

SYNOPSIS

03/03/2020

Review of “Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts”

Article citation: Hellewell J, Abbott S, Gimma A, Bosse NI, Jarvis CI, Russell TW, et al. Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts. *Lancet Global Health*. 2020 Feb 28 [Epub ahead of print]. Available from: [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(20\)30074-7/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(20)30074-7/fulltext)

One-Minute Summary

- Based on a mathematical model of the novel coronavirus (COVID-19), the authors measured the **probability** that an introduction of COVID-19 cases in a population **could be controlled within three months or before they reached 5,000 cases**, depending on the probability (ranging from 50%–100%) that contacts were traced.
- In the baseline scenario, **80% of contacts** need to be **successfully traced** to achieve a **90% probability of controlling an introduction** of COVID-19 cases.
- The **number of initial cases** had a large effect on the probability of achieving control. For example, with five initial cases, there was a >50% chance of achieving control. Conversely, if there were 40 initial cases, there was a <80% chance of achieving control.
- The **probability of outbreak control increased** as the:
 - Proportion of contacts successfully traced increased
 - The basic reproduction number (R_0 , a measure of infection transmissibility) decreased
 - Number of initial cases decreased
 - Interval from onset to isolation decreased
 - Proportion of transmissions occurring before onset decreased
 - Proportion of subclinical infections decreased
- The authors state that in most outbreak scenarios, **case isolation and contact tracing alone may be insufficient to control COVID-19 outbreaks**, particularly if asymptomatic transmission occurs.

Additional Information

- Scenarios (baseline in **bold**) varied in terms of the number of initial cases (5, **20**, 40), the R_0 (1.5, **2.5**, 3.5), average delay from symptom onset to isolation (**short = 3.8 days**, or long = 9.1 days), the proportion of transmission occurring before symptom onset (<1%, **15%**, 30%) and proportion of subclinical infections (**0%**, 10%).
- The authors assumed that isolation was 100% effective once contacts were identified.
- The authors estimated the burden of contact tracing, based on the maximum number of weekly cases. **In many scenarios**, there were **between 25 and 100 symptomatic cases within a week**. All secondary contacts for these cases would need contact tracing.

PHO Reviewer's Comments

- Many of these parameters are liable to differ from country to country and as such, the probability of outbreak control is likely to vary greatly around the globe.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Review of “Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts”. Toronto, ON: Queen’s Printer for Ontario; 2020.

Disclaimer

This document was developed by Public Health Ontario (PHO). PHO provides scientific and technical advice to Ontario’s government, public health organizations and health care providers. PHO’s work is guided by the current best available evidence at the time of publication.

The application and use of this document is the responsibility of the user. PHO assumes no liability resulting from any such application or use.

This document may be reproduced without permission for non-commercial purposes only and provided that appropriate credit is given to PHO. No changes and/or modifications may be made to this document without express written permission from PHO.

Public Health Ontario

Public Health Ontario is a Crown corporation dedicated to protecting and promoting the health of all Ontarians and reducing inequities in health. Public Health Ontario links public health practitioners, front-line health workers and researchers to the best scientific intelligence and knowledge from around the world.

For more information about PHO, visit publichealthontario.ca.

