COVID-19 vaccine breakthrough case investigations

Information for Facilities

CDC has created a system to track and evaluate cases of SARS-CoV-2 infections among people fully vaccinated against COVID-19. We aim to capture both symptomatic and asymptomatic infections. These cases will be analyzed to identify trends or clustering in patient characteristics, the administered vaccine, or the infecting virus.

We are defining a vaccine breakthrough case as someone who has:

1. Completed the primary series of an FDA-authorized vaccine, and
2. Tested positive for SARS-CoV-2 RNA or antigen on a specimen collected ≥14 days after the final dose of vaccine, and
3. Not tested positive in the previous 45 days

Steps when your facility has identified a possible COVID-19 vaccine breakthrough case:

1. Contact the laboratory and ask them to hold any residual specimens from the positive test (respiratory specimen, RNA extract, or viral isolate). If this person qualifies as a true breakthrough case we would like to perform further analysis of the virus in the sample.
2. Contact your local health department
    - The health department will have access to the system that guides through the investigation and will coordinate reporting to CDC.

COVID-19 vaccine breakthrough case investigations

Information for state and local health departments

Objective

Investigate SARS-CoV-2 infections among people who received COVID-19 vaccine to identify trends or clustering in patient characteristics, the administered vaccine, or the infecting virus.

Case definition

U.S. resident who has SARS-CoV-2 RNA or antigen detected on respiratory specimen collected ≥14 days after completing the primary series of an FDA-authorized COVID-19 vaccine.

Exclusion criteria

SARS-CoV-2 RNA or antigen detected on a respiratory specimen collected <45 days before the most recent positive test.

Screening questions to assess if case meets vaccine breakthrough investigation criteria

1. Received full primary series of an FDA-authorized COVID-19 vaccine (e.g., two doses of the Pfizer or Moderna mRNA vaccine)?
    a. **If YES, proceed to question #2**
    b. Stop if:
        i. No documented or reported COVID-19 vaccination
        ii. Received incomplete primary series of COVID-19 vaccine (e.g., 1 dose of Pfizer or Moderna mRNA vaccine)
        iii. Received a COVID vaccine that is not FDA-authorized

2. Respiratory specimen collected ≥14 days after receiving the last dose of an FDA-authorized COVID-19 vaccine tested positive for SARS-CoV-2 RNA or antigen?
    a. **If YES, proceed to question #3.**
    b. Stop if:
        i. No COVID-19 laboratory test result
        ii. Only a negative or equivocal test result
        iii. Only a positive result on another test type (e.g., antibody)
        iv. Only a positive result on another specimen type (e.g., serum)
        v. Positive specimen was collected <14 days after receiving the last dose of the COVID-19 vaccine

3. Known positive test for SARS-CoV-2 RNA or antigen on a respiratory specimen collected <45 days prior to the most recent test?
    a. **If NO or UKNOWN, proceed with case investigation on the next page.**
    b. Stop if:
        i. Documented SARS-CoV-2 RNA or antigen detected on a respiratory specimen collected <45 days before the most recent positive test.

Steps for initiating a COVID-19 vaccine breakthrough case investigation

1. Request the clinical or public health laboratory hold any residual specimens from the positive COVID-19 test (respiratory specimen, RNA extract, or viral isolate).
2. Report the available case data to NNDSS, per normal procedures.
3. Record the case in the CDC COVID-19 vaccine breakthrough REDCap database
    a. Initially, please notify the CDC vaccine breakthrough case investigation team by sending a brief email to our functional mailbox (eocevent531@cdc.gov).
        i. Subject: Vaccine breakthrough case in [state name] (state ID number).
        ii. We will send you a link to access the REDCap database.
    b. In the coming week, CDC will offer health departments the option to do direct data entry into the REDCap database without contacting CDC.
4. CDC will provide instructions for laboratories to send residual primary specimens for further testing or sequencing.
    a. RNA sequence results from another laboratory can be provided by entering the GISAID or GenBank accession number into the REDCap database.
5. CDC will monitor NNDSS, VAERS, other reporting systems for additional cases.
    a. We will contact you if we identify cases from your state.
    b. We will upload available data reported to those systems into the REDCap database for your review and confirmation.

Data access and management

CDC will create data access groups in the CDC COVID-19 vaccine breakthrough REDCap database so designated state health department investigators can enter, store, and manage data for cases in their area. The health department investigator will have full access to data for cases reported from their jurisdiction.

Questions

Please contact the CDC vaccine breakthrough case investigations team at eocevent531@cdc.gov.