

# Morbidity Among Tribal Under-Five Children of Tea Garden Areas in a Block of Darjeeling District, West Bengal: A Cross-Sectional Study

KAUSHIK ISHORE<sup>1</sup>, SHARMISTHA BHATTACHERJEE<sup>2</sup>, DILIP KUMAR DAS<sup>3</sup>

## ABSTRACT

**Background:** In the developing world, more than half of infant and childhood mortality is related to childhood diseases particularly- acute respiratory infections (ARI) and diarrhoea. The situation is worse among underprivileged population such as tribals and people living in tea garden areas.

**Aim:** To identify the morbidity pattern and the associated factors among tribal, under five, children living in tea garden areas of Darjeeling district.

**Materials and Methods:** A cross-sectional study was conducted in three randomly chosen tea garden areas of a block in Darjeeling District, West Bengal, India from September

2013-February 2014. The collected data was analysed using SPSS software and binary logistic regression was applied to test association between morbidity and other epidemiological correlates.

**Results:** Morbidity was noted among 74 out of 192 children studied. Major causes of morbidity were- diarrhoea (26%), acute respiratory infections (24.5%) and fever (16.7%). Proportion of underweight children according to their age was 64.4%. Morbidity status was found statistically significant with some factors, like- religion, socio-economic status, immunization status and number of siblings.

**Conclusion:** There is high prevalence of diarrhoea and ARI associated morbidity in this part of the country.

**Keywords:** Acute respiratory infections, Diarrhea, Fever, IMNCI

## BACKGROUND

Children are backbone of the country and their health is a prime concern. The first few years of life are the most crucial period of life as this age is known for accelerated growth and development; warranting regular monitoring and any adverse influences during this period may result in severe limitations in their development [1]. Children under five years of age are the most vulnerable section of the society and are affected most by various common and easily treatable illnesses. The major diseases affecting this age group are mainly acute respiratory tract infections, diarrheal diseases, anaemia, skin diseases, and ear discharge, etc.

Globally, there is variation in morbidity pattern among under-five children in different countries. In India, The National Family Health Survey-3 (2005-06) showed huge variation in childhood morbidity profile among different states (ARI was noted as a disease of highest prevalence among under-five children) [2]. It can be easily predicted that if this situation prevails, India would be raising a generation which is debilitated and unable to contribute effectively to the productivity of the country.

Many studies had been undertaken in various parts of the country to reveal the magnitude and nature of morbidity profile among under-five children [3-10]. However, findings of the studies indicate geographical differences in nature and extent of the problem highlighting the need for area specific strategies and interventions. The burden of morbidities appears particularly high among rural and indigenous tribal populations who constitute about 8.2% (84.3 million) of total population in India [11].

The tribal population of Darjeeling district is about 8.4% of the total population [11], who live mainly in tea gardens in residential colonies. Piteable socio-economic surroundings, ignorance due to illiteracy, over-crowded and unhygienic living conditions make these people susceptible to various communicable diseases and malnutrition.

Literature search necessitates the need for community-based information on morbidity patterns among under-five children living in these areas which can be used to assess the overall impact of various ongoing nutritional improvement and disease control programs as well as in planning resource allocations.

In this context, the present study was done to address the morbidity and nutritional status among tribal under five children and its association with various socio-environmental factors in tea garden areas of a block of Darjeeling district.

## MATERIALS AND METHODS

A descriptive cross-sectional study was conducted among tribal under five children over a period of 6 months from September 2013 to February 2014 in three randomly chosen tea gardens of Naxalbari block of Darjeeling District. The inhabitants of these tea gardens are exposed to environmental dynamics of poor housing, water supply and sanitation.

Considering the prevalence of childhood morbidity noted in a similar type of study as 41.4% [3], a confidence level of 95%, 10% absolute precision, design effect 2, and 10% non-response rate, the sample size was calculated as 208. However, 208 were rounded off to 210 to get an equal sub-sample size of 70 from each of the gardens. A list of all tribal children in those tea-gardens was prepared with the help of tea-garden officials and local health workers which served as the sampling frame. Systematic random sampling was applied to choose 70 children from each of the tea gardens.

After getting permission from the Institutional ethics committee and tea-garden officials, pilot testing of the questionnaire was done among a small sub-sample of children, to check for consistency.

Data collection was done at the household level using a predesigned and pre tested questionnaire; mothers being the respondents. If any selected eligible study subject was found absent on the day of data collection, the household was revisited up to 2 times. Subjects not available even after those three visits were considered as non-responder.

The mothers were briefed about the purpose of the study and informed consent was obtained from them after assuring confidentiality and anonymity. They were asked about socio-demographic variables (age of child, religion, socioeconomic status, literacy level of mother) and history of any illness during last 15 days for assessment of morbidity. Immunization status was noted from the immunization card.

Every child was subjected to a thorough clinical examination in daylight for assessment of morbidity according to IMNCI guidelines. Body weight was measured with the help of platform weighing machine in case of children >1 year and Salter weighing scale in case of infants which were standardized and calibrated before every measurement. The weight was measured following standard guidelines and measurements were taken to an accuracy of 100 grams. The weight was plotted against their age in WHO growth chart separately for boys and girls and nutritional status was noted.

Collected data was checked for consistency and entered in Microsoft Excel data sheet. Data was analysed by IBM Statistical Package for Social Sciences (SPSS) version 20. It was organized and presented using the principles of descriptive statistics.

Binary logistic regression was applied to test association between morbidity and other epidemiological correlates. In this analysis, morbidity status of the child was used as the dependent variable, where having any morbidity and/or history within last 15 days was taken as 1 and absence of morbidity was taken as 0. The predictor variables used for the analysis include: Age, gender, religion, caste, socioeconomic status, mother's education, immunization status and weight for age.

The child's age was categorized into < 1 year and ≥ 1 year; gender as male and female; and the religion were grouped as Hindu and Christian. A relative indicator of household wealth was calculated from the per capita monthly income of the family and categorized as per recommendations of Tendulkar Committee's recommendation [12] into two classes – Above poverty line (≥ Rs. 673) and below poverty line (< Rs. 673). Immunization status was noted from the card and categorized into completely (up to date) and incompletely immunized according to their age and nutritional status was categorized as Normal and low weight for age (Below 2 SD).

## RESULTS

In the present study, 192, under five children were included; the mean age of the children was 31.1 ± 16.4 months and the males (51%) slightly outnumbered the females (49%). Majority of the children belonged to families living below poverty line and following Hinduism. Fourth of the sample studied belonged to lower class and almost 90% of their families were Hindu by religion. 62.5% mothers were illiterate. For 81.6% of the total enrolled children, birth weights were of normal and immunization status was completed for 92.2% of them. But it was seen that only 35.6% of the children were of normal weight for age.

Overall, 38.5% (74 out of 192) of the children had any morbidity, diarrhoea (26%), being the commonest followed by acute respiratory infections (24.5%). Palmer pallor was present in 24.5% children [Table/Fig-1].

Binary logistic regression analysis suggests that the odds of suffering from morbidities were significantly higher among children less than one year of age, female gender, belonging to families following Hinduism, and having malnutrition. Socio-economic conditions, mother's education and immunization status were not found to be significantly associated with morbidities [Table/Fig-2]. Though

Morbidities*	Frequency	Percent
Diarrhoea	50	26.0
Acute respiratory infection	47	24.5
Palmer pallor	47	24.5
Fever	32	16.7
Other illnesses#	29	15.1

**[Table/Fig-1]:** Distribution of the study children according to various morbidities. (n=192)

\* Multiple responses found

# Other illness includes- Pyogenic and fungal skin infections, scabies etc

Variables	Morbidity		Statistical tests OR (95% CI)
	Present (%)	Absent (%)	
<b>Age</b>			
< 1 year	15 (50.0)	15 (50.0)	3.144* (1.152 - 8.580)
1 year or more	59 (36.4)	103 (63.6)	1 (Referent)
<b>Gender</b>			
Male	33 (33.7)	65 (66.3)	0.393* (0.193 - 0.803)
Female	41 (43.6)	53 (56.4)	1 (Referent)
<b>Religion</b>			
Hindu	72 (41.9)	100 (58.1)	10.784 *(2.128 - 54.660)
Christian	2 (10.0)	18 (90.0)	1 (Referent)
<b>Socio-economic status</b>			
APL	58 (35.4)	106 (64.6)	0.491 (0.185 - 1.306)
BPL	16 (57.1)	12 (42.9)	1 (Referent)
<b>Literacy of mother</b>			
Literate	23 (31.9)	49 (68.1)	0.788 (0.361 - 1.719)
Illiterate	51 (42.5)	69 (57.5)	1 (Referent)
<b>Immunization status</b>			
Complete	70 (39.5)	107 (60.5)	4.868 (0.947 - 18.995)
Incomplete	4 (26.7)	11 (73.3)	1 (Referent)
<b>Weight for age</b>			
Normal	16 (23.2)	53 (76.8)	0.157*(0.066 - 0.373)
Undernourished	58 (47.2)	65 (52.8)	1 (Referent)
Total	74 (38.5)	118 (61.5)	192

**[Table/Fig-2]:** Socio demographic and other correlates of morbidity. (n=192)

\* p= <0.05

children belonging to BPL families and having illiterate mothers had higher odds of suffering from malnutrition than their respective counterparts, the difference was not found to be significant. Surprisingly, immunization status was not found to be significantly associated with morbidities.

## DISCUSSION

Understanding the morbidity and nutritional status of under five children has far-reaching implication for the better development of future generations. In this study, morbid conditions in the form of common illnesses were found among 74 children (38.5%), which was quite less as compared to the studies by Ukey et al., and Dongre et al., showing illness in 41.4% and 72.6% children respectively [3,4]. The reason might be the improving immunization coverage in recent years and also health services and their utilization have increased over past few years.

The leading causes of morbidity among all the children were diarrhoeal diseases (26%), followed by acute respiratory infections (24.5%) and fever (16.7%). Whereas most of the studies conducted in other parts of the country reported ARI as the major cause of morbidity among under five children [3-10]. Such higher proportion of diarrhoea in the study area might be due to lack of supply of safe and wholesome water and also absence of sanitary latrines amongst the vast majority of the houses of the tea garden areas.

Most striking feature was a very high proportion of underweight children (64.4%) in the study area than the findings of other studies in other parts of the country, like a study in Bhubaneswar by Pattnaik et al., [5]. This may be both due to long-term deprivation as well as recent episodes of diseases.

Results from logistic regression analysis suggest that the odds of morbidities among children less than one year of age, female gender, belonging to families following Hinduism, living below poverty line, illiterate mothers and having malnutrition were higher compared to their counterparts. This pattern could be due to factors such as an increased exposure to contaminated food in these circumstances.

A unique feature of the study is that socio economic status and maternal education were not found to be significantly associated with morbidity. This can be explained by the fact that most of the mothers who dwell in the tea gardens are labourers themselves and earn very meagerly. Thus the time spent for rearing children is greatly reduced. The fact that immunization was not associated significantly with morbidities may be attributed to the very low proportion of unimmunized study subjects.

## CONCLUSION

Morbidity was found to be quite high among the tribal children living in tea garden areas. The findings of the present study may have important implications for policy-makers and planners seeking to meet national and international development targets.

## REFERENCES

- [1] UNICEF. Data on under five health and statistics. Available from [http://www.unicef.org/infobycountry/india\\_statistics.html](http://www.unicef.org/infobycountry/india_statistics.html). [Last accessed on 15th March 2015].
- [2] Ministry of health and Family Welfare. National family and health survey-III, Vol-II 2005-06. P 236. Available from <http://www.measuredhs.com/pubs/pdf/FRIND3/00FrontMatter00.pdf>. [Last accessed on 15th March 2015].
- [3] Ukey UU, Chitre DS. Morbidity Profile of Pre-School Children in an Urban Slum Area. Indian Medical Gazette August 2012.
- [4] Dongre AR, Deshmukh PR, Garg BS. Childhood morbidity, household practices and health care seeking for sick children in a tribal district of Maharashtra, India. *Indian Journal of Medical Sciences*. 2010;64(1):7-16.
- [5] Patnaik L, Pattnaik S, Kumar V, Sahu T. Morbidity pattern among under 5 children of in an urban slum area of Bhubaneswar City, Odisha. *Indian Journal of Maternal and Child Health*. 2012;14(2):1-7
- [6] Narkhede V, Sinha U, Bhardwaj SD, Pitale S. Morbidity profile in under five children in urban slum area of nagpur. *National Journal of Community Medicine*. 2012;3(3):442-46.
- [7] Gupta S, Jamwal DS, Kumar D, Gupta SK. Morbidity among Under Five Children in a Rural Area of Jammu. *Journal of JK Sciences*. 2012;14(2):85-88.
- [8] Singh NH, Devi SH, Singh MY. Study on morbidity among under-five children of a rural area of manipur, thanga: A cross-sectional study. *Journal of Evolution of Medical and Dental Sciences*. 2013;16(2):2643-47.
- [9] Srivastava DK, Tripathi D, Gour N, Jain PK, Singh CM, Kumar S, et al. Morbidity Profile of Under five Children in urban slums of Etawah District, Bhopal, India. *Indian Journal of Community Health*. 2012;24(2):153-57.
- [10] Lakshmi JA, Begum K, Saraswathi G, Prakash J. Influence of Nutrition and Environment on Morbidity Profile of Indian Preschool Children. *Malaysian Journal of Nutrition*. 2005;11(2):121-32.
- [11] Government of India. Prospective planning division. Planning Commission, 2012. Report of the expert group to recommend the detailed methodology for the identification of families living below poverty line in the urban areas. New Delhi: Planning Commission. Available from: [http://planningcommission.nic.in/reports/genrep/rep\\_hasim1701.pdf](http://planningcommission.nic.in/reports/genrep/rep_hasim1701.pdf) [Last accessed on 15th March 2015].
- [12] Government of India. Prospective planning division. Planning Commission, 2012. Report of the expert group to recommend the detailed methodology for the identification of families living below poverty line in the urban areas. New Delhi: Planning Commission. Available from: [http://planningcommission.nic.in/reports/genrep/rep\\_hasim1701.pdf](http://planningcommission.nic.in/reports/genrep/rep_hasim1701.pdf) [Last accessed on 15th March 2015].

### PARTICULARS OF CONTRIBUTORS:

1. Post Graduate Trainee, Department of Community Medicine, North Bengal Medical College, Sushrutanagar, Darjeeling, West Bengal, India.
2. Assistant Professor, Department of Community Medicine, North Bengal Medical College, Sushrutanagar, Darjeeling, West Bengal, India.
3. Professor & Head, Department of Community Medicine, North Bengal Medical College, Sushrutanagar, Darjeeling, West Bengal, India.

### NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Sharmistha Bhattacharjee,  
Assistant Professor, Department of Community Medicine, North Bengal Medical College,  
Po: Sushrutanagar, 734012, Darjeeling, West Bengal  
E-mail: [sharmistha.bhattacharjee@gmail.com](mailto:sharmistha.bhattacharjee@gmail.com)

Date of Submission: **Mar 18, 2015**  
Date of Peer Review: **Apr 26, 2015**  
Date of Acceptance: **Jun 15, 2015**  
Date of Publishing: **Aug 01, 2015**

FINANCIAL OR OTHER COMPETING INTERESTS: None.