

# Pilot estimates of admission rates with confirmed influenza in the Global Influenza Hospital Surveillance Network (GIHSN) sites, 2014-2015 influenza season, in regions with known or unknown denominators

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## Background

The Global Influenza Hospital Surveillance Network (GIHSN) was established in 2012 to generate epidemiologic data on influenza admissions. A common protocol is currently being used in 32 hospitals in the Russian Federation, Czech Republic, France, Turkey, China, India, Valencia, Mexico and Brazil.

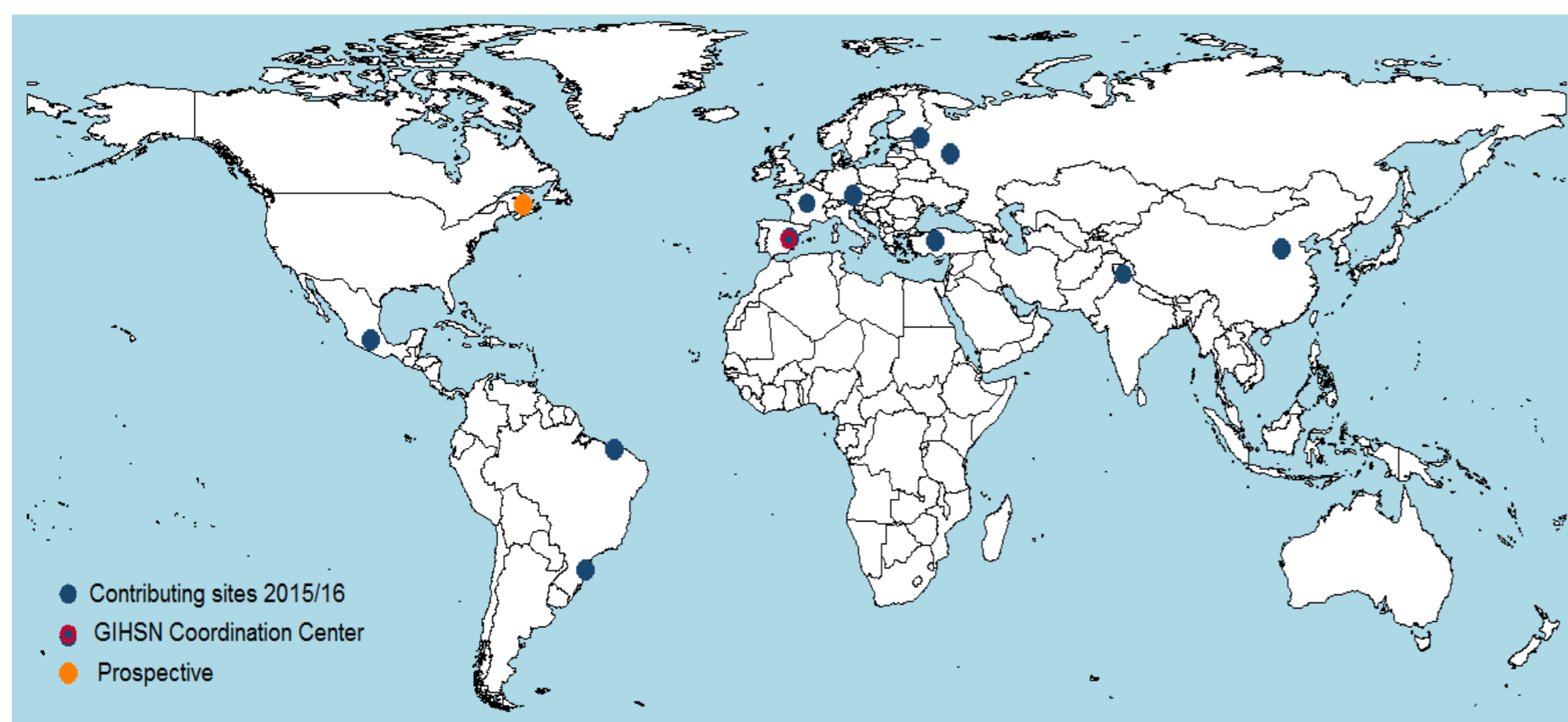


Figure 1: Map of the GIHSN contributing sites in 2015/16 season.

GIHSN goal to measure the incidence of severe disease related to influenza has proved difficult due to lack of denominators, because patients can go to any hospital, only specific wards in a participating hospital are involved or participating hospitals are reference centers for big regions.

The GIHSN has set-up in 2015/16 a pilot activity to evaluate the feasibility and reliability of estimating in the GIHSN sites the incidence of admissions with influenza following the recommendations recently issued by WHO.

## Methods

We requested all participating sites to define a "residence area". Only admissions in patients residing for the last six months in this area were considered for inclusion.

In Valencia, a well-defined denominator by hospital was available and cumulative incidence rates of admissions with influenza per 100,000 by age-group were estimated for the 2014/15 season. For sites as Moscow or St. Petersburg, with an unknown denominator, each city was defined as the residence area, whereas, in Ankara, it was decided to be all Turkey. We estimated a most plausible site-denominator obtaining the population by age group for the residence area and multiplying the number of subjects in each age-group by the fraction of admissions due to ARI/ILI (in St. Petersburg) or pneumonia (in Moscow) in the participating hospitals over the total of ARI/ILI or pneumonia admissions in the residence area.

## Results

The information obtained from the sites is shown in Table 1 and the overall incidence rates are shown in Table 1 and Figure 2.

Site/parameter	Age group								Total
	0 to <1 yrs	1 to <5 yrs	5 to <18 yrs	18 to <50 yrs	50 to <65 yrs	65 to <75 yrs	75 to <85 yrs	85 yrs or more	
St Petersburg	289817	389153	3705656	807064					5191690
ILI and ARI hosp	3761	304	608	74					2767
ILI and ARI area	6806	2059	3105	381					12351
% ILI and ARI	26.17%	14.76%	19.58%	19.42%					22.40%
Numerators (flu cases)*	291	97	184	30					602
Denominators	75,840	57,456	725,616	156,753					1,015,665
Rates of influenza positive admissions	383.70	168.82	25.36	19.14					59.27
Moscow	132306	443575	1239706	5888476	2543172	964063	832598		12043896
Population of the catchment area	53	292	267	412	129	51	73		1276
Pneumonia hosp	374	1196	892	4128	2494	1525	2882		13491
Pneumonia area	14,17%	24.37%	29.88%	9.98%	5.17%	3.32%	2.54%		9.46%
Numerators (flu cases)*	16	78	85	218	22	6	10		435
Denominators	18,749	108,112	370,383	587,706	131,543	32,030	21,186		1,269,710
Rates of influenza positive admissions	85.34	72.15	22.95	37.09	16.72	18.73	47.20		34.26
Turkey	1,276,303	5,105,213	16,456,004	37,985,748	11,422,546	3,982,569	1,994,234	518,436	78,741,053
Population of the catchment area	83	159	149	212	275	284	310	147	1,619
Pneumonia hosp	16,498	46,101	22,079	34,723	47,850	55,569	64,454	26,560	313,834
Pneumonia area	0.50%	0.34%	0.67%	0.61%	0.57%	0.51%	0.48%	0.55%	0.52%
Numerators (flu cases)**	17	23	7	13	13	19	10		115
Denominators	6,421	17,608	111,053	231,921	65,647	20,354	9,592	2,869	465,464
Rates of influenza positive admissions	264.76	130.63	6.30	5.61	19.80	63.87	198.09	348.51	24.71
Valencia	18414	84138	294610	1088213	451687	214489	141240	58735	2351526
Population of the catchment area	28	30	9	34	71	149	238	178	737
Numerators (flu cases)*	152.06	35.66	3.05	3.12	15.72	69.47	168.51	303.06	31.34
Rates of influenza positive admissions									

\* Cases ascertained during the 2014/15 season  
\*\* Cases ascertained during the 2015/16 season, preliminary data after end of field work activities

Table 1: Source population and overall and by age-group cumulative incidence rates of admissions with influenza-positive admission per 100,000.

Cumulative incidence rates by age group are shown in the Table 1 and Figures 3 and 4. Admission rates by age group followed the expected age pattern with admission rates being higher at age extremes.

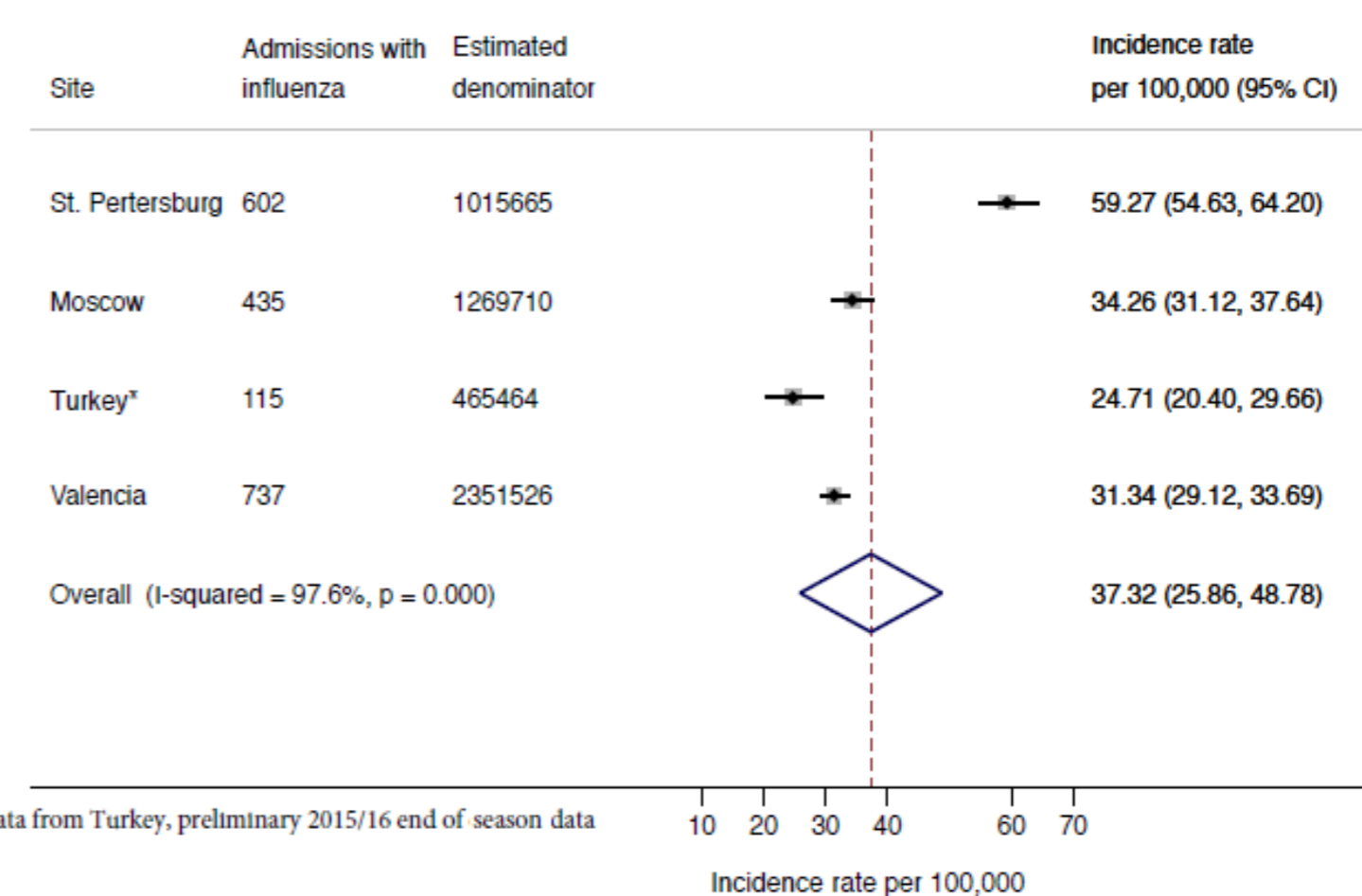
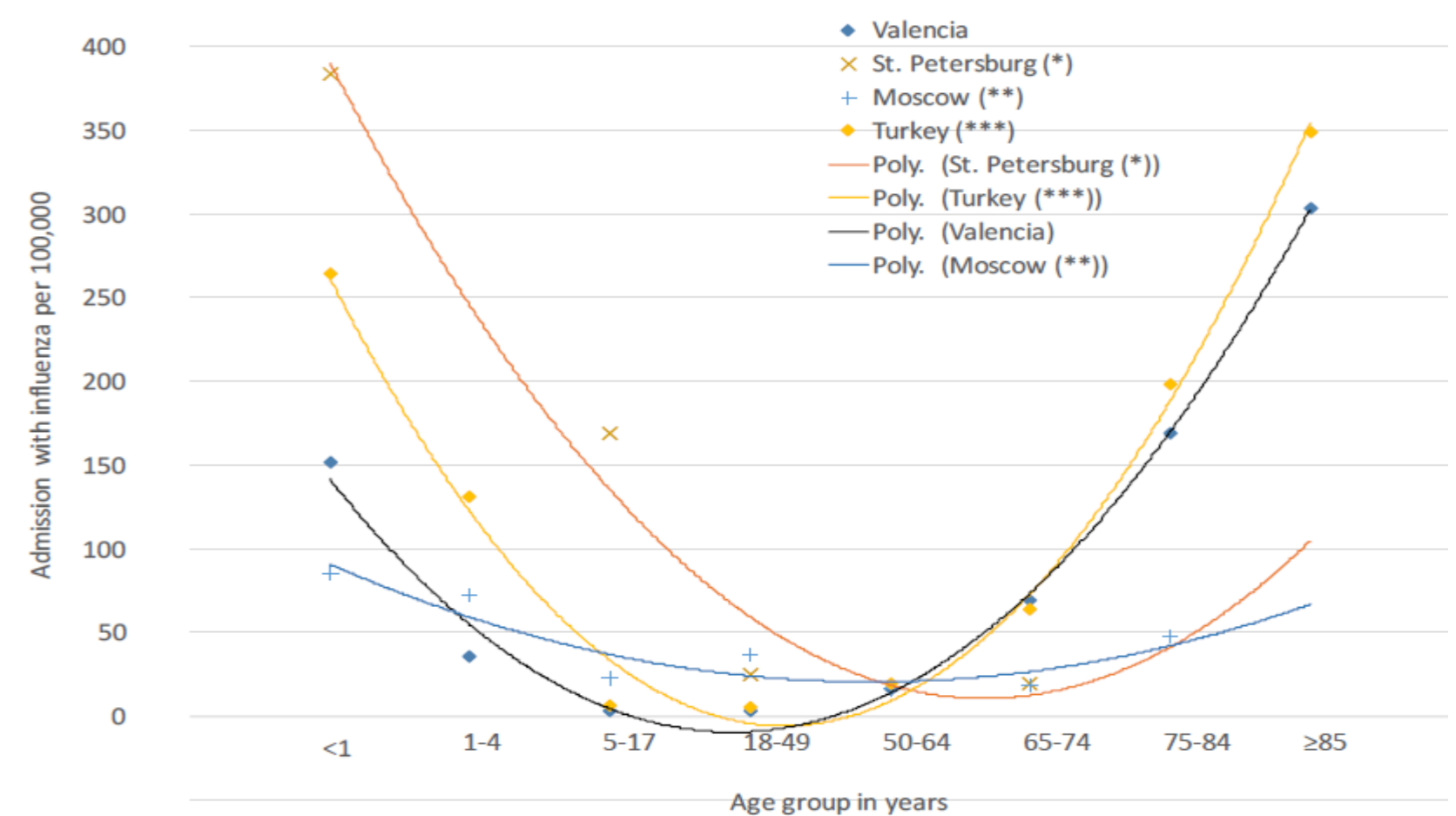
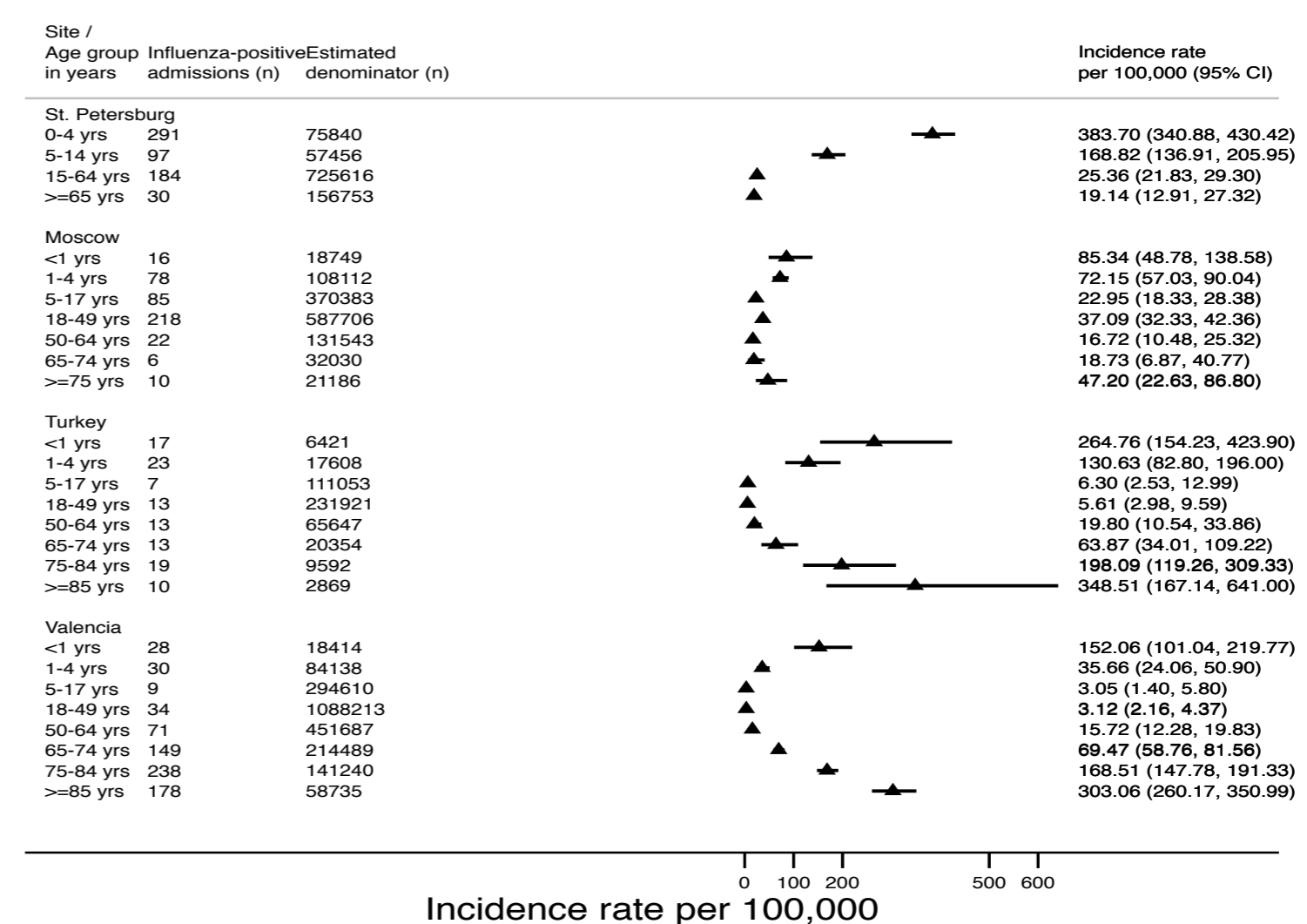


Figure 2: Overall cumulative incidence rates of influenza-positive admissions GIHSN sites, 2014/15.



(\*) Age groups for St. Petersburg: 0-4, 5-14, 15-64, 65+  
(\*\*) Age groups in Moscow: 0-0, 1-4, 5-17, 18-49, 50-64, 65-74, 75+  
(\*\*\*) Season 2015-2016 for Turkey

Figure 3: Pilot estimates of influenza cumulative incidence rates in 2014/15 season in GIHSN sites.



\* Data from Turkey, preliminary 2015/16 en of season data

Figure 4: Incidence rates of influenza-positive admissions GIHSN sites, 2014/15.

## Limitations

For the majority of GIHSN participating sites it was not possible to provide residence-area denominators, and when available by age-groups, the age group range was not homogenous.

## Conclusion

The application of the WHO approach standardizes for in-site differences in health care services involved in ascertaining admissions with influenza. Next step is to set-up mechanisms to obtain the basic information needed to estimate weighted denominators and to explain the heterogeneity inside and across sites.