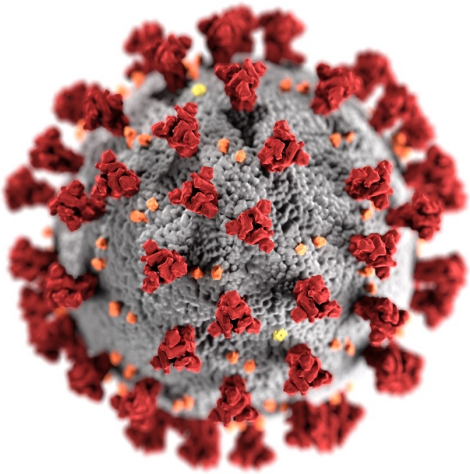
# COVID-19 Vaccines

## Second Booster and the Future of COVID-19 Vaccine Boosters



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National Center for Immunization and Respiratory Diseases
May 5, 2022

cdc.gov/coronavirus

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## COVID-19 vaccine recommendations

- A COVID-19 vaccine primary series is recommended for **everyone ages 5 years and older**
- A COVID-19 vaccine booster dose is recommended for **everyone ages 12 years and older**
- In most situations, an **mRNA COVID-19 vaccine (Pfizer-BioNTech or Moderna)** is preferred over the Janssen COVID-19 Vaccine for primary and booster vaccination

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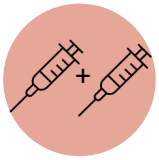
## 2nd COVID-19 Vaccine Booster Doses

- Following FDA's regulatory action on March 29, 2022, CDC updated its COVID-19 vaccination guidance that some people **may** receive a second booster dose using an mRNA COVID-19 vaccine **at least 4 months** after the first booster dose

People ages 50 years and older

People ages 12 years and older who are moderately or severely immunocompromised



People ages 18 years and older who received Janssen as both primary and booster dose

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## Today's presentation

- Review vaccine effectiveness of the 1st booster dose
- Discuss evidence and considerations for receiving 2nd booster dose
- Discuss future considerations for COVID-19 booster doses

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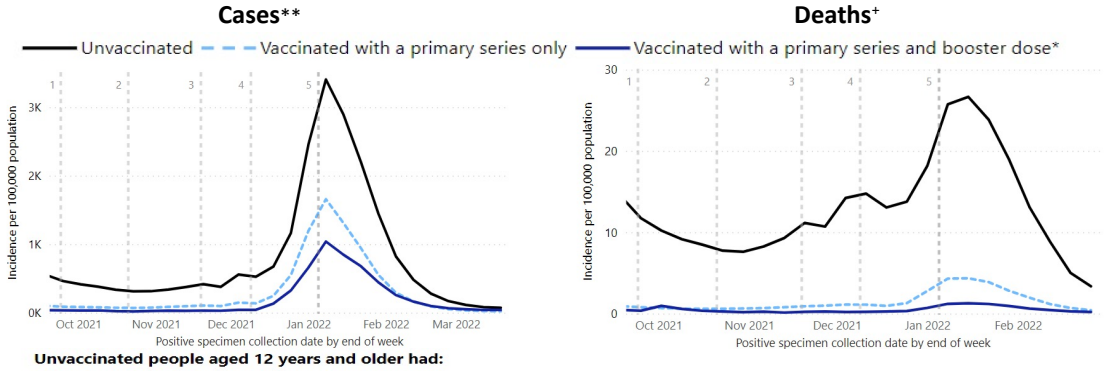
## Rates of COVID-19 cases & deaths by vaccination status and receipt of booster dose*




**Unvaccinated people aged 12 years and older had:**

**3.1X** *Risk of Testing Positive for COVID-19* **AND** **20X** *Risk of Dying from COVID-19* **in February, and**

**2.0X** *Risk of Testing Positive for COVID-19* **in March,* compared to people vaccinated with a primary series and a booster dose.****

*This includes people who received booster doses and people who received additional doses.
** Data from September 19, 2021 – March 19, 2022 (24 U.S. jurisdictions)
+ Data from September 19, 2021 – February 26, 2022 (23 U.S. jurisdictions)
CDC COVID Data Tracker. https://covid.cdc.gov/covid-data-tracker/#rates-by-vaccine-status Accessed April 19, 2022

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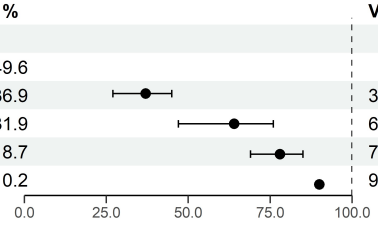
## Vaccine effectiveness (VE) against COVID-19-associated hospitalizations during Omicron in adults aged ≥18 years

Dec 16, 2021-Mar 7, 2022

| Medical event/vaccination status | Total | SARS-CoV-2 Positive | Row % | VE % (CI) |
|---|---|---|---|---|
| Hospitalizations | | | | |
| Unvaccinated (referent) | 12377 | 6134 | 49.6 | |
| 1 Janssen vaccine dose (14 - 150 + days) | 1194 | 440 | 36.9 | 37 (27-45) |
| 2 Janssen vaccine doses (7-120 days) | 135 | 43 | 31.9 | 64 (47-76) |
| 1 Janssen/ 1 mRNA vaccine dose (7-120 days) | 252 | 47 | 18.7 | 78 (69-85) |
| 3 mRNA vaccine doses (7 - 120 days) | 5994 | 613 | 10.2 | 90 (89-91) |




- 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

Natarajan K, Prasad N, Dascomb K, et al. Effectiveness of Homologous and Heterologous COVID-19 Booster Doses Following 1 Ad.26.COV2.S (Janssen [Johnson & Johnson]) Vaccine Dose Against COVID-19-Associated Emergency Department and Urgent Care Encounters and Hospitalizations Among Adults — VISION Network, 10 States, December 2021-March 2022. MMWR Morb Mortal Wkly Rep. ePub: 29 March 2022. DOI: http://dx.doi.org/10.15585/mmwr.mm7113e2external icon

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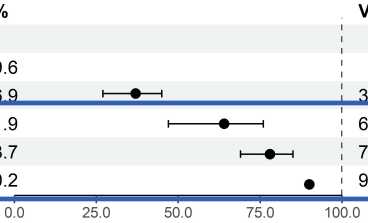


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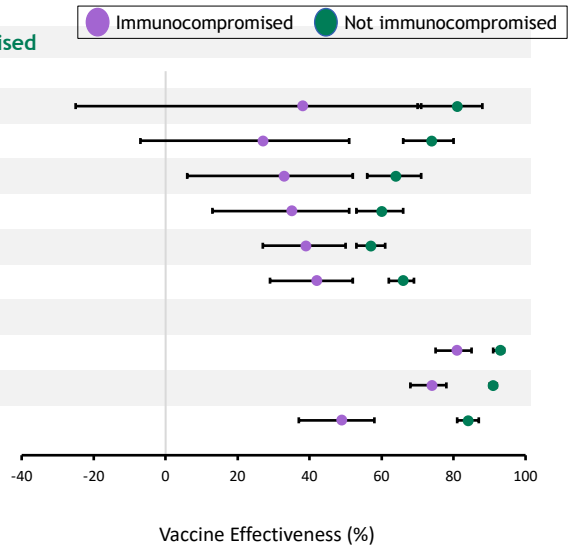
## mRNA vaccine effectiveness (VE) for hospitalization by number of doses and time since last dose receipt for adults ≥50 years, Dec 2021–Mar 2022, by immunocompromised status

| | Adjusted VE% (95% CI) | |
|---|---|---|
| Status: | Immunocompromised | Not immunocompromised |
| 2 doses | | |
| 14-59 days | 38 (-25-71) | 81 (70-88) |
| 60-119 days | 27 (-7-51) | 74 (66-80) |
| 120-179 days | 33 (6-52) | 64 (56-71) |
| 180-239 days | 35 (13-51) | 60 (53-61) |
| 240-299 days | 39 (27-50) | 57 (53-61) |
| 300+ days | 42 (29-52) | 66 (62-69) |
| 3 doses | | |
| 14-59 days | 81 (75-85) | 93 (91-94) |
| 60-119 days | 74 (68-78) | 91 (90-92) |
| 120-179 days | 49 (37-58) | 84 (81-87) |




CDC, preliminary unpublished data from VISION network. 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

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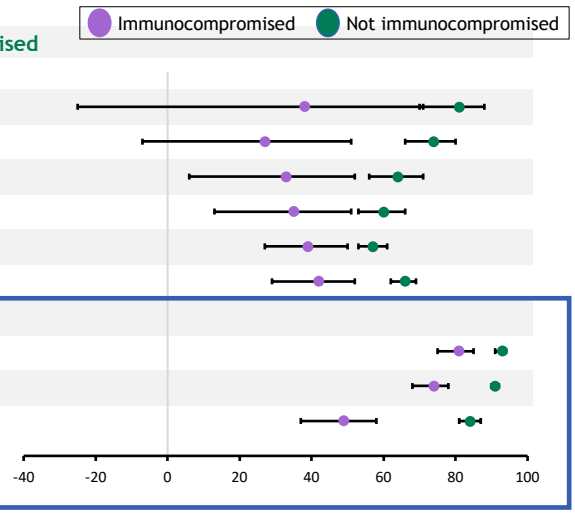


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## Effectiveness of a fourth dose of COVID-19 mRNA vaccine against Omicron among persons ages ≥60 years – Israel

- On January 2, 2022, began administering a 4th dose of Pfizer-BioNTech COVID-19 vaccine to people ages ≥60 years, who had received a 3rd dose of vaccine at least 4 months earlier
- Follow-up from January 10-March 2 for confirmed infection and February 18 for severe illness

| | Cases (person-days at risk) | | Rate Ratio (95% CI) | Adjusted rate difference per 100,000 person-days at risk (95% CI) |
|---|---|---|---|---|
| | 3rd dose only | Week 4 after 4th dose | 3rd dose only vs week 4 after 4th dose | 3rd dose only vs. week 4 after 4th dose |
| **Confirmed infections** | 111,780 (31,000,299) | 7,225 (3,883,824) | 2.0 (1.9, 2.1) | 170 (162, 176) |
| **Severe illness** | 1210 (24,857,976) | 66 (3,639,393) | 3.5 (2.7, 4.6) | 3.9 (3.4, 4.5) |

4th dose estimated to prevent additional **3-4 cases** of severe disease per 100,000 person-days compared to 3 doses

https://www.nejm.org/doi/full/10.1056/NEJMoa2201570

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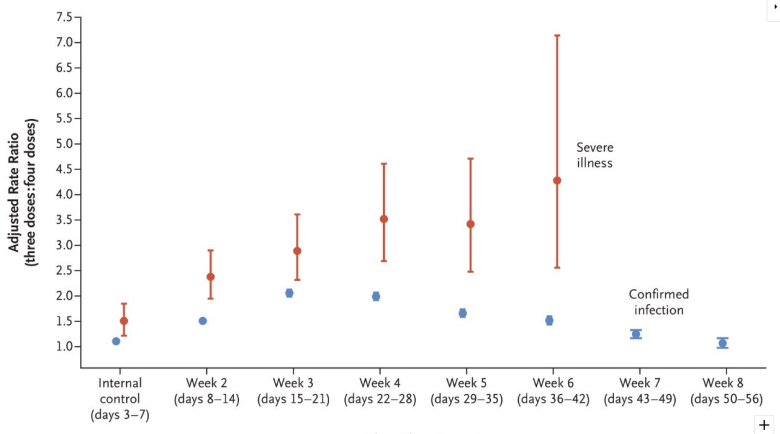
## Effectiveness of a fourth dose of COVID-19 mRNA vaccine against Omicron among persons ages ≥60 years – Israel

- Rapid waning of additional protection against infection

**Adjusted rate ratios for confirmed infection and severe illness**




https://www.nejm.org/doi/full/10.1056/NEJMoa2201570

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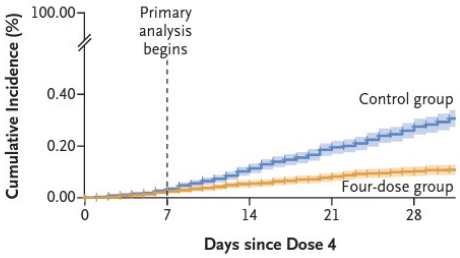
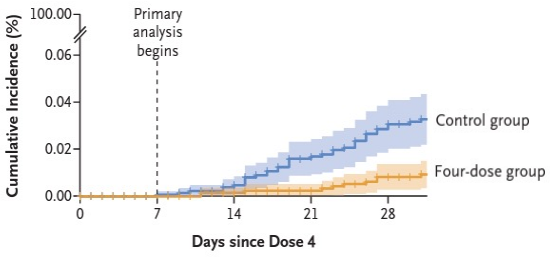
## Effectiveness of a fourth dose of COVID-19 mRNA vaccine against Omicron among persons ages ≥60 in a large healthcare organization – Israel

**COVID-19-Related Hospitalization**




Day 14 to 30 Relative VE: 72% (95% CI: 63% – 79%)

**Death from COVID-19**




Day 14 to 30 Relative VE: 76% (95% CI: 48% – 91%)

https://www.nejm.org/doi/pdf/10.1056/NEJMoa2201688?articleTools=true

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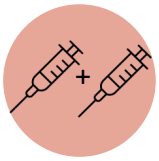
## Summary: People eligible for a 2nd booster dose in the United States

People ages 50 years and older

People ages 12 years and older who are moderately or severely immunocompromised



People ages 18 years and older who received Janssen as both primary and booster dose

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## Considerations for Eligible People on Getting a 2nd Booster Dose As Soon As Possible

- Certain underlying medical conditions that increase the risk of severe COVID-19 illness
- Moderate or severe immunocompromise
- Living with someone who is immunocompromised, at increased risk for severe disease, or who cannot be vaccinated due to age or contraindication
- Increased risk of exposure to SARS-CoV-2 through occupational, institutional, or other activities (e.g., travel or large gatherings)
- Living or working in an area where the COVID-19 community level is medium or high

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## Considerations for Eligible People on Waiting to Receive a 2nd Booster Dose

- Recent SARS-CoV-2 infection within the past 3 months
- Hesitancy about getting another recommended booster dose in the future, as a booster dose may be more important in the fall and/or if a variant-specific vaccine is needed.

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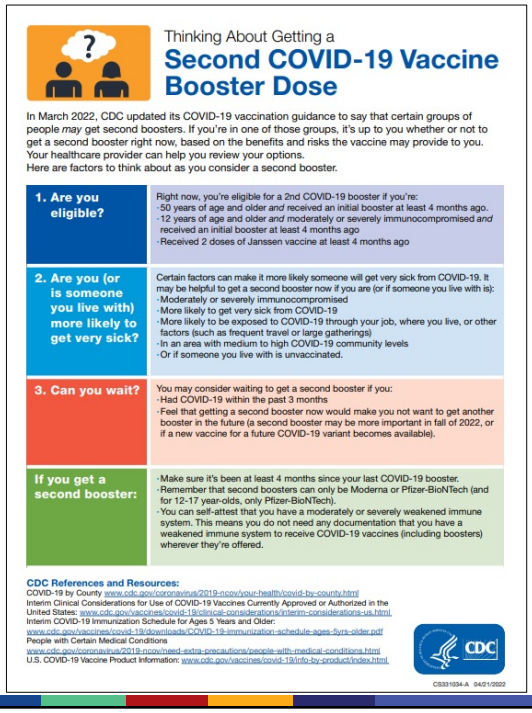
## For more information:

https://www.cdc.gov/coronavirus/2019-ncov/vaccines/booster-shot.html



Thinking About Getting a
**Second COVID-19 Vaccine Booster Dose**

In March 2022, CDC updated its COVID-19 vaccination guidance to say that certain groups of people *may* get second boosters. If you're in one of those groups, it's up to you whether or not to get a second booster right now, based on the benefits and risks the vaccine may provide to you. Your healthcare provider can help you review your options.
Here are factors to think about as you consider a second booster.

| | |
|---|---|
| **1. Are you eligible?** | Right now, you're eligible for a 2nd COVID-19 booster if you're:<br>·50 years of age and older *and* received an initial booster at least 4 months ago.<br>·12 years of age and older *and* moderately or severely immunocompromised *and* received an initial booster at least 4 months ago<br>·Received 2 doses of Janssen vaccine at least 4 months ago |
| **2. Are you (or is someone you live with) more likely to get very sick?** | Certain factors can make it more likely someone will get very sick from COVID-19. It may be helpful to get a second booster now if you are (or if someone you live with is):<br>·Moderately or severely immunocompromised<br>·More likely to get very sick from COVID-19<br>·More likely to be exposed to COVID-19 through your job, where you live, or other factors (such as frequent travel or large gatherings)<br>·In an area with medium to high COVID-19 community levels<br>·Or if someone you live with is unvaccinated. |
| **3. Can you wait?** | You may consider waiting to get a second booster if you:<br>·Had COVID-19 within the past 3 months<br>·Feel that getting a second booster now would make you not want to get another booster in the future (a second booster may be more important in fall of 2022, or if a new vaccine for a future COVID-19 variant becomes available). |
| **If you get a second booster:** | ·Make sure it's been at least 4 months since your last COVID-19 booster.<br>·Remember that second boosters can only be Moderna or Pfizer-BioNTech (and for 12-17 year-olds, only Pfizer-BioNTech).<br>·You can self-attest that you have a moderately or severely weakened immune system. This means you do not need any documentation that you have a weakened immune system to receive COVID-19 vaccines (including boosters) wherever they're offered. |

**CDC References and Resources:**
COVID-19 by County www.cdc.gov/coronavirus/2019-ncov/your-health/covid-by-county.html
Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States: www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html
Interim COVID-19 Immunization Schedule for Ages 5 Years and Older: www.cdc.gov/vaccines/covid-19/downloads/COVID-19-immunization-schedule-ages-5yrs-older.pdf
People with Certain Medical Conditions www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html
U.S. COVID-19 Vaccine Product Information: www.cdc.gov/vaccines/covid-19/info-by-product/index.html

CDC

CS331034-A 04/21/2022

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## Staying Up to Date on COVID-19 Vaccines

- CDC recommends everyone get up to date with their COVID-19 vaccinations.
- Being up to date means a person has received all recommended doses in their primary vaccine series, and a booster dose, when eligible.
- Receipt of a second booster dose is not necessary to be considered up to date at this time.

https://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html

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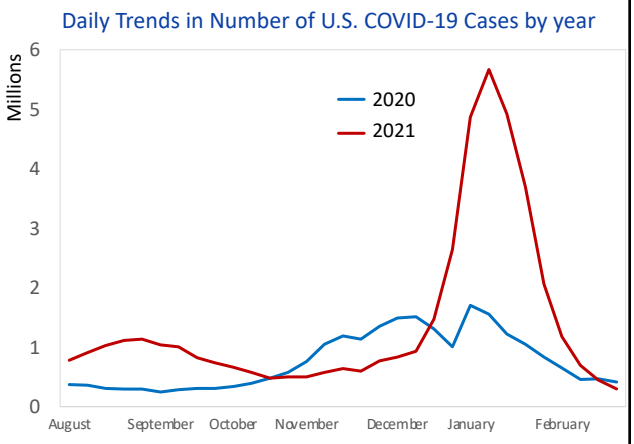
## Future doses of COVID-19 vaccines

- COVID-19 epidemiology unpredictable to date, without defined seasonality
- Winter surges noted in the two prior years
  - 2020 surge began in October/November
  - 2021 surge began in December/January
- Likely difficult to predict timing of future surges, but booster dose may be needed in the Fall prior to next winter surge




https://covid.cdc.gov/covid-data-tracker/#trends_dailycases

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## Future doses of COVID-19 vaccines

- Policy around future doses require **continued evaluation** of COVID-19 epidemiology and vaccine effectiveness, including the impact of both **time** and **variants**, and the ability of doses to **improve** protection
- Evolution of COVID-19 vaccines will be important as SARS-CoV-2 virus evolves
  - May include evolution of strains included in the vaccines as well as vaccine platform

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## Future doses of COVID-19 vaccines
### Next Steps

- FDA and CDC will continue to partner for future discussions
- ACIP will continue to review additional data:
  - COVID-19 epidemiology, genomic surveillance and vaccine effectiveness
  - Manufacturer data on safety, immunogenicity and possible efficacy of variant-specific vaccines
- Further discussions around feasibility, implementation, and balance of benefit and risks by age group and population to inform the timing and populations for future doses of COVID-19 vaccines

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- Tamara Pilishvili
- Ruth Link-Gelles
- Heather Scobie
- VTF ACIP WG Team and CMO
- ACIP COVID-19 Vaccines Work Group
- Vaccine Task Force
- Epi Task Force
- Data Analytics and Visualization Task Force
- Respiratory Viruses Branch


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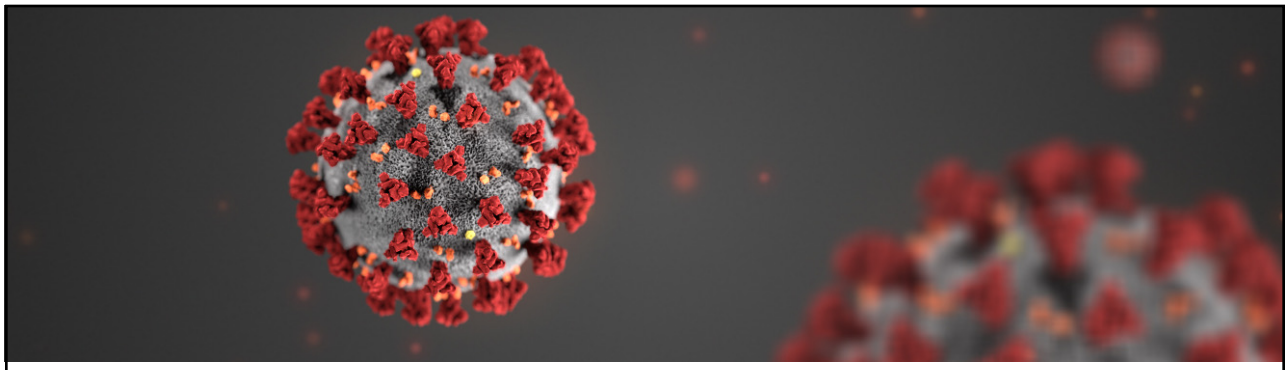

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

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.

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