Interim Estimates of 2025–26 Seasonal Influenza Vaccine Effectiveness — California, October 2025–January 2026

By Zhu et al. 2026

A study on infectious disease surveillance

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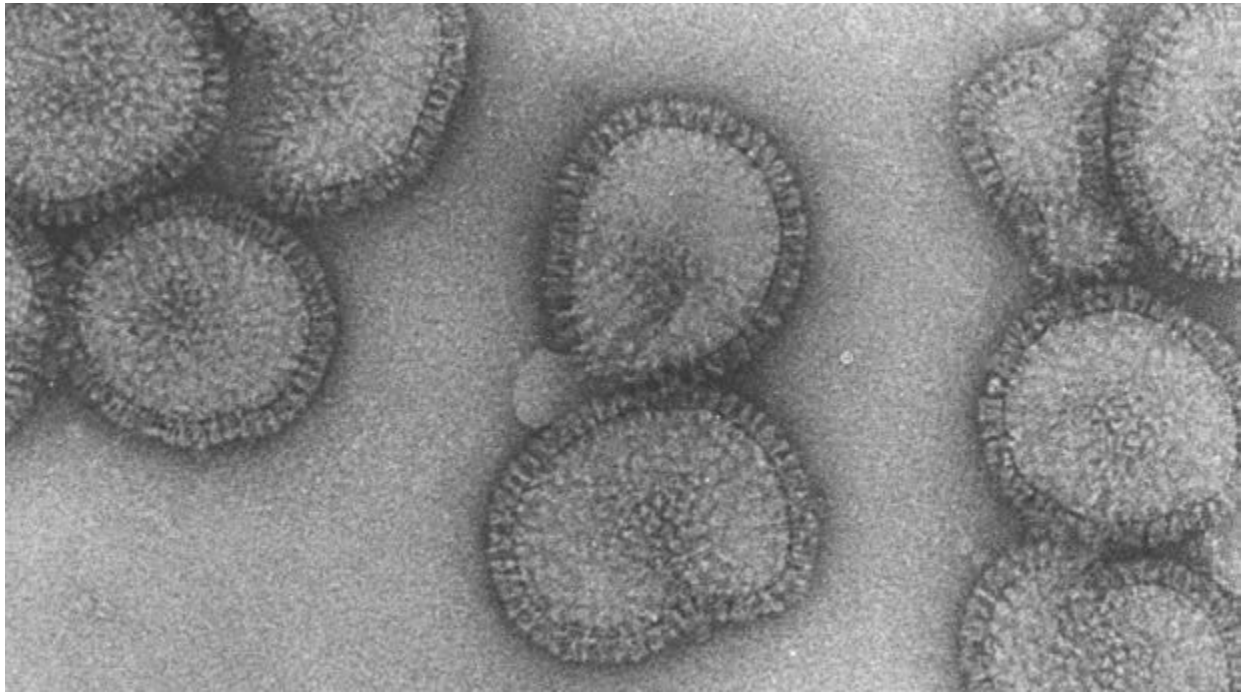
Presentation plan

1. Summary of the article
2. Key point examination
    1. The case-control study type
    2. Vaccination efficiency
    3. Interim analysis
3. Conclusion

1. Summary of the article : background



The influenza virus through an electronic microscope

- Influenza A(H1N1), sub-clad pdm09
- Influenza A(H3N2), sub-clad K
- Influenza B

Influenza flu

Seasonal disease occurring during the winter season

2024-2025 flu season in the US (CDC report):

- 51 million cases
- 23 million medical consultations
- 710’000 hospitalisation
- 45’000 deaths

Highly contagious, low severity

Symptoms : headache, sneezing, tiredness

Source: 2024–2025 Influenza Season Summary: Severity, Disease Burden, and Burden Prevented | Flu Burden | CDC and En savoir plus sur l'influenza | Institut national de santé publique du Québec

1. Vaccination

TABLE 1. Influenza vaccines — United States, 2025–26 influenza season*

Vaccine type and trade name (manufacturer)	Presentation	Age indication	µg HA (IIV3s and RIV3) or virus count (LAIV3) for each vaccine virus (per dose)	Route	Contains thimerosal as preservative
IIV3s (standard-dose, egg-based vaccines†)					
Afluria (Seqirus)	0.5-mL PFS§	≥3 yrs§	15 µg/0.5 mL	IM¶	No
	5.0-mL MDV**	≥6 mos§ (needle and syringe)	7.5 µg/0.25 mL	IM¶	Yes
		18 through 64 yrs (jet injector)¶	15 µg/0.5 mL		24.5 µg Hg/0.5 mL**
Fluarix (GlaxoSmithKline)	0.5-mL PFS	≥6 mos	15 µg/0.5 mL	IM¶	No
FluLaval (GlaxoSmithKline)	0.5-mL PFS	≥6 mos	15 µg/0.5 mL	IM¶	No
Fluzone (Sanofi Pasteur)	0.5-mL PFS††	≥6 mos††	15 µg/0.5 mL	IM¶	No
	5.0-mL MDV**	≥6 mos††	7.5 µg/0.25 mL	IM¶	Yes
			15 µg/0.5 mL		25 µg Hg/0.5 mL**
ccIIV3 (standard-dose, cell culture–based vaccine)					
Flucelvax (Seqirus)	0.5-mL PFS	≥6 mos	15 µg/0.5 mL	IM¶	No
	5.0-mL MDV**	≥6 mos**	15 µg/0.5 mL	IM¶	Yes
					25 µg Hg/0.5 mL**
HD-IIV3 (high-dose, egg-based vaccine†)					
Fluzone High-Dose (Sanofi Pasteur)	0.5-mL PFS	≥65 yrs	60 µg/0.5 mL	IM¶	No
aIIV3 (standard-dose, egg-based vaccine† with MF59 adjuvant)					
Fluad (Seqirus)	0.5-mL PFS	≥65 yrs	15 µg/0.5 mL	IM¶	No
RIV3 (recombinant HA vaccine)					
Flublok (Sanofi Pasteur)	0.5-mL PFS	≥9 yrs	45 µg/0.5 mL	IM¶	No
LAIV3 (egg-based vaccine†)					
FluMist (AstraZeneca)	0.2-mL prefilled single-use intranasal sprayer	2 through 49 yrs	$10^{6.5–7.5}$ FFU/0.2 mL	Intranasal	No

From [Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices — United States, 2025–26 Influenza Season]

Who gets vaccinated ?

- Everyone above 6 months except if immunosuppression

Vaccination strategy:

- 1 dose per year (flu season)
- 2 doses if vulnerabilities

Most vaccines are cultivated from inactivated antigens in cell cultures

Question: How efficient are the vaccines to prevent influenza flu ?

1. Research question and objectives

Research question of the article : what is the vaccinal efficiency (VE) of the currently available vaccines (no distinction) ?

Objectives:

1. Inform on the incidence of flu virus in California for 2025-2026 flu season
2. Provide early measures of the efficiency of the vaccines according to age and exposure
3. Comment the vaccination policy

1. Methodes

Population : all Californian aged > 5 months susceptible to get the flu in 2025-2026 and tested through molecular nucleic acid amplification tests

Intervention : any flu vaccination notified in the Californian IIC register

Comparison : people who received a negative antigenic test

Outcome : positive antigenic test for a strain of influenza virus

Time : from October 1, 2025, to January 31, 2026

Study type: case-patient study

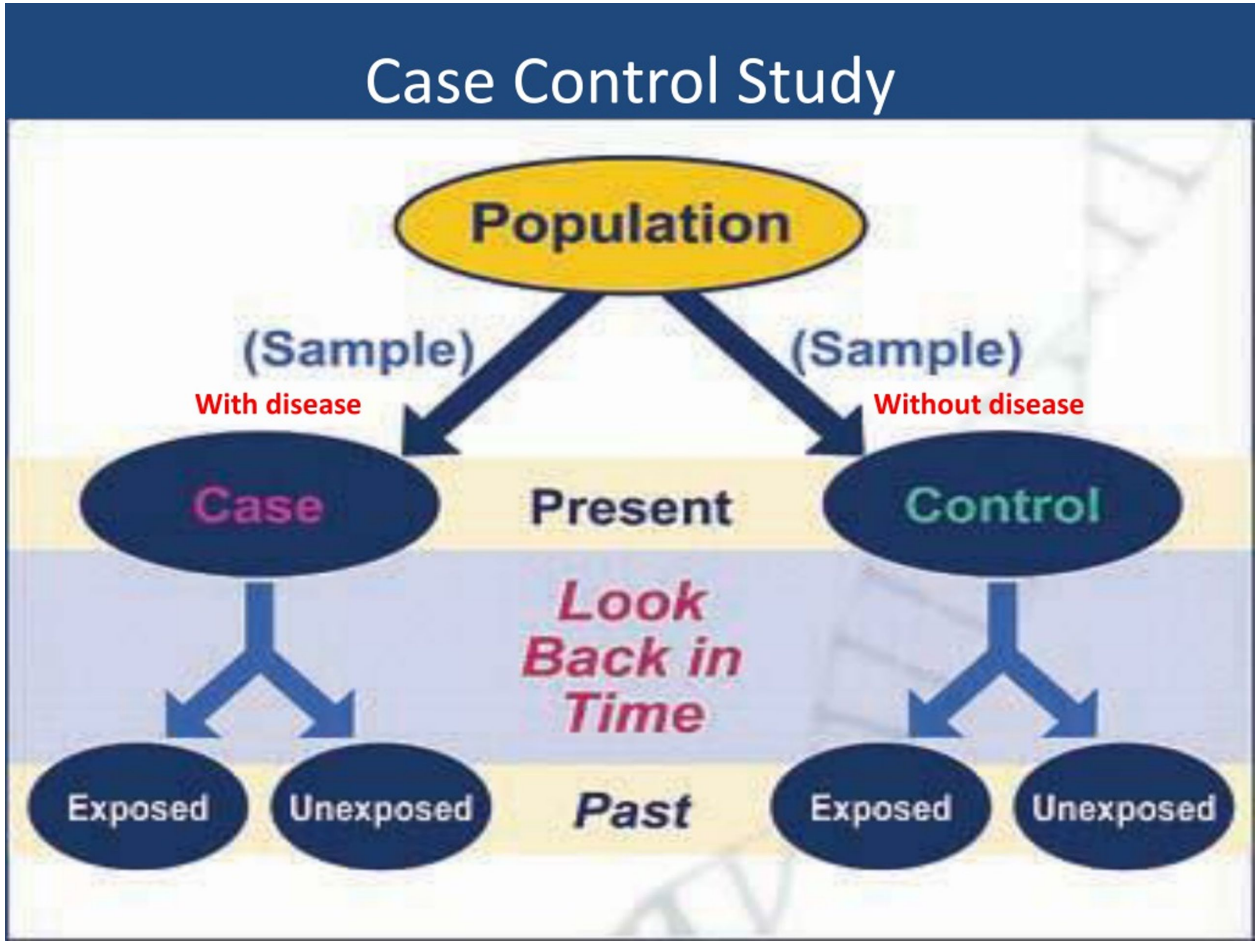
1. Summary of the results

1. 952’765 test results with 86’369 positive ones (9 %)
2. Most influenza cases were Influenza A(H3N2) sub-clad K
3. The most administered vaccine was the inactivated influenza, simple dose
4. Most vaccinated people were children (0.6 to 18 years)
5. Overall, VE was 33 % (32 % against influenza A and 47 % against influenza B)

2. Key points

1. The case-control study type
2. VE
3. Interim analyse

2.1 Case-control



Strengths :

1. Cheap
2. Ethical
3. Can infer causality

Weaknesses:

1. Retrospective only
2. Information bias
3. Only uses the OR (overestimate the risk)

2.2 Vaccine Efficiency (VE)

	Exposure		
Outcome	Vaccinated (V+)	Not-vaccinated (V-)	Total
Disease (D+)	D+IV+	D+IV-	D+
Healthy (D-)	D-IV+	D-IV-	D-
Total	V+	V-	N

1. Might evaluate how efficient the vaccine is at preventing a case
2. Comparison with the critical proportion (Pc)
3. Uses the OR / RR
4. Is underestimated due to the OR

Somme formulas :

- Pc = (1-1/R0) x 100
  % of the population to vaccinate for elimination
- Odd's ration (OR) = ([D+IV+] x [D-IV-]) / ([D-IV+] x [D+IV-])
  Value which multiplicate the ratio of exposure
- VE = (1 – OR) x 100
  % of risk of infection avoided

Source : Interim Estimates of 2025–26 Seasonal Influenza Vaccine Effectiveness — California, October 2025–January 2026

2.3 Interim analysis

Statistical analysis performed at midpoint of a survey/experiment

Two objectives :

1. Provide information at an early stage
2. Might motivate early termination

3. Conclusion

- Flu vaccines significantly reduces the ratio of flu cases
- Main limitations and biases:
  - Selection bias (inclusion of COVID positive tests)
  - Information biases (unknown validity of reference databases)
  - Retrospective study type, not representative of the population
  - OR is overestimating the risk and underestimating the VE
- Further analysis are warranted by the authors

Source : Interim Estimates of 2025–26 Seasonal Influenza Vaccine Effectiveness — California, October 2025–January 2026

Thank you !