

# COVID Data Tracker

Maps, charts, and data provided by CDC, updates Mondays and Fridays by 8 p.m. ET

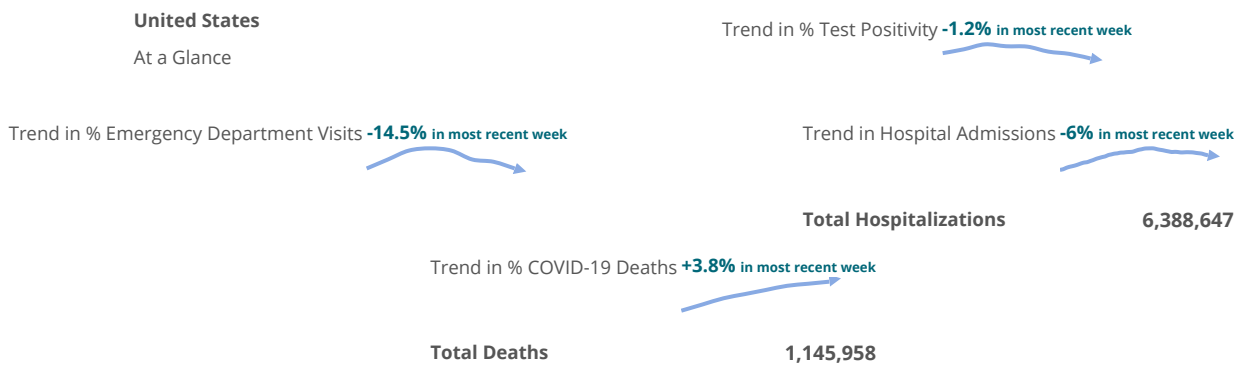
[COVID-19 Home >](#)



Effective September 29, 2023, weekly updates to maps, charts, and data provided by CDC for COVID Data Tracker will occur on Fridays by 12 p.m. ET. This change aligns with the timing of CDC's weekly updates for respiratory viruses (<https://www.cdc.gov/respiratory-viruses/index.html>).

## United States at a Glance

Collapse —



Data Tracker Home

Trends

Maps

Hospitalizations

Deaths

Emergency Department Visits

Vaccination Distribution & Coverage

Vaccine Effectiveness

## COVID-19 Vaccine Effectiveness Update

**Note:** Vaccine effectiveness estimates are not expected to change from month to month unless circulating variants significantly change. However, as more time has passed since COVID-19 vaccines have been introduced in the United States, scientists evaluate vaccine effectiveness relative to time since the most recent vaccine the person received to inform future recommendations.

This page highlights the most current and relevant CDC-authored vaccine effectiveness studies that will be updated with data, as well as key findings from the studies by age group. This page also includes a spotlight on one of the studies to explain more detail and context.

Release Date: **August 31, 2023**

**Includes COVID-19 vaccine effectiveness studies published through August 18, 2023**

### What You Need to Know

Staying up to date on COVID-19 vaccination helps protect against hospitalization, critical illness, and death in all age groups. CDC recommends everyone [stay up to date](#) with COVID-19 vaccines for their age group.



Find [clinical and professional resources](#) for COVID-19 vaccines.

- [Variants & Genomic Surveillance](#)
- [Traveler-Based Genomic Surveillance](#)
- [Wastewater Surveillance](#)
- [Post-COVID Conditions](#)
- [Health Equity](#)
- [Pediatric](#)
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CDC works with partners to study COVID-19 vaccine effectiveness using several data collection platforms and study designs. Vaccine effectiveness studies vary based on the outcome (such as infection, emergency room visits, hospitalization, or death), population, and study design.

Results of these evaluations are published in CDC's MMWR or other scientific journals. CDC's COVID-19 Vaccine Effectiveness Update summarizes these studies to provide a snapshot of how well COVID-19 vaccines are working in different populations and against currently circulating variants.

- Learn about how CDC monitors how well [COVID-19 vaccines are working](#)
- Learn about vaccine [effectiveness research and monitoring systems](#)

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## Updates on COVID-19 Vaccine Effectiveness

CDC studies published from April 2023–August 2023 on COVID-19 vaccine effectiveness found the following:

### Effectiveness in Adults

- [Effectiveness of Monovalent mRNA COVID-19 Vaccination in Preventing COVID-19–Associated Invasive Mechanical Ventilation and Death Among Immunocompetent Adults During the COVID-19 Variant Period - IVY Network, 19 U.S. States, February 1, 2022–January 31, 2023 MMWR / April 2023 / 72\(17\); 463–468](#)
  - Original monovalent (ancestral SARS-CoV-2 strain) mRNA vaccination was 76% effective at preventing COVID-19–associated invasive mechanical ventilation and death up to 6 months after the last dose and remained 56% effective at 1–2 years.
  - Original mRNA COVID-19 vaccines provided substantial, durable protection against COVID-19–associated invasive mechanical ventilation and death. All adults should remain up to date with recommended COVID-19 vaccination to prevent critical outcomes of COVID-19.
- [Estimates of Bivalent mRNA Vaccine Durability in Preventing COVID-19–Associated Hospitalization and Critical Illness Among Adults with and Without Immunocompromising Conditions - VIY Network, September 2022–April 2023 MMWR / May 26, 2023 / 72\(21\); 579–588](#)
  - Among adults aged ≥18 years without immunocompromising conditions, bivalent (ancestral and BA.4/BA.5 strains) vaccine effectiveness (VE) against COVID-19–associated hospitalization declined from 62% at 7–59 days postvaccination to 24% at 120–179 days compared with among unvaccinated adults. Among immunocompromised adults, lower bivalent booster VE was observed. However, bivalent booster VE was sustained against critical COVID-19–associated outcomes, including intensive care unit admission or death.
  - Adults should stay up to date with recommended COVID-19 vaccines. Optional additional bivalent vaccine doses are available for older adults and persons with immunocompromising conditions.
- [Effectiveness of Up-to-Date COVID-19 Vaccination in Preventing SARS-CoV-2 Infection Among Nursing Home Residents - United States, November 20, 2022–January 8, 2023 MMWR / July 2023 / 72\(25\); 690–693](#)
  - Among nursing home residents who were up to date with COVID-19 vaccination (most received a bivalent vaccine), vaccine effectiveness against SARS-CoV-2 infection was 33%.
  - Staying up to date with COVID-19 vaccination recommendations and, if eligible, getting an additional bivalent dose, provides additional protection against SARS-CoV-2 infection. Nursing home residents would benefit from the protection offered by staying up to date with recommended COVID-19 vaccinations.

### Effectiveness in Children

- [Effectiveness of Monovalent and Bivalent mRNA Vaccines in Preventing COVID-19–Associated Emergency Department and Urgent Care Encounters Among Children Aged 6 Months–5 Years](#)

[VISION Network, United States, July 2022–June 2023](#)

- Using data from the VISION network, CDC evaluated the vaccine effectiveness against 19-associated emergency department and urgent care visits by the length of time since a dose was received during July 4, 2022–May 2023 among children ages 6 months to 4 years (Pfizer-BioNTech) and 6 months to 5 years (Moderna).
- Both the original (monovalent) mRNA COVID-19 vaccine series and the bivalent vaccine series provided protection against COVID-19-associated emergency department and urgent care visits among children ages 6 months to 4 years (Pfizer-BioNTech) and 6 months to 5 years (Moderna). Children should stay up to date with recommended COVID-19 vaccines, including starting a new vaccination series as soon as they're eligible.
- Children continue to be impacted by COVID-19. As of June 2023, there were more than 1 million COVID-19 cases, more than 20,000 hospitalizations, and more than 400 deaths among children aged 6 months to 4 years. All children aged 6 months and older should stay up to date with recommended COVID-19 vaccines, including starting the vaccine series as soon as they're eligible and completing it within the recommended time for the best protection.

Read all of CDC's COVID-19 vaccine effectiveness studies that have been published in MMWR: [by Topic | MMWR \(cdc.gov\)](#)

## Vaccine Effectiveness (VE) Estimates

The publications in the table are organized by date of publication, with the most recent first. Studies that include more than one outcome or multiple age groups are listed more than once and the table can be sorted by the variables.

**Outcome**

- All outcomes
- SARS-CoV-2 infection
- Multisystem inflammatory syndrome
- Critical illness
- Emergency department/urgent care visits
- Hospitalization
- Invasive mechanical ventilation (IMV) or death

**Age Group**

- All age groups
- Adults
- Adolescents
- Children
- Infants

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
Emergency department/urgent care visits	<b>23%</b> among children aged 6 months-5 years ≥14 days after 1st dose of original monovalent Moderna, Omicron period <b>29%</b> among children aged 6 months-5 years ≥14 days after 2nd dose of original monovalent Moderna, Omicron period	Children	Original monovalent mRNA, Moderna	8 states	July 4, 2022 – June 17, 2023
Emergency department/urgent care visits	<b>17%</b> among children aged 6 months-4 years ≥14 days to 1 month after 1st dose of original monovalent Pfizer, Omicron period <b>37%</b> among children aged 6 months-4 years ≥14 days after 2nd dose of original monovalent Pfizer, Omicron period <b>43%</b> among children aged 6 months-4 years ≥14 days after 3rd dose of	Children	Original monovalent mRNA, Pfizer	8 states	July 4, 2022 – June 17, 2023

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
	original monovalent Pfizer, Omicron period				
Emergency department/urgent care visits	<b>80%</b> ≥14 days after ≥1 bivalent dose among children aged 6 months-5 years who received at least a primary series irrespective of manufacturer, Omicron period	Children	Bivalent mRNA	8 states	December 24, 2022 - June 17, 2023
SARS-CoV-2 infection	<b>31.2%</b> among nursing home residents who were up to date with COVID-19 vaccination, Omicron period	Nursing home residents	Bivalent booster, mRNA	U.S. skilled nursing facilities	Nov. 20, 2022 - Jan 8, 2023
Hospitalization	<b>62%</b> during the first 7-59 days after the bivalent dose among immunocompetent adults, Omicron period <b>24%</b> at 120-179 days after the bivalent dose among immunocompetent adults, Omicron period <b>28%</b> during the first 7-59 days after the bivalent dose among immunocompromised adults, Omicron period <b>13%</b> at 120-179 days after the bivalent dose among immunocompromised adults, Omicron period	Adults	Bivalent booster, mRNA	7 states	Sept. 13, 2022 - April 21, 2023
Critical illness	<b>69%</b> during the first 7-59 days after the bivalent dose among immunocompetent adults, Omicron period <b>50%</b> by 120-179 days after the bivalent dose among immunocompetent adults, Omicron period <b>40%</b> during the first 7-59 days after the bivalent dose among immunocompromised adults, Omicron period <b>53%</b> at 120-179 days after the bivalent dose among immunocompromised adults, Omicron period	Adults	Bivalent booster, mRNA	7 states	Sept. 13, 2022 - April 21, 2023
Invasive mechanical ventilation (IMV) or death	<b>76%</b> <6 months after the last original monovalent dose among immunocompetent adults 56% at ≥1 year after last original monovalent dose among immunocompetent adults	Adults	Original monovalent mRNA	21 U.S. Hospitals	Feb. 1, 2022 - Jan 31, 2023
SARS-CoV-2 infection	<b>40%</b> among children age 3-5 years 14 days to 1	Children	mRNA, Moderna	49 states, Washington,	July 4, 2022-

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
	month after 1st dose of monovalent Moderna, Omicron period <b>60%</b> among children age 3-5 years 14 days to 2 months after 2nd dose of monovalent Moderna, Omicron period <b>36%</b> among children age 3-5 years 3 to 4 months after 2nd dose of monovalent Moderna, Omicron period			D.C., and Puerto Rico	February 2023
SARS-CoV-2 infection	<b>19%</b> among children age 3-4 years 14 days to 1 month after 1st dose of monovalent Pfizer, Omicron period <b>40%</b> among children age 3-4 years 14 days to 3 months after 2nd dose of monovalent Pfizer, Omicron period <b>31%</b> among children age 3-4 years 14 days to 4 months after 3rd dose of monovalent Pfizer, Omicron period	Children	mRNA, Pfizer	49 states, Washington, D.C., and Puerto Rico	July 4, 2022–February 2023
SARS-CoV-2 infection	<b>52%</b> relative VE among adults age 18-49 $\geq$ 14 days after bivalent booster dose compared with those who received 2-3 monovalent doses only, BA.5-related sublineages <b>43%</b> relative VE among adults age 50-64 $\geq$ 14 days after bivalent booster dose compared with those who received 2-4 monovalent doses only, BA.5-related sublineages <b>37%</b> relative VE among adults age $\geq$ 65 $\geq$ 14 days after bivalent booster dose compared with those who received 2-4 monovalent doses only, BA.5-related sublineages	Adults	Bivalent Booster, mRNA	49 states, Washington, D.C., and Puerto Rico	December 1, 2022–January 1: 2023
SARS-CoV-2 infection	<b>49%</b> relative VE among adults age 18-49 $\geq$ 14 days after bivalent booster dose compared with those who received 2-3 monovalent doses only, XBB/XBB.1.5-related sublineages <b>40%</b> relative VE among adults age 50-64 $\geq$ 14 days after bivalent booster dose compared with those	Adults	Bivalent Booster, mRNA	49 states, Washington, D.C., and Puerto Rico	December 1, 2022–January 1: 2023

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
	who received 2-4 monovalent doses only, XBB/XBB.1.5-related sublineages <b>43%</b> relative VE among adults age $\geq 65$ $\geq 14$ days after bivalent booster dose compared with those who received 2-4 monovalent doses only, XBB/XBB.1.5-related sublineages				
Emergency department/urgent care visits	<b>56%</b> $\geq 7$ days after bivalent booster compared with no vaccination, Omicron BA.5 period <b>34%</b> relative VE $\geq 7$ days after bivalent booster compared with those who received their last monovalent dose 2-4 months earlier <b>50%</b> relative VE $\geq 7$ days after bivalent booster compared with those who received their last monovalent dose $\geq 11$ months earlier	Adults	Bivalent Booster, mRNA	9 states	September 13, 2022–November 18, 2022
Hospitalization	<b>59%</b> 7 days after bivalent booster among immunocompetent adults compared with no vaccination <b>48%</b> relative VE $\geq 7$ days after bivalent booster compared with those who received their last monovalent dose $\geq 11$ months earlier	Adults	Bivalent Booster, mRNA	9 states	September 13, 2022–November 18, 2022
Hospitalization	<b>84%</b> 7 days after bivalent booster among immunocompetent adults compared with no vaccination, Omicron period <b>73%</b> relative VE $\geq 7$ days after bivalent booster among immunocompetent adults ages $>65$ compared with monovalent vaccination alone, Omicron period	Adults	Bivalent Booster, mRNA	22 hospitals in 18 states	September 8, 2022–November 30, 2022
SARS-CoV-2 infection	<b>56%</b> relative VE among ages 18-49 years compared with those who received their last monovalent dose $\geq 8$ months earlier <b>48%</b> relative VE among ages 50-64 years compared with those who	Adults	Bivalent Booster, mRNA	49 states, Washington, D.C., and Puerto Rico	September 14, 2022–November 11, 2022

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
	received their last monovalent dose $\geq 8$ months earlier <b>43%</b> relative VE among those ages $\geq 65$ years compared with those who received their last monovalent dose $\geq 8$ months earlier				
Hospitalization	<b>39%</b> $\geq 14$ days after 2nd dose, BA.1/BA.2 period <b>69%</b> $\geq 7$ days after 3rd dose, BA.1/BA.2 period <b>61%</b> $\geq 7$ days after 4th dose, BA.1/BA.2 period <b>41%</b> $\geq 14$ days after 2nd dose, BA.4/BA.5 period <b>31%</b> $\geq 7$ days after 3rd dose, BA.4/BA.5 period <b>60%</b> $\geq 7$ days after 4th dose, BA.4/BA.5 period (median interval between the last dose and illness onset = 145 days)	Adults	mRNA	18 states	December 26, 2021–August 31 2022
Hospitalization	<b>36%</b> $\geq 14$ days after 2nd dose among immunocompromised adults, Omicron period <b>57%</b> $\geq 7$ days after 3rd dose among immunocompromised adults, Omicron period <b>69%</b> 7-89 days after 3rd dose among immunocompromised adults, Omicron period <b>44%</b> $\geq 90$ days after 3rd dose among immunocompromised adults, Omicron period	Adults	mRNA	10 states	December 16, 2021–August 20 2022
Hospitalization	<b>61%</b> for 2 doses during BA.1 <b>92%</b> for 3 doses 7–119 days after 3 <sup>rd</sup> dose during BA.1 <b>85%</b> for 3 doses $\geq 120$ days after 3 <sup>rd</sup> dose during BA.1 <b>24%</b> for 2 doses during BA.2/BA.2.12.1 <b>69%</b> for 3 doses 7–119 days after 3 <sup>rd</sup> dose during BA.2/BA.2.12.1 <b>52%</b> for 3 doses $\geq 120$ days after 3 <sup>rd</sup> dose during BA.2/BA.2.12.1 <b>55%</b> for 3 doses among $\geq 50$ yo $\geq 120$ days after 3 <sup>rd</sup> dose during BA.2/BA.2.12.1 <b>80%</b> for 4 doses among	Adults	mRNA	10 states	Dec 18, 2021–Jun 10, 2022

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
	≥50yo >1 week after 4 <sup>th</sup> dose during BA.2/BA.2.12.1				
SARS-CoV-2 infection	<b>58%</b> overall, without prior infection <b>67%</b> ≤150 days of receipt of the 2nd dose of Pfizer-BioNTech, pre-Delta period <b>75%</b> ≤150 days of receipt of the 2nd dose of Moderna, pre-Delta period <b>33%</b> >150 days of receipt of the 2nd dose of Pfizer-BioNTech, Delta period <b>77%</b> >150 days of receipt of the 2nd dose of Moderna, Delta period	Adults	mRNA	4,315 residents in 105 nursing homes in 10 states	Dec 14, 2020–Nov 9, 2021
Hospitalization	<b>52%</b> overall <b>70%</b> against ICU admission <b>47%</b> against non-ICU hospitalization <b>80%</b> during Delta <b>38%</b> during Omicron <b>69%</b> for either variant when maternal vaccination occurred after 20 weeks of pregnancy <b>38%</b> when maternal vaccination occurred during the first 20 weeks of pregnancy	Infants (<6 months)	mRNA (maternal vaccination)	30 pediatric hospitals across 22 states	Jul 1, 2021–Mar 8, 2022
SARS-CoV-2 infection	<b>17.8%</b> 14 days to 1 month since one dose of Janssen <b>8.4%</b> 2 to 4 months since one dose of Janssen <b>27.9%</b> two doses of Janssen, 14 days to 1 month since last dose <b>29.2%</b> two doses of Janssen, 2 to 4 months since last dose of Janssen <b>61.3%</b> Janssen/mRNA booster, 14 days to 1 month since last dose <b>45.3%</b> Janssen/mRNA booster, 2 to 4 months since last dose <b>68.9%</b> 3 mRNA doses, 14 days to 1 month since last dose <b>62.8%</b> 3 mRNA doses, 2 to 4 months since last dose	Adults	Janssen, mRNA	49 states, Washington, D.C., and Puerto Rico	Jan 2–Mar 23, 2022 (Omicron)
SARS-CoV-2 infection	<b>60.1%</b> among children during month 0 after the second dose <b>28.9%</b> during month 2 after the second dose <b>59.5%</b> among adolescents during month 0 after the	Children (5–11 years) Adolescents (12–15 years)	mRNA	49 states, Washington, D.C., and Puerto Rico	Dec 26, 2021–Feb 21, 2022 (Omicron)

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
	second dose <b>16.6%</b> during month 2 after the second dose <b>71.1%</b> among adolescents 2 to 6.5 weeks after third dose				
SARS-CoV-2 infection	<b>46.9%</b> (relative VE compared to primary series only) after additional or booster dose	Nursing home residents	mRNA	U.S. skilled nursing facilities	Feb 14–Mar 27, 2022 (Omicron)
Hospitalization	<b>68%</b> in children after 2 doses, median interval since vaccination 34 days (Omicron <sup>†</sup> ) <b>93%</b> in adolescents after 2 doses, 2 to 22 weeks after vaccination (Delta <sup>†</sup> ) <b>92%</b> in adolescents after 2 doses, 23 to 44 weeks after vaccination (Delta <sup>†</sup> ) <b>43%</b> in adolescents after 2 doses, 2 to 22 weeks after vaccination (Omicron <sup>†</sup> ) <b>38%</b> in adolescents after 2 doses, 23 to 44 weeks after full vaccination (Omicron <sup>†</sup> )	Children (5–11 years) Adolescents (12–18 years)	mRNA	23 states	Jul 1, 2021–Feb 17, 2022
Critical illness	<b>96%</b> after 2 doses (Delta <sup>†</sup> ) <b>79%</b> after 2 doses (Omicron <sup>†</sup> )	Adolescents (12–18 years)	mRNA	23 states	Jul 1, 2021–Feb 17, 2022
Emergency department/urgent care visits	<b>24%</b> after 1 Janssen dose <b>54%</b> after 2 Janssen doses <b>79%</b> after 1 Janssen+1 mRNA dose <b>83%</b> after 3 mRNA doses (median interval between receipt of the most recent dose and the ED/UC encounter ranged from 49 to 59 days)	Adults	Janssen, mRNA	10 states	Dec 2021–Mar 2022
Hospitalization	<b>31%</b> after 1 Janssen dose <b>67%</b> after 2 Janssen doses <b>78%</b> after 1 Janssen+1 mRNA dose <b>90%</b> after 3 mRNA doses (median interval between receipt of the most recent dose and hospitalization ranged from 48 to 59 days)	Adults	Janssen, mRNA	10 states	Dec 2021–Mar 2022
Invasive mechanical ventilation (IMV) or death	<b>94%</b> median 60 days after 3 doses (Omicron <sup>†</sup> )	Adults	mRNA	21 U.S. medical centers	Mar 2021–Jan 2022
SARS-CoV-2 infection	<b>31%</b> in children after 2 doses, 14–82 days after 2nd dose (Omicron <sup>†</sup> ) <b>59%</b> in adolescents after 2 doses (Omicron <sup>†</sup> ) <b>87%</b> in adolescents after 2	Children (5–11 years) Adolescents (12–15 years)	mRNA	4 states	Jul 2021–Feb 2022

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
	doses, 14–149 days after 2nd dose (Delta <sup>†</sup> )				
Hospitalization	<b>85%</b> after 2 doses (Alpha <sup>†</sup> ) <b>81%</b> after 2 doses, >150 days before illness onset (Delta <sup>†</sup> ) <b>88%</b> after 2 doses, 14–150 days (Delta <sup>†</sup> ) <b>94%</b> after 3 doses (Delta <sup>†</sup> ) <b>65%</b> after 2 doses (Omicron <sup>†</sup> ) <b>86%</b> after 3 doses (Omicron <sup>†</sup> )	Adults	mRNA	21 U.S. hospitals	Mar 2021–Jan 2022
Emergency department/urgent care visits	<b>46%</b> in children within 14–67 days after dose 2 <b>51%</b> in children within 14–67 days after dose 2 (Omicron <sup>†</sup> ) <b>83%</b> in adolescents 12–15 years within 14–149 days after dose 2 <b>76%</b> in adolescents 16–17 years within 14–149 days after dose 2 <b>38%</b> in adolescents 12–15 years ≥ 150 days after dose 2 <b>46%</b> in adolescents 16–17 years ≥ 150 days after dose 2 <b>86%</b> in adolescents 16–17 years ≥ 7 days after dose 3 <b>81%</b> in adolescents 16–17 years ≥ 7 days after dose 3 (Omicron <sup>†</sup> )	Children (5–11 years) Adolescents (12–15 years) Adolescents (16–17 years)	mRNA	10 states	Apr 2021–Jan 2022
Hospitalization	<b>74%</b> in children within 14–67 days after dose 2 <b>92%</b> in adolescents 12–15 years within 14–149 days after dose 2 <b>94%</b> in adolescents 16–17 years within 14–149 days after dose 2 <b>73%</b> in adolescents 12–15 years ≥ 150 days after dose 2 <b>88%</b> in adolescents 16–17 years ≥ 150 days after dose 2	Children (5–11 years) Adolescents (12–15 years) Adolescents (16–17 years)	mRNA	10 states	Apr 2021–Jan 2022
Hospitalization	<b>37%</b> for primary series alone among immunocompetent adults <b>65%</b> for primary series plus one booster among immunocompetent adults <b>76%</b> 7–120 days after receipt of booster dose <b>63%</b> for primary series plus two boosters among immunocompetent adults <b>49%</b> for primary series	Adults	mRNA, Janssen	21 U.S. Hospitals	December 26, 2021–June 30, 2022

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
	alone among immunocompromised adults <b>69%</b> for primary series plus one booster among immunocompromised adults <b>72%</b> 7-120 days after receipt of booster dose				
Multisystem inflammatory syndrome	<b>84%</b> overall after two doses <b>78%</b> after two doses among children ages 5-11 <b>90%</b> after two doses among adolescents ages 12-17.	Children (5-11 years) Adolescents (12-17 years)	mRNA	29 pediatric hospitals across 22 states	July 1, 2021- Apr 7, 2022
Emergency department/urgent care visits	<b>84%</b> among pregnant adults 14-149 days after 2 <sup>nd</sup> dose, Delta period <b>75%</b> among pregnant adults ≥150 days after 2nd dose, Delta period <b>81%</b> among pregnant adults 7-119 days after 3rd dose, Delta period <b>3%</b> among pregnant adults 14-149 days after 2nd dose, Omicron period <b>42%</b> among pregnant adults ≥150 days after 2nd dose, Omicron period <b>79%</b> among pregnant adults 7-119 days after 3rd dose, Omicron period <b>124%</b> among pregnant adults ≥120 days after 3rd dose, Omicron period	Adults aged 18-45 years	mRNA	10 states	June 1, 2021-June 2, 2022 (site-depender)
Hospitalization	<b>84%</b> among pregnant adults 14-149 days after 2nd dose, Delta period <b>75%</b> among pregnant adults ≥150 days after 2nd dose, Delta period <b>81%</b> among pregnant adults 7-119 days after 3rd dose, Delta period <b>3%</b> among pregnant adults 14-149 days after 2nd dose, Omicron period <b>42%</b> among pregnant adults ≥150 days after 2nd dose, Omicron period <b>79%</b> among pregnant adults 7-119 days after 3rd dose, Omicron period <b>124%</b> among pregnant adults ≥120 days after 3rd dose, Omicron period <b>99%</b> among pregnant adults, 14-149 days after 2nd dose, Delta period	Adults aged 18-45 years	mRNA	10 states	June 1, 2021-June 2, 2022 (site-depender)

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s)#	Population	Study period
	<p><b>96%</b> among pregnant adults ≥ 150 days after 2nd dose, Delta period</p> <p><b>97%</b> among pregnant adults 7-119 days after 3rd dose, Delta period</p> <p><b>86%</b> among pregnant adults, 14-149 days after 2nd dose, Omicron period</p> <p><b>64%</b> among pregnant adults ≥ 150 days after 2nd dose, Omicron period</p> <p><b>86%</b> among pregnant adults, 7-119 days after 3rd dose, Omicron period</p> <p><b>53%</b> among pregnant adults ≥ 120 days after 3rd dose, Omicron period</p>				
Hospitalization	<p><b>94%</b> among adults &lt;2 months after 2nd dose, pre-Delta period</p> <p><b>96%</b> among adults &lt;2 months after 2nd dose, Delta period</p> <p><b>87%</b> among adults 4-5 months after 2nd dose, pre-Delta period</p> <p><b>89%</b> among adults 4-5 months after 2nd dose, Delta period</p> <p><b>73%</b> among adults &lt;2 months after 2nd dose, Omicron period</p> <p><b>57%</b> among adults 4-5 months after 2nd dose, Omicron period</p> <p><b>96%</b> among adults &lt;2 months after 3rd dose, Delta period</p> <p><b>89%</b> among adults &lt;2 months after 3rd dose, Omicron period</p> <p><b>66%</b> among adults 4-5 months after 3rd dose, Omicron period</p> <p><b>72%</b> among adults ages 50-64 years after 4th dose, Omicron period</p> <p><b>76%</b> among adults ages 65 years and older after 4th dose, Omicron period</p> <p><b>48%</b> among immunocompromised adults after 4th dose, Omicron period</p>	Adults	mRNA	10 states	January 2021-July 12, 2022
Emergency department/urgent care visits	<p><b>95%</b> among adults &lt;2 months after 2nd dose, pre-Delta period</p> <p><b>93%</b> among adults &lt;2 months after 2nd dose, Delta period</p>	Adults	mRNA	10 states	January 2021-July 12, 2022

Outcome	Vaccine effectiveness*	Age Group	Vaccine(s) <sup>#</sup>	Population	Study period
	<b>63%</b> among adults <2 months after 2nd dose, Omicron period <b>96%</b> among adults <2 months after 3rd dose, Delta period <b>83%</b> among adults <2 months after 3rd dose, Omicron period <b>46%</b> among adults 4-5 months after 3rd dose, Omicron period <b>57%</b> among adults ages 50-64 years after 4th dose, Omicron period <b>73%</b> among adults ages 65 years and older after 4th dose, Omicron period				
SARS-CoV-2 infection	<b>25.8%</b> against infection among adults <60 days after 2nd vaccine booster dose	Adults	mRNA	19 states	March 29-July 25, 2022
Critical illness	<b>73.9%</b> against critical illness among adults <60 days after 2nd vaccine booster dose	Adults	mRNA	19 states	March 29-July 25, 2022
Hospitalization	<b>60.1%</b> against hospitalization among adults <60 days after 2nd vaccine booster dose	Adults	mRNA	19 states	March 29-July 25, 2022
Death	<b>89.6%</b> against death among adults <60 days after 2nd vaccine booster dose	Adults	mRNA	19 states	March 29-July 25, 2022

<sup>#</sup>Where applicable, individual vaccine is specified; mRNA refers to COVID-19 vaccines BNT162b2 (Pfizer-BioNTech) and mRNA (Moderna) for adults; for children and adolescents, mRNA refers to BNT162b2 (Pfizer-BioNTech); Janssen refers to Ad.26.CC (Johnson & Johnson).

\*Confidence interval (CI) for all effectiveness estimates is 95%.

<sup>†</sup>Dates used for periods of SARS-CoV-2 variant predominance in the United States differ slightly by study and geographic location and are approximately: Alpha (March 11–July 3, 2021); Delta (Jul 1–Dec 18, 2021); Omicron (Dec 19, 2021–present: sublineages E [December 2021–March 2022] and BA.2/BA.2.12.1 [March–October 2022]).

## How CDC Monitors Vaccine Effectiveness

## COVID-19 Vaccines Work

## COVID-19 Vaccine Effectiveness Research

## Cite COVID Data Tracker

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<https://covid.cdc.gov/covid-data-tracker>

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