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Seasonal influenza vaccine effectiveness in patients with underlying medical conditions and aged 65+ between 2015-2018 in Lithuania

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Background and objectives

Due to lack of knowledge about seasonal influenza vaccine effectiveness (SIVE) against laboratory-confirmed influenza in patients with underlying conditions and aged 65+, a study to measure SIVE in hospitalised persons due to severe acute respiratory infection (SARI) in Lithuania during the 2015-2018 was conducted.

The co-circulation of other respiratory viruses was also described.

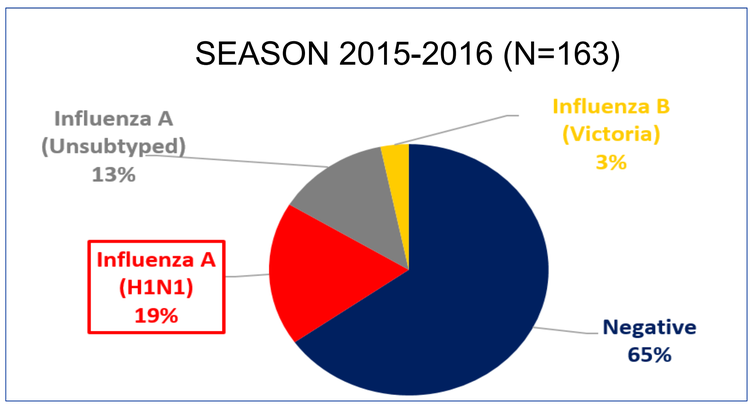
Methods

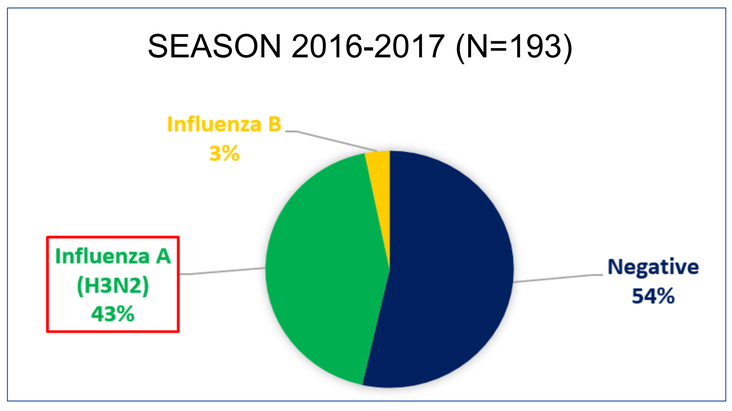
- A test-negative case-control study.
- Two university hospitals.
- Three influenza seasons: 2015-2016, 2016-2017, 2017-2018.
- Cases defined as testing positive, and controls as testing negative for influenza.
- Nasopharyngeal swabs were tested for influenza and other respiratory viruses by multiplex RT-PCR.
- SIVE and its 95% confidence intervals (95%CI) were calculated as (1-OR)*100%.

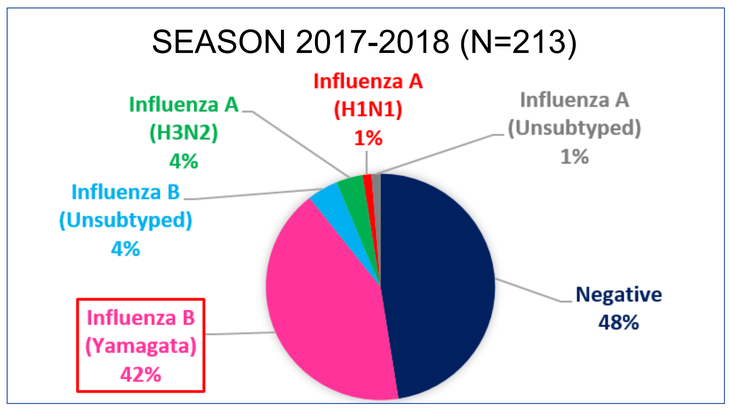
Results

> 6500 screened → **569 included** → **286 (50.3%) controls** + **283 (49.7%) cases**

54 (9.5%) VACCINATED overall







Seasonal influenza vaccine effectiveness

	Vaccinated/ Cases	Vaccinated/ Controls	Unadjusted OR (95% CI)	SIVE (%)	95% CI	Vaccine composition	Main circulating strain
2015 - 2016							
Influenza	4/72	11/91	0.43 (0.13; 1.41)	57%	-41%; 87%	• California/7/2009(H1N1)-like • A/Switzerland/9715293/2013(H3N2)-like • B/Phuket/3073/2013-like (Yamagata)	• California/7/2009(H1N1)-like • B/Brisbane/60/2008-like (Victoria)
Influenza A (H1N1pdm09)	2/50	11/91	0.30 (0.06; 1.43)	70%	-43%; 94%		
2016 - 2017							
Influenza	9/89	17/104	0.58 (0.24; 1.36)	42%	-36%; 76%	• A/California/7/2009(H1N1)-like • A/Hong Kong/4801/2014(H3N2)-like • B/Brisbane/60/2008 (Victoria)-like	• A (H3N2) A/Bolzano/7/2016
Influenza A (H3N2)	9/83	17/104	0.67 (0.28; 1.58)	33%	-58%; 72%		
2017 - 2018							
Influenza	5/122	8/91	0.44 (0.14; 1.40)	56%	-40%; 86%	• A/Michigan/45/2015 (H1N1)pdm09-like • A/Hong Kong/4801/2014 (H3N2)-like • B/Brisbane/60/2008-like (Victoria)	• B/Phuket/3073/2013-like (Yamagata)
Influenza B (Yamagata)	4/97	8/91	0.48 (0.14; 1.60)	52%	-60%; 86%		

Distribution of other respiratory viruses

RESPIRATORY VIRUSES	2015-2016 n (%)	2016-2017 n (%)	2017-2018 n (%)	Overall n (%)	p
Respiratory Syncytial Virus	8 (5.0)	11 (5.7)	4 (1.9)	23 (4.1)	0.12
Rhinovirus	6 (3.7)	4 (2.1)	1 (0.5)	11 (2.1)	0.07
Metapneumovirus	7 (4.3)	3 (1.6)	3 (1.4)	13 (2.3)	0.12
Coronavirus	3 (1.9)	3 (1.6)	3 (1.4)	9 (1.6)	0.94
Adenovirus	7 (4.3)	-	1 (0.5)	8 (1.4)	0.01
Parainfluenza	1 (0.6)	-	1 (0.5)	2 (0.4)	-
TOTAL	32 (20.0)	21 (10.9)	13 (6.1)	66 (11.6)	<0.001

Conclusions and recommendations

- Half of the hospitalized SARI cases were confirmed with influenza, which shows high influenza disease burden in this population. Although the results should be interpreted with caution due to broad confidence intervals, the point estimates suggest moderate SIVE in 2015-2016 and 2017-2018, and low SIVE in 2016-2017.
- In 2015-2016 the circulating influenza B Victoria lineage was distinct from the B Yamagata vaccine component.
- In 2017-2018 the circulating influenza B Yamagata did not match influenza B Victoria in the vaccine composition.
- Co-circulation of the other viruses tested was low and significantly more common in 2015-2016.

Key words

Influenza, influenza vaccine effectiveness, influenza risk groups, respiratory viruses.