

**A COMPREHENSIVE EPIDEMIOLOGICAL CASE STUDY OF DIARRHEAL DISEASES IN BALASORE DISTRICT, ODISHA FROM THE YEAR 2013 TO 2024****Nibedita Mohapatra\***

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**ABSTRACT** This study investigates the incidence and impact of diarrhoeal diseases in Balasore district, Odisha, over a span of twelve years (2013–2024). Data was collected through field visits to schools, Anganwadi Centres (AWCs), and hospitals, followed by community-based interventions involving frontline health workers. Block-wise and year-wise data analysis revealed significant variations in disease prevalence and mortality across different regions and years. Among the blocks, DHH Balasore reported the highest number of cases (110), while Oupada had the highest death rate (5%). Notably, Simulia block recorded zero cases. Year-wise, diarrhoeal cases peaked in 2022 (930 cases) and were lowest in 2015 (5 cases). The highest mortality rate (3%) occurred in 2016. A remarkable decline in cases during 2020–2021 is attributed to COVID-19-related hygiene practices and lockdown measures. However, cases surged post-pandemic, indicating a relapse into unsafe sanitary habits and urban lifestyle factors. The findings underscore the need for sustained public health initiatives, improved sanitation infrastructure, and targeted health awareness campaigns to reduce the burden of diarrhoeal diseases in Balasore district.

**KEYWORDS :****INTRODUCTION**

Diarrhoeal diseases remain a critical global health challenge, particularly for children under five in developing nations. Globally, an estimated 1.7 billion cases occur annually, resulting in over 500,000 child deaths (WHO, 2017). The risk is most acute during the second year of life, with children in low-resource settings experiencing an average of three episodes per year (Walker et al., 2013). Infections caused by bacteria, viruses, or protozoa are the primary drivers of diarrhoea, which ranks among the leading causes of under-five mortality worldwide (WHO, 2023).

The interplay between diarrhoea and malnutrition creates a vicious cycle: 8% of under-five deaths are directly attributed to diarrhoeal disease, while malnutrition underlies 45% of all child mortality, exacerbating vulnerability to fatal infections like pneumonia (15%), diarrhoea (8%), and malaria (5%) (WHO, 2023; UNICEF, 2023). Geographic disparities further compound this burden—in 2008, five countries (India, Nigeria, Democratic Republic of the Congo, Pakistan, and China) accounted for nearly half of all diarrhoea-related child deaths, reflecting systemic gaps in clean water access, sanitation, and healthcare (Boschi-Pinto et al., 2008).

Diarrhoeal diseases spread predominantly via the faecal-oral route, where pathogens from contaminated food, water, or surfaces enter the digestive tract. This is pervasive in regions with inadequate sanitation infrastructure and unsafe drinking water (WHO, 2017; CDC, 2023). Person-to-person transmission further amplifies outbreaks, particularly in contexts of poor hand hygiene, overcrowding, or unsafe disposal of human waste (Guerrant et al., 2013).

The main objective of this brief analysis of the project report is to know and highlight the scenario of the Diarrhoeal disease within a span of consecutive years from 2013-2024 and to be familiarized with Diarrhoea; its mode of transmission, its disease process, its symptoms, its area of occurrence and mostly its treatment and the measures to prevent it. It helps us to get an idea over the situation and gravity of disease in our area.

This would help us to concentrate our efforts and work towards the root cause of the problem not only by curing it but also by adopting different effective measures to prevent the disease.

The main purpose of this project's report is to provide a clue or a foundation to any group or individual who wants to expand the research further.

**MATERIALS AND METHODS**

To carry out a comprehensive investigation into the diarrhoeal outbreak in Balasore district, a variety of tools and resources were utilized across multiple domains. For data collection, several materials were employed to ensure a thorough understanding of the situation.

The investigation employed a multi-modal methodology to dissect the outbreak's drivers and systemic vulnerabilities.

The primary data source for this research was the Integrated Disease Surveillance Programme (IDSP) unit located in the Z.S.S Administrative Building of Fakir Mohan Medical College and Hospital in Balasore. To obtain historical and recent data related to diarrhoeal cases in the district, a visit was made to the institution. With the supportive referral of the Chief District Medical Officer (CDMO) of Balasore, access was granted to the Diarrhoea Department within the IDSP unit. The designated officials at the unit were cooperative and provided comprehensive datasets, which included case records from previous years and recent statistics. This collaboration ensured the accuracy and authenticity of the collected information, serving as the cornerstone for further analysis and reporting.

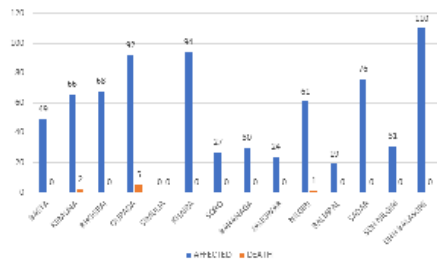
**RESULTS**

To analyze the effect of Diarrhoea on people of Balasore district, the researchers initially visited the schools, AWCs (Anganwadi Centres) and hospitals to observe and understand the health services and hygiene facilities. Post survey, the intervention methodology was based on community participation with all the stakeholders i.e. the Frontline health workers.

1. The given data provides an overview of reported attacks and deaths across 14 administrative blocks. Each block has been analyzed based on the number of attacks, deaths, and the percentage of deaths (rounded off). The total number of attacks recorded across all blocks is 747, while the total number of deaths stands at 8, leading to an overall death percentage of approximately 1%. This low mortality rate indicates that while attacks are occurring, most do not result in fatalities, reflecting either the non-lethal nature of these incidents or the effectiveness of healthcare and emergency responses.

Among the blocks, DHH Balasore reported the highest number of attacks at 110, followed by Khairi with 94, Oupada with 92, and Sadar with 76. These blocks can be considered high-incident zones and may require targeted preventive measures and closer monitoring to reduce the number of attacks. On the other hand, Simulia reported zero attacks and zero deaths, making it a model of peace and safety. Other blocks with zero deaths, despite having reported attacks, include Basta, Bhograi, Khairi, Soro, Bahanaga, Jaleswar, Baliapal, Sadar, SDH Nilgiri, and DHH Balasore.

Only three blocks—Remuna, Oupada, and Nilgiri—reported deaths. Remuna had 66 attacks and 2 deaths, resulting in a death percentage of 3%. Oupada had 92 attacks and 5 deaths, giving it the highest death percentage at 5%. Nilgiri reported 1 death out of 61 attacks, yielding a death percentage of 2%. These figures suggest that while most blocks are managing to prevent fatalities, some, like Oupada, may need to improve response mechanisms or address specific local risks.



**Fig-1-** Block-wise distribution of patients affected with Diarrhoea within a span of last few years

2. Overall, this twelve-year analysis showcases an evolving epidemiological landscape. While fluctuations in the number of diarrhoeal cases are evident—with specific years showing sharp increases—the consistent reduction in mortality, especially from 2020 to 2024, is remarkable. This trend reflects significant advancements in health infrastructure, disease surveillance, patient care, and public awareness. The absence of deaths in the last five years, despite substantial caseloads, is particularly encouraging. It underscores the effectiveness of sustained health interventions, availability of prompt medical care, and perhaps a better-informed public, all contributing to a decline in diarrhoeal disease severity and improved outcomes at the community level.



**Fig-2-** Year-wise survey report of Diarrhoeal disease affecting to all the age groups within a span of last 12 years.

In this graph the case numbers fluctuated significantly over the decade, mortality rates consistently improved after 2016, peaking in resilience during the unprecedented 2022–2024 surges. Successes likely stem from integrated strategies: rapid medical response, preventive education, and infrastructure strengthening. However, recurring case spikes signal the need for sustained investment in clean water access, sanitation, and equitable healthcare to curb transmission risks.



**Fig-3-** Affected vs death of Diarrhoeal disease in Remuna, Oupada and Nilgiri Block

## DISCUSSION

According to the National Health Mission data, the incidence rate of Diarrhoea in overall Balasore district had an increase in magnitude in 2013 and 2014, followed by a slight decrease in 2015. During 2016, 2017 and 2018, there was a fluctuation in the incidence rate of Diarrhoea in Balasore district with 2016 showing the overall highest number of Diarrhoeal attacks. During 2020 and 2021, there is a decrease in the incidence rate of Diarrhoea in Balasore district.

This above chart is a graphical representation of the data mentioned in the Table No.1 under Results Heading. It is found that the DHH Balasore is the place where people are most affected with Diarrhoea may be probably due to consuming lots of junk and fast foods, improper waste disposal, poor sewage treatment facility, and

unhygienic conditions due to carelessness of the residents. Death percentage is more in Remuna as compared to other places mentioned in the table. Simulia block records nil Diarrhoeal cases.

From the year-wise data of diarrhea cases in Balasore from 2013 to 2024, it is observed that there was an initial decline in cases from 2013 to 2015. This may be due to increased public health awareness, better sanitation, and improved access to clean drinking water during those years. The lowest number of cases was recorded in 2015, with only 5 cases and no deaths. However, in 2016, a sudden spike in cases was noted, with 145 reported attacks and 4 deaths, resulting in the highest death percentage of 3%. This rise may have occurred due to water contamination during the monsoon, poor drainage systems, or temporary lapses in public health measures. From 2017 to 2019, the cases remained relatively under control, with occasional rises like in 2019, but no significant fatalities were reported.

## CONCLUSION

Diarrhoea remains a persistent public health challenge in Odisha, disproportionately affecting rural communities where gaps in healthcare access, sanitation infrastructure, and clean water supply exacerbate vulnerabilities. Children, particularly those with underlying malnutrition, face heightened risks, as poor nutritional status amplifies the severity of diarrhoeal episodes and complicates recovery. In response, the Odisha government has prioritized interventions such as scaling up Oral Rehydration Therapy (ORT) through campaigns like the Intensified Diarrhoea Control Fortnight (IDCF), which promotes ORS and zinc supplementation to prevent child deaths, alongside emergency clean water distribution to water-scarce villages. However, critical gaps persist, including the need for stricter monitoring of sanitation programs in rural areas, accelerated rotavirus vaccination in high-incidence zones, and community-led hygiene education to shift cultural practices toward consistent toilet use and handwashing. By addressing these challenges through equitable, coordinated action, Odisha can transition from crisis management to lasting resilience, ensuring that rural families and malnourished children are no longer left behind in the fight against this preventable, yet persistent, threat.

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