 years) were noticed. On the whole, the age group of 60+ years experienced greater morbidity; the age groups of 40–59 and 30–39 years come next. There was a male preponderance in two of the centres (Bangalore and Baroda) and a female preponderance in the Patiala centre. The four period-representative studies (1960s, 1970s, 1980s and 1990s) point towards an age range of 30–45 years with three of the four studies showing a female preponderance (Gururaj *et al.* 2005). Reddy *et al.* (1994) observed in their study that the extremes of age had a higher morbidity with more neurotics in the 21–30 years age group (18% *v.* 7%). The meta-analysis of Reddy and Chadrashekar (1998) showed a greater proportion of mental disorders among the 35–44 years age group and among females. In essence, regarding age–sex distribution, it could be inconclusively said that adult females in the age group of 30–45 years are more at risk for mental illness. Astbury (2000), realizing the information gaps in studying gender disparities, lists out the systemic 'fault lines' (status, roles, options and treatment in society) which predispose women and push them into the more vulnerable group.
- **Urban/rural differences:** Dube (1970) found a higher rate in the non-rural population (rural 18/1000 *v.* 25/1000 non-rural), as did the pooled meta-analysis of Reddy and Chandrashekar (1998) (rural 49/1000, urban 81/1000 population). Ganguli (2000) found a small difference (rural 71/1000 and urban 73/1000 population). The only other recent combined study in both urban and rural areas (Sharma *et al.* 2001) did not show any difference in the rates. However, considering the fact that a large part of the population of India lives in rural areas, the burden of mental morbidity and need for services will be higher in these areas.
- **Income:** Income has been strongly implicated in many individual studies: those with low-income levels show a

higher prevalence of mental illness. However, it continues to be debated whether income levels are a result of the mental illness or a cause. Contrary to expectation, the ICMR study (ICMR 1987) showed that the high-income category had a greater proportion of mental illness. The Calcutta centre found a higher prevalence among the extremes of income levels. Income levels only need to be considered as a proxy for lack of resources among the mentally ill, the result of which would drive them further down the income categories (the social causation versus the downward drift hypotheses—Mueser and McGurk 2004). Thus, despite there being no conclusive evidence from available studies for severe mental disorders, those with low-income levels need to be considered as a more vulnerable group. Patel *et al.* (2003), reviewing the literature pertaining to CMDs, found the evidence supporting a specific association with income levels to be weak. However, poverty as a 'marker' of deprivation is found to result in a vicious cycle of poverty–mental and behavioural disorders–economic impact. Further, it was observed that just overcoming poverty is insufficient to comprehensively address deprivation, but would need 'equitable distribution of resources'.

- **Education:** Education as variable of study is important both from identifying the at-risk group and in guiding the planning of interventions, including continuity of care. The different definitions adopted in defining the education levels among various studies pose problems in comparison. Verghese *et al.* (1973) and ICMR (1987) found a greater proportion of low literacy levels among the mentally ill.
- **Occupation:** Dube (1970) reported that 'non-earning employment, unremunerative work with all monotony and lack of motivation and lack of security may be more stressful contributing to mental illness'; in contrast, 'earners had better self-esteem, better interpersonal relationships (thus) preventing precipitation of a breakdown'. In addition, 'indebtedness without undue anxiety', 'multiple drug users', 'short temperament', 'vocational maladjustment', 'special strains (anxiety to financial overstrain, heavy indebtedness, severe anxiety on account of disease, marriage, domestic problems)' had higher morbidity. This feature has been consistent even with the ICMR study (1987) and that of Verghese *et al.* (1973).
- **Marital status:** All reports indicate that those who are widowed, separated or divorced have greater mental morbidity. Contrary to western data, the Indian married population have a greater proportion of the mentally ill. Various reasons have been ascribed for this finding, a major one being the possibility of not differentiating but accommodating a mentally ill person in day-to-day activities.
- **Migration:** Migration as a specific variable of study has been reported by Dube (1970). It has been observed that Punjabi refugees were more afflicted than Sindhi refugees. Nandi *et al.* (1992), using a case–control approach,

studied the migration of a tribal and a resettled population and found that neurotic illness was more prevalent among those who had migrated to an 'urban' area but had little effect on the total mental morbidity. Reviewing the literature on migration and mental health, Bhugra (2004) implores that the role of social and cultural factors is paramount in both aetiology and management of psychiatric illnesses.

- **Type of family:** Living alone was a specific risk factor for severe mental morbidity as revealed by the ICMR study (1987). The contradictory findings of Dube (1970) and Verghese *et al.* (1973) regarding the type of family that is at greater risk needs to be seen in the larger sociocultural context. The former reports a greater risk among the joint family while the latter report a greater risk among nuclear families.

In the absence of longitudinal studies that would help to identify the time-trends of the disease and evaluate causal mechanisms, interval studies are invaluable. Nandi *et al.* reported their findings on the prevalence and sociodemographic correlates of mental illness in the villages of Gambhargarchi and Paharpur in the 24 Parganas district in West Bengal over two time intervals: 1972–82 and 1972–92 (Nandi *et al.* 1986, Nandi *et al.* 2000). The small sample sizes do not permit generalizations. However, the change, which has been documented over a period of two decades, is a definite pointer. The enhanced 'affluence' of the communities does not reflect on the overall morbidity pattern. The 'cohort effect' could be a plausible reason. The finding of a lesser proportion of morbidity among those healthy in the earlier surveys further bolsters this point.

In a community-based analytical study, Chandran *et al.* (2002) indicated that incident cases of postpartum depression are predicted by low income (RR=3), an adverse life event in the year preceding delivery (RR=4), problems with the in-laws (RR=3), poor relationship with parents (RR=3), birth of a daughter when a son was desired (RR=3) and lack of physical help at home during the postpartum period (RR=3). In epilepsy, studies point to the relative risk of genetic factors (RR: 0.7–5.6) with the other major contributory risk factors being brain injuries (RR: 1.4–12.7), febrile convulsions (RR: 3.0–14.2) and pyogenic meningitis (RR: 7–40) (Gourie Devi *et al.* 1999). The findings from such studies are particularly important as they point out the urgent need for identifying, incorporating or strengthening the mental health component of existing health and other developmental programmes for disease prevention: Maternal and Child Health, Integrated

Child Services Development Scheme, Poverty Alleviation Schemes, etc.

In recent years, further research into causation has identified specific areas of association. For schizophrenia and other psychoses, the genetic basis of these illnesses is gathering momentum. Reduced brain volumes with deficient brain neurocircuits in specific areas from twin studies suggest a biological basis for the disorder. These studies also suggest a key role for prenatal and postnatal stressors being responsible for determining the onset, course and outcome of the illness (Walker *et al.* 2004). Dementia is recognized primarily as a neurodegenerative disorder with a vascular basis (Peng 2003). Alcohol and substance use disorders are predominantly sociocultural phenomena in the early stages of experimentation which, with later abuse, acquire a distinct biological basis rooted in altered neurochemistry and functioning. Depressive disorders as noted above have a strong mooring within the sociocultural and demographic correlates, in turn linked with endocrinal imbalance. The dominant theme of present-day research is to explore the bio-psycho-social models rather than individual components.

A major objective of enquiry into the causal mechanisms or determinants of an illness is to arrive at possible interventions. In India, currently, the major issue is with regard to problems pertaining to the three A's of service delivery: availability, accessibility and affordability. The public health determinants and causes of morbidity need to be attended to and addressed as an utmost priority. For better planning and bundling of interventions and thereby services, the classification of causes also need to be modified. WHO has classified interventions for mental and behavioural disorders into prevention, treatment and rehabilitation. Correspondingly, there is a need to examine the causation of mental disorders from a different perspective from those that can be prevented (preventable mental illness/disorder: e.g. MR due to preventable causes), easily managed (treatable mental illness/disorder: e.g. CMDs, especially depression, anxiety disorders, deviant behavioural problems of children, alcohol and other substance use disorders, etc.) and those disorders requiring long-term care along with appropriate rehabilitation (all types of moderate to severe functional psychoses—schizophrenia, mania, manic-depressive episodes, all types of established MR, dementia and others). Some examples of risk factors directly and indirectly related to health and non-health parameters for selected conditions is provided in Table 7. Detailed discussion of causation is beyond the scope of this report.

**Table 7.** Causal (risk) analysis of mental and behavioural disorders

Condition	Direct (medical) causes	Indirect/distant (non-medical) causes
Schizophrenia	<ul style="list-style-type: none"> <li>• Immunological factors</li> <li>• Genetic predisposition</li> <li>• History of alcohol and drug abuse</li> <li>• Course and outcome of conditions</li> <li>• Personality/nature of individual</li> <li>• Past viral infections</li> <li>• Presence of violence</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of income and employment</li> <li>• Poverty</li> <li>• Stigma</li> <li>• Marital status (not clear) (single/ widowed/divorced/separated)</li> <li>• Available drugs beyond the reach of the poor</li> <li>• Living alone</li> <li>• Lack of family support systems</li> <li>• Gender and age (equivocal)</li> <li>• Social adversities</li> <li>• Family status</li> </ul>
Alcohol and drug abuse	<ul style="list-style-type: none"> <li>• Predisposition of the individual</li> <li>• Personality profile</li> <li>• Family history of usage</li> </ul>	<ul style="list-style-type: none"> <li>• Easy availability of alcohol and drugs</li> <li>• Extensive promotion in the media</li> <li>• Liberalized values among the people</li> <li>• Lack of clear policies on production, availability, distribution and promotion</li> <li>• Peer group influences</li> </ul>
Mental retardation	<ul style="list-style-type: none"> <li>• Lack of obstetrics services</li> <li>• Neonatal sepsis</li> <li>• Infections of the nervous system</li> <li>• Inborn errors of metabolism</li> <li>• Absence of premarital and genetic counselling</li> <li>• Lack of investigative facilities for metabolic errors</li> <li>• Previous medical conditions (hypertension)</li> </ul>	<ul style="list-style-type: none"> <li>• Poor life-skills</li> <li>• Lack of rehabilitative facilities</li> <li>• Social factors</li> <li>• Difficulties in health care due to lack of resources</li> <li>• Absence of policies on rehabilitation</li> <li>• Lack of iodine in the nutrition</li> </ul>
Dementia	History of mental disorders	<ul style="list-style-type: none"> <li>• Emerging social issues such as isolation</li> <li>• Deprivation of basic care</li> <li>• Absence of supportive care</li> </ul>

*Note:* General service-related issues such as help-seeking behaviour, lack of physical and human resources, low levels of mental health, literacy and failure to implement existing programmes are intermediate spokes in the complex chain of causation for all mental disorders.

## PART III

### Interventions for mental and behavioural disorders

*Knowing is not enough; we must apply  
Willing is not enough; we must do*

—GOETHE

#### Learning from the past

The twentieth century bears testimony to the improvement in the way mental illness has been managed. Moving away from the mental asylum approach, the concept of mental hospitals is undergoing a major change in their role and functioning. Reflecting the movement away from custodial care of the mentally ill, the first 'General Hospital Psychiatry Unit' was established in Calcutta in 1933 (Parkar *et al.* 2001). On the eve of Independence, the Health Survey and Development Committee headed by Sir Joseph Bhore (1942–46), was a notable effort to comprehensively plan for the health of the people of India. Noting the non-availability of data on the burden of mental disorders, the Bhore Committee in its report, assumed 'the population of mental patients be taken as two per thousand population'. Accordingly, the infrastructure was recommended to make

available facilities for 800,000 patients 'as against the existing 10,000 beds' (Chandrashekar and Isaac 1999). In 1954, on the recommendations of the Bhore Committee, the All India Institute of Mental Health, Bangalore was set up to increase the availability of trained manpower in the country. Apart from making available trained human resources, emphasis was on research endeavours which would be suited for planning better services. The Mudaliar Committee (1959), commenting on the lack of 'reliable statistics regarding the incidence of mental morbidity in India', (Chandrashekar and Isaac 1999) recommended that 'each district should have a psychiatric clinic and five to ten beds may be earmarked for psychiatric cases' (Agarwal *et al.* 2004).

Amid the debates in causation and intervention, despite documented social vulnerabilities, proven pharmacological remedies and psychotherapies, the overall burden of existing mental disorders continues all over the world. Andrews *et al.* (2000) reviewed the data from the Australian National Survey of mental health and well-being on the two commonest mental disorders (generalized anxiety disorder and depression)

and observed that 'too many people do not seek treatment and when they do, efficacious treatments are not always used effectively'. Indian studies too have found a huge treatment gap. For example, epilepsy is an eminently preventable, easily identifiable and diagnosable major public health problem, and 70%–80% of seizures are effectively controlled with one or two drugs. However, the treatment gap is said to be in the range of 50%–70% (Gourie Devi *et al.* 1999). In the recently concluded consensus study in developing countries for resource utilization in select neuropsychiatric conditions, Ferri *et al.* (2004) found that current treatment coverage was below 20% for Alzheimer dementia to about 60% for epilepsy across 7 developing nations. For India, the current coverage rate was schizophrenia—40%, bipolar disorder—38%, depression—28%, panic disorder—16%, alcohol misuse—20%, alcohol dependence—23%, Alzheimer disease—9% and epilepsy—45%. Only a fraction of those currently covered adhered to the management protocol; this ranged between 15% and 45%. There is therefore gross underutilization of even the minimal available services. The reasons for underutilization of services and thereby the causes for mental disorders can be varied: they could either lie with the patient or the family (stigma, distance, long duration of therapy, no permanent cure, etc.) or the service provider (non-recognition of the illness/disorder either as stand-alone or with co-morbidities such as substance abuse, inadequate clinical skills to manage the illness after 'case detection'), or with the health system (inadequate drugs and infrastructure, inappropriate development of human resources, adopting culturally inappropriate, western treatment/management protocols in their entirety) (Thara 2004a).

Several experiments in the Indian region have successfully demonstrated the possibility, feasibility and integration of mental health services with primary care services, in line with international thought to deprofessionalize health care, decentralize health services and further the 'community approach'. Several mental health professionals have documented their experience across India. Reddy (1983) lists the major developments in mental health care delivery as organization of outpatient services, family psychiatric services, rehabilitation services, community mental health services for both rural and urban populations, training of school teachers and lay volunteers, domiciliary care programme, extension services (satellite clinics and self-help groups of parents). The fact that basic and essential mental health care can be delivered resulted in the birth of the National Mental Health Programme (NMHP) for India in 1982. The Central Council of Health and Family Welfare in its meeting held in 1982 recommended that 'mental health must form an integral part of health programmes and as such should be included in all national policies and programmes in the field of health; and education and social welfare'. The key messages from different studies/reviews which have investigated outreach activities and related aspects are as follows:

- Epilepsy, neurotic disorders, mental retardation, psychoses and other disorders of the CNS form the major neuropsychiatric problems at the community level (Kapur *et al.* 1982, Gururaj *et al.* 1988).
- The possibility of extending mental health services through neuropsychiatric camps, satellite clinics and satellite units is a cost-effective method to deliver mental health services to a large majority of the needy population. (Wig *et al.* 1980, Kapur *et al.* 1982, Mathai 1984, Reddy *et al.* 1986).
- Follow-up activities and establishing proper referral patterns are vital to the success of the programme (Gururaj *et al.* 1988).
- Lack of resources, the population explosion, misplaced priorities and adopting unrealistic approaches have continued to hamper the reaching of the desired objectives (Verma 1986).
- Rehabilitation through work therapy needs to move from the passive 'make work' approach to the active 'participatory' work restoration (Menon 1996).
- Augmenting family self-help groups is possible and feasible (Reddy *et al.* 1986).
- Psychotherapy models based on indigenous philosophical systems can be tried (Balodhi 1990).
- The use of affordable, simple drugs in general health care settings is associated with improved clinical and economic outcomes, especially in the short term (Patel and Kleinman 2003).
- Training primary care medical officers in mental health care is possible, feasible, effective and beneficial (Reddy *et al.* 1986, Sriram *et al.* 1990).
- There is a need for collaborative programmes both in research and in training of human resources (Wig *et al.* 1977).
- The low proportion of the mentally ill utilizing the Government health infrastructure at the primary care level prevents a realistic economic analysis of the services provided (Chisholm *et al.* 2000).
- A quick 5-minute questionnaire to the adult respondent in the family was found to be most suitable for a primary mental health care set-up for screening, as it can identify adults with epilepsy, psychoses and those with other psychiatric problems (Isaac 1980).
- Mental health planning and policy development at the national level needs to address the varying aspirations of the different stakeholders (community, professionals, State Government, etc.) (Reddy *et al.* 1986, Murthy 2004).
- Integrating mental health care with the general health services has the twin benefits of avoiding problems associated with a highly institutionalized and professional mode of treatment and is a key means of providing basic mental care by a simple approach (Gururaj *et al.* 1988, Murthy 2004, Reddy *et al.* 1986).
- There is a great deal of scope for mental health professionals to liaise with the education, welfare and health sectors (Murthy 1987b, Gururaj *et al.* 1988).

- Communities (including educated urban groups) are largely uninformed about the various aspects of mental health and the information possessed by them remains uncrystallized (Prabhu *et al.* 1984).
- The various pathways for care of the mentally ill include formal, informal and non-formal health professionals. Longer delays in referral are found with native healers (Gater *et al.* 1991).
- Ignorance and stigma, duration of treatment, initial side-effects due to drugs, relative distance of the health facility, etc. pose problems for the mentally ill in rural areas (Wig *et al.* 1980).
- Other unmet needs, differing concepts of mental illness, professional non-commitment, differing demand and governmental priorities, absence of a social welfare net, vertical nature of national health programmes and such other factors have limited the care that could be provided for people with mental disorders in developing countries such as India (Jacob 2001).

It is to be noted that the above key messages do not constitute true scientific evaluations, despite many of them following scientific methodologies of enquiry. In this context, there is a dire need for in-depth systematic evaluation of the many innovations that have been attempted. For example, international literature has evaluated Assertive Community Treatments and case management as models of community-based care (Marshall *et al.* 1997, Marshall *et al.* 1998). However, the precise concept, components and configurations that can mirror the existing Indian situations need to be delineated first and then evaluated.

Amid improvements in service delivery, unfortunately, even as late as 2002, there was a substantial deficit of dedicated human resources for mental health services at the national level: 52% of the districts in India did not have psychiatric facilities; there was an acute shortage of psychiatrists (77%), psychologists (97%) and psychiatric social workers (90%) (Goel *et al.* 2004). This is notwithstanding the huge variations at the individual State level. In the light of health being a fundamental right, the National Human Rights Commission and the Supreme Court have played a very proactive role in bringing to the fore the quality aspect in the delivery of health care services.

### The National Mental Health Programme (NMHP)

The NMHP recognized that services need to be planned for a minimum population of 1 crore who suffer from a serious mental disorder. It classified the burden as acute mental disorders, chronic or frequently recurring mental illnesses, emotional illness, and alcohol abuse and drug dependence. It specified service components with three sub-programmes—treatment, rehabilitation and prevention—to be implemented through primary health care. The different levels identified were the village/subcentre, primary health centre, district hospital, mental hospitals and teaching psychiatric units.

Emphasizing equally on mental health training, it set out an 'outline plan of action' with a 'set of targets and of detailed activities'.

Ideally, the mental health services for the country need to be undertaken in the backdrop of the estimated disease burden, expanding on health care delivery based on previous experience and in the light of the policy directions. The Programme objectives and key approaches as enunciated in 1982 have been considered as a critical framework for the current report. The District Mental Health Programme (DMHP) came to be recognized as a strategy to implement the NMHP. In a major review in 2002 undertaken prior to the expansion under the Tenth Plan, it was found that there was considerable scope for improvement in many areas of the NMHP (Goel *et al.* 2004). The specific areas that needed strengthening included examination of issues related to duration of actual implementation of the Programme, inappropriate pilot districts being chosen for implementation, problems in recruiting appropriate personnel, lack of on-the-job or periodical refresher training programmes, inadequate monitoring (no standard reporting formats, need for simple recording and reporting systems), differential (and thus ineffective) IEC materials. 'No centre had undertaken community surveys of mental disorders as they were very much preoccupied in setting up service components of the scheme.' Where functioning was better, it was observed that the District Mental Health Clinic, inpatient facility at the district hospital and community outreach and liaison with primary health centres were relatively better organized (NIMHANS 2004). However, a major bottleneck was timely release of funds by both the Central and State Governments. In many instances, these factors seriously impacted the service delivery component. A specific instance has been the decrease in the number of patients seeking care (DMHP, Thiruvananthapuram, Kerala 2004).

In this context, another ambitious attempt is being made to restructure and re-strategize the NMHP. Proposing an outlay of Rs 190 crore during the Tenth Plan period, the five major domains being addressed are modernization of mental hospitals, strengthening of medical college departments of psychiatry, IEC and training, research and an 'ambulating' DMHP (Agarwal *et al.* 2004). An all-India action plan with a Vision for 2020 has been proposed and the focus is on the efforts that need to be undertaken under the umbrella of the district health care system (Goel *et al.* 2004).

### Resources for mental health care delivery in India

Since the time of Independence, India has steadily built up the health care infrastructure. This formidable human and infrastructure resource could be easily utilized to deliver better mental health care services. This has been proved beyond doubt in the various pilot projects across the country and also forms the backbone of the NMHP. The suggested resource management for mental and behavioural disorders is shown below.

At the district headquarters/district hospital:

- For curative activities:
  - a. The General Hospital Psychiatry Unit (GHPU) headed by a psychiatrist/trained mental health person, supported by other staff with equivalent qualifications along with ancillary staff
  - b. The existing general health care services at the *taluka* hospitals/community health centres/primary health centres to cater to the management of mental disorders
- For rehabilitative activities: The integrated district disability limitation/rehabilitation facility
- For preventive and promotive activities: The DMHP officer to liaise and coordinate with other staff headed by the District Health and Family Welfare Officer (monitoring referral services, periodic review for training and supervision of staff at the primary health centre and subdistrict hospitals (first referral unit/*Taluka* Hospital/Community Health Centre). The responsible officer should also build liaison services with the related sectors of education, women and child welfare, etc.

### Interventions in the mental health care delivery system

#### The burden

Based on the understanding and burden of mental health problems in India as outlined in Part I of this paper, it can be estimated that a minimum of 6.7 crore persons would need immediate care for severe and moderate (easily recognizable) problems, while at the district level there would be nearly 100,000 persons requiring mental health services. The break-up as per various diagnostic categories for the average district is provided in Table 8. The break-

up of the estimate for the minimum district population and maximum district population is also given in Table 8.

#### Framework for intervention and goals of treatment

Early diagnosis and prompt treatment forms the key approach for all conditions. For disorders such as substance abuse (alcohol, tobacco, drugs), and CMDs (depression, anxiety, emotional problems), health promotion and specific protection can have a major impact that is equivalent in terms of early diagnosis and treatment. While no single approach will yield 100% positive results, combined approaches will be of great benefit to communities.

The major goal in management is to decrease the morbidity and disability (and to a certain extent mortality) associated with the disorders. The specific goal of treatment for psychotic disorders is to induce remission so as to decrease the frequency, severity and consequences of the episodes (exacerbations) and maximize social and psychological functioning of the individual. The principal tasks of treatment during the acute phase of the illness are reduction of symptoms and risk of harm, and improvement of functioning. In the post-acute phase, the aim is to consolidate the remission, maintain continued reduction in symptoms and prevent early relapse. Maintaining or improving the level of functioning and preventing recurrences are the specific tasks during the stable phase of the illness. Undertaking a comprehensive assessment before evolving a therapeutic plan in collaboration with the family members and ensuring adherence to treatment is critical (Indian Psychiatric Society 2004).

#### Specific activity/intervention

The various staff-specific activities that can be effectively undertaken by various health care functionaries are:

**Table 8.** Burden of mental and select neurological and behavioural illnesses in a district

No. of districts in India = 593	All India	Average district	Minimum district population	Maximum district population
Population	1,028,610,328	1,734,587	1,500,000	2,000,000
Major mental, select neurological and behavioural disorders	66,859,671	112,748	97,500	130,000
Schizophrenia	3,085,831	5,204	4,500	6,000
Mood disorders	16,457,765	27,753	24,000	32,000
Cannabis users	8,228,883	13,877	12,000	16,000
Opiate users	2,057,221	3,469	3,000	4,000
Mental retardation	1,028,610	1,735	1,500	2,000
Child and adolescent disorders	25,509,536	43,018	37,200	49,600
Geriatric disorders	2,550,954	4,302	3,720	4,960
Dementia	1,563,488	2,637	2,280	3,040
Epilepsy	9,257,493	15,611	13,500	18,000
Common mental disorders	56,573,568	95,402	82,500	110,000
Alcohol users	257,152,582	433,647	375,000	500,000
Alcohol dependency	82,288,826	138,767	120,000	160,000

Note: The numbers do not total up, please see box on page 236

- Community health volunteer: Case identification, targeted referral, liaison with patients, ensuring continuity of care
- Multipurpose worker: Screening, appropriate referral, liaison with other sectors, ensuring compliance
- Health supervisors: Follow-up of cases and further referral if needed, liaison with local school authorities for delivery of life-skills education and other health promotion activities
- Medical officer: Early diagnosis of cases, management of psychiatric emergencies, pharmacological management of cases, counselling as part of preventive and promotive mental health, follow-up and referral, maintaining records, staff training, community outreach activities, ensuring continuous availability of sufficient/minimal medicines, family education activities
- Medical staff at the CHC: Early diagnosis of cases, management of psychiatric emergencies, pharmacological management of cases, counselling as part of

preventive and promotive mental health, management of organic mental disorders, follow-up and referral, organizing community outreach activities, ensuring continuous availability of sufficient/minimal medicines, family education activities

- General Hospital Psychiatry Unit: Outpatient and inpatient services, pharmacological therapy, ECT, psychosocial interventions, family education, training of health personnel, rehabilitation services
- DMHP officer: Monitoring, supervision/coordination of ongoing activities in the district, surveillance and planning for services, documentation—both administrative and technical, networking, advocacy and establishing linkages, planning for training

Support systems need to be strengthened with physical and technical resources. For mental health care, advanced equipment is not required; however, an uninterrupted supply of medicines is essential and crucial.

## PART IV

### Emerging issues and concerns

The *World Health Report 2001* has listed 10 minimum actions required for delivery of mental health care. These include providing treatment in primary care; making psychotropic drugs available; giving care in the community; educating the public; involving communities, families and consumers; establishing national policies, programmes and legislations; developing human resources; linking with other sectors; monitoring community health; and supporting more research. In the Indian context, some priority issues are placed herewith for planning, implementation and evaluation of the mental health care delivery system, and listed under the broad headings of Research, Service and Policy.

#### Research

The need of the hour is

- To develop epidemiological databases (registries) of adequate sample sizes with better funding and coordination, utilizing culture-specific study instruments, which would aid in delineating the aetiology and management of mental disorders
- To undertake research into the emerging problems of alcoholism, child mental health, geriatric mental health, adolescent health, urban health and behavioural risk factor studies
- To initiate surveillance systems to study the time-trends of existing and emerging mental and behavioural disorders at possibly district and State levels
- To conduct operational research in mental health services to examine utilization, drug availability, manpower

development, removal of stigma, barriers to care, and others

- To take a closer look at the association of issues such as poverty, urbanization and changing life patterns with mental health
- To designate national co-coordinating centres to examine specific issues. A group of centres can be given collective responsibility in specific areas with adequate financial and logistical support.
- To systematically evaluate the different components of the DMHPs. The existing mechanism of reviews based on programme statistics alone would be inadequate to address the issues arising in the expansion phase of the Programme.

#### Service

- Ensure that commonly required minimum medicines are available in all PHCs, *taluka* and district hospitals.
- Increase the participation of medical officers and other health workers in the mental health care delivery process.
- Incorporate other support systems such as availability of basic laboratory facilities, teaching materials and others in district hospitals and PHCs.
- Ensure better coordination of rehabilitation activities, especially at the district level.
- Reduce stigma at the community level so that more needy people access available resources.
- Promote more outreach programmes through extension services, mental health camps, school mental health activities and greater interaction with NGOs.
- Improve administrative mechanisms for availability of

funds, personnel and other support mechanisms from the Centre to the State.

- Evaluation should be an inbuilt component of a service delivery programme for mid-course corrections and refinement. Undertaking a systematic, regular, time-bound evaluation of activities pertaining to mental health at the district level should be done at periodic intervals.
- Expand the existing models being tested to larger populations to widen the scope of work.
- Strengthen health promotion efforts to move towards prevention of specific mental health problems such as suicide, substance abuse, common mental disorders, etc.
- Through targeted interventions focus on vulnerable populations such as women, children, the homeless, rural population, etc. for making minimum mental health care available in India.
- Develop capacity-building measures to enlist the cooperation of society at all levels, along with support for need-based human resources.
- Integrate the mental health programme with other ongoing national health programmes such as RCH and others.

Apart from the above-mentioned issues, five major areas require the attention of policy-makers and professionals.

- **Reorientation** of the system of cure (of merely dispensing pills) to a system of care (recognizing the overall individual's needs and not just the person as a disease entity).
- **Lab to land:** Critical reappraisal of pilot projects and translating their successes into the routine health care delivery system.
- **Empowerment:** The families in the ambit of community-based services need more support than is generally available currently. There is a need to ensure that the economic productivity of the family or its members are not compromised and they are able to participate better in the programmes.
- **Better integration:** No formal mechanisms exist at present for systematic integration of both the public and private sectors, including the formal and informal sectors. Integration mechanisms spelt out in the Mental Health Policy should also be reflected in Mental Health Act and the rules thereof.
- **Psychiatric rehabilitation:** In the absence of a planned or organized programme or policy on rehabilitation of the mentally ill there is a need to ensure quality and appropriate care uniformly across the country.

## Policy

- Systemic reforms and changes in mental health policies and programmes are urgently required. Outdated laws need to be replaced with more humane approaches to mental health care.

- Focus on periodic, regular, systematic evaluation of ongoing community-based interventions to identify areas requiring further improvement to enhance the systems approach.
- Support broader policy frameworks under the NMHP by working with governments, NGOs and professionals to develop integrated models of mental health care.
- Policy reforms are required to reorient and re-energize existing mental hospitals in the country to redefine their role as centres of integrated activities and to function as referral centres.
- Augment manpower development and capacity-building programmes at all professional and non-professional levels to bridge the resource gap.
- Prioritize mental health problems for research and service delivery for effective utilization of meagre resources.
- Bridge the gap between research and service through promotion of operational research in a decentralized setting.
- Integrate mental health with education, child health, women's health, empowerment, legal systems, etc.
- Change the role of mental hospitals from being mere custodial care providers of patients to centres with integrated services, human resource development, capacity building and operational research.

As India moves towards a greater market-oriented economy and globalization, mental health problems will place a greater burden on the health care systems. Neglected for too long, mental health undoubtedly deserves a better place on the public health agenda in India. There is a need to move from a piecemeal and fragmented approach to an integrated and systems approach to provide better care for those with mental illness and improve their quality of life.

## Acknowledgements

The authors acknowledge with gratitude the support and cooperation of the National Commission on Macroeconomics and Health, Ministry of Health and Family Welfare, Government of India; Dr D. Nagaraja, Director/Vice Chancellor, NIMHANS, Bangalore; Dr Mathew Verghese, Associate Professor and Dr Vivek Benegal, Associate Professor from the Department of Psychiatry, NIMHANS, Dr Murali T., Professor and Head of Psychiatric and Neurological Rehabilitation, NIMHANS, and Research Officers Ms Shailaja B.C., Dr Srivatsa D.V. The authors would like to express their sincere thanks for the critical comments on the earlier draft by Dr Vijay Chandra, Regional Advisor, Health and Behaviour, WHO-SEARO, New Delhi, Dr Vikram Patel, Reader in International Mental Health, London School of Hygiene and Tropical Medicine, Dr Prathap Tharyan, Professor and Head of Psychiatry, CMC, Vellore and Dr D.S. Goel, National Advisor for Mental Health, Ministry of Health and Family Welfare, Government of India.

## References

- Adityanjee MD, Wig NN. Alcohol related problems in the emergency room of an Indian general hospital. *Australian and New Zealand Journal of Psychiatry* 1989;**23**:274–8.
- Agarwal SP (ed). *Mental health—an Indian perspective 1946–2003*. New Delhi: Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India; 2004.
- Agarwal SP, Icchpujani RL, Shrivastava, Goel DS. Restructuring the national Mental Health Programme. In: Agarwal SP (ed). *Mental health—an Indian perspective 1946–2003*. New Delhi: Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India; 2004:119–31.
- Ahmad A, Sen AK. Prevalence of drug abuse among students of Jamia Millia Islamia: A survey report. *Disabilities and Impairments* 1998;**12**:31–9.
- Amin G, Shah S, Vankar GK. The prevalence and recognition of depression in primary care. *Indian Journal of Psychiatry* 1998;**40**:364–9.
- Anand K. Assessment of burden and surveillance of major non-communicable diseases in India. New Delhi: World Health Organization (WHO), South East Asia Regional Office, Workshop document; 2000.
- Andrews G, Sanderson K, Slade T, Issakidis C. Why does the burden of disease persist? Relating the burden of anxiety and depression to effectiveness of treatment. *Bulletin of the World Health Organization* 2000;**78**:446–54.
- Astbury J. *The state of evidence: Gender disparities in mental health*. Geneva: WHO; 2000.
- Bagadia VN, Ayyar KS, Lakdawala PD, Susainathan U, Pradhan PV. Value of the General Health Questionnaire in detecting psychiatric morbidity in general hospital out-patient population. *Indian Journal of Psychiatry* 1985;**27**:293–6.
- Balodhi JP. Psychotherapy based on Hindu philosophy. *Journal of Personality and Clinical Studies* 1990;**6**:51–6.
- Banerjee G. Mental hospitals and healing practices in colonial India. 2002. Available from URL: [www.psyplexus.com](http://www.psyplexus.com) (accessed on 15 Sept 2004).
- Banerjee T, Mukherjee SP, Nandi DN, Banerjee G, Mukherjee A, Sen B, et al. Psychiatric morbidity in an urbanised tribal (Santhal) community: A field survey. *Indian Journal of Psychiatry* 1986;**28**:243–8.
- Bang AT, Bang RA. Community participation in research and action against alcoholism. *World Health Forum* 1991;**12**:104–9.
- Benegal V, Velayudhan, Jain S. The social cost of alcoholism (Karnataka). *NIMHANS Journal* 2000;**18**:67–76.
- Bhatia MS, Agarwal P, Rastogi V, Aseri AK, Malik SC. Psychiatric morbidity in patients attending surgery OPD. *Annals of National Academy of Medical Sciences (India)* 1989;**25**:331–6.
- Bhola P, Kapur M. Child and adolescent psychiatric epidemiology in India. *Indian Journal of Psychiatry* 2003;**45**:208–17.
- Bhugra D. Migration and mental health. *Acta Psychiatrica Scandinavica* 2004;**109**:243–8.
- Chandra V, Ganguli M, Pandav R, Johnston J, Belle S, Dekosky ST. Prevalence of Alzheimer's disease and other dementias in rural India: The Indo-US Study. *Neurology* 1998;**51**:1000–8.
- Chandran M, Tharyan P, Muliylil JP, Abraham S. Postpartum depression in a cohort of women from a rural area of Tamil Nadu, India—Incidence and risk factors. *British Journal of Psychiatry* 2002;**181**:499–504.
- Chandrashekar CR, Isaac MK. Development of psychiatric epidemiology in India. *NIMHANS Journal* 1999;**17**:297–306.
- Channabasavanna SM. Overview of epidemiology of drug abuse. In: Ray R, Pickens RW (eds). *Proceedings of the Indo-US Symposium on Alcohol and Drug Abuse*. Bangalore: National Institute of Mental Health and Neurosciences; 1989.
- Chaturvedi HK, Mahanta J. Socio-cultural diversity and substance use pattern in Arunachal Pradesh. *India Drug and Alcohol Dependence* 2004;**74**:97–104.
- Chisholm D, James S, Waddington C, Mubbashar M, Saeed K, Murthy SR, et al. *Community mental health care in low-income countries: Developing and demonstrating methods for economic analysis*. London: Institute of Psychiatry, King's College London (IOP-UK) Institute for Health Sector Development; 2000.
- District Mental Health Programme (DMHP), Thiruvananthapuram, Kerala (2004). Status report of DMHP Thiruvananthapuram, Kerala 2003–2004. Available from URL: <http://dmhp.org> (accessed on 24 Jan 2005).
- Dube KC, Kumar N, Dube S. Long term course and outcome of the Agra cases in the International Pilot Study of Schizophrenia. *Acta Psychiatrica Scandinavica* 1984;**44**:220–7.
- Dube KC. A study of prevalence and biosocial variables in mental illness in a rural and an urban community in Uttar Pradesh. *Acta Psychiatrica Scandinavica* 1970;**46**:327–59.
- Eisenberg L. Social psychiatry and the human genome: Contextualizing heritability. *British Journal of Psychiatry* 2004;**184**:101–3.
- Elnagar MN, Maitra P, Rao MN. Mental health in an Indian rural community. *British Journal of Psychiatry* 1971;**118**:499–503.
- Ferri C, Chisholm D, Ommeren MV, Prince M. Resource utilization for neuropsychiatric disorders in developing countries: A multinational Delphi consensus study. *Social Psychiatry and Psychiatric Epidemiology* 2004;**39**:218–27.
- Francisco A. *Mental and neurological health in the 10/90 report on health research 2003–2004*. Geneva: Global Forum for Health Research; 2004.
- Ganguli HC. Epidemiological finding on prevalence of mental disorders in India. *Indian Journal of Psychiatry* 2000;**42**:14–20.
- Gater R, de Almeida E, Sousa B, Barrientos G, Caraveo J, Chandrashekar CR, et al. The pathways to psychiatric care: A cross-cultural study. *Psychological Medicine* 1991;**21**:761–74.
- Goel DS, Agarwal SP, Icchpujani RL, Srivastava. Mental health 2003: The Indian scene. In: Agarwal SP (ed). *Mental health: An Indian perspective 1946–2003*. New Delhi: Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India; 2004.
- Gopinath PS. Epidemiology of mental illness in Indian village. Prevalence survey for mental illness and mental deficiency in Sakalawara (MD thesis), 1968.
- Gourie Devi M, Gururaj G, Satishchandra P, Subbukrishna DK. Prevalence of neurological disorders in Bangalore: A community-based study with a comparison between urban and rural areas. *Neuroepidemiology* 2004;**23**:261–8.
- Gourie Devi M, Gururaj G, Satishchandra P. Report of the National Workshop on Public Health Aspects of Epilepsy for Senior Personnel of State Health Departments in India. *Annals of the Indian Academy of Neurology* 1999;**2**:43–8.
- Government of India. *National human development report, 2001*. New Delhi: Government of India; 2002.
- Government of India. *Selected socio-economic statistics, India, 2002*. New Delhi: Central Statistical Organization, Ministry of Statistics and Programme Implementation, Government of India; 2004.
- Govindaswamy MV, Ramachandra Rao SK. Report of the work done on the 'Pilot studies on mental morbidity in selected parts of Mysore state' inquiry under Dr Govindaswamy up to the end of Sept 1958. *PRATIBHA—Journal of the All India Institute of Mental Health* 1959;**2**:32–42.
- Gupta SG, Sethi BB. Prevalence of mental retardation in Uttar Pradesh. *Indian Journal of Psychiatry* 1970;**12**:264–72.
- Gururaj G, Girish N, Benegal V. Psycho-social impact of alcohol—the hidden public health burden. Paper presented at the 31st Annual Conference of Indian Association of Preventive and Social Medicine, Chandigarh, 2004.

- Gururaj G, Girish N, Isaac MK. Mental, neurological and substance abuse disorders: Strategies towards a systems approach. Report submitted to the National Commission of Macroeconomics and Health. Ministry of Health and Family Welfare, Government of India, New Delhi, 2005.
- Gururaj G, Isaac MK, Girish N, Subbakrishna DK. Final report of the pilot study establishing health behaviour surveillance in respect of mental health. Report submitted to Ministry of Health and Family Welfare, Government of India and WHO India Country Office, New Delhi, 2004.
- Gururaj G, Isaac MK. Psychiatric epidemiology in India—moving beyond numbers. In: Agarwal SP (ed). *Mental health—an Indian perspective 1946–2003*. New Delhi: Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India; 2004.
- Gururaj G, Reddy GNN, Subbakrishna DK. Service utilization pattern in extension services of NIMHANS. *NIMHANS Journal* 1988;**6**:91.
- Halliburton M. Finding a fit: Psychiatry pluralism in south India and its implications for WHO studies of mental disorder. *Transcultural Psychiatry* 2004;**41**:80–98.
- Harding TW, Arango De MV, Baltazar J, Climent CE, Ibrahim HHA, Ladrado-Ignacio L, et al. Mental disorders in primary health care—a study of their frequency and diagnosis in four developing countries. *Psychological Medicine* 1980;**10**:231–41.
- Harrison G, Hopper K, Craig T, Laska E, Siegel C, Wanderling J. Recovery from psychotic illness: A 15- and 25-year international follow-up study. *British Journal of Psychiatry* 2001;**178**: 506–17.
- Hazarika NC, Biswas D, Phukan RK, Hazarika D, Mahanta J. Prevalence and pattern of substance abuse at Bhandarwewa, a border area of Assam and Arunachal. *Indian Journal of Psychiatry* 2000;**42**:262–66.
- Hyman SE. The genetics of mental illness: Implications for practice. *Bulletin of the World Health Organization* 2000;**78**:455–63.
- ICMR. Collaborative study on severe mental morbidity report. Indian Council of Medical Research and Department of Science and Technology, New Delhi, 1987.
- ICMR. Epidemiological study of child and adolescent psychiatric disorders in urban and rural areas, 2001. (Unpublished data)
- ICMR–CAR–CMH. Report of the longitudinal study of mental health problems in a primary health centre area. Bangalore, 1990 (mimeograph).
- ICMR–SOFACOS. Final report of the multi-centred collaborative study on factors associated with the course and outcome of schizophrenia. New Delhi: ICMR; 1988.
- ICMR–SOFPUC. Longitudinal study of functional psychosis in an urban community. New Delhi: ICMR; 1990.
- Indian Psychiatric Society. Task Force on clinical practice guidelines for psychiatrists in India. Draft proposals on clinical practice guidelines for psychiatrists in India presented at the National workshop, Jaipur 2004.
- Isaac MK. Contemporary trends of alcoholism in India. In: Grant M (ed). *Alcohol and emerging markets: Patterns, problems and responses*. Ann Arbor, USA: Taylor & Francis International Centre for Alcohol Policies; 1998:145–76.
- Isaac MK. A cost-effectiveness analysis of three different methods of psychiatric case finding in the general population. *British Journal of Psychiatry* 1980;**137**:540–6.
- Jablensky A. Schizophrenia. Recent epidemiologic issues. *Epidemiologic Reviews* 1995;**17**:10–20.
- Jacob KS. Community care for people with mental disorders in developing countries. *British Journal of Psychiatry* 2001;**178**: 296–8.
- Jha S, Patel R. Some observations on the spectrum of dementia. *Neurology India* 2004;**52**:213–14.
- Kapur M. Promotive and intervention strategies in the community. In: Kapur M et al. (eds). *Child mental health*. Proceedings of the Indo-US symposium. National Institute of Mental Health and Neuro Sciences, Bangalore, 1993.
- Kapur RL, Chandrashekar CR, Shamsundar C, Isaac MK, Parthasastry R, Shalini S. Extension of mental health services through psychiatric camps: A new approach. *Indian Journal of Psychiatry* 1982;**24**:237–41.
- Kessler RC. Psychiatric epidemiology: Selected recent advances and future directions. *Bulletin of the World Health Organization* 2000;**78**:464–74.
- Kiely M. The prevalence of mental retardation. *Epidemiologic Reviews* 1987;**9**:194–218.
- Kishore J, Reddaiah VP, Kapoor V, Gill JS. Characteristics of mental morbidity in a rural primary health centre of Haryana. *Indian Journal of Psychiatry* 1996;**38**:137–42.
- Lal B, Singh G. Alcohol consumption in Punjab. *Indian Journal of Psychiatry* 1978;**20**:217–25.
- Madhavan T. Childhood psychiatric epidemiology—community surveys. Workshop on research issues in psychiatric epidemiology in India, 1987 (unpublished).
- Marshall M, Gray A, Lockwood A, Green R. Case management for people with severe mental disorders. Cochrane review; 1997.
- Marshall M, Lockwood A. Assertive community treatment for people with severe mental disorders. Cochrane review; 1998.
- Mathai JP et al. Psychiatric practice through satellite units—Report of an experience. *Indian Journal of Psychological Medicine* 1984;**7**:66–72.
- Meena PK, Vohra AK. Prevalence and pattern of alcohol and substance abuse in urban areas of Rohtak city. *Indian Journal of Psychiatry* 2002;**44**:348–52.
- Mehta P, Joseph A, Verghese A. An epidemiologic study of psychiatric disorders in a rural area in Tamil Nadu. *Indian Journal of Psychiatry* 1985;**27**:153–8.
- Menon S. Psychosocial rehabilitation: Current trends. *NIMHANS Journal* 1996;**14**:295–305.
- Mitchell PB, Pavlavic DH. Lithium treatment for bipolar disorder. *Bulletin of the World Health Organization* 2000;**78**:515–17.
- Mohan D, Chopra A, Sethi H. A rapid assessment study on prevalence of substance abuse disorders in metropolis Delhi. *Indian Journal of Medical Research* 2001;**114**:107–14.
- Mohan D, Chopra A, Sethi H. Incidence estimates of substance use disorders in a cohort from Delhi, India. *Indian Journal of Medical Research* 2002;**115**:128–35.
- Mohan D, Desai NG, Chopra A, Sethi H. Rapid survey and substance abuse disorder in the urban slums of New Delhi. *Indian Journal of Medical Research* 1992;**96**:122–7.
- Mueser KT, McGurk SR. Seminar on schizophrenia. *Lancet* 2004;**363**:2063–72.
- Murthy RS, Kala R, Wig NN. Mentally ill in a rural community—some initial experiences in case identification and management. *Indian Journal of Psychiatry* 1978;**20**:143–7.
- Murthy RS. Disaster and mental health: Responses of mental health professionals. *Indian Journal of Social Work* 2000;**61**:675–92.
- Murthy RS. Integration of mental health with primary health care—Indian experience. In: Murthy RS, Burns BJ (eds). *Community mental health*. Proceedings of the Indo-US symposium. National Institute of Mental Health and Neurosciences, Bangalore, 1987b.
- Murthy RS. Integration of molecules and milieu: Towards an understanding of the mind. Souvenir of the 57th Annual National Conference of the Indian Psychiatric Society, 29 January–1 February 2005, Chandigarh.
- Murthy RS. Mental health in the new millennium: Research strategies for India. *Indian Journal of Medical Research* 2004;**120**:63–6.
- Murthy RS. Overview of psychiatric epidemiology in India. Workshop on research issues in psychiatric epidemiology in India, 1987a (unpublished).

- Murthy RS. *Schizophrenia. Country Report, India*. Bangalore: Department of Psychiatry, NIMHANS; 1999.
- Nambi SK, Prasad J, Singh D, Abraham V, Kuruvilla A, Jacob KS. Explanatory models and common mental disorders among patients with unexplained somatic symptoms attending a primary care facility in Tamil Nadu. *National Medical Journal of India* 2002;**15**:331–5.
- Nandi DN, Ajmany S, Ganguli H, Banerjee G, Boral GC, Ghosh A, *et al*. The incidence of mental disorders in one year in a rural community in West Bengal. *Indian Journal of Psychiatry* 1976;**18**:79–87.
- Nandi DN, Ajmany S, Ganguli H, Banerjee G. Psychiatric disorders in a rural community in West Bengal: An epidemiological study. *Indian Journal of Psychiatry* 1975;**17**:87–9.
- Nandi DN, Banerjee G, Chowdhury AN, Banerjee T, Boral GC, Biswajit S. Urbanisation and mental morbidity in certain tribal communities in West Bengal. *Indian Journal of Psychiatry* 1992;**34**:334–9.
- Nandi DN, Banerjee G, Boral GC, Ganguli H, Ajmany S, Ghosh A, *et al*. Socio-economic status and prevalence of mental disorders in certain rural communities in India. *Acta Psychiatrica Scandinavica* 1979;**59**:276–93.
- Nandi DN, Banerjee G, Ganguli H, Ajmany S, Boral GC, Ghosh A, *et al*. The natural history of mental disorders in a rural community—longitudinal study. *Indian Journal of Psychiatry* 1978;**21**:390–6.
- Nandi DN, Banerjee G, Mukherjee SP, Ghosh A, Nandi AS, Nandi S. Psychiatric morbidity of a rural Indian community—changes over a 20-year interval. *British Journal of Psychiatry* 2000;**176**:351–6.
- Nandi DN, Banerjee G, Mukherjee SP, Sarkar S, Boral GC, Mukherjee A, *et al*. A study of psychiatric morbidity of a rural community at an interval of 10 years. *Indian Journal of Psychiatry* 1986;**28**:179–94.
- Nandi PS. A study of psychiatric morbidity of the elderly population of a rural community in West Bengal. *Indian Journal of Psychiatry* 1997;**39**:122–9.
- NIMHANS. Evaluation of the district mental health programme. Report submitted to the Ministry of Health and Family Welfare, Government of India, 2004.
- NSSO. Disabled persons in India. New Delhi: NSSO, 58th round; July–December 2002; Report no 485, Government of India.
- NSSO. Morbidity and treatment of ailments. New Delhi: NSSO, 52nd round; November 1998.
- Padmavathi R, Rajkumar S, Narendra Kumar, Manoharan A, Kamath S. Prevalence of schizophrenia in an urban community in Madras. *Indian Journal of Psychiatry* 1987;**31**:233–9.
- Parkar SR, Dawani VS, Apte JS. History of psychiatry in India. *Journal of Postgraduate Medicine* 2001;**47**:73–6.
- Patel V, Kleinman A. Poverty and common mental disorders in developing countries. *Bulletin of the World Health Organization* 2003;**81**:609–15.
- Patel V, Marilyn R, D'Souza N. Gender poverty and postnatal depression: A study of mothers in Goa, India. *American Journal of Psychiatry* 2002;**40**:364–9.
- Patel V, Pereira J, Mann AH. Somatic and psychological models of common mental disorder in primary care in India. *Psychological Medicine* 1998;**28**:135–43.
- Peng FC. Is dementia a disease? *Gerontology* 2003;**49**:384–91.
- Ponnudurai R, Jayakar J, Raju B, Pattamuthu R. An epidemiological study of alcoholism. *Indian Journal of Psychiatry* 1991;**33**:176–9.
- Pothen M, Kuruvilla A, Philip K, Joseph A, Jacob KS. Common mental disorders among primary care attenders in Vellore, south India: Nature, prevalence and risk factors. *International Journal of Social Psychiatry* 2003;**49**:119–25.
- Prabhu GG, Raghuram A, Verma N, Maridass AC. Public attitudes toward mental illness: A review. *NIMHANS Journal* 1984;**2**:1–14.
- Prabhu GG. Child and adolescent mental health research in India: An overview. *NIMHANS Journal* 1987;**5**:79–87.
- Premarajan KC, Danabalan M, Chandrashekar R, Srinivasa DK. Prevalence of psychiatry morbidity in an urban community of Pondicherry. *Indian Journal of Psychiatry* 1993;**52**:99–102.
- Puri DK. Depression in general clinical practice—a diagnostic problem. *Journal of the Indian Medical Association* 1995;**93**:103–4.
- Rajkumar S, Kumar S, Thara R. Prevalence of dementia in a rural setting: A report from India. *International Journal of Geriatric Psychiatry* 1997;**12**:702–7.
- Rajkumar S, Padmavathi R, Thara R, Menon S. Incidence of schizophrenia in an urban community in Madras. *Indian Journal of Psychiatry* 1993;**35**:18–21.
- Rajkumar S. Epidemiology and cause of schizophrenia in India. In: Koslow *et al*. (eds). *Decade of brain. India/USA research in mental health and neurosciences*. Rockville, MD: US Department of Health and Human Services, National Institute of Mental Health; 1987:95–100.
- Rao V. Psychiatric morbidity in the aged. *Indian Journal of Medical Research* 1997;**106**:361–9.
- Reddy GNN, Channabasavanna SM, Devi GM, Prabhu GG, Shariff IA, Kalipernumal VG, *et al*. Extension of mental health services by satellite clinics as a model. *NIMHANS Journal* 1986; **4**:71–5.
- Reddy GNN. Innovations in neuropsychiatric services. *NIMHANS Journal* 1983;**1**:1–14.
- Reddy MV, Chandrashekar CR. Prevalence of mental and behavioral disorders in India: A meta-analysis. *Indian Journal of Psychiatry* 1998;**40**:149–57.
- Reddy PR, Murthy KK, Anand B. An interval study of mental morbidity in a south Indian rural community in 1981–91. *Indian Journal of Social Psychiatry* 1994;**10**:11–19.
- Rose S. Moving on from old dichotomies: Beyond nature–nurture towards a lifeline perspective. *British Journal of Psychiatry* 2001;**178**:S3–S7.
- Roth M. The diagnoses of dementia in late and middle age of life. In: Mortimer JA (ed). *The epidemiology of dementia*. Oxford: Oxford University Press; 1980.
- Sachdeva JS, Singh S, Sidhu BS, Goyal RKD, Singh J. An epidemiological study of psychiatric disorders in rural Faridkot (Punjab). *Indian Journal of Psychiatry* 1986;**28**:317–23.
- Satija DC, Khatri JS, Satija YK, Nathawat SS. A study of prevalence and patterns of drug abuse in industrial workers. *International Journal of Social Psychiatry* 1997;**13**:47–52.
- Sen B. Psychiatric phenomena in primary health care—their extent and nature. *Indian Journal of Psychiatry* 1987;**39**:200–7.
- Seshadri S. An overview of child psychiatric epidemiology in India. In: Kapur M, Kellam S, Tarker R, Wilson R (eds). *Child mental health*. Proceedings of the Indo–US symposium, National Institute of Mental Health and Neuro Sciences, Bangalore, and Alcohol, Drug Abuse and Mental Health Administration, USA. 1993; 61–5.
- Sethi BB, Gupta SC, Kumar R, Kumari P. A psychiatric survey of 500 rural families. *Indian Journal of Psychiatry* 1972;**14**:183–96.
- Sethi BB, Gupta SC. An epidemiological and cultural study of depression. Paper presented at the 22nd Annual Conference of Indian Psychiatric Society, Hyderabad, 1970.
- Sethi BB, Trivedi JK. Drug abuse in a rural population. *Indian Journal of Psychiatry* 1979;**21**:211–12.
- Shah VA, Goswami UA, Maniar RC, Hajariwala DC, Sinha BK. Prevalence of psychiatric disorders in Ahmedabad (an epidemiological study). *Indian Journal of Psychiatry* 1980; **22**:384–9.
- Shaji S, Promodu K, Abraham T, Roy KJ, Verghese A. An epidemiological study of dementia in a rural community in Kerala, India. *British Journal of Psychiatry* 1996;**168**:745–9.

- Shaji S, Verghese A, Promodu K, George B, Shibu VP. Prevalence of priority psychiatric disorders in a rural area of Kerala. *Indian Journal of Psychiatry* 1995;**37**:91–6.
- Sharma S, Singh MM. Prevalence of mental disorders: An epidemiological study in Goa. *Indian Journal of Psychiatry* 2001;**43**:118–26.
- Sharma V, Murthy S, Kumar K, Agarwal M, Wilkinson G. Comparison of people with schizophrenia from Liverpool, England and Sakalwara, Bangalore, India. *International Journal of Social Psychiatry* 1998;**44**:225–30.
- Shyamasundar C, Krishnamurthy S, Prakash O, Prabhakar N, Subbakrishna D. Psychiatric morbidity in a general practice in an Indian city. *British Medical Journal* 1986;**292**:1713–15.
- Srinath S, Girimaji SC. Epidemiology of child and adolescent mental health problems and mental retardation. *NIMHANS Journal* 1999;**17**:355–66.
- Sriram TG, Chandrashekar CR, Isaac MK, Murthy RS, Shanmugham V. Training primary care medical officers in mental care: An evaluation using a multiple-choice questionnaire. *Acta Psychiatrica Scandinavica* 1990;**81**:414–17.
- Surya NC, Datta SP, Krishna GR, Sundaram D, Kutty J. Mental morbidity in Pondicherry. *Transactions of the All India Institute of Mental Health* 1962;**5**:1–61.
- Thacore VR, Gupta SC, Suraiya M. Psychiatric morbidity in a north Indian community. *British Journal of Psychiatry* 1975;**126**:364–9.
- Thara R, Srinivasn L. Disabilities in schizophrenia. *Indian Journal of Psychiatry* 1998;**40**:331–7.
- Thara R. Focus of Psychiatry in India. *British Journal of Psychiatry* 2004a;**184**:366–73.
- Thara R. Twenty-year course of schizophrenia. The Madras longitudinal study. *Canadian Journal of Psychiatry* 2004b;**49**:564–9.
- United Nations and Government of India. The extent, pattern and trends of drug abuse in India – National Survey – 2004, Office of Drugs and Crime, United Nations and Ministry of Social Justice and Empowerment, Government of India, New Delhi, 2004.
- Varma VK, Singh A, Singh S, Malhotra A. Extent and pattern of alcohol use and alcohol related problems in North India. *Indian Journal of Psychiatry* 1980;**22**:331–7.
- Vas CJ, Pinto C, Panikker D, Noronha S, Deshpande N, Kulkarni L, et al. Prevalence of dementia in an urban Indian population. *International Psychogeriatrics* 2001;**13**:439–50.
- Verghese A, Beig A, Senseman LA, Rao SSS, Benjamin. A social and psychiatric study of a representative group of families in Vellore town. *Indian Journal Medical Research* 1973;**61**:608–20.
- Verma OP. Forty years after Bhole Committee. Dr BC Dasgupta memorial oration delivered at the 30th Annual Conference of the Indian Public Health Association, Calcutta, 1986.
- Vohra AK, Yadav BS, Khurana HA. Study of psychiatric co-morbidity in alcohol dependence. *Indian Journal of Psychiatry* 2003;**45**:247–50.
- Vyas JN, Ahuja N (eds). *Textbook of postgraduate psychiatry*. New Delhi: Jaypee Publishers; 1999:1–2.
- Walker E, Kestler L, Bollini A, Hochman KM. Schizophrenia: Course and etiology. *Annual Reviews in Psychiatry* 2004;**55**:401–30.
- WHO and Ministry of Health and Family Welfare, Government of India. Epidemiological study of mental disorders; ongoing multicentric study, 2003.
- WHO. 'Get high on alcohol without alcohol': *Prevention of harm from alcohol use*, New Delhi: WHO, SEARO; 2003.
- WHO. Child and adolescent mental health policies and plans: Mental Health Policy and service guidance package. Geneva: World Health Organization; 2005.
- WHO. *From prejudice to hope: Epilepsy out of the shadows*. New Delhi: World Health Organization, SEARO; 2001b.
- WHO. Schizophrenia: A multinational study: Public health paper No 63, World Health Organization, Geneva, 1975.
- WHO. *The world health report. Mental health: New understanding, new hope*. Geneva: World Health Organization; 2001.
- Wig NN, Murthy RS, Mani M, Arpan D. Psychiatric services through peripheral health centers. *Indian Journal of Psychiatry* 1980;**22**:311–16.
- Wig NN, Murthy RS. Collaboration in mental health programmes: Need and scope in India. *Indian Journal of Psychiatry* 1977;**19**:60–8.
- Wig NN, Vijoy KV, Mattoo SK, Behere PB, Misra AK, Srinivasa Murthy R, et al. An incidence study of schizophrenia in India. *Indian Journal of Psychiatry* 1993;**35**:27–39.

## Appendix 1

**Table A1.1** Prevalence rates of all mental disorders—combined rural and urban studies

Author and year	Place	Sample size	Screening instrument	Crude rate per 1000	Male rates	Female rates
Dube 1970	Agra	29,468	Prepared schedule	23.8 Rural: 18 Semi rural: 25 Urban: 25	15.8	33.3
Reddy et al. 1998	All India	33,572	NA	58.2 Urban: 79.1 Rural: 37.1	40.5	49.9
Ganguli 2000	All India	NA	NA	73 Urban: 73 Rural: 70.5	NM	NM
Sharma et al. 2000	Goa	4,022	Rapid Psychiatric Examination Schedule	60.2 Urban: 59 Rural: 61	85.7	35.6

NA: Not applicable; NM: not mentioned

**Table A1.2** Prevalence rates of all mental disorders—urban studies

Author and year	Place	Sample size	Screening instrument	Crude rate per 1000	Male rates	Female rates
Surya <i>et al.</i> 1962	Pondicherry	2,731	Symptom checklist	9.5	NA	NA
Verghese <i>et al.</i> 1973	Vellore	26,039	Mental Health item sheet	66.5	60	73
Thacore <i>et al.</i> 1975	Lucknow	2,696	Health questionnaire	81.6	85	78
Shah <i>et al.</i> 1980	Ahmedabad	2,712	58 question symptom checklist	47.2	39	56
Banerjee <i>et al.</i> 1986	West Bengal	771	4 schedules prepared	51.9	54	49.7
Gopinath 1988	Bangalore	423	Mental illness questionnaire	16.54	NA	NA
Premarajan <i>et al.</i> 1989	Pondicherry	1,115	Modified IPSS	99.4	85.3	113.9

NA: not available; IPSS: Indian Psychiatric Survey Schedule

**Table A1.3** Prevalence rates of all mental disorders—rural studies

Author and year	Place	Sample size	Screening instrument	Crude rate per 1000	Male rates	Female rates
Elnagar <i>et al.</i> 1971	Nasibpur village, Bengal	1,383	3 stage interview	27	36	19
Sethi and Gupta 1972	Lucknow	2,691	Questionnaire	39.4	50	23.5
Nandi <i>et al.</i> 1975	West Bengal	1,060	3 schedules prepared	103	91	115
Nandi <i>et al.</i> 1976	West Bengal	1,078	3 schedules prepared	108	101	114
Nandi <i>et al.</i> 1977	West Bengal	2,918	4 schedules prepared	58.3	57.5	59
Murthy <i>et al.</i> 1978	Haryana	2,500	Case vignettes	12.4	NM	NM
Nandi <i>et al.</i> 1978	West Bengal	1,259	3 schedules prepared	48	41	55
Nandi <i>et al.</i> 1979	West Bengal	3,718	4 schedules prepared	102	75.4	128.5
Mehta <i>et al.</i> 1985	Vellore	5,941	Symptoms in others of IPSS	14.5	16	13
Reddy <i>et al.</i> 1981	Andhra Pradesh	967	IPSS	59	52	67
Sachdeva <i>et al.</i> 1986	Faridkot	1,989	IPSS, symptoms in others	22	22	22.3
Nandi <i>et al.</i> 1986	West Bengal	1,539	4 schedules prepared	81.9	78.3	85.2
ICMR 1987	Calcutta	34,582	IPSS, symptoms in others	8.3	8.3	8.3
	Baroda	39,655	IPSS, symptoms in others	4.6	5.1	3.9
	Patiala	36,595	IPSS, symptoms in others	14.1	12.8	15.7
	Bangalore	35,548	IPSS, symptoms in others	11.1	12.8	9.3
Reddy <i>et al.</i> 1991	Andhra Pradesh	1,964	IPSS	58	47	70
Shaji <i>et al.</i> 1995	Ernakulam, Kerala	1,094	Symptoms in others, IPSS	14.6	12.3	16.87
Nandi <i>et al.</i> 2000	West Bengal	3,488	4 schedules prepared	105.2	73.5	138.3
Nandi <i>et al.</i> 2000	West Bengal	2,183	4 schedules prepared	116.8	86.9	146.8

IPSS: Indian Psychiatric Survey Schedule; NM: not mentioned