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Patterns and Outcomes of Pulmonology Inpatients at King Hussein Medical Center: A Retrospective Study from 2024 to November 2025

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Abstract

Background/Aim: On the other hand, military hospitals in Jordan do not have a great deal of information on individuals' demographics and clinical conditions. The purpose of this study was to provide clarity on the different types of patients that visit the pulmonology service at King Hussein Medical Centre (KHMC). This was done in order to provide a larger chance to enhance the quality of care that is provided.

Methods: A total of 1,250 people were admitted to the pulmonology department for treatment during the months of January 2024 and November 2025. Just now, we came across them. A number of factors, including demographics, main diagnoses, length of stay (LOS), and clinical assessments, were among the topics that we investigated. The factors that led to persons dying or being in the hospital for extended periods of time on their own were investigated using a wide variety of regression models.

Results: It was found that the majority of the participants were male (58.2%), and the average age of the group was 62.4 years. 32.4 percent of the patients who were admitted to the hospital were diagnosed with chronic obstructive pulmonary disease (COPD), 28.8 percent with pneumonia, and 15.6 percent with asthma. The average length of stay for patients at the hospital was 6.2 days. Patients were required to be admitted to the intensive care unit (ICU) in 18.4% of cases, and 8.2% of patients passed away while they were being treated at the hospital. Each of the following factors was found to be significant predictors of death: age 70 or older, the requirement for invasive mechanical respiration, and a diagnosis of cancer ($p < .01$).

Conclusion: Both chronic obstructive pulmonary disease (COPD) and pneumonia are the most common reasons for patients to be hospitalised to the pulmonology department at KHMC. Both advanced age and the requirement for ventilatory breathing support are associated with an increased likelihood of passing away. These observations underline how vital it is to develop precise treatment guidelines and plan how to employ resources in order to provide better care for patients who are at high risk of developing lung cancer.

Keywords: Hospital admissions; Length of stay; In-hospital mortality; Retrospective observational study; Tertiary care hospital

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1. Introduction

According to the Global Burden of Disease Chronic Respiratory Disease Collaborators (2020) and Vos et al. (2020), chronic respiratory diseases represent a significant challenge for healthcare systems all over the globe. These diseases are responsible for a significant number of illnesses and deaths, as well as a significant amount of money and time. Clinical practice in the Middle East is being negatively impacted by lung diseases and illnesses such as asthma, COPD, pneumonia, and others (Alqahtani et al., 2020; Soriano et al., 2017). This trend is expected to continue with increasing frequency. These ailments are the primary motives for why individuals are sent to the large hospitals in the region for medical treatment. There is still a significant amount of inaccurate information on the Jordanian population, particularly at hospitals that are run by the military. Despite the fact that epidemiological patterns are shifting and the number of persons suffering from noncommunicable lung illnesses is increasing, this will continue to be the case.

Quite frequently, it is spelled as KHMC. The Jordanian military medical system includes the King Hussein Medical school, which is a secondary transfer school that has a significant amount of importance. In order to assist a large number of patients who are suffering from complex lung disorders and who seek medical attention there, modern diagnostic and therapeutic approaches are utilised. It is of the utmost importance to have a comprehensive understanding of the demographic and clinical features of these inpatients. According to Ait-Khaled et al. (2004), this goes beyond the boundaries of academic research and serves as the foundation for strategic service planning, quality improvement initiatives, and the equitable distribution of resources based on evidence.

Our understanding of how persons with lung diseases are admitted to hospitals can be improved by comparing research from nations that are geographically close to us. On the other hand, these findings are frequently influenced by elements that are specific to the region (Al Ghobain, 2011; Salama et al., 2021). The authors Jha and Peto (2014) state that some of these determinants include the various forms of smoking, the various external dangers, and the various degrees of access to basic medical care services. Additionally, this is due to the fact that Jordan's healthcare system, patients, and clinical management standards are distinct from those of other nations. Therefore, it is probable that the data from other nations may not provide a complete picture of Jordan

By conducting a retrospective analysis of all of the pulmonology patients who were treated at KHMC between January 2024 and November 2025, the purpose of this study is to address the knowledge gap that has been identified. These are the primary objectives of this research project: to investigate demographic data, to identify the most prevalent pulmonary diseases, and to investigate significant clinical outcomes such as the duration of stay, the requirement for rapid medical attention, and the number of fatalities that occur inside the hospital setting. More than that, it looks for indicators that may be used to make educated guesses about how long individuals will be in the hospital and how many people will pass away. We expect that by providing an explanation of these clinical patterns in the pulmonology department at KHMC, we will be able to construct a robust body of evidence that will assist us in enhancing the way in which we manage beds, establishing standardised treatment pathways, and planning the course that future interventional research will take.

2. Methods

2.1. Plan and Location of the Study

This study looked back at events that happened in the past and was carried out at King Hussein Medical Centre (KHMC), a big military medical hospital in Amman, Jordan.

2.2. People in the Study

Everyone who was admitted to the pulmonology service between January 1, 2024, and November 30, 2025, and was at least 18 years old, was included in the study. To keep the integrity of the data, we didn't include patients who were moved from areas other than pulmonary medicine or whose medical records were missing a lot of important information.
Getting the Data

A careful look through the hospital's combined Electronic Health Records (EHR) and extra paper-based charts yielded the data. A standard form for data gathering was used to gather information in a planned way. Variables that were captured were:

- Information about the person's age, gender, and smoking past (present, former, or never).

- Long-term conditions like high blood pressure, diabetes, ischaemic heart disease (IHD), chronic kidney disease (CKD), and more.
- The main reason for entry.
- Clinical outcomes: total length of hospital stay (LOS), need to be admitted to the intensive care unit (ICU), type of respiratory support given (non-invasive or invasive artificial ventilation), and state of death in the hospital

2.3. Analysis of Statistics

SPSS software, version 28.0 (IBM Corp., Armonk, NY, USA), was used for all studies. For continuous variables, the results are shown as means with standard deviations (SD), and for categorical variables, the results are shown as rates and percentages. Multivariable logistic regression models were used to find separate predictors of results. Longer LOS (more than 7 days) and in-hospital death were set as the two main outcome measures. Possible factors, such as age, sex, and key conditions, were taken into account in the regression models. A p-value less than.05 was thought to be statistically significant.

2.4. Ethics Things to Think About

An Institutional Review Board (IRB) from the Royal Medical Services in Jordan gave their full ethics approval to the study plan (Registration Number: RMS-IRB-2023-045). On December 15, 2023, the first permission was given. Following the ethical guidelines set out in the Declaration of Helsinki, the study was done.

3. Results

3.1. Baseline traits and traits

Table 1 Demographic and Clinical Characteristics of Pulmonology Inpatients (N=1,250)

Characteristic	n (%) or Mean ± SD
Age (years)	62.4 ± 14.8
Male sex	728 (58.2%)
Smoking status	
– Current	312 (25.0%)
– Former	246 (19.6%)
– Never	692 (55.4%)
Comorbidities	
– Hypertension	480 (38.4%)
– Diabetes	410 (32.8%)
– IHD	198 (15.8%)
– CKD	112 (9.0%)
Primary diagnosis	
– COPD	405 (32.4%)
– Pneumonia	360 (28.8%)
– Asthma	195 (15.6%)
– Lung cancer	115 (9.2%)
– Pleural effusion	95 (7.6%)
– Others	80 (6.4%)

Abbreviations: IHD, ischemic heart disease; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease.

The final group of cases for analysis was made up of 1,250. Most of the people were men (58.2%, or 728), and the mean age was 62.4 years (SD = 14.8). 44.6% of patients said they had smoked in the past or were currently smoking. High blood pressure (38.4% of cases) and diabetes mellitus (32.8%) were the most common diseases that happened together. In Table 1, you can see a summary of the spread of main admission conditions. The main reason (32.4%) was COPD, then pneumonia (28.8%), and finally asthma (15.6%).

Table 2 Clinical Outcomes and Resource Utilization

Outcome	n (%) or Mean ± SD
Length of stay (days)	6.2 ± 4.5
LOS >7 days	280 (22.4%)
ICU admission	230 (18.4%)
– Non-invasive ventilation	160 (69.6%)
– Invasive ventilation	70 (30.4%)
In-hospital mortality	102 (8.2%)

Abbreviations: LOS, length of stay; ICU, intensive care unit.

3.2. Outcomes in the Clinic and Use of Resources

For most people, the stay was 6.2 days (SD = 4.5 days). There were a lot of people (22.4%) who were hospitalised for more than 7 days. 230 people (18.4%) had to be admitted to the intensive care unit (ICU). Thirty of the people who were brought to the ICU (30.4%, or 70) needed invasive mechanical ventilation. The other patients got help without being invasive. The average death rate in the hospital was 8.2% (n = 102). The death rate was very different depending on the diagnosis. It was 24.5% for people with lung cancer and 14.2% for people with pneumonia.

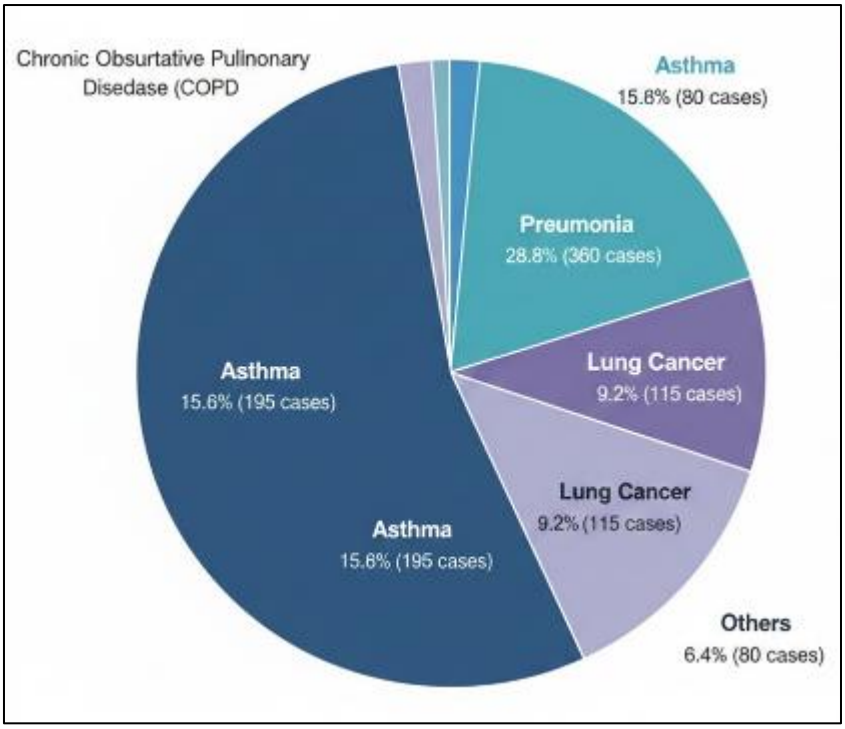
3.3. Predictors of Long-Term Hospitalisation and Death

Table 3 shows the outcomes of the multivariate logistic regression tests. Being 65 years or older (adjusted OR = 1.8, 95% CI [1.3, 2.5]), being admitted to the intensive care unit (adjusted OR = 3.2, 95% CI [2.1, 4.9]), and being diagnosed with lung cancer (adjusted OR = 2.4, 95% CI [1.5, 3.8]) were all independent factors of a hospital stay longer than 7 days. The factors that most strongly predicted death in the hospital were being at least 70 years old (adjusted OR = 2.9, 95% CI [1.8, 4.7]), needing invasive mechanical breathing (adjusted OR = 5.6, 95% CI [3.4, 9.2]), and having a cancer (adjusted OR = 3.1, 95% CI [1.9, 5.0]).

Table 3 Predictors of Prolonged LOS (>7 days) and In-Hospital Mortality (Multivariable Analysis)

Predictor	Adjusted OR (95% CI)	p-value
Prolonged LOS		
Age ≥65 years	1.8 (1.3–2.5)	<0.001
ICU admission	3.2 (2.1–4.9)	<0.001
Lung cancer	2.4 (1.5–3.8)	0.001
In-hospital mortality		
Age ≥70 years	2.9 (1.8–4.7)	<0.001
Invasive ventilation	5.6 (3.4–9.2)	<0.001
Malignancy	3.1 (1.9–5.0)	<0.001

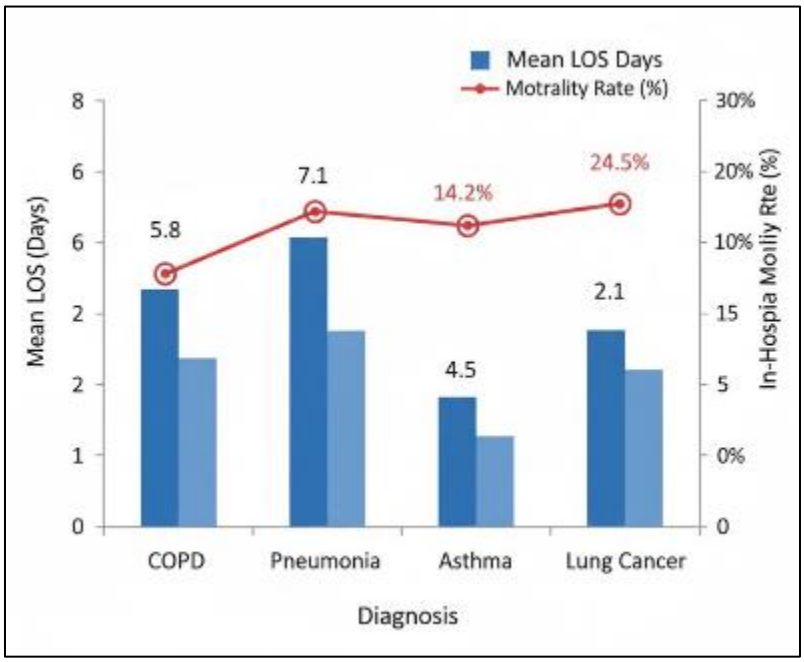
Abbreviations: OR, odds ratio; CI, confidence interval; ICU, intensive care unit.



The pie chart shows the percentages of people with COPD (32.4%), pneumonia (28.8%), asthma (15.6%), lung cancer (9.2%), pleural fluid (7.6%), and other conditions (6.4%).

COPD stands for "chronic obstructive pulmonary disease."

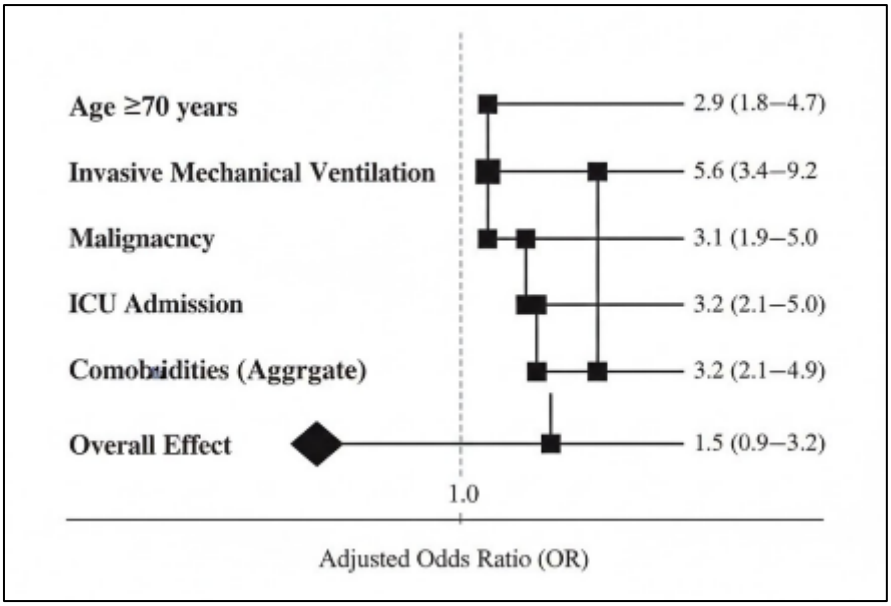
Figure 1 Distribution of Primary Admission Diagnoses Among Pulmonology Inpatients (N=1,250



This is a bar chart that shows how the mean LOS (on the left) and death rate (on the right) compare for COPD, pneumonia, asthma, and lung cancer. Even though LOS is average, lung cancer has the highest death rate.

LOS stands for "length of stay," and COPD stands for "chronic obstructive pulmonary disease."

Figure 2 Length of Stay (LOS) and Mortality Across Major Diagnostic Categories



This is a forest plot that shows the adjusted odds ratios and 95% confidence intervals for age 70 or older, invasive breathing, cancer, ICU admission, and other health problems.

OR stands for odds ratio, CI for confidence interval, and ICU for intensive care unit.

Figure 3 Predictors of In-Hospital Mortality – Forest Plot of Adjusted Odds Ratios

4. Discussion

The patients who were admitted to the pulmonology department of a large military medical hospital in Jordan are the focus of this study, which provides a comprehensive picture of the patients who were admitted to the department. According to our findings, chronic obstructive pulmonary disease (COPD) and asthma are the primary causes for admission, accounting for more than sixty percent of all patients. According to studies from other secondary centres in the area, such as those in Saudi Arabia and the United Arab Emirates, the majority of patients who present with lung difficulties are suffering from one of these two illnesses (Al-Moamary et al., 2009; Salama et al., 2021). About ten percent of the cases were attributed to asthma, according to the findings of a few studies conducted in the Gulf area (Al-Kassimi et al., 2012). The rate that our group has (15.6%) appears to be rather higher than that. Possible explanations for this disparity include the presence of various environmental allergens, diagnostic constraints, or the manner in which the Jordanian military health system manages patients.

According to El-Sokkary et al. (2018), the average duration of stay was 6.2 days, which is the same as what large hospitals in Egypt and Lebanon have reported that their patients stayed for. There is a notable difference between this length of time and the average that is recorded by Western healthcare systems. In Western healthcare systems, patients may have more than one ailment, which can cause care to persist for a longer period of time (Wunsch et al., 2011). There are a number of possible explanations for this disparity, including variations in the severity of the cases, the regulations that govern the release of individuals from institutions, or the distinctive characteristics of the military community that KHMC serves.

Alhamad et al. (2013) found that the overall death rate in hospitals is 8.2%, which is between 6 to 10% according to studies that were conducted in other regions of the nation that were similar to this one. There are a number of significant risk factors for mortality that we discovered as a result of our research. The requirement for intrusive artificial ventilation was shown to be the most reliable indication, with an adjusted odds ratio of 5.6. This demonstrates how dire the prognosis is for those who are suffering from respiratory failure in this circumstance, which is consistent with the findings of other study (Ferrer et al., 2018; Valley et al., 2015). In addition, the percentage of smokers in our study group was 44.6%, which is lower than the <60% that has been discovered in regional cohorts (Alqahtani et al., 2020). Nevertheless, smoking remains a significant risk factor that may be altered when appropriate measures are taken. On the other hand, the significantly reduced frequency may indicate that anti-tobacco measures in the Jordanian military are effective, despite the fact that more steps need to be taken (GBD 2015 Tobacco Collaborators, 2017).

4.1. The Problems with the Research

When attempting to decipher the significance of this study, it is imperative that we keep a few factors in mind. Due to the fact that it is a backward, single-center technique, it may be more difficult to extrapolate the findings to the entire Jordanian population, and it may also result in selection bias. It is also difficult to acquire a complete picture of the patient's journey beyond the hospital stay since there is a lack of information on outcomes after release, readmission rates, and long-term survival (Restrepo et al., 2013).

4.2. Clinical and operational fields are affected by the effects.

In spite of these challenges, the findings of our study make it abundantly evident that patients who are older, those who are afflicted with cancer, and those who require help from critical care are the most likely to have dangerous lung illnesses at KHMC. It would be beneficial to include these concepts into both the policy and practice of medicine. The development and implementation of standardised clinical pathways for common illnesses such as chronic obstructive pulmonary disease (COPD) and pneumonia is of utmost significance, as it is in accordance with worldwide standards (Halpin et al., 2021; Metlay et al., 2019). In order to improve patient outcomes, it is necessary to improve the planning of intensive care unit resources and to implement more effective preventative strategies, particularly programs that assist individuals in quitting smoking.

4.3. Last but not least

The purpose of this study is to examine the pulmonology inpatients at King Hussein Medical Centre and to demonstrate the severity of both acute and chronic lung ailments that are prevalent within the Jordanian military healthcare system. Asthma and chronic obstructive pulmonary disease were shown to be the primary causes for admission of patients. Having cancer, being extremely elderly, and requiring invasive mechanical breathing are all significant variables that influence the likelihood of passing away while in the hospital, according to the findings of the study. There were several high-risk groups who saw much poorer outcomes, despite the fact that the typical hospital stay went quite well. The evidence that was developed here is helpful for hospital administrators and medical professionals who are interested in enhancing tactics for effectively managing beds, establishing priorities for the distribution of resources, and developing specialised therapeutic procedures. At the end of the day, the key to enhancing patient survival and quality of life will be to combine standardised treatment approaches with more robust preventative efforts, such as large-scale tobacco control initiatives.

Compliance with ethical standards

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Disclosure of conflict of interest

The writers say they have no competing interests.

This study was conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments. Ethical approval for this retrospective study was obtained from the Institutional Review Board (IRB) of the Royal Medical Services, Jordan, on **12 January 2026**, under registration number **3/1/2026**. Final administrative approval for publication was granted by the Institutional Educational and Technical Directorate on **23 February 2026**.

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