GIHSN-site’s experience  
&  
Results of season 2015-2016  

Moscow, Russia  

D.I. Ivanovsky Institute of Virology, FSBI “N.F. Gamaleya FRCEM” 
Ministry of Health of Russian Federation  
Hospital #1 for Infectious Diseases  

elena-burtseva@yandex.ru  
s.trushakova@gmail.com
Participants

Hospital #1 for infectious diseases

Sending swabs

Swabbing

Treatment

The National Influenza Center in Russia (NIC, Moscow)

D.I. Ivanovsky Institute of Virology, FSBI “N.F. Gamaleya FRCEM” Ministry of Health of Russian Federation

Laboratory of influenza etiology and epidemiology

- PCR diagnostic
- Virus isolation
- Sera diagnostic
- Completion GIHSN excel file

<table>
<thead>
<tr>
<th>Total number of beds 706 (17 wards)</th>
<th>Adults 485</th>
<th>Children 221</th>
<th>Obstetric 69</th>
<th>ICU 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in GIHSN</td>
<td>314 (6 wards for ARVI)</td>
<td>120</td>
<td>53 (0-3) 60 (3-14)</td>
<td>69 12</td>
</tr>
</tbody>
</table>

Site experience and results of season 2015-2016 – [Moscow], [Russia]
**Catchment area - Moscow**

Population which hospital covers – Moscow citizens and visitors

**Population of Moscow**
12 197 596 (2015) + guests...

**Age range**
- 0-2 y.o: 291 616 (2,5%)
- 3-6 y.o: 389 870 (3,4%)
- 7-14 y.o: 712 511 (6,1%)
- 15-64 y.o: 8 562 633 (74,0%)
- > 65 y.o: 1 620 391 (14%)

<table>
<thead>
<tr>
<th>District</th>
<th>% admission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6,4%</td>
</tr>
<tr>
<td>2</td>
<td>12,5%</td>
</tr>
<tr>
<td>3</td>
<td>11,5%</td>
</tr>
<tr>
<td>4</td>
<td>6,5%</td>
</tr>
<tr>
<td>5</td>
<td>14,6%</td>
</tr>
<tr>
<td>6</td>
<td>11,0%</td>
</tr>
<tr>
<td>7</td>
<td>11,9%</td>
</tr>
<tr>
<td>8</td>
<td>10,9%</td>
</tr>
<tr>
<td>9</td>
<td>9,9%</td>
</tr>
<tr>
<td>10</td>
<td>0,7%</td>
</tr>
<tr>
<td>11</td>
<td>3,0%</td>
</tr>
<tr>
<td>12</td>
<td>0,1%</td>
</tr>
<tr>
<td>not Moscow</td>
<td>0,9%</td>
</tr>
<tr>
<td>Missing</td>
<td>0,2%</td>
</tr>
</tbody>
</table>

**Question 10a: District of residency?**
Results GIHSN 2015-2016

Screened: 2459
- Included: 1982 (81%)
- Excluded: 477 (19%)

Total: 1982

- Elderly 65+: 35
- Adults 15-64*: 519
- Pregnants: 643
- Children 0-4: 606
- Children 5-14: 179

Flu positive (RT-PCR): 698 (35%)

*except pregnant
### Excluded patients

<table>
<thead>
<tr>
<th>Reason for exclusion</th>
<th>Amount of patients 2015-2016 (477)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No consent</strong></td>
<td>26   5,5%</td>
</tr>
<tr>
<td><strong>Onset of ILI more than 7 days</strong></td>
<td>139  29,1%</td>
</tr>
<tr>
<td><strong>Institutionalized patients</strong></td>
<td>32   6,7%</td>
</tr>
<tr>
<td><strong>Absent of symptoms combination</strong></td>
<td>58   12,2%</td>
</tr>
<tr>
<td><strong>Hospitalized in the last previous 30 days</strong></td>
<td>34   7,1%</td>
</tr>
<tr>
<td><strong>Not a resident</strong></td>
<td>84   17,6%</td>
</tr>
<tr>
<td><strong>Not able to communicate</strong></td>
<td>112  23,5%</td>
</tr>
<tr>
<td>- language</td>
<td>11   2,3%</td>
</tr>
<tr>
<td>- <strong>discharged</strong></td>
<td>97   20,3%</td>
</tr>
<tr>
<td>- no proxy or tutor</td>
<td>1    0,2%</td>
</tr>
<tr>
<td>- other</td>
<td>3    0,6%</td>
</tr>
<tr>
<td>- neuronal damage</td>
<td>0    0%</td>
</tr>
</tbody>
</table>

Male – 266 (55,7%)
Female – 211 (44,2%)
**Admission 2015-2016**

**Start of the study period**
13 December 2015

**End of the study period**
01 June 2016

- **Screened**: 2459
- **Included**: 1982 (81%)
- **Excluded**: 477 (19%)

<table>
<thead>
<tr>
<th>Number of admitted patients</th>
<th>Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients 5+</td>
<td></td>
</tr>
<tr>
<td>Patients 0-4</td>
<td></td>
</tr>
<tr>
<td>Total positive</td>
<td></td>
</tr>
</tbody>
</table>

- **Week 1**: 33, 8
- **Week 2**: 46, 15
- **Week 3**: 20, 10
- **Week 4**: 40, 20
- **Week 5**: 53, 33
- **Week 6**: 31, 33
- **Week 7**: 36, 33
- **Week 8**: 10, 20
- **Week 9**: 24, 16
- **Week 10**: 26, 16
- **Week 11**: 22, 26
- **Week 12**: 19, 26
- **Week 13**: 24, 26
- **Week 14**: 19, 26
- **Week 15**: 24, 26
- **Week 16**: 24, 26
- **Week 17**: 24, 26
- **Week 18**: 24, 26
- **Week 19**: 19, 26
- **Week 20**: 19, 26
- **Week 21**: 19, 26
- **Week 22**: 19, 26

Site experience and results of season 2015-2016 – [Moscow], [Russia]
Influenza weekly results 2015-2016

Site experience and results of season 2015-2016 – [Moscow], [Russia]
Influenza distribution by groups of patients

<table>
<thead>
<tr>
<th>Group</th>
<th>N=159</th>
<th>N=78</th>
<th>N=160</th>
<th>N=15</th>
<th>N=286</th>
<th>N=698</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children 0-4</td>
<td>75.5%</td>
<td>66.7%</td>
<td>61.9%</td>
<td>66.7%</td>
<td>67.5%</td>
<td>67.9%</td>
</tr>
<tr>
<td>Children 5-14</td>
<td></td>
<td>28.2%</td>
<td>26.9%</td>
<td>20.0%</td>
<td>8.0%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Adults(15-64)*</td>
<td>2.5%</td>
<td>2.6%</td>
<td>8.8%</td>
<td>2.5%</td>
<td>8.8%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Elderly 65+</td>
<td>17.6%</td>
<td>28.2%</td>
<td></td>
<td>20.0%</td>
<td>22.4%</td>
<td>22.8%</td>
</tr>
<tr>
<td>Pregnants</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

- **A(H1N1)pdm09**
- **A(H3N2)**
- **B/Victoria**
- **A untyped**
- **B untyped**

N - number of influenza cases
*except pregnant*
Influenza and chronic conditions

Site experience and results of season 2015-2016 – [Moscow], [Russia]

Comorbidities – 14.4%

N- number of comorbidities
*except pregnant
Influenza and Pneumonia

Pneumonia – 11.7% of all patients

48.4% - bilateral pneumonia

N=232

N=48

N=19

N=117

N=15

N=33

N- number of pneumonia
*except pregnant patients

Site experience and results of season 2015-2016 – [Moscow], [Russia]
Influenza and Bronchitis

Bronchitis – 27% of all patients

N=534
N=135
N=41
N=180
N=14
N=164

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Total Children 0-4 Children 5-14 Adults(15-64) Elderly 65+ Pregnants

Bronchitis Bronchitis with influenza

N- number of bronchitis
*except pregnant
SARI cases

ICU – 0,6%
Mech.ven. – 0,5%
Death – 0,3%

All deaths – A(H1N1)pdm09

Site experience and results of season 2015-2016 – [Moscow], [Russia]
Vaccinated patients

Vaccination - 4.4% of all patients

<table>
<thead>
<tr>
<th>Group</th>
<th>Flu positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=7</td>
<td>57.2%</td>
<td>42.8%</td>
</tr>
<tr>
<td>N=13</td>
<td>76.9%</td>
<td>23.1%</td>
</tr>
<tr>
<td>N=61</td>
<td>82%</td>
<td>18%</td>
</tr>
<tr>
<td>N=4</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>N=4</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>N=88</td>
<td>76.1%</td>
<td>23.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group</th>
<th>Flu positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children 0-4</td>
<td>57.2%</td>
<td>42.8%</td>
</tr>
<tr>
<td>Children 5-14</td>
<td>76.9%</td>
<td>23.1%</td>
</tr>
<tr>
<td>Adults 15-64</td>
<td>82%</td>
<td>18%</td>
</tr>
<tr>
<td>Elderly 65+</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Pregnants</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Total</td>
<td>76.1%</td>
<td>23.9%</td>
</tr>
</tbody>
</table>

Strain                       | Vaccinated | Unvaccinated          |
------------------------------|------------|-----------------------|
A(H1N1)pdm09                 | 8/88 (9%)  | 466/1894 (24.6%)      |
A(H3N2)                      | 6/88 (6.8%)| 40/1894 (2.4%)        |
B/Victoria                   | 9/88 (10%) | 150/1894 (8.0%)       |
All cases                    | 21/88 (23.9%)| 677/1894 (35.7%)   |

Site experience and results of season 2015-2016 – [Moscow], [Russia]
### Specific antibodies (HI test) to influenza viruses in sera taking during hospitalization of patients with acute respiratory disease in 2015-2016

<table>
<thead>
<tr>
<th>Influenza viruses</th>
<th>Vaccinated (14)</th>
<th>Unvaccinated (89)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GMT±2m (lg)</td>
<td>≥1:40 (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A/California/07/2009 (H1N1)pdm09 – v*</td>
<td>6,3±1,4</td>
<td>71,0</td>
</tr>
<tr>
<td>A/IIV-Moscow/189/2015 (H1N1)pdm09</td>
<td>6,0±1,5</td>
<td>64,0</td>
</tr>
<tr>
<td>A/Switzerland/9715293/2015 (H3N2) - v</td>
<td>5,8±1,1</td>
<td>71,0</td>
</tr>
<tr>
<td>A/Hong Kong/5738/14 (H3N2)</td>
<td>6,7±1,1</td>
<td>86,0</td>
</tr>
<tr>
<td>B/Massachusetts/02/12 (Yam) - v</td>
<td>7,2±0,9</td>
<td>93,0</td>
</tr>
<tr>
<td>B/Phuket/3073/13 (Yam)</td>
<td>6,3±1,0</td>
<td>86,0</td>
</tr>
<tr>
<td>B/Brisbane/60/2008 (Vic)</td>
<td>5,5±1,1</td>
<td>64,0</td>
</tr>
</tbody>
</table>

**v* - vaccine strain**
Influenza in pregnant women

Site experience and results of season 2015-2016 – [Moscow], [Russia]
Key aspects from the season

• Sharp start of the influenza season in December and long-term period till June of 2016
• Dominant virus was A(H1N1)pdm09.
• Severe cases causing by influenza A(H1N1) resulting 6 deaths.
• Influenza B/Yamagata has changed to B/Victoria
• Mismatches between vaccine and epidemic strains of A(H3N2) and B viruses
• Efficacy vaccine to influenza A(H1N1)pdm09 virus infection
• There are differences in seroprotection between vaccinated and unvaccinated hospitalized patients
Strain specific of influenza in seasons

2014-2015
- A/H3N2: 37%
- B/Yam: 40%
- B nosubt: 12%
- A nosubt: 2%
- B/Vic: 2%
- A/H1N1pdm09: 7%

2015-2016
- A(H3N2): 7%
- A untyped: 1%
- B untyped: 1%
- B/Victoria: 23%
- A(H1N1): 68%

Site experience and results of season 2015-2016 – [Moscow], [Russia]
Weekly Influenza results for 4 seasons

Site experience and results of season 2015-2016 – [Moscow], [Russia]
Challenges

• Room for improvement?
  1) to improve gathering data on pregnant; possibly to make a separate questionnaire - Separate questionnaire has been done for pregnant. But data are not sufficient and results needed careful processing and good representativeness.
  2) to improve completion of questionnaires, especially for excluded patients.
  3) to improve completion and calculation of data and results to escape mistakes and confusion

• Perspectives
  1) Publication of results at conferences and journals
  2) study antigenic and genetic properties of influenza strains
  3) serological study of sera

• Strengths and weaknesses
  Strg: - Good number of patients
  - good percent of positive on influenza
  - many pregnant women
  Wkn: - Low number of vaccinated
  - Low number of elderly
  - No ARVI diagnostic, only in sporadic and severe cases

Site experience and results of season 2015-2016 – [Moscow], [Russia]
Thank you

Moscow team

Hospital #1 for infectious diseases

1. Ludmila Kolobukhina, professor, MD, ScD
2. Liliya Merkulova, MD, PhD (adults)
3. Raisa Vartanyan, MD, PhD (children 0-3)
4. Irina Kruzhkova, MD (children 3-14)
5. Lidiya Kisteneva MD, ScD (pregnants)

D.I. Ivanovsky Institute of Virology, FSBI “N.F. Gamaleya FRCEM” Ministry of Health of Russian Federation
Laboratory of influenza etiology and epidemiology

1. Elena Burtseva, MD, ScD
2. Svetlana Trushakova, PhD
3. Kirill Krasnoslobotsev
4. Evgeniya Mukasheva
5. Ekaterina Garina