

GIDR WORKING PAPER SERIES

No. 252 : December 2018

**Health Vulnerabilities among Children in
the Age Group of 0-5:
An Analysis of the Data from the
NSS 71st Round**

**N. Lalitha
Biplab Dhak**



**Gujarat
Institute of
Development
Research**

Working Paper No. 252

**Health Vulnerabilities among Children in
the Age Group of 0-5:
An Analysis of the Data from the
NSS 71st Round**

**N. Lalitha
Biplab Dhak**

December 2018

**Gujarat Institute of Development Research
Gota, Ahmedabad 380 060**

Abstracts of all GIDR Working Papers are available on the Institute's website. Working Paper No 121 onwards can be downloaded from the site.

All rights are reserved. This publication may be used with proper citation and due acknowledgement to the author(s) and the Gujarat Institute of Development Research, Ahmedabad.

© Gujarat Institute of Development Research

First Published December 2018

Price Rs. 100.00

Abstract

This paper discusses health vulnerabilities of children in general followed by an analysis of data regarding health scenario of children below five years of age from the NSS 71st Round. Data reveals that persons of higher socio-economic status report higher (a) morbidity, (b) hospitalization rate as well as (c) duration of illness of their children. It raises the paradox of how children belonging to the relatively lower socio-economic status experience higher mortality despite lower morbidity reported as compared to children belonging to the higher socio-economic status. The paradox nonetheless gets revolved through analysing disease patterns of the children. Poor people under-report about their children's illness despite greater suffering from life threatening diseases like diarrhoea as compared to children from higher economic strata.

Keywords : Healthcare, Children, Sanitation, morbidity, vulnerability.

JEL Classification : I1, I18, J1

Acknowledgements

A previous version of the paper was presented in the National Seminar on the Subjects Covered in the 71st and 72nd Rounds of NSS, organised by the National Sample Survey Office, (Coordination and Publication Division) Ministry of Statistics and Programme Implementation, New Delhi and held at Andhra University, Visakhapatnam during 23-24, August, 2018. We thank the participants for their comments. Our sincere thanks to Prof. Tara Nair for her meticulous corrections and efforts to publish this paper as part of the GIDR working paper series.

Contents

Abstract	i
Acknowledgements	i
Contents	ii
List of Tables / List of Figure	ii
1. The Context: Rights of Children and Deprivation of their Rights	1
2. Emerging Issues Due to Industrialization, Urbanization and Climate Change	4
3. Analysis of NSS Data: Status of Illness of Children Aged 0-5 Years and Health Care Utilization	8
4. Conclusions	16
References	18

List of Tables

Table 1: Indicators for Measuring Child Deprivation	3
Table 2: Rate of Morbidity and Hospitalization of Children Aged 0-5 Years	9
Table 3: Results of Logistic Regression of Morbidity and Hospitalization	12
Table 4: Results of Logistic Regression of Untreated Morbidity	13
Table 5: Distribution of Nature of Diseases by MPCE	15
Table 6: Distribution of Nature of Diseases by Type of Latrine	15
Table 7: Causes of Death of Children Aged 1-59 Months in India, WHO 2016	16

List of Figures

Figure 1: Duration of Ailment by Place of Residence, Gender, MPCE and Type of Latrine	10
Figure 2: Percentage of People Not Seeking Healthcare by Place of Residence, Gender, MPCE and Type of Latrine	11

Health Vulnerabilities among Children in the Age Group of 0-5: An Analysis of the Data from the NSS 71st Round

**N. Lalitha
Biplab Dhak**

1. The Context: Rights of Children and Deprivation of their Rights

Maximum numbers of children (27 million) are born in India than in any other country in the world. This means that in the future India can reap the benefits of demographic dividend as the country would have more population in the working age group that can contribute to national productivity and growth. Implicitly, the young population requires an enabling environment that keeps them healthy. India is one of the countries that has ratified the United Nations Convention on the Rights of the Child in 1992. In 2013 India also announced the National Policy on Children adopting rights-based approach. As per this approach, every child has the right to life, survival, development, education, protection and participation.

Protecting child rights in India in terms of their survival, growth, cognitive development and protection from social, economic, cultural and environmental vulnerabilities remain a major development challenge (Chaurasia, 2016a) despite repeated commitments and policy prescriptions.

Children on their own cannot claim their right and it has to be provided and made accessible to them. Particularly, children in the age group of 0-5 years are dependent on their parents or caregivers. Children are subject to varieties of vulnerabilities and deprivation depending on the socio economic condition of the 'adults' who provide them with care .If due to economic and social reasons, children do not enjoy their rights, then it is termed as 'deprivation'. Thus, literature suggests that various factors like poverty of the household, lack of literacy of the parents or care givers, their work and living

N. Lalitha (lalithanarayanan@gmail.com) is professor at the Gujarat Institute of Development Research, Ahmedabad, and Biplab Dhak (biplab3b@gmail.com) is assistant professor at the A.N. Sinha Institute of Social Studies, Patna.

environment, access to the physical infrastructure and essential needs, shape the degree of the child deprivation and vulnerability. In terms of Sen's capability approach, these factors define the children's endowments, capacities and opportunities. For instance, while poverty at the household level affects everyone, it affects children the most as they are deprived of their fundamentals like food, nutrition, education and subjects them to a variety of vulnerabilities. These may include physical, psychological and educational vulnerabilities. Physical vulnerabilities would include death, illness, injury, malnutrition, heat stress, physical and sexual abuse. Educational vulnerabilities would include missed school, poor academic performance, delayed progress, failure to complete education and psychological vulnerabilities would include post-traumatic stress disorders, depression, anxiety, sleep disorder, emotional distress, somatic complaints and behavioural problems (Lori, 2008).

Added to these existing concerns, there are newer elements of vulnerabilities posed by developmental changes like urbanisation, industrialisation and climate change. Studies done in the context of India (Dreze and Khera, 2012; Chaurasia 2016a, 2016b) have focused mainly on the physical and educational vulnerabilities that can be based on quantifiable indicators, which can precisely help in describing the status of children's right/deprivation in survival, growth and development domain.

In this paper, using the NSSO 71st Round data (NSSO, 2015) on health consumption, we have tried to see the health vulnerabilities of children by their living arrangement. This paper is organised as follows. Section 2, following this introduction, briefly highlights the prevailing child deprivation in India. Section 3 lists the possible issues due to urbanisation, industrialisation and climate change. Section 4 discusses the children's' health scenario based on NSS 71st Round data. In this section, morbidity, diseases pattern, treatment based on medical advice, rate of hospitalisation, mean hospitalisation costs, income loss due to illness among children under five are discussed based on the place of residence and type of sanitation facilities. Section 5 lists the possible strategies to address the vulnerabilities.

Table 1: Indicators for Measuring Child Deprivation

1. Survival	Full antenatal care	Proportion of women who did not receive full antenatal care during their pregnancy
	Check up of the new born	Proportion of new born who did not receive first check up within 24 hours of birth
	Birth weight	Proportion of new born who weighed less than 2.5 kg at birth
	Immunization	Proportion of children 12-23 months of age not fully immunized
2. Growth	Initiation of breastfeeding	Proportion of children 0-23 months of age who were not initiated into breast feeding within one hour of birth
	Linear growth	Proportion of children 0-59 months who were stunted
	Ponderal growth	Proportion of children aged 0-59 months who were wasted
3. Development	Preschool education	Proportion of children who were not attending preschool/primary school education
4. Protection	Early marriage	Proportion of girls ever married aged 10-19 years
5. Environment	Sanitation	Proportion of households practicing open defecation

Source: Chaurasia (2016a), Table 1, p. 195.

Using the data from Rapid survey of Children in India 2013-14, a recent study points out that deprivation of children in the areas of survival, health, nutrition, development, education, protection and environment is present across states, social class, and type of residence like rural or urban areas (Chaurasia, 2016a). Table 1 provides the indicators chosen to define the different domains of deprivations. According to this study, for India as a whole, Child Deprivation Index (CDI) (comprising of survival, health, nutrition, development, education, protection and environment indices) stands at 0.43 (medium CDI). But the same in the urban areas is low and medium for rural areas. Similarly, while the CDI for other social classes is low, for ST population it is high and for SC and OBC groups it is medium.

2. Emerging Issues Due to Industrialization, Urbanization and Climate Change

Both industrialization and urbanization have both positive and negative impact on both population and development. The extent and degree depend on to the extent to which the said population is involved in both industrialization and urbanization and the outcomes realized by the same. Though industrialization-led developmental strategies adopted by different states in India is fast reducing the rural-urban differences, they posit new challenges on the carrying capacity for demand for basic services such as health, sanitation, transport and other civic infrastructure in the existing as well as in the newly emerging urban areas. Faster rate of urbanization means increased demand for social amenities and reduced space for children unless planned appropriately. There are number of schools and residential areas with no space for children to play. The demand for housing, services and employment comes from both the existing urban population and those that have migrated from rural areas. It is often true that the supplies of civic structure grow slowly compared to the demand for the urban amenities. This leads to the expansion of the urbanization area where there are notified and non-notified slums.

According to NSSO (2014) of the 33,510 slums¹, estimated to be in urban India in 2012, 13,761 were notified and 19,749 were non-notified slums. An estimated 8.8 million households lived in these slums. Majority of the houses had pucca structures in nearly 60% of the slums – including 85% of notified slums, and 42% of non-notified slums. Taps were the major source of drinking water in nearly 71% of all slums (including 82% of notified slums), and tube wells/ bore wells in 20%. About 68% of slums at the all-India level had electricity both for household use and for street lights, the proportion being about 86% for notified slums and 55% for non-notified slums. The all-India proportion of slums having no electricity connection was 7%, and most slums belong to the non-notified category. In 15% of notified slums, 42% of non-notified slums, and 31% of all slums taken together, no latrine was used by most of the residents. 44% of notified

¹ A slum may be notified or non-notified. Notified slum is notified as slums by respective municipalities, corporations, local bodies or development authorities. A non-notified slum was a compact urban area with a collection of poorly built tenements, mostly of temporary nature, crowded together usually with inadequate sanitary and drinking water facilities in unhygienic conditions.

slums and 18% of non-notified slums, had an underground sewerage system, the proportion for all slums being 29%. An estimated 31% of slums, which consists of 11% and 45% of notified and non-notified slums respectively, had no drainage system. The open pucca drainage system prevailed in 35% of all slums – 49% of notified and 25% of non-notified slums. 26% of notified slums but only 14% of non-notified slums had an underground drainage system. In 27% of all slums – 11% of notified and 38% of non-notified slums – there was no arrangement of garbage disposal. The problem of water logging (due to rainfall) of either the slum, or the approach road to the slum, was reported by about 46% of all slums – including 27% where both the approach road and the slum itself got waterlogged. At the all-India level about 59% of both notified and non-notified slums were within half a kilometre of a government primary school. Moreover, among notified slums, about 91%, and among non-notified slums, about 85% were within one km of a school. At the all-India level about 20% of both notified and non-notified slums were within half a kilometre of a government hospital/ health centre. Among notified slums, about 50%, and among non-notified slums, 46% were within one km of a government hospital/ health centre. 24% of slums – 32% among notified and 18% among non-notified slums – reported that they had benefited from welfare schemes like Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and Rajiv Awas Yojana (RAY).

In 48% of slums, the condition of water supply had remained unchanged over the precious five years. In 7% of slums, water supply facilities were reported as non-existent on the date of survey, as well as five years ago. For 57% of slums in urban India, electricity facilities had not changed during the previous five years with 5% of all slums reporting that electricity facilities were non-existent both five years earlier and now. 46% of slums reported no change in the condition of the road as a whole over the past five years, while 4% of slums reported that such a road did not exist now or five years earlier. 49% of slums reported that there had been no change in the condition of street lights during the last five years. In 11% of all slums, street lights did not exist, and had not existed five years ago. 47% of slums reported that there had been no change in the condition of latrine facilities during the last five years. In 17% of slums, latrine facilities were reported as non-existent now as well as five years earlier. No change in condition of drainage facilities during the last 5 years was reported by 47% of slums. In an estimated 17% of all urban slums, drainage facilities did not exist either five

years earlier, or on the date of survey. However, very few slums in any state reported deterioration in drainage facilities. About 50% of slums in urban India reported that no change in sewerage facilities had taken place during the last five years. In another 26% of slums, sewerage facilities did not exist now or five years ago. In about 50% of slums, no change in the facilities of garbage disposal had occurred during the last 5 years. About 14% of all slums in urban India including 20% of non-notified slums reported that they had no garbage disposal facilities, either at present or five years ago. No change in the improvement of education facility at primary level was reported by 57%, with 11% reporting that the facility did not exist now or five years ago. About 64% reported no change in the improvement of medical facilities and only 1% reported deterioration, with about 15% reporting that medical facilities did not exist on the date of survey and had not existed five years earlier.

The gap in the amenities could be the source of potential health hazards both for children and adults such as gastro intestinal, skin issues and febrile conditions. Inefficiencies in collection combined with unsafe disposal of waste result in widespread insanitation, contaminated water and high incidence of chronic respiratory and communicable diseases in India (Sridhar and Mathur, 2009). Further, as the living spaces are quite small in such areas, the density in each of the household could be quite high, exposing the children to health hazards that the adults suffer from.

Besides the overall safety and protection of children in the urban slum areas, living environments, which do not provide safe drinking water, sanitation facilities and drainage affect children's health. Repeated attacks of diarrheal conditions lead to severe malnutrition in children leading to stunted and wasted growth. Use of biomass fuels such as crop residues, cow dung etc. for cooking purposes inside the house, proximity to traffic and the level of crowding in their homes are the factors which lead to respiratory disease condition in children (Barnes, 2005).

With globalization, the pattern of jobs is changing more towards contractual and informal employment. Unlike the formal sector, where employment opportunities are subject to skills and availability, the informal sector² tends to be the panacea for those seeking an earning, giving rise to a number of

² Largely defined as those which are outside the purview of rules and regulations of the state due to their size, investment and operation.

micro enterprises and household businesses that range from street vending to small scale manufacturing (Ghatak and Lalitha, 2015).

A related issue with urbanization and globalization is that of location of unorganized units. The micro small enterprises often get interspersed with urban residential locations. As most micro enterprises and home-based units occupy smaller space, work with limited labor and machinery, the location of these units is often interspersed with the living spaces of individuals and often do not lend themselves to be applicable for industrial zoning or provision for any pollution control measures, a feature that is most commonly observed in some of the most industrialized locations like Ludhiana or Rajkot in India (Sridhar and Mathur, 2009). This exposes the children to the risks of dust, air pollution and chemical fumes that also cause asthma and the other chronic obstructive lung diseases. A research based on National Family Health Survey (2005-06), in the context of eight large cities of India - Chennai, Delhi, Hyderabad, Indore, Meerut, Kolkata, Mumbai and Nagpur - notes that slum dwellers suffer a disproportionate risk of communicable illnesses such as TB.

Industrialization and urbanization are also leading to acquisition of the (agricultural) land, which has impact on food availability, and food and nutrition security. An additional factor inducing vulnerability is linked to climate change.

The IPCC has identified the following impacts due to climate change:

- (1) An increase in the extent of drought-affected areas and a 10-30% decrease in precipitation over some dry regions, many of them already water stressed areas;
- (2) An increase in the frequency and intensity of rainfall, leading to increased flooding in some high latitude areas and wet tropical areas, with annual river runoff increasing by 10-40%;
- (3) Rising sea levels and coastal erosions with many more areas projected to be flooded every year (leading to loss of lives and property);
- (4) An increase in the severity of heat waves in many places;
- (5) An increase in the range of disease vectors and in the numbers of people consequently exposed to malaria and other vector borne diseases (Bartlett, 2008).

A few of the direct implication of these factors on children are: (1) inadequate food and nutrition security both during drought and excessive rains, (2) loss of human lives and property, leading to lasting psychological impact, and (3) diseases.

Besides this, there are 'Newly Emerging Needs' that affect the children. Newly Emerging Need is defined as "loosely connected group of challenges, opportunities, events, problems and threats that are relevant to the overall development of children, but that hitherto have not been encountered by these children, nor by those before them in their societies or if they were present, then there is now a dramatic increase in their evidence (Wazir, 2008).HIV-AIDS is a good example, where the children suffer due to the behavioral attitude of the adults.

With this background, we look at the health issues of children in the following paragraphs.

3. Analysis of NSS Data: Status of Illness of Children Aged 0-5 Years and Health Care Utilization

Descriptive Statistics

Reported morbidity (or the state of illness) of all children aged 0-5 years records at 9.6%. It is higher with the rate of 10% in urban areas as compared to rural areas with the rate of 9.5% (Table 2). There is also gender differential in the reporting of morbidity - 10.5% and 8.6% for males and females respectively. As far as association with the household economic status measured by Monthly Per-capita Consumption Expenditure (MPCE) is concerned morbidity rate is found to be increasing as one moves to higher level of MPCE. When we look at the morbidity of the children by the type of sanitation facilities morbidity rate is observed to be increasing with better type of latrine facility. In other words reported morbidity rate is higher with better level of sanitation. For example, morbidity rate accounts 6.9% among children with access to service type latrine facility against the rate of 9.4% of septic/flash type latrine. No latrine category remains exceptional with reporting morbidity rate of 9%.

Like morbidity, hospitalization rate shows similar pattern with reference to place of residence and gender. The rate is higher in urban areas and among

boys as compared to respective counterparts. It increases with MPCE category. Again, the rate is found to be higher among households with better hygienic latrine facility. In aggregate, hospitalization rate records 2.6%. It is 2.3% in rural and 3.4% in urban area. It records 3.1% for male children as compared to 2% for female children. The rate increases from 1.5% of 1st MPCE to 4.2% of 4th MPCE group. Similarly, households with service type latrine report hospitalization rate of 1.9% as compared to 3.3% of households having septic/flush type latrine.

Table 2: Rate of Morbidity and Hospitalization of Children Aged 0-5 Years

	Morbidity	Hospitalization
Place of Residence		
Rural	9.5	2.3
Urban	10	3.4
Gender		
Male	10.5	3.1
Female	8.6	2.0
MPCE		
1 st	9.0	1.5
2 nd	8.9	2.0
3 rd	9.5	2.8
4 th	10.8	4.2
Type of latrine		
Service	6.9	1.9
Pit	9.3	3.3
Septic/flush	9.4	3.3
No Latrine	9.0	2.0
All	9.6	2.6

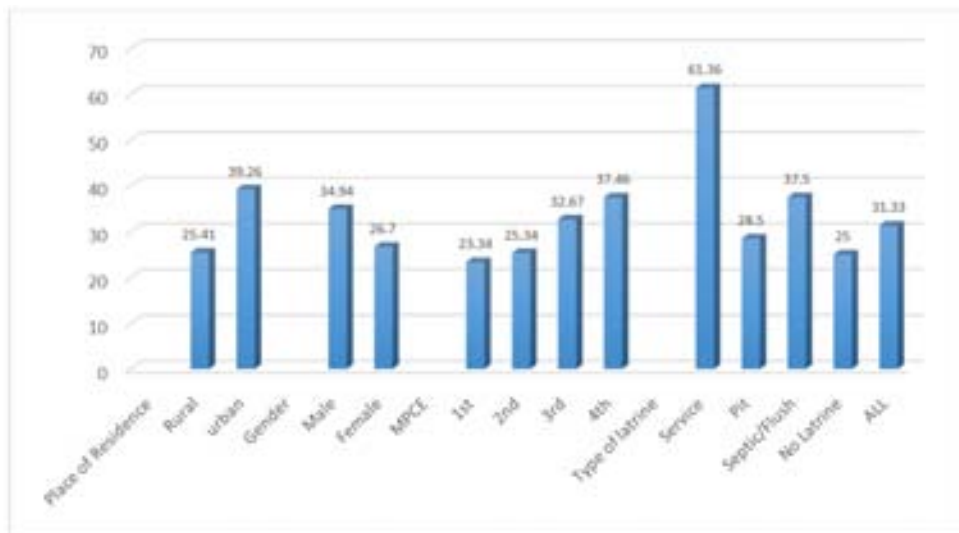
Source: Chaurasia (2016a), Table 1, p. 195.

The illness episode which symbolises severity of illness also goes with the pattern of reporting morbidity as well as hospitalization (Figure 1). In aggregate, the average number of days of illness episode has been 31.33 days. It has been higher in urban areas, among male children. It is found to be increasing with higher MPEC quintiles. It is observed that households with service type of latrine, i.e., most unhygienic latrine facility, and those who belong to lower socio-economic status, report higher duration of illness episode as compared to relatively better quality of latrine facility. This indicates a strong positive association between lack of sanitation and chronic illness.

As far as health seeking behaviour is concerned, a negative association between MPCE and percentage of untreated illness is observed (Figure 2). The percentage of untreated illness varies from 14.1% of 1st MPCE quintile to 7.1% of 4th quintile. The rate is higher with 13.5% in rural areas as compared to urban areas with the rate of 7.9%. The rate is also marginally higher for males (11.4%) as compared to females (10.6%). Among type of latrine facilities, the rate for specific/flush appears distinct with the rate of 7.9% as compared to around 11-12% for other type of latrine facilities.

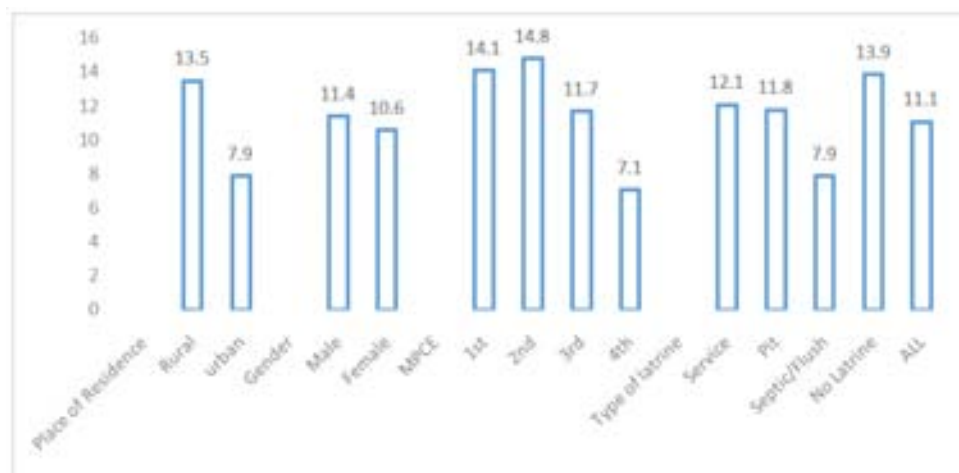
In sum, descriptive statistics depict that people of higher socio-economic status report more about their children's illness, higher illness episode, and they are more likely to seek medical treatment. Given the strong association between socio-economic status and type of latrine, the latter also puts forth a similar picture as observed for the state of illness and health utilization pattern. The strong positive association between lack of hygiene and illness is brought by the relatively more number of ailment days reported by those who have service type of latrines compared to others with different types of latrine.

Figure 1: Duration of Ailment by Place of Residence, Gender, MPCE and Type of Latrine



Source: Calculated from NSS 71st Round.

Figure 2: Percentage of People Not Seeking Healthcare by Place of Residence, Gender, MPCE and Type of Latrine



Source: Calculated from NSS 71st Round.

Results of logistic regression

This section presents results of three logistic regression analyses: chances of reporting morbidity, chances of hospitalization and not seeking health care after reporting illness. The main purpose of these analyses is to present the determinants of morbidity, hospitalization and not seeking health care. Odds ratios are shown for place of residence, gender, MPCE and type of latrine (Table 3). What is striking is that the picture remains almost the same for morbidity and hospitalization as it appears in the descriptive statistics for all variables. While chances of reporting illness and chances of hospitalization are observed to be higher in urban areas, among males and among children of higher economic strata, poor latrine service is likely to lead to reporting higher level of morbidity as well as hospitalization. For example, persons belonging to 4th MPCE quintile report 26% higher level of morbidity as compared to 1st MPCE quintile. Likewise, reported morbidity level has been around 60% lower for children of households with septic/flush type facility as compared to service type latrine.

Table 3: Results of Logistic Regression of Morbidity and Hospitalization

	Morbidity	Hospitalization
Place of Residence		
Rural	1	1
Urban	1.01	1.07 _a
Gender		
Male	1	1
Female	0.79 _a	0.65 _a
MPCE		
1st	1	1
2nd	1.23 _a	1.46 _a
3rd	1.24 _a	1.97 _a
4th	1.26 _a	1.94 _a
Type of latrine		
Service	1	1
Pit	0.70 _a	0.49 _a
Septic/Flush	0.41 _{1a}	0.26 _a
No Latrine	0.48 _a	0.36 _a
Constant	3.50	5.46

Note: 'a' denotes $p < 0.01$; Controlled for religion and social groups.

Source: Calculated from NSS 71st Round.

The most interesting result relates to the determinants of why people do not seek treatment for their children. Surprisingly, it is observed from logistic regression analysis that poor are more likely to seek treatment after reporting illness (Table 4). Result shows that children belonging to 4th MPCE quintile are like to remain untreated more by 55% as compared to children of 1st quintile. Similarly, untreated morbidity is found to be higher among urban children as compared to their rural counterparts. Sanitation has been exceptional to the earlier trend: chances of untreated morbidity are found to be higher among children of households with poor latrine facility as compared to better type of latrine facility. For example, children of households with service type of facility i.e. poor latrine facility are likely to remain untreated more by around 2.3 times as compared to children of households with septic/flush type latrine facility.

In sum, the results of the regression analysis show that people of higher socio-economic status are more likely to report higher level of morbidity and get hospitalization for their children. But children exposed to poor sanitation report more illness and get more hospitalization despite expected

covariance of poor sanitation and poor socio-economic status. At the same time those children, who are exposed to poor sanitation remains untreated as compared to others. This is also an exception to other socio-economic characteristics. Other variables like MPCE and place of residence show positive association with untreated morbidity.

It, therefore, appears that children who are exposed to poor sanitation face double burden of disadvantage - poor health status and poor health seeking behaviour. It needs to be remembered that greater morbidity and hospitalization rates are recorded despite the nature of under reporting of sickness of poor people, which expectedly co-varies with poor sanitation. Again, it seems that severity of illness leads them to seek treatment. Severity of illness is reflected through duration of illness episode.

Table 4: Results of Logistic Regression of Untreated Morbidity

	Odds Ratio
Place of Residence	
Rural	1
Urban	1.40 _a
Gender	
Male	1
Female	1.07
MPCE	
1 st	1
2 nd	1.54 _a
3 rd	1.65 _a
4 th	1.55 _a
Type of latrine	
Service	1
Pit	0.41 _b
Septic/Flush	0.43 _a
No Latrine	0.34
Constant	-0.363

Note: 'a' denotes $p < 0.01$; 'b' denotes $p < 0.05$; Controlled for religion and social groups.

Source: Calculated from NSS 71st Round.

Disease pattern and causes of death

This section in particular is linked to the forgoing section, which has ended up with some paradoxes. The first paradox is how reported morbidity level of better socio-economic status appears higher as compared to poorer counterparts. The second paradox is why the extent of untreated morbidity is found to be higher among children of better socio-economic group as compared to poorer counterparts. Also, morbidity of children belonging to a household with service type latrine i.e., unhygienic latrine facility are expected to be reporting higher level of morbidity, but less likely to seek treatment. This result appears contradictory as far as association between socio-economic status and reporting of morbidity and health seeking behaviour are concerned. As presented in the forgoing section based on NSSO data, people of higher socio-economic strata are more likely to report illness and remain untreated.

These paradoxes nonetheless get resolved by examining the disease pattern and causes of death (Table 5). It is observed that type of disease children suffer from is very much associated with economic status and sanitation facility of a household. This was also discussed in the earlier sections. Among the many observations, what is worth mentioning is the appearance of higher proportion of diarrheal disease amongst children of lower socio-economic group and those exposed to poor sanitation (Table 6). This seems to be the key point in resolving the paradox.

Looking at the causes of death statistics it can be noted that poor people report less about their illness, but suffer more from diseases of life threatening nature like diarrhoea (Table 7). Similar picture appears for unhygienic latrine facility. Diarrheal disease has been much higher with service type latrine facility as compared to septic/flush type facility. But the important point is the emergence of sanitation as one of the strong determinants of sickness. The reported sickness comes higher for children exposed to poorer latrine facility despite poor people's behaviour of under reporting.

Table 5: Distribution of nature of diseases by MPCE

Diseases	MPCE				
	1st	2nd	3rd	4th	All
Fever with loss of consciousness	2.6	3.7	3.8	3	3.3
Fever with rash	1.6	3.6	2.9	2.1	2.6
Fever due to diphtheria, whooping cough	6.3	8.3	5.9	6.5	6.7
All other fevers	40.7	35	36.7	40.2	38.2
Diarrhoeas	10.1	8.2	7.8	5.4	7.4
Acute upper respiratory infections	19.1	22.2	22.6	22.9	22.1
Cough with sputum	6.3	4.3	4.9	4.8	5
Bronchial asthma				1.2	
Gastric and peptic ulcers	2.5	1.1	1.7	1.3	1.6
Skin infection	1.9	3.5	2.2	2.5	2.5
Illness in the new-born	1.5	1.2	1.4	1.3	1.3
Others	7.4	8.9	10.1	8.8	9.3
All	100	100	100	100	100

Source: Calculated from NSS 71st Round.

Table 6: Distribution of Nature of Diseases by Type of Latrine

Diseases	Type of latrine				
	Service	Pit	Septic/Flush	No latrine	All
Fever with loss of consciousness	12.1	3.3	3.2	3.2	3.3
Fever with rash	6.1	3.2	1.9	2.9	2.6
Fever due to diphtheria, whooping cough	6.1	4.8	7.3	7	6.7
All other fevers	30.3	42	37	37.1	38.2
Diarrhoeas	15.2	6.3	6.8	8.5	7.4
Acute upper respiratory infections	15.2	18.6	24.5	21.1	22.1
Cough with sputum	3.0	5.2	4.7	5.1	5.0
Bronchial asthma	3.0	-	1	-	-
Gastric and peptic ulcers	-	1.4	1.6	1.6	1.6
Skin infection	3.0	3	2.2	2.7	2.5
Illness in the new-born	3.0	1.1	1.2	1.6	1.3
Others	3.0	11.1	8.6	9.2	9.3

Source: Calculated from NSS 71st Round.

Table 7: Causes of Death of Children Aged 1-59 Months in India, WHO 2016

Cause of death	% Distribution
HIV/AIDS	0.9
Diarrhoeal diseases	22.2
Measles	5.5
Meningitis/encephalitis	4.2
Malaria	1.4
Acute lower respiratory infections	28.3
Prematurity	4.9
Birth asphyxia and birth trauma	1.2
Other communicable, perinatal and nutritional conditions	10
Congenital anomalies	6
Other no communicable diseases	7.7
Injuries	7.8
All	100.1

Source: WHO Website.

4. Conclusions

This paper highlighted a variety of health vulnerabilities of children followed by a discussion on the pattern of reported morbidity and hospitalization and health care utilization drawing data from NSSO 71st round of survey. An important contribution of this paper is that it strengthens the existing understanding on the influence of sanitation for health in general and child health in particular.

The pattern of health status led us further to resolve the appeared paradox as far as association among socio-economic status, status of health and health seeking behaviour and mortality pattern are concerned. Our analysis revealed that people of higher economic status are more likely to report higher level of illness and seek treatment in hospital for their children as compared to the poor. But surprisingly children of higher socio-economic status remain untreated despite reported higher level of morbidity. The paradox is resolved by examining the disease pattern and causes of health in India. It has come out that poor people report their illness and resort to treatment only when it becomes very serious. Again, it is found that poor children suffer from diseases that are more life threatening as far as causes of death in India is concerned. For example, prevalence of diarrheal disease, which is one of the leading causes of child health in India is found to be remarkably high among children of poor households.

Despite the tendency of poor people in under-reporting morbidity and hospitalization, it is observed that rates appear higher for children, who belong to households having poor quality of latrine. It is even seen that having no latrine is better than having unhygienic latrine facility as far as susceptibility of diseases are concerned. In addition, health seeking behaviour remained very poor. Therefore, children of households with poor sanitation face double whammy of higher prevalence of life threatening disease and poor health seeking behaviour.

In conclusion, it may be stated that despite the doubt on self-reported morbidity as an appropriate measure of health outcome, the extent of health vulnerabilities among children belonging to lower socio-economic groups, particularly those who are also exposed to unhygienic latrine facility or poor sanitation, is alarming. This scenario needs serious attention in the area of preventive health care in order to reap benefits of demographic dividend. It is very much essential that greater attention must be put on younger generation in order to generate quality human resources. With the increasing urbanisation, the number of notified and non-notified slums would increase and it would be a permanent challenge for the civic authorities to ensure hygienic sanitation and drainage facility. Inadequate and improper functioning of these basic facilities deprive children of their fundamental right to life and health. It is hoped that the 'Swachh Bharat' campaign leads to reduced illness among the population in general and in the vulnerable children in particular.

References

- Barnes, B., 2005. Interventions to Reduce Child Exposure to Indoor Air Pollution in Developing Countries: Behavioural Opportunities and Research Needs. *Children Youth and Environments*, 15 (1), pp. 67-82.
- Bartlett, S., 2008. The Implications of Climate Change for Children in Lower Income Countries. *Children, Youth and Environments*, 18 (1), pp. 71-98.
- Chaurasia, A. R., 2016a. Child Deprivation in India: Evidence from Rapid Survey of Children 2013-2014. *Indian Journal of Human Development*, 10 (2), pp. 191-214.
- Chaurasia, A. R., 2016b. Child Deprivation in Gujarat. *Social Change*, 46 (3), pp. 371-392.
- Derken, S. and Krishnan, P., 2009. Poverty and the Psychosocial Competencies of Children: Evidence from the Young Lives Sample in Four Developing Countries. *Children, Youth and Environments*, 19 (2), pp. 138-163.
- Dreze, J. and Khera, R., 2012. Regional Patterns of Human and Child Deprivations in India. *Economic and Political Weekly*, 47 (39), pp. 42-49.
- Ghatak, Amrita and Lalitha, N., 2015. Occupational Health among Informal Workers in India. *Working Paper No. 228*, Gujarat Institute of Development Research, Ahmedabad, September.
- Gupta, I., and Guin, P., 2015. Health Status and Access to Health Services in Indian Slums. *Health*, 7, pp. 245-255. <http://dx.doi.org/10.4236/health.2015.72029>
- National Sample Survey Organisation (2013). *Some Characteristics of Urban Slums. NSS 69th Round, (July 2012-December 2012), NSSKI (69/0/21)*, Ministry of Statistics and Programme Implementation, Government of India, New Delhi.
- National Sample Survey Organisation (2015). *Key Indicators of Social Consumption in India Health, NSS 71st Round, Jan-June 2014*, Ministry of Statistics and Programme Implementation, Government of India, New Delhi.
- Peek, Lori, 2008. Children and Disasters: Understanding Vulnerability, Developing Capacities and Promoting Resilience - An Introduction, *Children Youth and Environments*, 18 (1), pp. 1-29.

Sridhar K. S. and Mathur, O. P., 2009. *Costs and Challenges of Local Urban Services - Evidence from India's Cities*, Oxford University Press, New Delhi.

Wazir, Rekha, 2008. Newly Emerging Needs of Children: Towards Widening the Policy Agenda in South Asia, *Indian Journal of Human Development*, 2 (1), pp. 183-202.

World Health Organization, 2016. Global Health Observatory Data Repository, available at <http://apps.who.int/gho/data/view.main.ghe3002015-IND?lang=en> (accessed 1st September, 2018).

THE GIDR WORKING PAPER SERIES (No. 201 onwards)

201. Rudra N. Mishra and Udaya S. Mishra, "Assessing Characteristic Differential in Dichotomous Outcomes: A Case of Child Undernourishment", April 2011. Rs. 35.
202. P. K. Viswanathan, "Will Neoliberal Policies Resolve Water Sector Dilemmas? Learnings from Maharashtra and Gujarat", May 2011. Rs. 45.
203. Jharna Pathak, "Agroforestry in Tribal Areas of Gujarat: Move towards Sustainable Agriculture?", June 2011. Rs. 45.
- 204*. Madhusudan Bandi, "The Telangana Turmoil: Apprehensions and Hope", August 2011. Rs. 30.
205. Tara S. Nair, "Two Decades of Indian Microfinance: Trajectory and Transformation", September 2011. Rs. 40.
206. Biplab Dhak and Amita Shah, "International Migration from Gujarat: An Exploratory Analysis", September 2011, Rs. 35.
- 207*. Anil Gumber, Biplab Dhak and N. Lalitha, "Declining Free Healthcare and Rising Treatment Costs in India: Analysis of National Sample Surveys, 1986-2004", October 2011, Rs. 40.
- 208*. Tara S. Nair, "Power to Women through Financial Services: Revisiting the Microfinance Promise", November 2011, Rs. 30.
- 209 N. Lalitha, "Protecting IPRs of Siddha Practitioners through People's Biodiversity Register", December 2011, Rs. 35.
- 210*. Amita Shah, Dipak Nandani and Hasmukh Joshi, "Marginalisation or Mainstreaming? Evidence from Special Economic Zones in Gujarat", July 2012, Rs. 45.
211. P.K. Viswanathan, "Rationalisation of Agriculture in Kerala and Its Implications for Natural Environment, Agro-Ecosystems and Livelihoods", September 2012. Rs. 40.00.
212. Keshab Das, "Situating Labour in the Global Production Network Debate: As if the 'South' Mattered", December 2012. Rs. 40.00
213. Jaya Prakash Pradhan and Keshab Das, "Determinants of Regional Patterns of Manufacturing Exports: Indian Firms since the Mid-1990s", January 2013. Rs. 40.00.

214. Madhusudan Bandi, "A Review of Decentralisation in India with Particular Reference to PRIs in Gujarat", February 2013. Rs. 30.00.
215. Madhusudan Bandi, "*Samras* in Gujarat Gram Panchayats: A Constructive Experiment or Challenge to Electoral Democracy?", March 2013. Rs. 30.00.
216. P.K. Viswanathan and Amita Shah, "Has Indian Plantation Sector Weathered the Crisis? A Critical Assessment of Tea Plantation Industry in the Post-reforms Context", April 2013. Rs. 40.00.
217. Keshab Das, "Developing Regional Value Chains in South Asian Leather Clusters: Issues, Options and an Indian Case", May 2013. Rs. 45.00.
218. Chandra Sekhar Bahinipati, "Determinants of Farm-Level Adaptation Diversity to Cyclone and Flood: Insights from a Farm Household-Level Survey in Eastern India", August 2013. Rs. 40.00.
219. Chandra Sekhar Bahinipati, "Farm-level Adaptation to Climate Extremes in India: Do We Need a Separate Adaptation Policy?", December 2013. Rs. 40.00.
220. Tara S. Nair, Milind Sathye, Muni Perumal, Craig Applegate and Suneeta Sathye, "Regulating Microfinance through Codes of Conduct: A Critical Review of the Indian Experience", by March 2014. Rs. 45.00
221. Keshab Das, "The Sector Reforms Process in Rural Drinking Water and Sanitation: A Review of the Role of WASMO in Gujarat", August 2014. Rs. 100.00.
222. Itishree Pattnaik and Amita Shah, "Trend in Agricultural Growth and Decomposition of Crop Output in Gujarat: A Recent Evidence", September 2014. Rs. 100.00.
223. Madhusudan Bandi and P.K. Viswanathan, "Forest Governance Sustainability in India: Determinants and Challenges", October 2014. Rs. 100.00.
224. Jharna Pathak, "Class Gains in Fisheries Management: Problems and Prospects", December 2014. Rs. 100.00
225. Keshab Das, "Provisioning Drinking Water in Gujarat's Tribal Areas: An Assessment", January, 2015. Rs. 100.00.
226. Chandra Sekhar Bahinipati and Unmesh Patnaik, "Climate Change Economics: A Review on Theoretical Understanding and Controversies", April 2015. Rs. 100.00.

227. Keshab Das, “Institutional Constraints to Innovation: Artisan Clusters in Rural India”, June 2015. Rs. 100.00
228. N. Lalitha and Amrita Ghatak, “Occupational Health Risks among Workers in the Informal Sector in India”, September 2015. Rs. 100.00.
229. Leela Visaria and Rudra N. Mishra, “Health Training Programme for Adolescent Girls: Some Lessons from India’s NGO Initiative”, October 2015. . Rs. 100.00.
230. Tara Nair and Keshab Das, “Financing the MSME Sector in India: Approaches, Challenges and Options”, December 2015. . Rs. 100.00.
231. Chandra Sekhar Bahinipati and P.K. Viswanathan, “Role of Policies and Institution in the Diffusion of Micro-Irrigation in Gujarat, Western India”, February 2016. . Rs. 100.00.
232. Keshab Das and Hastimal Sagara, “State and the IT Industry in India: A Policy Critique”, March 2016. Rs. 100.00.
233. Tara Nair , “Media, Technology and Family: Exploring the Dynamics of Interactions”, May 2016. Rs. 100.00.
234. Amrita Ghatak, Debasish Nandy and Suddhasil Siddhanta, “Burden of Diseases due to Air Pollution in Urban India”, July 2016. Rs. 100.00.
235. Unmesh Patnaik, Prasun Kumar Das, Chandra Sekhar Bahinipati, Onkar Nath, “Can Developmental Interventions Reduce Households’ Vulnerability? Empirical Evidence from Rural India”, August 2016. Rs. 100.00.
236. N. Lalitha and Amrita Ghatak, “India’s Social Science Research Publications from an International Perspective”, September 2016. Rs. 100.00.
237. Keshab Das, “Craft Clusters and Work in Rural India: An Exploration”, October 2016. Rs. 100.00.
238. N. Lalitha, “Creating Viable Markets through Use of Geographical Indications: What can India Learn from Thailand?”, November 2016. Rs. 100.00.
239. Unmesh Patnaik, Prasun Kumar Das and Chandra Sekhar Bahinipati, “Effect of Rural Livelihoods Project on Adaptation Decision and Farmers’ Wellbeing in Western Odisha, India: Application of Endogenous Switching Regression”, December 2016. Rs. 100.00.
240. N. Lalitha and Soumya Vinayan, “GIs for Protecting Agro-Biodiversity and Promoting Rural Livelihoods: Status, Strategies and Way Forward”, January 2017. Rs. 100.00.

241. Itishree Pattnaik, “Land Ownership Rights and Women Empowerment in Gujarat: A Critical Assessment”, February 2017. Rs. 100.00.
242. Itishree Pattnaik and Kuntala Lahiri-Dutt, “Tracking Women in Agriculture through Recent Census Data in India”, March 2017. Rs. 100.00.
243. Tara Nair, “Institutional Credit and Transformation of Rural India: Chequered Trajectories and Contested Connections”, April 2017. Rs. 100.00.
244. Keshab Das, “Labour Market Resilience in India: Conceptual and Policy Issues”, May 2017. Rs. 100.00.
245. Chandra Sekhar Bahinipati and Unmesh Patnaik, “Can Increasing Human Development and Income Reduce Impact from Natural Disaster? Empirical Evidence for Floods in India”, June 2017. Rs. 100.00.
246. Anil Gumber, Biplab Dhak and N. Lalitha, “Rising Healthcare Costs and Universal Health Coverage in India: An Analysis of National Sample Surveys, 1986-2014”, July 2017. Rs. 100.00.
247. Keshab Das, “Children’s Right to Safe Sanitation in Urban Gujarat: Evidence from the Margins”, January 2018. Rs. 100.00.
248. Hastimal Sagara and Keshab Das, “Technological Disruptions and the Indian IT Industry: Employment Concerns and Beyond”, February 2018. Rs. 100.00.
249. Keshab Das and Nonita Tumalak Yap, “Dunking the Dust: Innovation Diffusion, Informality and Policy Opportunities in a Stone Crushing Cluster, India”, April 2018. Rs. 100.00.
250. Venkatanarayana Motkuri, Rudra Narayana Mishra, “Pharmaceuticals Industry and Regulation in India: A Note”, September 2018. Rs. 100.00.
251. Keshab Das, “Crafts, Innovation and Exclusion: Posers from a Terracotta Cluster in Rural Rajasthan”, October 2018. Rs. 100.00.

About the Institute

The Gujarat Institute of Development Research (GIDR), established in 1970, is a premier organisation recognised and supported by the Indian Council of Social Science Research, New Delhi and Government of Gujarat. It is an approved institute of Maharaja Krishnakumarsinhji Bhavnagar University, Bhavnagar, Gujarat. GIDR undertakes analytical and policy-oriented research concerning development issues.

The broad thrust areas of research at the Institute include Natural Resource Management, Agriculture and Climate Change, Industry, Infrastructure, Trade and Finance, Employment, Migration and Urbanisation, Poverty and Human Resource Development and Regional Development, Institutions and Governance.

- In the area of **Natural Resource Management, Agriculture and Climate Change**, in-depth studies have been carried out relating to some of the major development interventions like Participatory Irrigation Management, Watershed Development Programmes, Joint Forest Management and Protected Area Management. The studies have focused mainly on aspects relating to economic viability, equity and institutional mechanisms. In the sphere of management of natural resources, these studies often explore the interrelationships between the community, government and civil society. Many of these studies, based on careful empirical enquiry at the micro level, have contributed to the on-going debates on sustainable environment and institutions. Issues in Common Property Land Resources and land use have also been researched extensively.
- The research in the area of **Industry, Infrastructure, Trade and Finance** focuses on the response of micro, small and medium enterprises to the changing government policies in the wake of liberalisation. The research has contributed to work on industrial clusters, flexible specialization and addresses issues involving intellectual property regimes, especially for pharmaceuticals and biotechnology. Studies dealing with issues in provisioning of and access to basic infrastructure both in the rural and urban areas, the linkages between infrastructure, trade and finance, regional growth and aspects of governance have also been carried out at the Institute.
- Studies under the theme **Employment, Migration and Urbanisation** relate to population, demographic changes, labour, nature of employment, diversification of economic activities and migration. An emerging aspect has been to study international migration to trace social, economic, cultural and political influences through remittances, social spending and norms setting. Urban services and aspects of urban economy and governance have also been an important emerging area of research at the Institute.
- The research in **Poverty and Human Resource Development** focuses on population, labour and poverty issues. The studies relate to quality of life, education, social infrastructure, diversification of economic activities and migration. The informalisation process in the labour and production systems leading to poverty and social security issues forms another important theme. The research on health and family welfare has contributed towards developing a framework for target-free approach in family planning. In the informal sector debate the research has focused on the collection of social statistics to influence policies for better labour conditions and social security reforms.
- The enquiry in **Regional Development, Institutions and Governance** concentrates on application of regional planning models, data collection and analysis for regional planning exercises, impact of area development plans on growth and development of the regional economy. Studies have also focused on studying the role and participation of Non-Governmental Organisations (NGOs) in the development process, the changes in the characteristics of the NGOs and so on.

The major strength of the Institute is a thorough understanding of the micro processes and a consolidated effort to link these to macro issues. The faculty members have made considerable endeavour towards developing policy-sensitive database of the Indian economy, especially relating to the informal activities, including child labour. The Institute has played a useful role in promoting empirical research in the country and the evolution of related conceptual framework and approaches. Overtime, the Institute's research agenda has broadened to cover a fairly wide range of issues pertaining to development policy both at the regional and the national levels. The results of the Institute's research are shared with policy makers, non-governmental organisations and other academicians. The faculty members at the Institute also participate in government panels, committees and working groups to influence certain policy decisions. The Institute promotes public discussion through the publication of its research findings and through seminars, conferences and consultation and undertakes collaborative research along with NGOs, international organisations, government and academic institutions.