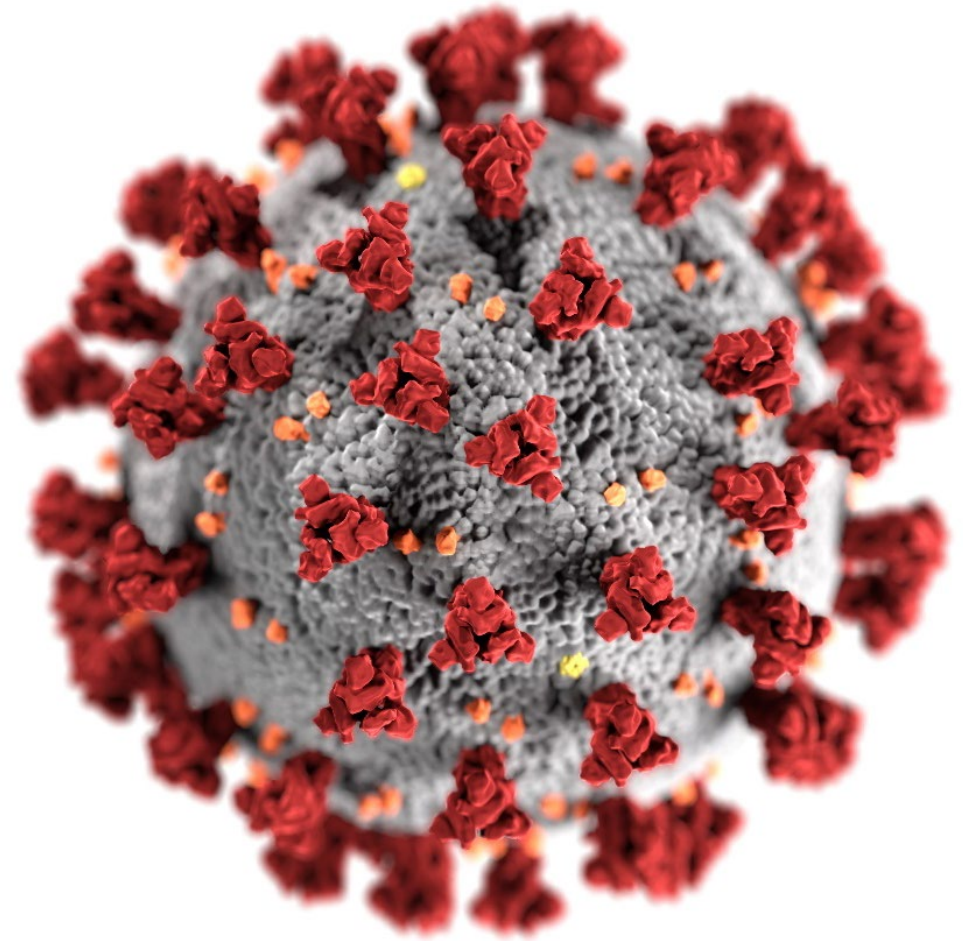


# COVID-19 Vaccine Effectiveness during Omicron

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ACIP  
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[cdc.gov/coronavirus](https://cdc.gov/coronavirus)

# Organization of presentation

- Evidence organized by outcome
  - Infection
  - Emergency department/urgent care (ED/UC)
  - Hospitalization

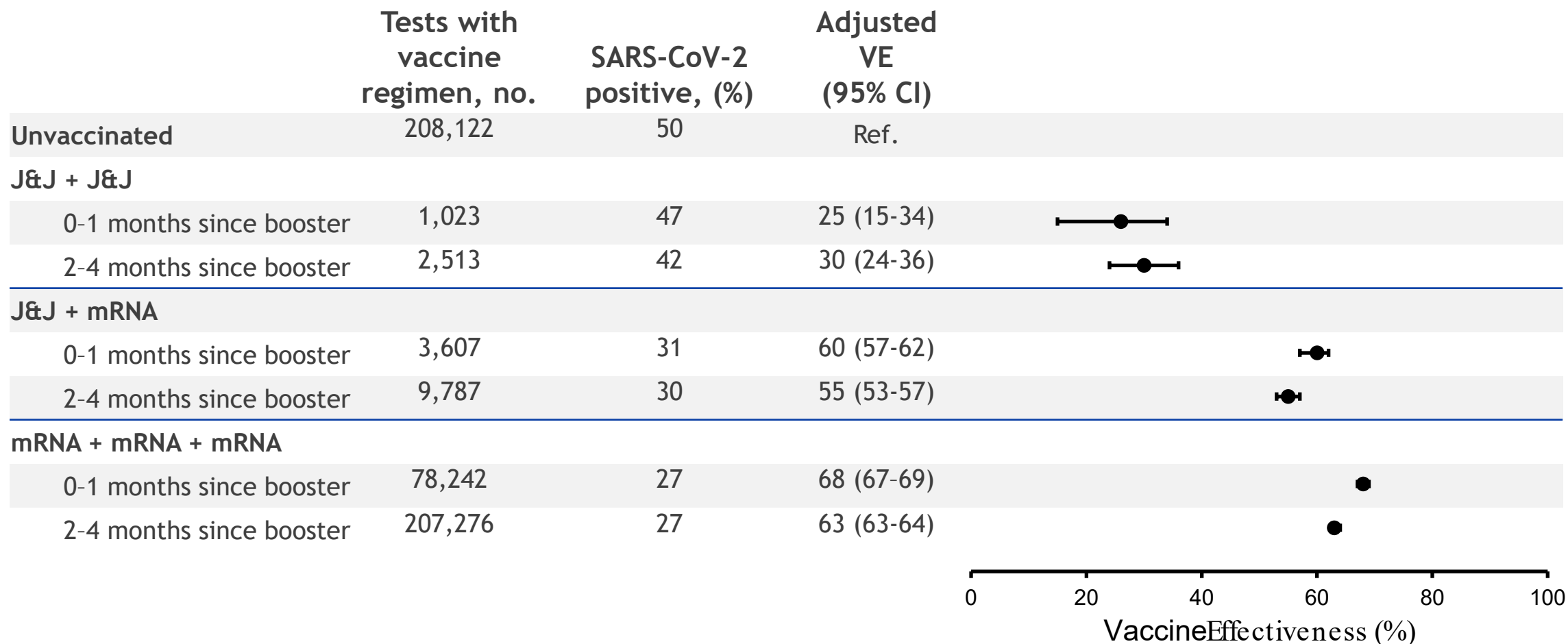
# Vaccine effectiveness (VE) data for infection with Omicron

# Increasing Community Access to Testing (ICATT)

## Partnership: VE analysis for symptomatic infection

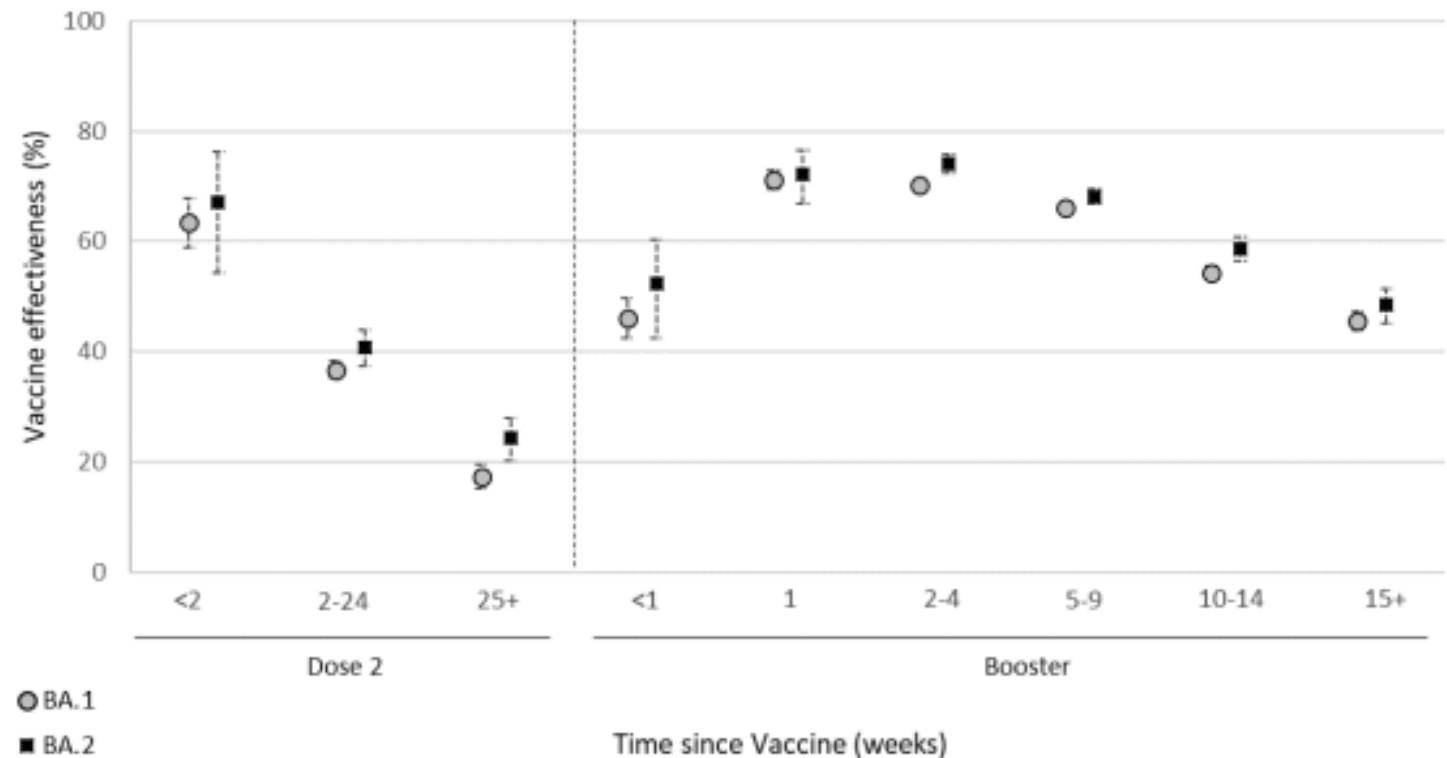
- Nationwide community-based drive-through COVID-19 testing via pharmacies
- Self-reported vaccine history at time of registration for COVID-19 testing; excluded those who did not report vaccination status
- **Design:** Test-negative, case-control analysis
- **Population:** Persons with  $\geq 1$  COVID-like symptom and nucleic acid amplification testing (NAAT)
- **Adjusted for:**
  - Calendar day, race, ethnicity, gender, site's HHS region, site census tract's social vulnerability index (SVI)
  - Prior infection excluded
- **Period:**
  - Tested December 26, 2021 - March 23, 2022

## Increasing Community Access to Testing (ICATT) Partnership, booster VE against symptomatic infection in adults $\geq 18$ years during Omicron, Dec 26, 2021-Mar 23, 2022



# Data from the UK: VE vs. symptomatic infection comparing Omicron sublineages (BA.1 vs BA.2) by time since booster

- Pfizer-BioNTech, Moderna, or ChAdOx1-S primary series, Pfizer-BioNTech or Moderna booster
- VE was generally comparable by Omicron sublineage



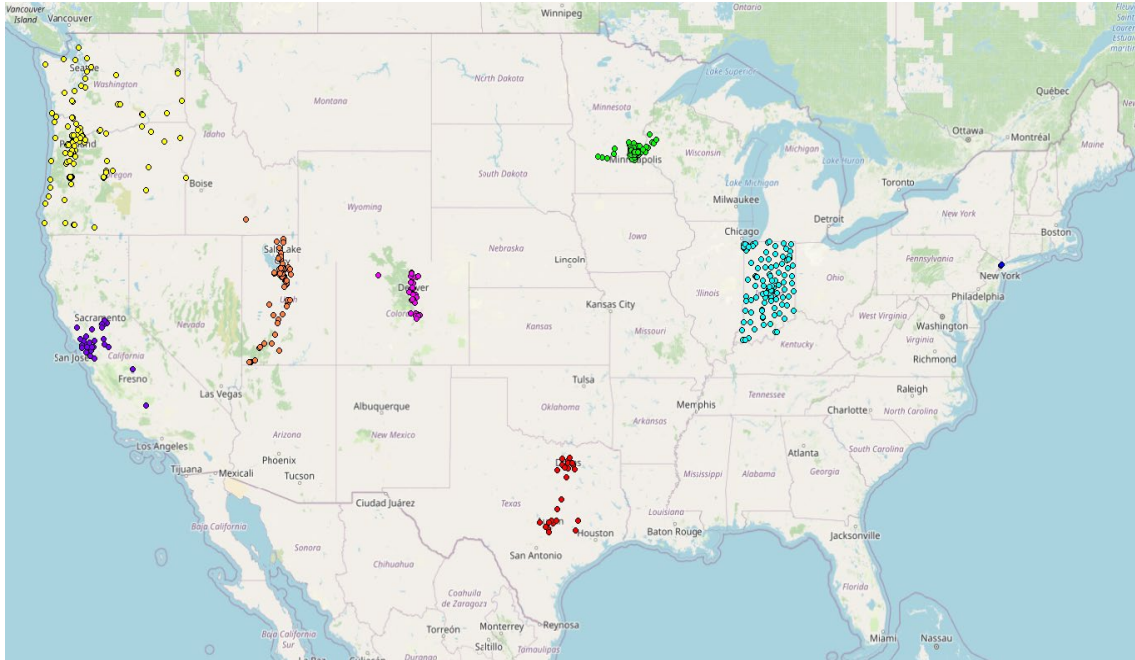
# Overall summary of VE against infection

- VE looks different for recipients of J&J vaccine; lower overall vs. regimens that include at least 1 mRNA
- Evidence of slight waning against infection for 3 mRNA doses by 2-4 months after the last dose
- Early VE data from the UK show similar VE for BA.1 and BA.2 sublineages of Omicron variant

Vaccine effectiveness data for emergency department/urgent care (ED/UC) due to Omicron in the US

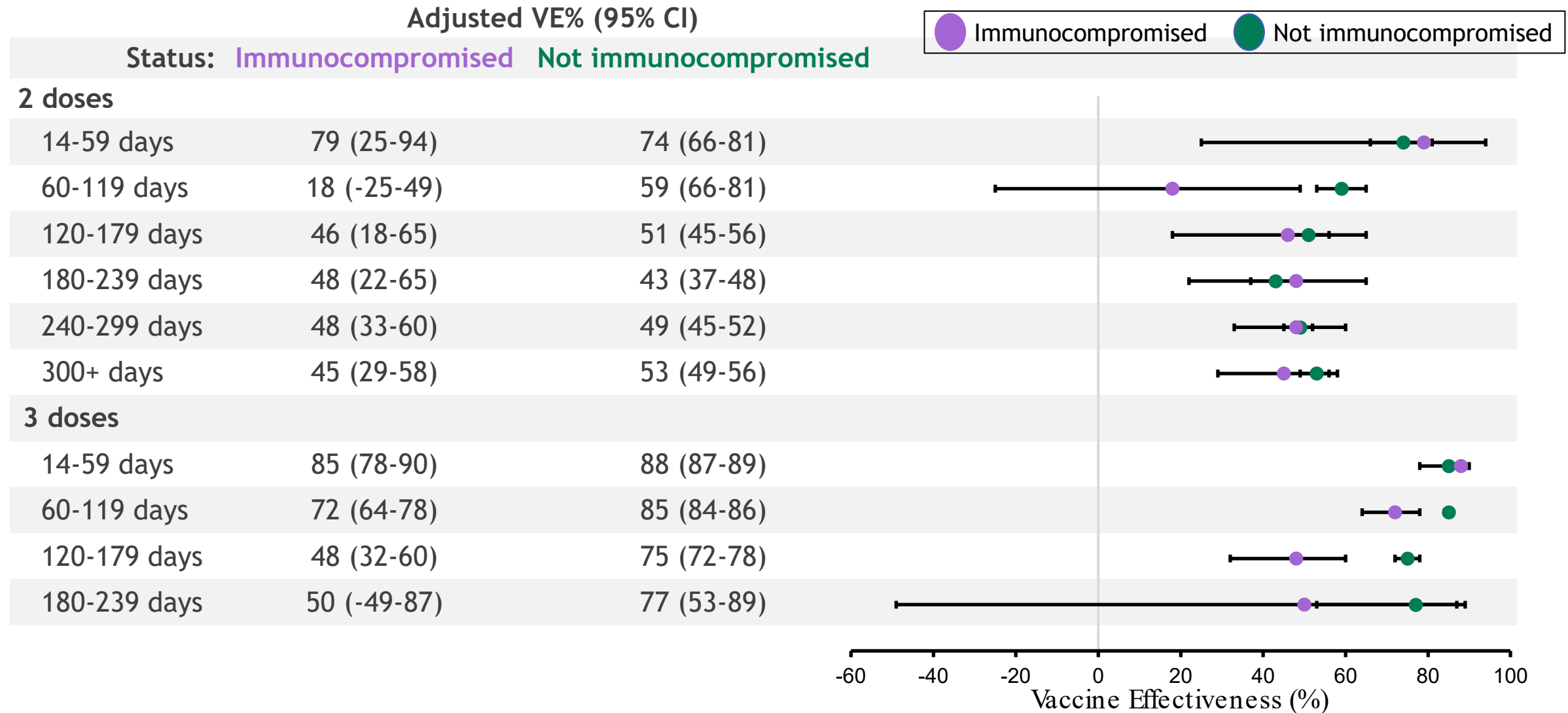


# VISION Multi-State Network of Electronic Health Records



- **Cases:** COVID-like illness (CLI) with positive PCR for SARS-CoV-2 within 14 days before or 72 hours after the admission or encounter
- **Controls:** CLI with negative PCR for SARS-CoV-2
- Delta vs. Omicron determined by time when Omicron predominated in study site (mid-December 2021)
- VE adjusted by propensity to be vaccinated weights, calendar time, region, local virus circulation, and age
- Vaccination documented by electronic health records and state and city registries

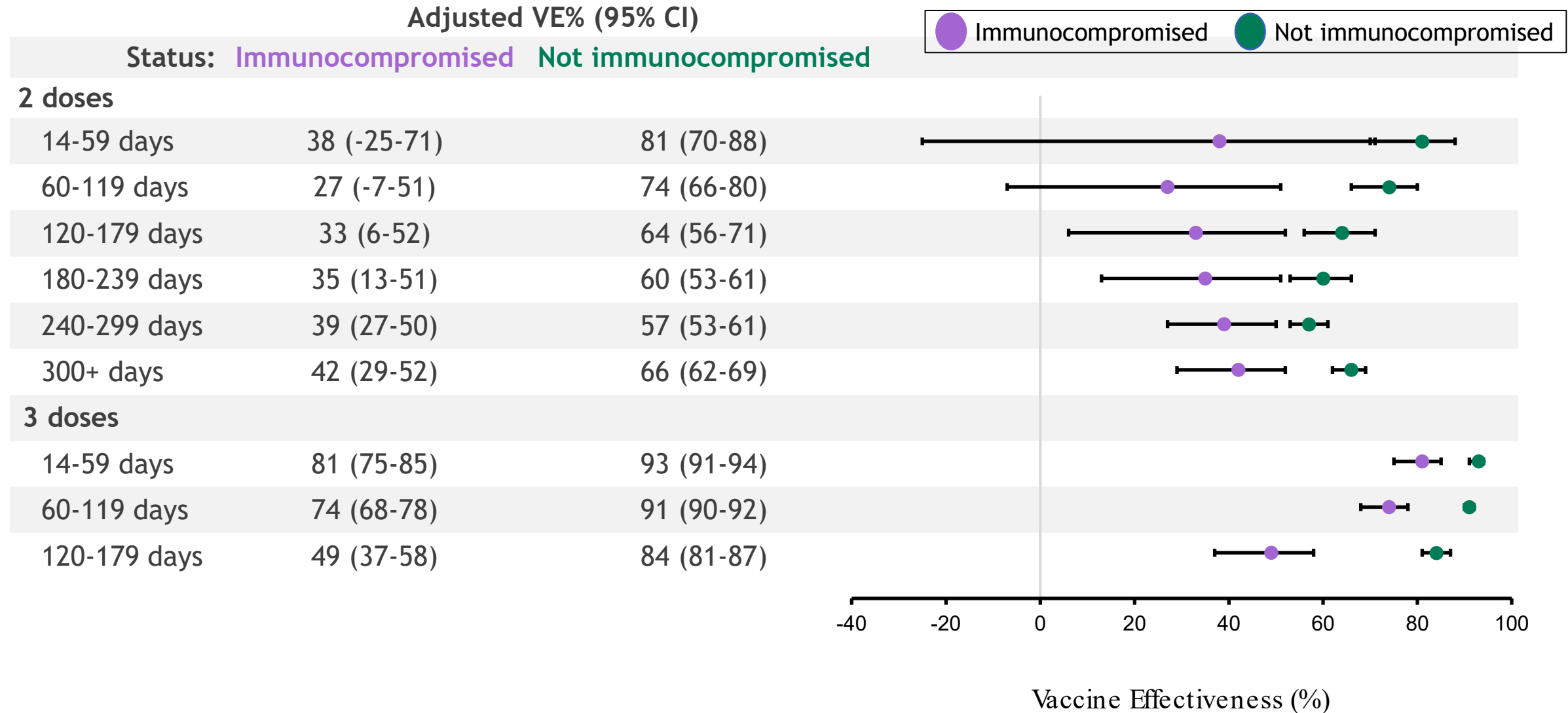
# VISION: mRNA VE for ED/UC visits by number of doses and time since last dose receipt for adults ≥50 years, Dec 2021–Mar 2022, by immunocompromised status



CDC, preliminary unpublished data. Individuals with prior infections excluded. Logistic regression conditioned on calendar week and geographic area, and adjusted for age, sex, race, ethnicity, local virus circulation, respiratory or nonrespiratory underlying medical conditions, and propensity to be vaccinated

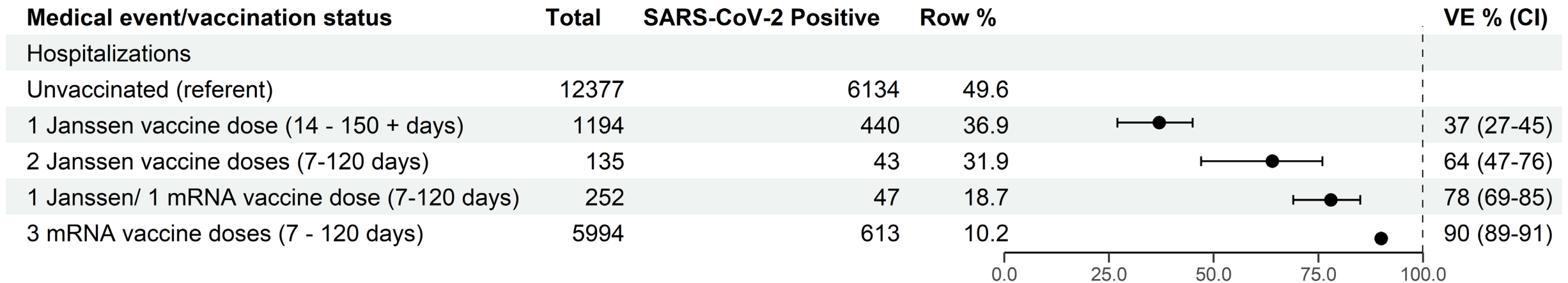
# Vaccine effectiveness data for hospitalization due to Omicron in the US

# VISION: mRNA VE for hospitalization by number of doses and time since last dose receipt for adults ≥50 years, Dec 2021–Mar 2022, by immunocompromised status



CDC, preliminary unpublished data. Individuals with prior infections excluded. Logistic regression conditioned on calendar week and geographic area, and adjusted for age, sex, race, ethnicity, local virus circulation, respiratory or nonrespiratory underlying medical conditions, and propensity to be vaccinated

# VE against COVID-19-associated hospitalizations during Omicron, Dec 16, 2021-Mar 7, 2022



- VE of any booster dose is significantly higher than VE for 1 Janssen dose only
- VE of 3 mRNA doses is significantly higher than Janssen plus booster

# Effectiveness of mRNA vaccines for preventing COVID-19 hospitalization, IVY Network

- **Population:** Adults ( $\geq 18$  years) hospitalized at 21 medical centers in 18 states
- **Design:** Test-negative case-control
- **Case status:**
  - Cases: COVID-like illness and SARS-CoV-2/RT-PCR (+)
  - Controls: COVID-like illness and SARS-CoV-2 RT-PCR (-)
- **Testing:** SARS-CoV-2 testing within 10 days of illness onset, and admission within 14 days of illness onset

IVY  
INFLUENZA AND OTHER VIRUSES IN THE ACUTELY ILL

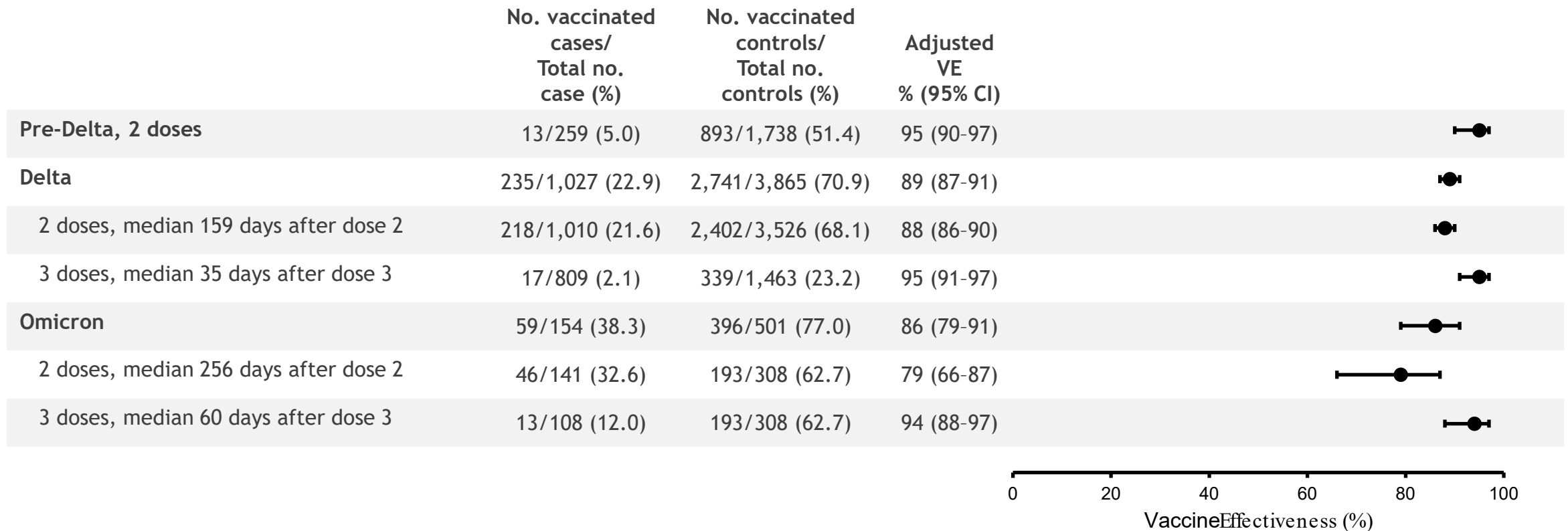


## Effectiveness of mRNA COVID-19 vaccines against COVID-19-associated hospitalization, Dec 26, 2021 – Mar 15, 2022

Group	No. of vaccinated case-patients/total case-patients (%)	No. of vaccinated control-patients/ total control-patients (%)	Adjusted* vaccine effectiveness % (95% CI)
3 doses overall	288/909 (32)	508/776 (65)	78 (73–83)
Immunocompromised	153/250 (61)	191/238 (80)	65 (44–78)
7–120 days	89/186 (48)	134/181 (74)	73 (55–84)
>120 days	64/161 (40)	57/104 (55)	54 (16–75)
Not immunocompromised	135/659 (20)	317/538 (59)	85 (80–89)
7–120 days	118/642 (18)	273/494 (55)	86 (81–89)
>120 days	17/541 (3)	44/265 (17)	79 (59–89)

\*Adjusted for age (18-64 or ≥65 years), sex, race/ethnicity, admission date (biweekly), and US census region  
 CDC preliminary unpublished data

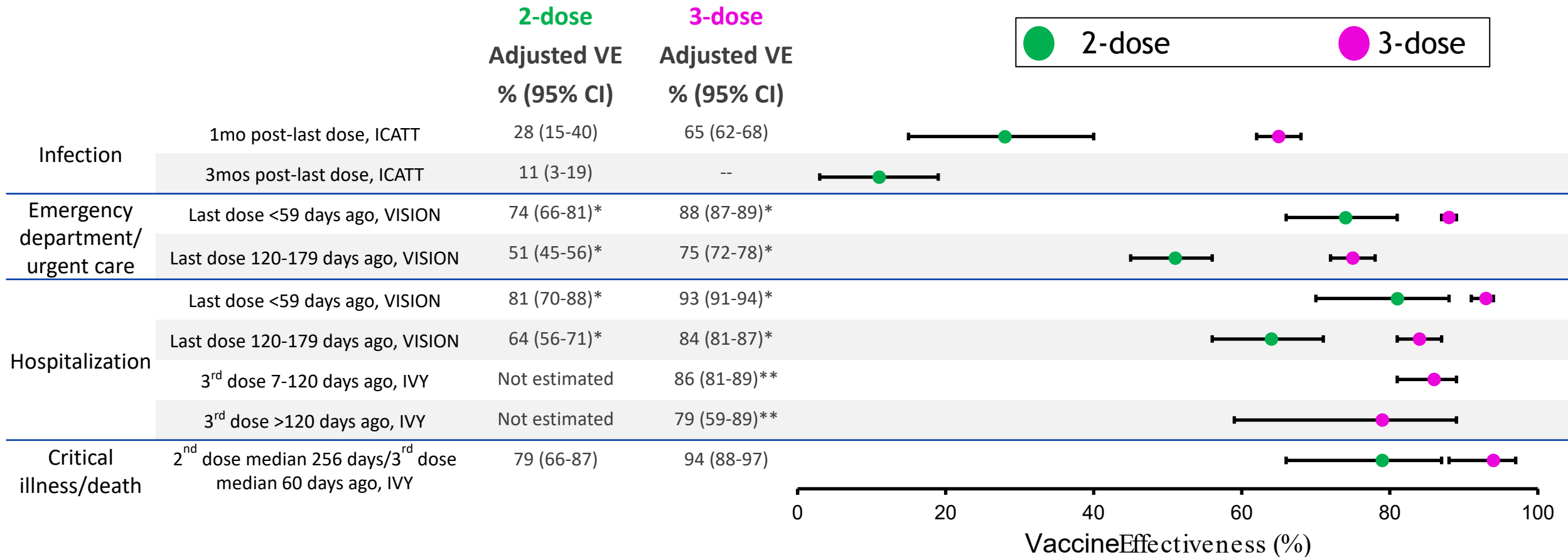
# IVY: VE against invasive mechanical ventilation or in-hospital death, by variant, Jul 4, 2021-Jan 24, 2022





# Summary

# Summary: VE of 2 doses of mRNA vaccine increases with increasing severity of outcome during Omicron in adults ≥18 years; 3<sup>rd</sup> dose increases VE



**Booster receipt increases protection across all outcomes.  
Booster dose VE remains high among non-immunocompromised individuals 4-6 months after dose.**

\*Among non-immunocompromised individuals ≥50 years of age.

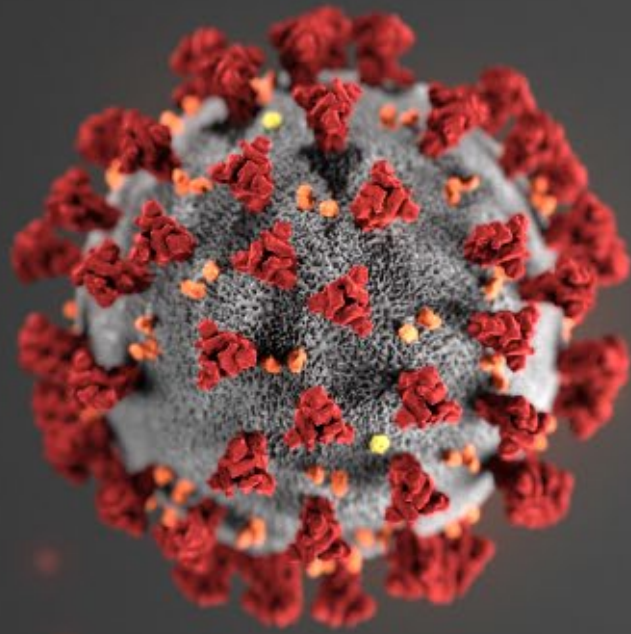
\*\* Among non-immunocompromised individuals ≥18 years of age.

# Summary: mRNA VE during Omicron

	Not immunocompromised	Immunocompromised
<b>2-dose VE against:</b>		
Infection (+/- symptoms)	Limited protection, fast waning	Not estimated
ED/UC	Higher protection, some waning	Not estimated
Hospitalization	Highest protection, some waning	Not estimated
<b>3-dose VE against:</b>		
Infection (+/- symptoms)	Some protection, evidence of waning	Not estimated
ED/UC	Some protection, limited waning	Some protection, clear waning
Hospitalization	Highest protection, limited waning	Highest protection, clear waning

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    - Mark Thompson



For more information, contact CDC  
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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

