

Influenza in Hospitalized Patients in 2012-2015, Moscow, Russia

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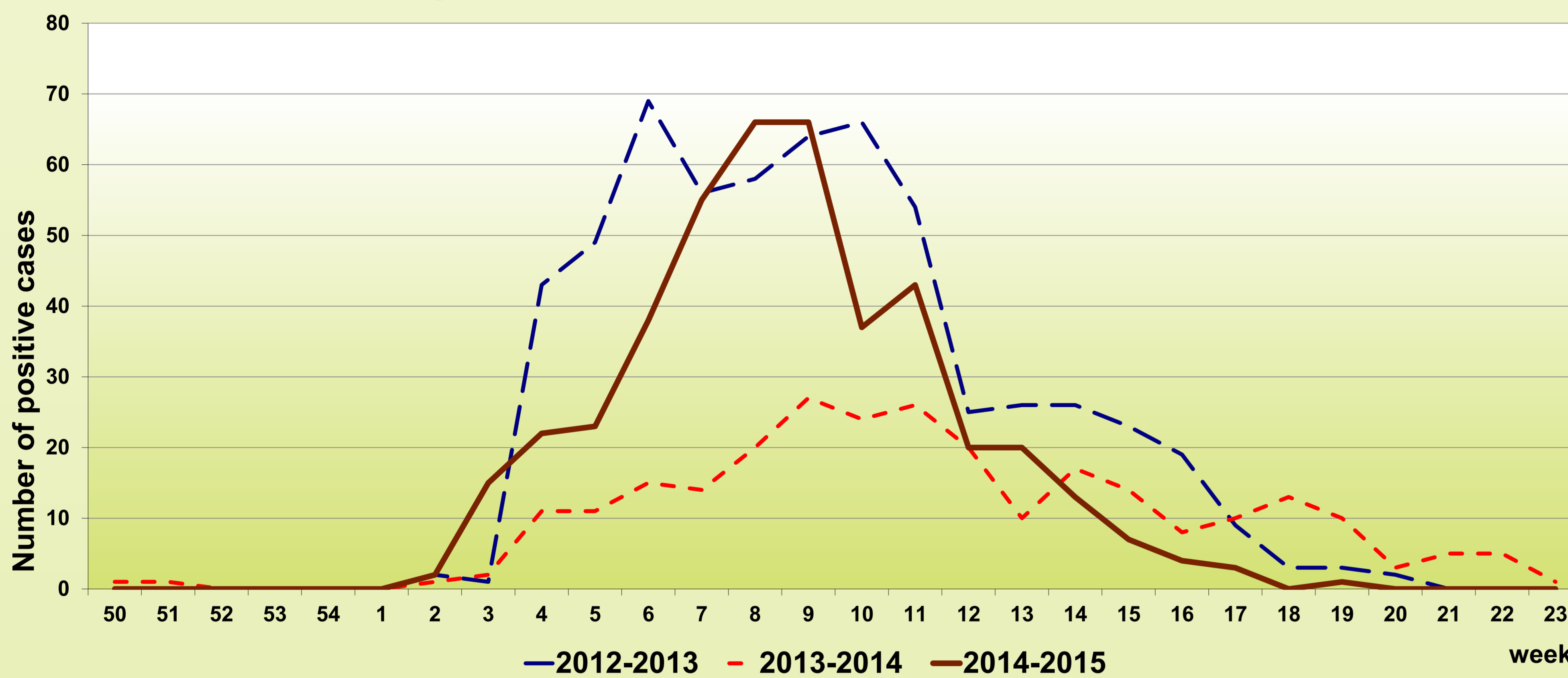
Introduction

The influenza A and B viruses, as known, circulate every year and can cause severe diseases. The Global Influenza Hospital Surveillance Network (GIHSN) is a network to address growing awareness to influenza-related hospitalization that remains insufficiently characterized. Based on the GIHSN protocol the influenza virus seasonal activity and severity has been studied in hospitalized patients in Moscow, Russia over 2012-2015.

Methods

Patients with influenza like-illness (ILI) were admitted to Hospital #1 for infectious diseases in Moscow. Hospitalized patients of all ages presenting with ILI within 7 days between the onset of symptoms and admission were swabbed. The information on health conditions was obtained by face to face interview and review of clinical records correspondingly to the GIHSN protocol. RT-PCR was applied to detect influenza A(H3N2), A(H1N1)pdm09 and B.

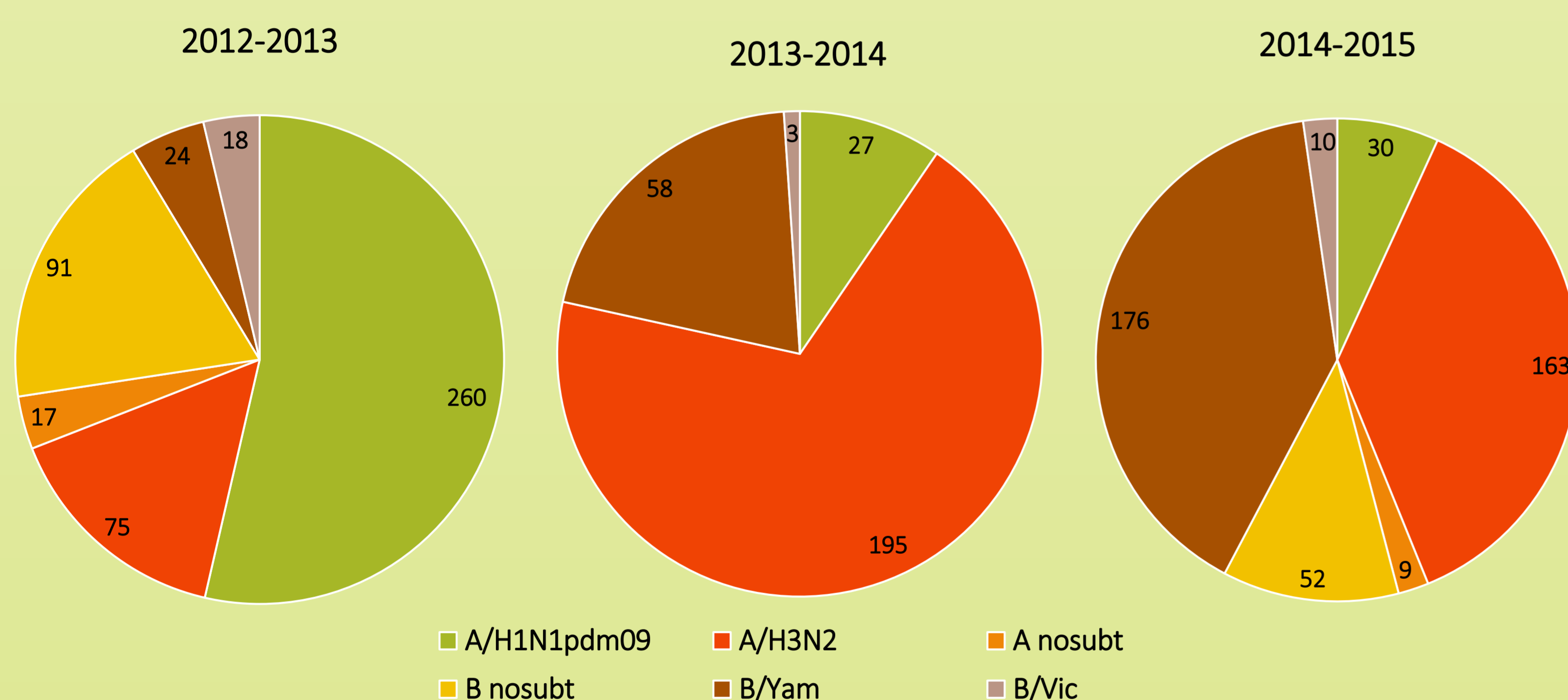
Weekly PCR results for influenza in 2012-2015



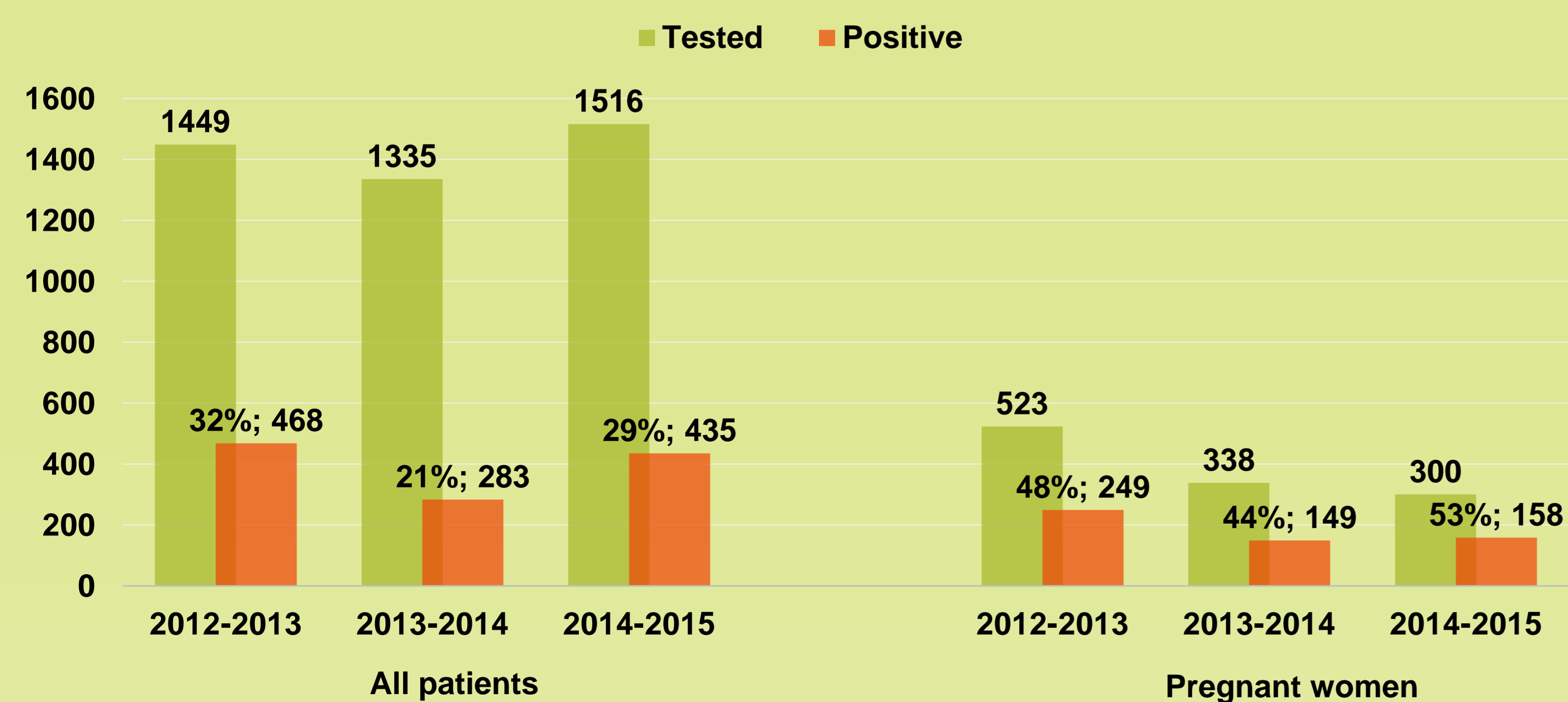
Results

During 2012-2015 influenza seasons 4300 hospitalized patients were tested for influenza infection: 1449 in 2012-2013, 1335 in 2013-2014 and 1516 in 2014-2015. There were 32%, 21% and 29% of specimens positive on influenza, accordingly. Influenza A(H1N1)pdm09 (18%) virus dominated in the etiology of influenza infection since January till March 2012-2013, followed A(H3N2) - 5% and B - 9% at the end of the season. In the previous season 2013-2014 influenza A(H3N2) virus was dominated and identified in 15% of investigated patients, A(H1N1)pdm09 - 2% and influenza B - 4%. Data of the 2014-2015 season have shown that the dominant virus is influenza B virus - 20%, influenza A(H1N1)pdm09 - 2%, influenza A(H3N2) - 15%. The peculiarity of the current season have been noted a high activity of influenza B virus over all epidemic period. Subtyping of influenza B revealed that the most of them belonged to B/Yamagata-lineage (96%) and only 4% belonged to B/Victoria-lineage in the all three seasons. There were many pregnant women among hospitalized patients: 523 - in 2012-2013, 338 - in 2013-2014, 300 - in 2014-2015. The most of them were positive for influenza 48%, 44% and 47%, accordingly.

PCR results for influenza viruses in each season 2012-2015



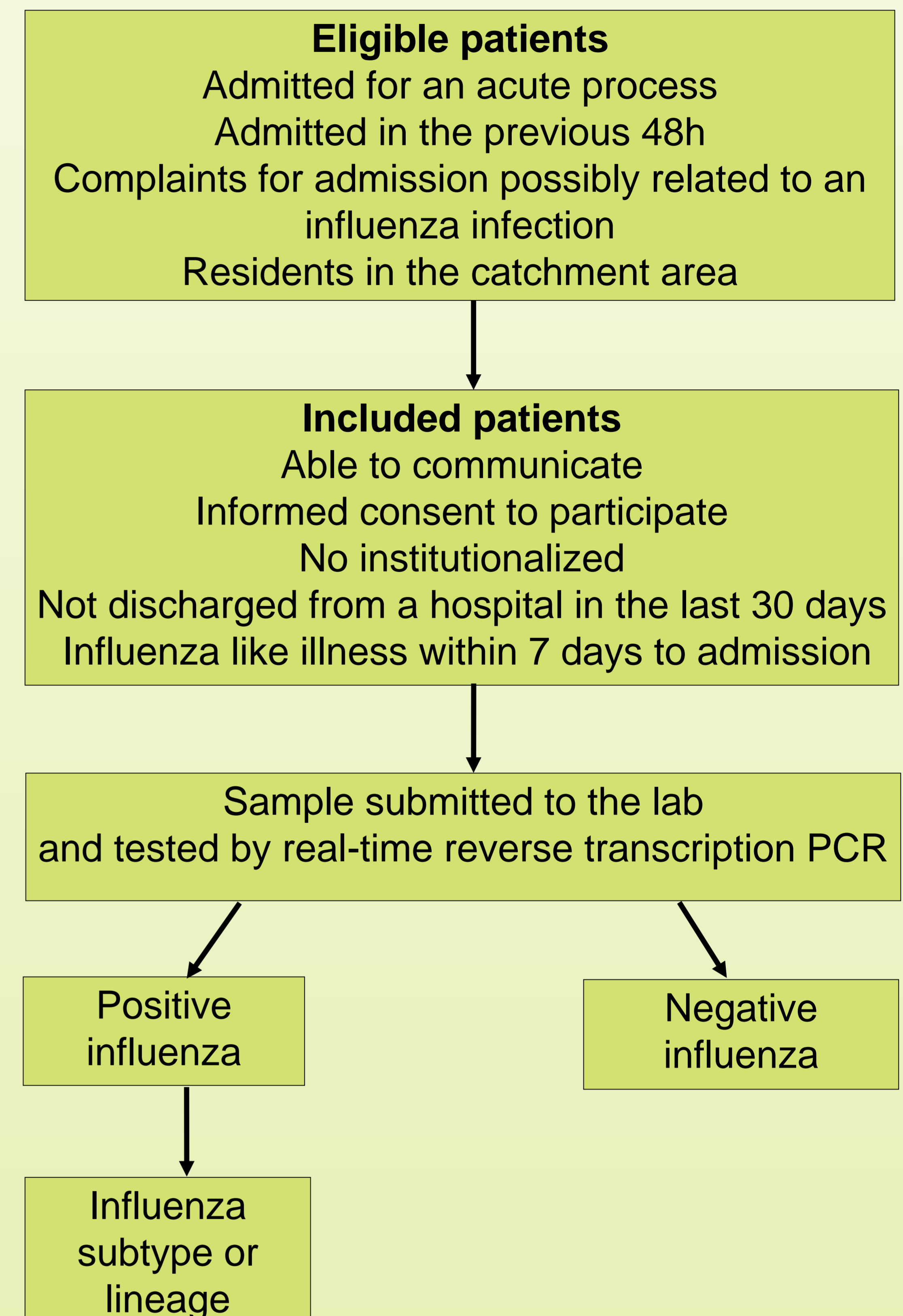
Hospitalized patients by season and positive for influenza



Conclusions

We observed annual changing of the dominated influenza strain in the etiology of epidemics for the all period as well as each season had individual peculiarities. Any type of influenza virus can cause severe disease and hospitalization. Pregnant women are exposed to severe influenza independently of the etiology of epidemics. Vaccination, rapid hospitalization and early antiviral therapy are the main way to prevent and protect against influenza among the high-risk population groups.

GIHSN protocol flow diagram



Characteristics of pregnant women with influenza vs noninfluenza.

Characteristics	A(H1N1)pdm09 N=179	A(H3N2) N=203	B (Yam/Vic/nosubt) N=172	Negative for influenza N=602
Age, mean±SD	27,6 ± 0,4	28,3 ± 0,4	29,7 ± 0,4	28,8 ± 0,4
Day of hospitalization	2,7 ± 0,1	2,8 ± 0,1	3,2 ± 0,1	3,3 ± 0,1
Illness duration, mean days±SD	8,3 ± 0,2	8,8 ± 0,2	9,3 ± 0,3	9,3 ± 0,2
Hospitalization duration, days±SD	6,6 ± 0,2	7,0 ± 0,2	7,1 ± 0,3	7,1 ± 0,2
Trimester of pregnancy				
First (1-13 wks)	52 (29)	45 (22)	32 (19)	150 (25)
Second (14-26 wks)	72 (40)	66 (33)	66 (39)	189 (31)
Third (27-42 wks)	56 (31)	93 (46)	74 (43)	258 (43)
Symptoms				
Fever	169 (95)	196 (97)	166 (97)	495 (82)
Headache	78 (44)	65 (45)	71 (42)	272 (45)
Malaise	82 (46)	93 (46)	81 (47)	282 (47)
Myalgia	71 (40)	60 (30)	57 (33)	100 (17)
Cough	132 (75)	137 (67)	122 (71)	319 (53)
Sore	82 (46)	143 (70)	114 (67)	424 (70)
Breath	13 (7)	8 (4)	5 (3)	22 (4)
Chronic conditions				
Cardiovascular diseases	10 (6)	6 (2)	3 (2)	14 (2)
Renal impairment	12 (7)	18 (9)	9 (5)	33 (5)
Asthma	2 (1.2)	3 (1.5)	2 (1)	5 (1)
Cirrhosis	2 (1.2)	2 (1)	4 (2)	4 (1)
COPD	5 (3)	5 (2.5)	0	6 (1)
Autoimmune	3 (2)	8 (4)	4 (2)	4 (1)
Comorbidities				
Bronchitis	31 (18)	56 (40)	56 (32)	169 (28)
Urinary infection	24 (14)	35 (25)	17 (10)	96 (16)
Laryngitis, sinusitis	2 (1.2)	3 (2)	14 (8)	64 (11)
Pneumonia	8 (5)	2 (1.4)	-	13 (2)
High-risk pregnancy				
Miscarriages	5 (3)	3 (1)	6 (3)	28 (5)
Labor	15 (8)	24 (12)	23 (13)	74 (12)
Term	16	13	11	62
Premature	2	5	2	9
Cesarean section	5	5	6	6
Smoking	14 (8)	8 (4)	8 (5)	40 (7)

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