# Feasibility of controlling 2019–nCoV outbreaks by isolation of cases and contacts

Status: Paper published at journal | First online: 07-02-2020 | Last update: 01-03-2020

**Authors:** *Joel Hellewell, Sam Abbott[1], Amy Gimma[1], Nikos I Bosse, Christopher I Jarvis, Timothy W Russell, James D Munday, Adam J Kucharski, W John Edmunds, CMMID COVID-19 working group (/groups/ncov-group), Sebastian Funk[2] & Rosalind M Eggo (mailto:r.eggo@lshtm.ac.uk)[*2].*

* corresponding author    1 contributed equally    2 contributed equally

## Aim

To assess the viability of isolation and contact tracing to control transmission from imported cases of 2019-nCoV.

## Summary of Methods

We modelled outbreak scenarios with:

- reproduction numbers of 1.5, 2.5, and 3.5

- short and long onset-to-isolation delay of new cases (3.8 days, 9.1 days)

- 0%, 15%, 30% of transmission before symptom onset

- 0 or 10% subclinical (asymptomatic) infection

In the model, initial cases are isolated following the delay to isolation, and their contacts are isolated immediately upon developing symptoms. An outbreak is defined as controlled if there are no cases after 3 months.

## Summary of findings

- The percentage of contacts traced is critical to achieving control in all scenarios (Figure).

- Higher transmission (higher R0) makes outbreaks more difficult to control.

- 30% transmission before symptoms makes control less likely in all scenarios.

- 60-80% of contacts must be traced (and transmission stopped) in order to achieve control in most scenarios, and more for some characteristics.

- Presence of subclinical (asymptomatic) cases has an outsize and negative impact on probability to achieve control.

## Key Assumptions and Limitations

- Heterogeneity in individual-level number of secondary cases is the same as SARS.