

MERS-CoV just a few mutations away from becoming a pandemic threat

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Dromedary camels from a study site in Ethiopia. Credit: Eve Miguel.

An international team of researchers has found that the Middle East respiratory syndrome (MERS-CoV) is just a few mutations away from becoming a serious pandemic threat. In their paper published in

Proceedings of the National Academy of Sciences, the group describes their study of different variants of the virus.

MERS-CoV was first observed in 2012 in Saudi Arabia. Testing of the virus showed it to be highly lethal—approximately 40% of initial patients died from their infections. Researchers also found that the majority of infections came from infected dromedaries. They also found some evidence that the dromedaries had been infected by infected bats.

While alarming, the MERS-CoV outbreak received little attention because it did not appear to be transferable between humans. Since the initial outbreak, researchers have found that up to 80% of dromedaries that have been tested—70% of which live in Africa—have antibodies for MERS-CoV.

One mystery regarding the virus is why more African people have not been infected, considering the number of dromedaries and their interactions on the African continent. To find out, the researchers collected samples of the [virus](#) in a variety of places in the Middle East and Africa, looking to find its variants. They grouped those from Africa and the Middle East into different clades.

Next, they compared the samples genetically and under lab conditions using human lung cells. They found that variants originating in Arabian clades were easily transmissible to humans, while variants collected in Africa were not.

A closer look showed the differences between the variants came down to amino acids in the S protein. Genetically engineering an African variant to have the same [amino acids](#) allowed the variant originating in Africa to more easily infect human cells.

The researchers suggest the reason that the variant from the samples

collected in the Middle East has not yet mutated to infect humans is due to the dromedary trade—it is virtually one way, with the animals being traded from Africa to the Middle East. They note that if the trade reverses at some point, or another animal becomes a carrier and is traded to Africa, mutations could arise, setting off a deadly pandemic.

More information: Ziqi Zhou et al, Phenotypic and genetic characterization of MERS coronaviruses from Africa to understand their zoonotic potential, *Proceedings of the National Academy of Sciences* (2021). [DOI: 10.1073/pnas.2103984118](https://doi.org/10.1073/pnas.2103984118)

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