

Year: 2018

Week: 6

Period: 05.02.2018-11.02.2018

**Influenza and ARI morbidity data**

Epidemiological data show increase of influenza and other ARI activity in Russia in comparison with previous week. The ILI & ARI incidence rate (77.5 per 10 000 of population) was above by 6.8% the new nationwide baseline (72.6) calculated by RII NIC for 2017-2018 season.

ILI and ARI epidemic thresholds were exceeded in 6 of 61 cities collaborating with two WHO NICs in Russia.



Exceeding of morbidity epidemic thresholds for overall population

- No data     
  - less 20%     
  - 20 - 49%     
  - 50% and more

**Cumulative number of diagnosed influenza cases**

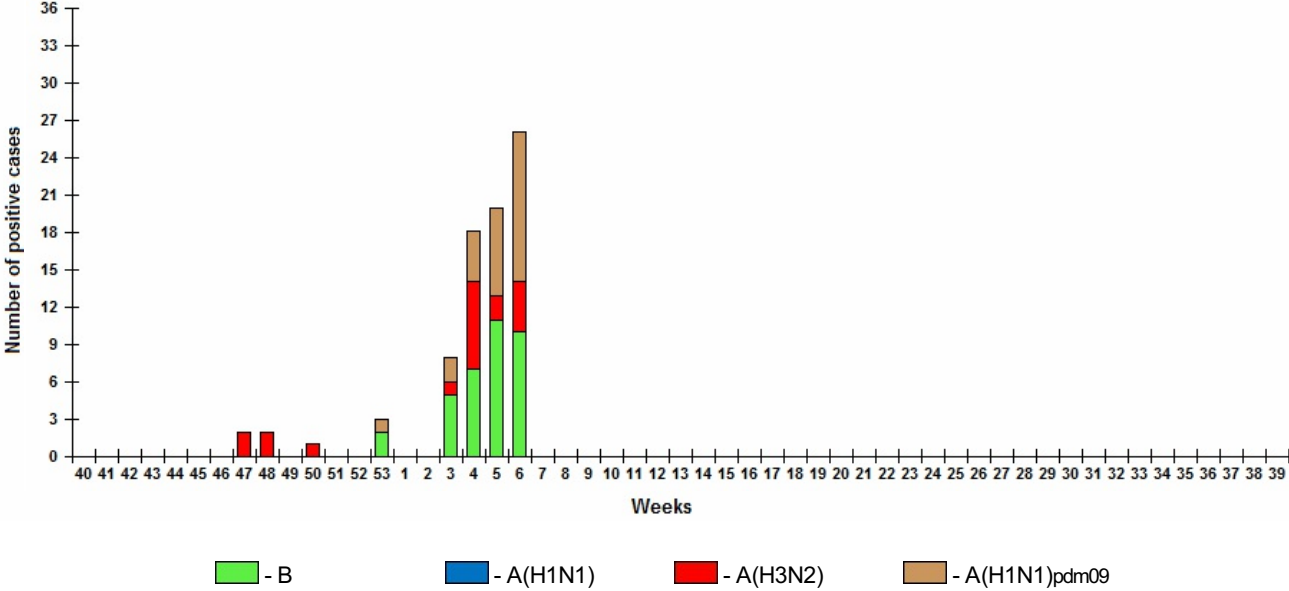
Cumulative results of influenza laboratory diagnosis by different tests were submitted by 52 RBLs and two WHO NICs. According to these data as a result of 2583 patients investigation the percent of samples positive for influenza was estimated as **10.0%**. Proportion of influenza A(H1N1)pdm09, A(H3N2) and B viruses was estimated as 29.0%, 35.1% and 35.5%, respectively.



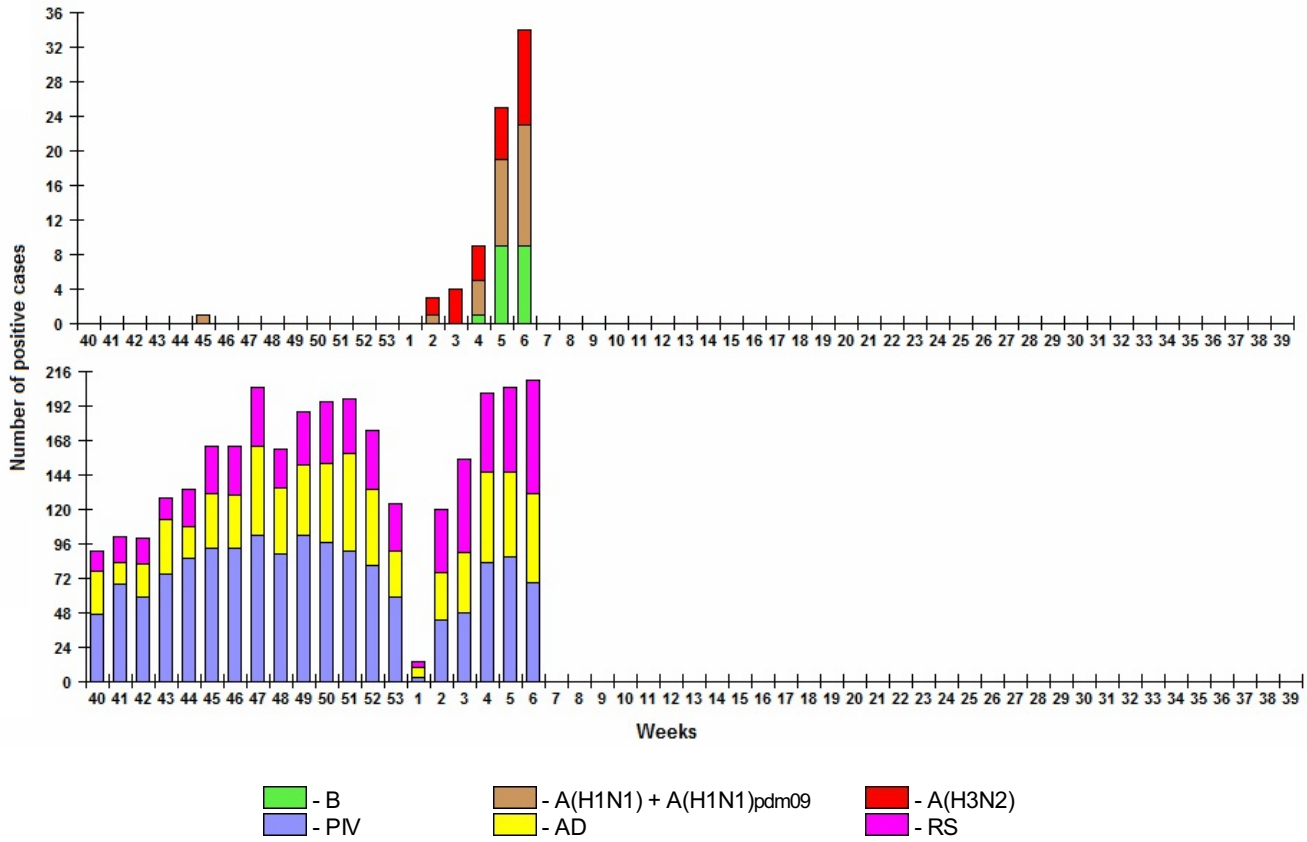
Results of influenza diagnosis

- |                  |                     |             |
|------------------|---------------------|-------------|
| ■ - No data      | ■ - H1pdm09+H3      | ■ - B+H1    |
| ■ - No detection | ■ - H1pdm09+H3+H1   | ■ - H3      |
| ■ - H1pdm09      | ■ - H1pdm09+H3+B    | ■ - H3+H1   |
| ■ - H1pdm09+H1   | ■ - H1pdm09+H3+H1+B | ■ - H3+B    |
| ■ - H1pdm09+B    | ■ - H1              | ■ - H3+H1+B |
| ■ - H1pdm09+B+H1 | ■ - B               |             |

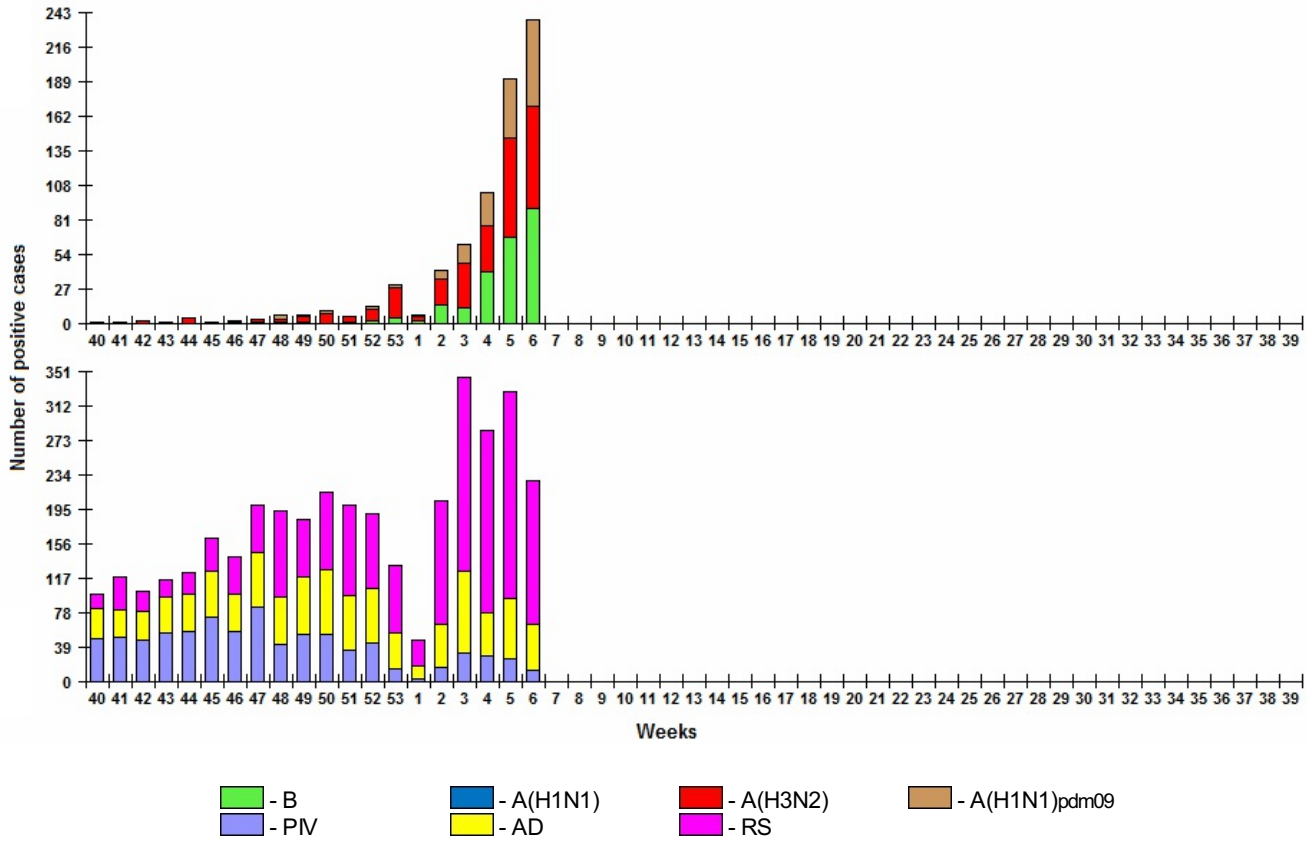
**Influenza Virus Isolation**



**Influenza Virus Antigen Detection by Immunofluorescence Assay (IFA)**



**Influenza Virus RNA Detection by RT-PCR**



**Table N1. Influenza Virus Isolation**

Base lab.	Number of investigated patients	Number of viruses isolated					
		H1	H3	B	H1pdm09	Untyped virus	Total
BL of RII	158	0	4	7	7	0	18
(%)		0,0	2,5	4,4	4,4	0,0	11,4
BL of IV	41	0	0	3	5	0	8
(%)		0,0	0,0	7,3	12,2	0,0	19,5
<b>TOTAL</b>	<b>199</b>	<b>0</b>	<b>4</b>	<b>10</b>	<b>12</b>	<b>0</b>	<b>26</b>
(%)		0,0	2,0	5,0	6,0	0,0	13,1

**Table N2. Influenza Virus Antigen Detection by Immunofluorescence assay (IFA)**

Base lab.	Number of investigated patients	Influenza			Parainfluenza			AD	RS	Total
		H1+H1pdm09	H3	B	I	II	III			
BL of RII	729	12	11	8	20	8	18	51	68	196
(%)		1,6	1,5	1,1	2,7	1,1	2,5	7,0	9,3	26,9
BL of IV	120	2	0	1	5	2	16	11	11	48
(%)		1,7	0,0	0,8	4,2	1,7	13,3	9,2	9,2	40,0
<b>TOTAL</b>	<b>849</b>	<b>14</b>	<b>11</b>	<b>9</b>	<b>25</b>	<b>10</b>	<b>34</b>	<b>62</b>	<b>79</b>	<b>244</b>
(%)		1,6	1,3	1,1	2,9	1,2	4,0	7,3	9,3	28,7

**Table N3. Influenza Virus RNA detection by RT-PCR**

Base lab.	Number of investigated patients	Influenza						PIV	AD	RS
		A (not subtyped)	H1	H3	H5	B	H1pdm09			
BL of RII	1818	3 / 1818	0 / 726	68 / 1428	0 / 715	66 / 1818	53 / 1250	11 / 1171	49 / 1195	150 / 1195
(%)		0,2	0,0	4,8	0,0	3,6	4,2	0,9	4,1	12,6
BL of IV	334	0 / 334	0 / 67	12 / 170	0 / 67	24 / 324	15 / 186	2 / 179	3 / 179	13 / 179
(%)		0,0	0,0	7,1	0,0	7,4	8,1	1,1	1,7	7,3
<b>TOTAL</b>	<b>2152</b>	<b>3 / 2152</b>	<b>0 / 793</b>	<b>80 / 1598</b>	<b>0 / 782</b>	<b>90 / 2142</b>	<b>68 / 1436</b>	<b>13 / 1350</b>	<b>52 / 1374</b>	<b>163 / 1374</b>
(%)		0,1	0,0	5,0	0,0	4,2	4,7	1,0	3,8	11,9

**Table N4. Cumulative Number of Diagnosed Influenza Cases**

Base lab.	Number of investigated patients	Number of diagnosed influenza cases						
		H1	H1+H1pdm09 (IFA)	H3	A (not subtyped)	B	H1pdm09	Total
BL of RII	2196	0	12	79	2	71	58	209
(%)		0,0	0,5	3,6	0,09	3,2	2,6	9,5
BL of IV	387	0	2	12	0	21	17	50
(%)		0,0	0,5	3,1	0,0	5,4	4,4	12,9
<b>TOTAL</b>	<b>2583</b>	<b>0</b>	<b>14</b>	<b>91</b>	<b>2</b>	<b>92</b>	<b>75</b>	<b>259</b>
(%)		0,0	0,5	3,5	0,08	3,6	2,9	10,0

## **Conclusion**

**Influenza and ARI morbidity data.** Increase of influenza and other ARI activity was registered during week 06.2018 in Russia. The ILI & ARI incidence rate (77.5 per 10 000 of population) was above by 6.8% the nationwide baseline.

**Etiology of ILI & ARI morbidity.** The overall percent of respiratory samples positive for influenza was estimated as **10.0%**. Proportion of influenza A(H1N1)pdm09, A(H3N2) and B viruses was estimated as 29.0%, 35.1% and 35.5%, respectively.

**Antigenic characterization.** 39 influenza viruses were characterized antigenically in two NICs, including 14 influenza A(H1N1)pdm09 viruses, 7 influenza A(H3N2) strains and 18 influenza type B strains. All influenza A(H1N1)pdm09 and A(H3N2) strains matched influenza vaccine strains for the season 2017-2018. 15 influenza type B strains of Yamagata lineage were like B/Phuket/3073/2013 reference virus, 3 influenza type B strains of Victoria lineage were antigenically related to B/Brisbane/60/2008 virus.

**Genetic characterization.** Full-genome NGS of 58 influenza positive samples and viruses from 6 cities was conducted. 16 influenza A(H1N1)pdm09 viruses belonged to phylogenetic group 6B.1 with amino acid substitutions in HA S84N, S162N and I216T. According to phylogenetic analysis of HA 18 of 22 tested influenza A(H3N2) viruses belonged to clade 3C.2a carrying aa substitutions L3I, N144S, F159Y, K160T, N225D and Q311H in HA1. Four influenza A(H3N2) viruses belonged to genetic subgroup 3C.2a1 and carried aa substitutions K92R, N121K, T135K and H311Q. 2 influenza B viruses of Victoria-lineage belonged to genetic subgroup 1A (B/Brisbane/60/2008-like). All 18 influenza B viruses of Yamagata-lineage belonged to clade 3 (B/Phuket/3073/2013-like) and had substitution L172Q and M251V in HA1.

**Susceptibility to antivirals.** Most viruses were susceptible to NA inhibitors excluding three influenza A(H1N1)pdm09 strains isolated in Moscow which had H275Y amino acid substitution in NA responsible for highly reduced susceptibility to oseltamivir and zanamivir. 14 influenza strains tested in MUNANA-assay for antiviral resistance to NA inhibitors in RII NIC, including 3 A(H1N1)pdm09 strains isolated in St.Petersburg, 4 A(H3N2), two B Victoria strains and 5 B Yamagata viruses were susceptible to oseltamivir and zanamivir. All influenza A strains tested were resistant to rimantadine.

Percent of positive ARI cases of non-influenza etiology (PIV, adeno- and RSV) was estimated as **24.7%** of investigated patients by IFA and **16.7%** by PCR. Last weeks RSV dominated among ARI agents.

In sentinel surveillance system clinical samples from 164 SARI and ILI/ARI patients were investigated by rRT-PCR. 10 (**12.5%**) influenza cases were detected among SARI patients, including 1 influenza A(H1N1)pdm09 case, 5 influenza A(H3N2) cases and 4 influenza B cases. Among ILI/ARI patients 28 (**33.3%**) influenza cases were detected, including 4 influenza A(H1N1)pdm09 cases, 14 influenza A(H3N2) cases and 10 influenza B cases.

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