

Hospitalizations with influenza during the 2013–2014 Northern Hemisphere influenza season: Preliminary results from the Global Influenza Hospital Surveillance Network

Joan Puig-Barberà^a, Anita Tormos^a, Svetlana Trushakova^b, Anna Somnina^c, Maria Pisareva^c, Meral A. Ciblak^d, Selim Badur^d, Hongie Yu^e, Benjamin J. Cowling^f, Elena Burtseva^b, on behalf The GIHSN Group

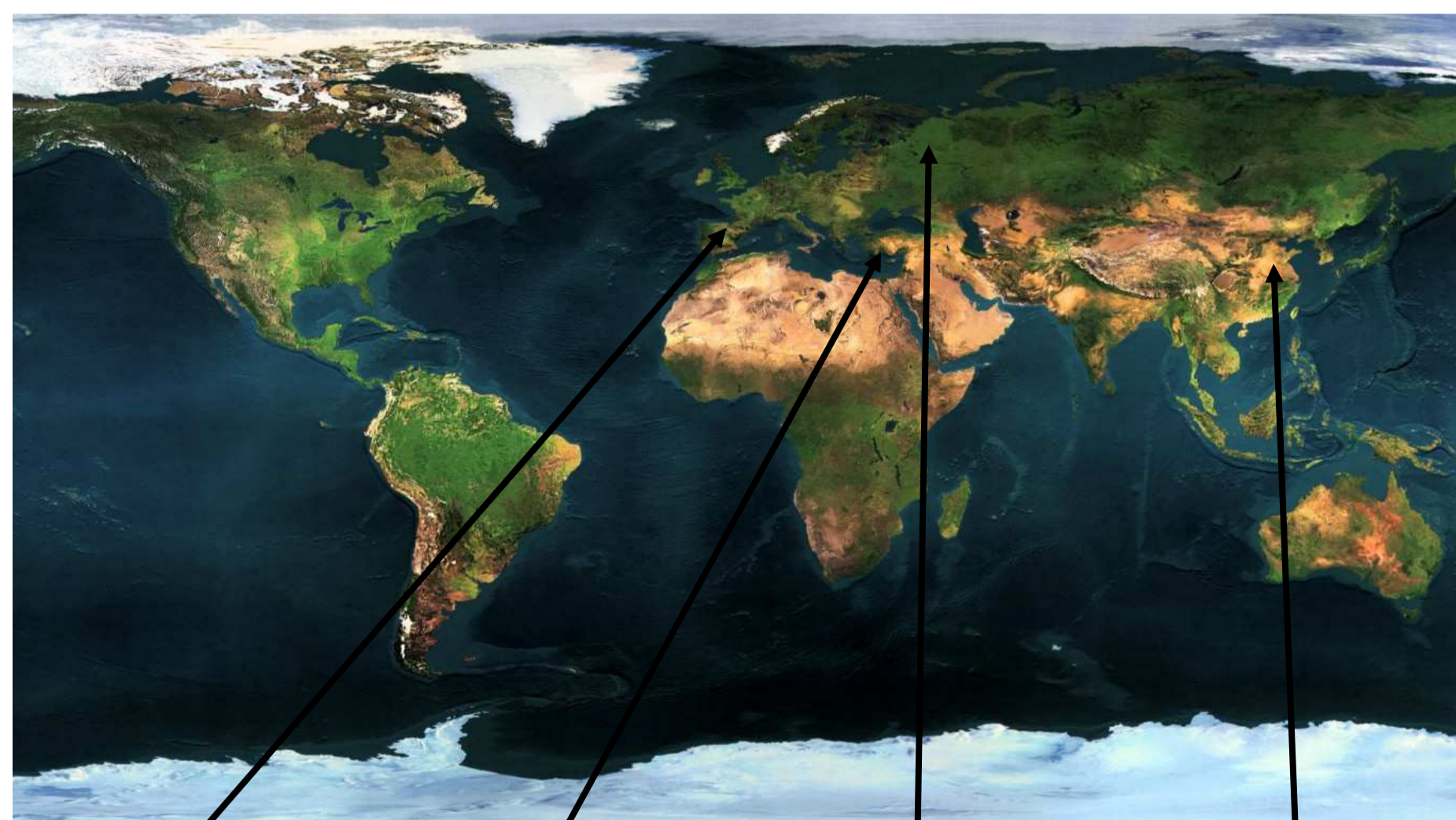
^a Fundación para el Fomento de la Investigación Sanitaria y Biomédica de la Comunidad Valenciana (FISABIO), Valencia, Spain. ^b D.I. Ivanovsky Institute of Virology, Moscow, Russian Federation. ^c Research Institute of Influenza, St. Petersburg, Russian Federation. ^d National Influenza Reference Laboratory Capa-Istanbul, Istanbul, Turkey. ^e Key Laboratory of Surveillance and Early-warning on Infectious Disease, Division of Infectious Disease, Chinese Center for Disease Control and Prevention, Beijing, China. ^f School of Public Health, Li Ka Shing Faculty of Medicine, University of Hong Kong, Hong Kong Special Administrative Region, China.

Introduction

The Global Influenza Hospital Surveillance Network (GIHSN) launched in 2012 to address growing awareness that influenza-related hospitalization is a significant burden that remains insufficiently characterised. The GIHSN is a partnership between industry and public health institutions that use active surveillance and a common core protocol to collect data on the epidemiology of severe influenza. Here we present preliminary results for the 2013–2014 Northern Hemisphere influenza season.

Methods

This was a multi-centre, prospective, active-surveillance, hospital-based epidemiological observational study during the main 2013–2014 influenza season in 19 hospitals of the Northern Hemisphere



- 6 Hospitals in Spain. 2 in Valencia, 2 in Castellón, 2 in Alicante
- 7 Hospitals in Turkey. 4 in Istanbul, 2 in Ankara, 1 in Bursa
- 4 Hospitals in the Russian Federation. 1 in Moscow, 3 in St. Petersburg
- 2 Hospitals in China. 2 in Beijing

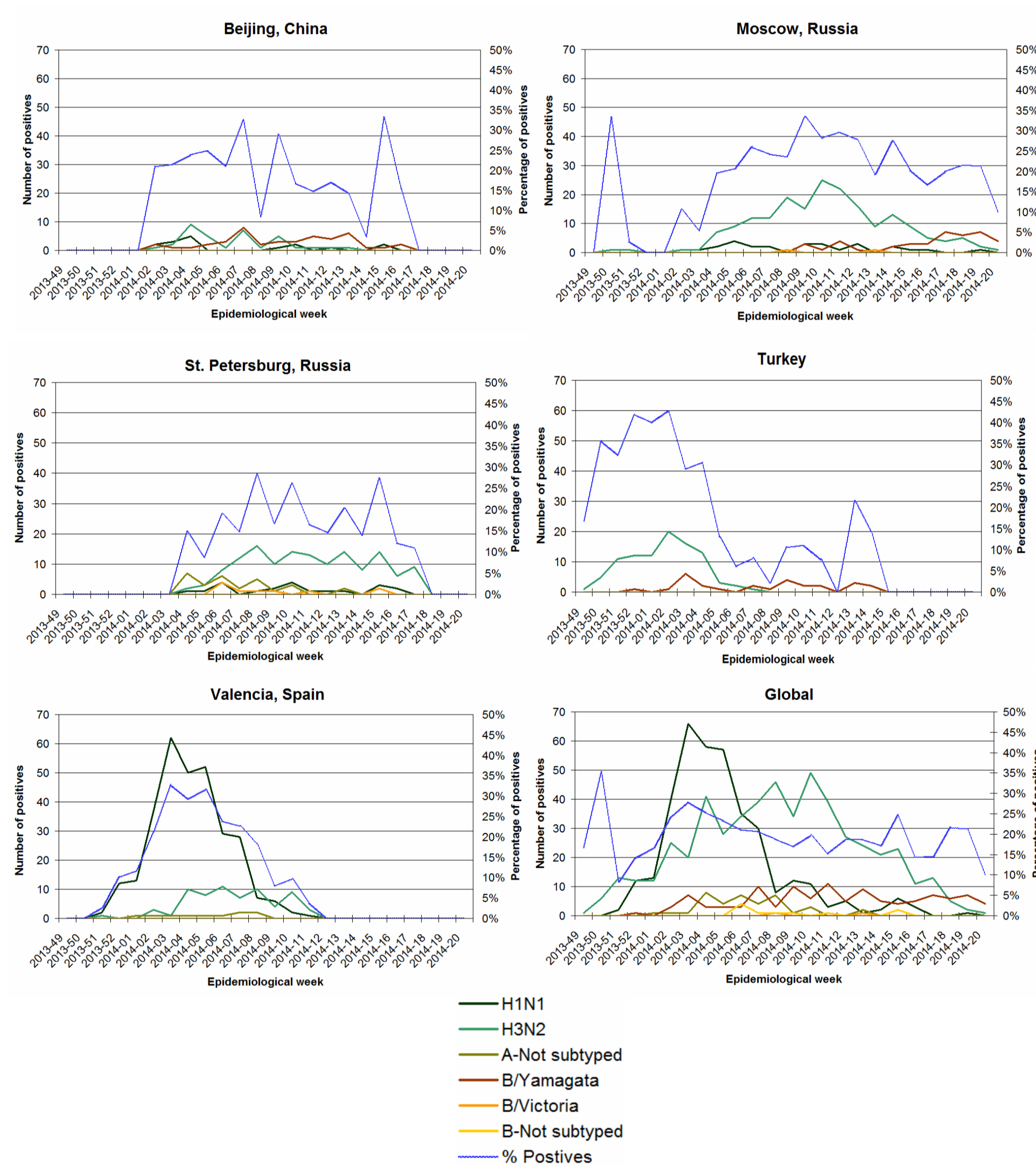
Hospitalized patients of all ages presenting influenza like-illness (ILI) within 7 days between onset of symptoms and admission were swabbed. Positives for influenza were real time reverse transcription polymerase chain reaction (RT-PCR) positive for influenza A(H3N2), A(H1N1)pdm09, or influenza B.

Results

Of 8233 patients screened, 5297 had valid RT-PCR and 1044 (20%) were positive for influenza. Influenza A(H3N2) type (n = 526, 50%) was the most common, followed by A(H1N1)pdm09 (n = 365, 35%) and influenza B/Yamagata lineage (n = 111, 11%).

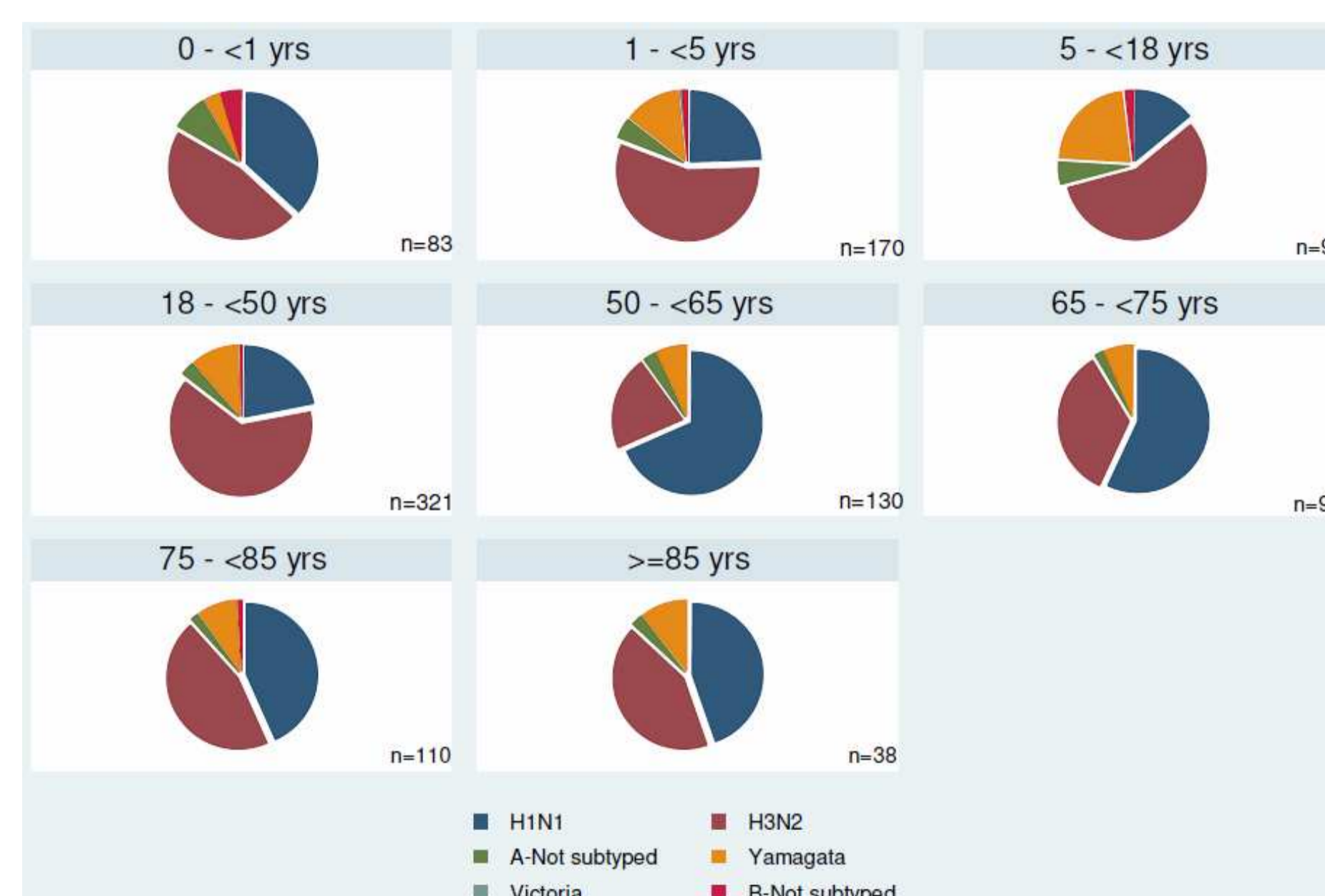
For the GIHSN sites of the northern hemisphere, the influenza season started in December with an early peak of A(H1N1)pdm09 from wk3 to wk5, and second peak of A(H3N2) from wk8 to wk10.

Figure 1: Number of influenza positives by epidemiological week, by site and globally



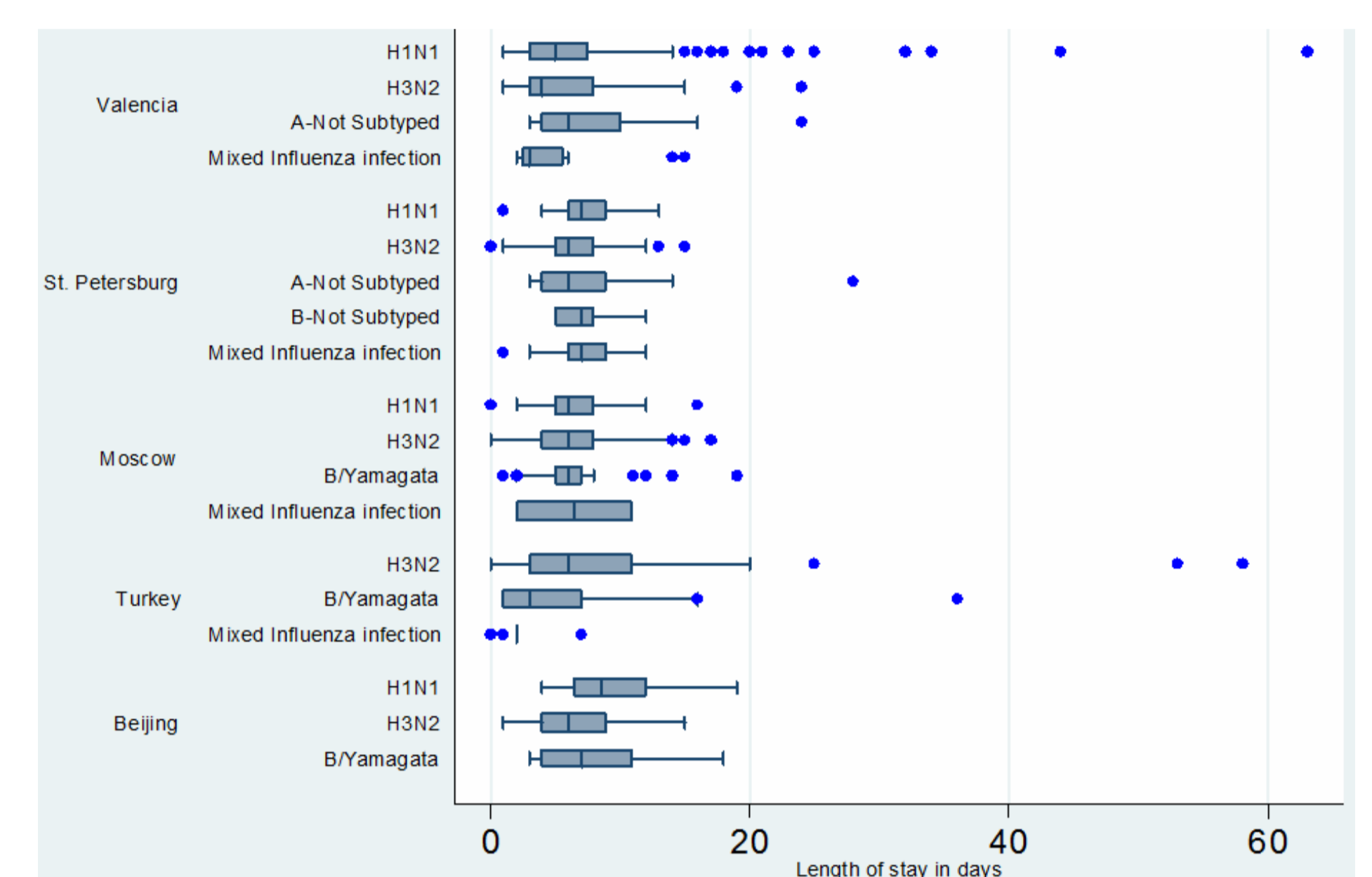
Hospitalizations due to A(H3N2) were most common in Moscow, St. Petersburg and Turkey in ages between 18 and 50 years old.

Figure 2: The distribution of influenza viruses in hospitalized patients by age group in years.



The influenza A(H3N2) strain caused a mean length of stay at the hospital of 6.34 days [95%CI: 5.92 – 6.77].

Figure 3: Length of hospital stay by coordinating site and influenza strain. Boxes indicate interquartile ranges, bars indicate the upper and lower adjacent values, and points indicate outliers.



Being pregnant (adjusted RR 3.3) and the presence of comorbidities (RR 1.7 for 1 and 1.4 for 2 or more) were significant risk factors for admission with influenza. Vaccination was associated with a 30% (12% to 44%) reduction in risk of admission with influenza among those vaccinated.

Table: Multivariable regression of estimated relative risk ratios of being positive for influenza among patients hospitalized with a possible influenza infection.

	Positive for influenza N = 1044	Negative for influenza N = 4253	Estimated RR	95% CI	P-value
Age					
<18 y	350	1968	1		
18–64 y	451	1232	1.53	1.27–1.84	<0.001
≥65 y	241	1036	1.18	0.92–1.51	0.204
Sex					
Male	520	2402	1		
Female	524	1847	1.05	0.90–1.22	0.556
Pregnant	145	162	3.27	2.47–4.33	<0.001
Number of comorbidities					
0	579	2620	1		
1	263	784	1.68	1.38–2.04	<0.001
≥2	171	725	1.32	1.03–1.68	0.029
Vaccinated 2013–2014					
No	910	3563	1		
Yes	134	690	0.70	0.56–0.88	0.003

Missing values were excluded from the analysis. CI, confidence interval; RR, relative risk

Conclusions

Given the virus and vaccine features, it is relevant that geographic representative information on influenza epidemiology, burden of disease and vaccine performance is an on-going monitoring activity performed across consecutive seasons. The preliminary data obtained in the second GIHSN season gives a global overview of the 2013-2014 influenza season in the Northern Hemisphere.