Global Influenza Hospital Surveillance Network

National Institute for Infectious Diseases "Prof. Dr. Matei Balș", Bucharest, Romania

GIHSN prospective epidemiological active surveillance study in Romania 2016-2017

NATIONAL INSTITUTE OF INFECTIOUS DISEASES "Prof. Dr. MATEI BALȘ"

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Site presentation

The site was a national reference center for infectious diseases. Patients were selected for inclusion in the study if they met the criteria for >24 hours hospital admission. The catchment area was the Bucharest-Ilfov region (the population of this geographical area is estimated to be 2.245.049 people). We present the data for the influenza season 2016-17 in the studied area corresponding to the GIHSN site in Romania: weeks 1-17 2017.

Methods

Inclusion and exclusion criteria: as outlined in the GIHSN study protocol; patients <65 years were selected for participation, to avoid an I-MOVE overlap. **Study procedures**: informed consent, eligibility, medical questionnaire, nasopharyngeal + pharyngeal swab for adults (≥14 years), nasopharyngeal + nasal swab for children (<14 years). **Laboratory procedures**: RT-PCR Xpert Flu/RSV (Cepheid, Sunnyvale, CA) to establish the presence of influenza viruses A or B, followed by a second rRT-PCR analysis on the HA gene of influenza A strains (Allplex Respiratory panel 1 – Seegene, South Korea) for determination of H1, H1pdm or H3 subtypes, or, a second rRT-PCR analysis (SNP genotyping) of influenza B viruses for lineage determination (Yamagata or Victoria).

Results

We screened 902 patients during weeks 1-17 in 2017. Of these, 393 met the eligibility criteria (Figure 1) and were tested for the presence of influenza viruses type A and type B using RT-PCR. Overall, 44% of the tested samples were positive for influenza (n=173), with a predominance of B viruses (73%) this season (Fig. 2 A and B), although the general pattern of genotype distribution was in line with the previously observed initial preponderance of A viruses and their gradual replacement by the end of the influenza season by B viruses (Fig. 3). A co-infection influenza/RSV was detected in 8 cases, other respiratory viral etiologies were not tested due to financial constraints. A number of 113 (65.3%) of the positive samples from all study weeks were subtyped and the results showed that all tested influenza A samples belonged to subtype H3 (n=39) and all tested B samples belonged to B Victoria lineage (n=74) (Fig 4).

Among patients with ages below 5 years, one patient with confirmed influenza A H3N2 died, while 2 patients with influenza and 3 with RSV infection required intensive care; among patients aged 5 years and above, no deaths were recorded, and only one patient required intensive care.

Fig 1. Screening and eligibility data

Fig 2. A. Laboratory confirmed influenza (173/393 samples). B. Distribution of Influenza strains

Fig 3. Distribution of positive results by calendar week 2017
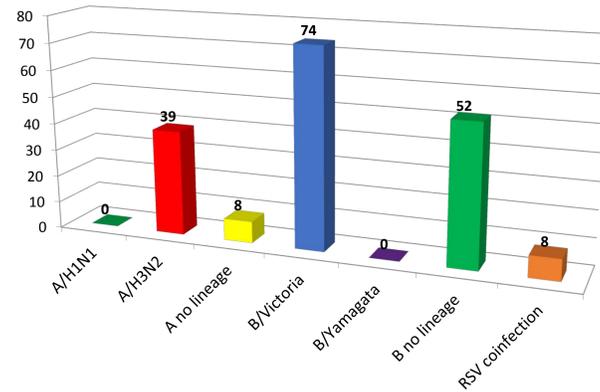

Fig 4. Laboratory results – influenza positive patients (n=173)
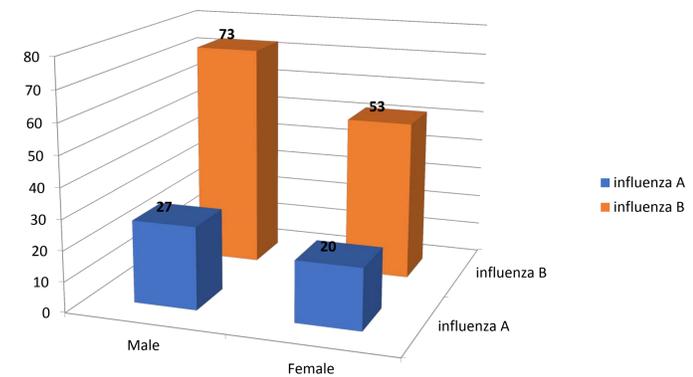

Fig 5. Gender distribution of influenza cases (p=0.212)
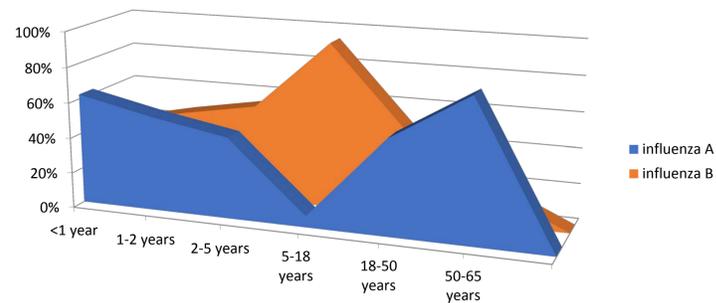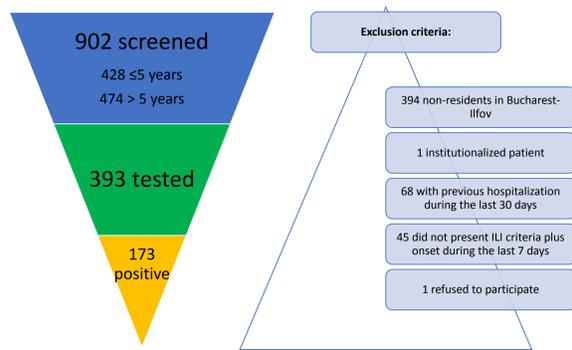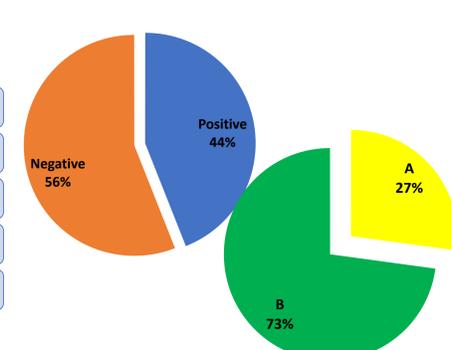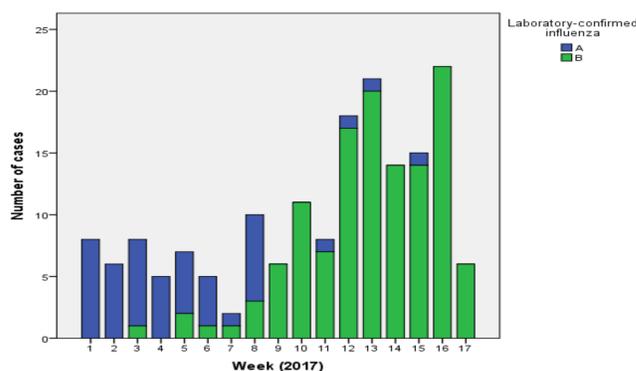

Fig 6. Laboratory confirmed influenza – distribution by age group

The two circulating strains identified in 2017 were B/Victoria, and A/H3N2, with an even distribution between genders (Fig 5). Patients in the 5-18 years old age group had 22-fold higher odds of having influenza B rather than A (P<0.001, phi=0.6, OR=22, CI95%: 6.5-74.4) – Fig 6.

Key aspects & challenges

This study has provided important information on the characteristics of the influenza season 2016-17 in patients requiring hospitalization for influenza, namely the increased circulation of B strains in the studied area, particularly in the 5-18 years category. Through the contribution of the National Institute for Infectious Diseases "Prof. Dr. Matei Balș", Bucharest, Romania, we were able to increase the number of patients screened and tested, and to exceed the target of 100 positive subjects initially planned for Romania during this influenza season. Among other important issues, this study has also drawn attention to the burden of mixed viral infections such as influenza and RSV, which can lead to higher morbidity particularly in children and the elderly. Of the 8 identified cases, 4 occurred in children below 4 years of age, with negative history of influenza vaccination. We also identified 8 cases of hospitalized influenza-like illness during pregnancy. Among these, one patient was confirmed with influenza A, one with influenza B, two with RSV infection, and the rest were negative for the tested viruses. Importantly, despite the fact that the peak influenza season in Romania was recorded during weeks 1-17 2017 (end of April), we also noticed continued influenza activity throughout late May and early June, albeit at low intensity. Continued surveillance of influenza and potentially other respiratory viruses is necessary to inform local and regional policies.

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