



**Medical
Blueprints**

PREDICTING COVID IN YOUR TOWN? REPORT #2998

BACKGROUND: The most recent omicron subvariant BA.5 is the most easily transmissible COVID variant to date. It can evade previous immunity from COVID infection and vaccination. According to the CDC, this variant accounted for more than 75 percent of the country's new COVID cases. They report an average of 122,639 new cases of COVID daily, and daily averages of 5,762 new hospital admissions and 336 new deaths. Reported symptoms are similar to previous COVID variants such as fever, runny nose, coughing, sore throat, headaches, muscle pain, and fatigue. Emerging research is finding that with each repeat COVID infection, even asymptomatic, increases the risk for complications including stroke, heart attack, diabetes, digestive and kidney disorders, and long-term cognitive impairment, including dementia. Each reinfection also carries with it the risk of long COVID, a syndrome with ongoing symptoms that can last for weeks or months after infection.

(Source: <https://health.ucdavis.edu/coronavirus/news/headlines/how-to-protect-yourself-from-covid-subvariant-ba5/2022/07>)

PREDICTING COVID VARIANTS: Scientists have developed a machine learning model that can predict which SARS-CoV-2 viral variants are likely to cause surges in COVID-19 cases. Pardis Sabeti, a member at the Broad Institute of MIT, a professor at the Center for Systems Biology and the Department of Organismic and Evolutionary Biology at Harvard University, and a professor of immunology and infectious diseases at Harvard T.H. Chan School of Public Health, was part of the research team that developed the model, called PyR0. The model was trained using more than six million SARS-CoV-2 genomes from the GISAID (Global Initiative on Sharing Avian Influenza Data) database and can estimate how genetic mutations will impact the fitness of a particular coronavirus variant. In January 2022, when researchers tested the model using viral genomic data, it predicted the rise of the BA.2 variant, which caused surges in many countries. "This kind of machine learning-based approach that looks at all the data and combines that into a single prediction is extremely valuable," Sabeti said. "It gives you a leg up on identifying what's emerging and could be a potential threat."

(Source: <https://www.hsph.harvard.edu/news/hsph-in-the-news/machine-learning-tool-can-predict-which-covid-variants-will-cause-case-surges/>)

SURPRISING TREATMENT DISCOVERY: One of the drugs authorized for use in people for COVID treatment is molnupiravir. It can be taken orally and at home in an effort to avoid hospitalization. A group of investigators, headed by a team at Georgia State University, studied the effect of molnupiravir on different variants of concern, including Alpha, Beta, Gamma, Delta, and Omicron, on human cells, human cell-derived organoids, ferrets, and dwarf hamsters. A surprising finding from the study was that male dwarf hamsters fared better overall than female hamsters when treated with molnupiravir after infection with Omicron. Researchers did not observe this variation with other variants, and the impact of sex on the results in the other models as the only ferrets used were female and the cells used to develop organoids were male. Simon Funnell, MD, a scientific leader of the U.K. Health Security Agency and a member of the World Health Organization expert group said, "Female human donors are available for organoid culture, and it seems that this could easily be investigated. The media used for such studies could also be balanced to reflect human hormonal differences in circulating blood."

(Source: <https://www.medicalnewstoday.com/articles/molnupiravir-more-effective-against-omicron-in-males-animal-study-suggests>)

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