



Research Letter | Infectious Diseases

COVID-19 Vaccine Effectiveness Among Older Adults

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Introduction

From September to November 2025, many European countries launched COVID-19 vaccination campaigns, when SARS-CoV-2 incidence was decreasing after a period of high circulation.¹ These campaigns targeted specific groups, including older adults (ie, individuals aged at or above a minimum threshold that varied from age 60 to 70 years across countries). We estimated the effectiveness of COVID-19 vaccines administered during these seasonal vaccination campaigns in Europe against medically attended, symptomatic SARS-CoV-2 infection among older adults, from September 29, 2025, to January 10, 2026.

Methods

This case-control study used data from the Vaccine Effectiveness, Burden and Impact Studies primary care study, which recruited patients with acute respiratory infection who presented to a primary care physician 14 days or more after the start of seasonal COVID-19 vaccination campaigns in France, Germany, Ireland, Italy, or Spain, and belonged to the older target group for vaccination.² Either all or a systematic sample (with known sampling fraction) of these patients were selected for swabbing. Cases and controls were patients who tested positive or negative for SARS-CoV-2 by reverse transcription-polymerase chain reaction (RT-PCR), respectively. We defined vaccinated individuals as those who received any COVID-19 vaccine dose on or after the vaccination campaign start date and whose symptom onset occurred 14 days or more postvaccination. Unvaccinated patients were those not vaccinated during the campaign or in the 3 months before, as well as those vaccinated on or after the day of symptom onset.

We used logistic regression models adjusted for the a priori confounders of study site, symptom onset time, age, and sex, to estimate vaccine effectiveness (VE) with medically attended, symptomatic, RT-PCR-confirmed SARS-CoV-2 infection, overall and by time since vaccination. We explored various functional forms for variables and chose the best-fitting model among fully adjusted ones, using the Akaike information criterion.³

Sensitivity analyses included an exploration of whether the presence of a chronic condition confounded VE estimates, and an analysis excluding influenza cases from the control group.

To minimize sparse data bias, we did not estimate VE if the number of sites was higher than the number of cases (or controls) divided by 10, or if there were fewer than 20 exposed or unexposed patients. We also repeated analyses using Firth penalized regression⁴ if there were fewer than 10 events per model parameter,⁵ or fewer than 5 events per cell of the table formed by the exposure and outcome variables. If the penalized regression estimate differed by 10% or more from the standard regression, we did not report that estimate. Data were analyzed from January to February 2026 using R version 4.4.1 (R Project for Statistical Computing). Statistical significance was set at $P < .05$. Additional methods are available in the eMethods in [Supplement 1](#).

+ Supplemental content

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Official ethical approval and patient consent was not required in Ireland, Italy or Spain as this study was classified as routine care or surveillance. Local ethical approval was received from a national or regional review board in France (ethics statement 471393) and Germany (EA2/126/11). Verbal consent was obtained in France and written consent was obtained in Germany. We followed the [STROBE](#) guideline.

Results

We included 2046 patients, 125 (6%) cases, and 1921 (94%) controls. The median (25th-75th percentile) age was 72 years (64-79) among cases and 73 years (67-79) among controls.

Table 1. Baseline Characteristics of Participants, VEBIS Primary Care Study, Europe, September 2025 to January 2026

Characteristics	Participants, No. (%)	
	SARS-CoV-2-positive cases	Test-negative controls
Total	125 (6)	1921 (94)
Study site (minimum age threshold for older target group, y)		
France, 65 y	22/125 (18)	213/1921 (11)
Germany, 60 y	24/125 (19)	97/1921 (5)
Ireland, 60 y	13/125 (10)	309/1921 (16)
Italy, 60 y	53/125 (42)	674/1921 (35)
Spain, 70 y	13/125 (10)	628/1921 (33)
Age, median (IQR)	72 (64-79)	73 (67-79)
Sex		
Female	80/125 (64)	1097/1921 (57)
Male	45/125 (36)	824/1921 (43)
Presence of chronic conditions ^a		
Missing	3	44
Vaccinated against COVID-19 in the autumn and winter 2025 to 2026 campaign	7/125 (6)	374/1921 (19)
Vaccine brand and valency ^b		
Comirnaty LP.8.1	5/6 (83)	132/272 (49)
Comirnaty unspecified	1/6 (17)	138/272 (51)
Bimervax unspecified	0/6 (0)	2/272 (1)
Missing	1	102
No. of days since vaccination, median (IQR) ^b	36 (34-50)	36 (23-54)
SARS-CoV-2 lineage ^c		
XFG	18/19 (95)	NA
NB.1.8.1	1/19 (5)	NA
Missing	106	NA

Abbreviations: NA, not available; VEBIS, Vaccine Effectiveness, Burden And Impact Studies.

^a Chronic conditions that classify a patient as part of the target group for COVID-19 vaccination in their country of recruitment.

^b Among exposed patients.

^c Among SARS-CoV-2 positive cases.

Table 2. Pooled COVID-19 Vaccine Effectiveness Against Symptomatic, Medically Attended SARS-CoV-2 Infection Among Older Adults, VEBIS Primary Care Study, Europe, September 2025 to January 2026

Vaccine status	SARS-CoV-2-positive cases, No. (n = 125)	Time since vaccination among cases, median (IQR), d	Test-negative controls, No. (n = 1921)	Time since vaccination among control, median (IQR), d	Vaccine effectiveness (95% CI)
Unvaccinated	118	NA	1547	NA	NA
Vaccinated					
Time since vaccination, d					
≥14	7	36 (34 to 50)	374	36 (23 to 54)	59 (14 to 83)
14-41	4	34 (28 to 34)	219	25 (20 to 33)	64 (8 to 89)
42-83	3	52 (50 to 52)	153	56 (50 to 67)	52 (-39 to 89)
14-59	7	36 (34 to 50)	310	32 (22 to 45)	54 (3 to 81)

Abbreviation: VEBIS, Vaccine Effectiveness, Burden And Impact Studies.

Seven of 125 cases (6%) were vaccinated compared with 374 of 1921 (19%) controls (**Table 1**). The median (25th-75th percentile) number of days since vaccination was 36 (34-50) days in cases and 36 (23-54) days in controls. Among 278 of 381 vaccinated patients (73%) with known vaccine brand, 276 (99%) received Comirnaty. Of these, 137 (50%) had known valency; all were SARS-CoV-2-LP.8.1-adapted vaccines.

As of February 2026, 19 of 125 (15%) of the SARS-CoV-2-positive samples were genetically sequenced. All but one belonged to the XFG lineage. Sequencing of additional cases is ongoing.

Overall COVID-19 VE was 59% (95% CI, 14% to 83%) among older adults (**Table 2**). The VE was 64% (95% CI, 8% to 89%) and 52% (95% CI, -39% to 89%) at 14 to 41 days and 42 to 83 days postvaccination, respectively. The VE was 54% (95% CI, 3% to 81%) within 14 to 59 days of vaccination. Our estimates varied by 5% or less in all sensitivity analyses. When penalized regression was used as per our criteria (ie, for the 14 to 41-day and 42 to 83-day intervals), VE varied by 8% or less compared with standard regression estimates.

Discussion

Vaccines administered in autumn and winter 2025 to 2026 showed approximately 55% effectiveness against symptomatic disease among older adults within 2 months of vaccination. This estimate was consistent with results from the past 2 seasons^{6,7} and with those from a US preprint for the 2025 to 2026 season.⁸

This study has limitations. The sample size was limited due to reduced SARS-CoV-2 circulation following vaccination campaigns, which was also observed in the previous season,⁷ and requires caution in results interpretation and assessment of optimal timing of COVID-19 vaccination campaigns. The low uptake of vaccines, which showed substantial short-term effectiveness, suggests missed opportunities for preventing symptomatic COVID-19 among unvaccinated vulnerable groups.

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Data Sharing Statement: See [Supplement 3](#).

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SUPPLEMENT 1.**eMethods.****SUPPLEMENT 2.****Nonauthor Collaborator Statement****SUPPLEMENT 3.****Data Sharing Statement**