

# Dropping anti-Covid measures during vaccine rollout 'risks resistant variants'

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Relaxing restrictions like mask-wearing and social distancing when most people have been vaccinated greatly increases the risk of vaccine-resistant variants of the virus that causes COVID-19, new research showed on Friday.

At a time when nearly 60 percent of Europeans have received at least one vaccine dose, the authors said their modeling study showed the need to maintain non-vaccination measures until everyone is fully jabbed.

To predict how the SARS-CoV-2 virus might mutate in response to vaccination campaigns, a pan-European team of experts simulated the probability of a vaccine-resistant strain emerging in a population of 10 million people over three years.

Variables included vaccination, mutation and transmission rates—including recurring "waves" of infections and declines in the number of cases in response to lockdowns.

Predictably, the model showed that a rapid rate of vaccination reduced the risk of a resistant strain emerging.

But in what the authors called a "counterintuitive result", the model showed that the highest risk of resistant strains emerging came when a large proportion of the population was vaccinated, but not large enough to ensure herd immunity.

This is in essence where much of Europe is currently, where the Delta variant is spreading rapidly.

The authors said the model showed a threshold of 60 percent of the population vaccinated, after which resistant variants were more likely to occur.

The situation in the US—where 60 percent of adults are fully vaccinated and 80 percent of new cases are caused by the Delta variant—is similar.

"Vaccines are our best bet to beat this pandemic" said co-author Simon Rella, from Austria's Institute of Science and Technology (IST).

"What our model showed is that when most people are vaccinated, the vaccine-resistant strain has an advantage over the original strain.

"This means that the vaccine-resistant strain spreads through the population faster than the original strain at a time when most people are vaccinated," Rella told journalists in an online briefing.

Viruses constantly mutate in response to environmental constraints, such as growing immunity and response measures designed to limit transmission.

With SARS-CoV-2, the Delta variant is significantly more infectious than the original virus variant, but there is currently little evidence to suggest it is more deadly.

## **'Evolution is powerful'**

Authors said that their research highlighted the need to maintain other anti-COVID measures until everyone is vaccinated.

"Of course we hope that vaccine-resistance does not evolve over the course of this pandemic, but we urge caution," said Fyodor Kondrashov, an IST researcher and study co-author.

"Evolution is a very powerful force and maintaining some reasonable precautions throughout the whole vaccination period may actually be a good tool to control this evolution."

Currently just over one billion people around the world are fully vaccinated against COVID-19, with many countries—particularly in Africa and South America—yet to start widespread rollouts due to lack of supply.

"Without global coordination, vaccine resistant strains may be eliminated in some populations but could persist in others," said the study, published in *Nature Scientific Reports*.

"Thus, a truly global vaccination effort may be necessary to reduce the chances of a global spread of a resistant strain."

Reacting to the study, Nick Davies, assistant professor of Mathematical Modeling at the London School of Hygiene and Tropical Medicine, said it showed the need for every country to "do their part to avoid creating fertile grounds for viral evolution".

"But ultimately, dealing with the emergence of a vaccine escape strain is really a global issue, not a national one," said Davies, who was not involved in the research.

"As soon as a vaccine escape mutant emerges somewhere, it becomes everybody's problem."

**More information:** Simon A. Rella et al, Rates of SARS-CoV-2

transmission and vaccination impact the fate of vaccine-resistant strains, *Scientific Reports* (2021). [DOI: 10.1038/s41598-021-95025-3](https://doi.org/10.1038/s41598-021-95025-3)

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