

## PREVALENCE OF MENTAL AND BEHAVIOURAL DISORDERS IN INDIA : A META-ANALYSIS

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### ABSTRACT

*A meta-analysis of 13 psychiatric epidemiological studies consisting of 33572 persons in 6550 families yielded an estimate prevalence rate of 58.2 per thousand population. Organic psychosis (prevalence rate 0.4), schizophrenia (2.7), affective disorders (12.3) contributed a rate of 15.4 for psychoses. The prevalence rate for mental retardation (6.9), epilepsy (4.4), neurotic disorders (20.7), alcohol/drug addiction (6.9) and miscellaneous group (3.9) were estimated. Higher prevalence for urban sector, females, age group of 35-44, married/widowers/divorced, lower socioeconomic status, and nuclear family members were confirmed. Epilepsy and hysteria were found significantly high in rural communities. Manic affective psychosis, mental retardation, alcohol/drug addiction and personality disorders were significantly high in males. The findings indicated that there are 1.5 crore people suffering from severe mental disorders (psychoses) in India, and that severe diseases have higher representation at specialized as well as general hospital clinics. Among other things, the results aid in conducting morbidity surveys by more methodological approach.*

*Key Words : Meta-analysis, estimate prevalence rate, mental and behavioural disorders, biosocial correlates*

Many epidemiological studies on mental and behavioural disorders have been published by different workers from different states and union territories of India, but only a few have been based on door-to-door surveys and for all age groups. The prevalence rates reported in these studies varied greatly from 9.5 (Surya et al., 1964) to 130.0 (Nandi et al., 1980b) and their nature of biosocial correlates were inconsistent. The variation was not mainly due to the inadequate definition of a case and lack of uniformity in diagnostic classification used, but also due to wide variation in coverage of psychiatric conditions and types of study areas chosen. Based on a single study, it was difficult to base opinion on the prevalence and generalize biosocial correlates for a country such as India with divergent subcultures.

Moreover, the variance of binomial proportion could not stabilize for extreme values (Snedecor & Cochran, 1967). That is, for example the presence of a case of organic psychosis in a survey of one thousand persons yields a prevalence rate of 1.0 which is twice more than what is expected for the disorder. Hence an attempt has been made to combine the results of selected studies to arrive at a precise estimate of prevalence rates and to generalize their correlates with available biosocial variables. The techniques used for the systematic synthesis of results from many studies are usually referred to as meta-analysis (Glass et al., 1981; Hedges et al., 1985).

**Selection of studies :** The following inclusion criteria were laid down in selecting the studies

for the meta-analysis:

- a) The core of the design was a door-to-door enquiry of families as units and each individual member of the family separately
- b) Inclusion of severe psychiatric conditions and coverage of all age groups.
- c) Availability of separate prevalence reports for rural and urban sectors (in case of mixed studies), and for males and females for all included disorders.

After fulfilling the above cited criteria, only thirteen studies qualified for the analysis. The general information and prevalence rates reported in these studies are presented in Table 1. The studies covered a period from 1967 to 1995. Majority (seven) of the studies were conducted in the state of West Bengal (WB), two were in Uttar Pradesh (UP) and one each in Tamil Nadu (TN), Punjab, Kerala and the Union Territory of Pondicherry (Pondy). Eight (62%) studies were conducted in rural areas, three were in urban sector and two were in both rural and urban sectors. Three studies (Mehta et al., 1985; Premarajan et al., 1993; Shaji et al., 1995) were carried out only on priority psychiatric disorders.

**Study areas :** The studies adopted the following schemes of selection of study areas/sampling procedures depending on the purpose and scope of the studies. In the rural sector, the schemes included the selection of :

- a) a part of a village (Elnager et al., 1971)
- b) a single village (Nandi et al., 1975; Sachdeva et al., 1986)
- c) villages in two wards of a panchayat (Shaji et al., 1995)
- d) all families of three communities in clusters of small villages (Nandi et al., 1977; 1980a)
- e) a random sample of families from four villages (Sethi et al., 1972) and
- f) a random sample of 50% of families in eleven villages of a block (Mehta et al., 1985)

In the urban sector, the schemes included the selection of :

- a) a random sample of families from urban health centres (Sethi et al., 1967; Premarajan et al., 1993) and
- b) a slum locality in a metropolitan city (Sen et al., 1984). In the mixed sector, the scheme included the selection of :
- a) a sample of families of a forward community and a backward community in certain villages,

**TABLE 1**  
**GENERAL INFORMATION AND PREVALENCE RATES IN MENTAL MORBIDITY STUDIES INCLUDED FOR THE META-ANALYSIS**

Sl No.	Chief investigator	Year of report	State/ UT	Locality	Number of families	Number of persons	Average family size	Number of cases	Prevalence rate
1	Sethi	1967	UP	Urban	300	1733	5.8	126	72.7
2	Elnagar	1971	WB	Rural	184	1383	7.5	38	27.5
3	Sethi	1972	UP	Rural	500	2691	5.4	106	39.4
4	Nandi	1975	WB	Rural	177	1060	6.0	112	105.7
5	Nandi	1977	WB	Rural	590	2918	4.9	170	58.3
6	Nandi	1980a	WB	Rural	815	4053	5.0	204	50.3
7	Nandi	1980b	WB	Mixed	404	1862	4.6	242	130.0
8	Sen	1984	WB	Urban	337	2168	6.4	99	45.7
9	Mehta	1985	TN	Rural	1195	5941	5.0	86	14.5
10	Sachdeva	1986	Punjab	Rural	376	1989	5.3	75	37.7
11	Nandi	1992	WB	Mixed	353	1424	4.0	68	47.8
12	Premarajan	1993	Pondy	Urban	225	1115*	5.0	106	99.4
13	Shaji	1995	Kerala	Rural	1094	5284	4.8	82	15.5

\* Only 1066 were enumerated

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**TABLE 2  
PREVALENCE RATES OF MENTAL MORBIDITY AND BIOSOCIAL CORRELATES**

Variables	Sample size	Number of cases	Prevalence rate	Number of studies
<b>1. Locality</b>		1514	45.1	All
Rural		1009	37.1	
Urban		505	79.1**	
<b>2. Gender</b>		1514	45.1	All
Male		693	40.5	
Female		821	49.9**	
<b>3. Age (years)</b>		507	27.7	Five
0-14		125	21.4	
15-24		80	22.2	
25-34		85	30.1	
35-44		91	41.7**	
45-59		80	33.7	
60+		46	31.3	
<b>4. Marital status</b>		235	84.1	Two
Single		97	61.7	
Married		117	105.7*	
Widower/Divorced		21	185.8**	
<b>5. Educational level</b>		560	56.4	Six
Pre-school		3	6.3	
Illiterates		253	57.4	
Up to primary school		227	70.6**	
Up to High school		67	45.1	
Up to college		10	29.9	
<b>6. Occupation</b>		376	54.7	Four
Students		47	55.6	
Housewives		92	73.1**	
Business		3	18.0	
Labourers		31	91.4**	
Professionals		1	22.2	
All others		202	47.9	
<b>7. Monthly per capita income (1967-72)</b>		232	52.4	Two
Rs 0-100		141	48.3	
Rs 101-250		47	57.3	
Rs 251-500		37	76.8**	
Rs 500+		7	34.1	
<b>8. Socio-economic status</b>		121	18.6	Two
Lower		26	26.3*	
Lower middle		57	18.9	
Middle		31	12.1	
Upper middle		7	9.9	
Upper		+	+	
<b>9. Family structure</b>		276	43.0	Three
Nuclear		157	61.5**	
Joint		119	30.8	
<b>10. Family size</b>		192	22.2	Two
Up to 5 members		81	22.6	
Above 5 members		111	21.9	

\* p < 0.05

\*\* p < 0.01

+ No case in the subsample

and a sample of families of officers staying in their official quarters in a particular area of a city (Nandi et al., 1980b) and  
b) a sample of families of a tribal community migrated to an urban area and a sample of families of the same community lived in a cluster of villages (Nandi et al., 1992).

**Tools used :** In most of the studies, the study teams made preliminary contact and established rapport with the people. The design of the studies included the utility of several instruments in the surveys. The household schedules recorded the identification of families and biosocial particulars. As case identification schedule, several authors (Mehta et al., 1985; Sachdeva et al., 1986; Premarajan et al., 1993; Shaji et al., 1995) adopted a modified form of the symptoms in others - a questionnaire part of the Indian Psychiatric Survey Schedule (Kapur et al., 1974), while others constructed their own schedules according to the operational definition of a case given by the World Health Organization (WHO, 1960). The Case Record Schedule gave all relevant information regarding the cases detected and recorded the findings of the examination and final diagnoses. In one study (Shaji et al., 1995), case summaries were prepared in the field and independently evaluated by another psychiatrist and diagnosis were made independently by both the clinicians. In some studies, the socioeconomic status schedule developed by Pareek and Trivedi (1966) and standardized for use in rural India, and the Socio-Economic Status Schedule for urban population developed by Kuppaswamy (1976) were used.

**Characteristics of the sample :** The studies covered a total of 6550 families with 33572 persons, and thus 5.1 was the average family size. In the sample, 6385 (19%) persons were from urban sector. Children (below 15 years) constituted 34.2% and aged person (60 and above) constituted 7.2%. The sex-ratio was 961.

**Prevalence and biosocial correlates :** An attempt has been made to correlate the

prevalence rates with available biosocial variables as shown in table 2. The prevalence rates by locality and gender were based on all the studies, while for the remaining variables, the rates were calculated based on the studies in which the variables were included and reported. The rates by age were based on five studies that followed the uniform classification of age as that of the census reports of India.

Significantly higher prevalence rate has been observed for urban people as compared to rural people, and for females as compared to males. The morbidity increased gradually with age up to (35-44) age group and decreased thereafter. Widowers/divorced had significantly higher prevalence of psychiatric illness than those of married, and married people had significantly higher prevalence than those of singles. Pre-school children had lowest and illiterates had moderate rate of psychiatric morbidity. The highest morbidity was found among those who had up to primary school education and decreased with increase in education level. Significantly high prevalence was noted among labourers followed by housewives: the lowest prevalence was among businessmen followed by professionals. In the sample, lowest and highest income groups people had lower prevalence rate than the middle income group people. A trend that the morbidity rates decreased with increase in socioeconomic status was observed. Significantly high risk of mental morbidity for people of nuclear families was also observed.

**Estimate prevalence rates :** Sixteen mental and behavioural disorders classified into eight groups, viz: organic psychosis (denoted as OP), schizophrenia (Schi), manic affective psychosis (Man), manic depression (MD), endogenous depression (ED), mental retardation (MR), epilepsy (Epi), phobia (Phob), generalized anxiety (AN), neurotic depression (ND), obsession and compulsion (OC), hysteria (Hys), alcohol/drug addiction (AL), somatization (Som), personality disorders (PD) and behavioural/

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**TABLE 3  
PREVALENCE RATES OF MENTAL AND BEHAVIOURAL DISORDERS REPORTED IN  
STUDIES INCLUDED FOR THE META-ANALYSIS**

Chief investigator	Affective disorders						Neurosis					Miscellaneous				
	OP	Schi	Man	MD	ED	MR	Epi	Phob	AN	ND	OC	Hys	AL	Som	PD	BE
1. Sethi (1967)	-	2.3	-	-	1.7	22.5	1.2	1.2	17.9	5.2	1.2	4.0	#	0.6	1.7	13.2
2. Elnagar (1971)	-	4.4	-	-	2.9	1.4	4.4	-	-	-	1.4	13.0	#	#	#	
3. Sethi (1972)	0.4	1.1	-	0.7	-	25.3	2.2	-	3.0	1.5	-	2.2	#	-	1.5	1.5
4. Nandi (1975)	-	2.8	-	-	37.7	2.8	10.4	1.0	12.3	4.7	1.0	17.0	0.9	9.4	2.8	2.8
5. Nandi (1977)	-	2.4	1.4	-	14.4	7.2	3.1	3.4	1.7	1.0	2.4	4.1	16.1	-	-	1.0
6. Nandi (1980a)	-	2.2	1.5	-	17.3	8.7	3.2	4.4	1.7	0.7	3.0	6.0	-	-	-	0.7
7. Nandi (1980b)	-	5.4	4.3	10.7	30.8	-	5.4	27.4	17.7	3.8	21.5	3.2	#	#	#	#
8. Sen (1984)	-	5.5	-	0.9	17.5	5.1	3.2	1.4	1.9	3.2	0.5	4.6	#	-	-	1.8
9. Mehta (1985)	0.5	1.9	-	1.5	-	3.2	7.4	#	#	#	#	#	#	#	#	#
10. Sachdeva (1986)	2.0	2.0	-	13.1	-	2.5	2.5	#	#	#	#	#	15.6	#	#	#
11. Nandi (1992)	-	0.7	2.8	-	31.6	5.6	4.2	-	1.4	-	0.7	0.7	#	#	#	#
12. Premaranjan (1993)	-	1.9	-	15.0	-	4.7	0.9	-	13.1	24.4	-	1.9	25.3	-	1.9	10.3
13 Shaji (1995)	0.9	3.6	-	3.0	-	2.8	5.1	#	#	#	#	#	#	#	#	#
Weighted prevalence rate	0.4	2.7	0.7	2.7	6.9	6.9	4.4	4.2	5.8	3.1	3.1	4.5	6.9	0.6	0.6	2.7

-Nil # Not covered

emotional disorders (BE) were reported in the studies. The prevalence rates of the disorders reported in the studies are presented in table 3. It can be noted that schizophrenia and epilepsy were enumerated in all the studies, and that no consistent trend can be seen in the prevalence rates of any of the disorders during the period from 1967 to 1995. The estimate prevalence rate for a particular disorder was calculated based on those studies which covered the disorder as shown in the last row of the table.

The estimate prevalence rates for groups, viz; affective disorders, neuroses and miscellaneous (somatization, personality disorders and behavioural/emotional disorders) were obtained by adding the estimate prevalence rates for all the disorders included in the group as shown in table 4.

The estimate prevalence rate for organic psychosis was 0.4 (with 0.2 to 0.6 as 95% confidence interval), while it was 2.7 (2.2 to 3.3) for schizophrenia and 12.3 (11.1 to 13.5) for affective disorders. Mental retardation (6.9) and epilepsy (4.4) constituted a prevalence rate of 11.3 per thousand. Neurotic disorders constituted a rate of 20.7. The rate for alcohol/drug addiction was 6.9. The disorders in 'miscellaneous' group were enumerated only in seven studies which contributed a rate of 3.9 to the total prevalence rate of 58.2 (55.7 to 60.7) per thousand population.

Locality-wise distribution : The prevalence rates were estimated for rural and urban sectors separately as shown in table 5. The prevalence rate for rural sector was 48.9 and it was 80.6 for urban sector. Only epilepsy and

**TABLE 4**  
**ESTIMATE PREVALENCE RATES AND THEIR 95% CONFIDENCE INTERVAL OF MENTAL AND BEHAVIOURAL DISORDERS IN INDIA**

Diagnosis	Prevalence rates (95% Confidence Interval)
Organic psychosis	0.4 (0.2-0.6)
Schizophrenia	2.7 (2.2-3.3)
Affective disorders	12.3 (11.1-13.5)
Mania	0.7(0.4-1.0)
Manic depression	2.7(2.2-3.2)
Depression	8.9(7.9-9.9)
Mental retardation	6.9 (6.0-7.8)
Epilepsy	4.4 (3.7-5.1)
Neuroses	20.7 (18.7-22.7)
Phobia	4.2(3.3-5.1)
Anxiety	5.8(4.7-6.9)
Depression	3.1(2.4-3.8)
Obsession	3.1(2.4-3.8)
Hysteria	4.5(3.6-5.4)
Alcohol/drug addiction	6.9 (5.7-8.1)
Miscellaneous	3.9 (3.0-4.8)
Somatic complaints	0.6(0.2-1.0)
Personality disorders	0.6(0.2-1.0)
Behr./Emotional disorders	2.7(1.9-3.5)
All diagnosis	58.2 (55.7-60.7)

hysteria were significantly high in rural communities, while endogenous depression, mental retardation, all neurotic disorders (except hysteria) and behavioural/emotional disorders were significantly high in urban communities.

**Gender-wise distribution :** The prevalence rates were also worked out for males and females separately as shown in table 6. The prevalence rate for males was 51.9 and it was 64.8 for females. Manic affective psychosis, mental retardation, alcohol/drug addiction and personality disorders were significantly high in males, while organic psychosis, manic depression, endogenous depression and all neurotic disorders were significantly high among females.

**Age distribution :** Three studies (Sethi et al., 1967; 1972; Nandi et al., 1975) have reported age-groups for all included disorders. The mean presenting age and 95% confidence interval of ten disorders were calculated as shown in Figure 1. The mean presenting age of schizophrenia was less than that of the endogenous depression, while their age variations were in the reverse order.

## DISCUSSION AND CONCLUSION

Though the majority of the selected studies were carried out in only one state, the general characteristics of the sample such as age distribution, sex-ratio, average family size and proportion of urban sector indicated that the sample was a fair representation of Indian population during the period. The total prevalence rate of 58.2 obtained in the present analysis laid within the range of those reported in studies (Verghese et al., 1973; Thacore et al., 1975) which covered all psychiatric disorders.

Higher prevalence for urban sector, female gender, (35-44) age group, married/divorced/widowers, lower socioeconomic status people and people of nuclear families had general agreement with other studies (Dube 1970; Verghese et al., 1973; Sethi et al., 1974; Thacore et al., 1975; Shah et al., 1980) which were not included in the original analysis. However in one study (Thacore et al., 1975) the higher prevalence for males was reported and it was due to higher presentation of drug addicts. In another study (Shah et al., 1980), higher prevalence in the age group of 60 years and above was reported and it was due to low representation of the age group in the sample. In two studies (Dube, 1970; Shah et al., 1980), the families were compared instead of persons and the higher prevalence rates reported for joint families were due to the higher average family size of these families. Higher prevalence rates obtained for urban sector as well as for females (Table 2) had confirmation with their estimate rates calculated based on the studies

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**TABLE 6**  
**LOCALITY-WISE DISTRIBUTION OF PREVALENCE OF**  
**MENTAL AND BEHAVIOURAL DISORDERS**

Diagnosis	Prevalence rates	
	Rural	Urban
Organic psychosis	0.5	+
Schizophrenia	2.6	2.9
Affective disorders	11.0	17.9**
Mania	(0.6 0.8 )	
Manic depression	(2.7 3.0 )	
Depression	(7.7 14.1**)	
Mental retardation	6.4	6.9 *
Epilepsy	4.8 *	2.5
Neuroses	13.9	35.7**
Phobia	(2.4 8.0**)	
Anxiety	(3.1 11.6**)	
Depression	(1.1 7.7**)	
Obsession	(2.3 5.0**)	
Hysteria	(5.0* 3.4)	
Alcohol/drug addiction	7.3	5.8
Miscellaneous	2.4	6.9**
Somatic complaints	(0.8 0.2 )	
Personality disorders	(0.6 0.8 )	
Behr./Emotional disorders	(1.0 5.9**)	
All diagnosis	48.9	80.6**

\* p < 0.5 \*\* p < 0.01 + No case in the subsample

which covered the disorder.

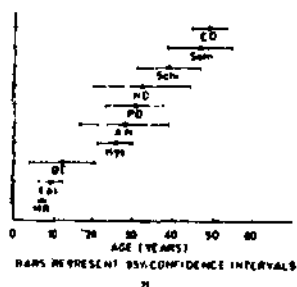
The estimate prevalence rate for organic psychosis was less when compared with those of other studies (Dube, 1970; Verghese et al., 1973). The rate of schizophrenia was around the values reported by these authors. The prevalence of affective disorders was more than four times that of the schizophrenia; endogenous depression was about twelve times more than that of manic affective psychosis. About 15 per thousand suffer from psychoses in general population. Including mental retardation and epilepsy, the rate of priority psychiatric disorders was about 27 per thousand. Among neurotic disorders, maximum prevalence was reported for anxiety followed by hysteria, phobia, depression and obsession.

The prevalence rate for urban sector was

more than one and half times that of the rural sector. The stress related disorders such as neurotic depression, anxiety neurosis and obsession contributed to this difference. Females were more prone to psychiatric disorders. However, the high representation of males in drug addiction narrowed that difference. Dube (1970) has reported mean presenting age of several psychiatric conditions such as 39.2 years for schizophrenia and 33.1 for hysteria as against 38.8 and 25.3 respectively reported in this report.

In the absence of inclusion of neurotic disorders and drug addiction in several studies, the estimate prevalence rate of 58.2 have several implications. Allowing an error of 20% of the prevalence rate (wishing to get the estimated prevalence rate between 46.6 and 69.8), and wishing that the estimate is correct in 95 out of 100 attempts, the optimum sample size required is 1554 persons (or 305 families) for a mental morbidity study.

FIGURE 1 MEAN PRESENTING AGE OF PSYCHIATRIC DISORDERS



The prevalence of psychiatric disorders is 58.2 per thousand means that there are about 5.7 crore people suffering from some sort of psychiatric disturbance. Out of this, 4 lakhs people have organic psychosis, 26 lakhs people have schizophrenic psychosis and 1.2 crore people have affective psychosis. Thus there are about 1.5 crore people suffering from severe mental disorders (psychoses) besides twelve thousand inpatients in government mental hospitals (Reddy et al., 1996) in the country.

Again the prevalence rate of 58.2 means that there are 1951 psychiatric disorders cases

in the present sample of 3372 persons. Out of this organic psychosis formed 0.7% against 5.2% in the general hospital clinic population (Reddy et al., 1995), functional psychoses formed 25.8% (against 44.6), neuroses formed 35.6% (against 31.8%) and mental retardation formed 11.8% (against 3.8%). These figures indicated that more serious disorders had more chance of getting treated in a general hospital clinics.

It is suggested to carry out meta-analysis procedures once in ten years based on increased number of published works to obtain the trends and pattern of psychiatric morbidity in the community. The investigators in future are suggested to follow uniform classification of biosocial variables and psychiatric conditions, and report separate prevalence rates for all

disorders with respect to all included variables. It is worth to include the age of onset variable in the surveys.

## ACKNOWLEDGMENTS

The authors are grateful to several investigators for their publications of various mental morbidity studies, and to Dr. S.M. Channabasavanna, Emeritus Professor of Psychiatry and former Director/Vice-Chancellor of NIMHANS Bangalore for his kind encouragement and useful suggestions.

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TABLE 6  
GENDER-WISE DISTRIBUTION OF PREVALENCE OF MENTAL AND BEHAVIOURAL DISORDERS

Diagnosis	Prevalence	
	Male	Female
Organic psychosis	0.2	0.6**
Schizophrenia	2.3	3.2
Affective disorders	9.1	15.6**
Mania (1.2* 0.1)		
Manic depression (2.3 3.2*)		
Depression (5.6 12.3**)		
Mental retardation	9.2**	4.5
Epilepsy	4.9	3.9
Neuroses	9.7	32.2**
Phobia (2.4 6.0**)		
Anxiety (3.2 8.4**)		
Depression (1.2 5.2**)		
Obsession (1.7 4.6**)		
Hysteria (1.2 8.0**)		
Alcohol/drug addiction	11.9**	1.7
Miscellaneous	4.6	3.1
Somatic complaints (0.7 0.4)		
Personality disorders (1.2* +)		
Behr./Emotional disorders (2.7 2.7)		
All diagnosis -	51.9	64.8**

\* p < 0.05 \*\* p < 0.01 + No case in the subsample



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