

# Prevalence of acute diarrhoeal diseases in children below 5 years of age in Indian settings

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## Abstract

**Background:** Diarrhoeal diseases which are one of the leading reasons behind global mortality and morbidity is more threatening for infants and young children. Childhood diarrhoea is becoming increasingly prevalent disease in developing countries like India. Moreover, it is a major cause of malnutrition that contributes towards third major cause of under 5 mortalities. This has raised a serious concern in the domain of public health.

**Objective:** The present study attempts to identify the prevalence of acute diarrhoeal diseases in children below 5 years of age in Indian settings.

**Methods:** This community-based, cross-sectional epidemiological and single-center study conducted in the rural field practice area attached to Department of Community Medicine of Topiwala National Medical College, Mumbai, and Maharashtra, India from March 2017 to February 2018 was aimed to identify the prevalence of acute diarrhoeal diseases in children below 5 years of age in Indian settings. Ethics approval was obtained from Ethics Committee for Academic Research Projects (ECARP). Research tools included a pre-structured questionnaire. Baseline information of study area was taken from the Primary Health Centre. Data was entered in Microsoft Excel spreadsheet to perform analysis.

**Results:** In our study, a total of 370 living children aged <12–59 months were included in the analysis. Most of the children who belonged to in Class III socioeconomic status (61.4%), affiliated to joint family (54.6%), belonged to Hindu religion (94.6%). Only 9.2% of mothers were illiterate whereas remaining 91.8% mothers had completed at least primary education. The prevalence of diarrhoea in children under 5 years of age was recorded as 20.5%.

**Conclusion:** The present study contributed to providing the prevalence of acute diarrhoeal diseases in children below 5 years of age in Indian settings.

**Keywords:** Diarrhoea; Morbidity; Prevalence, Under 5 Children

## Introduction

Diarrhoea is one of the leading reasons of under-five child mortality and morbidity across globe <sup>[1-3]</sup>. These diseases can be caused by bacteria, viruses and protozoan parasites infection especially among young and adult children <sup>[4]</sup>. According to the latest report of World Health Organization, nearly 8% of under five children death is due to diarrhoeal disease.

This indicates an alarming situation worldwide <sup>[5]</sup>. The latest report of United Nations International Children's Emergency Fund (UNICEF) revealed that deaths among under five children are mostly caused by malnourishment (45%), pneumonia (15%) diarrhoea (8%), malaria (5%) and others (9%) <sup>[6]</sup>. Moreover, diarrhoeal disease is the major cause of malnutrition that contributes towards third major cause of under 5 mortality especially in the developing countries. Further, globally 1.7 billion children are affected by diarrhoea out of that more than half millions of children die every year. Precisely, diarrhoea is more prevalent when a child is in second year of his life <sup>[7]</sup>.

In the developing countries, on an average three times in a year an under 5 children suffer from diarrhoea. Five countries India, Nigeria, Congo, Pakistan and China together contribute for half of the diarrhoea death among children <sup>[8]</sup>.

The National Family Health Survey (NFHS) shows that the prevalence of childhood diarrhoea has increased from 9% to 9.2% from 2016 to 2020 in India <sup>[9]</sup>. It is the third most common responsible disease for under five mortality. Profound studies have revealed that under five mortality persists due to diarrhoea in India <sup>[10, 11]</sup>. It is, thus, clear that this disease is a major public health issue in India. A study shows that under-five mortality and infant mortality (IMR) has been reduced to 50% and 41% in 2016 from 74% and 57% in 2005 <sup>[12]</sup>. Furthermore, Kamath *et al.* (2018), have mentioned that among the states Uttar Pradesh and Assam have shown more prevalence of childhood diarrhoea deaths than rest of the states of India <sup>[13]</sup>.

Diarrhoea disease among children has become crucial health concerns in India. Despite of having different interventions and schemes to control, diarrhoea death among under five children in India is still alarming <sup>[13]</sup>.

In view of this, this community-based, cross-sectional epidemiological and single-center study conducted in rural field practice area attached to Department of Community Medicine of Topiwala National Medical College, Mumbai, and Maharashtra, India was aimed to identify the prevalence of acute diarrhoeal diseases in children below 5 years of age in Indian settings.

## Materials and Methods

This community-based, cross-sectional epidemiological and single-center study was carried out between March 2017 to February 2018 on consecutive 370 Children below 5 years of age in the study area. This study carried out in the in the rural field practice area attached to Department of Community Medicine of Topiwala National Medical College, Mumbai was aimed to identify the prevalence of acute diarrhoeal diseases in children below 5 years of age in Indian settings. Inclusion criteria composed of children below five years of age, children whose parents are willing to participate in the study and children whose parents are staying for past 6 months in the study area. Whereas children whose parents/caregivers do not present at the time of interview and children suffering from persistent diarrhoea, or any other severe illness were excluded from our study. Sampling method was systematic random sampling. Data collection was done using preformed questionnaire. Data was entered in Microsoft Excel spreadsheet and the data underwent analysis using descriptive statistics involving tables, graphs and bar diagrams. The study was reviewed by the Institutional Ethics Committee for Academic Research Projects (ECARP) of the medical college and approval was sought.

## Results

**Table 1:** Distribution of socio-demographic profile of the study population.

Variables	Sub variables	No.	Percentage (%)
Gender	Male	185	50.0%
	Female	185	50.0%
Age (in months)	<12	60	16.2%
	13-24	69	18.6%
	25-36	71	19.2%
	37-48	91	24.6%
	49-60	79	21.4%
Religion	Hindu	350	94.6%
	Muslim	20	5.4%
Mother's Education	Illiterate	34	9.2%
	Primary education	170	45.9%
	Secondary education	108	29.2%
	Higher Secondary education	58	15.7%
Socio-economic status	Class II	20	5.4%
	Class III	227	61.4%
	Class IV	90	24.3%
	Class V	33	8.9%
Type of Family	Nuclear	168	45.4%
	Joint	202	54.6%

As shown in Table 1 that a total of 370 living children aged <12–59 months were included in the analysis. Most children who belonged to in Class III socioeconomic status (61.4%), affiliated to joint family (54.6%), belonged to Hindu religion (94.6%). Only 9.2% of mothers were illiterate whereas remaining 91.8% mothers had completed at least primary education. From the above table, it was observed that out of the total 370 subjects, 185(50%) were males and 185(50%) were females. Age wise distribution shows that children below 12 months were 60(16.2%), 13-24 months were 69(18.6%), 25 to 36 months were 71(19.2%), 37-48 months were 91(24.6%), and between 49-60 months were 79(21.4%)

Most of the subjects Religion wise i.e. 350(94.6%) were Hindu followed by Muslims 20(5.4%) populations. Literacy wise figures concerning mother's education was illiterate 34(9.2%), primary 170(45.9%), secondary 108(29.2%) and higher secondary or graduate degree were 58(15.7%) respectively. According to Modified Prasad Classification (2018), 20(5.4%) belongs to class II, 227(61.4%) belong to Class III, 90(24.3%) belongs to class IV and 33(8.9%) belong to socio-economic Class V. Out of the total 370 subjects, 168(45.4%) children belong to nuclear family, while 202(54.6%) children belong to Joint family.

**Table 2:** Prevalence of diarrhoeal episodes in the children in past 2 weeks.

Diarrhoeal episodes	Frequency (No.)	Percentage (%)
Yes	76	20.5%
No	294	79.5%
Total	370	100%

From the above Table 2, it was observed that out of 370 children, 76 (20.5%) children had diarrhoeal episodes and 294(79.5%) had no such episodes during past 2 weeks. Thus, the prevalence of diarrhoea in children under 5 years of age comes out to be 20.5%.

## Discussion

Diarrhoea is one of the leading killer diseases among under five years' children, so it is an important public health problem in India. India already sets her goals to achieve the SDGs

Target to reduce under-five child mortality by 25 in 2030 (WHO & SDGs). To achieve Millennium Development Goal-4 (MDG) and reduce child mortality the government of India innovated various program and schemes like the child survival and safe motherhood program (1992), target-free approach (1996), reproductive and child health program (RCH) in 1997 and 2005, national rural/urban health mission between 2005 and 2012, national health mission (NHM) in 2013 to-date, program related to immunization and prevent diarrheal disease and acute respiratory infection (ARI). As a result, under-five mortality (U-5MR) reduced 55 to 29 per 1000 live births between 2011 to 2015. To prevent under-five mortality and to achieve the various targets (including SDGs and MDG), special attention needs to be put on the most prevalent diseases among under-five children including diarrhoea [14].

In India, 9.2% of under 5 children suffer from diarrhoeal disease (NFHS-4). In our study, the prevalence of diarrhoea in children under 5 years of age was recorded as 20.5%. The findings of this study revealed that children living in Class III socioeconomic status were more likely to experience diarrhea than those living in other classes. This finding is in line with previous studies conducted in India [15] and Jamma district of Ethiopia [16]. This could be due to limited access to healthcare and sanitation facilities in rural areas.

Religion was significantly associated with childhood diarrhoeal disease. The present study found that children from Hindu religion had a higher risk of diarrhoea compared with Muslim religion. This finding is contrary to the findings of study carried out in India, [15] wherein Muslim children were 18% more likely to develop the diarrhoeal disease as compared to Hindu children. This might be due to scheduled caste and Muslim children have lower access to improved sources of drinking water and sanitation facilities compared to other socio-religious groups of children.

Concerning maternal education, this variable has been associated with diarrhoea in children under 5 years of age. In our study, 91.8% mothers had completed at least primary education. Literature has revealed that women's education was associated with reduced likelihood of diarrhoea in children as compared to those who had no education or primary level of education. This could be explained by hygiene practices, child feeding and caring practices, and improved living conditions of an educated mother [17-19].

However, there were few limitations before considering profound study findings. First, causality cannot be assumed from this analysis due to the cross-sectional nature of data. Further research is needed using longitudinal data to examine the potential pathways for the occurrence of diarrhoea in children. Secondly, dietary diversity may play an important role, and hence, a further work may utilize information on this aspect while explaining the prevalence of diarrhoea. Similarly, immunization status also can be used as an explanatory variable in further work. The responses of diarrhoeal diseases information were completely based on mother's knowledge about the diarrhoeal diseases which is not medically verified during the survey, hence, may not be true for generalizing overall study findings.

## Conclusion

In conclusion, the present study contributes in providing the prevalence of acute diarrhoeal diseases in children below 5 years of age in Indian settings. Overall, the steady decline in under-five mortality in a large country like India is laudable; however, acceleration through greater investment, focus, and innovation is the need of the hour. Based on findings from the current study, we recommend that the public health programs must focus to eradicate the higher prevalence of childhood diarrhoea.

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**Ethical approval:** The study was approved by the Institutional Ethics Committee for Academic Research Projects

**References:**

1. Omona S, Malinga GM, Opoke R, Openy G, Opiro R. Prevalence of diarrhoea and associated risk factors among children under five years old in Pader District, northern Uganda. *BMC Infectious Diseases*. 2020;20(1):1-9.
2. Mulatya DM, Ochieng C. Disease burden and risk factors of diarrhoea in children under five years: Evidence from Kenya's demographic health survey 2014. *International Journal of Infectious Diseases*. 2020;93:359-66.
3. Mallick R, Mandal S, Chouhan P. Impact of sanitation and clean drinking water on the prevalence of diarrhea among the under-five children in India. *Children and Youth Services Review*. 2020;118:105478.
4. Lungu EA, Darker C, Biesma R. Determinants of healthcare seeking for childhood illnesses among caregivers of under-five children in urban slums in Malawi: a population-based cross-sectional study. *BMC pediatrics*. 2020;20(1):1-3.
5. Das JK, Salam RA, Bhutta ZA. Global burden of childhood diarrhea and interventions. *Current opinion in infectious diseases*. 2014;27(5):451-8.
6. Prudden HJ, Hasso-Agopsowicz M, Black RE, Troeger C, Reiner RC, Breiman RF, *et al*. Meeting Report: WHO Workshop on modelling global mortality and aetiology estimates of enteric pathogens in children under five. Cape Town, 28–29th November 2018. *Vaccine*. 2020;38(31):4792-800.
7. Chowdhury F, Shahid AS, Ghosh PK, Rahman M, Hassan MZ, Akhtar Z, *et al*. Viral etiology of pneumonia among severely malnourished under-five children in an urban hospital, Bangladesh. *PloS one*. 2020;15(2):e0228329.
8. Adedokun ST. Correlates of childhood morbidity in Nigeria: evidence from ordinal analysis of cross-sectional data. *Plos one*. 2020;15(5):e0233259.
9. Ghosh K, Chakraborty AS, Mog M. Prevalence of diarrhoea among under five children in India and its contextual determinants: A geo-spatial analysis. *Clinical Epidemiology and Global Health*. 2021;12:100813.
10. Ghosh P, Rohatgi P, Bose K. Determinants of time-trends in exclusivity and continuation of breastfeeding in India: An investigation from the National Family Health Survey. *Social Science & Medicine*. 2022;292:114604.
11. Paul P. Socio-demographic and environmental factors associated with diarrhoeal disease among children under five in India. *BMC public health*. 2020 Dec;20(1):1-1.
12. Rodgers J, Kim R, SV S. Explaining within-vs between-population variation in child anthropometry and hemoglobin measures in India: a multilevel analysis of the national family health survey 2015-2016. *Journal of epidemiology*, 2019. JE20190064.
13. Kamath A, Shetty K, Unnikrishnan B, Kaushik S, Rai SN. Prevalence, patterns, and predictors of diarrhea: a spatial-temporal comprehensive evaluation in India. *BMC Public Health*. 2018;18(1):1-0.
14. Sayem AM, Nury AT, Hossain MD. Achieving the millennium development goal for under-five mortality in Bangladesh: current status and lessons for issues and challenges for further improvements. *Journal of health, population, and nutrition*. 2011;29(2):92.
15. Vijayan B, Ramanathan M. Prevalence and clustering of diarrhoea within households in India: some evidence from NFHS-4, 2015-16. *Journal of Biosocial Science*. 2021;53(1):108-20.
16. Workie GY, Akalu TY, Baraki AG. Environmental factors affecting childhood diarrheal disease among under-five children in Jamma district, South Wello zone, Northeast

- Ethiopia. BMC infectious diseases. 2019;19(1):1-7.
17. Melese B, Paulos W, Astawesegn FH, Gelgelu TB. Prevalence of diarrheal diseases and associated factors among under-five children in Dale District, Sidama zone, Southern Ethiopia: a cross-sectional study. BMC Public Health. 2019;19(1):1-0.
  18. Sarker AR, Sultana M, Mahumud RA, Sheikh N, Van Der Meer R, Morton A. Prevalence and health care-seeking behavior for childhood diarrheal disease in Bangladesh. Global pediatric health. 2016;3:2333794X16680901.
  19. Zedie FB, Kassa DH. Socio-economic, behavioral and environmental factors associated with diarrhea among under five children in health development and non-health development army member mothers in Wondo Genet, south Ethiopia. Health Educ Care. 2018;3(3):1-8.