Middle East respiratory syndrome coronavirus has not yet reached pandemic potential

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New estimates of the transmissibility of the Middle East respiratory syndrome coronavirus in humans suggest that it does not yet have pandemic potential, according to research published in *The Lancet*.

Amid concerns of a new pandemic more deadly than severe acute respiratory syndrome (SARS), a group of researchers from the Institut Pasteur in Paris, France analysed data on MERS-CoV clusters (55 of the 64 laboratory-confirmed cases worldwide) to estimate the basic reproduction number (R0) and compare it to that of prepandemic SARS.

In their worst case senario, MERS-CoV had a lower R0 (0.69) compared with prepandemic SARS (0.80). When R0 is above 1, epidemic potential has been reached; the R0 for pandemic SARS was estimated to be between 2.2 and 3.7.

"Despite sharing many clinical, epidemiological, and virological similarities with SARS, the two viruses have distinct biology, such as the use of different receptors to infect cells in human airways", explains Arnaud Fontanet, who led the research.

"MERS-CoV has not spread as rapidly or as widely as SARS did. SARS' adaption to humans took just several months, whereas MERS-CoV has already been circulating more than a year in human populations without mutating into a pandemic form."

The researchers calculated that in the worst case scenario, eight or more secondary infections directly caused by the next index patient (initial person with symptoms) would suggest that there is a 5% or higher chance that the re-estimated MERS-CoV R0 is larger than 1 (ie, that it might have epidemic potential). This outcome, they write, "seems unlikely because the largest count of secondary cases attributed to a patient is seven (six in a dialysis ward and one outside) and is an outlier."

However, they caution that it is possible that milder cases have gone undetected which could raise the R0 estimate.

According to Fontanet, "One of the main lessons of the SARS pandemic has been that early control of the virus (while it was still confined to southeast China) might have prevented its global spread… We recommend enhanced surveillance, active contact tracing, and vigorous searches for the MERS-CoV animal hosts and transmission routes to human beings."

Commenting on the study, Chris Bauch from the University of Waterloo in Ontario, Canada, and Tamer Oraby from the University of Guelph in Ontario, Canada, say, "MERS-CoV has probably been transmitted from an unknown animal host to human beings repeatedly in the past year…To maximise our chances of containing MERS-CoV infection, we need continuing research, including updated R0 estimates and methodological refinements. However, the analysis by Breban and colleagues concludes that MERS-CoV—in its current guise—is unlikely to cause a pandemic."

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