**Biomedical and Biopharmaceutical Research**
**Abbreviation**: Biomed. Biopharm. Res.
Volume: 22: Issue: 01 |Year: 2025
Page Number: 129-133

# PREVALENCE AND CLINICAL CHARACTERISTICS OF INFLUENZA AND OTHER RESPIRATORY VIRAL INFECTIONS: A RETROSPECTIVE OBSERVATIONAL STUDY

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Article Received:20-01-2025

Article Accepted:19-03-2025



## Abstract

**Background:** Influenza and other respiratory viruses are major contributors to global morbidity and mortality, particularly among vulnerable populations. This study aims to analyse the prevalence, demographic distribution, and clinical characteristics of influenza and co-circulating respiratory viruses, including COVID-19, in a cohort of symptomatic patients.

**Methods:**A retrospective observational study was conducted at Government Medical College, Department of Virology, Amritsar. A total of 551 patients were included based on predefined eligibility criteria. Clinical symptoms, comorbidities, and demographic data were collected. Laboratory diagnosis was performed using RT-PCR, rapid antigen testing, and viral culture to detect Influenza A (IAV), Influenza B (IBV), H1N1, H3N2, SARS-CoV-2, and other respiratory viruses. Statistical analyses were performed using descriptive and inferential methods, with significance set at $p < 0.05$.

**Results:**Among the 296 patients, the most common symptoms were fever, cough, sore throat, headache, and breathlessness (93.2%). The majority of cases occurred in the 6–64 years age group (81.9%), followed by ≥65 years (18.3%) and ≤5 years (3.6%). Influenza A was the most frequently detected virus (119 cases), with H1N1 (49 cases) and H3N2 (6 cases) as the dominant subtypes. COVID-19 was identified in 16 cases, while other respiratory viruses, including RSV, adenovirus, and human metapneumovirus, were detected at lower frequencies. Patients with comorbidities such as lung disease, diabetes, and heart disease had a higher prevalence of infections.

**Conclusion:**Influenza A, particularly H1N1 and IAV, was the predominant respiratory virus in this study, affecting mostly adults. The co-circulation of SARS-CoV-2 and other respiratory viruses underscores the need for comprehensive surveillance and multiplex testing to improve diagnosis and treatment strategies. Findings from this study highlight the importance of targeted vaccination programs and early intervention in high-risk populations.

**Keywords:**Influenza, H1N1, SARS-CoV-2, respiratory infections, epidemiology, viral co-infection, public health

## INTRODUCTION

Every year, influenza and other respiratory viruses cause a great deal of morbidity and mortality, which puts a heavy strain on global public health. Every year, seasonal influenza outbreaks cause up to 650,000 respiratory fatalities and 3 to 5 million episodes of severe illness [1]. The two main circulating strains of influenza are IAV and IBV; IAV is more common and linked to pandemics because of its propensity for antigenic drifts and changes [2]. IAV has been dominated by the H1N1 and H3N2 subtypes in recent years; the 2009 pandemic was caused by H1N1 [3].Acute respiratory infections are caused by a number of respiratory viruses in addition to influenza, such as coronaviruses, adenoviruses, human metapneumoviruses, and respiratory syncytial virus (RSV) [4]. Since the symptoms of COVID-19 can be confused with those of influenza and other viral diseases, the late 2019 development of SARS-CoV-2 created significant

difficulties in the diagnosis and treatment of respiratory infections [5]. Concerns regarding the severity and clinical consequences of multiple infections have been raised by studies that have documented cases of co-infections involving influenza and SARS-CoV-2 viruses [6].

According to Uyeki et al. [7], influenza and other respiratory viruses can cause minor symptoms like fever, cough, and sore throat, as well as more serious ones like pneumonia, respiratory failure, and multi-organ dysfunction. Severe consequences are more likely to occur in those with underlying medical disorders, such as diabetes, cardiovascular disease, immunosuppression, and chronic lung disease [8]. According to Thompson et al. [9], age also has a significant impact on disease susceptibility, with pregnant women, older adults (≥65 years), and children being particularly susceptible to severe influenza and its associated consequences. This study intends to analyze the distribution of influenza and other respiratory viruses across different age groups and genders, assess their associated clinical symptoms, and evaluate the presence of co-infections, including COVID-19 to help inform public health policies, vaccination strategies, and clinical management approaches to mitigate the impact of respiratory viral infections. Given the ongoing burden of respiratory infections, surveillance studies are crucial to understanding the prevalence, demographic distribution, and co-circulation of multiple viral pathogens.

## MATERIALS AND METHODS

This study was conducted as a **retrospective observational analysis** of patients presenting with symptoms of respiratory infections at Government Medical College, Amritsar. A total of **551 patients** were included in the study based on predefined eligibility criteria.

Inclusion Criteria:

- Patients presenting with **symptoms of respiratory infection**, such as fever, cough, sore throat, breathlessness, headache, and chest pain.
- Individuals of **all age groups and both genders**.
- Patients diagnosed with **influenza, COVID-19, or other respiratory viral infections** through laboratory testing.

Exclusion Criteria:

- Patients with **non-infectious respiratory conditions** (e.g., chronic obstructive pulmonary disease without acute infection).
- Individuals without **confirmed viral infection**.
- Patients with **incomplete clinical records**.

Demographic and Clinical Data: Patient demographic information, including age, gender, and underlying comorbidities (e.g., diabetes, cardiovascular disease, kidney disease, lung disease), was recorded. Symptoms were documented and categorized according to their frequency.

Age Group Classification: Patients were categorized into three age groups:

- **≤5 years (infants and young children)**
- **6–64 years (adults and working-age population)**
- **≥65 years (elderly population)**

Sample Collection and Processing: Nasopharyngeal and/or throat swabs were collected from all symptomatic patients and processed using molecular diagnostic techniques.

Detection of Influenza and Other Respiratory Viruses

- **Real-Time Polymerase Chain Reaction (RT-PCR):** Used for the detection of **Influenza A (IAV) and Influenza B (IBV)** subtypes (H1N1, H3N2) and **SARS-CoV-2 (COVID-19)**.
- **Rapid Antigen Testing:** Performed for initial screening of **influenza viruses and COVID-19**.
- **Viral Culture:** Conducted in select cases to confirm **co-infections with RSV, adenovirus, and human metapneumoviruses**.

Statistical Analysis

Descriptive statistics were used to summarize **demographic, clinical, and laboratory findings**.

- **Continuous variables** (e.g., age) were reported as **mean ± standard deviation (SD)**.
- **Categorical variables** (e.g., gender, symptoms) were presented as **frequencies and percentages**.
- **Chi-square tests** were used to assess **associations between age groups, gender, and infection type**.
- A **p-value of <0.05** was considered statistically significant.

**RESULTS**

Table 1: Stratification of gender

| | Females | Males |
|---|---|---|
| Average age± SD | 47.03±17.53518 | 47.59±19.53 |
| Total no | 293 | 258 |

Table 2: Stratification of gender according to age groups

| Age group | Females | Males | Total |
|---|---|---|---|
| ≤5 years | 6 | 13 | 19 |
| 6-64 years | 238 | 197 | 435 |
| ≥65 years | 49 | 48 | 97 |

Table 3: Case types of Influenza and age stratification

| Age | Influenza type | Cases no |
|---|---|---|
| ≤5 years | IAV/ H1N1 | 6 |
| 6-64 years | IBV | 2 |
| | H3N2 | 6 |
| | H1N1 | 49 |
| | IAV | 108 |
| ≥65 years | IAV | 11 |
| | IAV/H1N1 | 9 |

Table 4: Symptoms among patients with influenza

| Symptoms | Number |
|---|---|
| Fever, Cough, sore throat, headache, breathlessness | 276 |
| High BP | 1 |
| Diarrhoea, Vomiting | 2 |
| Kidney disease, Diabetes | 2 |
| Lungs Disease | 7 |
| Chest Pain | 3 |
| Low BP | 3 |
| Heart disease | 2 |
| Total | 296 |

**DISCUSSION**

This study sheds light on the age-wise distribution, prevalence, and symptoms of respiratory illnesses, especially influenza, in the study population. The results emphasize the prevalence of influenza A (IAV) and its subtypes, the age categories that are most impacted, and the co-circulation of COVID-19 and other respiratory viruses.

**Prevalence of Symptoms and Disease Burden:**

In influenza and other respiratory infections, the most often reported symptoms are fever, cough, sore throat, headache, and dyspnea (276 cases, 93.2%). These results are in line with other research that found that the most common symptoms of influenza in patients were fever and cough [7]. Furthermore, the existence of chronic illnesses such heart disease (2 instances), kidney disease/diabetes (2 cases), and lung disease (7 cases) indicates that those with comorbidities may be more vulnerable to serious consequences [8].

**Age and Gender Distribution:**

According to the data, 81.9 percent of cases occur in people aged 6 to 64, compared to 97 instances (18.3%) in older adults (≥65 years) and only 19 cases (3.6%) in children aged ≤5. This is in line with results from earlier influenza surveillance studies, which indicate that working-age individuals are often impacted, possibly as a result of increased exposure in public areas and at work [10]. However, because influenza infections in this age group are frequently linked to greater morbidity and death, the elderly continue to be a vulnerable group [9]. There were somewhat more females (293 cases) than males (258 cases) in terms of gender distribution. The difference in this dataset is not significant enough to make definitive conclusions, despite some research suggesting biological or immunological variables may play a role in gender disparities in respiratory infections [11].

**Dominance of Influenza A and Its Subtypes:**

With 119 cases found, influenza A (IAV) was the most commonly discovered virus. Notable among its subtypes were H1N1 (49 cases) and H3N2 (6 cases). The distribution of influenza strains by age reveals that IAV was common in all age groups, although H1N1 primarily afflicted people aged 6–64 years (49 cases). These results are consistent with worldwide surveillance data showing that the two main influenza A subtypes in circulation are H1N1 and H3N2 [3]. Additionally, the two cases of influenza B that were found point to a lower prevalence of this strain than influenza A. This is in line with other research that found influenza B can still contribute to the seasonal influenza burden even though it typically appears at lower frequency [2].

**Co-Circulation of COVID-19 and Other Respiratory Viruses:**
The fact that COVID-19 was found in 16 cases shows that it is still present in addition to influenza. This observation raises concerns regarding dual infections and overlapping symptoms because it is consistent with reports of influenza and SARS-CoV-2 viruses co-circulating in different populations [6]. Low frequencies of detection of other respiratory viruses, such as Adenovirus (2 cases), Respiratory Syncytial Virus (RSV) (1 case), and Human Metapneumovirus (1 case), indicate that influenza was the predominant viral pathogen in this group.

**Clinical and Public Health Implications:**
The necessity of yearly influenza vaccination programs to lower the illness burden is highlighted by the prevalence of influenza, especially H1N1 and IAV. Furthermore, specific preventative initiatives for high-risk populations (e.g., elderly, those with diabetes, heart disease, or lung illness) should be given priority because some patients have comorbid disorders [12]. Additionally, the co-occurrence of influenza and COVID-19 emphasizes how crucial multiplex testing is to ensuring proper diagnosis and treatment during respiratory illness outbreaks. This is especially important in medical contexts where managing patients and preventing infections depend on being able to differentiate between these viruses [5].

**Limitations:**
There are several restrictions on this study. First of all, it lacks data on hospitalization rates and case severity, which would provide a more comprehensive picture of the disease burden. Furthermore, seasonal fluctuations were not taken into account, which could have an impact on influenza prevalence over time. Lastly, the dataset does not distinguish between people who have had vaccinations and those who have not, which restricts our understanding of how effective vaccines are in this population

.

## CONCLUSION

The results of the study confirm that the most prevalent respiratory infection in the population under investigation is influenza A, specifically H1N1 and IAV. Although older people and those with comorbidities are still at danger, adults from 6 to 64 years were the most affected. Although there were COVID-19 instances, they were less numerous than influenza infections, highlighting the importance of ongoing respiratory virus surveillance. To better inform public health actions, future research should concentrate on seasonal changes, disease severity, and vaccine effectiveness.

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