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**Original Article**

**Patterns of Communicable and Non-Communicable Diseases: A Hospital-Based Study in Ethiopia**

Alemayehu Abebe1\*, Meron Tafesse2, Gemechu Beraso1, Desalegn Dawit1, Tsega Argaw3, Fekadeselassie Berhie1

1Public Health Academic and Service Directorate; 2Medical Laboratory Academic and Service Directorate; 3Hospital HMIS, College of Medicine and Health Sciences, Hawassa University, Hawassa, Ethiopia

\*Corresponding author; E-mail: aleab27@yahoo.com

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| **Abstract****Background:** The patient group exhibited a nearly equal gender distribution, with a predominance of middle-aged individuals. Tuberculosis and other infectious diseases accounted for 25% of admissions, reflecting the continued relevance of communicable diseases in a shifting health landscape. Conversely, non-communicable diseases (NCDs), more particularly cardiovascular diseases, diabetes mellitus, and chronic kidney disease, were gaining pace, which demonstrates a trendline that highlights the two-sided burden of communicable and non-communicable diseases. These findings underscore the need for integrated healthcare approaches to manage both disease categories effectively.**Methods**: A hospital-based descriptive cross-sectional study was performed over 12 months, between January and December 2024. The research comprised a sample of 1,118 patients of 15 years and above, and data were extracted from complete medical records. They used the International Classification of Diseases (ICD) criteria for classifying the diseases. Data were collected by trained nurses using ICD classification and analyzed using SPSS to identify patterns.**Results**: CDs accounted for 25% of hospital admissions, with tuberculosis comprising 7.2% of all admissions. NCDs represented 75% of admissions, with cardiovascular diseases accounting for 18.2%. Significant gender associations were found for tuberculosis of other specified sites (p = 0.036), chronic liver disease (p = 0.011), intracerebral hemorrhage (p = 0.001), and tuberculosis meningitis (p = 0.013). Length of hospital stay was significantly associated with patient outcomes (p < 0.001), with the highest mortality rate observed among patients admitted for 1-3 days. Hospital mortality rate was 6.0%, lower than other Ethiopian hospitals, while high rates of discharge against medical advice (8.3%) and referrals (7.2%) highlighted systemic challenges.**Conclusion**: The study reveals that infectious diseases continue to be the leading cause of hospital admissions. Concurrently, NCDs, particularly those affecting the cardiovascular and genitourinary systems, are rising in line with the ongoing epidemiological transition in Ethiopia. The findings also highlight marked gender differences in disease patterns, with tuberculosis and chronic liver disease showing particularly uneven distributions between men and women. Collectively, these findings emphasize the importance of integrated approaches that address both persisting infectious diseases and the emerging challenge of chronic illnesses in Ethiopia.**Keywords:** communicable, non-communicable, diseases, patterns, admission  |
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**Introduction**

The pattern of hospital admissions is an indicator of the overall burden of disease within a health system and thus instrumental in the determination of resource allocation, health policy, and clinical priorities. The epidemiological shift towards non-communicable diseases (NCDs) has become a real trend in most low- and middle-income countries, and Ethiopia is no exception in line with its urban and peri-urban areas (1). Historically, communicable diseases (CDs) like malaria, tuberculosis, and acute respiratory infections were the most prevalent causes of admissions and deaths in Ethiopian hospitals (2). The latest reports, however, show an increasing pattern of admissions that have been attributed to NCDs encompassing cardiovascular diseases, diabetes mellitus, chronic kidney disease, and malignancies (3). This has been due to the changing pattern attributed to fast urbanisation, change of lifestyle, better control of infectious diseases, and increased life expectancy (4).

CDs are the leading cause of hospitalisation in low-and middle-income countries, yet in high-income countries, the cause of hospitalisation more often includes NCDs (4,5). The burden of the disease in sub-Saharan Africa in adults is not well captured; the projections of the World Health Organization, however, suggest that there is a significant shift in patterns of disease and causes of death in this region, where most NCDs are likely to be the number one cause of morbidity and mortality by the year 2025 (6,7). This tendency is greatly explained by high urbanisation and lifestyle changes that are related to westernisation. The NCD burden has increased due to urbanisation and westernisation, which have resulted in decreased physical activity, a change in diet, and prevalence of obesity and hypertension (3). Still, CDs have a prominent presence as a cause of morbidity and mortality, especially in terms of rural and underserved patients (8).

Knowledge of the existing diversity of diseases that cause admissions to hospitals is necessary in order to make informed health planning and prioritization. In Ethiopia, the studies conducted earlier reveal the admission pattern inconsistency between different regions and hospitals, depending on demographic, socioeconomic, and environmental factors (9). Nevertheless, up-to-date statistics concerning the comparison between CD and NCDs concerning their contribution to the number of hospitalised individuals are scarce, particularly due to the occurrence of the epidemiological transition. Consequently, the objective of this study is to determine the pattern of hospital admissions due to CDs compared to NCDs during the study period and to investigate how demographic factors are associated with these disease categories. Additionally, the study aims to identify the most common individual communicable and non-communicable diseases among patients admitted to the medical ward of the Hawassa University Comprehensive Hospital. The study results will be of great utility to clinicians, hospital managers, and policymakers in the ongoing Ethiopian health sector to ensure the best care for patients and the efficient use of their resources.

**Methods and materials**

**Study Area**

The study was conducted in Hawassa University Comprehensive Specialized Hospital, located in Hawassa town, Sidama regional state, Southern Ethiopia. The town is 275 km south of the capital city, Addis Ababa. The study period was from January 2024 to December 2024.

## **Study Design and Period**

A hospital-based descriptive cross-sectional study design was employed among patients admitted to the medical ward.

## **Source and Study population**

The study included all adult patients aged 15 years and above who were admitted to the medical ward during the study period and had complete medical records, including demographics, diagnosis, and discharge status. Patients with incomplete records or those transferred to other departments (e.g., surgical or obstetric wards) were excluded to maintain data consistency.

**Variable and Outcome Measurement**

The independent variables included demographic, clinical, and admission-related predictors (age, sex, residency, referral status, and diagnosis). The dependent variables concentrated on two main sets of outcomes: (a) the primary diagnosis coded ICD-10 codes (like the CDs and the NCDs); and (b) the clinical outcomes, that is, discharge, in-hospital mortality, or referral to a higher level of care. The stratification of diagnosis also occurred based on etiology (CD or NCD) and severity (such as stroke subtypes or acute infections). Outcomes were defined as ordinal (e.g., number of days a patient spent in hospital) or binary (e.g., dead or alive at the time of discharge), and mortality was determined as death before discharge.

**Definition of operational terms**

**Admission to the medical ward:** it is the patient’s entry for diagnosis, treatment, or strict follow-up by healthcare providers.

**Discharge against medical advice (DAMA):** The patient decides to voluntarily depart before completing recommended care.

**Discharge**: is the formal release of a patient from the hospital after treatment completion or stabilisation.

**Outcomes**: the patient’s health status post-admission, including recovery, complications, or mortality.

**Data collection tools and procedures**

A structured checklist was developed based on WHO and Ethiopian Federal Ministry of Health guidelines, and data were retrospectively collected based on a structured checklist using Microsoft Excel 2019 to record variables. Physical and electronic medical records were reviewed by two trained nurses who were recording the main variables such as admission dates, diagnostic test results, and discharge summaries. Diseases were categorized according to the International Classification of Diseases (ICD). The categorization of diseases into communicable and NCD types was based on guidelines from the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO).

**Data Quality Control**

The checklist was refined, and the abstraction procedures became standardized with the help of a pilot test on 5 % records. A comprehensive review of the medical records of all patients admitted to the ward was conducted during the study period. Two MSc nurses, trained in data collection techniques, collected the data. The validity of the collected data was confirmed by two experts in public health. To maintain the quality of data, supervisors did daily cross-checks of the data to settle inconsistencies through consensus.

**Data entry and Analysis**

The data obtained were entered into SPSS software version 27 for statistical analysis. Descriptive statistics, including frequency and percentage, were used to describe the characteristics of the study participants. Finally, a chi-square test was done to check the distribution of diseases by gender at a significance level of 0.05. The results are presented in text, tables, and graphs.

**Results**

**Sociodemographic Characteristics**

The sample size consisted of 1118 patients, who were admitted to the medical ward. The distribution of genders was almost fifty-fifty, with the males being 49.7% (n=556) and females being 50.3% (n=562). The age of the patients ranged from 15 to 91. The mean age of the patients was 36 years (SD + 15.74). Age was predominated by middle-aged patients as patients within 36 years and up to 45 years counted 21.9% (n=245), 26 years to 35 years 17.4% (n=194), and 46 years to 55 years 17.5% (n=196). There were also younger and older adults; 15.4% (n=173) of the adults were younger (15-25 years), whereas older adults (>75 years) comprised 4.4% (n=49). Most of the participants were 75.8% (847) in urban areas, and 24.2% (n=271) were in rural settings.

In total, one can observe an almost equal number of men and women included in the patient population, and most of them are in the middle-aged group. Smaller is the representation of the younger adults, with few older adults. The majority of the urban dwellers would mean that the study population tends to sing more to people who have access to the urban healthcare facilities (Table 1).

Table 1: Sociodemographic profile of adult medical ward patients at HUCSH, 2024 (N = 1118)

|  |  |
| --- | --- |
| **Characteristic** | **N (%)** |
| **Gender** |  |
|  Male | 556 (49.7%) |
|  Female | 562 (50.3%) |
| **Age group (years)** |  |
|  15–25 | 172 (15.4%) |
|  26–35 | 194 (17.4%) |
|  36–45 | 245 (21.9%) |
|  46–55 | 196 (17.5%) |
|  56–65 | 158 (14.1%) |
|  66–75 | 104 (9.3%) |
|  >75 | 49 (4.4%) |
| **Residence** |  |
|  Urban | 847 (75.8%) |
|  Rural | 271 (24.2% ) |

**Reasons for Admission by WHO-Disease Category-ICD**

Most in this study were admitted because of infectious and parasitic diseases (ICD-A/B), which amounts to 25% (n=280) of cases. The disease of the circulatory system (ICD-I) was the second most frequent category, and it constituted 18.2% (n=204) of admissions. Increased risk of cardiovascular diseases in Ethiopia and other similar environments has been extensively noted, and hypertension and its resultant heart failure are among the most frequent cases that can lead to hospitalisation. The proportion of admissions due to genitourinary diseases (ICD-N) was 12.4% (n=139). Disorders of the nervous system (ICD-G) represented 11.7% of (n=131) the admissions and were disproportionately represented by females (64.9%). The male

gender prevailed in diseases of the endocrine, nutritional, and metabolic system (ICD-E, 62.7%). Non-gastrointestinal malignant neoplasms (ICD-C) accounted for 3.8 % (n=43) of admissions, with low gender differences (Table 2).

Table 2: Reasons for Admission by WHO-Disease Category (ICD) to Medical Ward (N =1118)

|  |  |  |  |
| --- | --- | --- | --- |
| ICD Category | Reason for Admission | MaleN (%) | FemaleN (%) |
| A/B | Infectious or parasitic diseases | 137 (24.6%) | 143(25.4%) |
| C | Malignant neoplasms | 25 (4.5%) | 18 (3.2%) |
| D | Diseases of the blood | 29 (5.2%) | 24 (4.3%) |
| E | Endocrine, nutrition, and metabolic diseases | 37 (6.7%) | 22 (3.9%) |
| G | Diseases of the nervous system | 46 (8.3%) | 85 (15.1%) |
| I | Diseases of the circulatory system | 98 (17.6%) | 106 18.9%) |
| J | Diseases of the respiratory system | 39 (7.0%) | 40 (7.1%) |
| K | Diseases of the digestive system | 46 (8.3%) | 44 (7.8%) |
| M | Spondylopathies and musculoskeletal disorders | 35 (6.3%) | 5 (0.9%) |
| N | Diseases of the genitourinary system | 64 (11.5%) | 75 (13.3%) |
|  | Total | 556 (100%) | 562 (100%) |

**ICD=International Classification of Diseases**

**Diseases Causing Admissions to the Medical Ward**

The most frequently diagnosed specific condition was congestive heart failure (CHF), which comprised 7.8% of all admissions and was somewhat female predominant (Table 3).

Table 3: Common diagnoses among adult medical admissions, stratified by sex (N = 1118).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Disease | Male n (%) | Female n (%) | Total n (%) | P-value |
| Congestive heart failure | 40 (45.9%) | 47(54%) | 87(7.8%) | 0.180 |
| Acute kidney failure | 45(56.3%) | 35(45.9%) | 80 (7.2%) | 0.328 |
| Tuberculosis of another specified organ or site | 34(42.5%) | 46(57.5%) | 80 (7.2%) | 0.036\* |
| Transient ischaemic attack | 44(55.7%) | 35(44.3%) | 79(7.1%) | 0.355 |
| Deep vein thrombosis | 24(42.1%) | 33(57.9%) | 57(5.1%) | 0.066 |
| Intracranial haemorrhage, unspecified | 30(53.6%) | 26(46.4%) | 56(5%) | 0.674 |
| Other specified diseases of the nervous system | 22(44%) | 28(56%) | 50(4.4%) | 0.346 |
| Chronic liver disease | 30(65.2%) | 16(34.8%) | 46(4.1%) | 0.011\* |
| Intracerebral haemorrhage | 31(73.8%) | 11(26.2%) | 42(3.8%) | 0.001\* |
| Bacterial meningitis | 23(60.3%) | 15(39.5%) | 38(2.9%) | 0.228 |
| Tuberculous meningitis | 23(69.7%) | 10(30.3%) | 33(2.9%) | 0.013\* |
| Respiratory tuberculosis, confirmed | 16(66.7%) | 8(33.3%) | 24(2.1%) | 0.118 |
| Bell palsy | 14(63.6%) | 8(36.3%) | 22(1.9%) | 0.222 |
| Subarachnoid haemorrhage | 8(40%) | 12(60%) | 20(1.8%) | 0.325 |
| Chronic kidney disease | 14(70%) | 6(30%) | 20(1.8%) | 0.064 |
| Other | 208(54.2%) | 176(45.8%) | 384(34.3%) | 0.704 |

Note: X2 15= 30.84, P<0.009

The second predominant disease conditions are acute kidney failure and tuberculosis, with 7.2% each, and this affects the other specified organs, contributing to the current burden of NCDs and CDs at the study hospital. Neurological conditions were also predominant, as cases of transient ischemic attack (7.1%), intracranial hemorrhage (5.0%), and tuberculous meningitis (2.9%) were the most common.

Other significant causes included deep vein thrombosis (5.1%), intracerebral hemorrhage (3.8%), as well as chronic kidney disease (1.8%). Among the top 4 leading causes of patient admissions to the medical ward, males outnumbered females in the three categories except for the first ICD group, which includes infectious and parasitic diseases.

Generally, the pattern in the admission cases indicates a significant existence of overlap between the communicable and NCD conditions, pointing to the necessity of integrated care practices. The chi-square test of independence that is estimated with a significance level of 0.05 determined that the overall association between disease-causing admissions and gender was statistically significant (X2 15= 30.84, P<0.009). Particularly, there were substantial gender differences in various conditions, such as Tuberculosis of Other Specified Organ or Site had a higher admission proportion in females (57.5 %) than males (42.5 %) (p = 0.036).

Chronic Liver Disease had higher admissions among males, with a higher proportion of 65.2% (p = 0.011) as compared to females. Intracerebral hemorrhage recorded a remarkably higher proportion of 73.8% admissions (p = 0.001). The gender proportion of patients admitted with tuberculous meningitis showed a higher admission rate for males (69.7%) than females (30.3%). The difference in admissions of tuberculous meningitis between genders was also statistically significant (p = 0.013). These findings indicate that gender distinctions do exist in as far of enhancing or lowering the chances of contracting some of the diseases that lead to admission and exposure to additional treatment and investigation in clinical and epidemiological studies.

**Duration and Outcome of Hospital Admission**

While the highest absolute number of improved/discharged patients (877 out of 1118, or approximately 78%) was observed among those who stayed 4–7 and >7 days, a higher proportion of deaths occurred among those with shorter hospital stays (1–3 days), possibly reflecting critical conditions on arrival. It is worth noting that deaths were most evident in the shortest stay group (1-3 days: 11.4 %), and least evident in the 4-7 days (3.4 %) and >7 days (4.9 %) groups. Conversely, the shortest hospital stays (1-3 days) yielded the highest mortality rate (i.e., 11.4%), presumably because these patients were very ill at admission or had delayed presentation. A Chi-square test of independence showed that hospital stay duration was significantly associated with admission outcomes (X26= 26.43, p<0.001). Particularly, the outcomes of patients admitted to the medical ward varied greatly across hospital stay durations, with a notably higher proportion of deaths occurring within the shortest hospital stays (1-3 days) (Table 4). On the whole, these findings signify that early management and intervention are significant in mitigating early in-hospital mortality and enhancing patient outcomes.

**Causes of Mortality**

As indicated in Figure 1 below, the most frequent cause of death among the 67 deaths that occurred during the study period was tuberculosis, with 16.4% (11) of all deaths being extrapulmonary (7 deaths) and meningeal (4 deaths). A significant percentage of 7.5% (5 deaths) was caused by chronic liver disease, which indicates that the disease continues to exert pressure on hepatic complications in various regions of Ethiopia.

Table 4: Association between hospital length of stay and patient outcomes (N = 1118)

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| --- | --- | --- |
| **Admission Outcome** | **Hospital stays** | **P-value** |
| 1-3 days n (%) | 4-7 days n (%) | >7 days n (%) | Total n (%) | 0.000 |
| Improved/discharged | 206 (23.4%) | 359 (40.9%) | 312 (35.5%) | 877 (78.4%) |
| Referred | 19 (23.4%) | 35 (43.2%) | 27 (33.3%) | 81 (7.2%) |
| DAMA | 32 (34.4%) | 34 (36.5%) | 27 (29%) | 93 (8.3%) |
| Died | 33 (49.2%) | 15 (22.3%) | 19 (28.3%) | 67 (6.0%) |
| DAMA: Discharged against medical advice. Note: X26= 26.43, P<0.001 |

Neurological conditions, such as intracranial hemorrhage, contributed to the death rate of 4.5 % (3 deaths), and HIV-related complications contributed to 10.4 % (7 deaths). And this resulted in the refusal of CD in modern times despite treatment access. The proportion of deaths due to congestive heart failure and acute kidney failure was 7.5 % (5 deaths), indicating the growing deaths in relation to NCDS in Ethiopian hospitals.

 Overall, the findings (Figure 1) indicate that CDs remain one of the greatest causes of mortality, and amongst disorders categorized as TB-related difficulty (diseases including pulmonary tuberculosis, tuberculous meningitis, and tuberculosis of other organs or sites), they make major contributions to death rates. HIV/AIDS, both with and without TB complications, contribute a lot to the death rate. All these CDS have a considerable rate of mortality on their own, which shows the disease has continued to have an impact in clinical settings. On the other hand, NCDs encompassing chronic liver disease, congestive heart failure, acute renal failure, intracerebral and subarachnoid hemorrhage, megaloblastic anemia because of vitamin B12 deficiency, and other neural complications contribute a major proportion of deaths.

**Discussion**

This study provides a detailed analysis of medical admission patterns, etiological factors, and patient outcomes at HUCSH, reflecting the complex interaction between CDs and NCDs among Ethiopia's ongoing epidemiological transition. The sociodemographic profile of the admitted patients revealed almost a balanced gender distribution (49.7% male, 50.3% female), with a predominance of middle-aged adults (36-45 years). A significant proportion of patients (75.8%) were urban residents, aligning with findings that urban areas generally have better healthcare access (1). This contrasts with studies in rural sub-Saharan Africa, where access to healthcare facilities is significantly lower, with a considerable percentage of the population residing more than three hours away from a health post (1).

Infectious and parasitic diseases (ICD A/B) remained the leading cause of admissions (25.0%), consistent with the high burden of CDs in sub-Saharan Africa (10,11). The WHO reports that TB was the second leading infectious disease killer worldwide in 2022, after COVID-19 (11).



Figure 1: Leading causes of in-hospital mortality among adult medical patients (N = 67 deaths).

Increased risk of cardiovascular diseases in Ethiopia and other similar environments has been extensively noted, and hypertension and its resultant heart failure are among the most frequent cases that can lead to hospitalisation (12). In addition to this, the substantial proportion of admissions due to circulatory system diseases (18.2%) and genitourinary conditions (12.4%) highlights the increasing impact of NCDs (13,14). This epidemiological shift, driven by urbanisation, lifestyle changes, and ageing populations, mirrors patterns observed across the African continent (15, 16). NCDs are projected to overtake communicable, maternal, neonatal, and nutritional diseases as the leading cause of mortality in Africa by 2030 (17,18).

Disease-specific analysis revealed that congestive heart failure (7.8%), acute kidney failure (7.2%), and tuberculosis of other specified organs (7.2%) were the most common diagnoses. This pattern aligns with findings from other Ethiopian hospitals and reflects the broader challenges in managing both infectious diseases and the rising prevalence of NCDs (13,19,20). In the present study, statistically significant associations were observed between patient gender and the causes of medical ward admissions for some major diseases, specifically tuberculosis of other specified organ or site, CLD, intracerebral haemorrhage, and tuberculous meningitis (Table:3). Gender related disparities in disease admissions have also been documented in other comparable studies (21, 22, 23).

Admissions for tuberculosis of other specified organ or site showed a significant gender difference, with females representing 57.5% compared to 42.5% among males (p = 0.036), suggesting a higher burden of extrapulmonary tuberculosis in female patients. Similar findings were observed in a systematic review, with women significantly associated with extrapulmonary TB in middle age (24). Conversely, CLD admissions were predominantly male, comprising 65.2% versus 34.8% in females (p = 0.011), reflecting potential gender-related risk factors. Gender disparity and higher rates of chronic liver disease (CLD) admissions and mortality in males than in females were also observed in another study (25).

Neurological conditions, including intracerebral haemorrhage and tuberculous meningitis, also featured prominently, particularly among male patients. This is comparable to existing trends at Ethiopian hospitals since it is estimated that approximately one-fourth of all cases involving neurological issues are a result of stroke and infections of the central nervous system (26). Intracerebral haemorrhage demonstrated a marked male predominance with 73.8% of admissions being male compared to 26.2% female admissions (p = 0.001), indicating greater vulnerability or severity among men. A recent systematic and multicentre study demonstrates that male patients have a higher incidence and admission rate for intracerebral haemorrhage than females (27). These results suggest that gender differences are present with respect to increasing or decreasing risks of having certain diseases, which result in medical admissions, and the subject to further clinical and epidemiological research. Similarly, tuberculous meningitis was more frequently observed in males, accounting for 69.7% against 30.3% in females (p = 0.013). The Epidemiological evidence that shows the existence of gender variations in the incidence of tuberculosis (TB) is consistent. In line with this, a study revealed that male individuals are at greater risk of developing TB infection compared to females (22). Moreover, modelling studies have reported higher incidences of tuberculous meningitis in males when compared to females, hence further emphasising the persistent and cross-cutting nature of sex-related disparities across different forms of tuberculosis (28).

Hospital outcomes were generally favourable, with 78.4% of patients improving and being discharged. The median length of stay (7 days) raises questions about the adequacy of treatment for complex cases, given resource constraints and the increasing burden of chronic conditions. Patients with the shortest hospital stay (1-3 days) had the highest mortality rate (11.4%), likely due to being critically ill upon admission or presenting late for care (29). The mortality rate of 6.0% is comparable to other Ethiopian medical wards (1). The leading causes of death are tuberculosis (16.4%), HIV-related complications (10.4%), chronic liver disease (7.5%), congestive heart failure (7.5%), and acute kidney failure (7.5%)-underscore the persistent impact of CDs alongside the growing contribution of NCDs to inpatient mortality (30, 31). A meta-analysis of 43 cohort studies in sub-Saharan Africa found a pooled incidence of mortality of 17% among persons receiving second-line tuberculosis treatment (32).

The dual burden of disease observed in this study reflects national and regional patterns, where CDs remain prevalent but NCDs are rapidly increasing (6, 7). The relatively high rates of discharge against medical advice (8.3%) and referrals (7.2%) may indicate gaps in health system capacity, financial barriers, or patient preferences for alternative care (33, 34). These issues are compounded by inadequate human resources, insufficient budgetary allocation, and management challenges within the healthcare system (35). In this study, the observed hospital mortality rate among medical ward admissions was 6.0%. This rate is notably lower than previously reported rates from other Ethiopian hospitals, where mortality rates have ranged from 12.6% at Jimma University Specialised Hospital (36), 14.9% at Ayder Hospital (19), to as high as 24.2% at Saint Paul Hospital (3).

Overall, these findings emphasise the need for a health system response that balances infectious disease control with the growing demands of chronic disease management (37, 38). Strengthening early detection and integrated care for both CDs and NCDs is essential (39, 40). Investments in health information systems, community-based prevention, and capacity building for chronic disease care are warranted to reduce preventable morbidity and mortality (4, 41). Moreover, addressing gender and urban-rural disparities in access and outcomes should be a priority for policymakers and hospital administrators (42). Continued surveillance and multicentre research are needed to monitor trends and inform evidence-based interventions in Ethiopian hospitals (43). As sub-Saharan Africa undergoes a double burden of diseases, a multidisciplinary, multi-sectoral approach is crucial to address the evolving disease burden and improve overall health outcomes (4). The limitation of this study is a retrospective cross-sectional design that is based on the quality and information completeness of the current medical records, admissions log books, and HMIS databases. There were possibilities of errors in classification and missing data that could have happened, and this would have influenced the accuracy of the diagnosis and results. Moreover, being a kind of single-centre study, the results cannot be applied to other facilities or areas. There is also no follow-up data that would make an evaluation of the long-term patient outcomes possible.

**Conclusion**

In conclusion, this study highlights the complex and evolving landscape of medical admissions and outcomes at Hawassa University Comprehensive Specialized Hospital, showing the co-existence, as well as interaction of CDs with NCDs that constitute the current shift in patterns of disease and causes of death in Ethiopia. Though infectious and parasitic diseases remain the number one cause of admissions, there is still a heavy and increasing burden of NCDs, especially those of the circulatory and genitourinary origins, as the epidemiological transition currently underway in Ethiopia. The outcomes of the study also disclose the extensive gender disparities in the disease patterns, especially in the cases of tuberculosis and chronic liver disease admissions, as demonstrated in the present analysis.

Although the discharge rate is favorable, the medical ward admission mortality rate is lower than in some other Ethiopian hospitals, and the dual burden of disease, with the associated challenges of high rates of discharges against medical advice or systemic resource shortage, illustrates an eminent issue that requires improvement in an integrated healthcare response. Improving the outcomes will require efforts to improve early detection and encourage chronic disease management, and address gender and geographic disparities.

Finally, there is a need to further invest in building health system capacity, research, and multi-sectoral approaches to be able to effectively respond to the evolving burden of illness and the resulting morbidity and mortality levels that are avoidable in Ethiopia and other contexts.

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**Ethical considerations**

Ethical permission (Ref No. IRB/426/17) for this study was obtained from the Institutional Review Board (IRB) of the College of Medicine & Health Sciences at Hawassa University. No patient consent was necessary as the records were reviewed. Permission was also taken from the Hawassa University Comprehensive Specialized Hospital management. All information obtained was kept confidential and was used only for this study.

**Data availability statement**

The data set is handled by the corresponding author and can be provided upon request.

**Conflicts of interest**

The authors declared that no conflicts of interest exist.

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**References**

1. Yoon CW, Bushnell CD. Stroke in women: a review focused on epidemiology, risk factors, and outcomes. J Stroke. 2023;25(1):2-15.
2. Tesfay FH, Mengistu E, Negash K, et al. Prevalence of chronic non-communicable diseases in Ethiopia: a systematic review and meta-analysis of evidence. Front Public Health. 2022;10:936482.
3. Mengistu MD, Benti H. Assessment of magnitude and spectrum of cardiovascular disease admissions and outcomes in Saint Paul Hospital Millennium Medical College, Addis Ababa: a retrospective study. PLoS One. 2022;17(12):e0267527.
4. World Health Organization (WHO) Regional Office for Africa. Trends in communicable and noncommunicable disease burden and control in Africa. Brazzaville: WHO; 2023.
5. Coates MM, Fadelu T, Kaptoge S, et al. Burden of non-communicable diseases from infectious causes in 2017: a modelling study. Lancet Glob Health. 2020;8(12):e1489-e1498.
6. Li Z, Deng Q, Li L, et al. Temporal trends in the burden of non-communicable diseases in countries with the highest malaria burden, 1990-2019: evaluating the double burden of non-communicable and communicable diseases in epidemiological transition. Glob Health. 2022;18(1):90.
7. Gouda HN, Charlson F, Sorsdahl K, et al. Burden of non-communicable diseases in sub-Saharan Africa, 1990-2017: results from the Global Burden of Disease Study 2017. Lancet Glob Health. 2019;7(10):e1375-e1387.
8. Alene KA, Tesema AG, Munshea A, et al. Spatial codistribution of HIV, tuberculosis, and malaria in Ethiopia. BMJ Glob Health. 2022;7:e008074.
9. Abebe D, Tegegne KT, Fenta A, et al. Patient satisfaction and associated factors in Addis Ababa's public referral hospitals: insights from 2023. Front Med (Lausanne). 2024;11:1456566.
10. Nyaruaba R, Muga J, Phan NV, et al. Socio-economic impacts of emerging infectious diseases in Africa. Infect Dis (Lond). 2022;54(5):315-324.
11. World Health Organization. Global tuberculosis report. Geneva: WHO; 2024.
12. Misganaw A, Hailemariam D, Araya T, Lefevre P. Epidemiology of major non-communicable diseases in Ethiopia: a systematic review. J Health Popul Nutr. 2014;32(1):1.
13. Addo J, Agongo G, Bahendeka SK, et al. The Africa non-communicable diseases (NCD) Open Lab: Impact of a portfolio of clinical studies to deepen the understanding of NCDs in sub-Saharan Africa. J Glob Health. 2024;14:04065.
14. Tolossa T, Alemu A, Menna T, et al. Burden and determinants of chronic kidney disease among diabetic patients in Ethiopia: a systematic review and meta-analysis. Public Health Rev. 2021;42:1603969.
15. Kamanzi Ntakirutimana G. Prevalence and epidemiology of diabetes in West Africa: trends and challenges. Res Invention J Biol Appl Sci. 2024;4(3):23-27.
16. Bickler SW, Morris M, Mwanga-Amumpaire J, et al. Urbanization in sub-Saharan Africa: declining rates of chronic and recurrent infection and their possible role in the origins of non-communicable diseases. World J Surg. 2018;42(6):1617-1628.
17. Müller SA, Elimian K, Rafamatanantsoa JF, et al. The burden and treatment of non-communicable diseases among healthcare workers in sub-Saharan Africa: a multi-country cross-sectional study. Front Public Health. 2024;12:1375221.
18. Bigna JJ, Noubiap JJ. The rising burden of non-communicable diseases in sub-Saharan Africa. Lancet Glob Health. 2019;7(10):e1295-e1296.
19. Hailu A, Gebremariam T, Gelaw YM, et al. Patterns of medical admissions and predictors of mortality in Ayder Comprehensive Specialized Hospital, Northern Ethiopia: a prospective observational study. Int J Gen Med. 2023;16:243-257.
20. Ahmed A, Fentie M, Weldegebreal F, et al. Incidence and determinants of tuberculosis infection among adult patients with HIV attending HIV care in north-east Ethiopia: a retrospective cohort study. BMJ Open. 2018;8(2):e016961.
21. Naveed H, Munshi I, Zafar S, et al. Women and stroke: disparities in clinical presentation, severity, and short- and long-term outcomes. Front Neurol. 2023;14:1147858.
22. Humayun M, Chirenda J, Ye W, et al. Effect of gender on clinical presentation of tuberculosis (TB) and age-specific risk of TB, and TB-human immunodeficiency virus coinfection. Open Forum Infect Dis. 2022;9(10):ofac512.
23. Mokhtarpour K, Kazeminasab S, Khamseh ME, et al. Impact of gender on chronic complications in participants with type 2 diabetes: evidence from a cross-sectional study. Endocrinol Diabetes Metab. 2024;7(3):e488.
24. Min J, Park JS, Kim HW, et al. Differential effects of sex on tuberculosis location and severity across the lifespan. Sci Rep. 2023;13(1):6023.
25. Ezeamii VC, Arinzechi CI, Oghotuoma OO, et al. Temporal trends and disparities in chronic liver disease mortality: an analysis using National Center for Health Statistics (NCHS) data ranging from 1999 to 2023. Cureus. 2025;17(5):e000000.
26. Agazhe M, Tufa TB, Ayele Y, et al. Incidence and pattern of stroke among patients admitted to the medical ward at Yirgalem General Hospital, Sidama Regional State, Southern Ethiopia. SAGE Open Med. 2021;9:20503121211001154.
27. Zhao J, Zhang T, Wan H, Yu Y, Wen J, Wang X. Sex-related differences in spontaneous intracerebral hemorrhage outcomes: a prognostic study based on 111,112 medical records. Front Neurol. 2022;957132.
28. Dodd PJ, Osman M, Cresswell FV, et al. The global burden of tuberculous meningitis in adults: a modelling study. PLOS Glob Public Health. 2021;1:e0000069.
29. Deriba C, Teshome D, Jemal N, et al. In-hospital mortality and associated factors among adult patients with acute heart failure in a tertiary hospital, Harar, Eastern Ethiopia: a cross-sectional study. Interv Cardiol. 2024;16(5):915-923.
30. Merzah M. Trends in incidence, prevalence, and mortality of non-communicable diseases in Iraq (2003-2021). BMC Public Health. 2025;25(1):374.
31. Doh D, Dahwa R, Renzaho AMN. A scoping review of non-communicable diseases among the workforce as a threat to global peace and security in low- and middle-income countries. Int J Environ Res Public Health. 2024;21(9):e000000.
32. Edessa D, Sisay M, Asefa F, et al. Incidence and predictors of mortality among persons receiving second-line tuberculosis treatment in sub-Saharan Africa: a meta-analysis of 43 cohort studies. PLoS One. 2021;16(12):e0261149.
33. Borchers A, Pieler T. Programming pluripotent precursor cells derived from Xenopus embryos to generate specific tissues and organs. Genes (Basel). 2010;1(3):413-26.
34. Alhajeri SS, Alabdulaziz N, Alharthi SS, et al. Leaving against medical advice: current problems and plausible solutions. Cureus. 2024;16(7):e64230.
35. Godswill D, Akintoye O, Adomako D. Assessment of the governance and leadership structures of the healthcare system in Ghana and its implications for the implementation of networks of practice: the case of a newly created region. Int J Res Innov Soc Sci. 2024;8(11):2532-2555.
36. Ali E, Woldie M. Reasons and outcomes of admissions to the medical wards of Jimma University Specialized Hospital, Southwest Ethiopia. Ethiop J Health Sci. 2010;20(2):119-125.
37. Muller SA, Elimian K, Rafamatanantsoa JF, et al. The burden and treatment of non-communicable diseases among healthcare workers in sub-Saharan Africa: a multi-country cross-sectional study. Front Public Health. 2024;12:1375221.
38. Kaluvu L, Alene KA, Birhan TY, et al. Multimorbidity of communicable and non-communicable diseases in low- and middle-income countries: a systematic review. J Multimorb Comorb. 2022;12:26335565221112593.
39. Richter P, Wisniewski H, Mweemba O, et al. The case for integrating health systems to manage noncommunicable and infectious diseases in low- and middle-income countries: lessons learned from Zambia. Health Secur. 2022;20(4):286-297.
40. Modjadji P. Communicable and non-communicable diseases coexisting in South Africa. Lancet Glob Health. 2021;9(7):e889-e890.
41. Amu H, Laar A, Agbozo F, et al. Improving investment in chronic disease care in sub-Saharan Africa is crucial for the achievement of SDG 3.4: application of the chronic care model. Arch Public Health. 2023;81(1):169.
42. Oke GI, Sibomana O. Understanding health inequality, disparity and inequity in Africa: a rapid review of concepts, root causes, and strategic solutions. Public Health Chall. 2025;4(1):e70040.
43. Yusuf A, Geleta S, Tessema M, et al. Integrated disease surveillance response practice and associated factors among health professionals working in public hospitals in West Hararghe Zone, Eastern Oromia, Ethiopia: multi-center cross-sectional study. J Multidiscip Healthc. 2023;16:1111-1126.