Interim Estimates of 2018–19 Seasonal Influenza Vaccine Effectiveness against Medically Attended Influenza from the US Flu VE Network

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For the US Flu VE Network

Advisory Committee on Immunization Practices

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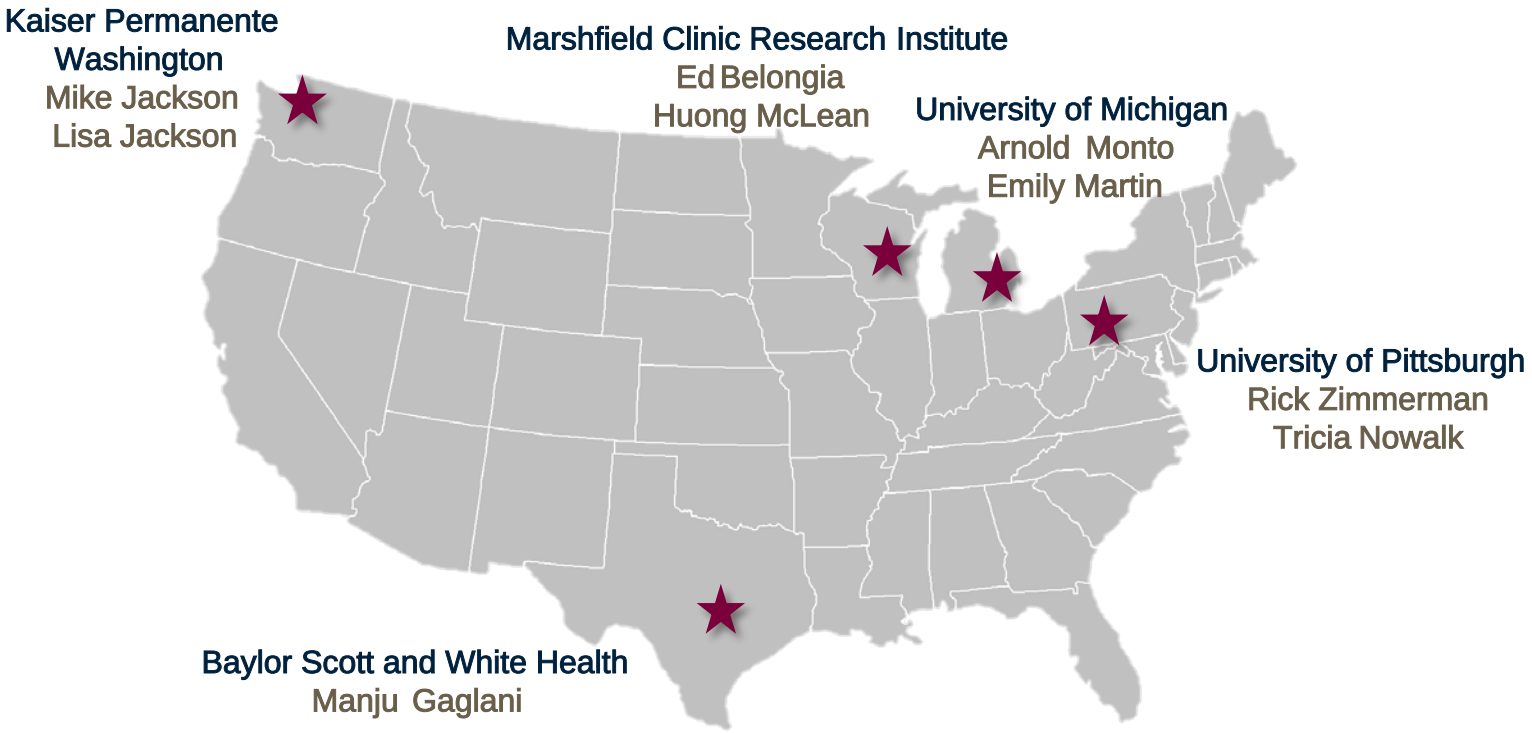
US Flu VE Network sites and principal investigators



US Flu VE Network Methods

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

Dates of enrollment: November 23, 2018–February 2, 2019

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 2018–19 seasonal flu vaccine according to medical records, immunization registries, and/or self-report

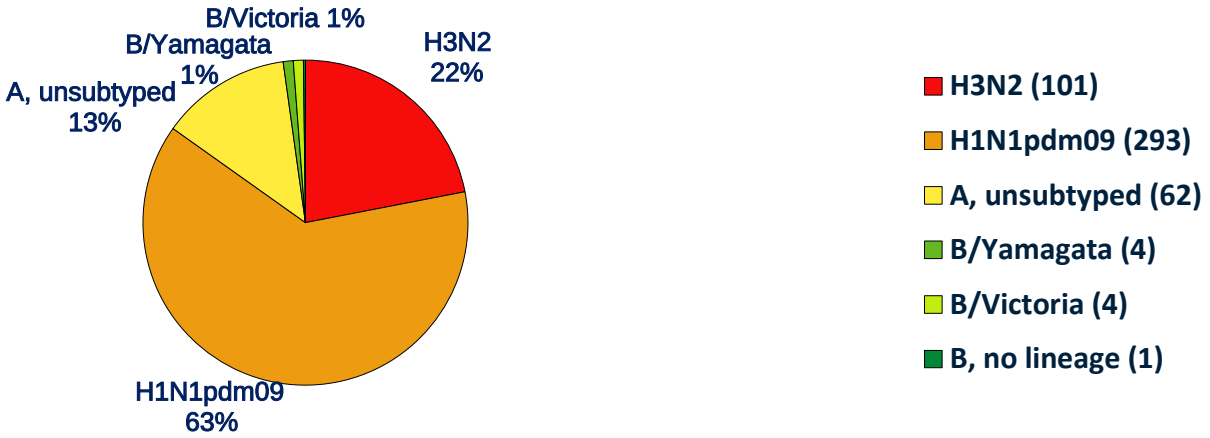
Analysis: VE = (1 – adjusted OR) x 100%

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

Interim Results (Published Feb 15, 2019 MMWR)

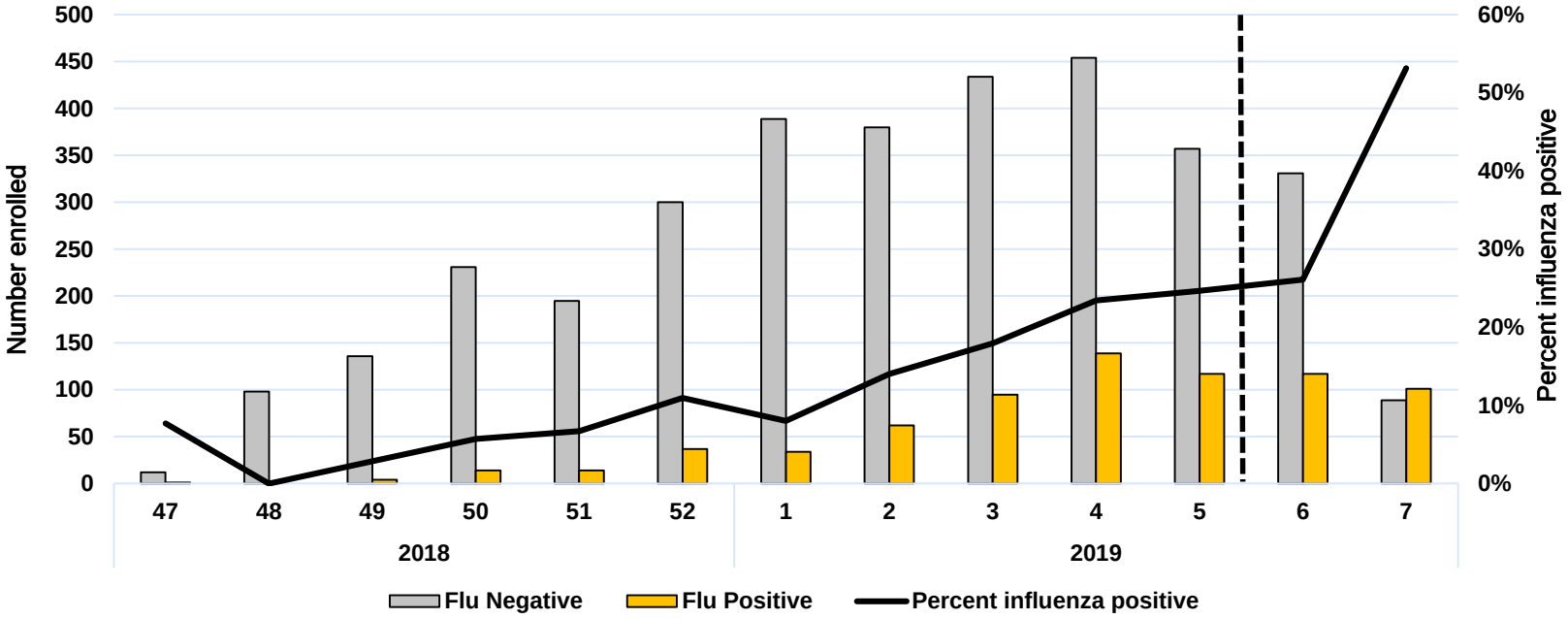
- 3,254 enrolled from Nov 23, 2018–Feb 2, 2019 at 5 sites
- 465 (14%) influenza RT-PCR positive
- 2,789 (86%) influenza RT-PCR negative

Cases enrolled by (sub)type, N=465



Doyle et al, MMWR 2019

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



Note: Week 7 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 A/B by age group, 2018–19

					Vaccine Effectiveness			
	Influenza positive		Influenza negative		Unadjusted		Adjusted*	
Any influenza A or B virus	**N vaccinated /Total**	**(%)**	**N vaccinated /Total**	**(%)**	**VE %**	**95% CI**	**VE %**	**95% CI**
Overall	198/465	(43)	1591/2789	(57)	44	(32 to 54)	**47**	**(34 to 57)**
Age group (yrs)								
6 mos–17	58/173	(34)	515/926	(56)	60	(43 to 71)	**61**	**(44 to 73)**
18–49	58/166	(35)	403/932	(43)	30	(1 to 50)	**37**	**(9 to 56)**
≥50	82/126	(65)	673/931	(72)	29	(-6 to 52)	**24**	**(-15 to 51)**

* Multivariable 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 A subtypes by age group, 2018–19

	Influenza positive		Influenza negative		Vaccine Effectiveness			
					Unadjusted		Adjusted*	
	N vaccinated /Total	(%)	N vaccinated /Total	(%)	VE %	95% CI	VE %	95% CI
Influenza A/H1N1pdm09								
Overall	125/293	(43)	1591/2789	(57)	44	(29 to 56)	**46**	**(30 to 58)**
Age group (yrs)								
6 mos–17	37/106	(35)	515/926	(56)	57	(35 to 72)	**62**	**(40 to 75)**
18–49	38/113	(34)	403/932	(43)	33	(0 to 56)	**45**	**(14 to 64)**
≥50	50/74	(68)	673/931	(72)	20	(-33 to 52)	**8**	**(-59 to 46)**
Influenza A/H3N2								
Overall	42/101	(42)	1591/2789	(57)	46	(20 to 64)	**44**	**(13 to 64)**

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

Summary

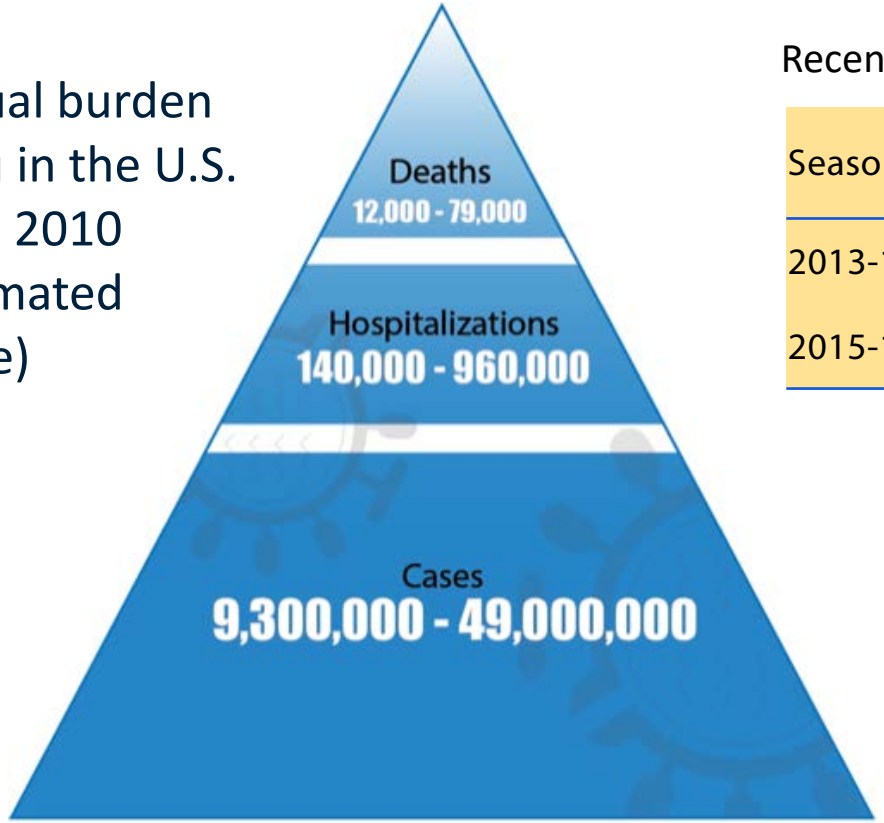
- Interim results for 2018–19 season (through February 2, 2019) indicate protection against influenza
  - 47% (CI: 35, 57) vaccine effectiveness against any influenza virus
  - 46% (CI: 30, 58) against H1N1pdm09, 44% (CI: 13, 64) against H3N2
- Effectiveness estimates among children aged 6 months – 17 years
  - 61% (CI: 44, 73) against any flu, 62% (CI: 40, 75) against H1N1pdm09
- Effectiveness estimates 37% – 45% among adults aged 18-49 years
- Effectiveness estimates not statistically significant among those ≥50 years
  - US Flu VE study will continue enrolling through end of season

Recently published estimates of 2018-19 VE

- Canada, Skowronski et al, Eurosurveillance 2019
  - VE 68% (CI: 55, 77) against any flu, 72% against H1N1pdm09
- Europe, Kissling et al, Eurosurveillance 2019
  - VE 32% – 43% against flu A, 45% – 71% against H1N1pdm09
  - UK, LAIV: VE 87% (CI: 4, 100) against H1N1pdm09
- Hong Kong, Chiu et al, Eurosurveillance 2019
  - Inpatient VE 92% (CI: 82, 96) against H1N1pdm09, 6m-17 years
- Australia (2018), Australian Government website
  - VE 78% (CI: 51, 91) against H1N1pdm09, all ages

Influenza disease burden during recent H1N1pdm09-predominant seasons

Annual burden of flu in the U.S. since 2010 (estimated range)

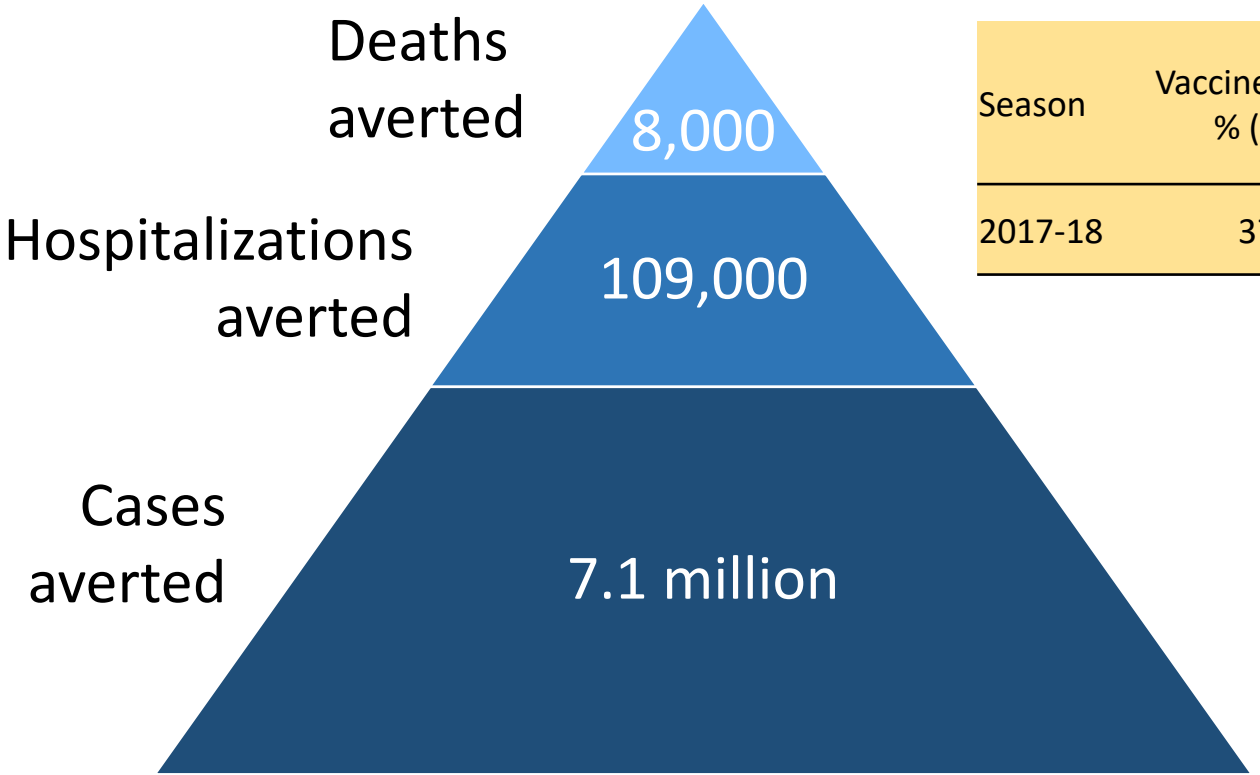


Recent A(H1N1)pdm09 predominant seasons

Season	Cases	Hospitalizations	Deaths
2013-14	30,000,000	350,000	38,000
2015-16	25,000,000	310,000	25,000

www.cdc.gov/flu/about/burden/index.html

Deaths, hospitalizations and cases averted in the US due to influenza vaccination, 2017-18 flu season



Season	Vaccine coverage % (range)	Vaccine effectiveness % (95% CI)
2017-18	37–58	38 (31–43)

Estimates of 2018-19 averted burden expected in fall 2019

Rolfeset al, Clinical Infectious Diseases 2019

US Flu VE Network

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.