Report 3: Transmissibility of 2019-nCoV

Natsuko Imai, Anne Cori, Ilaria Dorigatti, Marc Baguelin, Christl A. Donnelly, Steven Riley, Neil M. Ferguson

WHO Collaborating Centre for Infectious Disease Modelling
MRC Centre for Global Infectious Disease Analysis
Abdul Latif Jameel Institute for Disease and Emergency Analytics (J-IDEA)
Imperial College London

Correspondence: neil.ferguson@imperial.ac.uk

Note: This is an extended version of an analysis previously shared with WHO, governments and academic networks between 22/1/20-24/1/20

Summary

Self-sustaining human-to-human transmission of the novel coronavirus (2019-nCov) is the only plausible explanation of the scale of the outbreak in Wuhan. We estimate that, on average, each case infected 2.6 (uncertainty range: 1.5-3.5) other people up to 18th January 2020, based on an analysis combining our past estimates of the size of the outbreak in Wuhan with computational modelling of potential epidemic trajectories. This implies that control measures need to block well over 60% of transmission to be effective in controlling the outbreak. It is likely, based on the experience of SARS and MERS-CoV, that the number of secondary cases caused by a case of 2019-nCoV is highly variable – with many cases causing no secondary infections, and a few causing many. Whether transmission is continuing at the same rate currently depends on the effectiveness of current control measures implemented in China and the extent to which the populations of affected areas have adopted risk-reducing behaviours. In the absence of antiviral drugs or vaccines, control relies upon the prompt detection and isolation of symptomatic cases. It is unclear at the current time whether this outbreak can be contained within China; uncertainties include the severity spectrum of the disease caused by this virus and whether cases with relatively mild symptoms are able to transmit the virus efficiently. Identification and testing of potential cases need to be as extensive as is permitted by healthcare and diagnostic testing capacity – including the identification, testing and isolation of suspected cases with only mild to moderate disease (e.g. influenza-like illness), when logistically feasible.

SUGGESTED CITATION
Natsuko Imai, Anne Cori, Ilaria Dorigatti, Marc Baguelin, Christl A. Donnelly, Steven Riley, Neil M. Ferguson. Transmissibility of 2019-nCoV. Imperial College London (25-01-2020), doi: https://doi.org/10.25561/77148.