



## EPIDEMIOLOGICAL FEATURES OF ACUTE RESPIRATORY VIRAL INFECTIONS DURING PANDEMIC SEASONS CORONAVIRUS INFECTION

Anvarov J.A.

Suyunov S.Z.

Asatullayeva M.A.

Tashkent Medical Academy, Republic of Uzbekistan

### ARTICLE INFO

Qabul qilindi: 10-May 2023 yil

Ma'qullandi: 13-May 2023 yil

Nashr qilindi: 15-May 2023 yil

### KEY WORDS

*respiratory virus epidemiology,  
flu-season, COVID-19 pandemic*

### ABSTRACT

*The COVID pandemic has forcefully turned the spotlight on the importance of the diagnosis of respiratory virus infections. Viruses have always been a frequent and common cause of respiratory tract infections. Rapid molecular diagnostics applied to the diagnostics of respiratory virus infections has revolutionized microbiology laboratories only a few years ago. Few studies illustrate the epidemiology of respiratory viruses, and fewer still those that have compared the pre-pandemic to the pandemic period. During the first year of the pandemic (2020–2021) it was clear to everyone to witness a sudden disappearance of the circulation of all the other respiratory viruses, especially those typically isolated during the winter time, such as RSV and Influenza virus. By examining the epidemiology of our local reality and three successive flu seasons (2018–2019, 2019–2020, and 2020–2021), we were able to confirm this phenomena in our study. According to the findings, the prevalence of respiratory viral infections decreased from 49.8% in 2018–2019 and 39% in 2019–2020 to 13.4% in 2020–2021. This decline is at least partially attributed to the security measures implemented (social distance and mask), but it undoubtedly creates new possibilities for the eventual termination of the restriction measures. Such research, in our opinion, can offer concrete evidence of the efficacy of public health measures taken during the present and upcoming pandemics.*

The SARS-CoV-2 coronavirus was originally discovered in clusters of pneumonia cases with an enigmatic origin in Wuhan, China, in December 2019 [1]. Globally, the rate of SARS-CoV-2 propagation has rapidly accelerated. On January 30, 2020, two Chinese visitors traveling to Italy were found to have the sickness, which the Italian authorities later verified [2]. On March 7, 2020, a SARS-CoV-2 positive case was identified in Pordenone, North East Italy. The Italian

government imposed a national lockdown on March 9, 2020, leading to the adoption of several public health measures, including the cancellation of public events, advice to stay at home, closures of schools and workplaces, restrictions on international travel, mask use recommendations, and the requirement to wear masks in enclosed public spaces. On March 11, 2020, the World Health Organization classified the COVID-19 global outbreak as a pandemic.

Acute Respiratory Infections (ARI) have always been a significant cause of morbidity and mortality before the COVID-19 pandemic. Although it is thought that viruses are the primary cause of up to 80% of cases, most of these viruses have never been systematically and specifically researched before. One of the main etiological agents of ARI is influenza viruses. However, both pediatric and adult populations can develop ARI from a variety of different respiratory viruses for which insufficient epidemiological data is currently available [4-6]. If not properly diagnosed, many respiratory viruses lead to high rates of hospitalization and occasionally ineffective use of antibiotic therapy.

A few laboratories had the exclusive right to diagnose the viral agent that causes ARI up until about ten years ago, but over the past ten years, the rapid molecular diagnostics applied to respiratory virus infections have revolutionized the diagnostic strategy of the microbiology laboratories [6, 7]. Few studies have compared the pre-pandemic to the pandemic period, though, and even fewer have illustrated the epidemiology of respiratory viruses [8].

We pondered the following two questions in light of the pandemic we are currently experiencing: What other respiratory viruses, besides Sars-CoV2, were in circulation prior to the pandemic? How much have social restriction policies and the usage of safety equipment affected the spread of every respiratory virus throughout the pandemic?

By comparing their patterns in detection with the 2018–2019 period (pre-pandemic time), we set out to examine in our local competition the impact of not having the SARS-CoV-2 respiratory virus in hospitalized patients in 2020–2021 (pandemic time).

#### METHOD AND MATERIALS

The following viruses were detected by the multiplex real-time PCR Allplex respiratory panel (All16, Seegene, Seoul, Republic of Korea) testing 6206 clinical respiratory specimens (nasopharyngeal swabs or bronchoalveolar lavage) from adult and pediatric hospitalized patients with symptoms of ARI. These viruses included influenza viruses A (FluA) and B (FluB), adenovirus (AdV), coronarvirus (229E, NL

The full observation period was split into three flu seasons that ran concurrently: May 2018 through April 2019, May 2019 through April 2020, and May 2020 through April 2021.

#### RESULTS

Of the 6206 specimens analyzed between May 2018 and April 2021, 2198, 3211, and 797, respectively, were examined in 2018–2019, 2019–2020, and 2020–2021 accordingly. 2452 (39.5%) of the 6206 total specimens produced good results. The group analyzed (adults and children hospitalized with flu-like symptoms and positive for any respiratory virus) is shown in Table 1, together with demographic information, units, and the median age of maximum circulation for each viral subtype identified.

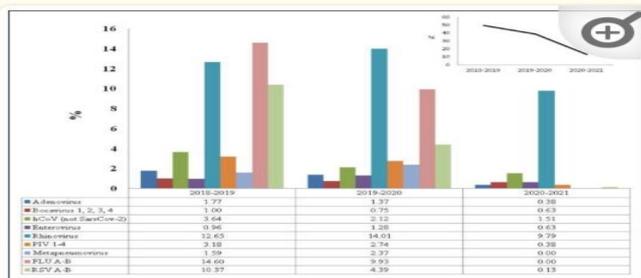
TABLE 1

Hospital unit	Adults(n)	Paediatric
Medicine	807	659
Surgery	50	
ICU	129	
ER	249	558
Sub Total	1235	1217

Respiratory virus	Median age(interval)	Detection (n)
Adenovirus	5 (0-90)	86
Enterovirus	4 (1-79)	67
Rhinovirus	39 (0-106)	806
Metapneumovirus	73 (1-106)	111
Total	49 (0-106)	2452

Given that there were much fewer requests for non-SARS-CoV-2 respiratory viruses during the pandemic, 1094/2198 (49.8%), 1251/3211 (39%) and 107/797 (13.4%) of the 2452 positives among the 6206 examined seasons, respectively, were in 2018-2019, 2019-2020, and 2020-2021.

The typical seasonal frequency trend for the 2018–2019 and 2019–2020 seasons was totally reversed in 2020–2021 (the pandemic year), as illustrated in Figure 1. The typical influenza season in the winter of 2020–2021, which is often dominated by FLU and RSV, has not been observed. In particular, no influenza viruses (FLU A–B) or RSVs (RSV A–B), typically winter viruses, have been discovered. Other comparable papers [9, 10] support our data. The primary causes of this lack of circulation most likely stem from the significant and unexpected effects that social isolation, the wearing of masks in public places and at work, and hand hygiene measures have had, as well as from the widespread use of community mitigation strategies during the tight lockdown phase, such as limiting travel and closing schools and some workplaces.



**Figure 1**

Total frequency (%) of virus in each flu season. The total trend of the percentage of all positive samples in the three seasons is shown at the top right.

**DISCUSSION**

The current study compared three consecutive flu seasons from 2018 to 2021 in our local setting in order to examine the potential impact of restriction measures implemented to manage the COVID pandemic on the spread of other respiratory viruses.

Our findings support previous research [9–11] indicating social isolation and mask use have a significant impact on the spread of respiratory infections. According to our findings, the prevalence of respiratory viral infections fell from 49.8% in the years 2018–2019 and 39% in the years 2019–2020 to 13.4% in the years 2020–2021. Home isolation and the implementation of hygienic procedures stopped the general population from contracting viral or bacterial infections, and they also stopped outbreaks among hospital patients. Additionally, these findings would indicate the necessity of preserving social distance, mask use, and hand hygiene, at the very least in a setting like a hospital environment or during the seasonal

influenza virus circulation. We think it's time to reconsider whether severe regulations are still essential and to stop concentrating solely on the flu vaccine campaign.

These data suggest that, in view of the aforementioned, the lower incidence of influenza and RSV may eventually result in more severe respiratory infections. Competition between viruses was noticed, despite the fact that coinfection with two or more viruses is not unusual. RSV presents abnormally in youngsters, according to early findings Australia and New Zealand. Additionally, respiratory virus surveillance can offer practical proof of the success of public health measures taken during the present and upcoming pandemic.

#### References:

1. Guan WJ, Ni ZY, Hu Y, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med.* 2020;382(18):1708–20. [PMC free article] [PubMed] [Google Scholar]
2. Giovanetti M, Benvenuto D, Angeletti S, et al. The first two cases of 2019-nCoV in Italy: Where they come from? *J Med Virol.* 2020;92(5):518521. [PMC free article] [PubMed] [Google Scholar]
3. Pagliano P, Sellitto C, Conti V, et al. Characteristics of viral pneumonia in the COVID-19 era: an update. *Infection.* 2021;49(4):607–16. [PMC free article] [PubMed] [Google Scholar]
4. Vidaur L, Totorika I, Montes M, et al. Human metapneumovirus as cause of severe community-acquired pneumonia in adults: insights from a ten-year molecular and epidemiological analysis. *Ann Intensive Care.* 2019;9:86. [PMC free article] [PubMed] [Google Scholar]
5. Leaver BA, Smith BJ, Irving L, et al. Hospitalisation, morbidity and outcomes associated with respiratory syncytial virus compared with influenza in adults of all ages *Influenza. Other Respir Viruses.* 2021 Dec 1; Online ahead of print. [PMC free article] [PubMed] [Google Scholar]

INNOVATIVE  
ACADEMY