

OVERVIEW OF THE RESULTS OF INFLUENZA SEASON 2018/19 IN VOJVODINA PROVINCE, SERBIA

Snežana Medić^{1,2}, Miodjub Ristić^{1,2}, Vesna Milošević^{1,2}, Jelena Radovanov¹, Vladimir Petrović^{1,2}

¹Institute of Public Health of Vojvodina, Novi Sad, Serbia ²Faculty of Medicine, University of Novi Sad, Serbia

Site presentation

Influenza surveillance is carried out in cooperation of the Institute of Public Health of Vojvodina (IPHV) and four tertiary care (study) hospitals. Study hospitals (total capacity of 954 hospital beds including 350 pediatric and 93 ICU beds) are situated in the city of Novi Sad. Only severe cases who have not been successfully treated in the general hospitals (9) throughout the Province, were «candidates» for the admission in any of the study hospitals. Total catchment area is equal to the entire population of Vojvodina (≈2 million inhabitants; 27% of Serbian population). Hereby we present the results of the hospital-based influenza surveillance obtained during 2018/19 season with aim to provide insight into the influenza disease burden among hospitalized patients in Vojvodina Province (Republic of Serbia).



FIG 1. MAP OF SERBIA AND POSITION OF VOJVODINA PROVINCE AND NOVI SAD (red dot) - LOCATION OF STUDY HOSPITALS

Methods

We performed multi-centre, prospective, surveillance study according to GIHSN Core Protocol. The study focused on patients of all ages and covered period from 40th calendar week 2018 to 20th calendar week 2019. Study questionnaires were filled on the spot by dedicated health care workers. Swab samples were collected, transported in UTM and tested in the Center for virology of IPHV within 48 hours. Testing was performed on influenza A H1N1pdm09, influenza A H3N2 and influenza B (with further determination of B/Yamagata and B/Victoria lineages) viruses using Singleplex Real-Time RT-PCR assays. Reverse transcription and amplification was realized using AgPath Idtm One-step RT PCR reagents and nucleotide primers and probes (CDC, USA). All influenza negative samples of severe cases were tested for other respiratory viruses [HCoV (OC43, 229E, NL63 and HKU1), human meta pneumovirus, human parainfluenza viruses 1, 2, 3 and 4, human rhinovirus, adenoviruses, boka virus and RSV] using Multiplex Real Time PCR tests. Descriptive analysis and statistics was applied.

Results

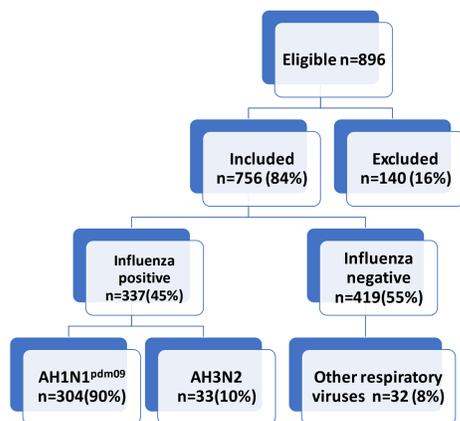


Figure 1 : Results of GIHSN influenza season 2018/19, Vojvodina Province, Serbia

Nearly half (45%; 337/756) of included patients tested positive on influenza virus while 8% of influenza negatives were positive on other respiratory viruses (Fig 1). The 2018/19 season was characterized by strong domination of influenza AH1N1^{pdm09} (90% of all influenza positives) and co-circulation of influenza AH3N2(10% of influenza positives). Influenza season lasted from week 1 to week 16, 2019. The epidemic started in the last week of January (week 5), reached its peak in mid-February (week 7) and ended in the third week of February (week 8)(Fig 2).

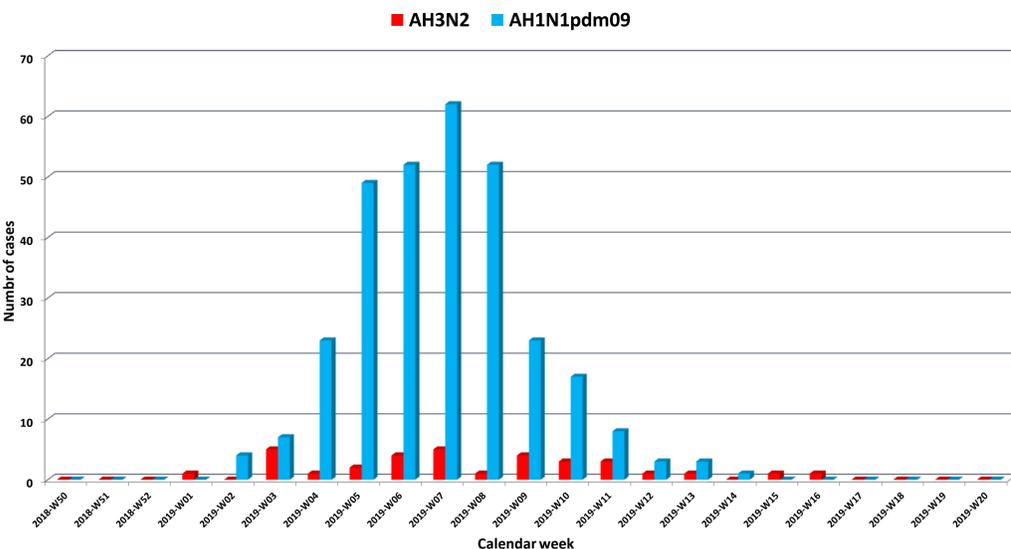


Figure 2 : Influenza virus distribution by calendar week, influenza season 2018/19

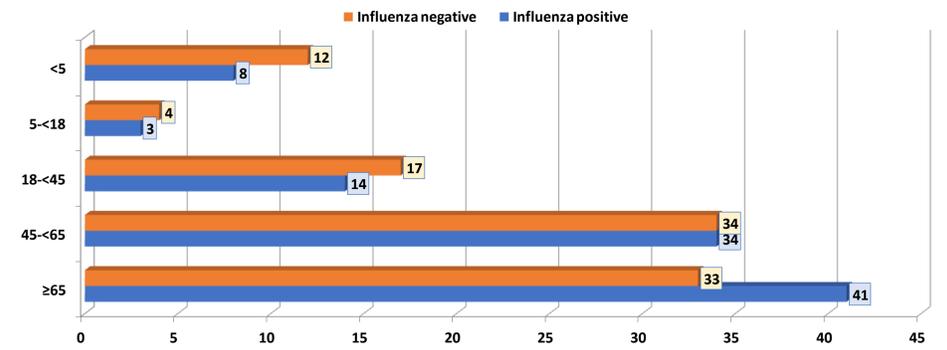


Figure 3 : Influenza virus distribution by age and influenza status

The age group ≥ 65 was dominant in both influenza positive and influenza negative patients (41 and 33%, respectively) (Figure 3). According to several surveillance systems, the 2018/19 influenza season was intense as reflected by high influenza disease burden. Portion of ICU admitted, mechanically ventilated, death rate and severity score among included patients are in favour of this conclusion (Table 1, Figures 4 and 5).

Table 1 : Patients distribution by severity and testing results

	Included patients (n)	Total n(%)	Influenza negative n (%)	Influenza positive n (%)	Respiratory virus infections n (%)
ICU admission	756	269 (35,6)	151(56,1)	107 (39,8)	11(4,1)
Mechanically ventilated	756	159 (21,0)	88(55,3)	65(40,9)	6(3,8)
Death outcome	756	76 (10,0)	40(52,6)	34(44,8)	2(2,6)

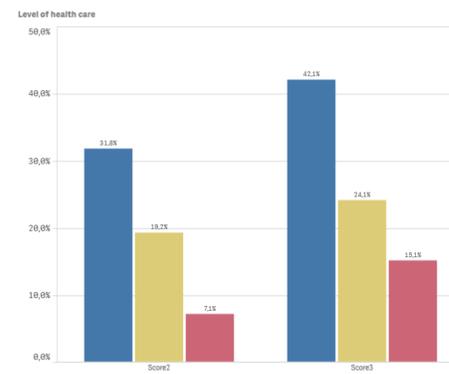


Figure 4. Severity score among all included patients (n=756)

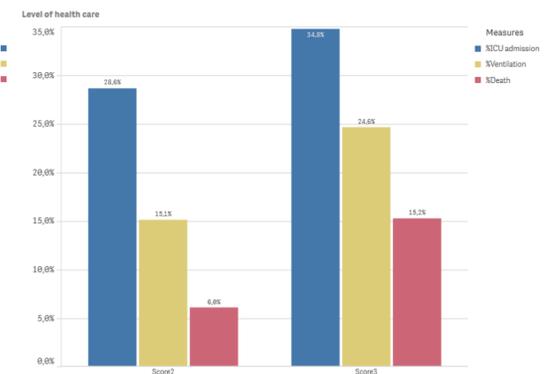


Figure 5. Severity score among influenza positive patients (n=337)

Key aspects & challenges

- Key aspects:** Influenza season sharply started in the first week of January and lasted until third week of April 2019. Influenza virus type A H1N1^{pdm09} was dominant virus strain followed by AH3N2. Influenza virus type B was not detected among included patients. Other respiratory viruses were confirmed in small portion (8%) of all influenza negative patients.
- Influenza-associated deaths (n=34), ICU admissions (16,7-45,2%) and applied mechanical ventilation (3,9-25,9%) varied according to the age of patients but were mainly registered in patients aged ≥65 years and with co-morbidities. The portion of patients with chronic conditions was high in both influenza positive and negative patients (83 and 84%, respectively).
- Most of the influenza disease burden and hospitalizations were recorded in patients aged between 65 and 80 years. Cardiovascular and chronic obstructive pulmonary disease (COPD) were leading co-morbidities in adults regardless of their influenza status (COPD and asthma in children) and only obesity was more frequently registered among adult influenza positives.
- A negligible share of included patients (2,2%) was vaccinated (2,7% of influenza positive patients and 1,9% of influenza negative patients). Influenza vaccine effectiveness was not assessed due to low national influenza vaccine coverage (3-4%) in general and unavailability of vaccination records for the majority of hospitalized patients.
- Conclusion:** Community-acquired influenza largely contributed to the high influenza disease burden in hospitalized patients especially in elderly with co-morbidities. The number of included and tested patients was higher compared to the previous influenza season, providing better understanding of the influenza disease epidemiology in Vojvodina, Serbia. **Challenges:** Improved availability of vaccine records for all hospitalized patients, an increase in the number of screened patients along with the higher influenza vaccine coverage would allow a influenza vaccine effectiveness study in the future.