

COCHRANE CORNER

Quarantine alone or in combination with other public health measures to control COVID-19: A rapid Cochrane review

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In March 2020, the South African government implemented various non-pharmacological prevention and control measures (e.g. isolation, social distancing and quarantine) in response to the COVID-19 pandemic. We summarise evidence from a rapid Cochrane review on the effect of quarantine alone v. quarantine plus combination measures to prevent transmission of and mortality caused by COVID-19. The findings show that when started earlier, quarantine combined with other prevention and control measures can be more effective than quarantine alone, and cost less.

S Afr Med J. Published online 30 April 2020. <https://doi.org/10.7196/SAMJ.2020.v110i6.14847>

COVID-19 is a new, rapidly emerging infectious disease that the World Health Organization (WHO) has classified as a pandemic. The virus is transmitted through droplets generated when an infected person coughs, sneezes or exhales. One big challenge with containing the transmission of COVID-19 is that there are currently no effective pharmacological interventions or vaccines to treat or prevent the disease. The WHO has therefore recommended non-pharmacological public health measures, such as isolation, social distancing and quarantine. The South African (SA) government has followed the WHO's recommendations, resulting in a nation-wide lockdown. This Cochrane Corner article summarises findings from a rapid review on the effectiveness of quarantine during serious coronavirus outbreaks, to support recommendations on quarantine.

Objectives

Nussbaumer-Streit *et al.*^[1] conducted a rapid review on whether and how effectively quarantine prevents transmission of and mortality caused by COVID-19, and whether quarantine was more effective when combined with other measures (such as closing schools).

Intervention and methods

Quarantine is the restriction of movement of asymptomatic healthy people who are presumed to have been exposed to a contagious disease. It can be implemented on a voluntary basis or legally enforced by governments (as is currently the case in SA) at an individual, group or community level. The rapid review included studies combining isolation (the separation of symptomatic patients) with quarantine.

An information specialist searched relevant (English and Chinese) databases up to March 2020. Cohort studies, case-control studies, case series, time series, interrupted time series and mathematical modelling studies that evaluated any type of quarantine to control COVID-19, as well as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), were of interest. Studies with confirmed or suspected cases, or individuals with symptoms, living in areas with high transmission rates or returning

from countries with a declared outbreak of COVID-19 were also of interest.

Two review authors independently screened 30% of the titles and abstracts; the remaining 70% were screened by one review author. Full-text articles were screened independently by two review authors. Data extraction and Grading of Recommendations Assessment, Development and Evaluation (GRADE) assessment (for incidence, onward transmission, mortality and resource use) were performed by one review author and independently checked by a second review author. Data were analysed using narrative synthesis owing to the heterogeneity of the methods to examine the outcomes of interest within the included studies.

Results

This rapid review included 29 studies. Ten studies (all modelling studies) focused specifically on COVID-19 and the rest on SARS, MERS and other viruses.

All 10 studies that simulated COVID-19 outbreaks in China, the UK and South Korea and on the Diamond Princess cruise ship found that quarantine measures reduced the number of people with the disease by 44 - 81% and the number of deaths by 31 - 63%. Additionally, combining quarantine with other measures (such as closing of schools, travel restrictions or social distancing) was more effective at reducing the spread of COVID-19 than quarantine alone. The findings of the remaining SARS and MERS studies agreed with those of the studies on COVID-19.

Conclusions

Quarantine in combination with other measures, such as closing of schools, travel restrictions and social distancing, had a greater effect on reducing transmissions and mortality rates than quarantine alone (low-certainty evidence). This finding needs to be interpreted with caution because the 10 modelling studies used limited data sets that make different assumptions on model parameters, and the remaining 19 studies on SARS and MERS only contribute indirect evidence.

Implications for practice

COVID-19 poses a global public health concern. Measures such as quarantine alone or in combination with other measures (such as social distancing) to prevent onward transmission of COVID-19 need to be examined from an overarching perspective of health, including physical and mental health outcomes. SA has been praised for implementing combination measures to curb the rapid increase in new COVID-19 cases. Looking to the future, SA will need to strike the balance between an abrupt end to combination measures (e.g. quarantine, social distancing, isolation and travel restrictions) or extended periods of these interventions or partial implementation thereof.

The SA experience of the HIV pandemic can offer a few lessons for prevention and control measures for the COVID-19 pandemic:^[2] (i) caution needs to be exercised so that combination measures do not reinforce existing health inequalities; (ii) information about interventions needs to be accessible for encouraging social and behaviour change; (iii) innovative and multisectoral approaches to implementing interventions are needed; and (iv) adequate contact tracing is needed to help 'flatten the curve', especially while the country is in quarantine.

Implementing combination measures can magnify health inequalities. Community engagement can be an effective strategy to gain understanding of whether and how implementation of combination measures needs to happen. For example, combination measures may be difficult to implement in high-density areas or informal settlements, where access to essential resources (e.g. water and sanitation) are lacking. Government-driven interventions therefore need to consider ways to address socioeconomic and structural barriers by making essential resources accessible at the same time as the implementation of quarantine with other measures.^[2]

Another consideration has to do with communicating to people in SA about combination measures. Communication needs to be free of jargon; content about interventions should be easily understood as images, where advanced literacy skills are not needed. Alongside accessible information, an environment that fosters behaviour change is necessary.^[2] Lack of information and behaviour change can lead to an increase in stigma of infected people within communities.^[2,3] Increased stigma can lead to fewer people acknowledging symptoms associated with COVID-19 and seeking care and/or self-isolating early.

Additionally, innovative and multisectoral approaches can enhance prevention and control measures for dealing with the COVID-19 pandemic.^[2] Innovative approaches, such as neoteric service delivery models, could assist in dealing with the pandemic while the business-

as-usual model of delivering services may not be flexible and responsive enough. Multisectoral collaboration can advance access to information, increase early testing, and minimise the onward spread of the coronavirus.

Lastly, the design and implementation of combination measures should take a more holistic approach to health and overcoming the COVID-19 pandemic. This means that the impact of combination measures in terms of people's mental and physical health needs to be considered. Quarantine and other measures (e.g. social distancing) are associated with negative psychological effects, such as stigma, frustration and boredom, and imbalance in work-life integration, among others.^[3] It is important also to consider the added physical health effects on people, especially in a country with high prevalences of HIV and obesity, where already compromised immune systems could be further affected. Novel interventions to assist with adequate contact tracing would assist in an attempt to flatten the curve. Combination measures should therefore include components that support the overall health of those living in SA, i.e. social interventions that promote and stimulate healthy psychological, physical and economic behaviour and wellbeing.

Declaration. None.

Acknowledgements. Cochrane Corner articles are co-ordinated from Cochrane South Africa at the South African Medical Research Council (SAMRC), but the views expressed in this article are those of the authors and do not necessarily reflect the views or policies of Cochrane or the SAMRC.

Author contributions. BS drafted the initial manuscript. ELD and TM drafted the 'Implications for practice' section. All authors reviewed and approved the final manuscript.

Funding. None.

Conflicts of interest. None.

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Accepted 27 April 2020.