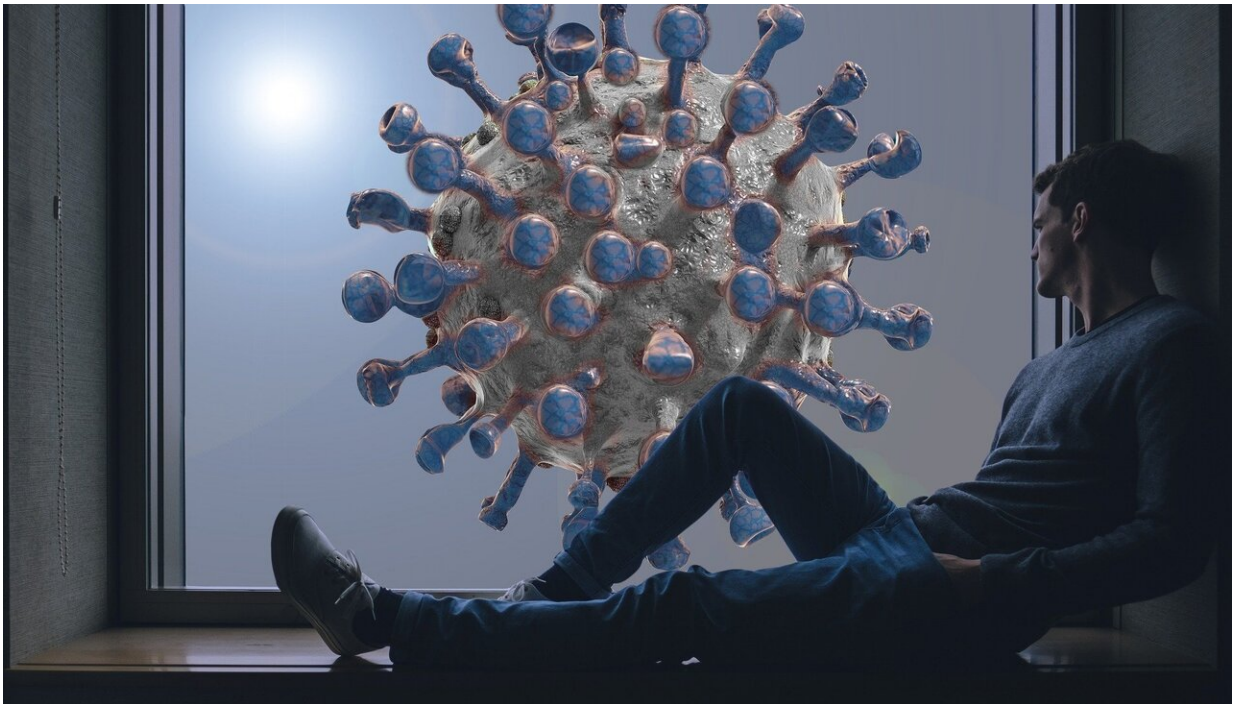


The role of newly introduced lineages in COVID-19 resurgence

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Following the first wave of SARS-CoV-2 infections in spring 2020, Europe experienced a resurgence of the virus starting late summer. Although it appears clear that travel had a significant impact on the circulation of the virus, it remains challenging to assess how it may have restructured and reignited the epidemic in the different European

countries.

In a new study published in the journal *Nature* this June 30th, 2021, Philippe Lemey—Rega Institute, KU Leuven, Simon Dellicour—SpELL, Spatial Epidemiology Lab, Université Libre de Bruxelles, and their collaborators, built a phylogeographic model to assess how newly introduced viral lineages, as opposed to persisting ones, contributed to the resurgence of COVID-19 in Europe. Their model was informed using epidemiological, mobility, and viral genomic data from ten European countries (Belgium, France, Germany, Italy, Netherlands, Norway, Portugal, Spain, United Kingdom, Switzerland).

Their analyses show that in the majority of the countries under investigation, more than half of the lineages circulating at the end of the summer resulted from new introductions since June 15. The researchers also show that the success of transmission of the newly introduced lineages was predicted by the local incidence of COVID-19: in countries that experienced a relatively higher summer incidence (e.g. Spain, Portugal, Belgium and France), the introduction events led to proportionately fewer active transmission chains after August 15.

For instance, their results also indicate that introductions in the UK were particularly successful in establishing local transmission chains, with a considerable fraction of introductions originating from Spain.

"Imagine a fire: if there are already quite a few outbreaks in a forest, lighting a few more will not change the fate of the forest; the fire will spread anyway. On the opposite, if there are only a few sporadic fire spots, then lighting new ones can accelerate and increase the violence of the overall fire to come" explains Dellicour—author of the article, FNRS Research Associate at the ULB.

These results illustrate the threat of viral spread via international travel, a

threat that must be carefully considered by strategies to control the current spread of variants that are more transmissible and/or evade immunity.

The pandemic exit strategy offered by vaccination programs is a source of optimism that also sparked proposals by EU member states to issue vaccine passports in a bid to revive travel and rekindle the economy. In addition to implementation challenges and issues of fairness, there are risks associated with such strategies when immunization is incomplete, as likely will be the case for the European population this summer.

The authors of the study conclude that conditions similar to those demonstrated in their study could provide fertile ground for viral dissemination and resurgence, which may now also involve the spread of variants that evade immune responses triggered by vaccines and previous infections. They hope that a well-coordinated, unified implementation of European strategies to mitigate the spread of SARS-CoV-2 will reduce the chances of future waves of infection.

More information: Philippe Lemey et al, Untangling introductions and persistence in COVID-19 resurgence in Europe, *Nature* (2021).
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