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Eliminate COVID-19 without a lockdown: the Taiwan model explained

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Abstract

Background

Never using a lockdown, Taiwan has no locally acquired cases of coronavirus disease 2019 (COVID-19) for more than 220 days. Here we report the theoretical basis behind the highly successful combination strategies used in the Taiwan model.

Methods

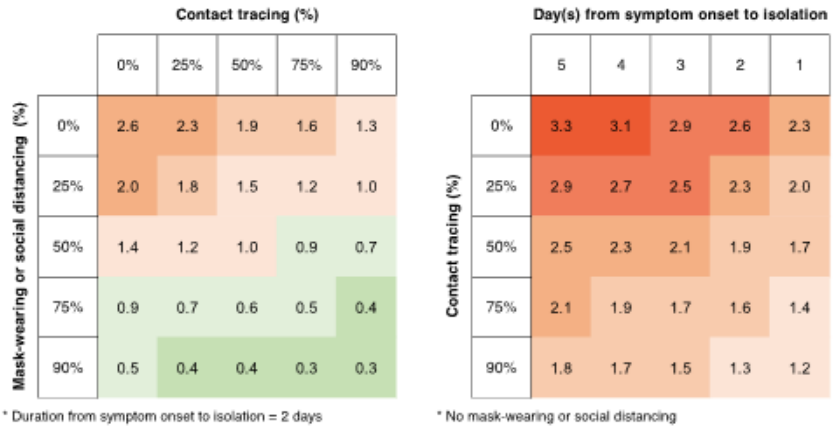
We constructed an SEIR model, with parameters based on large clinical and epidemiological studies, to assess effects of different intervention strategies, alone or in combination, to block the transmission of SARS-CoV-2 virus. Success in containment is defined as suppression of basic reproduction number (R0) to less than 1. We also modelled the medical and public health capacity required for practical implementation, under different influx rate of COVID-19 cases imported from other countries.

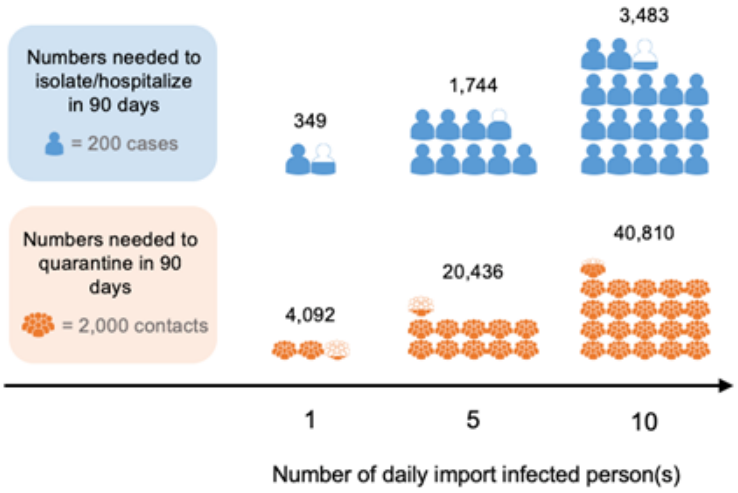
Results

The modelling results showed that a successful containment requires public surgical mask-wearing, in addition to rapid isolation and contact tracing (Figure 1). Furthermore, even with such combination interventions, a continuous influx of imported cases not detected at border will cause a proportional occurrence of secondarily transmitted local cases. Without a strict border control, when numbers of daily imported cases escaping quarantine increase from one to just ten, the pressure on medical and public health systems will rapidly escalate to a level beyond the upper limit of real-world capacity (Figure 2).

Conclusions

The two unique features of the Taiwan model, universal surgical mask-wearing and strict border quarantine, explain the successful elimination of COVID-19 in Taiwan without using lockdown. (Note: This work has been published on Journal of Formosan Medical Association)





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