



## Prevalence of physical disability in rural population of district Mau of Uttar Pradesh, India during May 2007

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### ABSTRACT

An estimated 10% of the world's population experience some form of disability or impairment. It is now recognized that a disability can often be complicated by additional medical, psychological, or environmental factors. The occurrence of disability is high in developing countries. It is among the poorest communities and that poverty breeds disablement and disablement breeds poverty, a vicious cycle that the poor can least afford. Most of the impairments can be prevented if proper preventive and rehabilitative measures are undertaken in this respect.

Multistage sampling technique was used in this study. For determining target sample size Population Proportionate Sampling was used. In a family all the members who are normal residence of the village were taken for interview. Disability criteria of National Sample Survey (NSS) 2002 had been used. These criteria were based on functional limitation. However, mental disability was not included in the current study. Informed consent had been taken prior to the interview. The interview schedule was piloted, translated and re-translated in the local dialect for field use. Assessment of living standard of the study population had been done by Standard of Living Index (SLI). Data had been analyzed for rates and proportions and corresponding Chi-square values were calculated.

The study population included 2107 members residing in 285 families. Total prevalence was 19.46 per 1000. Locomotor disabilities were most prevalent (10.44 per 1000). Prevalence of physical disabilities among the ≥60 age group was highest (90.28 per 1000). Prevalence was higher in male (20.41 per 1000) as compared to female (18.46 per 1000). Prevalence among illiterate was higher (47.20 per 1000). Physical disability was found to be higher in illiterates and community having low and medium standard of living.

**Keywords:** Physical disability, Prevalence, SLI, NSS, Rehabilitation

### INTRODUCTION

There were major change in population structures and disease pattern in the last century. The proportion of elderly people in the population is increasing; this increase is due to the "demographic transition" which describes the shift from high fertility and high mortality, to low fertility and low mortality. The "epidemiological transition" describes the change from a predominance of infectious disease, with high maternal and child mortality to a predominance of chronic disease <sup>[1]</sup>.

An important effect of chronic disease is a limitation in functional abilities, or "disability".

An estimated 10% of the world's population experience some form of disability or impairment <sup>[2]</sup>. The number of people with disabilities is increasing due to population growth, ageing, emergence of chronic diseases and medical advances that preserve and prolong life. The most common causes of impairment and disability include chronic diseases such as diabetes,

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cardiovascular disease and cancer; injuries such as those due to road traffic crashes conflicts, falls, landmines, mental impairment, birth defects, malnutrition, HIV/AIDS and other communicable disease<sup>[2]</sup>.

Our average life expectancy has increased. Life expectancy at birth in India was 59.70 and 60.90 in 1991 whereas 61.80 and 63.50 in male and female respectively in 2003<sup>[3]</sup>. However, Healthy life expectancy at birth in India is 53.30 (male) and 53.60 (female) in 2002. As a part of this honorable legacy, an "epidemic of survival" is leading to substantial increase in the number of people live with disabilities<sup>[4]</sup>.

Although, the process of identifying the disabled person has not been made very strong, yet the sample surveys provide an indication of the magnitude of the challenge. It is now recognized that a disability can often be complicated by additional medical, psychological, or environmental factors<sup>[5,6]</sup>.

Low (estimated) prevalence leads to low awareness, i.e., "disability as a small minority problem," which further leads to low priority in government policy. The prevalence of persons with disabilities in European and North American countries has been around 10 to 15% of total population even in 1980s and early 90s. These figures may have become higher (around 20%) in recent years due to population aging and increase of disability awareness in these countries<sup>[7]</sup>.

The objectives of the study were to estimate the prevalence of physical disabilities in the community.

## MATERIALS AND METHODS

This Cross Sectional Observational study was conducted amongst rural population of *Mau* district in *Uttar Pradesh* during February 2007 to June 2007. *Mau* is the powerhouse of textile weavers in Eastern *Uttar Pradesh*. The main Industrial setup here is of cloth making by powerloom due to the presence of a large number of weavers in the district.

National Sample Survey Organization - 2002 showed the prevalence of disability 1.85 per cent in rural residents and 1.50 per cent in urban.

According to census - 2001 there are 2.19 crores persons with disabilities in India who constitute 2.13 per cent of the total population. On the basis of NSSO – 2002 and Census - 2001 a prevalence of 2 was taken for sample size calculation. With a 95% confidence coefficient and 30% allowable error the sample size was 2091 for this study.

Multistage sampling technique was used in this study. In the first stage 4 community development blocks out of total 9 blocks were selected by random number method in the *Mau* district. For determining target sample size for each block, Population Proportionate Sampling (PPS) was used. In the second stage one village was selected from the block wise list of villages by using random number table. In third stage the hamlets/*tolas* of the village were enlisted and numbered serially. From this list a hamlet/*tola* was selected first and where the eligible population was below the target sample size, another *tola* was added to it. All family beginning with the center of the *tola* was included for interview till the target sample size was achieved.

In a family all the members who are normal residence of the village were taken for interview. Informed consent had been taken prior to the interview. All the disabled subjects had been counseled and informed about the available health care services and rehabilitation. In case of female participant, interview was in the presence of another family members or peer. Informed consent had been taken prior to the interview.

Disability criteria of National Sample Survey (NSS) 2002 had been used. These criteria were based on functional limitation. However, mental disability was not included in the current study. The interview schedule was piloted, translated and re-translated in the local dialect for field use. Assessment of living standard of the study population had been done by Standard of Living Index (SLI). This scale was developed by NFHS and had been taken for the present study from *Economic and Political Weekly*<sup>[8]</sup>.

Data had been analyzed for rates and proportions and corresponding Chi-square values were calculated.

(3.80 per 1000) and speech disabilities (0.95 per 1000). (Table 1)

## RESULTS

Total prevalence of physical disabilities in study population was 19.46 per 1000. The most prevalent physical disability was locomotor disabilities (10.44 per 1000) followed by hearing (4.27 per 1000), visual

Table 1: Physical disability according to age and sex; n = 41

Age group	Population Studied No. (%)			Loco motor		Visual		Hearing		Speech		Total (%)	Prevalence per 1000
	M	F	Total	M	F	M	F	M	F	M	F		
0-15	400 (18.98)	359 (17.04)	759 (36.02)	3	2*	0	0	0	3	0	0	8 (19.51)	10.54
	Prevalence per 1000			7.5	5.57	0	0	0	8.36	0	0		
15-45	498 (23.64)	500 (23.73)	998 (47.37)	5	3	0	0	1	1	1 <sup>@</sup>	0	11 (26.83)	11.02
	Prevalence per 1000			10.04	6	0	0	2.01	2	2.01	0		
45-60	106 (5.03)	100 (4.75)	206 (9.78)	3	2	1	1	1	0	1	0	9 (21.95)	43.69
	Prevalence per 1000			28.3	20	9.43	10	9.43	0	9.43	0		
≥ 60	74 (3.51)	70 (3.32)	144 (6.83)	3	1	2	4	1	2	0	0	13 (31.71)	90.28
	Prevalence per 1000			40.54	14.29	27.03	57.14	13.51	28.57	0	0		
Total	1078 (51.16)	1029 (48.84)	2107 (100)	14	8	3	5	3	6	2	0	41 (100)	19.46
	Prevalence per 1000			12.99	7.77	2.78	4.86	2.78	5.83	1.94	0		

\*One locomotor disabled female had speech disability also

@One speech disabled male had deafness also

Medical causes account for 54.55% of locomotor disability. Accidents were responsible for 9.09% and CTEV (Congenital Talipes Equino Varus) were account for 36.36% of locomotor disability. Medical and accidents compositely account for 63.64% for locomotor disability. Amongst causes of hearing disability drug history and infections account for

33.33% each whereas accidents were responsible for 22.22% and senility were 11.11%. 75% of visual disability is due to cataract. In study population infections causes 25% of visual disability. All the speech disabilities among study population were congenital. (Table 2)

Table 2: Disability by cause

Locomotor disability by cause; n <sub>locomotor</sub> = 22; n = 41			
	Causes	No. (%)	% of total Disability
Medical	Paralysis (CVA)	7 (31.82)	17.07
	Post polio paralysis	2 (9.09)	4.88
	Post partum paralysis	1 (4.55)	2.44
	Post operative paralysis	1(4.55)	2.44
	Post T.B. Spine	1(4.55)	2.44
	Sub Total	12 (54.55)	29.27
Congenital	CTEV	8* (36.36)	19.51
Traumatic	Accident	2 (9.09)	4.88
<b>Total</b>		22 (100)	51.22
<i>*One locomotor disabled person had speech disability also</i>			
Hearing disability by cause; n <sub>hearing</sub> = 9; n = 41			
Drug History		3 (33.33)	7.32
Infection		3(33.33)	7.32
Accident		2 (22.22)	4.88
Senility		1(11.11)	2.44
<b>Total</b>		9 (99.99)	21.95
Visual disability by cause; n <sub>visual</sub> = 8; n = 41			
Cataract		6(75%)	14.63
Infection		2(25%)	4.88
<b>Total</b>		8	19.51
Speech disability by cause; n <sub>speech</sub> = 2; n = 41			
Congenital		2*(100)	4.88
<b>Total</b>		2 (100)	4.88
<i>*One speech disabled person had deafness also</i>			

24.39% physical disabilities were congenital. All the congenital disabilities were belonged to 36.36% of locomotor and 100% of speech categories. In 24.39% of cases onset were at the age of 60 and

above. Onset of disabilities during 0-15, 15-45 and 45-60 year of age were 19.51%, 14.63% and 17.07% respectively. Onset of all the visual disabilities was during  $\geq 45$  year of age. (Table 3)

Table 3: Age of onset of disability; n = 41

Age of onset of Disability	Locomotor	Visual	Hearing	Speech	Total (%)
Congenital	8*	0	0	2 <sup>@</sup>	10(24.39)
0-15	3	0	5	0	8(19.51)
15-45	5	0	1	0	6(14.63)
45-60	2	3	2	0	7(17.07)
$\geq 60$	4	5	1	0	10(24.39)
<b>Total</b>	<b>22</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>41(99.99)</b>
<i>*One locomotor disabled person had speech disability also</i>					
<i>@ One speech disabled person had deafness also</i>					

In the study population prevalence of physical disabilities among the  $\geq 60$  age group was highest (90.28 per 1000). However, in the age group of 15-45 years it was 11.02 per 1000. Prevalence of physical disability in the age below 15 year was 10.54 per 1000 and in the age group of 45-60 were 43.69 per 1000 population. (see Table 1)

Prevalence of physical disabilities was higher in male (20.41 per 1000) as compared to female (18.46 per 1000). Amongst disabled 53.66% were male however this difference was statistically not significant at 95% confidence interval.

In population having low standard of living index prevalence of physical disability was 18.51 per 1000 and population with high standard of living index prevalence were 11.55 per 1000 population. In population having medium standard of living index, prevalence of physical disabilities was highest i.e. 24.97 per 1000. Among the study population 75.61% of physically disabled belong to medium and high standard of living index but, statistically it was not significant at 95% confidence interval. (Table 4)

Table 4: Disability as per standard of living index (SLI); n=41

Standard of Living Index	Population Studied No. (%)	Locomotor	Visual	Hearing	Speech	Total (%)	Prevalence per 1000
Low	540 (25.63)	5	2	2	1	10(24.39)	18.51
Medium	961 (45.61)	13	5	6	0	24(58.54)	24.97
High	606 (28.76)	4*	1	1	1 <sup>@</sup>	7(17.07)	11.55
<b>Total</b>	<b>2107 (100)</b>	<b>22</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>41(100)</b>	<b>19.46</b>

\*One locomotor disabled person had speech disability also  
<sup>@</sup>One speech disabled person had deafness also

Prevalence of physical disability among schedule caste was 23.61 per 1000. Prevalence in other backward class and higher class were 17.24 and 15.38 per 1000 respectively. Composite prevalence

of physical disabilities among scheduled caste and other backward class was 20.38 per 1000. But 85.37% of disabled were scheduled caste and other backward class which was not statistically significant at 95% confidence interval. (Table 5)

Table 5: Distribution of disabled by caste; n=41

Caste	Population Studied No. (%)	Locomotor	Visual	Hearing	Speech	Total (%)	Prevalence per 1000
SC	847 (40.20)	12*	2	6	0	20 (48.78)	23.61
OBC	870 (41.29)	8	6	0	1	15 (36.59)	17.24
General	390 (18.51)	2	0	3	1 <sup>@</sup>	6 (14.63)	15.38
<b>Total</b>	<b>2107 (100)</b>	<b>22</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>41 (100)</b>	<b>19.46</b>

\*One locomotor disabled person had speech disability also,  
<sup>@</sup>One speech disabled person had deafness also

In joint family prevalence of physical disabilities were higher (23.00 per 1000) as compared to nuclear family (11.90 per 1000). 80.49% of disabled were living in joint family but statistically it was not

significant at 95% confidence interval. Amongst study population one of the joint families had two disabled person. (Table 6)

**Table 6: Disabilities as per type of the family; n=41**

Type of Family	Population Studied No. (%)	Locomotor	Visual	Hearing	Speech	Total (%)	Prevalence per 1000
<b>Nuclear</b>	672 (31.89)	2*	1	4	1	8(19.51)	<b>11.90</b>
<b>Joint</b>	1435 (68.11)	20	7	5	1 <sup>@</sup>	33(80.49)	<b>23.00</b>
<b>Total</b>	<b>2107 (100)</b>	<b>22</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>41(100)</b>	<b>19.46</b>

\*One locomotor disabled person had speech disability also  
<sup>@</sup>One speech disabled person had deafness also

Prevalence of physical disabilities among illiterate was 47.20 per 1000. In educational status up to primary levels (including illiterate) prevalence of physical disabilities was 26.76 per 1000. Amongst disabled 65.85% were illiterate or with primary level education. This difference was statistically significant at 95% confidence interval (Table 7).

Population who were not in any productive occupation had 40.52 per 1000 prevalence of physical disabilities which includes unemployed, less than 18 years of age and  $\geq 60$  years. Amongst disabled 85.37% were doing occupation other than agriculture; the difference was statistically not significant (CI 95%). (Table 8)

**Table 7: Disabilities as per educational status**

Educational Status	Population Studied No. (%)	Locomotor	Visual	Hearing	Speech	Total	Prevalence per 1000
<b>Not applicable (&lt; 7 year)</b>	402 (19.08)	4	0	2	0	6 (14.63)	<b>14.93</b>
<b>Illiterate</b>	572 (27.15)	12*	8	5	2 <sup>@</sup>	27 (65.85)	<b>47.20</b>
<b>Up to Primary</b>	437 (20.74)	0	0	0	0	0	<b>0</b>
<b>Illiterate and Up to Primary</b>	<b>1009 (47.89)</b>	<b>16</b>	<b>8</b>	<b>7</b>	<b>2</b>	<b>27 (65.85)</b>	<b>26.76</b>
<b>School level</b>	584 (27.72)	4	0	1	0	5 (12.20)	<b>8.56</b>
<b>Graduation and above</b>	112 (5.32)	2	0	1	0	3 (7.32)	<b>26.79</b>
<b>School and above</b>	<b>696</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>8 (19.51)</b>	<b>11.49</b>
<b>Total</b>	<b>2107 (100)</b>	<b>22</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>41 (100)</b>	<b>19.46</b>

\*One locomotor disabled person had speech disability also  
<sup>@</sup>One speech disabled person had deafness also

Table 8: Disability as per occupation; n = 41

Occupation		Population Studied	Locomotor	Visual	Hearing	Speech	Total	Prevalence per 1000
		No. (%)						
Agriculture		198 (9.40)	4	1	-	1	6 (14.63)	30.30
Labour/ skilled		30 (1.42)	0	0	0	0	0	0
Labour/ unskilled		125 (5.93)	0	0	1	0	1 (2.44)	8
Business		68 (3.23)	0	0	0	0	0	0
Pensioner		18 (0.85)	0	0	0	0	0	0
Service (Govt. and Pvt.)		73 (3.46)	1	0	1	0	2 (4.88)	27.40
House Wife		456 (21.64)	3	2	1	0	6 (14.63)	13.16
Student		522 (24.77)	1	0	0	0	1 (2.44)	1.92
in Not productive occupation	Unemployed (18-60 Year)	68(3.22)	4	0	1	2 <sup>@</sup>	6 (14.63)	88.24
	< 18 Year	472(22.40)	5*	0	3	0	8 (19.51)	16.95
	≥ 60 Year	77(3.65)	4	5	2	0	11 (26.83)	142.86
	<b>Sub Total</b>	<b>617(29.28)</b>	<b>13</b>	<b>5</b>	<b>6</b>	<b>2</b>	<b>25(60.97)</b>	<b>40.52</b>
<b>Total</b>		<b>2107 (100)</b>	<b>22</b>	<b>8</b>	<b>9</b>	<b>2</b>	<b>41 (100)</b>	<b>19.46</b>

\*One locomotor disabled person had speech disability also  
<sup>@</sup>One speech disabled person had deafness also

## DISCUSSION AND CONCLUSIONS

Total prevalence of physical disabilities in the present study was found to be 19.46 per 1000. Comparable rates were observed by NSSO 58<sup>th</sup> round, it found a prevalence of 18.5 per 1000 for rural residents [9]. According to Census 2001 figures, prevalence of disabilities in India was 2.13% of the total population that is 21.3 per thousand [10]. NSSO figures and Census 2001 figures included mental disability (11.34% and 10.33% respectively) in estimating disability prevalence. The intensive nature of the current survey and local high prevalence of disability could be the reason of this high value in the current study.

In the present study the Locomotor disability was found to be most common type of disability that is 53.66% of all disability. NSS 58<sup>th</sup> round 2002 also found the locomotor disability as most common type that is 57.51% [9]. Census 2001 reported locomotor disability as second most common type that is 27.87%.

Hearing disability was found to be second most common disability in the current study (21.95%). NSS 58<sup>th</sup> round 2002 also reported hearing disability as second most common type that at

16.56% [9]. Census 2001 reported hearing disability as least common type at 5.76%. In the Census 2001, a person who is able to hear, using hearing aid will not be considered as disabled. However, the NSS refers to a person's hearing ability without the use of hearing aid. This difference in the definition may explain the higher hearing disability prevalence estimates in the NSS compared to the census [11]. In the current study NSSO definition was used for hearing disability.

In the current study visual (19.51%) and speech disability (4.88%) were found to be 3<sup>rd</sup> and 4<sup>th</sup> common disability by relative ranking. NSS 58<sup>th</sup> round 2002 also showed same pattern that is visual (15.29%), speech (11.65%) [9]. Census 2001 reported visual disability as most common type of disability that is 48.55%. Speech disability was 7.49% in Census 2001. For visual disability, the census had a wider definition; and for speech disability NSS had wider definition [11].

In the present study medical causes were found to be responsible for 54.55% of locomotor disability. Medical causes included paralysis due to disease and other diseases. Post polio paralysis was found to be responsible for 9.09% of locomotor disability.

NSSO found polio to be the major reason for locomotor disability (30% in rural sector and 27% in urban). Injuries other than burns accounted for 26 to 27 per cent in their study<sup>[9]</sup>. The slump in polio cases and success of polio eradication program may be a reason for the difference.

Drug history and infections account for 33.33% each whereas accidents were responsible for 22.22% and senility were 11.11% as causes of hearing disability in the present study. In NSS 58<sup>th</sup> round, ear discharge and other illness were identified as the cause by a comparatively large proportion of persons with hearing disability<sup>[9]</sup>.

In the present study cataract was found to be main cause of visual disability its account for 75% of visual disability. 25% of visual disability was due to infections. Apart from the 'old age', 'cataract' happened to be one of the main causes of blindness – the percentage reporting the cause was about 21<sup>[9]</sup>.

All the speech disabilities found in the present study were congenital. Mittal et al. reported that 36 children had speech defects out of 372 children (9.67%). Stammering was commonest speech defect (61.11%) followed by substitution defect (25%), voice defect (11.11%) and distortion (2.77%)<sup>[12]</sup>.

In the present study prevalence of physical disabilities among the age group 60 and above was found to be highest (90.28 per 1000) and lowest in the age below 15 year (10.54 per 1000). Ghosh et al also reported that prevalence of disability was highest among the age group of 50 and above (26.5/1000) and was lowest among the under five (3.4/1000)<sup>[13]</sup>.

Prevalence of physical disabilities in current study was found to be higher in male (20.41 per 1000) than in female (18.46 per 1000). Yelurkar and Mazumdar reported that prevalence rate of physically handicapped were more in male (19.8 per 1000) as compared to female (13.6 per 1000)<sup>[14]</sup>.

The current study observed positive association between physical disability and educational status. In the present study prevalence of physical disabilities among illiterate was 47.20 per 1000. In

educational status up to primary levels (including illiterate) prevalence of physical disabilities was 26.76 per 1000. Amongst disabled 65.85% were illiterate or with primary level education. This difference was statistically significant at 95% confidence interval. Ghosh et al., Mathur et al. and NSS data support the observation<sup>[13, 15, 9]</sup>.

The current study also found positive association between standard of living index and physical disability. In the population having medium standard of living index, prevalence of physical disabilities was highest that is 24.97 per 1000 in the present study. In the current study 75.61% of physically disabled belong to medium and high standard of living index but, statistically it was not significant at 95% confidence interval. In the present study, population who were not in any productive occupation had 40.52 per 1000 prevalence of physical disabilities. Amongst disabled 85.37% were doing occupation other than agriculture; the difference was statistically not significant (CI 95%). Kumar et al. also reported 83.3% of all disability belonged to the lower class against 70.7% lower class population in the study<sup>[16]</sup>.

Physical disability was found to be higher in illiterates and community having low and medium standard of living. The occurrence of disability is high in developing countries. It is among the poorest communities and that poverty breeds disablement and disablement breeds poverty, a vicious cycle that the poor can least afford. The majority of people with disabilities find their situation affects their chances of going to school, working for a living, enjoying family life, and participating as equals in social life. Quality of life is compromised in the disabled person. The mortality and morbidity among disabled is much greater than normal.

The public health community has traditionally paid little attention to the health needs of people with disabilities. Public health has traditionally responded to emerging needs; people with disabilities are a group whose health needs should be targeted<sup>[4]</sup>. Most of the impairments can be prevented if proper preventive and rehabilitative measures are undertaken in this respect.

## LIMITATIONS

The study was questionnaire based. Medical examination and record analysis for the cases had not been done. Thus valuable data may have been lost due to the same, which could have been captured had all means of data collection been adopted. Precise measurement of disability had not been done in the present study. So this wouldn't give any estimate about severity or extent of physical disability. Quality of life in the disabled was not included in the study so there is a gap on how the disabled fare in Activities of Daily Living. Income and expenditure survey in the disabled were not included in the study so there is a gap regarding their dependency status.

**Authors' disclaimer:** The opinions expressed in this paper are those of the authors and may not reflect the position of their employing organizations

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