Original Article

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Epidemiological Assessment of Disease Burden and Demographic Characteristics among the Patients Attending in IAHS Hospital of Chattogram in Bangladesh

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ABSTRACT

Background: *Evaluation of disease patterns and demographic characteristics in hospital populations is essential for understanding local epidemiology and guiding healthcare planning. In many South-Asian settings, infectious diseases continue to account for a large proportion of hospital cases despite the growing burden of non-communicable conditions. To assess the disease profile, demographic distribution and predictors of infectious disease burden among patients attending a tertiary care hospital was observed by this research.*

Materials and methods: *This hospital-based cross-sectional study conducted from January to October 2025 included 2885 patients of all age groups and both gender. Data were collected retrospectively from hospital disease registry records using a structured format. Variables included age, gender and clinical diagnoses such as dengue fever, enteric fever, acute gastroenteritis, tuberculosis, anxiety disorder, malignancy and others. Diseases were categorized into infectious and non-infectious groups. Descriptive statistics were used to summarize disease distribution. Chi-square test assessed associations between gender and disease pattern, while multivariate logistic regression analysis identified independent predictors of infectious disease burden. A p-value <0.05 was considered statistically significant.*

Results: *Infectious diseases predominated within the study population, with dengue fever (45.4%) and enteric fever (30.9%) representing the most common conditions. The majority of patients belonged to the 31–50 years age group. Gender-wise comparison showed no significant difference for most diseases except tuberculosis, which was more frequent among males (p 0.03). Monthly trend analysis revealed a gradual increase in dengue and enteric fever cases, indicating possible seasonal influence. Multivariate analysis demonstrated that age (Adjusted OR=1.03, p 0.002) and anxiety disorder (Adjusted OR=1.74, p 0.014) were significant predictors of infectious disease burden.*

Conclusion: *Infectious diseases remain the dominant clinical burden in this hospital attending population, particularly among middle-aged adults. Targeted surveillance, preventive interventions and demographic risk assessment are essential to reduce disease impact in resource-limited healthcare settings.*

Key words : Disease burden; Epidemiological assessment; Healthcare planning.

Introduction

Understanding the epidemiological pattern of diseases in hospital settings is essential for effective healthcare planning, early diagnosis and targeted public health interventions. The global burden of disease has undergone significant transitions over the past decade, with many developing countries experiencing a dual burden of communicable and non-communicable diseases.[1,2] Despite improvements in healthcare infrastructure, infectious diseases continue to contribute substantially to morbidity and healthcare utilization, particularly in tropical and resource-limited settings where environmental and demographic factors influence disease transmission dynamics.[1,2]

In recent years, emerging and re-emerging infections such as dengue fever, enteric fever and acute gastroenteritis have posed considerable challenges to healthcare systems. Dengue fever has shown a marked increase in incidence worldwide, especially in South Asia, driven by urbanization, climate change and vector expansion.[3] Enteric fever remains a significant public health concern in regions with limited sanitation facilities and high population density, contributing to a large proportion of febrile illnesses presenting to hospitals.[4] Acute gastroenteritis also continues to be a

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leading cause of morbidity associated with contaminated food and water sources, emphasizing the need for ongoing epidemiological surveillance.[5]

Tuberculosis persists as a major infectious disease burden in many developing countries despite ongoing prevention programs. Previous studies have highlighted the importance of demographic variables such as age and gender in determining disease susceptibility and clinical outcomes.[6] At the same time, the growing presence of non-infectious conditions such as anxiety disorders and malignancies reflects the evolving epidemiological transition, where mental health and chronic diseases coexist alongside communicable illnesses.[7]

Hospital-based disease profiling provides valuable insight into the distribution and determinants of disease patterns within specific populations. Such analyses help identify high-risk groups, seasonal variations and predictors of disease burden. Several epidemiological investigations have demonstrated that demographic characteristics significantly influence disease prevalence and healthcare utilization patterns.[8] Age-related immune changes and varying exposure risks may contribute to differences in infectious disease occurrence, while gender-based disparities may reflect behavioral, occupational and biological factors affecting disease susceptibility.[9]

Moreover, advanced statistical approaches such as multivariate logistic regression enable researchers to identify independent predictors of disease burden and understand complex interactions between clinical variables. These analytical techniques are widely used in cross-sectional epidemiological studies to assess associations between demographic factors and health outcomes.[10] Therefore, the present study aims to evaluate the disease profile and demographic characteristics among patients attending a tertiary care hospital, with particular emphasis on infectious disease burden and associated predictors.

Materials and methods

This hospital-based cross-sectional study was conducted during the period from January to October 2025 to evaluate the disease profile and demographic characteristics of patients attending a tertiary care hospital. A total of 2885 patients both gender were included by convenient sampling using hospital disease registry data retrospectively. Socio-demographic variables (Age, gender) and clinical diagnoses such as dengue fever, enteric fever, acute gastroenteritis, tuberculosis, anxiety disorder, malignancy and other conditions were recorded.

Data were collected retrospectively using a structured format and categorized into infectious and non-infectious diseases. Statistical analysis was performed using descriptive statistics, Chi-square test for association and multivariate logistic regression to identify predictors of infectious disease burden. A p-value of <0.05 was considered statistically significant.

Inclusion criteria

- Patients aged 12 to 92 years, of both genders, were recorded in the hospital illness registry during the research period.
- Individuals with a confirmed clinical diagnosis documented in hospital records.
- Patients with complete demographic information (Age and gender) and recorded disease status.

Exclusion Criteria

- Patients with incomplete or missing demographic or diagnostic data.
- Duplicate records or repeated entries of the same patient.
- Cases with unclear or unspecified diagnosis in the registry.

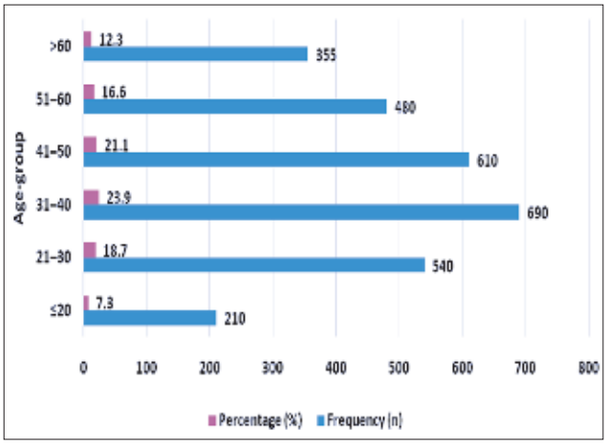

Figure 1 Age group distribution of study population (n=2885)

Highest number of participants were concentrated in the 31–40 years age group (23.9%, n=690) followed by 41–50 years (21.1%, n=610) and 21–30 years (18.7%, n=540) indicating that the study population was predominantly middle-aged adults. Older age groups (51–60 and >60 years) represented a moderate proportion, whereas individuals aged ≤20 years comprised the smallest segment 210 (7.3%).

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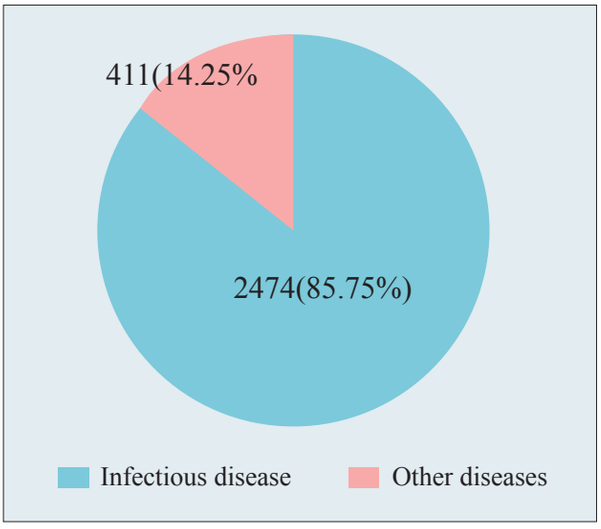

Figure 2 Pattern of disease explored from the records (n=2885)

Figure 2 demonstrates that infectious diseases constitute the major proportion of the disease burden (n=2474) compared to non-infectious conditions (n=411).

Table I Gender-wise disease distribution among the study population (n=2885)

Disease	Male n (%)	Female n (%)	p-value*
DF	560 (43.9)	751 (46.6)	0.08
Enteric	380 (29.8)	513 (31.8)	0.21
TB	52 (4.1)	31 (1.9)	0.03
Acute gastroenteritis	90 (7.1)	97 (6.0)	0.29

*Chi-square test

Gender-wise comparison showed that the distribution of DF, Enteric fever and AGE did not differ significantly between males and females ($p > 0.05$). However, Tuberculosis (TB) demonstrated a statistically significant association with gender ($p = 0.03$) with a higher proportion observed among males compared to females. Overall, these findings suggest that most infectious diseases in the study population were not strongly influenced by gender, except for TB.

Table II Distribution of major diseases among the study population (n=2885)

Disease	Frequency (n)	Percentage (%)
Dengue fever (DF)	1311	45.4
Enteric fever	893	31.0
Acute gastroenteritis (AGE)	187	6.5
Tuberculosis (TB)	83	2.9
Others	411	14.2
Total	2885	100.0

The distribution of major diseases shows that acute infectious diseases were predominant among the study population (n = 2885). Dengue fever was the most frequently observed condition, accounting for 45.4% of all cases, followed by enteric fever (31.0%). Acute gastroenteritis (6.5%) and tuberculosis (2.9%) were comparatively less common. A smaller proportion (14.2%) comprised other miscellaneous diseases. Overall, the findings indicate that vector-borne and water-borne infections represent the major disease burden in the studied population.

Figure 3 Monthly trend of total cases, dengue fever and enteric Fever among the study population (n=2885)

Figure 3 shows a gradual increase in the total number of cases from January to May, with a noticeable rise in dengue fever cases over time. Enteric fever also demonstrated a steady upward trend, although at a lower magnitude compared to dengue. This pattern suggests a possible seasonal increase in infectious diseases, particularly dengue fever, during the later months of the study period.

Table III Multivariate logistic regression analysis showing predictors of infectious disease burden among the study population (n=2885)

Predictor	Adjusted OR	95% CI	p-value
Age	1.03	1.01–1.05	0.002
Female sex	1.18	0.98–1.42	0.08
Anxiety disorder	1.74	1.12–2.71	0.014
Malignancy	0.68	0.41–1.13	0.13

Multivariate logistic regression analysis demonstrated that age was significantly associated with infectious disease burden, with a 3% increase in risk for each additional year (Adjusted OR = 1.03, $p = 0.002$). Anxiety disorder also showed a significant positive association (Adjusted OR = 1.74, $p = 0.014$) suggesting higher odds of infectious disease presence among affected individuals. Although female sex showed increased odds, the association was not statistically significant ($p = 0.08$) and malignancy did not demonstrate a significant association with infectious disease burden ($p = 0.13$).

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Discussion

The findings demonstrated that infectious diseases constituted the predominant proportion of clinical diagnosis, accounting for the majority of cases compared with non-infectious conditions. This observation aligns with recent epidemiological data from Bangladesh and neighboring countries, where communicable diseases continue to represent a major healthcare challenge despite ongoing epidemiological transition.[11]

Table II showed that dengue fever (45.4%) was the most prevalent condition, followed by enteric fever (30.9%) indicating a strong dominance of acute febrile illnesses within the study population. Similar hospital-based studies from South Asia have reported dengue and enteric fever as leading causes of hospital visits, particularly during seasonal outbreaks associated with monsoon-related environmental changes.[12] The relatively lower prevalence of tuberculosis (2.9%) and acute gastroenteritis (6.5%) in this study is consistent with recent national surveillance reports suggesting gradual improvement in tuberculosis control programs and better management of gastrointestinal infections.[13]

The age group distribution (Figure 1) revealed that middle-aged adults, particularly those between 31–50 years, comprised the largest proportion of patients (45%). This pattern reflects the increased occupational exposure and urban mobility commonly observed among economically active populations in Bangladesh. Previous regional studies have also demonstrated higher infectious disease incidence among working-age individuals due to increased environmental contact and travel-related exposure risks.[14] The finding highlights the socio-economic implications of disease burden, as illness within this age group may lead to reduced workforce productivity and increased healthcare expenditure.

Gender-wise analysis (Table I) demonstrated that most infectious diseases did not differ significantly between males and females; however, tuberculosis showed a statistically significant male predominance (p 0.003). This observation is consistent with global and regional tuberculosis data, where higher incidence among males has been attributed to occupational exposure, smoking prevalence and delayed healthcare-seeking behavior.[15] Similar gender-based trends have been reported in Bangladesh, reinforcing the need for targeted screening and early detection strategies among male populations.[16]

The monthly trend analysis (Figure 3) illustrated a gradual increase in total cases, particularly dengue fever, during the later months of the study period. Such seasonal variation is well documented in South Asia, where vector breeding increases during warmer and humid months, contributing to periodic outbreaks.[17] The parallel rise in enteric fever cases further emphasizes the role of environmental and sanitation factors in disease transmission within urban hospital settings.

Multivariate logistic regression analysis (Table III) identified age as an independent predictor of infectious disease burden, with increasing age associated with higher odds of infection. This finding is comparable to large-scale epidemiological analyses demonstrating age-related susceptibility due to immunological and comorbidity factors.[18] Additionally, anxiety disorder showed a significant association with infectious disease burden, suggesting a possible interaction between psychological stress and immune response. Emerging literature has highlighted the bidirectional relationship between mental health conditions and infectious diseases, particularly in resource-limited healthcare environments.[19]

Although non-infectious diseases such as malignancy and anxiety disorder constituted a smaller proportion of cases, their presence reflects the ongoing epidemiological shift in Bangladesh toward a dual burden of disease. Recent national health reports emphasize the simultaneous rise of chronic conditions alongside persistent infectious diseases, requiring integrated healthcare strategies that address both communicable and non-communicable conditions.[20]

Limitations

- The study was hospital-based, so the findings may not fully represent the disease pattern of the general community population.
- Use of retrospective registry data may introduce information bias due to incomplete or missing clinical details, as these are secondary data.
- Seasonal and environmental variables were not directly measured, which may affect interpretation of monthly disease trends.

Recommendations

- Future studies should include multi-center or community-based populations to improve generalizability of findings.
- Strengthening hospital surveillance systems and maintaining standardized electronic data recording will enhance data quality for epidemiological research.
- Public health strategies focusing on vector control, sanitation improvementand health education are essential to reduce infectious disease burden.

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Conclusion

This study demonstrated that infectious diseases, particularly dengue fever and enteric fever, constituted the major proportion of hospital cases, predominantly affecting middle-aged adults. Age was identified as an independent predictor of infectious disease burden, while gender showed limited association except for tuberculosis. The findings highlight the need for strengthened disease surveillance, preventive strategies and integrated healthcare planning to address the persistent burden of communicable diseases in a South-Asian hospital setting.

Disclosure

All the authors declared no conflict of interest.

References

1. GBD 2019 Diseases and Injuries Collaborators. Global burden of diseases study 2019. Lancet. 2020;396:1204-1222.

2. Stanaway JD et al. Global burden of infectious diseases update. Lancet Infect Dis. 2022;22(6):e178-e185.

3. World Health Organization. Dengue and severe dengue: Global epidemiology update. WHO. 2023.

4. Browne AJ et al. Global incidence of enteric fever. J Infect. 2020;80(3):263-272.

5. Troeger C et al. Global burden of acute gastroenteritis. Lancet Gastroenterol Hepatol. 2018;3(3):203-214.

6. World Health Organization. Global tuberculosis report. WHO. 2023.

7. Vigo D, Thornicroft G, Atun R. Estimating mental health burden worldwide. Lancet Psychiatry. 2016;3(2):171-178.

8. GBD Risk Factors Collaborators. Global risk factor analysis. Lancet. 2020;396:1223-1249.

9. Klein SL, Flanagan KL. Sex differences in immune responses. Nat Rev Immunol. 2016;16(10):626-638.

10. Hosmer DW, Lemeshow S, Sturdivant RX. Applied logistic regression in health research. Wiley. 2018.

11. Ahmed SM, Hossain MA, Chowdhury AMR. Disease burden and health transition in Bangladesh. BMJ Glob Health. 2020;5:e002179.

12. Bhatt S, Gething PW, Brady OJ et al. Global dengue epidemiology and regional trends. Nature. 2019;496:504-507.

13. Directorate General of Health Services (DGHS). National tuberculosis control program report Bangladesh. 2022.

14. Rahman MM, et al. Epidemiology of febrile illnesses in urban South Asia. BMC Infect Dis. 2018;18:152.

15. Horton KC, MacPherson P, Houben RMGJ et al. Sex differences in tuberculosis burden. Lancet Infect Dis. 2016;16(7):845-852.

16. Hossain S, Quaiyum MA, Zaman K. Tuberculosis epidemiology in Bangladesh. Int J Tuberc Lung Dis. 2019;23(3):312-318.

17. Ebi KL, Nealon J. Climate change and dengue risk in South Asia. Lancet Planet Health. 2018;2(2):e70-e71.

18. Vos T, Lim SS, Abbafati C et al. Global burden of diseases study 2019. Lancet. 2020;396:1204-1222.

19. Stubbs B, Koyanagi A, Veronese N et al. Depression, anxiety and immune response. Brain Behav Immun. 2018;71:1-9.

20. World Health Organization. Noncommunicable and communicable disease transition in South-East Asia. WHO. 2021.