Large, real-world study finds COVID-19 vaccination more effective than natural immunity

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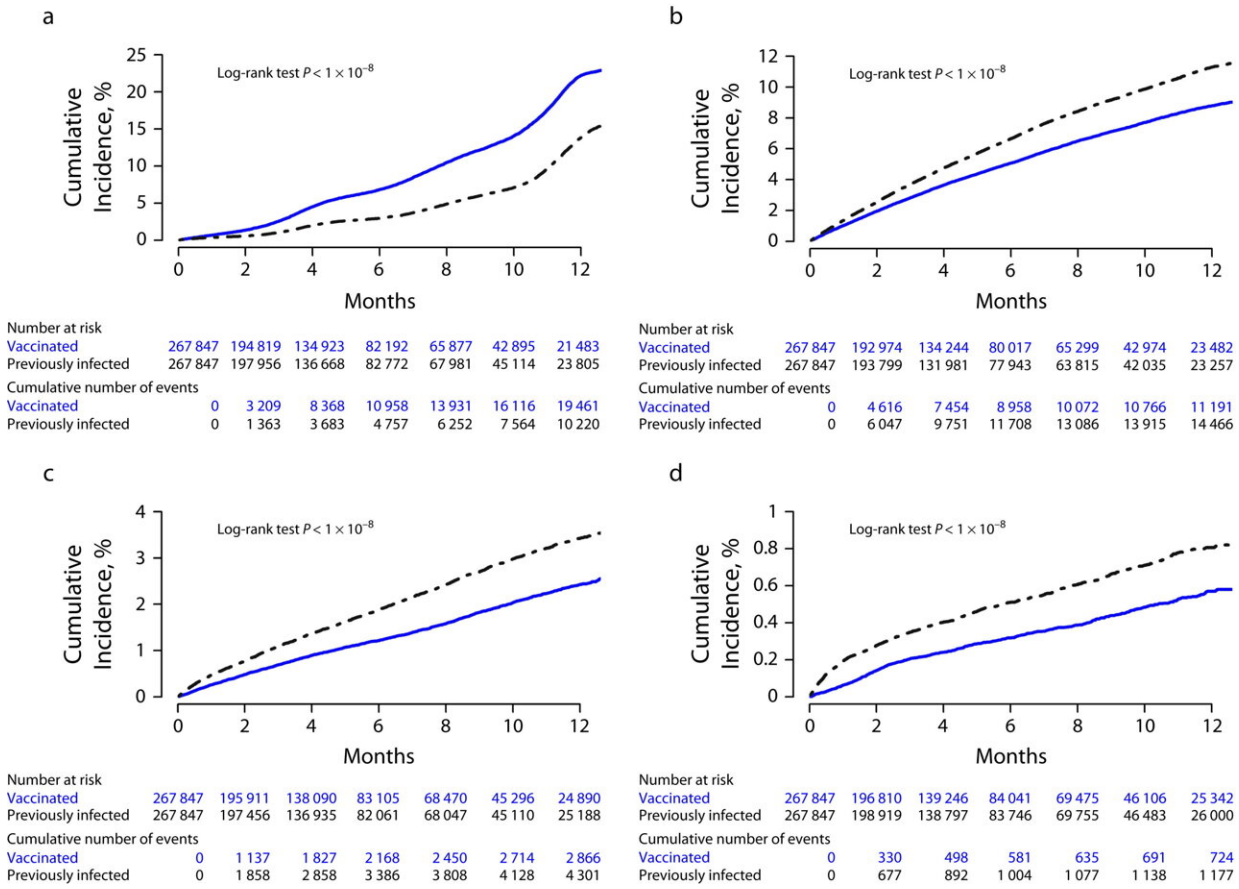

Cumulative Incidence Rates, in Vaccine Recipients and Individuals With Previous Infections, of (a) SARS-CoV-2 Infection or Reinfection, (b) Emergency Department Visit, (c) All-Cause Hospitalization, and (d) Death: SARS-COV-2 Infection, Hospitalizations, and Mortality in Vaccinated and Infected Individuals, Indiana, 2020–2022. Note. SARS-CoV-2 = severe acute

respiratory syndrome coronavirus 2. Credit: *American Journal of Public Health* (2022). DOI: 10.2105/AJPH.2022.307112

In one of the first large, real-world studies comparing the effectiveness of COVID-19 vaccines versus natural immunity in protecting against death, hospitalizations and emergency department (ED) visits for any cause, including COVID, research-scientists from Regenstrief Institute, Indiana University School of Medicine and Vanderbilt University Medical Center report that people of all age groups benefited significantly more from vaccination than natural immunity acquired from a previous COVID infection. The lower death rate of vaccinated individuals was especially impressive for adults ages 60 years or older.

Significantly, the all-cause death and hospital admission rates for vaccinated individuals were 37 percent lower than the rates for those with natural immunity acquired from previous COVID infection. The rate of ED visits for all causes was 24 percent lower for vaccinated individuals than for the previously infected.

"This large population study of the entire state of Indiana should encourage individuals everywhere to get themselves and their children vaccinated and not rely on natural immunity. While the incidence of COVID infection was higher in vaccine recipients (6.7 percent) than in individuals previously infected (2.9 percent), the vaccine protected against severe disease while natural immunity did not confer the same benefit," said study corresponding author and Regenstrief Institute Vice President for Data and Analytics Shaun Grannis, M.D.

"As vaccinated individuals were more likely to actually get COVID than those with natural immunity, the lower death rate of vaccine recipients who develop COVID appears to be due to vaccination and not to a

tendency for risk-averse behaviors, such as mask-wearing, hand sanitizing and social distancing."

Data on pairs of vaccine recipients and individuals with prior infections, aged between 12 and 110 years, matched on age, sex, CDC-defined COVID risk scores and dates of initial exposure (to the vaccines or the virus itself) were compared. This information was extracted from the Indiana Network for Patient Care, one of the nation's largest health information exchanges. Death reports from the State of Indiana were also analyzed.

"This study has important public health implications as previous studies investigated COVID-specific ED visits, hospitalizations and mortality but didn't capture the non-COVID related ones," said study first author Regenstrief Institute Research Scientist Wanzhu Tu, Ph.D. "Our work confirms that mRNA vaccines have kept people out of the ED and the hospital as well as lowered the likelihood of death from any cause. And we saw this pattern in every age group."

The study concludes, "The significantly lower rates of all-cause ED visits, hospitalization and mortality in the vaccinated highlight the real-world benefits of vaccination. The data raises questions about the wisdom of reliance on natural immunity when safe and effective vaccines are available."

The research is published in the *American Journal of Public Health*.

More information: Wanzhu Tu et al, SARS-CoV-2 Infection, Hospitalization, and Death in Vaccinated and Infected Individuals by Age Groups in Indiana, 2021–2022, *American Journal of Public Health* (2022). DOI: 10.2105/AJPH.2022.307112