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Infections After Inoculation Are Rare

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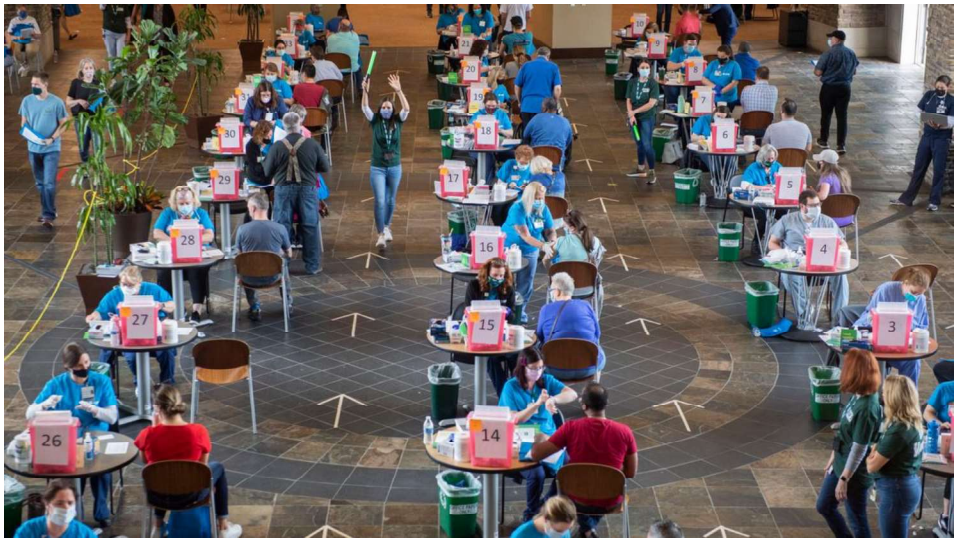

By Robbie Whelan

The U.S. Centers for Disease Control and Prevention has identified a small cohort of approximately 5,800 cases of Covid-19 infection among more than 66 million Americans who have completed a full course of vaccination.These so-called breakthrough cases, which are defined as positive Covid-19 test results received at least two weeks after patients receive their final vaccine dose, represent 0.008% of the fully vaccinated population.

Officials said such cases are in line with expectations because the approved vaccines in the U.S. are highly effective but not 100% foolproof. They are a reminder that even vaccinated people are at risk and should continue to take precautions such as masking and social distancing in many circumstances.

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The CDC earlier this year asked state health departments to track and report breakthrough cases to the federal government. So far, the cases that have been reported come from about 40 states.

Separately, The Wall Street Journal contacted health departments in all 50 states and the District of Columbia to ask how many breakthrough cases had been identified. Twenty-three states responded, reporting a total of 4,172 breakthrough cases.

One area of focus for the CDC is conducting genomic sequencing on respiratory samples from patients with breakthrough cases, so that the agency can track genetic variants of the coronavirus for clues as to how they interact with the vaccines. Public-health officials are studying whether certain mutations of the coronavirus are more resistant to vaccine-based immunity.

The CDC has established a database to record details of each breakthrough case, including patient demographics, geographic location, time since vaccination, vaccine type and virus lineage.

"You will always see some breakthrough infections no matter the efficacy of your vaccine," Anthony Fauci, the government's top infectious-disease official, said in an interview. "Before people get excited about the quantitative number of infections, they need to understand what the denominator is, and we're going to see breakthroughs in numbers that are going to be well within the 90%, 95%, 97% effectiveness rates of the vaccines."

At press briefings over the past two weeks, Dr. Fauci has tried to assure the public that a small number of these infections are to be expected.

Patients can become infected after vaccination for a number of reasons. Older people or those with compromised immune systems might not produce a sufficient immune

response to the vaccine, leaving the body vulnerable, said David Hirschwerk, an infectious-diseases physician at Northwell Health System in Manhasset, N.Y.

Other times, more aggressive variants of the virus can evade the protections brought on by immunization, or a patient could simply be exposed to a high viral load in a superspreader event, which could simply overwhelm the body's defenses.

"The experience so far is that the vaccine remains highly effective and those who did have breakthrough infections have had very mild and manageable illnesses," said Dr. Hirschwerk, who has treated at least one patient who fell ill with Covid-19 after being vaccinated. "This is really what we see each season with the influenza vaccine."

Of the breakthrough cases identified by the CDC, more than 40% occurred in people older than 60, while 65% of the cases were in female patients, according to Tom Clark, leader of the vaccine evaluation team at the federal agency. The CDC found that 29% of breakthrough infections were asymptomatic and 7% of patients experiencing a breakthrough infection were hospitalized. So far, 74 people have died after experiencing breakthrough infections. The agency is expected to publish some of these findings next week.

"It is fully expected that some people who are vaccinated against Covid-19 will still get Covid-19," said Joseph Wendelken, a spokesman for the department of health in Rhode Island. In that state, 290 people have tested positive after becoming fully vaccinated, representing 0.13% of the state's fully vaccinated population. "The fact that our positivity rate among vaccinated people is so low is a sign of how effective that Covid-19 vaccine is. This is another reason why people should get vaccinated when they are eligible."

Doctors and public-health officials emphasize that such cases aren't surprising when dealing with a disease for which no vaccine provides 100% efficacy at preventing infection. All three vaccines approved for use in the U.S.—manufactured by Pfizer Inc. and BioNTech SE together; Moderna Inc.; and Johnson & Johnson—were found in clinical trials to be highly effective at preventing both serious and symptomatic cases of Covid-19.

The Pfizer-BioNTech and Moderna shots were more than 94% effective at preventing Covid-19 in their late-stage clinical trials, while J&J's effectiveness was 66%. However, scientists are still studying the vaccines' effect on transmission and their efficacy in treating new variants of the virus.

Currently there are five variants of the SARS-CoV-2 virus circulating in the U.S., several of which scientists believe to be more easily transmissible among humans than the originally identified version of the virus. Public-health officials believe that studying

breakthrough cases will help them better understand how variants work.

The CDC recommends that even those who are fully vaccinated wear a mask indoors when not at home and continue to follow hand-washing and social-distancing guidelines to prevent post-vaccine infection.

Most flu vaccines are only about 60% effective, Dr. Hirschwerk said, but both flu and Covid-19 vaccines are highly effective at preventing serious illness.

"People who are getting Covid, despite the vaccine, there is a very good chance that those individuals would be in the hospital, some of them critically ill, not recovering at home, if they hadn't gotten the shot," he said.

When Sarah McCauley, a hospital nurse from Bethlehem, Pa., tested positive for Covid-19 in late March, she was flabbergasted. Just two months before, she had received her second shot of Pfizer's Covid-19 vaccine.

"I thought, 'There's no way this can be happening,'" Ms. McCauley, 35 years old, said. "We've been living with this disease for over a year, and I've been so careful, I got vaccinated. My jaw just dropped."

Ms. McCauley experienced fatigue, loss of sense of smell and congestion, but recovered quickly and returned to work. She says she was initially worried because she has asthma, but she is glad she got the shot.

"My respiratory symptoms were minimal, and I had no cough or fever," she said. "It scared me, but I felt pretty good and I'm hoping that it prevented a much worse sickness."

In Maryland, health officials are still collecting data, but the number of breakthroughs has been "very, very low," said Jinlene Chan, acting deputy secretary for public health services for Maryland.

"The fact is that the vaccination is working exactly as we expected it to," Ms. Chan said.

Write to Robbie Whelan at robbie.whelan@wsj.com

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