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Summary of COVID-19 Vaccine Breakthrough Cases — Alaska, February 1 through March 31, 2021

Background

COVID-19 vaccines are our safest and most effective tool to bring the pandemic under control. In December 2020, the U.S. Food and Drug Administration (FDA) issued Emergency Use Authorizations for COVID-19 vaccines produced by Pfizer-BioNTech and Moderna.^{1,2} In February 2021, FDA authorized a single dose Janssen vaccine.³ Vaccine effectiveness from studies was 95%, 94%, and 66%, respectively, in preventing symptomatic COVID-19. As such, there will be a small percentage of fully vaccinated people who still get COVID-19.

Methods

All cases of SARS-CoV-2 infection reported to the Section of Epidemiology (SOE) from February 1 to March 31, 2021 were assessed for history of COVID-19 vaccination using passive reports from case investigators and a query of VacTrAK, Alaska's immunization information system. Cases were classified as VB according to the Centers for Disease Control and Prevention (CDC) COVID-19 Vaccine Task Force case definition: a U.S. resident who has SARS-CoV-2 RNA or antigen detected in a respiratory specimen collected ≥ 14 days after completing the primary series of an FDA-authorized COVID-19 vaccine.⁴ Cases were included in this analysis if the vaccine series was completed during January 4 through March 17, 2021 and the person's positive SARS-CoV-2 specimen was collected by March 31. Persons clinically diagnosed as having a "long haul" COVID-19 case who tested positive again >90 days after their initial diagnosis were excluded.

Results

From February 1 to March 31, 2021, 152 cases of SARS-CoV-2 infection were classified as Alaska VB cases. Demographic characteristics of VB cases and reasons for testing are summarized in Tables 1 and 2. One person with multiple long-standing comorbidities, was hospitalized. A second person, also with long-standing comorbidities, died.

Table 1. Demographic Characteristics of 152 Persons with VB

Characteristic	# (%)
Median age in years (min-max)	51 (16–96)
Sex, male, # (%)	63 (41%)
Urban-area resident, # (%)	92 (61%)
White, # (%)	79 (52%)
AI/AN, # (%)	53 (35%)
Asian, # (%)	14 (9%)
Hispanic (of any race), # (%)	7 (5%)

Note: Race and/or ethnicity data were not reported for some persons.

Table 2. Reason for Testing among 152 Persons with VB

Reason for Testing	# (%)
Targeted asymptomatic screening	50 (33)
Travel screening	26 (17)
Pre-admit, pre-procedure screening	15 (10)
Asymptomatic with recent known exposure	16 (10)
Symptomatic at time of test without known exposure	21 (14)
Symptomatic at time of test with known exposure	12 (8)
Unknown	12 (8)

Additional Characteristics of the 152 VB Cases

- 112 (74%) persons with a VB infection received the Pfizer/BioNTech vaccine, 38 (25%) received Moderna, one received Janssen, and one received an unspecified vaccine type.
- 147 (97%) infections were identified by a molecular test; 5 (3%) were identified by an antigen-based test.
- 87 (57%) persons were asymptomatic at the time of testing and remained asymptomatic during their course of isolation, 14 (9%) persons were asymptomatic at the time of testing and later developed at least one symptom of COVID-19, and 39 (26%) were symptomatic at the time of testing; symptom information was not available for 12 (8%) persons.

- 15 infections were in persons with a history of a previous positive SARS-CoV-2 test, all of which occurred >90 days prior to the most recent test.
- 30 asymptomatic persons chose a test-based strategy to shorten their isolation period by successfully testing negative twice, separated by ≥ 24 hours.
- 27 (18%) cases were in persons who worked or resided in a long-term care facility.
- 57 (38%) samples were submitted for viral sequencing; of those, 18 (32%) have been successfully sequenced.
- Of the 18 sequenced samples, 8 (44%) were a variant of concern (VOC; 4 were B.1.1.7 and 4 were B.1.427/9).

Discussion

Increasing vaccination rates coincide with decreasing COVID-19 case counts and associated hospitalizations and deaths. As of March 31, 0.1% (152/144,295) of fully vaccinated Alaskans in VacTrAK were identified as VB cases, who represent 1.9% (152/7,927) of the SARS-CoV-2 infections reported in Alaska since January 4. More VB cases were associated with Pfizer; however, this likely reflects the earlier availability and higher proportion of Alaskans who have received that vaccine. Similarly, geographic variation in vaccine distribution and testing practices have impacted detection of VB cases in certain parts of the state (data not presented).

Because fully vaccinated people have substantial protective immunity, VB cases typically involve milder or asymptomatic infections. Further, 30 asymptomatic persons were negative on subsequent testing and only 32% of samples submitted for sequencing were successfully sequenced. These findings are consistent with the theory and observations that viral loads of VB cases may be lower than in non-VB cases, and not present the same risk of secondary transmission.⁵ Finally, the hospitalized patient was one of the many fully vaccinated people who had subsequent negative PCR tests shortly after their initial positive, indicating that if their initial test was a true positive, their viral load was extremely low. Testing is no longer recommended for asymptomatic vaccinated persons who are close contacts or who travel; further changes to testing guidance for other asymptomatic vaccinated populations are expected. We will continue to provide periodic data on VB case investigations; however, changes in testing practices and definitions of VB will impact interpretation of trends.

Recommendations

1. Anyone with COVID-19 symptoms should be tested for SARS-CoV-2 infection immediately (per [Alaska SOE Testing Guidance](#)), regardless of their vaccination status.
2. Anyone infected with SARS-CoV-2 must follow standard isolation procedures, regardless of their vaccination status.
3. Persons identified with asymptomatic VB infection may consider shortening their isolation period by obtaining serial negative tests, separated by at least 24 hours.
4. To identify VOC and see how the virus is responding to the pressure of vaccination, send clinical specimens to the [State Public Health Laboratory for sequencing](#).
5. Persons aged 16 years and older should seek vaccination promptly for the best protection against COVID-19 disease.

References

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5. CDC. Postvaccination SARS-CoV-2 Infections Among Skilled Nursing Facility Residents and Staff Members — Chicago, Illinois, December 2020–March 2021. *MMWR* 2021;70.