At-Home Nasal Flu Vaccine Associated with Lower Influenza Infection Rates Than In-Clinic Nasal Vaccine

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Key Findings:

- Patients who received the at-home nasal influenza vaccine in the 2025/2026 influenza season had a 37.4% lower likelihood of post-vaccination influenza infection compared to those who received the same nasal vaccine in a clinic, after accounting for other factors.

In September 2024, the FDA approved FluMist, the only nasal spray influenza vaccine for self-administration.[1] AstraZeneca launched FluMist Home in August 2025, offering home delivery in 34 states for the 2025/2026 season.[2] This at-home option is intended to improve vaccination access by removing logistical barriers such as clinic scheduling and needle aversion. FluMist is a live attenuated influenza vaccine (LAIV) approved for people ages 2 through 49, meaning it uses weakened live viruses administered through the nose rather than the inactivated virus delivered by injection. Understanding of the real-world efficacy of the at-home version remains limited.

We studied 10,260 patients aged 2 and older who received an influenza vaccine between August 1, 2025, and January 31, 2026, and who resided in one of the 34 states where the at-home nasal influenza vaccine was available. Patients were classified by whether they received the nasal vaccine at home or in clinic. We matched patients on vaccination month, race and ethnicity, and age. We additionally accounted for sex, social vulnerability and rurality based on most recent address, prior-year healthcare utilization, BMI classification, pregnancy status, and comorbidities.

We found that patients who received the at-home nasal vaccine were 37.4% less likely to be diagnosed with an influenza infection during the 2025/2026 influenza season compared to those who received the in-clinic nasal vaccine, as seen in Figure 1.

Likelihood of Influenza Infection by Vaccination Setting

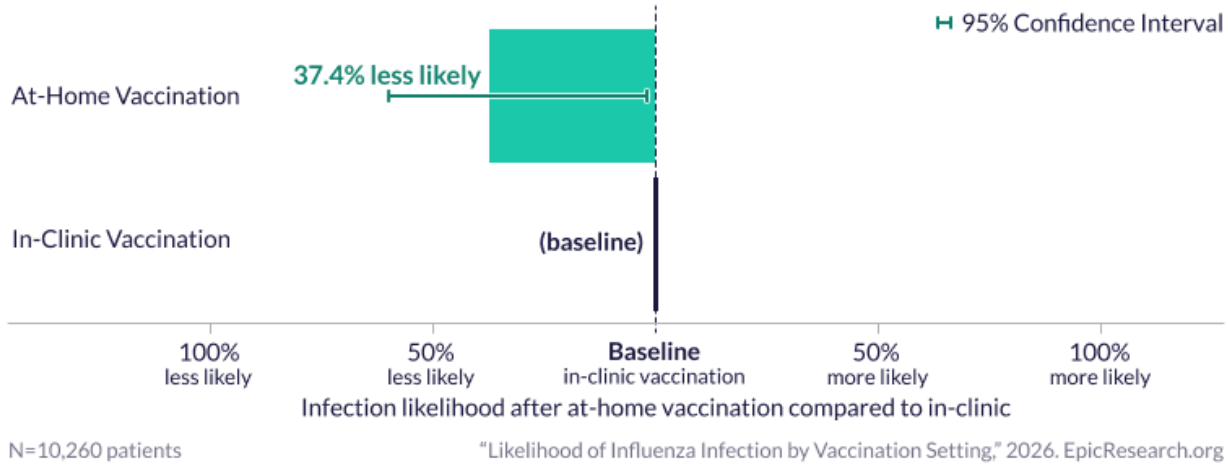

Figure 1. The likelihood of a patient being diagnosed with influenza after a nasal influenza vaccination by administration setting.

The unadjusted infection rate was 1.1% among the at-home vaccinated group compared to 1.7% among the in-clinic vaccinated group. While this difference favors the at-home group, its interpretation requires careful consideration of how the two populations differ. Both groups received the same vaccine; the difference lies in the setting of administration. As such, similar effectiveness would be expected, and the difference might indicate that there are meaningful differences between the populations that matching and adjustment were not able to fully account for.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 300 million patient records from 1,900 hospitals and more than 45,000 clinics from all 50 U.S. states, Canada, Lebanon, and Saudi Arabia. This study was completed by two teams that worked independently, each composed of a clinician and research scientist. The two teams came to similar conclusions. Graphics by Brian Olson.

References

1. US Food and Drug Administration. FDA approves nasal spray influenza vaccine for self- or caregiver-administration. FDA. Published September 20, 2024. https://www.fda.gov/news-events/press-announcements/fda-approves-nasal-spray-influenza-vaccine-self-or-caregiver-administration. Accessed February 26, 2026.
2. AstraZeneca. FLUMIST, the nation's only nasal spray flu vaccine, now available for home delivery. Published August 15, 2025. https://www.astrazeneca-us.com/media/press-releases/2025/FLUMIST-the-nations-only-nasal-spray-flu-vaccine-now-available-for-home-delivery.html. Accessed February 24, 2026.

Data Definitions

Term	Definition
Study period	08/01/2025 to 1/31/2026
Study population: inclusion	Patients who: • Received an **exposure** vaccine during the **study period** • Are at least 2 years old at the time of receiving the vaccine • Have a vaccine registry query at least seven days after the vaccine date • Live in a state that the **at-home nasal influenza vaccine** is available in (Alabama, Arizona, California, Colorado, Connecticut, Florida, Georgia, Iowa, Idaho, Illinois, Massachusetts, Maryland, Maine, Michigan, Montana, North Carolina, North Dakota, Nebraska, New Hampshire, New Jersey, Nevada, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Vermont, Washington, Wisconsin, or Wyoming)
Study population: exclusion	Patients who: • Received multiple doses and/or types of any flu vaccine • Contracted influenza earlier in the flu season, up through 14 days after receiving the vaccination
Exposures	Receipt of the **at-home nasal influenza vaccine** or **in-clinic nasal influenza vaccine**
Outcomes	**Influenza infection**

Confounders	Age at time of vaccination: 2–4, 5–11, 12–17, 18–49, 50+
	Evaluated sex: M/F
	RUCA: Metropolitan, Micropolitan, Small Town, Rural, Unknown
	Social Vulnerability Index quintiles
	BMI classification: (We classify based on the closest BMI to the vaccination date, limiting to values between 10 and 200, taken between 8/1/2024 and 1/31/2026.)
	• For patients on or before their 20th birthday:
	  ○ Underweight: under the 5th percentile
	  ○ Overweight: BMI above the 85th percentile
	  ○ Obese: above the 95th percentile
	• For patients aged 20+:
	  ○ Underweight: < 18.5
	  ○ Normal BMI: 18.5-<25
	  ○ Overweight: 25-<30
	  ○ Obese: 30+
	Number of all-cause ED encounters in the prior year, starting a week prior to vaccination: 0, 1, 2+
	Number of non-ED encounters in the prior year, starting a week prior to vaccination: 0, 1–2, 3–5, 6–9, 10–14, 15+
	Comorbidities:
	• Immunocompromised: Any diagnosis with ICD-10-CM C*, B20, E84*, or Z90.81 or SNOMED 77465005
	• Diabetes: Any diagnosis with ICD-10-CM E08-*-E13*
	• Chronic lung disease: Any diagnosis with ICD-10-CM J41*-J45*, J84*, E84*, J60, J67.8, J69.8, or J82.83

	• Chronic kidney disease: Any diagnosis with ICD-10-CM N18* • Cardiovascular disease: Any diagnosis with ICD-10-CM I20*-I26*, I30*-I49*, I51*, or I70*-I79* • Liver disease: Any diagnosis with ICD-10-CM code K70.3*-K70.4*, K71.3*-K71.5*, K71.7*, K72.1*, K73*, or K76.1 - Any diagnosis types or problem list problem documented since 2010 are considered for patients. **Influenza infection** in the prior two flu seasons **Pregnancy** during the **study period**
At-home nasal influenza vaccine	A vaccination with CVX code 333
In-clinical nasal influenza vaccine	A vaccination with CVX code 111 or 149
Injectable influenza vaccine	A vaccination with CVX code 160, 205, 168, 197, 135, 161, 166, 186, 171, 320, 153, 185, 155, 231, 201, 202, 205, 200, 331, 158, 150, 141, or 140
Influenza infection	A lab result with LOINC code of 86318-3, 85821-7, 85802-7, 85803-5, 85804-3, 85805-0, 85801-9, 23102-7, 23104-3, 44564-3, 15472-4, 44575-9, 46082-4, 46083-2, 5860-2, 6435-2, 5864-4, 6439-4, 5862-8, 6437-8, 5866-9, 6441-0, 80381-7, 72366-8, 72356-9, 72367-6, 80382-5, 80383-3, 72365-0, 61102-0, 77383-8, 77384-6, 44559-3, 44572-6, 49529-1, 50701-2, 49522-6, 49534-1, 44560-1, 44573-4, 44558-5, 44571-8, 88904-8, 88905-5, 5861-0, 6436-0, 5865-1, 6440-2, 86565-9, 23781-8, 88194-6, 44561-9, 44574-2, 5863-6, 6438-6, 6442-8, 5867-7, 29721-8, 22828-8, 22825-4, 23769-3, 23782-6, 31821-2, 31822-0, 31823-8, 50697-2, 44562-7, 44563-5, 43874-7, 31858-4, 31859-2, 44566-8, 44567-6, 33535-6, 31860-0, 24015-0, 31861-8, 31862-6, 54240-7, 44576-7, 54241-5, 44577-5, 43895-2, 31863-4, 31864-2, 31865-9, 88200-1, 88568-1, 91772-4, 6602-7, 6601-9, 6603-5, 6604-3, 48310-7, 94600-4, 38382-8, 80204-1, 49538-2, 85535-3, 54242-3, 54244-9, 49530-9, 100973-7, 100974-5, 82168-6, 82166-0, 82167-8, 82169-4, 82170-2, 92977-8, 92976-0, 101293-9, 101292-1, 101294-7, 101295-4, 90455-7, 90456-5, 81233-9, 88601-0, 92882-0, 90457-3, 55466-7, 97733-0, 44264-0, 44265-7, 44266-5, 56024-3, 44263-2, 59424-2, 59423-4, 60494-2, 53250-7, 53251-5, 88187-0, 55133-3, 55134-1, 49537-4, 95423-0, 91072-9, 91771-6, 82461-5, 22827-0, 48509-4, 39102-9, 39103-7, 55463-4, 74784-0, 51668-2, 62493-2, 76077-7, 76079-3, 88193-8, 88195-3, 86568-3, 86571-7, 49526-7, 60530-3, 49531-7, 49520-0, 49523-4, 49527-5, 50700-4, 49535-8, 60267-2, 76078-5, 77028-9, 77026-3, 77027-1, 80588-7, 80589-5, 80590-3, 76080-1, 80591-1, 88600-2, 88596-2, 92142-9, 101423-2, 101424-0, 101983-5, 81428-5, 92141-1, 94395-1, 94396-9, 94394-4, 88599-6, 88592-1, 92809-3, 92808-5, 85477-8, 85478-6, 100344-1, 100343-3, 86569-1, 86572-5, 55465-9, 38381-0, 49521-8, 57985-4, 49524-2, 44795-3, 38272-1, 68986-9, 68987-7, 38271-3, 38270-5, 49528-3, 99623-1, 34487-9, 55464-2, 62462-7, 60538-6, 95658-1, 103787-8, 40982-1, 62860-2, 74785-7, 74786-5, 81305-5, 81308-9, 81307-1, 81309-7, 81327-9, 81325-3, 86317-5, 74038-1, 74039-9, 77605-4, 74040-7, 88835-4, 90886-3, 85526-2, 90885-5, 81320-4, 81321-2, 44091-7, 74787-3, 40981-3, 54243-1, 87715-9, 39025-2, 49532-5, 87714-2, 50702-0, 87716-7, 61101-2, 50705-3, 93762-3, 93763-1, 50704-6, 93761-5, 93760-7, 93759-9, 50706-1, 50707-9, 50708-7, 50711-1, 85532-0, or 49536-6.

	The lab must have an abnormal flag or a result of “Detected,” “Positive,” “Present,” or “Influenza A virus positive” or a diagnosis with ICD-10-CM code J10* or J11* • Diagnoses of influenza on the same day or encounter as the influenza vaccine are ignored
Pregnancy	A pregnancy episode or a diagnosis with ICD-10-CM code O*
Non-ED encounters	Encounters of type “Office Visit,” “Well Child,” “Follow-up,” “Telemedicine,” “Urgent Care,” “Walk-In,” “Routine Prenatal,” “Postpartum Visit,” “Fetal Care Consult,” “Hospice Admission,” “Hospital,” “Hospital Outpatient Visit,” “Inpatient Admission,” or “Hospital Outpatient Visit to Inpatient”
Model specifications	Logistic regression on poor outcomes Matched 1:4 on exact age, month of vaccination, and **race and ethnicity**
Race and ethnicity	Patients were categorized into a single category of either: • Hispanic • Non-Hispanic, Multiracial • Non-Hispanic, Asian • Non-Hispanic, Black • Non-Hispanic, White • Non-Hispanic, Other
Limitations	Several important limitations should be considered. First, the at-home vaccine exposure reflects vaccine ordering rather than confirmed administration; the vaccine might not have been used or might have been improperly stored. If some at-home recipients never administered their vaccine, they would effectively be unvaccinated, which would be expected to increase infection rates in the at-home group and bias results against the observed finding. Second, despite propensity-score matching and covariate adjustment, individuals who chose the at-home option may differ from clinic-vaccinated patients in unmeasured ways. The higher rate of prior healthcare utilization among at-home recipients suggests possible differences in overall health consciousness that adjustment may not fully address. Third, the follow-up window is limited to the first season of at-home availability, and influenza diagnoses depend on patients presenting for testing, a behavior that may itself differ between more and less health-engaged populations, as noted above.

Table 1: Likelihood of Influenza Infection by Vaccination Setting

	Odds Ratio	95% CI Low	95% CI High
ED Care - One	0.98	0.58	1.67
ED Care - Multiple	1.67	0.88	3.19
Non-ED Care 1-2	0.81	0.51	1.30
Non-ED Care 3-5	1.00	0.62	1.63
Non-ED Care 6-9	1.29	0.75	2.22
Non-ED Care 10-14	0.68	0.28	1.69
Non-ED Care 15+	1.18	0.54	2.58
RUCA - Micropolitan	1.53	0.86	2.71
RUCA - SmallTown	0.57	0.14	2.34
RUCA - Rural	0.00	0.00	inf

RUCA - Unknown	0.00	0.00	inf
Female Sex	1.00	0.73	1.38
Other Sex	0.00	0.00	inf
SVI Unknown	0.00	0.00	inf
SVI Q2	0.60	0.39	0.92
SVI Q3	0.82	0.53	1.25
SVI Q4	0.66	0.40	1.08
SVI Q5	0.54	0.29	1.00
Overlapping Pregnancy	1.14	0.15	8.64
Cardiovascular Disease	1.08	0.58	2.04
Chronic Kidney Disease	0.86	0.11	6.76
Chronic Liver Disease	0.00	0.00	inf
Chronic Lung Disease	1.34	0.88	2.04
Diabetes	0.69	0.15	3.05
Immunocompromised	0.99	0.23	4.32
BMI Unknown	0.40	0.13	1.18
BMI Underweight	0.59	0.16	2.22
BMI Overweight	0.76	0.28	2.06
BMI Obese	0.86	0.31	2.36
intercept	0.03	0.01	0.10
Age 2-4	1.30	0.72	2.36
Age 5-11	1.16	0.80	1.67
Age 18-49	0.36	0.18	0.72
Age 50+	0.58	0.15	2.21
Is Home Vaccine	0.63	0.40	0.98