Tracing the transmission rates and origins of SARS-CoV-2 strains circulating in Brazil

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A large international team of researchers has conducted a study aimed at tracing the transmission rates and the origin of major SARS-CoV-2

strains currently circulating in Brazil. In their paper published in the journal *Science*, the group outlines their strategy and what they learned about the progression of COVID-19 in Brazil.

Brazil, like the United States, has taken a hands-off approach in dealing with the COVID-19 pandemic. Like the U.S., the country has a leader who has not pushed for strategies known to slow the spread of the virus, such as wearing masks, self-isolating, and social distancing. The result has been one of the fastest-growing epidemics in the world, behind only the U.S. In this new effort, the researchers sought to learn more about transmission rates and the particular strains of SARS-CoV-2 infecting people in Brazil.

The researchers note that initial efforts to slow the spread of the virus in Brazil appeared to be effective, due to the efforts of local leaders—but as the virus spread to other parts of the country, the epidemic picked up steam. To learn more about the virus and why it was able to spread so quickly, the researchers used a variety of tools. One of the first was analyzing data from sources around the country that described mobility of infections, infection rates and deaths. They also included deaths not reported as due to COVID-19 but likely were—most were labeled simply as severe acute respiratory infections. In that part of the study, they used the data to create model simulations. And the model simulations showed that closing down stores and schools in hot spots slowed the spread of the virus. Ignoring it, on the other hand, did not.

Another part of the work involved looking into the path of infection into Brazil. In this effort, the researchers conducted PCR assays on tissue samples from 26,732 people across the country. In so doing, they found that approximately 29% of all the samples they tested came up positive for COVID-19. They also found over 100 strains of the SARS-CoV-2 virus. Further study showed that approximately 75% of the strains they identified fell into three main clades, all of which originated in Europe.

The researchers suggest it was likely an increase in long-distance flights that allowed the virus to spread so widely and quickly across the country. They conclude by suggesting that Brazil needs to work harder on nonpharmaceutical interventions to slow the spread of the virus.

More information: Darlan S. Candido et al. Evolution and epidemic spread of SARS-CoV-2 in Brazil, *Science* (2020). DOI: 10.1126/science.abd2161