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INPATIENT DISEASE PATTERNS AND THE TOP FIVE DIAGNOSES AT HA DONG GENERAL HOSPITAL IN 2023

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ABSTRACT

Introduction: The global disease pattern is continuously shifting, imposing a significant burden on healthcare systems. Ha Dong General Hospital is a Grade I hospital situated in the southwestern area of Hanoi, primarily serving insured patients. Analyzing the disease patterns among inpatients is essential for hospital planning and development, particularly as the hospital operates under the Group 2 financial autonomy model.

Objective: To describe the disease pattern among inpatients at Ha Dong General Hospital in 2023.

Methods: A cross-sectional descriptive study was conducted using retrospective data from electronic medical records stored at Ha Dong General Hospital between January 1 and December 31, 2023. Records that met the inclusion and exclusion criteria were classified into 22 ICD-10 chapters and analyzed to identify the five most common diagnoses.

Results: In 2023, the hospital recorded 40,048 inpatient visits. The highest proportions of visits fell under Chapter XV: Pregnancy, Childbirth, and the Puerperium (17%) and Chapter I: Certain Infectious and Parasitic Diseases (16%). The five most common diagnoses were Dengue fever (10.64%), Pneumonia with unspecified organism (2.39%), Diabetes mellitus Type 2 (2.05%), Acute bronchitis (1.76%), and Other bacterial intestinal infections (1.55%).

Conclusion: The disease pattern among inpatients at Ha Dong General Hospital in 2023 demonstrates a double disease burden, characterized by increasing rates of non-communicable diseases (NCDs) alongside persistent infectious diseases. To address this trend, strategic adjustments in resource allocation and workforce development are essential. Additionally, enhancing chronic disease management models is critical to managing the growing population with NCDs effectively.

Keywords: Morbidity Pattern, Top Five Diagnoses, Ha Dong Hospital.

1. INTRODUCTION

Hospital disease patterns are an important, though indirect, means of assessing community health and supporting healthcare planning. By identifying the types of diagnoses and prevalent conditions, we can gather essential data to enhance medical examination and treatment processes, allocate healthcare resources more efficiently, and improve the overall quality of care. In Vietnamese hospitals, non-communicable diseases (NCDs), especially chronic conditions, are the most common health issues. Previous studies have shown that respiratory diseases, circulatory system disorders, and infectious diseases frequently affect inpatients, which helps guide resource allocation and health policy development.[1].

Globally, studies in major hospitals report similar trends, with chronic diseases, including cardiovascular diseases, respiratory conditions, and diabetes mellitus, accounting for the highest

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proportion of inpatient visits. In Japan, the increasing prevalence of chronic diseases has significantly impacted the healthcare system's disease profile [2]. Similarly, a study in an Indian hospital highlighted high hospitalization rates due to respiratory and infectious diseases, underscoring the urgent need for better disease control to alleviate the healthcare burden [3].

Ha Dong General Hospital, a premier healthcare institution, provides services to residents in the southwestern region of Hanoi, primarily catering to patients with health insurance. As a semi-autonomous public hospital (Group 2), it faces financial pressures in maintaining and expanding its services. This reality raises critical questions about the current patterns of disease and the most prevalent conditions, which are essential for evidence-based healthcare planning.

Given these challenges, we conducted this study to determine the inpatient disease patterns at Ha Dong General Hospital in 2023 and to identify the top five most common diseases among hospitalized patients. These findings are crucial for informing strategic healthcare planning and increasing awareness of the current healthcare situation.

2. MATERIALS AND METHODS

Study Subjects: The study was conducted using the complete dataset of health insurance (HI)-covered medical examination and treatment records at Ha Dong General Hospital in 2023 (from January 1, 2023, to December 31, 2023). All data were retrieved from the hospital's Health Information System (HIS) database. We ensured the thoroughness of our study by applying strict inclusion and exclusion criteria, thereby enhancing the reliability of our results.

Study Design: A cross-sectional descriptive study was conducted using retrospective data stored in the hospital's electronic database. Descriptive statistics were used to calculate the proportions of disease categories and diagnoses based on ICD-10 codes among all inpatients at Ha Dong General Hospital.

Sample: The study included all inpatient cases recorded in the hospital's case management software from January 1 to December 31, 2023. Total number of inpatient episodes: n = 40,048.

Data Analysis and Processing: The data were cleaned before analysis. Descriptive statistics were used to calculate proportions. The chi-square test was used to compare proportions between two independent groups to determine whether the observed differences were statistically significant. All statistical processing and analysis were performed using STATA and Microsoft Excel.

Ethical Considerations: The research proposal was approved by the Proposal Review Committee of the Level II Healthcare Management Program at Hanoi Medical University. The study was conducted with the approval and consent of the leadership of Ha Dong General Hospital, permitting the use of hospital data for research purposes. We maintained the highest ethical standards throughout the study, ensuring patient confidentiality and the integrity of our research.

3. RESULTS

3.1. Characteristics of Inpatient Visits at Ha Dong General Hospital in 2023

Table 1. Distribution of Inpatient Visits by Gender and Age Group compared to all Patient Visits of the Hospital

		All visits		Inpatient visits	
		n	%	n	%
Gender	Male	103.222	47,2	18.139	45,3
	Female	115.344	52,8	21.909	54,7
Age group	<18	31.639	14,5	8.836	22,1
	18-30	15.470	7,1	7.271	18,2
	31-50	41.628	19,1	8.452	21,1
	>50	129.629	59,4	15.489	38,7
Total		218.366	100	40.048	100

In 2023, there were 40,048 inpatient visits, accounting for 18.33% of the hospital's total of 218,366 trips. The gender distribution for inpatient visits was 45.3% male and 54.7% female, with no significant difference compared to all patient visits (p = 0.543).

For age groups, 22.1% of inpatient visits were for those under 18, higher than the 14.5% among all patients. The 18–30 age group accounted for 18.2% of inpatient visits, compared to 7.1% overall. Meanwhile, patients over 50 years old represented only 38.7% of inpatient visits, which is lower than the 59.4% for all visits. These differences were statistically significant (p = 0.005).

3.2. Pattern of Disease among Inpatient Visits at Ha Dong General Hospital in 2023

Table 2. Classification of inpatient Diagnoses by ICD-10 Chapters at Ha Dong General Hospital in 2023 (n = 40,048)

ICD-10 Chapter		ICD-10 code	All visits		Inpatient visits	
			n	%	n	%
Chapter I:	Certain Infectious and Parasitic Diseases	A00-B99	31.855	14.6	6.405	16
Chapter II:	Neoplasms	C00-D48	7.026	3.2	1.740	4
Chapter III:	Diseases of the Blood and Blood-forming Organs and Certain Disorders Involving the Immune Mechanism	D50-D89	2.675	1.2	658	2
Chapter IV:	Endocrine, Nutritional, and Metabolic Diseases	E00-E90	33.479	15.3	1.109	3
Chapter V:	Mental and Behavioural Disorders	F00-F99	649	0.3	75	0
Chapter VI:	Diseases of the Nervous System	G00-G99	3.275	1.5	375	1
Chapter VII:	Diseases of the Eye and Adnexa	H00-H59	9.052	4.2	540	1
Chapter VIII:	Diseases of the Ear and Mastoid Process	H60-H95	3.248	1.5	763	2
Chapter IX:	Diseases of the Circulatory System	I00-I99	39.903	18.3	1.945	5
Chapter X:	Diseases of the Respiratory System	J00-J99	20.552	9.4	5.680	14
Chapter XI:	Diseases of the Digestive System	K00-K93	15.315	7.0	4.168	10
Chapter XII:	Diseases of the Skin and Subcutaneous Tissue	L00-L99	4.164	1.9	697	2
Chapter XIII:	Diseases of the Musculoskeletal System and Connective Tissue	M00-M99	11.858	5.4	1.862	5
Chapter XIV:	Diseases of the Genitourinary System	N00-N99	10.731	4.9	1.679	4
Chapter XV:	Pregnancy, Childbirth, and the Puerperium	O00-O99	6.848	3.1	6.628	17
Chapter XVI:	Certain Conditions Originating in the Perinatal Period	P00-P96	494	0.2	413	1
Chapter XVII:	Congenital Malformations, Deformations, and Chromosomal Abnormalities	Q00-Q99	730	0.3	320	1
Chapter XVIII:	Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified	R00-R99	7.046	3.2	1.300	3
Chapter XIX:	Injury, Poisoning, and Certain Other Consequences of External Causes	S00-T98	6.157	2.8	2.594	6
Chapter XX:	External Causes of Morbidity and Mortality	V01-Y98	50	0.02	27	0.067
Chapter XXI:	Factors Influencing Health Status and Contact with Health Services	Z00-Z99	2.403	1.1	626	2
Chapter XXII:	Codes for Special Purposes	U00-U99	856	0.4	444	1
Total			218.366	100	40.048	100.0

Our statistical data shows that Ha Dong General Hospital had 40,048 inpatient visits in 2023, which accounted for 18.34% of the hospital's total visits of 218,366. Among the inpatient group, the highest numbers of visits were recorded in Chapters XV: Pregnancy, Childbirth, and the Puerperium, with 6,628 visits (17%), and I: Certain Infectious and Parasitic Diseases, with 6,405 visits (16%). In comparison, these two categories represented only 3.1% (6,848 visits) and 14.6% (31,855 visits) of the total hospital visits, respectively. This indicates that most patients in Chapter XV were admitted for inpatient care, while the majority of those with infectious diseases in Chapter I were treated on an outpatient basis.

Chapter IV: Endocrine, Nutritional, and Metabolic Diseases accounted for 1,109 inpatient visits (3%), which is significantly lower than the total of 33,479 visits (15.3%). Similarly, Chapter IX: Diseases of the Circulatory System recorded 1,945 inpatient visits (5%) out of a total of 39,903 visits (18.3%). These two chapters mainly include Type 2 diabetes and hypertensive cardiovascular diseases, which are primarily managed through outpatient services at the hospital.

In contrast, respiratory diseases accounted for 5,680 inpatient visits (14%) out of a total of 20,552 visits (27.7%). The inpatient ratios for respiratory diseases were statistically significant compared to those for circulatory and metabolic diseases. This pattern reflects the effectiveness of outpatient disease management and its correlation with inpatient visits. In recent years, Ha Dong General Hospital has enhanced its outpatient management for diabetes and hypertension, allowing patients to achieve better disease control and reducing hospitalization rates for complications. However, despite these efforts, the management of chronic respiratory diseases, such as COPD and asthma, still presents relatively high hospitalization rates compared to other conditions.

Neoplasms (Chapter II) recorded 1,740 inpatient visits (4%) out of a total of 7,026 visits (3.2%), which is not a high proportion. This might be attributed to the geographical proximity of K Hospital - Tan Trieu, a specialized cancer center, which reduces the number of oncology patients treated at Ha Dong General Hospital.

Chapter V: Mental and Behavioral Disorders and Chapter XX: External Causes of Morbidity and Mortality had the lowest number of inpatient visits, with 75 (0.18%) and 27 (0.07%), respectively. These chapters also had low total patient volumes, with only 649 (0.3%) and 50 (0.02%) visits, respectively. Patients in these categories often seek care at specialized facilities rather than at Ha Dong General Hospital.

Other disease groups categorized under different ICD-10 chapters had inpatient visit rates below 5%, with relatively small deviations from their overall proportions in the hospital. This reflects the hospital's profile as a general facility with a full range of specialties, while still maintaining strengths in specific departments with higher patient volumes, both for inpatient care and overall.

Table 3. Non-communicable Diagnoses in Comparison to other Conditions among inpatient Visits

Group			
All visits		Inpatient visits	
n	%	n	%
Group of communicable diseases			
47.498	21,8	11.109	27,7
Group of non-communicable diseases			
165.451	75,8	26.600	66,4
Group of Injuries, Poisonings, and Accidents			
5.417	2,5	2.339	5,8
Total			
218.366	100,0	40.048	100,0

In 2023, the hospital conducted a total of 165,451 consultations and treatments for non-communicable diseases, which accounted for 75.8% of all patient encounters. Among these, there were 26,600 inpatient visits, representing 66.4% of the total inpatient cases.

Communicable diseases accounted for 47,498 visits (21.8%), including 11,109 inpatient visits (27.7%). Meanwhile, the category of accidents, poisoning, and injuries recorded 5,417 visits (2.5%), with 2,339 of these being inpatient cases (5.8%).

These statistics indicate that non-communicable diseases are primarily managed on an outpatient basis, resulting in a lower inpatient admission rate compared to the hospital average. In contrast, patients suffering from accidents, poisoning, and injuries tend to require inpatient care and continuous monitoring due to the acute nature of their conditions. This difference was statistically significant (p = 0.06)..

3.3. The most common Diagnoses at Ha Dong General Hospital in 2023

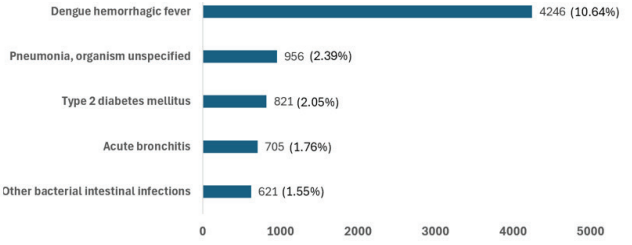

Figure 1. The five most common Diagnoses at Ha Dong General Hospital in 2023

Results showed that in 2023, Dengue fever (A91) was the most common inpatient diagnosis at Ha Dong General Hospital, with 4,262 cases, accounting for 10.64% of all visits.

The four other most frequent diagnoses were:

- J18: Pneumonia, organism unspecified – 956 cases (2.39%)
- E11: Type 2 diabetes mellitus – 821 cases (2.05%)
- J20: Acute bronchitis – 705 cases (1.76%)
- A04: Other bacterial intestinal infections – 621 cases (1.55%)

Among these five conditions, four were infectious diseases, while Type 2 Diabetes mellitus was the only non-communicable disease.

3.4. Distribution of Inpatient Visits by Department at Ha Dong General Hospital 2023

Table 4. Name???

Dept. code	Department	All visits		Inpatient visits	
		Quantity	%	Quantity	%
K01	Outpatient Clinic	175.911	80,6	10	0,0
K27	Obstetrics and Gynecology	7.061	3,2	7.061	17,6
K18	Pediatrics	5.718	2,6	5.718	14,3
K03	General Internal Medicine	3.763	1,7	2.757	6,9
K11	Tropical Diseases	2.881	1,3	2.881	7,2
K22	Gastrointestinal Surgery	2.658	1,2	2.658	6,6
K04	Cardiology	2.446	1,1	1.631	4,1
K05	Gastroenterology	2.015	0,9	1.950	4,9
K5012	Respiratory and Pulmonary Diseases	1.943	0,9	1.943	4,9
K24	Orthopedics and Trauma	1.832	0,8	1.832	4,6
K02	Emergency	1.700	0,8	1.697	4,2
K33	Oncology	1.518	0,7	1.518	3,8
K20	Neurosurgery	1.473	0,7	1.473	3,7
K08	Endocrinology	1.148	0,5	1.148	2,9
K23	Urology	1.141	0,5	1.141	2,8
K0735	Nephrology	1.135	0,5	607	1,5
K48	Intensive Care Unit (ICU) / Critical Care	942	0,4	942	2,4
K28	Ear, Nose, and Throat (ENT)	918	0,4	918	2,3
K29	Dentistry and Maxillofacial Surgery	842	0,4	842	2,1

Dept. code	Department	All visits		Inpatient visits	
		Quantity	%	Quantity	%
K16	Traditional Medicine	631	0,3	631	1,6
K30	Ophthalmology	578	0,3	578	1,4
K26	Anesthesiology and Resuscitation	112	0,1	112	0,3
Total		218.366	100,0	40.048	100,0

There were significant variations in the number of patients examined and treated across different departments. The Outpatient Department recorded the highest patient volume, with 175,911 visits, accounting for 80.6% of the total hospital encounters. This included 175,901 outpatient visits and 10 inpatient visits. The Obstetrics and Gynecology Department had the second highest volume, with 7,061 inpatient visits, representing 3.2% of the hospital's total visits.

Additionally, the Departments of Tropical Diseases, General Internal Medicine, and Gastrointestinal Surgery reported substantial inpatient numbers, with 2,881 (7.2%), 2,757 (6.9%), and 2,658 (6.6%) visits, respectively. The total number of visits, including inpatient care, was 2,881 (1.3%) for Tropical Diseases, 3,763 (1.7%) for General Internal Medicine, and 3,658 (1.2%) for Gastrointestinal Surgery. Among these three departments, General Internal Medicine also provided outpatient services due to its comprehensive clinical scope. Similarly, other internal medicine departments such as Cardiology and Gastroenterology offered both outpatient and inpatient services.

In contrast, surgical departments—excluding Obstetrics and Gynecology—did not provide outpatient consultations or treatments. The Ophthalmology and Traditional Medicine departments recorded the lowest inpatient volumes, with 587 (1.4%) and 631 (1.4%) visits, respectively. The Department of Anesthesiology and Resuscitation, because of its specialized nature, admitted 112 inpatients, accounting for 0.3% of the total inpatient volume. Surgical specialties, including Obstetrics and Gynecology, accounted for 14,165 inpatient visits in 2023, making up 35.37% of total inpatient cases, which is significantly higher than the figures for internal medicine, pediatrics, and other subspecialties..

4. DISCUSSION

In 2023, Ha Dong General Hospital recorded 40,048 inpatient visits - more than three times the number of inpatients at Dong Da General Hospital during 2017–2019 and at Son Tay General Hospital during 2020–2021 [4], [5]. Among the ICD-10 chapters, Chapter XV: Pregnancy, childbirth, and the puerperium accounted for the highest number of inpatient cases. This result is consistent with the morbidity pattern reported at Son Tay General Hospital in 2021 5.

Other chapters with a high proportion of inpatient cases included Chapter I: Certain Infectious and Parasitic Diseases, Chapter X: Diseases of the Respiratory System, and Chapter XI: Diseases of the Digestive System. A study by Do Thi Thanh Toan at Dong Da General Hospital (2017–2019) reported similar findings [4]. In contrast, a study conducted at Bach Mai Hospital in Hanoi revealed that inpatient visits were primarily dominated by chronic conditions such as cardiovascular diseases, diabetes, and cancer, with a much lower proportion of obstetric-gynecologic and infectious diseases [6]. The functional roles and referral levels of the hospitals may explain this difference. Central hospitals, such as Bach Mai, often receive severe, chronic, and complicated cases referred from across the country. In contrast, district- or provincial-level hospitals, such as Ha Dong General Hospital, primarily manage acute and common conditions that occur at the community level. Moreover, the proportion of inpatients across the remaining ICD-10 chapters varied inconsistently. This variation may be attributed to several factors, including demographic characteristics, socioeconomic conditions, local healthcare needs, and the structure and specialization of each hospital.

Dengue fever was the most common inpatient diagnosis at Ha Dong General Hospital in 2023. This finding is consistent with the study conducted at Dong Da General Hospital from 2017 to 2018. This trend can be attributed to the tropical monsoon climate in Hanoi and northern Vietnam in general, where the rainy season lasts from May to October, providing ideal conditions for mosquito breeding and transmission of the dengue virus. In 2023, a notable increase in dengue cases was also observed in Hanoi and neighboring provinces. Other common inpatient diagnoses included pneumonia with unspecified organism, type 2 diabetes mellitus, acute bronchitis, and other bacterial intestinal infections. These findings are consistent

with the results of studies by Do Thi Thanh Toan [4] and Tran Quang Tu [1], which also identified these conditions among the most frequent causes of inpatient visits.

The differences in the disease structure between Ha Dong General Hospital and national-level data or findings from other studies can be attributed to the fact that our data reflect only the situation of a single Grade II hospital in Hanoi. In addition, variations in factors such as population size, age distribution, gender, and geographic location across regions may also contribute to these differences.

Our study provides an overview of the inpatient disease pattern at Ha Dong General Hospital in 2023. However, several limitations should be acknowledged. Since the study relied on secondary data, important demographic and socioeconomic variables—such as age, gender, educational level, and economic status—were not available. As a result, we were unable to analyze factors that may influence the disease distribution. Additionally, the study did not include detailed temporal analyses (by day or month), which would have enabled the identification of seasonal or time-based trends in the occurrence of common diseases.

5. CONCLUSION

The disease structure at Ha Dong General Hospital in 2023 revealed that the highest number of inpatient visits was associated with diagnoses under Chapter XV: Pregnancy, Childbirth, and the Puerperium. However, there was still a considerable number of infectious disease cases under Chapter I: Certain Infectious and Parasitic Diseases, as well as a growing number of non-communicable disease cases under Chapter X: Diseases of the Respiratory System. Inpatient care demand was also high for diagnoses under Chapter XI: Diseases of the digestive system. Dengue fever (10.64%) was the most common inpatient diagnosis in 2023, primarily reflecting a localized outbreak during that period rather than indicating a long-term trend. Type 2 diabetes mellitus (2.05%), a non-communicable disease, was also a frequently recorded diagnosis. However, its proportion remained relatively low because most patients with this condition are managed on an outpatient basis and are only hospitalized when complications arise.

The hospital's pattern of disease suggests that resources and workforce development should be aligned with the double burden of disease, addressing both communicable and non-communicable diseases. While infectious diseases tend to be seasonal and more challenging to control, non-communicable diseases are less likely to require hospitalization if they are effectively managed at the outpatient level. Therefore, the hospital should consider strategic investment in both preventive and treatment capacities to meet this evolving disease profile.

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