

Morbidity Among Urban Children in India Distinctions Between Slum and Non-slum Areas

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Introduction

Rapid and unplanned urbanization is a marked feature of Indian demography and poses many challenges for urban infrastructure, environment, health etc. Against this backdrop, the present study concentrates on illnesses such as diarrhoea, acute respiratory infection (ARI), anaemia and stunting among children living in slum and non-slum urban areas of metro cities in India. Moreover, the study will investigate the influence of various socio-economic and demographic factors in determining the acute and chronic health conditions of children. The underlying hypothesis is that low economic status and residence in slum areas play a vital role in determining the prevalence of infectious diseases and malnutrition among urban children.

Materials and Methods

Data

The present study is based on the National Family Health Survey (NFHS-3) 2005–06. The survey was conducted among 124,385 unmarried and married women of 15–49 years of age, residing in 109,041 households, by the International Institute of Population Sciences (IIPS). In addition, data on morbidity and other various health care indicators were collected from 48,679 living children of less than five years of age.

The study uses data from the slum and non-slum areas of eight cities: Chennai, Delhi, Hyderabad, Indore, Kolkata, Meerut, Mumbai and Nagpur. The prevalence of ARI, diarrhoea, anaemia, the nutritional and immunization status etc. was collected from a sample of 15,916 children who live in these cities. Among them, 9,258 live in non-slum areas and the rest in slum areas.

Study variables

Various determinants were collected:

- the age of children (categorized as 6–11, 11–23, 24–35 and 36 or more months),
- age of mother (categorized as less than 20, 20–30 and 30 or more years),
- sex of child,
- size of child at birth (categorized as less than average, average and greater than average),
- religion and caste (the two variables have been pooled together to form a single variable termed “forward caste Hindu”, “schedule caste and schedule tribe” and “other non-Hindu”),
- education of mother (illiterate, secondary completed and more than secondary),
- body mass index of mother (underweight, normal and overweight),
- work status of mother (working and not working),
- mass media exposure (yes or no)
- economic status (categorized as low, middle and high).

The variable “mass media exposure” was created from four variables, namely, “reads newspaper or magazine at least once a week”, “listens to radio at least once a week”, “watches television at least once a week”, and “visits the cinema or theatre at least once a month”. As information on household expenditure is not directly available, factor analysis scores of household consumer durable assets and landholding calculated by the NFHS-3 have been taken to determine economic status (for details see NFHS-3 all-India report). On the basis of this composite score, the (household) standard of living was divided into low, middle and high.

The “child’s health status” was defined through four variables, namely, “acute respiratory infection during the 15 days preceding the survey”, “diarrhoea during the 15 days preceding the survey”, “suffering from anaemia”, and “suffering from stunted growth”. All the four variables are dummy variables with the value 0 (Yes) or 1 (No). These four variables were added together to obtain an additive index for a “child health status”. The value of this variable ranges from 0 to 4, where 0 stands for the worst health situation of a child and 4 signifies that a child is free of these ailments.

Methods

In the present study, acute and chronic conditions among slum- and non-slum children were compared. The statistics were produced to demonstrate

the gross effect of demographic, social and economic factors on the prevalence of diseases among children with respect to their place of location. Multiple regressions models were employed to assess the effect of demographic, social and economic characteristics on a child's health status. Data were analysed using STATA Release 9.

Results

Sample characteristics

Table 1 presents the social and physical “background” that characterizes the children. Nearly 4 out of 7 urban children live in slums. More than two-fifths of the sample children belong to the age group of 36 months and above. More than one-fifth of the mothers interviewed are uneducated and more than two-fifths of the mothers belong to the “normal weight” category. A majority of the mothers (82 percent) did not work during the year preceding the survey.

The prevalence of acute and chronic diseases – by residence and income

It is clearly evident from Table 2(a) that slum children are at a significantly higher risk of, in particular, chronic conditions such as anaemia and undernutrition than their non-slum counterparts. 58.4 percent and 37.2 percent of slum children suffer from chronic conditions like iron deficiency anaemia (58 percent) and stunting (37 percent). Table 2(b) shows that the rate of chronic diseases among children from the low economic strata is elevated. In addition, even a substantial proportion of children of middle and upper income households suffer from anaemia and stunting.

TABLE 1: The social and health characteristics of 15,916 children selected from eight metro cities in India

Background characteristics	Percentage (%)
Child's age in months	
<6	8.8
6–11	10
11–23	19.4
24–35	20.4
36+	41.3
Mother's age in years	
<20	2.9
20–30	70
30+	27.1
Sex	
Male	53.5
Female	46.5
Size of the child at birth	
Below average	13
Average	63.9
Above average	23.2
Religion/Caste	
Forward caste Hindu	58.7
SC & ST Hindu	14.2
Non-Hindu	27.1
Mother's education	
Illiterate	21.1
Till secondary	50.2
Above secondary	28.7
Body mass index of mother	
Underweight	21.4
Normal weight	45.6
Overweight	33
Work status of mother	
Working	17.9
Not working	82.1
Mass media exposure	
No	12.1
Yes	87.9
Place of Location	
Slum	57.5
Non-slum	42.5

Source: NFHS-3, 2005–06.

TABLE 2(a): Percentage of children aged 0–59 months affected by acute respiratory infection, diarrhoea, any infection, anaemia and stunting by residence in urban India

Disease	Number of children	Slum (%)	Non slum (%)
Acute Respiratory Infection	15,239	7.3	6.7
Diarrhoea	15,268	7.2	6.6
Any infectious disease	15,220	12.8	12.2
Anaemia	9,850	58.5	54.1
Stunting	11,705	37.2	29.2

Source: NFHS-3, 2005–06.

Analysis of acute and chronic conditions by background characteristics

Table 3 shows that the prevalence of any infectious disease decreases with age. It also indicates that very young children (11–23 months) are more affected by anaemia and stunting than older children. Further, slum children are more likely to be affected by anaemia and stunting.

Equally, “low birth weight” children are more prone to acute and chronic diseases: again, this risk is higher for slum children. Among socioeconomic factors, it can be affirmed that non-slum children of forward caste Hindus are the least likely to be affected by any infectious diseases. Finally, the children belonging to the SC and ST communities show the highest prevalence of anaemia and stunting, while children belonging to “forward caste Hindus” are the least likely to be affected.

Interestingly enough, children of illiterate mothers as well as mothers not exposed to any mass media are less likely to report any infectious disease. Instead ailments increase with the increase in educational level and media exposure: less educated and non-exposed mothers are probably less likely to perceive the symptoms of infectious diseases due to their “ignorance”. However, as expected, children of illiterate mothers show a higher prevalence of anaemia and stunting and the proportion declines sharply as the educational level rises. Furthermore, children belonging to undernourished mothers are more likely to be affected by both acute and chronic diseases, of non-working mothers. From the same Table it can be observed that house-

TABLE 2(b): Percentage of children aged 0–59 months affected by acute respiratory infection, diarrhoea, any infection, anaemia and stunting by income group in urban India

Disease	Number of children	Low (%)	Middle (%)	High (%)
Acute Respiratory	15,239	7.7	6.3	6.9
Diarrhoea	15,268	7.8	7.2	5.5
Any infectious diseases	15,220	13.7	11.9	11.8
Anaemia	9,850	63	57.1	47.5
Stunting	11,705	43.4	32.8	21.4

Source: NFHS-3, 2005–06.

Note on Tables 2(a) and (b): Data on anaemia were collected for the children aged 6–59 months. Data on stunting were not available for 4,211 children because either their heights were not within a plausible limit or their age in days was out of the possible limits or data were missing for other reasons.

hold income has a significant correlation with the child's health status. It is interesting to note that the poorest slum children are seemingly less likely to suffer from any infectious disease! This under-reporting of ailments derives from the fact that mothers of slum-children are generally less educated and thus ignorant of the signs and symptoms of infectious diseases. However, this relationship does not hold for the children from non-slum areas. In the case of anaemia and stunting, children from the lowest economic strata are more likely than rich children, irrespective of residence, to be affected by chronic conditions.

TABLE 3: Acute and chronic diseases among children aged 6–59 months – by background characteristics and location

Background characteristics	Infectious disease		Anaemia		Stunting	
	Slum (%)	Non slum (%)	Slum (%)	Non slum (%)	Slum (%)	Non slum (%)
Total number of children	6,328	8,435	4,088	5,790	4,576	6,357
Percentage affected	791 (12.5)	1,029 (12.2)	2,391 (58.5)	3,133 (54.1)	1,788 (39.1)	1,951 (30.7)
Demographic variables						
Child's age (months)						
6–11	22.1	20.6	63.3	66.2	20.3	14.3
11–23	17.2	14.3	75.4	67.2	50.4	42.1
24–35	12.2	12.3	64.4	57.7	37.6	29.1
36+	8.5	8.8	46.8	43.6	38.3	30.6
Mother's age (years)						
<20	27.4	24	60.8	57.4	35.9	36.5
20–30	12.2	11.9	60.9	54.8	41.7	32.4
30+	11.3	12.1	51.3	52.2	31.6	26.3
Sex						
Male	12.7	12.1	58.9	53.5	38.2	28.9
Female	12.3	12.3	57.9	54.8	40.1	32.7
Size of the child at birth						
< Average	20.1	17	59.2	56.7	50.1	45.5
Average	12.4	11.3	58	52.4	37.8	30.2
> Average	8.4	12.3	57.4	52.2	35.9	23.4
Socio-economic variables						
Religion/Caste						
Forward Caste Hindu	13.4	11.6	54.3	51.6	36.9	27.8
SC & ST Hindu	13.4	13.4	72.4	63.4	45.5	41.7
Non-Hindu	10.7	13.1	57.9	54.1	40	33
Maternal education						
Illiterate	9.7	11.6	68.1	61.3	53.9	47.6
Till secondary	13.3	13.4	55.1	56.9	37.7	33.2
Above secondary	14	13.1	56.5	47.4	21.8	20.5

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Body mass index of mother						
Underweight	19.1	15.3	59.7	63.4	48	36.6
Normal weight	11.8	12.3	59.4	53.5	40.3	34.2
Overweight	11.2	11.4	56.7	49.9	29.5	22.5
Work status of mother						
Working	15.3	13	59.3	56.3	43.8	33.8
Not working	11.8	12	58.3	53.6	37.9	30
Mass media exposure						
No	11.4	14.2	64	64.8	55.1	44.2
Yes	12.7	12	57.7	53	36.8	29.2
Income group						
Low	11.4	15.8	62	64.1	43.8	47.8
Middle	13.5	9.9	55.7	58.3	39	30.1
High	13	11.9	55.7	45.3	26.9	21.4

Source: Calculated from NFHS-3, 2005–06.

Note: The bivariate analyses of the above table have been restricted to children aged 6–59 months since the prevalence of anaemia was available only for the children of more than six months of age. For this reason, the total number of observations has been reduced from 15,220 to 14,763 for any infectious disease (either diarrhoea or ARI) and from 11,705 to 10,933 for stunting.

Econometric Analysis

Table 4 demonstrates that age has a significant impact on the health status of children. The size of a child at birth (birth weight) has a substantial influence on the child's health. As size increases (i.e. higher birth weight), the child is more likely to have an improved health condition ($B=0.268$, 95% $CI=0.212, 0.323$). Similarly the religion/caste of the children has a substantial influence on their health. Upper caste Hindu children are less likely to be affected by diseases than untouchables and non-Hindus ($B=-0.220$, 95% $CI=-0.27, -0.16$ for SC and ST, $B=-0.065$, 95% $CI=-0.109, 0.021$ for non-Hindu). Children with educated mothers are less likely to be affected by any ailment than those of uneducated mothers, ($B=0.164$, 95% $CI=0.112, 0.216$ for till secondary, $B=0.242$, 95% $CI=0.178, 0.307$ for above secondary). Children of normal or overweight mothers are less likely to suffer from diseases than children of underweight mothers ($B=0.086$, 95% $CI=0.037, 0.134$ for normal weight, $B=0.109$, 95% $CI=0.056, 0.162$ for overweight). Children of working mothers are more likely to fall ill than children of non-working mothers ($B=0.121$, 95% $CI=0.069, 0.173$). Children of affluent households are at a significantly lower risk of diseases

than children of poor households ($B=0.105$, 95% CI=0.057, 0.152 for middle, $B=0.201$, 95% CI=0.144, 0.260 for high). Slum children are significantly more susceptible to diseases ($B=-0.046$, 95% CI=-0.084,-0.007).

TABLE 4: Result of multiple regression models of the child health status by background characteristics in urban India (based on 7,394 children)

Background characteristics	Coefficient	Significance level	95% confidence interval
Demographic variables			
Child's age (months)	.011	0.000	(.010, .012)
Mother's age (years)			
<20 (ref.)			
20-30	-.049	0.432	(-.171, .073)
30+	.001	0.998	(-.127, .127)
Sex			
Male (ref.)			
Female	-.006	0.739	(-.042, .030)
Size of the child at birth			
< Average (ref.)			
Average	.268	0.000	(.212, .323)
> Average	.392	0.000	(.329, .455)
Socio-economic variables			
Religion/Caste			
Forward caste Hindu (ref.)			
SC & ST Hindu	-.220	0.000	(-.274, -.167)
Non-Hindu	-.065	0.004	(-.109, .021)
Maternal education			
Illiterate (ref.)			
Till secondary	.164	0.000	(.113, .216)
Above secondary	.242	0.000	(.177, .307)
Body mass index of mother			
Underweight (ref.)			
Normal weight	.086	0.001	(.037, .134)
Overweight	.109	0.000	(.056, .162)
Work status of mother			
Not working (ref.)			
Working	-.121	0.000	(-.169, -.074)

(continued)

(continued)

Mass media exposure			
No (ref.)			
Yes	.024	0.480	(-.042, .090)
Wealth quintile			
Low (ref.)			
Middle	.105	0.000	(.057, .152)
High	.202	0.000	(.144, .260)
Location of residence			
Non-slum (ref.)			
Slum	-.046	0.020	(-.084, -.007)
Constant	2.128		

Source: Calculated from NFHS-3, 2005–06.

Discussion

The multiple regression analysis clearly shows that several demographic and socioeconomic factors significantly influence a child's health (Ghosh 2005; Pandey et al. 1998). Location (i.e. slum and non-slum) and the household income were the most important influences on the health of children (Table 4).

Though the role of income-related factors in child health and child survival is complex, our findings clearly indicate that household income plays a significant role in combating acute and chronic conditions during childhood. A higher living standard ensures better nutrition and healthcare for children and significantly reduces the risk of disease. The present study outlines the sharp disparities in the health of children that exist between the urban poor and the affluent in the large cities. Sen & Himanshu (2004) and Himanshu (2007) have found that economic inequality has been increasing between rich and poor, especially in urban areas. Other research studies have identified additional threats to a child's survival and wellbeing among the urban poor: low birth-weight, malnutrition, and exposure to pathogens in slum areas (Awasthi & Agarwal 2003). Although adequate nutrition is critical for the wellbeing of children (Walker et al. 2007; Das & Ghosh 2009), the findings of the present study show that poor city children are more susceptible to long-term undernourishment (as measured by stunting) and iron deficiency anaemia (Agarwal & Srivastava 2009). Moreover, the higher purchasing power of the rich drives up the prices of food, medicine and healthcare, making them unaffordable for the poor (Madhiwalla 2007). Therefore, the public distribution system for providing foodgrains to the poor and food-for-work programs must be strengthened in slum areas.

In the present study it has been found that, in addition to residence and living condition, there are several other factors affecting health: child's age, birth weight, maternal education and work; a mother's nutritional status, religion and caste membership etc.

It may be noted that although there was little difference between urban poor and non-poor children in the prevalence of infectious diseases (or acute conditions), there was a distinct disparity regarding the prevalence of chronic conditions such as stunting and anaemia. This was also noted by Agarwal & Srivastava 2009.

The prevalence of chronic conditions among children, as found in the NFHS, may not represent the actual scenario prevalent among urban children since these diseases always show seasonal variation. There are some other limitations too. First, during the survey, except for anaemia and stunting, the children were not clinically examined and the mothers were not given a precise definition of what constituted an episode of diarrhoea or ARI. The questions which were asked in the survey measure a mother's perception of her child's health rather the disease according to the clinical profile. This has been termed by other researchers as 'self-professed illness measurement' (Murray & Chen 1994; Ghosh 2005). This may create variations in the reporting of illnesses among different socioeconomic groups because the perception of illness varies across different socioeconomic groups. Secondly, forgetfulness as well as a misinterpretation of the reference period can also contribute to the measurement of disease frequency (Ghosh 2005; Gaminiratne 1991). An alternative explanation is advanced by the theory of "Positional Objectivity" (Sen 1993). It states that "What we decide to believe is influenced by what we observe" (Sen 1993: 145). However, data regarding chronic conditions such as stunting and anaemia were clinically measured and are obviously more accurate.

Our findings suggest that there is a pressing need for targeted interventions for the benefit of the urban poor, in general, and for poor urban women and children, in particular. Thus the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), launched in 2005 by the Government of India, needs to be strengthened. Although the Mission has a "Sub-Mission" for providing basic services to the urban poor, anecdotal evidence suggests poor results (Datta Dey et al. 2006). Additionally, the Integrated Child Development Services (ICDS) (a comprehensive programme for the nutritional needs and the general well-being among children organized by UNICEF and the Government of India) needs to be extended to the urban poor children. It was reported in 2003 that only six percent of the total sanctioned ICDS blocks were located in urban slum areas (Parliament of India 2003). This indicates that a considerable proportion of urban slum

children are debarred from ICDS intervention, which provides nutritional inputs and pre-school education (Ghosh & Das 2011). Some of the evaluation studies have also shown that the presence of an ICDS centre in a slum contributes to better nutrition and a lower infant mortality rate (Department of Family Welfare, Govt. of Uttar Pradesh 2004).

The analysis shows that low education contributes to acute and chronic ailments among children. It is thus essential to convey appropriate health and nutrition messages to the urban poor. Providing training to slum-based health volunteers or community-based organizations (CBOs) has been found to be an important strategy for improving the health of the urban poor (UHRC 2006). These volunteers can promote health awareness, stimulate demand and form a bridge between the population and service providers. It is also important to point out that the urban poor comprise to a large extent disadvantaged caste groups, who suffer from discrimination and economic vulnerability. Organizing the urban poor communities into groups can enable them to collectively demand essential services and enforce public action (Agarwal & Srivastava 2009; Agarwal et al. 2005).

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