Psychiatric epidemiology in India

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Epidemiological studies report prevalence rates for psychiatric disorders from 9.5 to 370/1000 populations in India. This review critically evaluates the prevalence rate of mental disorders as reported in Indian epidemiological studies. Extensive search of PubMed, NeuroMed and MEDLARS using search terms “psychiatry” and “epidemiology” was done. Manual search of literature was also done. Retrieved articles were systematically selected using inclusion and exclusion criteria. Only sixteen prevalence studies fulfilled the study criteria. Most of the epidemiological studies done in India neglected anxiety disorders, substance dependence disorders, co-morbidity and dual diagnosis. The use of poor sensitive screening instruments, single informant and systematic under-reporting has added to the discrepancy in the prevalence rate.

The prevalence of mental disorders reported in epidemiological surveys can be considered lower estimates rather than accurate reflections of the true prevalence in the population. Researchers have focused on broad non-specific, non-modifiable risk factors, such as age, gender and social class. Future research focused on the general population, longitudinal (prospective), multi-centre, co-morbid studies, assessment of disability, functioning, family burden and quality of life studies involving a clinical service providing approach, is required.

Key words Epidemiology - mental health - prevalence - psychiatric disorders

Psychiatric epidemiology has gone through various stages of growth over the past five decades in India, starting from the first psychiatric epidemiological study by K.C. Dube¹, in 1961 at Agra, to the development of tools like the Present Status Examination (PSE)² and the Indian Psychiatric Survey Schedule (IPSS)³. A major advance in psychiatric epidemiology is the development of reliable and valid diagnostic interviews.

Many epidemiological studies conducted in India on mental and behavioural disorders report varying prevalence rates, ranging from 9.5⁴ to 370 per 1000 population⁵. These discrepancies are not specific to Indian studies but are also seen in international studies like the Epidemiological Catchment Area Program and the National Comorbidity Survey⁶,⁷. This discrepancy will impact planning, funding and health care delivery. Providing accurate data about the prevalence of mental disorders in the community would help to justify the allocation of scarce resources and planning of health services.
Psychiatric epidemiology lags behind other branches of epidemiology due to difficulties encountered in conceptualizing, diagnosing, defining a case, sampling, selecting an instrument, lack of resources and stigma. The descriptive epidemiological studies have undergone unprecedented growth in India, but at the same time advances with respect to cost-effective, analytical and prospective experimental epidemiological studies have been minimal. A major challenge for psychiatric epidemiologists is to increase the relevance of their research with regard to their counterparts in preventive psychiatry and to the policy makers. Researchers have expressed reservations about the comparison of various epidemiological studies because of methodological differences. However, at present one has to rely on available studies to generalise the findings. Hence this article attempts to critically evaluate the (overall) prevalence rate of psychiatric disorders as reported in epidemiological studies from India. This review also attempts to answer the following questions: (i) What are the reasons for wide variation in the prevalence rate in India; (ii) Is the prevalence rate of psychiatric disorders stable or changing? (iii) What is the cost of treating psychiatric patients?; and (iv) What should be the focus of future epidemiological studies?

Methodology

Extensive search was done of NeuroMed (1982-1997) and MEDLARS for published Indian psychiatric epidemiological studies. The search terms included "psychiatry" "prevalence", "community", and "epidemiology". Attempts were also made to retrieve Indian epidemiological studies published in international journals through PubMed using search terms "psychiatry" and "epidemiology". Extensive manual search of issues of the Indian Journal of Psychiatry, NIMHANS Journal (before 1982 and after 1997) and Indian Journal of Medical Research was also done. Cross-references of the psychiatric prevalence studies were also reviewed.

Inclusion criteria were: general population studies either urban, rural or mixed from India; community study design involving door-to-door/house-to-house enquiry of families and random sampling of families; inclusion of all psychiatric disorders or at least priority/major mental disorders. (Various researchers have used this term to assess schizophrenia, manic depressive psychosis, organic psychosis, epilepsy and mental retardation in the community); and covering all age groups.

Studies were excluded if those were: specific syndrome/illness/disorder studies; hospital or clinic based studies; and particular age group studies.

Only data published in scientific journals were considered because of logistic reasons. This is one of the main limitations of this review. Only 16 prevalence studies (Table I) fulfilled the inclusion criteria. However, an attempt was made to summarize other studies like high-risk/special population, cost-effective analysis, incidence, follow up and meta analysis separately to have a comprehensive picture of epidemiological studies till date.

Evaluation of prevalence in each study was done on the following parameters: definition of a “case”, screening and diagnostic instrument used, diagnostic break-up assessed, methods of arriving at the diagnosis, sampling method, location of study, general population/high risk population study and number of informants used to collect data.

What are the reasons for wide variations noted in the prevalence rates of psychiatric epidemiological studies?

Defining a case: Inherent limitations in defining clinical cases in epidemiological studies are: (i) the definition of mental disorder fails to provide a clear boundary between psychopathology and normality; (ii) the concepts “clinical significance” and “medical necessity” are difficult to operationalize and to assess reliably; and (iii) lay interviewers do not have the experience necessary to judge clinical significance. Defining a case was one of the factors which contributed to the huge variation in prevalence rate. If the threshold for defining a case is very low then prevalence rate will be very high. Earlier studies had difficulty in defining a case, when clear-cut diagnostic criteria were not available, but Indian researchers used a broader diagnostic classification such as psycho-neurotic, schizophrenia, epilepsy, depression, mental deficiency, miscellaneous group. Researchers have also used case definitions as per WHO technical report series no. 185, 1960, WHO International Classification of Diseases (ICD) (1965 R), Diagnostic and Statistical Manual of Mental Disorders (DSM) of American Psychiatric Association (APA)1968, and 1965 ICD for diagnosis.

The ‘presence of a disorder’ implies ‘need for treatment’ in a clinical population; however, in epidemiological studies these differ. For example, in
Indian culture, people suffering from social phobia are generally considered shy and it is not considered that they require treatment. To determine the presence of a disorder, the need for treatment, distress, dysfunction, disability and availability of resources need to be established\textsuperscript{6,28}. Indian researchers made attempts to overcome this difficulty by assessing the positive cases on screening by qualified psychiatrist(s) for final diagnosis by using their clinical judgment. However, minor mental disorders which could not be tapped on screening were missed. Considering the difficulty of defining a case and diagnosis, Indian researchers made all attempts to overcome them by assessing all positive cases on screening.

**Screening instruments:** The majority of the epidemiological studies considered two-phase sampling for assessing prevalence\textsuperscript{1,4,13,14,17}. The first step was to screen the population for mental illness using a screening instrument and the next step was to confirm diagnosis. Screening instruments can be self-reported, observer-rated, or based on information from an informant. Self-reported ratings are highly dependent on the cooperation of patients and their ability to understand either written or verbal instructions. Observer-based ratings can be time-consuming, and lay interviewers can misinterpret the severity and impact of the illness\textsuperscript{7,23}. Hence the use of self-reported and observer-rated tools was not possible in our population. The most common method used by Indian researchers was based on information from one or more informants.

Screening scales or instruments included exploratory questions, and symptoms or diagnostic checklists for screening the community for possible mental illness, with positive cases referred for more extensive evaluation. Psychosis becomes less and less common at greater distances from the hospital patient, and in the community the epidemiologist is faced with large numbers of respondents who present with fewer, minor and non-specific symptoms\textsuperscript{29}. Indian epidemiological studies were largely inadequate to tap the most non-psychotic disorders like panic disorder, social phobia, obsessive compulsive disorder, sexual

<table>
<thead>
<tr>
<th>Investigator</th>
<th>Year</th>
<th>Centre</th>
<th>Location</th>
<th>Sampling</th>
<th>Tool</th>
<th>Population</th>
<th>Prevalence/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surya\textsuperscript{a}</td>
<td>1964</td>
<td>Pondicherry</td>
<td>U</td>
<td>H-H</td>
<td>MHSQ(P)</td>
<td>2731</td>
<td>9.5</td>
</tr>
<tr>
<td>Sethi et al\textsuperscript{b}</td>
<td>1967</td>
<td>Lucknow</td>
<td>U</td>
<td>H-H</td>
<td>QAPF</td>
<td>1733</td>
<td>72.7</td>
</tr>
<tr>
<td>Dube\textsuperscript{c}</td>
<td>1970</td>
<td>Agra</td>
<td>M</td>
<td>H-H</td>
<td>DCP</td>
<td>29,468</td>
<td>18</td>
</tr>
<tr>
<td>Elangar et al\textsuperscript{d}</td>
<td>1971</td>
<td>Hoogly</td>
<td>R</td>
<td>H-H</td>
<td>CHM &amp; DCP(2)</td>
<td>1393</td>
<td>27</td>
</tr>
<tr>
<td>Sethi et al\textsuperscript{e}</td>
<td>1972</td>
<td>Lucknow</td>
<td>R</td>
<td>H-H</td>
<td>CHQ &amp; CHM</td>
<td>2691</td>
<td>39.4</td>
</tr>
<tr>
<td>Verghese et al\textsuperscript{f}</td>
<td>1973</td>
<td>Vellore</td>
<td>U</td>
<td>SRS</td>
<td>MHIS &amp; DCP as per ICD (1965)</td>
<td>1887</td>
<td>66.5</td>
</tr>
<tr>
<td>Sethi et al\textsuperscript{g}</td>
<td>1974</td>
<td>Lucknow</td>
<td>R</td>
<td>3SPS</td>
<td>PSQ &amp; DCP as per DSM-II (1968)</td>
<td>4481</td>
<td>67.0</td>
</tr>
<tr>
<td>Thacore et al\textsuperscript{h}</td>
<td>1975</td>
<td>Lucknow</td>
<td>U</td>
<td>H-H</td>
<td>PHQ &amp; DCP</td>
<td>1977</td>
<td>81.6</td>
</tr>
<tr>
<td>Nandi et al\textsuperscript{i}</td>
<td>1975</td>
<td>West Bengal</td>
<td>R</td>
<td>H-H</td>
<td>HS, QS &amp; CRS as per ICD (1965 R)</td>
<td>1060</td>
<td>102.8</td>
</tr>
<tr>
<td>Nandi et al\textsuperscript{j}</td>
<td>1979</td>
<td>West Bengal</td>
<td>R</td>
<td>H-H</td>
<td>HS, SESS, CDS &amp; CRS</td>
<td>3718</td>
<td>102</td>
</tr>
<tr>
<td>Shah et al\textsuperscript{k}</td>
<td>1980</td>
<td>Ahmedabad</td>
<td>U</td>
<td>H-H</td>
<td>MHSQ &amp; DCP</td>
<td>2712</td>
<td>47.2</td>
</tr>
<tr>
<td>Mehta et al\textsuperscript{l}</td>
<td>1985</td>
<td>Vellore</td>
<td>R</td>
<td>S-S</td>
<td>IPSS &amp; DCP</td>
<td>5941</td>
<td>14.5</td>
</tr>
<tr>
<td>Sachdeva et al\textsuperscript{m}</td>
<td>1986</td>
<td>Faridkot</td>
<td>R</td>
<td>H-H</td>
<td>HS, SESS &amp; CDS</td>
<td>1989</td>
<td>22.12</td>
</tr>
<tr>
<td>Premarajan et al\textsuperscript{n}</td>
<td>1993</td>
<td>Pondicherry</td>
<td>U</td>
<td>RS</td>
<td>IPSS &amp; DCP as per ICD-9R</td>
<td>1115</td>
<td>99.4</td>
</tr>
<tr>
<td>Shaji et al\textsuperscript{o}</td>
<td>1995</td>
<td>Erankulam</td>
<td>R</td>
<td>H-H</td>
<td>IPSS, SESS, CRS &amp; DCP, ICD-10</td>
<td>5284</td>
<td>14.57</td>
</tr>
<tr>
<td>Sharma et al\textsuperscript{p}</td>
<td>2001</td>
<td>Goa</td>
<td>M</td>
<td>SRS</td>
<td>RPES &amp; DCP as per ICD-9</td>
<td>4022</td>
<td>60.2</td>
</tr>
</tbody>
</table>

U- urban; R- rural; H-H- house to house survey; S-S – systematic sampling; SRS – stratified random sampling
3SPS- 3 stage probability sampling; RS- random sampling, ICD- international classification of diseases
DSM-II- diagnostic and statistical manual of mental disorders.

Tools:
- MHSQ= Mental health Screening Questionnaire,
- QAPF=Questionnaire for the assessment of psychiatric state of the family,
- DCP = Diagnosis confirmed by a psychiatrist(s)
- CHM = Case history method
- IPSS=Indian Psychiatric Survey Schedule
- MHIS=Mental health item sheet,
- PSQ=Psychiatric screening questionnaire
- PHQ=Psychiatric health questionnaire,
- HS=Household schedule
- CRS=Case record schedule,
- SESS=Socio-economic status schedule
- RPES= Rapid psychiatric examination schedule
dysfunctions, substance use etc., in the community. Earlier studies prepared their own screening questionnaire, which was applied to the entire population to be studied without testing their validity for high-risk populations such as the children, the elderly and substance users, thereby missing mental disorders during the initial screening. This was a major drawback of these studies, which might have led to under-reporting of mental disorders.

Issac and Kapur, in their study on cost-effective analysis of three different methods of psychiatric case finding in the general population, answered the difference in prevalence reported by various researchers. Comparison of cases in various diagnostic categories identified through screening by using questionnaires and confirming the diagnosis by a psychiatrist (Method-1) missed out on depression, possession disorder, neurotic disorders, somatisation disorder and substance dependence during the initial screening. This was later picked up by using the Indian Psychiatric Survey Schedule (IPSS), schedule in the general population (Method-2). Major mental disorders that were identified were almost similar with both methods. Cost-effective analysis of the above two methods revealed that using the IPSS was 10 times more expensive. This study clearly demonstrated the significant difference in prevalence rates: 76/1000 in method-1 and 344/1000 on method-2.

Determining which screening instrument should be selected must always follow an analysis of the underlying purpose of whether this instrument can be applied to the chosen sample and to all age groups. Sensitivity rather than the specificity of the screening instrument is very important in prevalence studies to avoid false negatives. However, further essential criteria in determining choice of the scale are, cultural relevance, validity, time available and the person who is to carry out the rating. Instruments such as the Self Reporting Questionnaire (SRQ) and General Health Questionnaire (GHQ) have been used successfully for screening purposes in epidemiological studies.

Informants: A family informant is one who reports about his/her illness as well as on other biological relatives. It takes 30 to 90 min to administer the screening instrument, depending on the size of the family and the presence of family illness. There is agreement that compared with direct interviews, the family history by one informant method underreports illness and using two or more informants can partially correct this problem. Utilizing data from multiple informants provides a more valid assessment of the disorder in studies related to mental health problems. However, in certain epidemiological studies, the investigators interviewed only the head of the family or the housewife or any other responsible family member for data collection. This will lead to responder bias since the chances of under-reporting symptoms of psychiatric disorders are very high especially for minor mental disorders. But whenever researchers assessed all the family members or used multiple informants to collect data, the prevalence rate was found to be twice that of the single informant method. This is one of the main reasons that can account for discrepancies in the psychiatric prevalence rate reported in India.

Sampling methods: Another important methodological issue is the sampling approach. In order to properly estimate the prevalence of mental disorders, it is essential to choose the sample in a manner that will accurately reflect the general population. Eighty per cent of researchers had used the house-to-house survey method. In the design of studies of people with mental disorders, it is necessary to consider the likelihood of not being able to access people who are hospitalized due to illness, homeless people, wandering

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**Table II. Special/high-risk population studies**

<table>
<thead>
<tr>
<th>Investigator group</th>
<th>Year</th>
<th>Centre</th>
<th>Location</th>
<th>Sampling</th>
<th>Tool</th>
<th>Population</th>
<th>Prevalence/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carstairs &amp; Kapur</td>
<td>1973</td>
<td>Kota</td>
<td>R</td>
<td>H-H</td>
<td>IPSS &amp; SFQ</td>
<td>1233</td>
<td>370</td>
</tr>
<tr>
<td>Nandi et al</td>
<td>1977</td>
<td>West Bengal</td>
<td>R</td>
<td>H-H</td>
<td>HS, QS &amp; CDS</td>
<td>2918</td>
<td>58.2</td>
</tr>
<tr>
<td>Nandi et al</td>
<td>1978</td>
<td>West Bengal</td>
<td>R</td>
<td>H-H</td>
<td>HS, QS &amp; CDS</td>
<td>1259</td>
<td>47.6</td>
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<tr>
<td>Nandi et al</td>
<td>1980</td>
<td>West Bengal</td>
<td>R</td>
<td>RS</td>
<td>HS, SESS, CDS &amp; CRS</td>
<td>4053</td>
<td>50.3</td>
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<tr>
<td>Nandi et al</td>
<td>1980</td>
<td>West Bengal</td>
<td>M</td>
<td>H-H</td>
<td>HS, SESS, CDS &amp; CRS</td>
<td>1862</td>
<td>129.9</td>
</tr>
<tr>
<td>Sen et al</td>
<td>1984</td>
<td>West Bengal</td>
<td>U</td>
<td>H-H</td>
<td>HS, SESS, CDS &amp; CRS</td>
<td>2168</td>
<td>48.7</td>
</tr>
<tr>
<td>Banerjee et al</td>
<td>1986</td>
<td>West Bengal</td>
<td>U</td>
<td>H-H</td>
<td>HS, SESS, CDS &amp; CRS</td>
<td>771</td>
<td>51.9</td>
</tr>
<tr>
<td>Nandi et al</td>
<td>1992</td>
<td>West Bengal</td>
<td>U</td>
<td>H-H</td>
<td>HS, SESS, CDS &amp; CRS</td>
<td>1424</td>
<td>47.75</td>
</tr>
</tbody>
</table>

Abbreviation: As given in the foot note of Table I
Research has clearly demonstrated the burden of mental disorders on individuals, families, communities and health services globally. If the impact of mental illness on the economy is assessed by combining all the costs like health care cost, loss of wages and patient/family costs, then the magnitude of the impact of mental illness becomes evident. Psychiatric illness has disabling consequences\(^4^9\). The contribution of Indian researchers towards the burden assessment schedule (BAS) is noteworthy\(^5^0\), and can be applied in future epidemiological studies.

**Systematic under-reporting**: A survey of an urban community in southern India, found that one-third of people with schizophrenia had never accessed any treatment resources\(^3^1\). Even after the diseased individuals and their families were offered treatment, a third of them remained untreated\(^5^2\). The important question remains as mental health professionals, how can we reduce this stigma against mental illness in the mind of the public? The question is important because how the public perceives mental illness will decide how our services will be utilized by the society\(^5^3\).

Mental disorders are highly stigmatized conditions that many people want to keep private because of their embarrassment or fear of discrimination\(^5^4\). In the case of patients seeking professional treatment, there is reason to believe that self-reports will be complete and honest. However, this is not the case in epidemiological surveys, where patients do not seek help. It is not surprising then that concerns have been raised that under-reporting is a very serious problem in surveys of this sort\(^5^5\). Even when clinicians carry out interviews, methodological research has shown that some respondents are less liable to disclose embarrassing information when they are aware that their interviewer is a mental health professional\(^5^6\). The problem of systematic under-reporting continues to be a major challenge for the future of psychiatric epidemiology in India.

**Is the prevalence rate of psychiatric disorders stable or changing?**

Does globalization (liberalization) play any role on the mental health of the individuals? Does changing family structure (joint family to nuclear) influence the psychiatric morbidity? Unfortunately we do not have any long-term epidemiological studies to answer these questions.

A 10 yr follow up study reported that there was not much change in the prevalence rates over a decade, so the question remains as mental health professionals, how can we reduce this stigma against mental illness in the mind of the public? The question is important because how the public perceives mental illness will decide how our services will be utilized by the society\(^5^3\).
(prevalence rate in 1972 was 84.9 and in 1982 it was 81.9)\textsuperscript{57}. This was further reinforced by the 20 yr follow up study, where prevalence rate in 1972 was 116.8 and in 1992 it was 105.2\textsuperscript{58} (Table III). These two studies are milestones in psychiatric epidemiology looking at the same population cross-sectionally at two points. Though the prevalence rate did not change, the morbidity pattern (affective illness had increased) changed significantly. However, researchers and policy makers should exercise caution before generalizing the findings to whole country. Reason being follow up studies had small sample size and were on rural population.

Adding to the existing unmet needs of mental health, changing health scenario in India has led to imminent epidemic of non communicable diseases along with the unmet agenda of controlling infectious diseases\textsuperscript{59}. Life style disease (like obesity and substance use) and stress can increase the risk of several leading causes of death like cardiovascular diseases, cancer, diabetes, metabolic and endocrine disorders among others. In the management of non communicable and life style diseases, mental health component plays a crucial role. Psychiatric co-morbidity is common in non communicable diseases and chronic medical conditions. This co-morbidity further adds to the prevalence of mental health disorders.

**What does the meta-analysis of epidemiological studies of psychiatric disorders report?**

A meta-analysis of 13 epidemiological studies consisting of 33,572 persons, who met the following criteria; door-to-door survey, all age groups included and prevalence rate for urban and rural being available\textsuperscript{60}, reported a total morbidity of 58.2 per 1000. Though meta-analysis has its own limitations, this was the first attempt to analyze the epidemiological studies. Another meta-analysis of 15 epidemiological studies reported a total morbidity of 73 per 1000\textsuperscript{61}. This study included 15 studies on the basis of having similar design which were conducted in three phase/steps. The difference noted in the two available meta-analyses was due to the methodology of selecting the papers for the analysis. Earlier study had a criterion of door to door survey, whereas the latter had a criteria of studies being conducted in three phases/steps.

**What do the international epidemiological studies report?**

NIMH-Epidemiological Catchment Area study\textsuperscript{62} of US reported psychiatric morbidity as follows: one month prevalence of 151/1000 population; life time prevalence of 322/1000 population; one year incidence of 60/1000 population. National Co-morbidity Study of US\textsuperscript{63} reported 12 months prevalence of 277/1000 population and life time prevalence of 487/1000 population. Compared to these studies it is clear that prevalence rates and incidence rates reported in India are very low. Possible reasons for this difference may be (i) Indian epidemiological studies did not adequately measure psychiatric morbidity; (ii) The psychiatric prevalence rates are truly low in India; and (iii) Combination of both the above factors. Available evidence supports the first possibility of the under-reporting by Indian epidemiological studies because of poor sensitivity of the screening instrument, high-risk populations (children and adolescents, elderly) were not assessed, neurotic disorders and substance use disorders were not assessed adequately, stigma and single informant method would have lead to under-reporting. However, the possibility of genuine low prevalence of psychiatric disorders in Indian population cannot be disregarded because of low rates of substance use in general population compared to western countries and good outcome of psychiatric disorders due to various factors like religious, cultural, social and family support. Answer to this question can be obtained through multi-centred studies involving various countries with prospective design using single/common research protocol.

**What is the economic cost of treating psychiatric patients?**

Macro-economic commission report of 2005\textsuperscript{64} considered prevalence rate of 65/1000 population

## Table III. Follow-up studies on prevalence of psychiatric disorders in India

<table>
<thead>
<tr>
<th>Investigator</th>
<th>Year</th>
<th>Centre</th>
<th>Location</th>
<th>Sampling Tool</th>
<th>Tool</th>
<th>Year</th>
<th>Population</th>
<th>Prevalence/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nandi et al\textsuperscript{57} (1972-1982)</td>
<td>1986</td>
<td>West Bengal</td>
<td>R</td>
<td>H-H</td>
<td>HS, SESS, CDS &amp; CRS</td>
<td>1972</td>
<td>1060</td>
<td>84.9</td>
</tr>
<tr>
<td>Nandi et al\textsuperscript{58} (1972-1992)</td>
<td>2000</td>
<td>West Bengal</td>
<td>R</td>
<td>H-H</td>
<td>HS, SESS, CDS, CRS &amp; DCP</td>
<td>1972</td>
<td>2183</td>
<td>116.8</td>
</tr>
</tbody>
</table>

Abbreviation- As given in the foot note of Table I
(average of two meta-analysis-60, 61) and projected the prevalence rate for next two decades. However, if we consider prevalence of individual mental disorder and add, the overall prevalence rate will be approximately 115-130/1000 population.

Even if we consider 65/1000 population as prevalence rate, then 6.5 crores populations require professional help. If each patient requires INR 300 per month for the treatment, the total cost required per month will be 1,950 crores INR and per year will be 23,400 crores INR. If we do not address this issue by investing in mental health, the indirect costs in terms of loss of wages by the patient, disability and then families facing social isolation, burden, stigma and psychological strain will be enormous.

**Discussion**

In majority of the studies the researchers were able to assess major mental disorders accurately, but minor mental disorders were not assessed adequately. Indian researchers made attempts to overcome the difficulty of diagnosis by assessing the positive cases on screening by qualified psychiatrist(s) for final diagnosis by using their clinical judgment and available diagnostic guidelines at that time, thus avoiding clinician bias in diagnosis.

Prevalence rates of psychiatric disorders not only vary across the populations, but also in the same population from time to time. In addition, weak agreement at the level of diagnosis and systematic under-reporting continue to threaten the credibility of estimates of prevalence65. Prevalence rates can vary markedely with screening instruments used, changes in the assessment questions used in community surveys, minor changes in diagnostic criteria (thresholds for defining mental disorders), number of informants, and sampling methodology24.

With the exception of one study1, all the past epidemiological studies have surveyed a population less than 6000. This raises a query whether the findings can be generalized to even one State in a country like India, which is well known for its geographical, linguistic and ethnic diversity. Mental health care priorities need to be shifted from psychotic disorders to common mental disorders like depression, anxiety disorders, somatoform disorder, etc., which are also associated with high disability in all measures69.

The available evidence suggests that though there has been no increase in prevalence rate of psychiatric disorders in the past few decades in India, the changing health scenario has led to imminent epidemic of non communicable diseases60 and psychiatric co-morbidity being common in non communicable diseases and chronic medical conditions provides indirect evidence of rise in psychiatric prevalence.

**Scope of the future epidemiological studies:** Most of the past epidemiological studies were descriptive in nature. Thus the future epidemiological studies should be more analytical and experimental. High-risk individuals (survivors of disaster, people suffering from chronic general medical conditions, the destitute and homeless) with modifiable risk factors need to be identified and included in the studies. The effects of modifying risk factors on prevalence rates have to be explored. Studies to document the impact of organizing mental health services and preventive strategies are required. There is a need to study the effect of global socio-economic policies like liberalization and privatization, the fast growth of information technology, life style changes and its impact on the mental health of individuals. The effectiveness of various techniques and programmes of stress management and life skill implementation on individuals also need to be included as a part of epidemiological studies.

These is a need to determine the quality of life, co-morbidity, disability and burden of various mental disorders66. Longitudinal/prospective (experimental) epidemiological studies need to be carried out in which the natural course of all the disorders in the community can be studied and modifiable risk factors are identified
and targeted for interventions. It is also vital to study the factors (barriers) affecting better service use, the role of culture and religion in help-seeking behaviours and modifying the identified factors, which may help in better delivery of mental health care at the community level. Mental health care priority also requires to be shifted from mental hospitals to primary health centres\(^5\). Systems need to be set up to carry out small area estimations for needs assessment and programme planning. Remaining challenges include the refinement of diagnostic categories and criteria and using accurate assessment tools for studying disorders of children, adolescents and the elderly in community surveys\(^8\). By applying valid instruments and proper sampling techniques, generalization of the results can be achieved. Systematic under-reporting in epidemiological surveys of mental disorders must be evaluated so that the accurate prevalence can be assessed. The translation of these estimates from the community to policy, however, is exactly what most critics challenge\(^6\).

As only two incidence studies\(^25,27\) are available (Table IV), there is a need to carry out more incidence studies in representative populations. Prevalence studies need to be repeated in a given area to evaluate the effectiveness of intervention programmes like the District Mental Health Programme, school or college mental health programmes, life skills programmes and other preventive programmes\(^6\).

**Conclusions**

Considering the facts of systematic under-reporting, collecting data from single informant, use of low sensitivity screening instruments, poor sampling methods, assessing only priority mental disorders and changing health scenario indicates that the prevalence of mental disorders as reported in Indian epidemiological surveys can be considered lower estimates rather than accurate reflections of the true prevalence in the population. This should be kept in mind especially for policy making and for mental health care planning. Mental health care priorities need to be shifted from psychotic disorders to common mental disorders and from mental hospitals to primary health centres. Future research needs to focus on the general population, longitudinal (prospective), multi-centre, co-morbid studies, assessment of disability, functioning, family burden and quality of life studies involving a clinical service providing approach.

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