McMaster University | Health Forum

Living Evidence Synthesis

Effectiveness of trivalent and quadrivalent influenza vaccines in preventing infection, hospitalization, and severe outcomes in the 2023–2024 season onwards

17 March 2025

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Appendices

Appendix 1: Detailed search strategy

Databases searched:
- MEDLINE+ PUBMED via OVID
- Clinical trials registry: https://clinicaltrials.gov/

Search limits: 2023–current

Database retrieval: Effectiveness

Databases	10/03/2024
MEDLINE+ EMBASE via OVID	4,013
Preprint Citation Index	109
Clinical trials	199
Duplicates	237
TOTAL	3,468

MEDLINE+ EMBASE via OVID search:

#1	Influenza.mp. [mp=ti, ab, hw, tn, ot, dm, mf, dv, kf, fx, dq, bt, nm, ox, px, rx, ui, sy, ux, mx]
#2	exp Influenza/
#3	exp vaccine/
#4	exp vaccination/
#5	vaccin*.mp.
#6	trivalent.mp.
#7	quadrivalent.mp.
#8	1 or 2
#9	3 or 4 or 5 or 6 or 7
#10	exp influenza vaccine/
#11	8 and 9

#12	10 or 11
#13	(effectiveness or efficacy or protection*).mp.
#14	12 and 13
#15	limit 14 to humans
#16	limit 15 to yr="2023 -Current"
#17	remove duplicates from 16

Preprint Citation search:

#1	(TS=(Influenza)) AND TS=(vaccin* OR trivalent OR quadrivalent)) AND TS=((effectiveness OR efficacy OR protection))

Appendix 2: Summary of studies reporting on the effectiveness of trivalent and quadrivalent influenza vaccines in preventing infection, hospitalization, and severe outcomes

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

Costantino 2024 (1)	• Population studied
	  ○ General population (all ages)
	• Type of vaccine
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	  ▪ Inactivated quadrivalent influenza vaccine standard dose (QIV-sd)
	  ▪ Cell culture-based inactivated quadrivalent influenza vaccine (QIV-cc)
	  ▪ High-dose inactivated quadrivalent influenza vaccine (QIV-hd)
	  ▪ Adjuvanted with MF59 inactivated quadrivalent influenza vaccine (QIV-a)
	  ▪ Live attenuated quadrivalent influenza vaccine (LAIV)
	• Comparator
	  ○ Unvaccinated individuals
	• Testing
	  ○ Nucleic acid testing (RT-PCR)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Medically attended acute respiratory illness (patients with influenza-like illness (ILI) seeking medical care)
	• Timeframe (specimens collected)
	  ○ Mid-season 2023/24 (between 1 October 2023 and 31 January 2024)
		Type of publication: Peer reviewed
		
		Study design: Test-negative case-control
		
		Analysis: VE was estimated by comparing the odds ratio of vaccination between cases and controls and using a logistic regression model to estimate VE adjusted by sex and at least one comorbidity overall and by age group
		
		Setting and country: Sicily, Italy
			• The study included 1,230 samples from participants of all age groups collected from general practitioners (GPs) and family pediatricians (FPs) in Sicily from 16 October 2023 to 7 January 2024 with 29.2% (n=359) testing positive for influenza and 96.2% (n=345) of these cases being influenza A(H1N1) pdm09
			• Of 191 vaccinated individuals, 29.4% received QIV-sd, 11.1% received the QIV-cc, 25.4% received the LAIV, 23.1% received the QIV-hd, and 11.8% received the QIV-a
				• Overall VE:
				  ○ The overall influenza VE against influenza strain A(H1N1) pdm09: 41.4% (95% CI: 10.5–61.6%)
				• VE by age group:
				  ○ 7 months–14 years: 37.9% (95% CI: –0.7–61.7%)
				  ○ ≥65 years: 52.7% (95% CI: –38.0–83.8%)

Choi 2024 (2)	• Population studied
	  ○ People aged 19 and over
	• Type of vaccine
		Type of publication: Peer reviewed	• The study included 2,632 patients who visited the emergency department or	• VE against influenza:
				  ○ Overall: 22.5% (95% CI: 6.6–35.8%)
				  ○ 19–64 years: 24.3% (95% CI: 5.3–39.5%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
	○ Quadrivalent inactivated influenza vaccine (IIV4) • Comparator ○ Unvaccinated individuals • Testing ○ Antigen detection ○ RT-PCR • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Medically attended acute respiratory illness (patients who visited emergency departments or outpatient clinics with influenza-like illness (ILI)) ○ Hospitalization (patients who hospitalized with either laboratory-confirmed influenza or ILI symptoms) • Timeframe (specimens collected) • Early season 2023/24 (between 1 November 2023 and 31 December 2023)	Study design: Test-negative case-control Analysis: VE was estimated using multivariate logistic regression models, adjusted for sex, age, and underlying comorbidities Setting and country: Eight hospitals in South Korea	outpatient clinic with ILI, and those who were hospitalized with laboratory-confirmed influenza or with symptoms consistent with ILI from ages 19 years and older who visited eight hospitals in South Korea 1 November 2023 to 31 December 2023 • A RT-PCR testing confirmed 56.8% cases as influenza A (H1N1) and 38.4% cases as influenza A/H3N2 • 32.4% test-positive cases were vaccinated, and 35.5% test-negative controls were vaccinated	○ 65+ years: 17.4% (95% CI: –17.1- 41.8%) • VE by influenza type: ○ Influenza A ▪ Overall: 22.3% (95% CI: 6.1–35.7%) ▪ 19–64 years: 23.9% (95% CI: 4.5–39.3%) ▪ ≥65 years: 17.4% (95% CI: –17.1–41.8%) ○ Influenza A (H1N1) ▪ Overall: 9.4% (95% CI: –51.3–45.7%) ▪ 19–64 years: 32.5% (95% CI: –128.7–80.1%) ▪ ≥ 65 years: 38.2% (95% CI: –15.6–67%) ○ Influenza A/H3N2 ▪ Overall: 0.3% (95% CI: –77–43.8%) ▪ 19–64 years: 84.1% (95% CI: –28.1–98.0%) ▪ ≥65 years: 0.0% (95% CI: –121.8–54.9%)
Frutos 2024 (3)	• Population studied ○ Older adults (aged ≥65 years) ○ Children and adolescents aged 6 months to 17 years • Type of vaccine ○ Not specified (vaccination status: ≥1 dose of any 2023/24 influenza vaccine in the United States received ≥14 days before illness onset or medical encounter) • Comparator ○ Unvaccinated individuals • Testing ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome	Type of publication: Government report Study design: Test-negative case-control Analysis: VE was estimated to compare the odds ratio of vaccination against acute respiratory illness in different settings between cases and controls; a multivariable logistic regression model was used and adjusted for age, geographic region and calendar time of illness	• Control patients were those who had acute respiratory illness (ARI) who had received a negative influenza molecular assay result, and case patients were those who had ARI and had received a positive influenza assay result • Patients considered vaccinated in this study had received one or more dose of the 2023/24 influenza vaccine 14 days or more before an index date • Analyses were conducted using data from four Centers for Disease Control and Prevention (CDC) affiliated VE	• VE against any influenza: ○ Medically attended acute respiratory illness ▪ 0.5–17 years: NVSN 59% (95% CI: 48–67%), US Flu VE 67% (95% CI: 48–80), VISION 60% (95% CI: 57–64)% ▪ ≥18 years: US Flu VE 33% (95% CI: 16–47%), VISION 49% (95% CI: 47–51%) ▪ 18–64 years: US Flu VE 25% (95% CI: 3–42%), VISION 52% (95% CI: 50–55%) ▪ ≥65 years: US Flu VE 51% (95% CI: 14–72), VISION 41% (95% CI: 36–45%) ○ Hospitalization ▪ 0.5–17 years: NVSN 61% (95% CI: 40–75), VISION 52% (95% CI: 16–72%) ▪ ≥18 years: IVY 44% (95% CI: 32–54), VISION 41% (95% CI: 34–47%) ▪ 18–64 years: IVY49% (95% CI: 33–61), VISION 40% (95% CI: 28–50%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
	○ Medically attended acute respiratory illness (outpatient visits including clinics, urgent care, emergency departments for ARI) ○ Hospitalization (inpatient for ARI) • Timeframe (specimens collected) ○ Mid-season 2023/24 (between 1 October 2023 and 31 January 2024)	Setting and country: 22 states in the United States	networks, and VE estimates were calculated for influenza A subtypes A(H3N2) and A(H1N1) pdm09 when possible • NVSN = New Vaccine Surveillance Network; US Flu VE = U.S. Flu Vaccine Effectiveness Network; VISION = Virtual SARS-CoV-2, Influenza, and Other respiratory viruses Network; IVY = Investigating Respiratory Viruses in the Acutely Ill network	▪ ≥65 years: IVY 42% (95% CI: 23–56), VISION 42% (95% CI: 34–50%) • VE against any Influenza A: ○ Medically attended acute respiratory illness ▪ 0.5–17 years: NVSN 55% (95% CI: 41–66%), US Flu VE 46% (95% CI: 15–67%), VISION 59% (95% CI: 55–62%) ▪ ≥18 years: US Flu VE 27% (95% CI: 9–43%), VISION 46% (95% CI: 44–48%) ▪ 18–64 years: US Flu VE 13% (95% CI: –13–34%), VISION 49% (95% CI: 46–51%) ▪ ≥65 years: US Flu VE 52% (95% CI: 16–73%), VISION 40% (95% CI: 36–45%) ○ Hospitalization ▪ 0.5–17 years: NVSN 56% (95% CI: 30–73%), VISION 46% (95% CI: 7–69%) ▪ ≥18 years: IVY 42% (95% CI: 23–57%), VISION 40% (95% CI: 34–47%) ▪ 18–64 years: IVY 42% (95% CI: 13–61%), VISION 40% (95% CI: 28–50%) ▪ ≥65 years: IVY 42% (95% CI: 23–57%), VISION 40% (95% CI: 33–47%) • VE against Influenza A (H1N1) pdm09: ○ Medically attended acute respiratory illness ▪ 0.5–17 years: NVSN 54% (95% CI: 37–66)%, US Flu VE 61% (95% CI: 26–81%) ▪ ≥18 years: US Flu VE 25% (95% CI: 1–43%) ○ Hospitalization ▪ 0.5–17 years: NVSN 60% (95% CI: 32–77%) ▪ ≥18 years: IVY 50% (95% CI: 30–64%) • VE against Influenza A (H3N2): ○ Medically attended acute respiratory illness ▪ 0.5–17 years: NVSN 55% (95% CI: 20–74%) ▪ ≥18 years: US Flu VE 54% (95% CI: 11–77%) • VE against influenza B: ○ Outpatient medically attended acute respiratory illness ▪ 0.5–17 years: NVSN 64% (95% CI: 47–75%), US Flu VE 89% (95% CI: 70–97%), VISION 79% (95% CI: 71–85%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
				▪ ≥18 year: US Flu VE 78% (95% CI: 57–90%), VISION 78% (95% CI: 74–81%) ▪ 18–64 years: US Flu VE 75% (95% CI: 50–89%), VISION 79% (95% CI: 75–82%) ▪ ≥65 years: VISION 69% (95% CI: 51–80%) ○ Hospitalization ▪ ≥18 years: VISION 60% (95% CI: 30–77%) ▪ 18–64 years: VISION 50% (95% CI: 5–74%)
Frutos 2025 (4)	• Population studied ○ General population (all ages) ○ Older adults (aged ≥65 years) ○ Children and adolescents aged 6 months to 17 years • Type of vaccine ○ Trivalent inactivated influenza vaccine (IIV3) ○ Trivalent live attenuated vaccine (LAIV3) ○ Other (trivalent recombinant influenza vaccine) • Comparator ○ Unvaccinated individuals • Testing ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Medically attended acute respiratory illness ○ Hospitalization • Timeframe (specimens collected) ○ End of season 2024/25 (between 1 October 2024 and 31 March 2025)	Type of publication: Peer reviewed Study design: Test-negative case-control Analysis: Multivariable logistic regression adjusted for geographic region, age, calendar time of illness was used; VE was calculated using the following equation: VE = (1 – adjusted odds ratio) x 100% Setting and country: Four CDC-affiliated vaccine effectiveness networks (Investigating Respiratory Viruses in the Acutely Ill Network (IVY); New Vaccine Surveillance Network (NVSN); U.S. Flu Vaccine Effectiveness (U.S. Flu VE); Virtual SARS-CoV-2, Influenza, and Other respiratory viruses Network (VISION)) in the United States	• 3,175 adult participants were included from the IVY network • 4,611 participants <18 years were included from NVSN; 2,969 were outpatients and 1,642 were hospitalized • 3,344 participants were included from the U.S. Flu VE network; 1,134 were <18 years and 2,210 were adults • 139,558 outpatients were included from the VISION network; 36, 919 were patients <18 years and 102,639 were adults • 32,671 hospitalized patients were included from the VISION network; 1,638 were <18 years and 31,033 were adults • Among control patients <18 years proportion of outpatients vaccinated against influenza ranged from 22% in the VISION network to 34% in the NVSN network; in hospitalized patients 27% (VISION) to 40% (NVSN) were vaccinated • Among adult controls 34% of outpatients were vaccinated against influenza; 35% (IVY) to 39% (VISION) of	• Influenza VE against medically attended influenza infection in outpatients by network: ○ VISION: 56% (95% CI: 54–58%) ○ U.S. Flu VE: 42% (95% CI: 29–54%) • VE against medically attended influenza infection in outpatients <18 years old by network: ○ NVSN: 59% (95% CI: 47–68%) ○ U.S. Flu VE: 32% (95% CI: 1–54%) ○ VISION: 60% (95% CI: 56–63%) • VE against influenza hospitalization in patients <18 years old by network: ○ NVSN: 63% (95% CI: 41–76%) ○ VISION: 78% (95% CI: 60–89%) • VE against medically attended outpatient influenza A(H1N1)pdm09 infection in patients <18 years by network: ○ NVSN: 72% (95% CI: 59–81%) ○ U.S. Flu VE: 53% (95% CI: 3–79%) • VE against influenza A(H1N1)pdm09 hospitalization in patients <18 years in the NVSN network: 63% (95% CI: 30–81%) • VE against medically attended outpatient influenza A(H3N2) infection in patients <18 years by network: ○ NVSN: 42% (95% CI: 19–58%) ○ U.S. Flu VE: 16% (95% CI: –34–49%) • VE against influenza A(H3N2) hospitalization in patients <18 years in the NVSN network: 55% (95% CI: 14–77%) • VE against medically attended outpatient influenza infection in adults by network: ○ U.S. Flu VE: 36% (95% CI: 16–51%) ○ VISION: 54% (95% CI: 52–56%) • VE against influenza hospitalization in adults by network: ○ IVY: 41% (95% CI: 28–52%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
			hospitalized patients were vaccinated • Among controls 65 years or older 54% (VISION) to 59% (U.S. Flu VE) of outpatients were vaccinated against influenza; 45% (IVY) to 46% (VISION) of hospitalized patients were vaccinated	○ VISION: 55% (95% CI: 51–59%) • VE against medically attended outpatient influenza A(H1N1)pdm09 infection in adults in the U.S. Flu VE network: 42% (95% CI: 8–64%) • VE against influenza A(H1N1)pdm09 hospitalization in adults in the IVY network: 39% (95% CI: –14–67%) • VE against medically attended outpatient influenza A(H3N2) infection in adults in the U.S. Flu VE network: 25% (95% CI: –6–48%) • VE against influenza A(H3N2) hospitalization in adult patients in the IVY network: 51% (95% CI: 22–69%) • VE against medically attended outpatient influenza in adults aged 18–64 years by network: ○ U.S. Flu VE: 37% (95% CI: 16–53%) ○ VISION: 56% (95% CI: 53–58%) • VE against influenza hospitalization in adults aged 18–64 years by network: ○ IVY: 48% (95% CI: 28–63%) ○ VISION: 51% (95% CI: 41–59%) • VE against medically attended outpatient influenza infection in adults aged ≥65 years by network: ○ U.S. Flu VE: 18% (95% CI: –69–60%) ○ VISION: 51% (95% CI: 47–54%) • VE against influenza hospitalization in adults aged ≥65 years by network: ○ IVY: 38% (95% CI: 19–52%) ○ VISION: 57% (595% CI: 52–61%)
Maurel 2024 (5)	• Population studied ○ General population (all ages) ○ Older adults (aged ≥65 years) ○ Children and adolescents aged 6 months to 17 years • Type of vaccine ○ Quadrivalent • Comparator ○ Unvaccinated individuals • Testing ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Vaccine effectiveness	Type of publication: Peer reviewed Study design: Test-negative design Analysis: VE was estimated using multivariate logistic regression models, adjusted for sex, age, presence of chronic conditions, and onset date Setting and country: Europe	• A total of 12,036 patients were collected between September 2024 to January 2024 • Random influenza virus positive specimens were collected at eight primary care centres and three hospitals • In hospitals, 40% (1,595/3,978) of controls, 39% of A(H1N1), and 57% of A(H3N2) were vaccinated • For the control population, the percentage of controls were	• Overall VE against influenza A: ○ Medically attended acute respiratory illness ▪ All ages: 51% (95% CI: 41–59%) ▪ 0–17 years: 71% (95% CI: 55–82%) ▪ 18–64 years: 40% (95% CI: 22–55%) ▪ ≥65 years: 45% (95% CI: 22–62%) ○ Hospitalization ▪ All ages: 38% (95% CI: 27–48%) ▪ 18–64 years: 53% (95% CI: 31–68%) ▪ ≥65 years: 36% (95% CI: 22–47%) • VE against influenza A (H1N1) pdm09: ○ Medically attended acute respiratory illness

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

	• Influenza-related outcome
	  ○ Medically attended acute respiratory illness (primary care)
	  ○ Hospitalization
	• Timeframe (specimens collected)
	  ○ Mid-season 2023/24 (between 1 September 2023 and January 2024)
			64% for hospitals, 62% influenza A(H1N1) pdm09, and 75% A(H3N2)
			• The study used various types of quadrivalent influenza vaccines, with the majority (73%) being standard dose, egg-propagated, inactivated vaccines, while smaller proportions were high-dose (12%), cell-based (9%), adjuvanted (5%), or live attenuated vaccines (1%)
				▪ All ages: 53% (95% CI: 41–63%)
				▪ 0–17 years: 85% (95% CI: 71–93%)
				▪ 18–64 years: 40% (95% CI: 17–57%)
				▪ ≥65 years: 41% (95% CI: 8–62%)
				○ Hospitalization
				▪ All ages: 44% (95% CI: 30–55%)
				▪ 18–64 years: 59% (95% CI: 30–77%)
				▪ ≥65 years: 41% (95% CI: 23–54%)
				• VE against influenza A (H3N2):
				○ Medically attended acute respiratory illness
				▪ All ages: 30% (95% CI: –3–54%)
				▪ 18–64 years: 35% (95% CI: –13–65%)
				○ Hospitalization
				▪ All ages: 14% (95% CI: –32–43%)
				▪ ≥65 years: 13% (95% CI: –42–45%)
				• All age influenza vaccine effectiveness against medically attended acute respiratory illness was 53% (95% CI: –7 – 78%) for clade 5a.2a and 39% (95% CI: –44–74%) for 5a.2a.1

Whitaker 2024 (6)	• Population studied
	  ○ ≥ 2 years old
	• Type of vaccine
	  ○ All vaccines were quadrivalent
	  ○ Live-attenuated influenza vaccine (LAIV, for ages 2–17) via nasal spray
	  ○ Quadrivalent cell-based vaccine (QIVc for ages 18–64 years)
	  ○ Adjuvanted egg-based vaccine (QIVe for ages 65 years and older)
	• Comparator
	  ○ Unvaccinated individuals
	• Testing
	  ○ Not specified
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Medically attended acute respiratory illness (primary care)
	  ○ Hospitalization
	• Timeframe (specimens collected)
		Type of publication:
		Peer reviewed
		
		Study design: Test-negative case-control
		
		Analysis: VE was estimated using multivariate logistic regression models, adjusted for age, region, clinical risk status, sex, calendar time as week, setting (community or hospital), and deprivation quintile
		
		Setting and country: Three sites in the U.K., including England, Scotland, and Wales (GB-PC study), England (EN-H), and Scotland (SC-H)
			• The GB-PC study included 1,193 case and 12,098 controls for A(H1N1) pdm09, A(H3N2), influenza A (untyped), influenza B, and dual infections
			• The EN-H study included 1,359 cases and 22,539 controls with cases of influenza A (untyped), influenza B, and dual infections
			• The SC-H study included 1,977 cases and 34,476 controls with influenza A (untyped), influenza A(H1N1) pdm09, influenza A(H3N2), and influenza B
			• 96% of controls between ages 2 and 17 years had live-attenuated influenza vaccine (remaining had quadrivalent)
				• VE against all influenza (A and B):
				○ Medically attended ARI (GB-PC)
				▪ 2–17 years: 65% (95% CI: 41–79%)
				▪ 18–64 years: 55% (95% CI: 43–65%)
				▪ ≥65 years: 55% (95% CI: 32–70%)
				○ Hospitalization (EN-H)
				▪ 2–17 years: 63% (95% CI: 46–75%)
				▪ 18–64 years: 36% (95% CI: 20–49%)
				▪ ≥65years: 40% (95% CI: 29–50%)
				○ Hospitalization (SC-H)
				▪ 2–17 years: 65% (95% CI: 52–74%)
				▪ 18–64 years: 55% (95% CI: 43–65%)
				▪ ≥65years: 53% (95% CI: 44–61%)
				• VE against Influenza A(H1N1) pdm09:
				○ Medically attended ARI (GB-PC)
				▪ 2–17 years: 65% (95% CI: 23–84%)
				▪ 18–64 years: 62% (95% CI: 46–74%)
				▪ ≥65 years: 66% (95% CI: 35–82%)
				○ Hospitalization (EN-H)
				▪ 18–64 years: 36% (95% CI: 20–49%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
	• Mid-season 2023/24 (between 4 September 2023 and 28 January 2024)		• 86–97% of controls aged 18–64 years received quadrivalent cell-based vaccine • 96–99% of controls aged 65 years and older received adjuvanted egg-based vaccine	▪ ≥65years: 60% (95% CI: 17–81%) ○ Hospitalization (SC-H) ▪ 2–17 years: 71% (95% CI: 44–85%) ▪ 18–64 years: 64% (95% CI: 22–83%) ▪ ≥65 years: 61% (95% CI: 30–79%) • VE against Influenza A(H3N2): ○ Medically attended ARI (GB-PC) ▪ 2–17 years: 59% (95% CI: 18–79%) ▪ 18–64 years: 49% (95% CI: 26–65%) ▪ ≥65 years: 44% (95% CI: –3–70%) ○ Hospitalization (EN-H) ▪ 2–17 years: 80% (95% CI: 43–93%) ▪ 18–64 years: -3% (95% CI: –50–29%) ▪ ≥65 years: 39% (95% CI: 15–56%) ○ Hospitalization (SC-H) ▪ 2–17 years: 64% (95% CI: 24–83%) ▪ 18–64 years: 74% (95% CI: –1–72%) ▪ ≥65 years: 63% (95% CI: 37–78%)
Zhu 2024 (7)	• Population studied ○ General population (all ages) • Type of vaccine ○ For adults aged ≥65 years, high-dose, adjuvanted, or recombinant influenza • Comparator ○ Unvaccinated individuals • Testing ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Infection (data from various healthcare settings (e.g., outpatient, inpatient, or intensive care unit) • Timeframe (specimens collected) ○ Mid-season 2023/24 (between 1 October 2023 and 31 January 2024)	Type of publication: Published study Study design: Test-negative case-control Analysis: Interim VE against influenza was estimated by comparing the odds of vaccination amongst patients who received a positive influenza laboratory-confirmed test result (case patients) and patients who received a negative influenza test result (control patients); a mixed effects logistic regression model was used and adjusted for age, race, and ethnicity Setting and country: California, United States	• The study analyzed 678,422 individuals aged ≥6 months in California who underwent influenza testing between October 2023 and January 2024, with 11.4% testing positive for influenza • The intervention was 2023/24 seasonal influenza vaccination, received by 28.1% of the study population, with 88.8% of vaccinated adults aged ≥65 years receiving a high-dose, adjuvanted, or recombinant vaccine	• VE against influenza A and B: ○ All ages: 45% (95% CI: 44–46%) ○ <18 years: 56% (95% CI: 54–57%) ○ 18–49 years: 48% (95% CI: 46–50%) ○ 50–64 years: 36% (95% CI: 33–39%) ○ ≥65 years: 30% (95% CI: 27–33%) • VE against influenza A: ○ All ages 42% (95% CI: 41–43%) ○ <18 years: 52% (95% CI: 51–53%) ○ 18–49 years: 44% (95% CI: 42–46%) ○ 50–64 years: 35% (95% CI: 32–38%) ○ ≥65 years: 29% (95% CI: 26–32%) • VE against influenza B: ○ All ages 76% (95% CI: 73–78%) ○ <18 years: 79% (95% CI: 76–82%) ○ 18–49 years: 75% (95% CI: 71–75%) ○ 50–64 years: 67% (95% CI: 55–76%) ○ ≥65 years: 54% (95% CI: 34–67%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

Smolarchuk 2024 (8)	• Population studied
	  ○ General population (all ages)
	• Type of vaccine
	  ○ Not specified
	• Comparator
	  ○ Unvaccinated individuals
	• Testing
	  ○ Nucleic acid testing (RT-PCR)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Medically attended acute respiratory illness
	• Timeframe (specimens collected)
	• Early season 2023/24 (between 1 October 2023 and 31 December 2023)
		Type of publication: Rapid communication
		
		Study design: Test-negative case-control
		
		Analysis: VE by influenza type and age group was estimated using multivariate logistic regression models, adjusted for age, gender, calendar time, hospitalization status, and presence of comorbidities
		
		Setting and country: Alberta, Canada
			• The study included 38,136 patients across all age groups (6 months to 65+ years) who presented to physicians in Alberta, Canada with ILI between 29 October 2023 and 30 December 2023 with 8,325, 310, and 312 patients testing positive for influenza A(H_1N_1) pdm09, influenza A(H_3N_2), and influenza B, respectively	• VE by influenza type:
				  ○ Influenza A(H_1N_1) pdm09: 61% (95% CI: 58–64%)
				  ○ Influenza A(H_3N_2): 49% (95% CI: 28–63%)
				  ○ Influenza B: 75% (95% CI: 58–85%v)
				• VE by age group for influenza A(H_1N_1) pdm09:
				  ○ 6 months–9 years: 74% (95%CI: 66–79%)
				  ○ 10–19 years: 62% (95% CI: 32–78%)
				  ○ 20–64 years: 62% (95% CI: 57–67%)
				  ○ ≥65 years: 57% (95% CI: 52–61%)

Pérez-Gimeno 2024 (9)	• Population studied
	  ○ Children aged 6 to 59 months
	• Type of vaccine
	  ○ Quadrivalent
	  ▪ inactivated influenza vaccine (IIV4)
	  ▪ Intranasal live attenuated egg-based vaccine
	• Comparator
	  ○ Unvaccinated individuals
	• Testing
	  ○ Nucleic acid testing (RT-PCR)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Acute respiratory infections (ARI) in primary care (medically attended acute respiratory illness)
	  ○ Hospitalization
	• Timeframe (specimens collected)
	  ○ End of season 2023/24 (September 2023–June 2024)
		Study design: Test-negative case-control
		
		Analysis: VE was estimated by comparing the odds of vaccination between influenza cases and controls using logistic regression and Firth's method; estimates were adjusted for sex, age, week, chronic conditions, and region/hospital for both ARI and severe acute respiratory illness (SARI) models; VE was additionally estimated by influenza virus type, subtype, and clade
		
		Setting and country: Primary care (PC) and 27 hospitals in 12 regions of Spain
			• 1,666 patients with ARI in PC (n=1,364) or SARI in hospital (n=302); 292 patients tested positive for influenza (244 outpatient, 48 in hospital)
			• 33.2% of ARI patients and 33.1% of SARI patients had received a seasonal influenza vaccination
				• VE for ARI patients in PC:
				  ○ Against any influenza type: 70% (95% CI: 51–81%)
				  ○ Against A(H1N1)pdm09: 77% (95% CI: 56–88%)
				  ○ Against A(H3N2): 18% (95% CI: –97–65%)
				  ○ Against clade 5a.2a(H1N1): 96% (95% CI: 23–100%)
				  ○ Against 5a.2a.1 (H1N1): 49% (95% CI: –184–91%)
				  ○ Against 2a.3a.1 (H3N2): –116% (95% CI: –824–50%)
				• VE for SARI patients in hospital:
				  ○ Against any influenza type: 77% (95% CI: 21–93%)
				  ○ Against A(H1N1)pdm09: 75% (95% CI: –68–96%)
				  ○ Against A(H3N2): –3% (95% CI: –563–84%)

Shinjoh 2024 (10)	• Population studied
	  ○ Children and adolescents aged 6 months to 15 years
		Study design: Test-negative case-control	• 1,832 participants with fever were recruited from hospitals and outpatient clinics from	• VE by for influenza A:
				  ○ In hospitalized cases (6 months–15 years): 51% (95% CI: 23–69%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

	• Type of vaccine
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	• Comparator
	  ○ Unvaccinated individuals
	• Testing
	  ○ Nucleic acid testing (RT-PCR)
	  ○ Rapid influenza diagnostic tests
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Outpatients (medically attended acute respiratory illness)
	  ○ Inpatients (hospitalization)
	• Timeframe (specimens collected)
	• End of season 2023/24 (between 1 November 2023 and 31 March 2024)
		Analysis: VE was estimated using an adjusted odds ratio formula and adjusted for sex, age, comorbidity, area, month of onset, and diagnostic methods; VE was additionally estimated by age, presence of underlying disease, one dose vs. two dose regimen, influenza strain, and method of testing
		
		Setting and country: Hospitals in Japan (17 sites for hospitalized patients, two sites for outpatients)
			November 2023 to March 2024; 1,596 (20.4% positive) were involved in influenza A analysis, and 1,497 (15.1% positive) were involved in influenza B analysis
			• 35.8% of cases in the influenza A analysis were vaccinated with IIV4 against influenza; 36.2% of cases in the Influenza B analysis were vaccinated with IIV4 against influenza
				▪ In age 1–2 years: 54% (95% CI: 1–79%)
				▪ In age 6–12 years: 59% (95% CI: 6–82%)
				▪ Without underlying disease 58% (95% CI: 30–75%)
				▪ For one vaccine dose compared with none (6–12 months) 52% (95% CI: 4–76%)
				▪ For two vaccine doses compared with none (6–12 months) 47% (95% CI: 9–69%)
				○ In outpatient cases (6 months–15 years): 54% (95% CI: 27–71%)
				▪ In age 1–2: 81% (95% CI: 5–96%)
				▪ In age 3–5: 89% (95% CI: 60–97%)
				▪ Without underlying disease 69% (95% CI: 43–84%)
				▪ For one vaccine dose compared with none (6–12 months): 52% (95% CI: 2–77%)
				▪ For two vaccine doses compared with none (6–12 months): 59% (95% CI: 25–77%)
				• VE for influenza B:
				○ In hospitalized cases (6 months–15 years): 60% (95% CI: 22–79%)
				▪ In age 6–12: 62% (95% CI: 11–84%)
				▪ With underlying disease: 90% (95% CI: 53–98%)
				▪ For two vaccine doses compared with none (6–12 months): 60% (95% CI: 15–81%)
				○ In outpatient cases (6 months–15 years): 56% (95% CI: 26–74%)
				▪ In age 3–5: 97% (95% CI: 67–100%)
				▪ In age 13–15: 87% (95% CI: 19–98%)
				▪ Without underlying disease: 53% (95% CI: 13–75%)
				○ For two vaccine doses compared with one (6–12 months old): 74% (95% CI: 10–93%)

Mi 2024 (11)	• Population studied
	  ○ General population (all ages)
	  ○ Older adults (aged ≥65 years)
	  ○ Children and adolescents aged 6 months to 17 years
	• Type of vaccine
	  ○ Not specified
	• Comparator
	  ○ Unvaccinated individuals
		Study design: Test-negative case-control
		
		Analysis: VE by influenza type and age group using Bayesian logistic regression models, adjusted for age, gender, ethnicity, calendar year, and time interval
			• The study included 1,094 patients across all age groups (6 months and older) in four sentinel hospitals across three cities in Ili, Xinjiang China between 1 January to 7 April 2024; during this period, five to 50 nasopharyngeal specimens were randomly	• Overall VE against any influenza (A or B) infection: 54.7% (95% CI: 23.7–73.1%)
				• VE by influenza type:
				○ Influenza A: 62.3% (95% CI: 29.3–79.8%)
				○ Influenza B: 51.2% (95% CI: 28.7–83.0)
				• VE against any influenza (A or B) stratified by age group:
				○ 6 months–6 years: 63.1% (95% CI: 33.2–79.6)
				○ 7–17 years: –23.0% (95% CI: –56.0–34.8)
				○ 18–59 years: 60.0% (95% CI: 25.5–78.5)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

	• Testing
	  ○ Laboratory test (using nasal or nasopharyngeal specimens)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Infection
	• Timeframe (specimens collected)
	• End of season 2023/24 (between 1 January 2024 and 7 April 2024)
		Setting and country: Ili, Xinjiang, China	collected weekly from hospital outpatients and laboratory tested for influenza virus, with 87 patients (7.95%) testing positive mainly for influenza B, seven (8.0%) of which were vaccinated	• VE against influenza A by age group:
				  ○ 6 months–6 years: 38.8% (95% CI: –14.8–67.4)
				• VE against influenza B by age group:
				  ○ 6 months–6 years: 80.0% (95% CI: 62.6–89.2)
				  ○ 7–17 years: –7.9% (95% CI: –62.2–38.4)
				  ○ 18–59 years: 50.2% (95% CI: 7.3–73.2)

Domnich 2024 (12)	• Population studied
	  ○ Adults (aged ≥18 years)
	  ○ Older adults (aged ≥65 years)
	• Type of vaccine
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	• Comparator
	  ○ Unvaccinated
	• Testing
	  ○ Nucleic acid testing (RT-PCR)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Inpatient (hospitalization)
	• Timeframe (specimens collected)
	• End of season 2023/24 (between 15 October 2023 and 15 April 2024)
		Study design: Test-negative case-control study
		
		Analysis: VE was measured using logistic regression modeling, adjusted for age, sex, previous season vaccination, calendar week, and presence of comorbidities
		
		Setting and country: Hospital, Genoa, Italy
			• 1,664 patients ages 18 years and older at the San Martino Hospital were included in the study where they were tested (RT-PCR) for influenza infection within five days of hospital referral; inactivated influenza vaccine (IIV4) exposure was determined by linkage to the local vaccination registry; 114 patients tested positive for influenza (mostly influenza A(H1N1)pdm09) and were considered as cases	• VE against influenza type A:
				  ○ for older adults (aged ≥65 years): 50.6% (95% CI: 7.7–73.6%)
				  ○ for adults aged ≥18 years: 40% (95% CI: –5–66%)
				• VE against influenza A(H1N1)pdm09:
				  ○ for older adults (aged ≥65 years): 48.7% (95% CI: 1.9–73.2%)
				  ○ for adults aged ≥18 years: 35% (95% CI: –17–63)%
				• VE against influenza by vaccine type in older adults (aged ≥65 years):
				  ○ High-dose vaccine (HD-IIV4): 58% effective (95% CI: 1–82%)
				  ○ Adjuvanted vaccine (aIIV4): 56% effective (95% CI: –22–84%)
				  ○ Standard egg-based vaccine (eIIV4): <25% effective

Gào 2024 (13)	• Population studied
	  ○ General population (all ages)
	• Type of vaccine
	  ○ Trivalent inactivated influenza vaccine (IIV3)
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	  ○ Trivalent live attenuated vaccine (LAIV3)
	• Comparator
	  ○ Unvaccinated individuals
	• Testing
	  ○ Antigen
	  ○ Nucleic acid testing (RT-PCR)
		Study design: Test-negative case-control
		
		Analysis: VE by influenza type and age group was estimated using multivariate logistic regression models, adjusted for age, gender, calendar month of specimen collection, hospitalization status, and presence of comorbidities
			• Among 205,028 participants (aged ≥6 months) who presented with ILI in Yinzhou, southern China between September 2023 and March 2024, 13.4% of test-negative controls and 7.6% of test-positive cases had received any type of influenza vaccine (IIV3, IIV4, or LAIV3) at least 14 days before specimen collection	• VE against any influenza cases (A and B):
				  ○ All ages: 49.4% (95% CI: 47.8–50.9%)
				  ○ 6 months – 6 years: 45.8% (95% CI: 42.6–48.9%)
				  ○ 7–17 years: 38.6% (95% CI: 35.7–41.5%)
				  ○ 18–64 years: 46.7% (95% CI: 36.8–55%)
				  ○ ≥65 years: 46.1% (95% CI: 33.7–48.7%)
				  ○ Inpatient (hospitalization): 46.5% (95% CI: 35.4–55.8%)
				  ○ Outpatient and emergency: 49.7% (95% CI: 48.1–51.2%)
				• VE against influenza A:
				  ○ All ages: 41.9% (95% CI: 39.8–44.0%)
				  ○ 6 months–6 years: 38.7% (95% CI: 34.6–42.6%)
				  ○ 7–17 years: 33.2% (95% CI: 29.4–36.8%)
				  ○ 18–64 years: 42.9% (95% CI: 32.6–51.5%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Infection (outpatient and emergency, and inpatient)
	  ○ Inpatient (hospitalization)
	  ○ Outpatient and emergency (medically attended acute respiratory illness)
	• Timeframe (specimens collected)
	• End of season 2023/24 (between 4 September 2023 and 25 March 2024)
		Setting and country: Community and hospital, Yinzhou, China		○ ≥65 years: 40.4% (95% CI: 33.5–46.7%)
				○ Inpatient (hospitalization): 39.8 (25.8–51.1)
				○ Outpatient and emergency: 42.1% (95% CI: 40.0–44.2)
				• VE against influenza B:
				○ All ages: 59.9% (95% CI: 57.9–61.9%)
				○ 6 months–6 years: 61.0% (95% CI: 57.0–64.6%)
				○ 7–17 years: 48.4% (95% CI: 44.7–51.9%)
				○ 18–64 years: 67.3% (95% CI: 58.7–74.1%)
				○ ≥65 years: 62.6% (95% CI: 54.1–69.5%)
				○ Hospitalization: 60.5% (95% CI: 42.1–73.1%)
				○ Outpatient and emergency: 59.7% (95% CI: 57.6–61.7%)

Zeno 2024 (14)	• Population studied
	  ○ Older adults (aged ≥65 years for Argentina, Chile, and Uruguay; ≥60 years for Brazil and Paraguay)
	  ○ Children and adolescents (6 months–2 years in Argentina, 6 months–3 years in Paraguay, 6 months–5 years in Chile and Uruguay, 6 months–6 years in Brazil)
	• Type of vaccine
	  ○ Trivalent inactivated influenza vaccine (IIV3)
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	• Comparator
	  ○ Unvaccinated individuals
	• Testing
	  ○ Nucleic acid testing (RT-PCR)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Hospitalization
	• Timeframe (specimens collected)
	• End of season 2023/24 (between 13 March 2024 and 19 July 2024 – Southern hemisphere flu season)
		Study design: Test-negative case-control study
		
		Analysis: Interim VE was measured by comparing the odds of influenza vaccination between case patients and control patients using multivariable logistic regression, adjusted for sex, age, country, week of symptom onset, and presence of at least one comorbidity
		
		Setting and country: Hospitals in Argentina, Brazil, Chile, Paraguay, and Uruguay
			• In this study, 11,751 patients (all age groups) with SARI from 2,535 hospitals in the target countries were identified through the SARInet Plus between 13 March 2024 and 19 July 2024 and tested for influenza using RT-PCR testing; VE against influenza-associated hospitalization was measured by comparing patients who tested positive for influenza (case patients) with patients who tested negative (control patients) for influenza and SARS-CoV-2; trivalent vaccines containing antigens were used in Argentina, Brazil, Chile, and Uruguay while quadrivalent vaccines were used in Paraguay during each country's vaccination campaign	• VE against any influenza (A or B) by age group:
				○ Overall: 34.5% (95% CI: 26.4– 41.6)%
				○ 6 months–6 years: 39.0 (95% CI: 25.6–50.0%)
				○ 60+ years: 31.2% (95% CI: 18.3, 42.0%)
				○ Comorbidities: 58.7% (95% CI: 43.4–69.8%)
				• VE against influenza A by age group:
				○ Overall: 34.2% (95% CI: 26.0–41.4%)
				○ 6 months–6 years: 38.1 (95% CI: 24.4–49.2%)
				○ 60+ years: 31.4% (95% CI: 18.5–42.2%)
				○ Comorbidities: 58.3% (95% CI: 42.6–69.7%)
				• VE against influenza A(H3N2) by age group:
				○ Overall: 36.5% (95% CI: 25.8–45.7%)
				○ 6 months–6 years: 38.4% (95% CI: 17.3–54.1%)
				○ 60+ years: 30.8% (95% CI: 14.4,–44.0%)
				○ Comorbidities: 67.4% (95% CI: 49.3–79.0%)
				• VE against Influenza A(H1N1)pdm09 by age group:
				○ Overall: 37.1% (95% CI: 21.9–49.4%)
				○ 6 months–6 years: 27.8% (95% CI: 5.1–45.0%)
				○ 60+ years: 30.8% (95% CI: 14.4,–44.0%)
				○ Comorbidities: 57.6% (95% CI: 19.1–77.8%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

Skowronski 2024 (15)	• Population studied
	  ○ General population (all ages)
	• Type of vaccine
	  ○ Trivalent inactivated influenza vaccine (IIV3)
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	• Comparator
	  ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons)
	• Testing
	  ○ Nucleic acid testing (RT-PCR)
	  ○ Multiplex assays
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Medically attended acute respiratory illness
	  ○ Influenza-like illness (ILI)
	• Timeframe (specimens collected)
	  ○ Mid-season 2023/24 (between 1 October 2023 and 31 January 2024)
		Study design: Test-negative case-control
		
		Analysis: VE was calculated using the formula 1 – OR x 100%, adjusted for age group, province, and calendar time; Firth's penalized logistic regression was additionally used
		
		Setting and country: Community-based sentinel practitioners in Alberta, British Columbia, Ontario, and Quebec, Canada
			• 3,139 specimens were eligible for inclusion; 766 (24%) tested positive for influenza
			• 3,095 participants were included in the influenza A analysis: 722 (23%) tested positive for influenza A; 823 (27%) were vaccinated against influenza; 115 (16%) vaccinated individuals tested positive for influenza A; and the remaining 708 (30%) were influenza controls
				• VE against medically attended ARI type influenza A: 59% (95% CI: 48–68%)
				  ○ Age 1–19 years old: 60% (95% CI: 34–76%)
				  ○ Age 20–64 years old: 54% (95% CI: 38–66%)
				  ○ Age ≥ 65 years old: 70% (95% CI: 48–83%)
				• VE against medically attended ARI type influenza A(H_1N_1)pdm09: 63% (95% CI: 51–72%)
				  ○ By clade:
				  ▪ Vaccine-matched clade 5a.2a.1: 56% (95% CI: 33–71%)
				  ▪ Alternate clade 5a.2a: 67% (95% CI: 48–80%)
				  ○ By age:
				  ▪ 1–19 years old: 68% (95% CI: 42–83%)
				  ▪ 20–64 years old: 56% (95% CI: 38–69%)
				  ▪ ≥65 years old: 72% (95% CI: 47–85%)
				• VE against medically attended ARI type influenza A(H_3N_2): 40% (95% CI: 5–61%)
				• VE against ILI by influenza type:
				  ○ Influenza A: 58% (95% CI: 45–67%)
				  ○ Influenza A(H_1N_1)pdm09: 61% (95% CI: 47–71%)
				  ○ Influenza A(H_3N_2): 46% (95% CI: 11–67%)
				• VE estimates in patients ≥12 years old in BC, Ontario, and Quebec against medically attended ARI
				  ○ Against influenza A: 59% (95% CI: 45–69%)
				  ○ Against influenza A(H_1N_1)pdm09: 63% (95% CI: 48–74%)
				  ▪ Clade 5a.2a.1: 51% (95% CI: 18–71%)
				  ▪ Clade 5a.2a: 73% (95% CI: 48–86%)
				  ○ Against influenza A(H_3N_2): 44% (95% CI: 5–67%)

Rigamonti 2025 (16)	• Population studied
	  ○ Other (Children and adolescents aged two years to 14 years)
	• Type of vaccine
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	  ○ Other (quadrivalent live attenuated influenza vaccine (LAIV-4))
	• Comparator
	  ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons)
	• Testing
	  ○ Antigen
		Study design: Retrospective observational cohort
		
		Analysis: Mixed-effect Cox proportional-hazards model with VE calculated as VE = (1 – HR) x 100, which was adjusted for covariates (sex, age at the start of each influenza season, Italian region of birth, deprivation index, influenza vaccination status, number of influenza/ILI episodes, antibiotic therapies, primary care visits, and comorbidities)
			• A total of 65,545 (472,173 person-months) children were included in the study for the 2022/23 season and 72,377 (527,348 person-months) children were included in the study for the 2023/24 influenza season
			• 125,142 children were unvaccinated, 5,270 were exposed to LAIV-4, and 7,510 were exposed to IIV
			• A total of 6,003 (12.71 per 1,000 person-months) and
				• VE against ILI (LAIV-4): 43% (95% CI: 32–53%)
				  ○ 2022–2023 season: 38% (95% CI: 12–56%)
				  ○ 2023–2024 season: 40% (95% CI: 25–52%)
				• VE against ILI (IIV): 54% (95% CI: 46–61%)
				  ○ 2022–2023 season: 49% (95% CI: 37–58%)
				  ○ 2023–2024 season: 58% (95% CI: 44–68%)
				• VE against ILI (aged two to five years)
				  ○ LAIV-4: 46% (95% CI: 32–57%)
				  ○ IIV: 55% (95% CI: 43–64%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Pedianet pediatric primary care (medically attended influenza infection)
	• Timeframe (specimens collected)
	  ○ Other (1 September 2022 to 30 April 2023; 1 September 2023 to 30 April 2024)
		Setting and country: Primary care settings, Italy	6,777 (12.85 per 1,000 person months) children were vaccinated for influenza in the 2022/23 and 2023/24 seasons, respectively.	

Lee 2024 (17)	• Population studied
	  ○ Other (children aged 9 months to 17 years)
	• Type of vaccine
	  ○ Trivalent inactivated influenza vaccine (IIV3)
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	  ○ Other (quadrivalent live attenuated vaccine)
	• Comparator
	  ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons)
	• Testing
	  ○ Other (multiplex PCR assay)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Hospitalization
	• Timeframe (specimens collected)
	  ○ Other (16 November 2023 to 12 June 2024)
		Study design: Test-negative
		
		Analysis: VE was estimated as (1 – OR) x 100 among vaccinated vs. unvaccinated persons from logistic regression models, and adjusted for covariates (age, sex, prior year's vaccination status, and presence of underlying conditions)
		
		Setting and country: Queen Mary Hospital on Hong Kong Island and Princess Margaret Hospital in Kowloon, Hong Kong
			• 4,367 children aged 9 months to 17 years, 709 (16 %) tested positive for influenza
			• There were 2,311 children who reported receipt of influenza vaccination, including 2,247 (97 %) who received quadrivalent inactivated influenza, vaccine and 51 (2 %) that received quadrivalent live attenuated vaccine
			• Of the remaining 13 children, 8 received a trivalent vaccine and 5 received an unknown vaccination type
				• VE against hospitalization by age, influenza A(H3N2) (November 2023 to March 2024)
				  ○ Overall: 55.4 % (95% CI: 29.6–71.8%)
				  ○ Age 9 months–3 years: 60.3% (95% CI: 13.0–81.9%)
				  ○ Age 4–8 years: 55.9% (95% CI: 13.9–77.4%)
				  ○ Age 9–17 years: 27.0% (95% CI: –149.5–78.7%)
				• VE against hospitalization by age, influenza A(H1N1) (February to June 2024):
				  ○ Overall: 54.4% (95% CI: 33.4–68.8%)
				  ○ Age 9 months–3 years: 60.1% (95% CI: 31.8–76.6%)
				  ○ Age 4–8 years: 66.2% (95% CI: 34.6–82.5%)
				  ○ Age 9–17 years: 26.2% (95% CI: –39.0–60.8%)
				• VE against hospitalization by age, influenza B (November 2023 to June 2024)
				  ○ Overall: 66.1% (95% CI: 42.2–80.1%)
				  ○ Age 9 months–3 years: 84.1% (95% CI: 45.8–95.3%)
				  ○ Age 4–8 years: 58.2% (95% CI: –2.1–82.9%)
				  ○ Age 9–17 years: 44.7% (95% CI: –62.4–81.2%)

Yaron 2025 (18)	• Population studied
	  ○ Older adults (aged ≥65 years)
	• Type of vaccine
	  ○ Trivalent inactivated influenza vaccine (IIV3)
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
		Study design: Retrospective cohort
		
		Analysis: To calculate vaccine effectiveness using a 1:1 matching analysis
			• 8,063 participants received the high dose vaccine in the 2023/24 season and were matched with 377,126 participants who received the standard dose vaccine in the 2023/24 season	• Relative vaccine effectiveness of high dose versus standard dose influenza vaccines against hospitalization:
				  ○ 2022–2023: 27% (95% CI: −12–61%)
				  ○ 2023–2024: 7% (95% CI: −36–42%)
				  ○ Combined effectiveness: 17% (95% CI: –14–41%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
	○ Trivalent live attenuated vaccine (LAIV3) ○ Other (high dose IIV3) • Comparator ○ If none of above, extract the information from the study • Testing • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Hospitalization • Timeframe (specimens collected) ○ Other (1 September 2023 to 1 April 2024)	Setting and country: Medical records from health clinic in Israel		
Gharpure 2025 (19)	• Population studied ○ General population (all ages) • Type of vaccine ○ Trivalent inactivated influenza vaccine (IIV3) ○ Quadrivalent inactivated influenza vaccine (IIV4) • Comparator ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons) • Testing ○ Nucleic acid testing RT-PCR • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Hospitalization ○ ICU admission • Timeframe (specimens collected) ○ Other (5 March 2023 to 27 November 2023)	Study design: Test-negative design Analysis: A logistic regression model adjusted for age group, sex, underlying conditions, and week of symptom onset was used; VE was calculated as (1 – OR) x 100% Setting and country: Hospitals in Argentina, Australia, Brazil, Chile, New Zealand, Paraguay, Thailand, and Uruguay	• Data was analyzed from 12,609 patients; 4,388 (34.8%) were influenza-positive and 8,221 (65.2%) were influenza-negative • 672 (15.3%) of cases and 2,858 (34.8%) of controls had received the influenza vaccine	• Vaccine effectiveness against hospitalization by influenza subtype: ○ Any influenza: 51.9% (95% CI: 37.2–66.7%) ○ Influenza A: 49.5% (95% CI: 36.5–62·5%) ○ Influenza A(H1N1)pdm09: 51.8% (95% CI: 39.0–64.6%) ○ Influenza A(H3N2) (with data from Australia only): 71.5% (95% CI: 47.7–84.4%) ○ Influenza B: 66.3% (95% CI: 40.7–91.9%) • Vaccine effectiveness against hospitalization by age: ○ Older adults age ≥65: 47.7% (95% CI: 24.9–70.5%) ○ Children age 1–4: 70.9% (95% CI: 47.5–94.4%) ○ Age 5–64 with underlying health conditions: 56.6% (95% CI: 46.2–67.1%) • Vaccine effectiveness against ICU admission by influenza type and country: ○ Any influenza: ▪ Australia 69.7% (95% CI: 45.3–83.3%) ▪ Chile: 67.7% (95% CI: 44.5–81.2%) ○ Influenza A: ▪ Australia: 66.2% (95% CI: 36.9–81.9%) ▪ Chile: 70.3% (95% CI: 45.4–83.8%) ○ Influenza A(H1N1)pdm09: ▪ Australia: 65.8% (95% CI: 25.6–84.2%) ▪ Chile: 68.5% (95% CI: 42.1–82.8%) ○ Influenza B: ▪ Australia: 83.2% (95% CI: 56.2–93.5%) ▪ Chile: 66.7% (95% CI: –13.3–90.2%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

Separovic 2025 (20)	• Population studied
	  ○ General population (all ages)
	• Type of vaccine
	  ○ Other (inactivated and egg-based)
	• Comparator
	  ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons)
	• Testing
	  ○ Nucleic acid testing RT-PCR
	  ○ Other (multiplex assays)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Medically attended acute respiratory illness
	• Timeframe (specimens collected)
	  ○ Mid-season 2024/25 (between 1 October 2024 and 31 January 2025)
		Study design: Test-negative design
		
		Analysis: No analysis section provided
		
		Setting and country: Community-based sentinel practitioners in Alberta, British Columbia, Ontario, and Quebec, Canada
			• 4,421 participants were included; 609 (14%) were positive for influenza A and 3,812 (86%) were controls
			• 1,004 (23%) of participants were vaccinated for influenza including 101 (17%) cases and 903 (24%) controls
				• Overall influenza A: VE of 54% (95% CI: 41–64%)
				• Influenza vaccine effectiveness against ARI with influenza A by age:
				  ○ 1–64 years: 53% (95% CI: 37–64%)
				  ○ ≥65 years: 59% (95% CI: 29–76%)
				• Adjusted vaccine effectiveness for A(H1N1) pdm09: 53% (95% CI: 36–65%) against ARI
				• Influenza vaccine effectiveness against ARI with Influenza A(H1N1)pdm09 by age:
				  ○ 1–64 years: 50% (95% CI: 31–65%)
				  ○ ≥65 years: 57% (95% CI: 16–78%)
				• Adjusted vaccine effectiveness for A(H3N2): 54% (95% CI: 29–70%) against ARI

Choi 2025 (21)	• Population studied
	  ○ Other (age ≥18 years)
	• Type of vaccine
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	• Comparator
	  ○ Unvaccinated for the current seasonal vaccine, but vaccinated in the previous season
	• Testing
	  ○ Antigen
	  ○ Nucleic acid testing (RT-PCR)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Infection
	  ○ Hospitalization
	  ○ ICU admission
	• Timeframe (specimens collected)
	  ○ Other (November 2023 to April 2024)
		Study design: Retrospective case-control
		
		Analysis: VE was calculated using logistic regression analysis adjusted for age, sex, and comorbidities
		
		Setting and country: Hospital-based influenza surveillance system in South Korea
			• 3,390 participants were included; 1,695 (50%) were influenza positive and 1,695 (50%) were influenza negative
			• 1,294 participants were vaccinated including 610 (36.0%) of the influenza-positive participants and 684 (40.4%) of the influenza-negative participants
				• Overall vaccine effectiveness against influenza infection was 24.3% (95% CI: 11.5–35.2%)
				  ○ Early period (November to December 2023): 21.5% (95% CI: 4.3–35.5%)
				  ○ Late period (January to April 2024): 28.1% (95% CI: 7.2–44.4%)
				• Effectiveness was higher in young adults 31.1% (95% CI: 15.7–43.7%)
				• Vaccine effectiveness against influenza-related hospitalizations was not statistically significant: 16.5% (95% CI: −13.9–38.8%)
				• Vaccine effectiveness against ICU admission was not statistically significant: 55.2% (95% CI: –0.2–80.0%)
				• Vaccine effectiveness for Influenza A infection
				  ○ Overall: 19.0% (95% CI: 5.0–31.0%)
				  ○ Early period (November to December 2023): 20.4% (95% CI: 2.9–34.8%)
				  ○ Late period (January to April 2024): 12.4% (95% CI: –14.9–33.2%)
				• Vaccine effectiveness for influenza B infection: 56.3% (95% CI: 35.3–70.6%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

Zhu 2024 (22)	• Population studied
	  ○ Children and adolescents aged 6 months to 17 years
	• Type of vaccine
	  ○ Trivalent inactivated influenza vaccine (IIV3)
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	  ○ Trivalent live attenuated vaccine (LAIV3)
	• Comparator
	  ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons)
	• Testing
	  ○ Nucleic acid testing (RT-PCR)
	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Medically attended acute respiratory illness
	• Timeframe (specimens collected)
	  ○ Other (November 2023 to April 2024)
		Study design: Test-negative case-control
		
		Analysis: VE was calculated using one minus odds ratio; an unconditional logistic regression model was used; covariates age, sex, and calendar month were accounted for
		
		Setting and country: Guangzhou Women and Children's Medical Center, China
			• A total of 27,670 patients were involved in this study
			• 16,540 patients were included in the 2023/24 season; 7,378 (66.3%) tested positive for influenza and 9,162 (55.4%) tested negative
				• Influenza vaccine effectiveness against acute respiratory infection: 37% (95% CI: 31–43%)
				  ○ 2023–2024: 41% (95% CI: 34–47%)
				• Vaccine effectiveness against acute respiratory infection across age groups:
				  ○ Younger than 3: 32% (95% CI: 19–43%)
				  ○ Ages 3 to less than 9: 41% (95% CI: 34–47%)
				  ○ Ages 9 to less than 18: 23% (95% CI: −3–43%)
				• Vaccine effectiveness against acute respiratory infection for influenza A:
				  ○ Overall: 33% (95% CI: 26–40%)
				  ○ By age:
				  ▪ Younger than 3: 28% (95% CI: 12–41)
				  ▪ Ages 3 to less than 9: 36% (95% CI: 27–43%)
				  ▪ Ages 9 to less than 18: 30% (95% CI: 3–50%)
				  ○ By season:
				  ▪ 2021–2022: 25% (95% CI: 5–41%)
				  ▪ 2022–2023: 43% (95% CI: 27–57%)
				  ▪ 2023–2024: 33% (95% CI: 24–41%)
				• Vaccine effectiveness against for influenza B:
				  ○ Overall: 31% (95% CI: 21–40%)
				  ○ By age:
				  ▪ Younger than 3: 35% (95% CI: 16–51%)
				  ▪ Ages 3 to less than 9: 34% (95% CI: 22–44%)
				  ▪ Ages 9 to less than 18: 7% (95% CI: −34–37%)
				  ○ By season:
				  ▪ 2021–2022: 20% (95% CI: −4–38%)
				  ▪ 2022–2023: 4% (95% CI: −37–34%)
				  ▪ 2023–2024: 39% (95% CI: 28–49%)
				• VE by vaccine type:
				  ○ Trivalent inactivated vaccine (TIV): 38% (95% CI: 25–49%)
				  ○ Quadrivalent inactivated vaccine (QIV): 36% (95% CI: 29–42%)
				  ○ Live attenuated influenza vaccine (LAIV): –7% (95% CI: –84–38%)

Chung 2025 (23)	• Population studied
	  ○ General population (all ages)
	• Type of vaccine
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
		Study design: Test-negative case-control
		
		Analysis: Vaccine effectiveness was calculated using one minus odds ratio; odds ratio was
			• A total of 9,061 participants were recruited; 6,629 were included in the final analysis
			• Of the 6,629 included participants 1,780 (27%) were influenza-positive; 806 (45%)
				• VE against any influenza illness (overall results, all ages): 44% (95% CI: 36–51%)
				• VE against influenza A(H1N1)pdm09 (overall results): 29% (95% CI: 15–41%)
				• VE against B/Victoria (overall results): 74% (95% CI: 65–81%)
				• VE against A(H3N2) (overall results): 30% (95% CI: 8–47%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
	○ Other (egg-based, cell culture-based, or recombinant-based vaccines) • Comparator ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons) • Testing ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Medically attended acute respiratory illness • Timeframe (specimens collected) ○ Other (1 October 2023 to 30 April 2024)	estimated using logistic regression models adjusted for site, age, health condition, and month of onset Setting and country: Arizona, Michigan, Missouri, Ohio, Pennsylvania, Texas, and Washington, United States	were positive for influenza A(H1N1)pdm09, 567 (32%) tested positive for influenza B/Victoria, 328 (18%) tested positive for influenza A(H3N2), and 104 (6%) tested positive for influenza A with undetermined subtype • 2,432 (37%) of participants were vaccinated against influenza	• Influenza vaccine effectiveness against infection by age groups: ○ 8 months–8 years: 68% (95% CI: 51–79%) ○ 9–17 years: 59% (95% CI: 35–75%) ○ 18–49 years: 38% (95% CI: 24–50%) ○ 50–64 years: 16% (95% CI: −11–41%) ○ Older than 65: 37% (95% CI: 5–58%) • Influenza A(H1N1)pdm09 vaccine effectiveness against infection by age groups: ○ 8 months–8 years: 72% (95% CI: 49–86%) ○ 9–17 years: 42% (95% CI: −20–73%) ○ 18–49 years: 21% (95% CI: −6–41%) ○ 50–64 years: –8% (95% CI: −62–28%) ○ Older than 65: 39% (95% CI: 2–62%) • Influenza B/Victoria vaccine effectiveness against infection by age groups: ○ 8 months–8 years: 81% (95% CI: 61–92%) ○ 9–17 years: 77% (95% CI: 55–89%) ○ 18–49 years: 67% (95% CI: 51–78%) ○ 50+ years: 79% (95% CI: 50–92%) • Influenza A(H3N2) vaccine effectiveness against infection by age groups: ○ 8 months–17 years: –5% (95% CI: –90–43%) ○ 18–49 years: 35% (95% CI: 5–57%) ○ 50+ years: 23% (95% CI: –37–56%)
Martínez-Baz 2025 (24)	• Population studied ○ General population (all ages) • Type of vaccine ○ Quadrivalent inactivated influenza vaccine (IIV4) ○ Other (quadrivalent live attenuated vaccine; cell culture vaccine) • Comparator ○ Unvaccinated for the current seasonal vaccine, but vaccinated in the previous season • Testing ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome	Study design: Test-negative case-control Analysis: VE was calculated using 1 – OR; logistic regression was used to calculate the odds ratio and adjusted for sex, age, presence of chronic condition, nursing home residence, and month of sample collection Setting and country: Primary care centres and hospitals in the Navarre region of northern Spain	• Data from 3,550 participants was collected from November 2023 to March 2024; 3,133 (88%) were hospitalized and 417 (12%) were treated in primary care centres • 529 (17%) of hospitalized patients were influenza positive, and 2,604 were influenza-negative (83%) • 314 (59%) of hospitalized cases were vaccinated in the current season and 53 (10%) were vaccinated in previous seasons but not the current one; 1,674 (64%) hospitalized	• Influenza vaccine effectiveness against hospitalizations (not considering previous vaccination): 36% (95% CI: 20–49%) • Current season influenza vaccine effectiveness against hospitalizations (excluding previous-season vaccinated from reference group): 43% (95% CI: 26–56%) • Vaccine effectiveness in preventing outpatient cases (not considering previous vaccination): 51% (95% CI: –3–77%) • Influenza vaccine effectiveness against outpatient cases when previous vaccination was considered: 49% (95% CI: –9–76%) • Preventing outpatient cases against A/H1N1: 42% (95% CI: –33– 74%) • Influenza A(H1N1) vaccine effectiveness against hospitalization ○ Vaccinated in current season: 48% (95% CI: 30–61%) ○ Vaccine in previous season and no current: 29% (95% CI: –9–54%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
	○ Medically attended influenza illness (outpatient) ○ Hospitalization • Timeframe (specimens collected) ○ End of season 2023/24 (between 1 October 2023 and 31 March 2024)		controls were vaccinated in the current season • 146 (35%) of outpatients were influenza positive and 271 (65%) were influenza-negative • 18 (12%) of outpatient cases and 68 (25%) of outpatient controls were vaccinated in the current season	• Influenza A/H3N2 vaccine effectiveness against hospitalization 15% (95% CI: –42–49%) • Influenza vaccine effectiveness against hospitalization in patients <65 years: 61% (95% CI: 32–77%) • Influenza vaccine effectiveness against hospitalization in patients ≥65 years: 35% (95% CI: 10–53%)
Zhang 2025 (25)	• Population studied ○ General population (all ages) • Type of vaccine ○ Not reported • Comparator ○ Unvaccinated for the current seasonal vaccine, but vaccinated in the previous season ○ Vaccinated for the current seasonal vaccine • Testing ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Infection • Timeframe (specimens collected) ○ End of season 2023/24 (between 1 October 2023 and 31 March 2024)	Study design: Test-negative case-control Analysis: VE was estimated using multivariate logistic regression models, adjusted for age, gender, region, month of onset, and chronic conditions Setting and country: 39 sentinel hospitals in Beijing, China	• 18,665 individuals (all ages) with ILI between October 2023 to March 2024 participated in the study • 6,362 (34.1%) participants tested positive for influenza with 3,396 (53.38%) being infected with influenza A (H3N2) and 2,877 (45.22%) being infected with influenza B (Victoria); 83 (1.30%) were infected with A(H1N1)pdm09 and 6(0.10%) had mixed infection with influenza viruses • 342 (5.4%) of influenza positive patients and 1,291 (10.5%) influenza negative patients were vaccinated	• VE against influenza overall: 44.77% (95% CI:35.90–52.41%) • VE against influenza by type: ○ Influenza A(H1N1) pdm09: 36.47% (95% CI: –54.29–73.84%) ○ Influenza A(H3N2): 37.57% (95% CI: 23.83–48.83%) ○ Influenza B(Victoria): 52.19% (95% CI: 40.83–61.37%) • VE against influenza by age: ○ 0–5 years: 51.31% (95% CI: 4.90–75.07%) ○ 6–18 years: 34.07% (95% CI: 21.37–44.27%) ○ 19–59 years: 72.38% (95% CI: 57.34–82.11%) ○ ≥60 years: 49.69% (95% CI: 17.70–69.27%) • VE against influenza by consecutive season vaccination ○ Vaccinated in both seasons: 42.52% (95% CI: 30.91–52.19%) ○ Vaccinated only in previous season: 19.74% (95% CI: 0.70–35.12%) ○ Vaccinated only in current season: 48.28% (95% CI: 34.69–59.04%)
Lei 2025 (26)	• Population studied ○ General population (all ages) • Type of vaccine ○ Trivalent inactivated influenza vaccine (IIV3) ○ Quadrivalent inactivated influenza vaccine (IIV4) ○ Trivalent live attenuated vaccine (LAIV3) • Comparator ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons)	Study design: Test-negative case-control Analysis: VE was calculated as (1 – OR) x 100%; OR was estimated using multivariate logistic regression models that were adjusted for age, sex, influenza detection methods, and testing timing	• Of the 157,291 patients (6 months or older) with ILI who were tested between 1 October 2023 and 31 March 2024, 32,611 patients tested positive for influenza A, 24,030 tested positive for influenza B, and 63 had influenza A and B coinfections; overall influenza positivity rate was 36% • Overall, 11,148 (7.1%) participants were vaccinated	• VE against medically attended influenza infection overall: 48% (95% CI: 46–51%) • VE against infection by vaccine type: ○ IIV3: 59% (95% CI: 49–66%) ○ IIV4: 47% (95% CI: 45–50%) ○ LAIV3 (3–17 years): 53% (95% CI: 42–62%) • VE against infection by age group: ○ 0.5–2 years: 64% (95% CI: 54–72%) ○ 3–9 years: 43% (95% CI: 39–46%) ○ 10–17 years: 42% (95% CI: 36–48%) ○ 18–59 years: 52% (95% CI: 43–58%) ○ 60–69 years: 75% (95% CI: 59–85%) ○ 70+ years: 25% (95% CI: 4–41%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
	○ Unvaccinated for the current seasonal vaccine, but vaccinated in the previous season • Testing ○ Antigen ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Medically attended infection • Timeframe (specimens collected) ○ End of season 2023/24 (between 1 October 2023 and 31 March 2024)	Setting and country: Five terminal hospitals in Hangzhou, China	against influenza including 8,603 (8.6%) influenza-negative participants, 1,473 (4.5%) influenza A participants 1,065 (4.4%) influenza B participants, and 7 (11.1%) participants with coinfections	• VE against influenza A infection by vaccine type: ○ Overall: 38% (95% CI: 34–42%) ○ IIV3: 13% (95% CI: –9–31%) ○ IIV4: 40% (95% CI: 36–44%) ○ LAIV3: 25% (95% CI: 5–40%) • VE against influenza B infection by vaccine type: ○ Overall: 57% (95% CI: 54–60%) ○ IIV3: 87% (95% CI: 79–91%) ○ IIV4: 53% (95% CI: 50–57%) ○ LAIV3: 79% (95% CI: 69–86%) • VE against medically attended influenza by influenza type and season of vaccination: ○ Overall: ▪ Current and previous season: 45% (95% CI: 41–49%) ▪ Previous season only: 23% (95% CI: 18–27%) ▪ Current season only: 52% (95% CI: 49–55%) ○ Influenza A: ▪ Current and previous season: 29% (95% CI: 23–35%) ▪ Previous season only: 12% (95% CI: 5–18%) ▪ Current season only: 47% (95% CI: 42–51%) ○ Influenza B: ▪ Current and previous season: 59% (95% CI: 55–63%) ▪ Previous season only: 34% (95% CI: 28–40%) ▪ Current season only: 56% (95% CI: 52–60%)
Tenforde 2024 (27)	• Population studied ○ General population (all ages) • Type of vaccine ○ Trivalent inactivated influenza vaccine (IIV3) ○ Trivalent live attenuated vaccine (LAIV3) ○ Other (cell-based/recombinant or adjuvant Influenza vaccines) • Comparator ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons) ○ Unvaccinated for the current seasonal vaccine, but vaccinated in the previous season • Testing	Study design: Test-negative case-control Analysis: Logistic regression models adjusted for site, calendar day, age, sex, and race/ethnicity were used; VE was calculated as (1 – adjusted odds ratio) x 100 Setting and country: Seven sites in eight states (California, Colorado, Indiana, Minnesota, Wisconsin, Oregon, Washington, Utah), United States	• 70,307 hospitalizations and 271,299 emergency department (ED)/urgent care (UC) encounters were analyzed • 340 (9.8%) of the 3,479 ARI-associated hospitalizations in children and adolescents were positive influenza patients; 1,270 (36.5%) of hospitalized pediatric patients were vaccinated against influenza (18.5% of cases and 38.5% of controls) • 17,493 (24.8%) of the 70,521 ARI-associated ED/UC encounters in children and	• VE against influenza hospitalization in children and adolescents (≥6 months–17 years) overall: 58% (95% CI: 44–69%) • VE against influenza hospitalization in children and adolescents (≥6 months–17 years) by time since vaccination: ○ 14–59 days: 50% (95% CI: 18–71%) ○ 60–119 days: 57% (95% CI: 35–72%) ○ ≥120 days: 67% (95% CI: 45–81%) • VE against influenza hospitalization in children and adolescents (≥6 months–17 years) by age group: ○ 6 months–4 years: 71% (95% CI: 51–83%) ○ 5–17 years: 49% (95% CI: 27–65%) • VE against influenza hospitalization in children and adolescents (≥6 months–17 years) by immunocompromised status: ○ Immunocompromised: 46% (95% CI: –51–83%) ○ Not immunocompromised: 59% (95% CI: 44–70%) • VE against influenza hospitalization in children and adolescents (≥6 months–17 years) by influenza type:

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
	○ Other (molecular testing) • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Medically attended acute respiratory illness ○ Hospitalization ○ ICU admission ○ Death • Timeframe (specimens collected) ○ End of season 2023/24 (between 1 October 2023 and 31 March 2024)		adolescents tested positive for influenza; 19,728 (28.0%) were vaccinated against influenza (15.4% of cases and 32.1% of controls) • 5,721 (8.6%) of the 66,828 ARI-associated hospitalizations in adults were influenza positive; 32,455 (48.6%) were vaccinated (35.1% cases and 49.8% controls) • 40,893 (20.4%) of the 200,778 ARI-associated ED/UC encounters in adults were also positive cases; 76,988 (38.3%) were vaccinated against influenza (23.5% cases vs. 42.1% controls)	○ Influenza A: 44% (95% CI: 23–60%) ○ Influenza B: 85% (95% CI: 72–93%) • VE against ICU admission in children and adolescents (≥6 months–17 years): 43% (95% CI: –6–70%) • VE against ED/UC encounters in children and adolescents (≥6 months–17 years) by time since vaccination: ○ 14–59 days: 63% (95% CI: 60–66%) ○ 60–119 days: 56% (95% CI: 53–59%) ○ ≥120 days: 57% (95% CI: 53–60%) • VE against influenza EC/UC encounters in children and adolescents (≥6 months–17 years) by age group: ○ 6 months–4 years: 65% (95% CI: 62–68%) ○ 5–17 years: 54% (95% CI: 51–57%) • VE against ED/UC encounters in children and adolescents (≥6 months–17 years) by immunocompromised status: ○ Immunocompromised: 47% (95% CI: –74–85%) ○ Not immunocompromised: 58% (95% CI: 56–60%) • VE against influenza ED/UC encounters in children and adolescents (≥6 months–17 years) overall: 58% (95% CI: 56–60%) • VE against influenza ED/UC encounters in children and adolescents (≥6 months–17 years) by influenza type ○ Influenza A: 49% (95% CI: 46–51%) ○ Influenza B: 74% (95% CI: 72–77%) • VE against influenza hospitalization in adults (≥18 years) overall: 39% (95% CI: 35–43%) • VE against influenza hospitalization in adults (≥18 years) by time since vaccination: ○ 14–59 days: 49% (95% CI: 42–55%) ○ 60–119 days: 36% (95% CI: 31–41%) ○ ≥120 days: 37% (95% CI: 31–43%) • VE against influenza hospitalization in adults (≥18 years) by age group: ○ 18–49 years: 51% (95% CI: 42–60%) ○ 50–64 years: 40% (95% CI: 32–48%) ○ ≥65 years: 36% (95% CI: 31–41%) • VE against influenza hospitalization in adults (≥18 years) by immunocompromised status: ○ Immunocompromised: 34% (95% CI: 23–43%) ○ Not immunocompromised: 39% (95% CI: 35–43%) • VE against influenza hospitalization in adults by influenza type

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
				○ Influenza A: 37% (95% CI: 32–41%) ○ Influenza B: 67% (95% CI: 54–76%) • VE against influenza hospitalization in adults admitted to ICU: 41% (95% CI: 31–50%) • VE against influenza hospitalization in adults who died: 50% (95% CI: 31–65%) • VE against influenza hospitalization in adults admitted to ICU/death: 41% (95% CI: 30–49%) • VE against influenza ED/UC encounters in adults overall: 47% (95% CI: 46–49%) • VE against ED/UC encounters in adults (≥18 years) by time since vaccination: ○ 14–59 days: 57% (95% CI: 55–60%) ○ 60–119 days: 41% (95% CI: 39–44%) ○ ≥120 days: 48% (95% CI: 45–50%) • VE against influenza ED/UC encounters in adults by age group: ○ 18–49 years: 54% (95% CI: 53–56%) ○ 50–64 years: 44% (95% CI: 40–47%) ○ ≥65 years: 37% (95% CI: 34–40%) • VE against influenza ED/UC encounters in adults (≥18 year) by immunocompromised status: ○ Immunocompromised: 47% (95% CI: 35–58%) ○ Not immunocompromised: 47% (95% CI: 45–48%) • VE against influenza ED/UC encounters in adults by influenza type ○ Influenza A: 41% (95% CI: 39–42%) ○ Influenza B: 75% (95% CI: 72–77%)
Marron 2024 (28)	• Population studied ○ General population (all ages) • Type of vaccine ○ Quadrivalent inactivated influenza vaccine (IIV4) ○ Other (live attenuated influenza vaccine (Fluenz Tetra)) • Comparator ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons) • Testing ○ Nucleic acid testing (RT-PCR)	Study design: Test-negative case-control Analysis: Multivariable logistic regression adjusted for age, time of symptom onset, sex, and presence of a chronic condition were used to estimated adjusted odds ratios (aOR); VE was calculated using the following equation: VE = (1 – aOR) x 100	• 2,399 patients from the 2023/24 season were included in the dataset; 567 (24%) were influenza-positive and 1,832 (76%) were influenza-negative • 26.1% of controls were vaccinated compared to 16.9% of cases	• Influenza vaccine effectiveness against ARI by age group in 2023/24: ○ Overall: 35% (95% CI: 15–51%) ○ Age 2–17: 68% (95% CI: 30–87%) ○ Age 18–64: 35% (95% CI: 9–54%) ○ Age ≥ 65: 16% (95% CI: –83–60%) • Influenza vaccine effectiveness against ARI by influenza type and age in 2023/24: ○ Influenza B: ▪ Overall: 84% (95% CI: 53–97%) ▪ Age 2–17: 82% (95% CI: –39–100%) ▪ Age 18–64: 80% (95% CI: 38–96%) ○ Influenza A(H3N2):

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome

	• Outcome measures
	  ○ Vaccine effectiveness
	• Influenza-related outcome
	  ○ Medically attended acute respiratory illness
	• Timeframe (specimens collected)
	  ○ Other (16 October 2023 to 19 May 2024)
		Setting and country: Sentinel general practice surveillance network (encompassing 100 practices) in Ireland		▪ Overall: 25% (95% CI: –6–47%)
				▪ Age 2–17: 65% (95% CI: 15–87%)
				▪ Age 18–64: 16% (95% CI: –29–46%)
				▪ Age 65+: 25% (95% CI: –80–67%)
				○ Influenza A(H1N1)pdm09:
				▪ Overall: 30% (95% CI: –13–58%)
				▪ Age 2–17: 51% (95% CI: –66–91%)
				▪ Age 18–64: 39% (95% CI: –8–67%)

Tian 2024 (29)	• Population studied
	  ○ Other (healthcare workers age 20 to 60)
	• Type of vaccine
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	• Comparator
	  ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons)
	• Testing
	  ○ Other (not reported)
	• Outcome measures
	  ○ Incidence rate
	  ○ Odds ratio
	• Influenza-related outcome
	  ○ Influenza-like illness (ILI)
	• Timeframe (specimens collected)
	  ○ Other (recruitment from 20 September 2023 to 19 October 2023 with six-month follow-up)
		Study design: Prospective observational study
		
		Analysis: Single-factor or multi-factor logistic regression adjusted for vaccination, age, and staff type
		
		Setting and country: A comprehensive third-grade class-A hospital in Shenzhen, China
			• 100 participants were included; 50 (50%) were vaccinated and 50 (50%) were unvaccinated	• Incidence of ILI based on vaccination status:
				  ○ Unvaccinated: 36%
				  ○ Vaccinated: 18%
				• OR of ILI in vaccinated participants compared to unvaccinated participants using single-factor logistic regression: 0.39 (95% CI: 0.15–0.98%)
				• OR of ILI in vaccinated participants compared to unvaccinated participants using multi-factor logistic regression: 0.39 (95% CI: 0.15–1.00%)

Blanquart 2025 (30)	• Population studied
	  ○ General population (all ages)
	• Type of vaccine
	  ○ Quadrivalent inactivated influenza vaccine (IIV4)
	• Comparator
	  ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons)
	• Testing
	  ○ Nucleic acid testing (RT-PCR)
	• Outcome measures
		Study design: Test-negative
		
		Analysis: A logistic (binomial) linear model was fitted to the test result as a function of sex, age category, PCR technique, week, and vaccination status; VE was estimated using the odds ratio of the vaccine effect on testing positive for influenza
			• 59,472 patients presented at RELAB community laboratories; 44,420 were influenza-negative and 15,052 were influenza-positive
			• Among influenza-negative patients 10,875 (24%) were vaccinated; among influenza-positive patients, 1,916 (13%) were vaccinated
				• Vaccine effectiveness against influenza infection by influenza type and age:
				  ○ Overall: 42% (95% CI: 37–46%)
				  ○ Influenza A:
				  ▪ Overall: 26% (95% CI: 18–34%)
				  ▪ Age 0–64: 33% (95% CI: 22–43%)
				  ▪ Age ≥ 65: 20% (95% CI: 6.9–32%)
				  ○ Influenza B:
				  ▪ Overall: 75% (95% CI: 66–82%)
				  ▪ Age 0–64: 82% (95% CI: 74–88%)
				  ▪ Age ≥ 65: 64% (95% CI: 27–82%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
	○ Vaccine effectiveness • Influenza-related outcome ○ Infection • Timeframe (specimens collected) ○ End of season 2024/25 (between 1 October 2024 and 31 March 2025)	Setting and country: RELAB community laboratories (1,600), France		• Influenza vaccine effectiveness against influenza infection by age group: ○ Age 0–64: 60% (95% CI: 56–64%) ○ Age ≥65: 22% (95% CI: 13–30%) • Influenza vaccine effectiveness against influenza infection at the end of the period (January to February/weeks 1–5) by influenza type: ○ Overall: 40% (95% CI: 35–46%) ○ Influenza A: 22% (95% CI: 11–31%) • Influenza vaccine effectiveness against influenza infection over the school holiday (weeks 52–1) in individuals aged ≥65: 15% (95% CI: –6.7–33%) • Influenza vaccine effectiveness against influenza infection by type of symptoms and age: ○ Respiratory symptoms: ▪ Overall: 41% (95% CI: 36–46%) ▪ Age ≥65: 23% (95% CI: 13–32%) ○ Fever: ▪ Overall: 41% (95% CI: 35–47%) ▪ Age ≥65: 22% (95% CI: 9.1–33%)
Sun 2025 (31)	• Population studied ○ General population (all ages) • Type of vaccine ○ Trivalent inactivated influenza vaccine (IIV3) ○ Quadrivalent inactivated influenza vaccine (IIV4) • Comparator ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons) • Testing ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Vaccine effectiveness • Influenza-related outcome ○ Infection • Timeframe (specimens collected) ○ Mid-season 2024/25 (between 1 October 2024 and 31 January 2025)	Study design: Test-negative Analysis: Logistic regression was used to estimate odds ratios for vaccination status; VE was calculated with the following formula: (1 – OR) x 100% Setting and country: Influenza Surveillance system with 40 sentinel hospitals and 19 network laboratories in Beijing, China	• 8,775 patients were included; 6,741 (76.8%) were influenza-negative and 2,034 (23.2%) were influenza-positive • Of 8,442 patients with available immunization information, 6.2% of cases (124/1,998) and 15.5% (1,000/6,444) were vaccinated against influenza	• Influenza vaccine effectiveness against infection by influenza type: ○ Overall: 48.5% (95% CI: 34.8–59.5%) ○ Influenza A(H1N1)pdm09: 48.7% (95% CI: 35.1–59.7%) • Influenza vaccine effectiveness against infection by age: ○ Age 0–5: 57.9% (95% CI: 15.2–80.6%) ○ Age 6–17: 34.9% (95% CI: 11.9–52.1%) ○ Age 18–59: 83.9% (95% CI: 64.1–94.0%) ○ Age ≥60: 52.9% (95% CI: 7.6–76.8%) • Influenza vaccine effectiveness against infection in people with or without comorbidities: ○ With comorbidities: 77.4% (95% CI: 24.8–95.1%) ○ Without comorbidities: 47.2% (95% CI: 32.9–58.7%) • Influenza vaccine effectiveness against infection in people by pneumonia status: ○ With pneumonia: 65.3% (95% CI: –41.3–94.9%) ○ Without pneumonia: 47.8% (95% CI: 33.7–59.1%) • Influenza vaccine effectiveness against infection by season of vaccination: ○ Vaccinated in the current season and the previous one: 54.9% (95% CI: 40.1–66.3%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
				○ Vaccinated in the current season only: 52.5% (95% CI: 32.2–67.3%) ○ Vaccinated in the previous season only: 53.3% (95% CI: 36.6–66.0%)
Rose 2025 (32)	• Population studied ○ General population (all ages) • Type of vaccine ○ Trivalent inactivated influenza virus (IIV3) ○ Quadrivalent inactivated influenza virus (IIV4) • Comparator ○ Individuals who tested negative for Influenza but presented with similar symptoms • Testing ○ Nucleic acid testing (RT-PCR) • Outcome Measures ○ Vaccine effectiveness • Influenza-related outcome ○ Infection • Timeframe (specimens collected) ○ Mid-season 2024/25 (between 1 October 2024 and 31 January 2025	Study design: Test-negative case-control Analysis: VE was calculated using the formula (1 – OR) x 100; logistic regression adjusted for measured potential cofounding variables was used. Setting and country: Five single country studies and three multi-country studies across both primary care and hospital settings; primary care settings in Denmark, the United Kingdom, and the European Union; hospital settings in Denmark, England, Northern Ireland, Scotland, and European Union multi-country hospitals	• Participants presenting ILI or ARI had specimens collected • Vaccinated participants were defined as having received the 2024/25 influenza vaccine at least 14 days before symptom onset • Number of participants was not reported	• VE against all laboratory-confirmed influenza in primary care for all ages: ○ Denmark: 53% (95% CI: 47–58%) ○ EU: 40% (95% CI: 26–52%) ○ U.K.: 44% (95% CI: 37–51%) • VE against all laboratory-confirmed influenza in hospital for all ages: ○ Denmark: 52% (95% CI: 45–58%) ○ England: 51% (95% CI: 48–55%) ○ EU: 52% (95% CI: 40–62%) ○ Northern Ireland: 60% (95% CI: 39–74%) ○ Scotland: 34% (95% CI: 28–39) • VE against Influenza A(H1N1)pdm09 in primary care for all ages: ○ Denmark: 72% (95% CI: 60–81%) ○ EU: 30% (95% CI: 7–47%) ○ U.K.: 44% (95% CI: 36–51%) • VE against Influenza A(H1N1)pdm09 in hospital for all ages: ○ England: 53% (95% CI: 44–61%) ○ EU: 50% (95% CI: 27–67%) ○ Scotland: 46% (95% CI: 33–56%) • VE against influenza A(H3N2) in primary care for all ages: ○ Denmark: 47% (95% CI: 20–65%) ○ EU: 29% (95% CI: –22–60%) ○ U.K.: 47% (95% CI: 24–63%) • VE against influenza A(H3N2) in hospital for all ages: ○ England: 31% (95% CI: –13–58%) ○ EU: 38% (95% CI: –11–66%) ○ Scotland: 49% (95% CI: –15–78%) • VE against influenza B in primary care for all ages: ○ Denmark: 74% (95% CI: 59–83%) ○ EU: 61% (95% CI: 38–76%) ○ U.K.: 58% (95% CI: 27–76%) • VE against influenza B in hospital for all ages: ○ England: 74% (95% CI: 63–82%) ○ EU: 82% (95% CI: 66–91%) ○ Northern Ireland: 88% (95% CI: 21–99%)

Reference (author year), with URL	Clinical features	Study characteristics (type of publication, vaccine effectiveness analysis methods, setting and country)	Sample description and intervention	Summary of key findings in relation to the outcome
				○ Scotland: 73% (95% CI: 45–87%)
Martinez 2024 (33)	• Population studied ○ General population (all ages) • Type of vaccine ○ Other (not reported) • Comparator ○ Unvaccinated individuals (never vaccinated individuals in the studied seasons) • Testing ○ Nucleic acid testing (RT-PCR) • Outcome measures ○ Hazard ratio • Influenza-related outcome ○ ICU admission ○ Death • Timeframe (specimens collected) ○ Mid-season 2023/24 (between 1 October 2023 and 31 January 2024)	Study design: Single-centre retrospective observational study Analysis: Cox regression adjusted for age, sex, cardiovascular disease, renal disease, and influenza vaccination status was used to examine the association between hospitalization for influenza and admission to the ICU and/or death for vaccinated/unvaccinated participants; Kaplan Meier survival analysis and log-rank test were additionally performed Setting and country: Spain	• 238 patients were included; 101 (42.4%) were vaccinated against influenza	• Relationship between death/ICU admission and influenza vaccination (bivariate analysis): HR=0.219 (95% CI: 0.048–0.992%) • Influenza vaccination as a protective factor against ICU admission/death (multivariate analysis (Cox regression): HR=0.216 (95% CI: 0.062–0.759%)

Appendix 3: Documents excluded at the final stage of reviewing

Author and year of publication with hyperlink	Title	Reason for exclusion
Murphy et al. 2024	Influenza vaccine effectiveness against hospitalizations associated with influenza A(H3N2) in Hong Kong children aged 9 months to 17 years, June-November 2023	Wrong timeline
Prasert et al. 2023	Influenza virus circulation and vaccine effectiveness during June 2021–May 2023 in Thailand	Duplicate study
Broad et al. 2023	Adapting COVID-19 research infrastructure to capture influenza and respiratory syncytial virus alongside SARS-CoV-2 in UK healthcare workers Winter 2022/23 and beyond: Protocol for a pragmatic sub-study	Wrong study design
Ma et al. 2024	Association between influenza vaccination and one-year all-cause and cardiovascular mortality risk: A self-controlled case series and matched case-control study	Wrong outcomes
Maurel et al. 2024	Exploring the effect of clinical case definitions on influenza vaccine effectiveness estimation at primary care level: Results from the end-of-season 2022–23 VEBIS multicentre study in Europe	Wrong intervention
Stein et al. 2024	Relative vaccine effectiveness of cell- vs egg-based quadrivalent influenza vaccine against test-confirmed influenza over 3 seasons between 2017 and 2020 in the United States	Wrong comparator
McLean et al. 2023	Comparison of influenza vaccine effectiveness estimates from the US influenza vaccine effectiveness network and electronic health record source population data, 2021–2022	Wrong study design
Noble et al. 2023	Effectiveness of influenza vaccination against influenza-associated emergency department (ED) visits and hospitalizations among children with and without underlying medical conditions, new vaccine surveillance network (NVSN), 2015–2016 through 2019–2020	Wrong study design
Zemlianskaia et al. 2023	Substantially elevated influenza risk in vaccinated immunocompromised adults and high-risk patients relative to all vaccinated	Wrong comparator
Imran et al. 2024	Relative effectiveness of the MF59-adjuvanted influenza vaccine versus high-dose and non-adjuvanted influenza vaccines in preventing cardiorespiratory hospitalizations during the 2019–2020 US influenza season	Wrong comparator
Palmu et al. 2024	High-dose quadrivalent influenza vaccine for prevention of cardiovascular and respiratory hospitalizations in older adults	Wrong comparator
Platas-Abenza et al. 2024	Effectiveness of influenza vaccine in preventing severe cases of influenza: Season 2022/2023	Wrong timeline
Johansen et al. 2024	Effectiveness of high-dose versus standard-dose quadrivalent influenza vaccine against recurrent hospitalizations and mortality in relation to influenza circulation: A post-hoc analysis of the DANFLU-1 randomized clinical trial	Wrong comparator
Sui et al. 2023	Research progress of influenza vaccination, pneumococcal vaccination and COVID-19 vaccination among cancer patients	Wrong study design
Levin et al. 2024	A clinical and economic assessment of adjuvanted trivalent versus standard egg-derived quadrivalent influenza vaccines among older adults in the United States during the 2018–19 and 2019–20 influenza seasons	Wrong comparator
Akhtar et al. 2023	Optimal timing of influenza vaccination among patients with acute myocardial infarction – Findings from the IAMI trial	Wrong outcomes
Music et al. 2023	Perspectives of older adults on COVID-19 and influenza vaccination in Ontario, Canada	Wrong interventions

Author and year of publication with hyperlink	Title	Reason for exclusion
Brennan et al. 2023	Influenza vaccination: Simple, safe, and effective for patients with ischaemic heart disease and heart failure	Wrong outcomes
Zysman et al. 2023	Impact of pharmacological and non-pharmacological interventions on mortality in chronic obstructive pulmonary disease (COPD) patients	Wrong study design
Sookaromdee et al. 2023	Concurrent administration of COVID-19 vaccine and seasonal influenza vaccine: No increased estimated vaccine-related mortality rate	Wrong study design
Liu et al. 2023	Timing and sequence of vaccination against COVID-19 and influenza	Wrong study design
Shinjoh et al. 2023	Effectiveness of inactivated influenza and COVID-19 vaccines in hospitalized children in 2022/23 season in Japan – The first season of co-circulation of influenza and COVID-19	Wrong patient population
Imran et al. 2023	Relative effectiveness of the cell-based quadrivalent influenza vaccine in preventing cardiorespiratory hospitalizations in adults aged 18–64 years during the 2019–2020 US influenza season	Wrong comparator
Biering-Sorensen et al. 2023	DANFLU-1: Feasibility of a pragmatic randomised trial to assess the relative effectiveness of high-dose (QIV-HD) vs standard-dose quadrivalent influenza vaccine (QIV-SD) on severe cardio-respiratory outcomes in elderly adults	Wrong study design
Mazagatos et al. 2023	Impact of influenza vaccination on the burden of severe influenza in the elderly: Spain, 2017–2020	Wrong outcomes
Fruhwein et al. 2023	Enhanced targeted influenza vaccines – New evidence shows higher effectiveness in older adults	Wrong study design
Zeevat et al. 2023	Reducing hospital capacity needs for seasonal respiratory infections: The case of switching to high-dose influenza vaccine for Dutch older adults	Wrong comparator
Escandell et al. 2023	Effectiveness of the influenza vaccine in the prevention of influenza in people over 65 years of age	Wrong interventions
Andrejko et al. 2023	Receipt of COVID-19 and seasonal influenza vaccines in California (USA) during the 2021–2022 influenza season	Wrong outcomes
Johansen et al. 2023	A pragmatic randomized feasibility trial of influenza vaccines	Wrong comparator
Shrestha et al. 2024	Influenza epidemiology and vaccine effectiveness following funded influenza vaccine in Queensland, Australia, 2022	Wrong timeline
Chatzilena et al. 2024	Winter 2022–23 influenza vaccine effectiveness against influenza-related hospitalised aLRTD: A test-negative, case-control study	Wrong timeline
Laniece et al. 2024	Corrigendum to “Effectiveness of COVID-19 vaccines administered in the 2023 autumnal campaigns in Europe: results from the VEBIS primary care test-negative design study, September 2023–January 2024” [Vaccine 42(19) 2024]	Wrong interventions
Yang et al. 2024	Repeated vaccination does not appear to significantly weaken the protective effect of influenza vaccine in the elderly: A test-negative case-control study in China	Wrong timeline

Author and year of publication with hyperlink	Title	Reason for exclusion
Tenforde et al. 2024	Influenza vaccine effectiveness against Influenza A-Associated emergency department, urgent care, and hospitalization encounters among US adults, 2022–2023	Wrong timeline
McGovern et al. 2024	Relative vaccine effectiveness of MF59-adjuvanted vs high-dose trivalent inactivated influenza vaccines for prevention of test-confirmed influenza hospitalizations during the 2017–2020 influenza seasons	Wrong timeline
Tenforde et al. 2023	Vaccine effectiveness against influenza-associated urgent care, emergency department, and hospital encounters during the 2021–2022 season, VISION network	Wrong timeline
Shinjoh et al. 2022	Trends in effectiveness of inactivated influenza vaccine in children by age groups in seven seasons immediately before the COVID-19 era	Wrong timeline
Yildirim et al. 2021	A retrospective test-negative case-control study to evaluate influenza vaccine effectiveness in preventing hospitalizations in children	Wrong timeline
Grijalva et al. 2021	Influenza vaccine effectiveness for prevention of severe influenza-associated illness among adults in the United States, 2019–2020: A test-negative study	Wrong timeline
Chung et al. 2021	Influenza vaccine effectiveness against all-cause mortality following laboratory-confirmed influenza in older adults, 2010–2011 to 2015–2016 seasons in Ontario, Canada	Wrong comparator
Rao et al. 2021	Evaluation of influenza vaccine effectiveness among young children receiving consecutive versus nonconsecutive vaccination during Influenza A(H3N2)-predominant season	Wrong timeline
Gershon et al. 2020	Influenza vaccine effectiveness in preventing hospitalizations in older patients with chronic obstructive pulmonary disease	Wrong timeline
Feng et al. 2018	Effectiveness of influenza vaccination on influenza-associated hospitalisations over time among children in Hong Kong: A test-negative case-control study	Wrong timeline
Flannery et al. 2017	Interim estimates of 2016–17 seasonal influenza vaccine effectiveness – United States, February 2017	Wrong timeline
Kurečić et al. 2015	Influenza vaccine effectiveness estimates in Croatia in 2010–2011: A season with predominant circulation of A(H1N1)pdm09 influenza virus	Wrong timeline
Hélène et al. 2023	The relative effectiveness of a high-dose quadrivalent influenza vaccine vs standard-dose quadrivalent influenza vaccines in older adults in France: A retrospective cohort study during the 2021–22 influenza season	Wrong timeline
Bi et al. 2024	Evaluating reduced effectiveness after repeat influenza vaccination while accounting for confounding by recent infection and within-season waning	Wrong timeline
Bi et al. 2023	Reduced effectiveness of repeat influenza vaccination: Distinguishing among within-season waning, recent clinical infection, and subclinical infection	Wrong timeline
Graham et al. 2024	Quantifying and adjusting for confounding from health-seeking behaviour and healthcare access in observational research	Wrong timeline
Nakafero et al. 2024	Uptake, safety, and effectiveness of inactivated influenza vaccine in patients with inflammatory bowel disease: a nationwide study in the UK using data from the clinical practice research datalink	Wrong timeline
McGovern et al. 2024	Relative vaccine effectiveness of MF59-adjuvanted vs high-dose trivalent inactivated influenza vaccines for prevention of test-confirmed influenza hospitalizations during the 2017–2020 influenza seasons	Wrong timeline
Nakayama et al. 2024	The efficacy and safety of a quadrivalent live attenuated influenza nasal vaccine in Japanese children: A phase 3, randomized, placebo-controlled study	Wrong timeline
Prasert et al. 2024	Influenza virus circulation and vaccine effectiveness during June 2021–May 2023 in Thailand	Wrong timeline

Author and year of publication with hyperlink	Title	Reason for exclusion
Chung et al. 2024	Late-season influenza vaccine effectiveness against medically attended outpatient illness, United States, December 2022–April 2023	Wrong timeline
Chatzilena et al. 2024	Winter 2022–23 influenza vaccine effectiveness against influenza-related hospitalised aLRTD: A test-negative, case-control study	Wrong timeline
Hughes Kramer et al. 2024	Effectiveness of the influenza vaccine for preventing laboratory-confirmed influenza infections in outpatient immunocompromised adults, 2017–2018	Wrong timeline
Yang et al. 2024	Repeated vaccination does not appear to significantly weaken the protective effect of influenza vaccine in the elderly: A test-negative case-control study in China	Wrong timeline
Whitaker et al. 2024	End of 2022/23 season influenza vaccine effectiveness in primary care in Great Britain	Wrong timeline
Yang et al. 2024	Effectiveness of inactivated influenza vaccine against laboratory-confirmed influenza among Chinese elderly: A test-negative design	Wrong timeline
Mangas-Moro et al. 2024	Influenza vaccination mitigates severe complications in hospitalized patients: A ten-year observational study, Spain, 2009–2019	Wrong timeline
Tippett et al. 2024	Influenza vaccine effectiveness pre-pandemic among adults hospitalized with congestive heart failure or chronic obstructive pulmonary disease and older adults	Wrong timeline
Lewis et al. 2024	Vaccine effectiveness against Influenza A-associated hospitalization, organ failure, and death: United States, 2022–2023	Wrong timeline
Adams et al. 2024	Vaccine effectiveness against pediatric Influenza-A-associated urgent care, emergency department, and hospital encounters during the 2022–2023 season: VISION network	Wrong timeline
Domnich et al. 2024	Waning intra-season vaccine effectiveness against influenza A(H3N2) underlines the need for more durable protection	Wrong timeline
Whitaker et al. 2024	Influenza vaccination during the 2021/22 season: A data-linkage test-negative case-control study of effectiveness against influenza requiring emergency care in England and serological analysis of primary care patients	Wrong timeline
Rose et al. 2024	Vaccine effectiveness against influenza hospitalisation in adults during the 2022/2023 mixed season of influenza A(H1N1)pdm09, A(H3N2) and B circulation, Europe: VEBIS SARI VE hospital network	Wrong timeline
Al Kharusi et al. 2024	Frequency of asthma exacerbations and upper respiratory tract infections among adults with asthma according to vaccination status: Does the annual influenza vaccine have a protective effect?	Wrong timeline
Pang et al. 2024	Corrigendum to “Effectiveness of influenza vaccination on in-hospital death and recurrent hospitalization in older adults with cardiovascular diseases”	Wrong timeline
Olson et al. 2024	Effectiveness of maternal influenza vaccination during pregnancy against influenza-associated emergency department visits and hospitalizations in infants <6 months of age	Wrong timeline
Glenn et al. 2024	Influenza vaccine administration and effectiveness among children and adults with glomerular disease	Wrong timeline
Tsuzuki et al. 2023	Association between seasonal influenza vaccination and antimicrobial use in Japan from the 2015–16 to 2020–21 seasons: from the VENUS study	Wrong timeline
Maurel et al. 2024	Influenza vaccine effectiveness in Europe: Results from the 2022–2023 VEBIS (Vaccine Effectiveness, Burden and Impact Studies) primary care multicentre study	Wrong timeline
Kramer et al. 2023	Effectiveness of the influenza vaccine for preventing laboratory-confirmed influenza infections in outpatient immunocompromised adults, 2017–2018	Wrong timeline
Prevot et al. 2023	Influenza vaccine effectiveness among children: 2011–2020	Wrong timeline
Hsiao et al. 2023	Recombinant or standard-dose influenza vaccine in adults under 65 years of age	Wrong timeline

Author and year of publication with hyperlink	Title	Reason for exclusion
Wicke et al. 2023	Schatzung der wirksamkeit der grippeimpfung anhand von sekundardaten: Eine kohortenstudie und propensity-score-matching-analyse von leistungsdaten aus Baden-Wurttemberg (Translate title: Estimation of Influenza Vaccine Effectiveness using Secondary Data: A Cohort Study and Propensity Score-Matched Analysis of Claims Data from Baden-Wuerttemberg)	Wrong timeline
Cowling et al. 2023	Influenza vaccine effectiveness against influenza-associated hospitalization in Hong Kong children aged 9 months to 17 years, March–June 2023	Wrong timeline
Tenforde et al. 2023	Influenza vaccine effectiveness against influenza-A-associated emergency department, urgent care, and hospitalization encounters among U.S. adults, 2022–2023	Wrong timeline
Fell et al. 2023	Effectiveness of maternal influenza vaccination during pregnancy against laboratory-confirmed seasonal influenza among infants under 6 months of age in Ontario, Canada	Wrong timeline
Kildegaard et al. 2023	Effectiveness of the quadrivalent live attenuated influenza vaccine against influenza-related hospitalisations and morbidity among children aged 2 to 6 years in Denmark: a nationwide cohort study emulating a target trial	Wrong timeline
Su et al. 2023	Influenza vaccine effectiveness against influenza A during the delayed 2022/23 epidemic in Shihezi, China	Wrong timeline
Kislaya et al. 2023	End of season 2022/2023 quadrivalent influenza vaccine effectiveness in preventing influenza in primary care in Portugal	Wrong timeline
Glenn et al. 2023	Influenza vaccine administration and effectiveness among patients with glomerular disease	Wrong timeline
Chaves et al. 2023	High-dose influenza vaccine is associated with reduced mortality among older adults with breakthrough influenza even when there is poor vaccine-strain match	Wrong timeline
Pott et al. 2023	Vaccine effectiveness of non-adjuvanted and adjuvanted trivalent inactivated influenza vaccines in the prevention of influenza-related hospitalization in older adults: A pooled analysis from the Serious Outcomes Surveillance (SOS) Network of the Canadian	Wrong timeline
Fornaguera et al. 2023	Influenza vaccine effectiveness against hospitalization, season 2021/22: A test-negative design study in Barcelona	Wrong timeline
Martínez-Baz et al. 2023	Influenza vaccine effectiveness in preventing laboratory-confirmed influenza cases and hospitalizations in Navarre, Spain, 2022–2023	Wrong timeline
Li et al. 2023	Effect of influenza vaccination on rate of influenza virus infection in Chinese military personnel, 2015–2016: A cluster randomized trial	Wrong timeline
Zimmerman et al. 2023	Vaccine effectiveness of recombinant and standard dose influenza vaccines against influenza related hospitalization using a retrospective test-negative design	Wrong timeline
Fowlkes et al. 2023	Interim effectiveness estimates of 2023 Southern Hemisphere influenza vaccines in preventing influenza-associated hospitalizations – REVELAC-i Network, March–July 2023	Wrong timeline
Domnich et al. 2023	Influenza vaccine effectiveness in preventing hospital encounters for laboratory-confirmed infection among Italian adults, 2022/23 season	Wrong timeline
Sominina et al. 2023	Assessing the intense Influenza A(H1N1)pdm09 epidemic and vaccine effectiveness in the post-COVID season in the Russian Federation	Wrong timeline
Saadatian-Elahi et al. 2023	Patient influenza vaccination reduces the risk of hospital-acquired influenza: An incident test negative-case control study in Lyon university hospital, France (2004–2020)	Wrong timeline
Chung et al. 2023	Evaluating the impact of statin use on influenza vaccine effectiveness and influenza infection in older adults	Wrong timeline
Tenforde et al. 2023	Vaccine effectiveness against influenza-associated urgent care, emergency department, and hospital encounters during the 2021–2022 season, VISION network	Wrong timeline

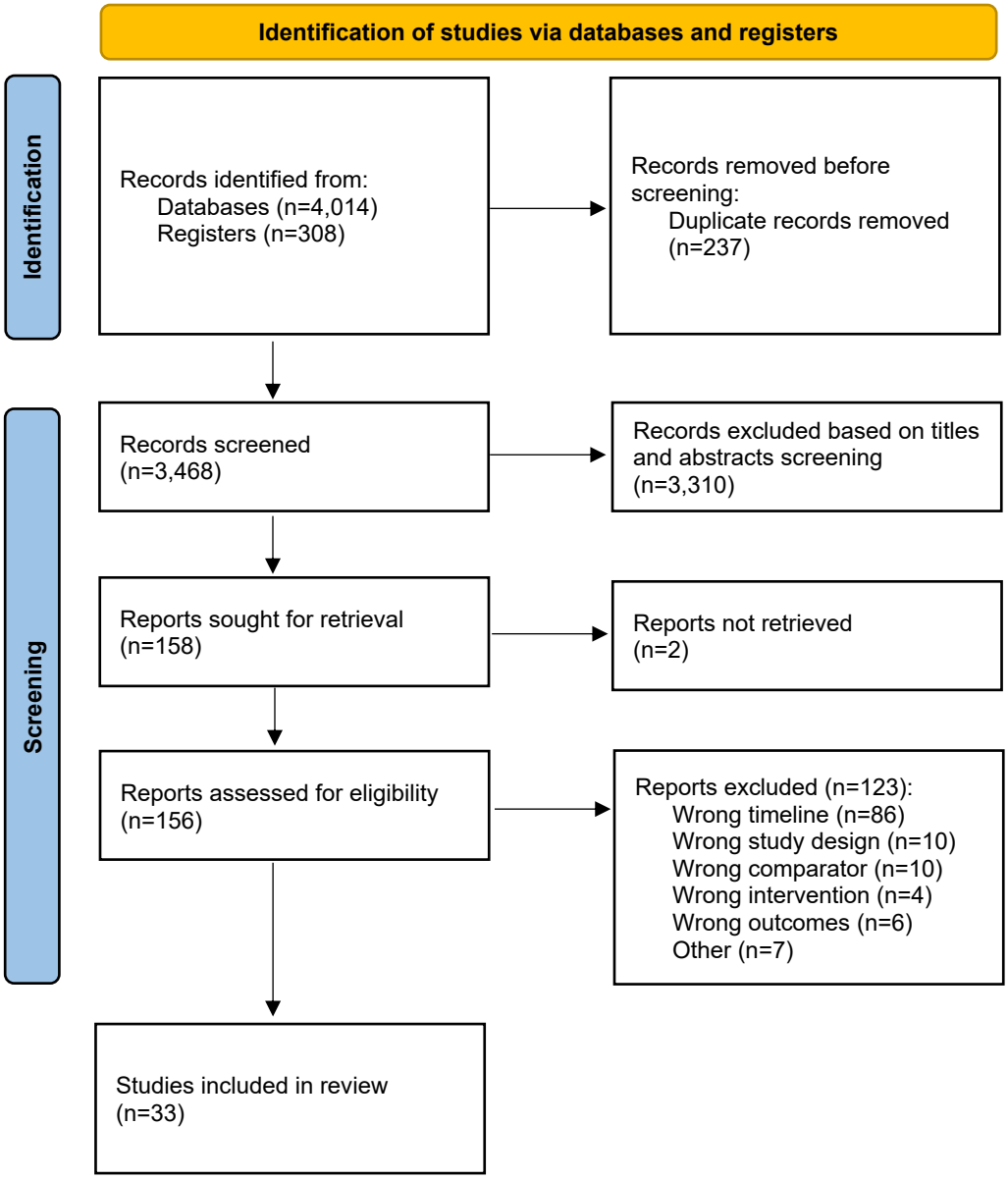
Author and year of publication with hyperlink	Title	Reason for exclusion
Stuurman et al. 2023	Brand-specific estimates of influenza vaccine effectiveness for the 2021–2022 season in Europe: results from the DRIVE multi-stakeholder study platform	Wrong timeline
Wagner et al. 2023	Single-dose vaccination among infants and toddlers provides modest protection against influenza illness, which wanes after 5 months	Wrong timeline
Hood et al. 2023	Influenza vaccine effectiveness among children: 2011–2020	Wrong timeline
Yokomichi et al. 2023	Association of influenza vaccination or influenza virus infection history with subsequent infection risk among children: The Japan Environment and Children's Study (JECS)	Wrong timeline
Uemura et al. 2023	Duration of influenza vaccine effectiveness in the elderly in Japan: A retrospective cohort study using large-scale population-based registry data	Wrong timeline
Chard et al. 2023	End-of-season influenza vaccine effectiveness during the Southern Hemisphere 2022 influenza season – Chile, Paraguay, and Uruguay	Wrong timeline
Awadalla et al. 2023	Moderately low effectiveness of the influenza quadrivalent vaccine: Potential mismatch between circulating strains and vaccine strains	Wrong timeline
Tenforde et al. 2023	Vaccine effectiveness against Influenza A(H3N2)–associated hospitalized illness: United States, 2022	Wrong timeline
Price et al. 2023	Influenza vaccine effectiveness against Influenza A(H3N2)-related illness in the United States during the 2021–2022 influenza season	Wrong timeline
Owusu et al. 2023	Effectiveness of maternal influenza vaccination in Peru PRIME cohort	Wrong timeline
Vaikutyte et al. 2023	Influenza vaccine effectiveness in patients hospitalized with severe acute respiratory infection in Lithuania during the 2019–2020 influenza season: A test negative case – control study	Wrong timeline
Aso et al. 2023	Effectiveness of vaccination on influenza-related critical illnesses in the elderly population	Wrong timeline
Sahni et al. 2023	Sustained within-season vaccine effectiveness against influenza-associated hospitalization in children: Evidence from the new vaccine surveillance network, 2015–2016 through 2019–2020	Wrong timeline
Zimmerman et al. 2023	Vaccine effectiveness of recombinant and standard dose influenza vaccines against outpatient illness during 2018–2019 and 2019–2020 calculated using a retrospective test-negative design	Wrong timeline
Regan et al. 2023	Severity of influenza illness by seasonal influenza vaccination status among hospitalised patients in four South American countries, 2013–19: A surveillance-based cohort study	Wrong timeline
Panatto et al. 2023	Surveillance of severe acute respiratory infection and influenza vaccine effectiveness among hospitalized Italian adults, 2021/22 season	Wrong timeline
Skowronski et al. 2023	Vaccine effectiveness estimates from an early-season influenza A(H3N2) epidemic, including unique genetic diversity with reassortment, Canada, 2022/23	Wrong timeline
Kissling et al. 2023	Influenza vaccine effectiveness against influenza A subtypes in Europe: Results from the 2021–2022 I-MOVE primary care multicentre study	Wrong timeline
Acevedo-Rodriguez et al. 2024	Influenza incidence, lineages, and vaccine effectiveness estimates in Lima, Peru, 2023	Wrong timeline
Donzelli 2024	Re: 'the relative effectiveness of a high-dose quadrivalent influenza vaccine versus standard-dose quadrivalent influenza vaccines in older adults in France' by Bricout et al.	Wrong study design
Branagan et al. (2015)	Fluzone high-dose influenza vaccine with a booster is associated with low rates of influenza infection in patients with plasma cell disorders	No full text

Author and year of publication with hyperlink	Title	Reason for exclusion
Sanz-Muñoz et al. 2024	Are we serologically prepared against an avian influenza pandemic and could seasonal flu vaccines help us?	Wrong outcomes
Morris et al. 2024	Estimating historical disease burden and the impact of vaccination by influenza type and subtype in the United States, 2016–2020	Wrong setting
Pendrey et al. 2024	Hospitalizations and emergency attendance averted by influenza vaccination in Victoria, Australia, 2017 – 2019	Wrong setting
McHugh et al. 2019	Baseline incidence of adverse birth outcomes and infant influenza and pertussis hospitalisations prior to the introduction of influenza and pertussis vaccination in pregnancy: a data linkage study of 78 382 mother-infant pairs, Northern Territory, Australia, 1994–2015	Wrong setting
Martín Ramos et al. 2025	Evolution of hospitalized patients with influenza during 2016–2020 according to their vaccination status	Wrong timeline
Hammerton et al. 2024	Estimating standard-dose and high-dose Fluzone vaccine efficacies for influenza A based on HAI titers	Wrong timeline
Lei et al. 2024	Influenza vaccine effectiveness against hospital-attended influenza infection in 2023/24 season in Hangzhou, China	Duplicate study
Rigamonti et al. 2025	Real-world effectiveness of live attenuated vs. inactivated influenza vaccines in children	Duplicate study

Appendix 4: The ROBINS-I assessment included in the synthesis

First author and published year	Due to confounding	Selection of participants	Classification of interventions	Deviations from intended interventions	Missing data	Measurement of outcomes	Selection of reported result	Overall bias
Choi 2024	Serious	Low	Low	Low	Moderate	Moderate	Low	Moderate
Costantino 2024	Moderate	Low	Low	Low	Moderate	Low	Low	Moderate
Domnich 2024	Low	Low	Low	Low	Low	Moderate	Moderate	Moderate
Frutos 2024	Low	Low	Low	Low	Low	Low	Low	Low
Gào 2024	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Lei 2024	Moderate	Low	Moderate	Low	low	Moderate	Low	Moderate
Maurel 2024	Low	Low	Moderate	Moderate	Moderate	Low	Low	Moderate
Mi 2024	Moderate	Low	Low	Moderate	Low	Moderate	Moderate	Moderate
Pérez-Gimeno 2024	Low	Low	Low	Low	Low	Low	Low	Low
Shinjoh 2024	Moderate	Low	Low	Moderate	Moderate	Moderate	low	Moderate
Smolarchuk 2024	Moderate	Low	Low	Low	Low	Low	Low	Low
Whitaker 2024	Low	Low	Low	Low	Low	Low	Low	Low
Zeno 2024	Low	Low	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Zhu 2024	Moderate	Low	Low	Low	Low	Low	Low	Low
Skowronski 2024	Moderate	Low	Low	Low	Low	Low	Low	Moderate
Choi 2025	Moderate	Low	Low	Low	Moderate	Low	Low	Moderate
Zhu 2025	Moderate	Low	Low	Low	Moderate	Low	Low	Moderate
Chung 2025	Moderate	Low	Low	Low	Moderate	Low	Low	Moderate
Martínez-Baz 2025	Moderate	Low	Low	Low	Low	Low	Moderate	Moderate
Zhang 2025	Moderate	Low	Low	Low	Low	Low	Moderate	Moderate
Lei 2025	Moderate	Moderate	Low	Low	Moderate	Moderate	Moderate	Moderate
Tenforde 2024	Moderate	Low	Low	Low	Moderate	Low	Low	Moderate
Martinez 2024	Serious	Moderate	Moderate	Low	Moderate	Moderate	Moderate	Serious
Marron 2024	Moderate	Low	Low	Low	Moderate	Low	Low	Moderate
Tian 2024	Moderate	Moderate	Low	Low	Low	Moderate	Low	Moderate
Blanquart 2025	Moderate	Moderate	Moderate	Low	Low	Low	Low	Moderate
Sun 2025	Moderate	Moderate	Low	Low	Moderate	Low	Low	Moderate
Rose 2025	Moderate	Low	Low	Low	Moderate	Low	Low	Low
Lee 2024	Moderate	Low	Low	Low	Low	Low	Low	Moderate
Yaron 2025	Moderate	Moderate	Low	Low	Low	Moderate	Low	Moderate
Gharpure 2025	Moderate	Moderate	Moderate	Low	Moderate	Low	Low	Moderate
Separovic 2025	Moderate	Low	Moderate	Low	Moderate	Low	Low	Moderate
Rigamonti 2025	Moderate	Moderate	Low	Low	Moderate	Moderate	Low	Moderate
Frutos 2025	Low	Low	Low	Low	Low	Low	Low	Low

Appendix 5: PRISMA flow diagram



References

1. Costantino C, Mazzucco W, Graziano G, Maida CM, Vitale F, Tramuto F. Mid-term estimates of influenza vaccine effectiveness against the A(H1N1) pdm09 prevalent circulating subtype in the 2023/24 season: Data from the Sicilian RespiVirNet Surveillance System. *Vaccines* 2024; 12(3): 305.
2. Choi YJ, Sohn JW, Choi WS, et al. Interim Estimates of 2023–2024 Seasonal Influenza Vaccine Effectiveness Among Adults in Korea. *Journal of Korean Medical Science* 2024; 39(15): e146.
3. Frutos AM. Interim estimates of 2023–24 seasonal influenza vaccine effectiveness—United States. *MMWR Morbidity and Mortality Weekly Report* 2024; 73(8): 168-174.
4. Frutos AM. Interim estimates of 2024–2025 seasonal influenza vaccine effectiveness—four vaccine effectiveness networks, United States, October 2024–February 2025. *MMWR Morbidity and Mortality Weekly Report* 2025; 74(6): 83-90.
5. Maurel M, Howard J, Kissling E, et al. Interim 2023/24 influenza A vaccine effectiveness: VEBIS European primary care and hospital multicentre studies, September 2023 to January 2024. *Eurosurveillance* 2024; 29(8): 2400089.
6. Whitaker H, Findlay B, Zitha J, et al. Interim 2023/2024 season influenza vaccine effectiveness in primary and secondary care in the United Kingdom. *Influenza and Other Respiratory Viruses* 2024; 18(5): e13284.
7. Zhu S. Interim Influenza vaccine effectiveness against laboratory-confirmed influenza—California, October 2023–January 2024. *MMWR Morbidity and Mortality Weekly Report* 2024; 73(8): 175-179.
8. Smolarchuk C, Ickert C, Zelyas N, Kwong JC, Buchan SA. Early influenza vaccine effectiveness estimates using routinely collected data, Alberta, Canada, 2023/24 season. *Eurosurveillance* 2024; 29(2): 2300709.
9. Pérez-Gimeno G, Mazagatos C, Lorusso N, et al. Effectiveness of influenza vaccines in children aged 6 to 59 months: a test-negative case–control study at primary care and hospital level, Spain 2023/24. *Eurosurveillance* 2024; 29(40): 2400618.
10. Shinjoh M, Yaginuma M, Yamaguchi Y, et al. Effectiveness of inactivated influenza vaccine in children during the 2023/24 season: The first season after relaxation of intensive COVID-19 measures. *Vaccine* 2024; 42(23): 126241.
11. Mi J, Wang J, Chen L, et al. Real-world effectiveness of influenza vaccine against medical-attended influenza infection during 2023/24 season in Ili Kazakh Autonomous Prefecture, China: A test-negative, case-control study. *Human Vaccines & Immunotherapeutics* 2024; 20(1): 2394255.
12. Domnich A, Icardi G, Panatto D, et al. Influenza epidemiology and vaccine effectiveness during the 2023/2024 season in Italy: A test-negative case-control study. *International Journal of Infectious Diseases* 2024; 147: 107202.
13. Gào X, Sun Y, Shen P, et al. Population-based influenza vaccine effectiveness against laboratory-confirmed influenza infection in Southern China, 2023–2024 Season. *Open Forum Infectious Diseases* 2024; 11(9): ofae456.
14. Zeno EE. Interim effectiveness estimates of 2024 southern hemisphere influenza vaccines in preventing influenza-associated hospitalization—REVELAC-i Network, five South American countries, March–July 2024. *MMWR Morbidity and Mortality Weekly Report* 2024; 73(39): 861–868.
15. Skowronski DM, Zhan Y, Kaweski SE, et al. 2023/24 mid-season influenza and Omicron XBB.1.5 vaccine effectiveness estimates from the Canadian Sentinel Practitioner Surveillance Network (SPSN). *Eurosurveillance* 2024; 29(7): 2400076.
16. Rigamonti V, Torri V, Morris SK, et al. Real-world effectiveness of influenza vaccination in preventing influenza and influenza-like illness in children. *Vaccine* 2025; 53: 126946.
17. Lee S-L, Kwan MY, Murphy C, et al. Influenza vaccine effectiveness against influenza-associated hospitalizations in children, Hong Kong, November 2023 to June 2024. *Vaccine: X* 2024; 20: 100570.
18. Yaron S, Yechezkel M, Yamin D, et al. Incremental benefit of high dose compared to standard dose influenza vaccine in reducing hospitalizations. *npj Vaccines* 2025; 10(1): 3.
19. Gharpure R, Regan AK, Nogareda F, et al. Effectiveness of 2023 southern hemisphere influenza vaccines against severe influenza-associated illness: pooled estimates from eight countries using the test-negative design. *The Lancet Global Health* 2025; 13(2): e203-e211.

20. Separovic L, Zhan Y, Kaweski SE, et al. Interim estimates of vaccine effectiveness against influenza A (H1N1) pdm09 and A (H3N2) during a delayed influenza season, Canada, 2024/25. *Euro Surveillance* 2025; 30(4): 2500059.
21. Choi YJ, Song JY, Wie S-H, et al. Early and late influenza vaccine effectiveness in South Korea during the 2023–2024 season. *Vaccines* 2025; 13(2): 197.
22. Zhu L, Han Y, Lu J, et al. Evaluation of influenza vaccine effectiveness from 2021 to 2024: A Guangdong-based test-negative case–control study. *Vaccines* 2024; 13(1): 4.
23. Chung JR, Price AM, Zimmerman RK, et al. Influenza vaccine effectiveness against medically attended outpatient illness, United States, 2023–24 season. *Clinical Infectious Diseases* 2025: ciae658.
24. Martínez-Baz I, Navascués A, Trobajo-Sanmartín C, et al. Effectiveness of influenza vaccination in preventing confirmed influenza cases and hospitalizations in Northern Spain, 2023/24 season: A population-based test-negative case-control study. *International Journal of Infectious Diseases* 2025; 151: 107364.
25. Zhang J, Zhang L, Li J, et al. Moderate effectiveness of influenza vaccine in outpatient settings: A test-negative study in Beijing, China, 2023/24 season. *Vaccine* 2025; 46: 126662.
26. Lei H, Niu B, Sun Z, et al. Influenza vaccine effectiveness against medically-attended influenza infection in 2023/24 season in Hangzhou, China. *Human Vaccines & Immunotherapeutics* 2025; 21(1): 2435156.
27. Tenforde MW, Reeves EL, Weber ZA, et al. Influenza vaccine effectiveness against hospitalizations and emergency department or urgent care encounters for children, adolescents, and adults during the 2023–2024 season, United States. *Clinical Infectious Diseases* 2024: ciae597.
28. Marron L, McKenna A, O'Donnell J, et al. Influenza vaccine effectiveness against symptomatic influenza in primary care: A test negative case control study over two influenza seasons 2022/2023 and 2023/2024 in Ireland. *Influenza and Other Respiratory Viruses* 2024; 18(12): e70023.
29. Tian Y, Ma Y, Ran J, et al. Protective impact of influenza vaccination on healthcare workers. *Vaccines* 2024; 12(11): 1237.
30. Blanquart F, Vieillefond V, Visseaux B, et al. Influenza vaccine effectiveness against detected infection in the community, France, October 2024 to February 2025. *Eurosurveillance* 2025; 30(7): 2500074.
31. Sun Y, Shi W, Zhang D, et al. Early vaccine effectiveness estimates against medically attended laboratory-confirmed influenza based on influenza surveillance, Beijing, China, 2024/25 season. *Eurosurveillance* 2025; 30(7): 2500084.
32. Rose AM, Lucaccioni H, Marsh K, et al. Interim 2024/25 influenza vaccine effectiveness: Eight European studies, September 2024 to January 2025. *Eurosurveillance* 2025; 30(7): 2500102.
33. Martinez CR, Valero S, Villalba EG, et al. Efectividad vacunal en pacientes ingresados por gripe durante la temporada 2023–2024. *Medicina Clínica* 2024; 163(12): 589-594.

Wu N, Phelps A, Bain T, Bhuiya AR, Dass R, Sivanesanathan T, Whitelaw H, Wilson MG. Living evidence synthesis 25.2. Effectiveness of trivalent and quadrivalent influenza vaccines in preventing infection, hospitalization, and severe outcomes in the 2023–2024 season onwards. Hamilton: McMaster Health Forum, 17 March 2025.

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