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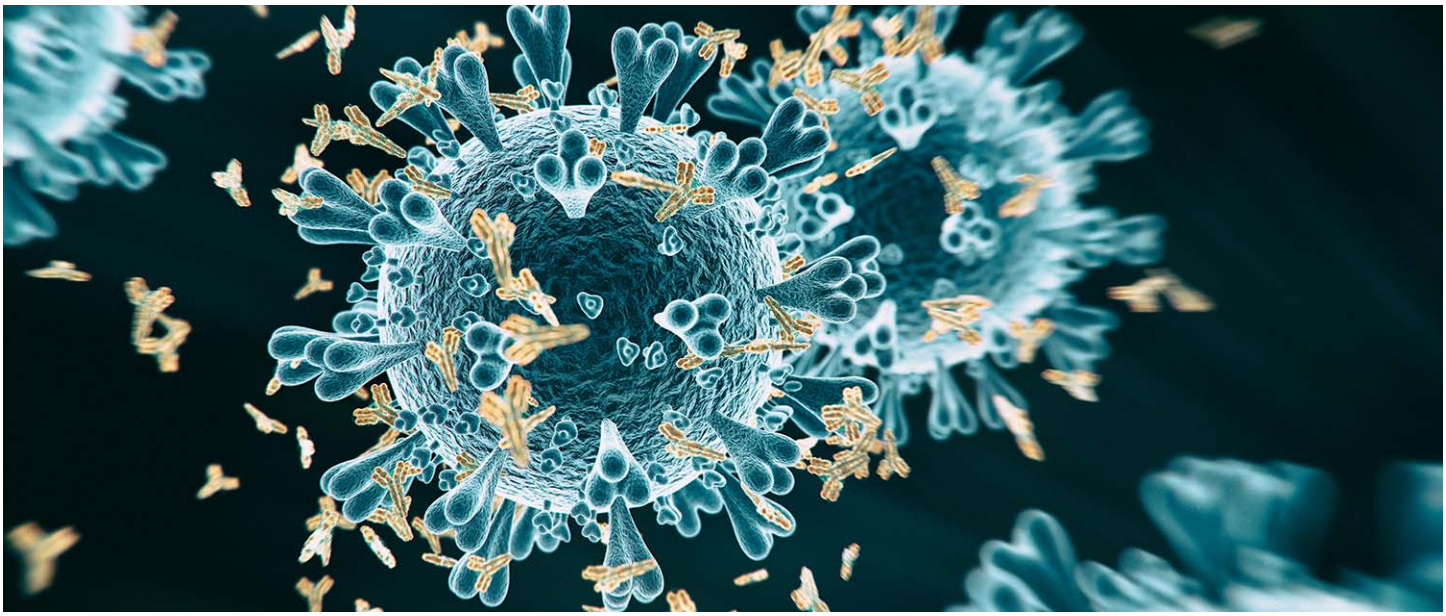

COMMUNITY HEALTH, INFECTIOUS DISEASE **Apr. 29 2020**

Risk of Coronavirus Reinfection

Health experts finds that reinfections with endemic coronaviruses are not uncommon, even within a year of prior infection. The study on the four endemic coronaviruses—not including SARS-CoV-2, the virus that causes COVID-19—found that when reinfection occurred, it was not associated with less severe symptoms. Instead, genetic factors may be a greater determinant of the severity of an infection. Individuals who were asymptomatic during their first infection did not experience symptoms during subsequent infections, and members of the same family reported similar symptom severity.

While the characteristics of immunity in COVID-19 survivors are still unknown, the immune response to the endemic coronaviruses studied (229E, OC43, NL63, and HKU1) could provide a useful reference for understanding the risk of repeat infection with SARS-CoV-2. Infections with the four endemic coronaviruses studied are common in the general population and usually produce mild or asymptomatic illness. Study results are published on the Columbia webpage of senior author Jeffrey Shaman, PhD, professor of environmental health sciences. The paper is currently under peer review.

"As the COVID-19 pandemic progresses, infecting millions of people worldwide, a key question is whether individuals are prone to repeat infection. The evidence from endemic coronaviruses suggests that immunity is short-lived and re-infection is common within one year, with symptom severity possibly more a function of genetics than the presence or absence of antibodies," says Shaman. "Research on endemic coronaviruses, along with findings for SARS and MERS, provide context for understanding protective immunity against repeat SARS-CoV-2 infections."

There is no firm evidence of SARS-CoV-2 reinfection, according to the researchers. Several individuals have tested positive weeks after seemingly clearing their infection. It is unclear whether this was due to false-negative test results, the near clearance of the virus followed by re-intensifying illness, or repeat infection. One study indicated that some recovered patients have low antibody levels. If immunity wanes within a few years, one would expect endemic circulation and possibly seasonal outbreaks going forward in time.

More than 90 percent of the population presents a baseline level of antibodies against the endemic coronaviruses studied, beginning at a young age. Shortly after infection, antibody levels increase sharply, reaching a peak after about two weeks, and by four months to one-year return to baseline levels. By contrast, research into SARS and MERS coronavirus infections, which often result in more severe illness, finds antibodies persist for two years or longer.

ADDITIONAL BACKGROUND ON THE STUDY

The researchers examined data from the Virome project, a study of the transmission dynamics of respiratory viral infections, including weekly nasal swabs and self-reports of respiratory symptoms, from 191 healthy children and adults in New York City collected between fall 2016 and spring 2018.

Over the course of the study, 86 individuals tested positive at least once for a coronavirus infection, and 12 individuals tested positive more than once for the same coronavirus. The median time between reinfection was 37 weeks. The majority of the repeated coronavirus infections were in children, a group more vulnerable to infection because of their

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