Interim Estimates of 2016–17 Seasonal Influenza Vaccine Effectiveness against Medically Attended Influenza from the US Flu VE Network

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For the US Flu VE Network

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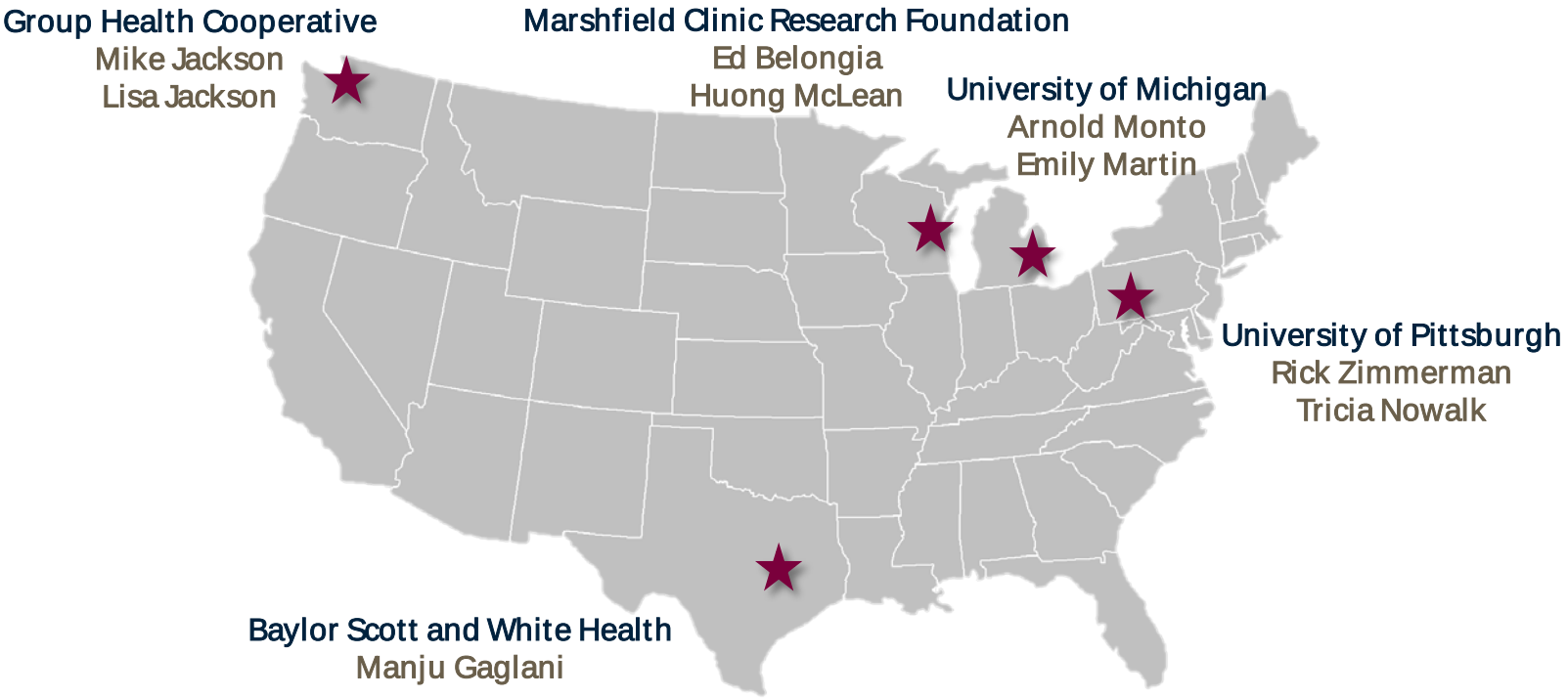
US Flu VE Network sites and principal investigators



US Flu VE Network Methods

Enrollees: Outpatients aged ≥6 months with acute respiratory illness with cough ≤7 days duration

Dates of enrollment: November 28, 2016–February 4, 2017

Design: Test-negative design

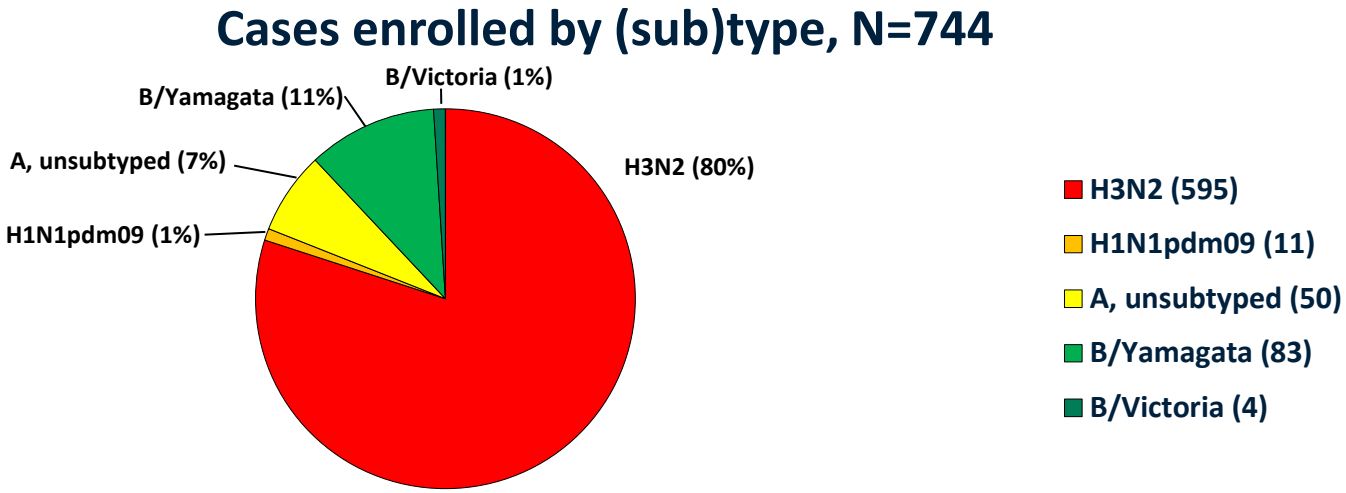
- Comparing vaccination odds among influenza RT-PCR positive cases and RT-PCR negative controls
- Vaccination status: receipt of at least one dose of any 2016–17 seasonal flu vaccine according to medical records, immunization registries, and/or self-report

Analysis: VE = (1 – adjusted OR) x 100%

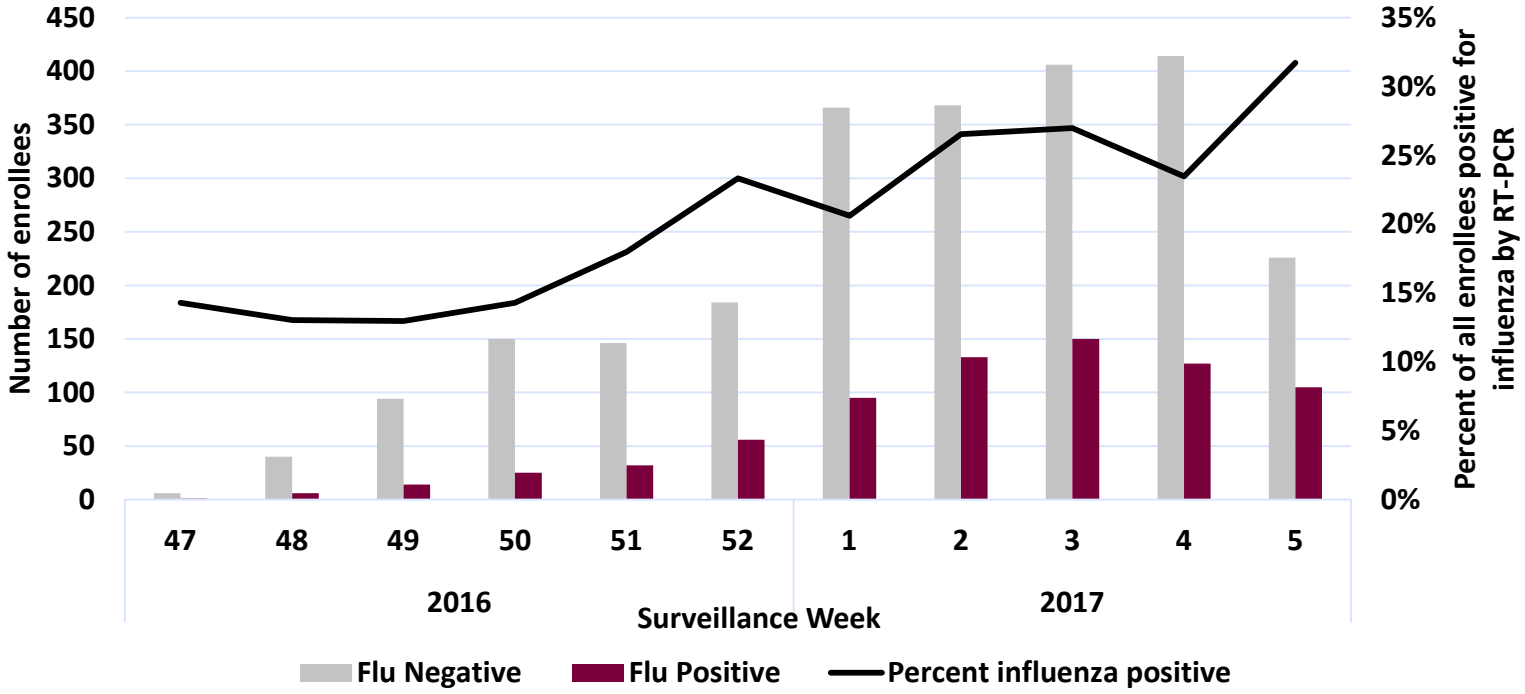
- Adjustment for study site, age, self-rated general health status, race/Hispanic ethnicity, interval (days) from onset to enrollment, and calendar time

Interim Results

- 3,144 enrolled from Nov 28, 2016–Feb 4, 2017 at 5 sites
- 744 (24%) influenza RT-PCR positive
- 2,400 (76%) influenza RT-PCR negative



Number of enrolled participants by influenza RT-PCR result and percent positivity by week of onset



Note: Week 5 only includes patients with completed laboratory tests and thus does not reflect all enrolled patients during that week across study sites.

Interim adjusted vaccine effectiveness against medically attended influenza, 2016–17

	Influenza positive		Influenza negative		Vaccine Effectiveness			
					Unadjusted		Adjusted*	
Any influenza A or B virus	N vaccinated /Total	(%)	N vaccinated /Total	(%)	VE %	95% CI	VE %	95% CI
Overall	333/744	(45)	1317/2400	(55)	33	(21 to 44)	**48**	**(37 to 57)**
Age group (yrs)								
6 mos–8	32/97	(33)	330/614	(54)	58	(33 to 73)	**53**	**(22 to 72)**
9–17	36/122	(30)	92/247	(37)	29	(-12 to 56)	**32**	**(-20 to 61)**
18–49	89/208	(43)	363/783	(46)	13	(-18 to 36)	**19**	**(-17 to 43)**
50–64	76/189	(40)	261/425	(61)	58	(40 to 70)	**58**	**(38 to 72)**
≥65	100/128	(78)	271/331	(82)	21%	(-31 to 52)	**46**	**(4 to 70)**

* Multivariate logistic regression models adjusted for site, age, sex, race/ethnicity, self-rated general health status, interval from onset to enrollment, and calendar time.

Interim adjusted vaccine effectiveness against medically attended influenza by virus type, 2016–17

	Influenza positive		Influenza negative		Vaccine Effectiveness			
					Unadjusted		Adjusted*	
	N vaccinated /Total	(%)	N vaccinated /Total	(%)	VE %	95% CI	VE %	95% CI
Influenza A/H3N2								
Overall	282/595	(47)	1317/2400	(55)	26	(11 to 38)	**43**	**(29 to 54)**
Age group (yrs)								
6 mos–8	24/68	(35)	330/614	(54)	53	(21 to 72)	**53**	**(16 to 74)**
9–17	28/94	(30)	92/247	(37)	29	(-19 to 57)	**23**	**(-43 to 59)**
18–49	73/168	(43)	363/783	(46)	11	(-24 to 36)	**13**	**(-30 to 41)**
50–64	70/154	(45)	261/425	(61)	48	(24 to 64)	**50**	**(23 to 67)**
≥65	87/111	(78)	271/331	(82)	20	(-37 to 53)	**44**	**(-3 to 69)**
Influenza B								
Overall	23/90	(26)	1317/2400	(55)	72	(54 to 83)	**73**	**(54 to 84)**

* Multivariate logistic regression models adjusted for site, sex, race/ethnicity, self-rated general health status, interval from onset to enrollment, and calendar time.

Summary

- Interim results for 2016–17 season (through February 4, 2017) indicate vaccine effectiveness of 48% against medically attended influenza
  - Interim estimate similar to previous seasons when vaccine was well matched to circulating influenza viruses
- Significant protection against circulating influenza A(H3N2) and B viruses (predominantly B/Yamagata)
  - VE not estimated against H1N1pdm09 or B/Victoria due to small number of cases
- Enrollment continues – end-of-season VE estimates may differ from interim estimates

VE against influenza A (H3N2) viruses

- VE of 43% against A (H3N2) similar to antigenically matched H3N2 viruses
  - 2011-12 (39%) and 2012-13 (39%)
  - Meta-analysis[1] of test-negative VE studies: 33% (26% - 39%)
- VE against A (H1N1)pdm09 (61%) and B viruses (54%) tend to be higher[1]
- A (H3N2) viruses have required more frequent vaccine updates
- Candidate A (H3N2) vaccine viruses more often have antigenic changes after adaptation to growth in eggs
- Efforts ongoing to improve VE against A (H3N2) viruses

[1] Belongia et al. Lancet Infect Dis, 2016

US Flu VE Network

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