

Seasonal Influenza Vaccine Effectiveness, 2005-2017

On This Page

- Table. Adjusted vaccine effectiveness estimates for influenza seasons from 2005-2016
- References

CDC conducts studies to measure the benefits of seasonal flu vaccination each flu season to help determine how well flu vaccines are working. These [vaccine effectiveness \(https://www.cdc.gov/flu/about/qa/vaccineeffect.htm\)](https://www.cdc.gov/flu/about/qa/vaccineeffect.htm) (VE) studies regularly assess and confirm the value of flu vaccination as a public health intervention. Study results of vaccine effectiveness can vary based on study design, outcome(s) measured, population studied and the season in which the flu vaccine was studied.

CDC has been working with researchers at universities and hospitals since the 2003-2004 flu season to estimate how well flu vaccine works through observational studies using medically attended laboratory-confirmed flu as the outcome. This is the U.S. Flu Vaccine Effectiveness (VE) Network. The U.S. Flu VE Network currently consists of five study sites across the United States that measure the flu vaccine's effectiveness at preventing outpatient medical visits due to laboratory-confirmed influenza. CDC's observational studies at U.S. Flu VE Network sites measure outpatient visits* for laboratory-confirmed influenza infections using a highly accurate lab test called rRT-PCR to verify the outcome. These studies compare the odds of vaccination among outpatients with acute respiratory illness and laboratory-confirmed influenza infection to the odds of vaccination among outpatients with acute respiratory illness who test negative for influenza infection.

The overall, adjusted vaccine effectiveness estimates for influenza seasons from 2005-2016 are noted in the chart below. (Estimates are typically adjusted for study site, age, sex, underlying medical conditions, and days from illness onset to enrollment.)

Table. Adjusted vaccine effectiveness estimates for influenza seasons from 2005-2016

Influenza Season†	Reference	Study Site(s)	No. of Patients‡	Adjusted Overall VE (%)	95% CI
2004-05	Belongia 2009 (http://www.ncbi.nlm.nih.gov/pubmed/19086915)	WI	762	10	-36, 40
2005-06	Belongia 2009 (http://www.ncbi.nlm.nih.gov/pubmed/19086915)	WI	346	21	-52, 59
2006-07	Belongia 2009 (http://www.ncbi.nlm.nih.gov/pubmed/19086915)	WI	871	52	22, 70
2007-08	Belongia 2011 (https://www.ncbi.nlm.nih.gov/pubmed/21767593)	WI	1914	37	22, 49
2008-09	Unpublished	WI, MI, NY, TN	6713	41	30, 50

2009-10	Griffin 2011 (https://www.ncbi.nlm.nih.gov/pubmed/21857999)	WI, MI, NY, TN	6757	56	23, 75
2010-11	Treanor 2011 (https://www.ncbi.nlm.nih.gov/pubmed/22843783)	WI, MI, NY, TN	4757	60	53, 66
2011-12	Ohmit 2014 (https://www.ncbi.nlm.nih.gov/pubmed/24235265)	WI, MI, PA, TX, WA	4771	47	36, 56
2012-13	McLean 2014 (https://www.ncbi.nlm.nih.gov/pubmed/25406334)	WI, MI, PA, TX, WA	6452	49	43, 55
2013-14	Gaglani 2016 (https://www.ncbi.nlm.nih.gov/pubmed/26743842)	WI, MI, PA, TX, WA	5999	52	44, 59
2014-15	Zimmerman 2016 (https://academic.oup.com/cid/article/63/12/1564/2282808/2014-2015- Influenza-Vaccine-Effectiveness-in-the)	WI, MI, PA, TX, WA	9311	19	10, 27
2015-16*	Jackson 2017 (https://www.ncbi.nlm.nih.gov/pubmed/28792867)	WI, MI, PA, TX, WA	6879	48*	41, 55*
2016-17**	ACIP presentation, Ferdinands [743 KB, 19 pages]	WI, MI, PA, TX, WA	7205	42**	35, 48

*Estimate from Nov 2, 2015–April 15, 2016.

**As presented at June 21, 2017 ACIP meeting

[Print-friendly Version PDF](#) [167 KB, 1 Page]

References

[Belongia EA, Kieke BA, Donahue JG, et al. Effectiveness of inactivated influenza vaccines varied substantially with antigenic match from the 2004-2005 season to the 2006-2007 season. J Infect Dis. 2009 Jan 15;199\(2\):159-67. doi:10.1086/595861. PubMed PMID: 19086915. \(http://www.ncbi.nlm.nih.gov/pubmed/19086915\)](#)

[Belongia EA, Kieke BA, Donahue JG, et al. Influenza vaccine effectiveness in Wisconsin during the 2007-08 season: comparison of interim and final results. Vaccine. 2011 Sep 2;29\(38\):6558-63. doi: 10.1016/j.vaccine.2011.07.002. Epub 2011 Jul 19. PubMed PMID: 21767593. \(http://www.ncbi.nlm.nih.gov/pubmed/21767593\)](#)

[Flannery B, Clippard J, Zimmerman RK, Norwalk MP, Jackson ML, Jackson LA, Monto AS, Petrie JG, McLean HQ, Belongia EA, Gaglani M, Berman L, Foust A, Sessions W, Thaker SN, Spencer S, Fry AM. Early Estimates of Seasonal Influenza Vaccine Effectiveness – United States, January 2015. MMWR Morb Mortal Wkly Rep. 2015 Jan 13;64\(1\):10-15. \(https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6401a4.htm\)](#)

[Griffin MR, Monto AS, Belongia EA, et al. Effectiveness of non-adjuvanted pandemic influenza A vaccines for preventing pandemic influenza acute respiratory illness visits in 4 U.S. communities. PLoS One. 2011;6\(8\):e23085. doi: 10.1371/journal.pone.0023085. Epub 2011 Aug 12. PubMed PMID: 21857999. \(http://www.ncbi.nlm.nih.gov/pubmed/21857999\)](#)

[McLean HQ, Thompson MG, Sundaram ME, Kieke BA, Gaglani M, Murthy K, Piedra PA, Zimmerman RK, Nowalk MP, Raviotta JM, Jackson ML, Jackson L, Ohmit SE, Petrie JG, Monto AS, Meece JK, Thaker SN, Clippard JR, Spencer SM, Fry AM, Belongia EA. Influenza Vaccine Effectiveness in the United States During 2012-2013: Variable Protection by Age and Virus Type. J Infect Dis. 2014 Nov 18. pii: jiu647. \[Epub ahead of print\] PubMed PMID: 25406334. \(http://jid.oxfordjournals.org/content/early/2014/12/16/infdis.jiu647.long\)](#)

[Ohmit SE, Thompson MG, Petrie JG, et al. Influenza vaccine effectiveness in the 2011-2012 season: protection against each circulating virus and the effect of prior vaccination on estimates. Clin Infect Dis. 2014 Feb;58\(3\):319-27. doi: 10.1093/cid/cit736. Epub 2013 Nov 13. \(http://www.ncbi.nlm.nih.gov/pubmed/24235265\)](#)

[Treanor JJ, Talbot HK, Ohmit SE, et al. Effectiveness of seasonal influenza vaccines in the United States during a season with circulation of all three vaccine strains. CID 2012; 55\(7\):951-959. Epub 2012 Jul 25. PubMed PMID: 22843783. \(http://www.ncbi.nlm.nih.gov/pubmed/22843783\)](#)

[Jackson ML, Chung JR, Jackson LA, Phillips CH, Benoit J, Monto AS, Martin ET, Belongia EA, McLean HQ, Gaglani M, Murthy K, Zimmerman R, Nowalk MP, Fry AM, Flannery B. N Engl J Med. 2017 Aug 10;377\(6\):534-543. doi: 10.1056/NEJMoa1700153. PMID: 2879286 \(https://www.ncbi.nlm.nih.gov/pubmed/28792867\)](#)

* From 2004-05 through 2010-11, the Network also enrolled inpatients.

† Vaccine effectiveness (VE) estimates for the 2008-2009 flu season have not yet been published.

‡ Number of patients used in VE calculation.

Get Email Updates

To receive weekly email updates about Seasonal Flu, enter your email address:

What's this? (<http://www.cdc.gov/emailupdates/>)

Submit (javascript:quicksubscribe();return false;)

Influenza Types
Seasonal
Avian
Swine/Variant
Pandemic
Other

File Formats Help:

How do I view different file formats (PDF, DOC, PPT, MPEG) on this site? (<https://www.cdc.gov/Other/plugins/>)

(<https://www.cdc.gov/Other/plugins/#pdf>)