

New and updated Cochrane summaries for COVID-19

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How effective is quarantine alone or combined with other public health measures to control coronavirus (COVID-2019)?

Protective clothes and equipment for healthcare workers to prevent them catching coronavirus and other highly infectious diseases

Factors that influence whether healthcare workers follow infection prevention and control guidelines for respiratory infectious diseases

How effective is quarantine alone or combined with other public health measures to control coronavirus (COVID-2019)?

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Authors: Nussbaumer-Streit B, Mayr V, Dobrescu Alulia, Chapman A, Persad E, Klerings I, Wagner G, Siebert U, Christof C, Zachariah C, Gartlehner G

Background

Coronavirus (COVID-19) is a new virus that has spread quickly throughout the world. COVID-19 spreads easily between people who are in close contact, or through coughs and sneezes. Most infected people suffer mild, flu-like symptoms but some become seriously ill and even die.

There is no effective treatment or vaccine (a medicine that stops people catching a specific disease) for COVID-19, so other ways of slowing (controlling) its spread are needed. One of the World Health Organization's (WHO) recommendations for controlling the disease is quarantine. This means separating healthy people from other healthy people, in case they have the virus and could spread it. Other similar recommendations include isolation (like quarantine, but for people with COVID-19 symptoms) and social distancing (where people without symptoms keep a distance from each other physically).

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What did we want to find out?

We wanted to find out whether and how effectively quarantine stops COVID-19 spreading and if it prevents death. We wanted to know if it was more effective when combined with other measures, such as closing schools. We also wanted to know what it costs.

Study characteristics

COVID-19 is spreading rapidly, so we needed to answer this question as quickly as possible. This meant we shortened some steps of the normal Cochrane Review process. Nevertheless, we are confident that these changes do not affect our overall conclusions.

We looked for studies that assessed the effect of any type of quarantine, anywhere, on the spread and severity of COVID-19. We also looked for studies that assessed quarantine alongside other measures, such as isolation, social distancing, school closures and hand hygiene. COVID-19 is a new disease, so, to find as much evidence as possible, we also looked for studies on similar viruses, such as SARS (severe acute respiratory syndrome) and MERS (Middle East respiratory syndrome).

Studies measured the number of COVID-19, SARS or MERS cases, how many people were infected, how quickly the virus spread, how many people died, and the costs of quarantine.

Key results

We included 29 studies. Ten studies focused on COVID-19, 15 on SARS, two on SARS plus other viruses, and two on MERS. Most of the studies combined existing data to create a model (a simulation) for predicting how events might occur over time, for people in different situations (called modelling studies). The COVID-19 studies simulated outbreaks in China, UK, South Korea, and on the cruise ship Diamond Princess. Four studies looked back on the effect of quarantine on 178,122 people involved in SARS and MERS outbreaks (called 'cohort' studies). The remaining studies modelled SARS and MERS outbreaks.

The modelling studies all found that simulated quarantine measures reduce the number of people with the disease by 44% to 81%, and the number of deaths by 31% to 63%. Combining quarantine with other measures,

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such as closing schools or social distancing, is more effective at reducing the spread of COVID-19 than quarantine alone. The SARS and MERS studies agreed with the studies on COVID-19.

Two SARS modelling studies assessed costs. They found that the costs were lower when quarantine measures started earlier.

We cannot be completely certain about the evidence we found for several reasons. The COVID-19 studies based their models on limited data and made different assumptions about the virus (e.g. how quickly it would spread). The other studies investigated SARS and MERS so we could not assume the results would be the same for COVID-19.

Conclusion

Despite limited evidence, all the studies found quarantine to be important in reducing the number of people infected and the number of deaths. Results showed that quarantine was most effective, and cost less, when it was started earlier. Combining quarantine with other prevention and control measures had a greater effect than quarantine alone.

This review includes evidence published up to 12 March 2020.

Protective clothes and equipment for healthcare workers to prevent them catching coronavirus and other highly infectious diseases

Authors: Verbeek JH, Rajamaki B, Ijaz S, Sauni R, Toomey E, Blackwood B, Tikka C, Ruotsalainen JH, Kilinc Balci F

Background

Healthcare workers treating patients with infections such as coronavirus (COVID-19) are at risk of infection themselves. Healthcare workers use personal protective equipment (PPE) to shield themselves from droplets from coughs, sneezes or other body fluids from infected patients and contaminated surfaces that might infect them. PPE may include aprons, gowns or coveralls (a one-piece suit), gloves, masks and breathing equipment (respirators), and goggles. PPE must be put on correctly; it may be uncomfortable to wear, and healthcare workers may contaminate themselves when they remove it. Some PPE has been adapted, for example, by adding tabs to grab to make it easier to remove. Guidance on the correct procedure for putting on and removing PPE is available from organisations such as the Centers for Disease Control and Prevention (CDC) in the USA.

This is the 2020 update of a review first published in 2016 and previously updated in 2019.

What did we want to find out?

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We wanted to know:

what type of PPE or combination of PPE gives healthcare workers the best protection;

whether modifying PPE for easier removal is effective;

whether following guidance on removing PPE reduced contamination;

whether training reduced contamination.

What did we find?

We found 24 relevant studies with 2278 participants that evaluated types of PPE, modified PPE, procedures for putting on and removing PPE, and types of training. Eighteen of the studies did not assess healthcare workers who were treating infected patients but simulated the effect of exposure to infection using fluorescent markers or harmless viruses or bacteria. Most of the studies were small, and only one or two studies addressed each of our questions.

Types of PPE

Covering more of the body leads to better protection. However, as this is usually associated with increased difficulty in putting on and removing PPE, and the PPE is less comfortable, it may lead to more contamination. Coveralls are the most difficult PPE to remove but may offer the best protection, followed by long gowns, gowns and aprons. Respirators worn with coveralls may protect better than a mask worn with a gown, but are more difficult to put on. More breathable types of PPE may lead to similar levels of contamination but be more comfortable. Contamination was common in half the studies despite improved PPE.

Modified PPE

Gowns that have gloves attached at the cuff, so that gloves and gown are removed together and cover the wrist area, and gowns that are modified to fit tightly at the neck may reduce contamination. Also, adding tabs to gloves and face masks may lead to less contamination. However, one study did not find fewer errors in putting on or removing modified gowns.

Guidance on PPE use

Following CDC guidance for apron or gown removal, or any instructions for removing PPE compared to an individual's own preferences may reduce self-contamination. Removing gown and gloves in one step, using two pairs of gloves, and cleaning gloves with bleach or disinfectant (but not alcohol) may also reduce contamination.

User training

Face-to-face training, computer simulation and video training led to fewer errors in PPE removal than training delivered as written material only or a traditional lecture.

Certainty of the evidence

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Our certainty (confidence) in the evidence is limited because the studies simulated infection (i.e. it was not real), and they had a small number of participants.

What do we still need to find out?

There were no studies that investigated goggles or face shields. We are unclear about the best way to remove PPE after use and the best type of training in the long term.

Hospitals need to organise more studies, and researchers need to agree on the best way to simulate exposure to a virus.

In future, simulation studies need to have at least 60 participants each, and use exposure to a harmless virus to assess which type and combination of PPE is most protective.

It would be helpful if hospitals could register and record the type of PPE used by their workers to provide urgently needed, real-life information.

Search date

This review includes evidence published up to 20 March 2020.

Factors that influence whether healthcare workers follow infection prevention and control guidelines for respiratory infectious diseases

Authors: Houghton C, Meskell P, Delaney H, Smalle M, Glenton C, Booth A, Chan XS, Devane D, Biesty LM

What is the aim of this review?

This review is one of a series of rapid reviews that Cochrane contributors have prepared to inform the 2020 COVID-19 pandemic. The aim of this Cochrane review of qualitative research (“qualitative evidence synthesis”) is to explore factors that influence whether healthcare workers follow infection prevention and control (IPC) guidelines for respiratory infectious diseases. To answer this question, we searched for and analysed qualitative studies about this topic.

Key messages

Healthcare workers point to several factors that influence their ability and willingness to follow IPC guidelines when managing respiratory infectious diseases. These include factors linked to the guideline itself and how it is communicated, support from managers, workplace culture, training, physical space, access to and trust in personal protective equipment (PPE), and a desire to deliver good patient care. The review also highlights the importance of including all facility staff, including support staff, when implementing IPC guidelines.

What was studied in this review?

When respiratory infectious diseases become widespread, such as during the COVID-19 pandemic, healthcare workers’ use of IPC strategies becomes even more important. These strategies include the use of PPE such as

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masks, face shields, gloves and gowns; separating patients with respiratory infections from others; and stricter cleaning routines. Exploring how healthcare workers view and experience these strategies can help authorities and healthcare facilities learn more about how best to support healthcare workers to implement them..

What are the main findings of this review?

We found 36 relevant studies and sampled 20 of these studies for analysis. Ten studies were from Asia, four from Africa, four from North America and two from Australia. The studies explored the views and experiences of nurses, doctors and other healthcare workers when dealing with SARS, H1N1, MERS, tuberculosis, or seasonal influenza. Most of these healthcare workers worked in hospitals; others worked in primary and community care settings.

Our review pointed to several factors that influenced healthcare workers' adherence to IPC guidance. The following factors are based on findings assessed as of moderate to high confidence.

Healthcare workers felt unsure when local guidelines were long, unclear or did not match national or international guidelines. They could feel overwhelmed because local guidelines were constantly changing. They also described how IPC strategies led to increased workloads and fatigue, for instance because they had to use PPE and take on additional cleaning. Healthcare workers described how their responses to IPC guidelines were affected by the level of support they felt they received from their management team. Clear communication about IPC guidelines was seen as vital. But healthcare workers pointed to a lack of training about the infection itself and about how to use PPE. They also thought it was a problem when training was not compulsory.

Having enough space to isolate patients was seen as vital. Too few isolation rooms, anterooms (small rooms leading from a corridor into an isolation room) and shower facilities was a problem. Other important practical measures described by healthcare workers included minimising overcrowding, fast-tracking infected patients, restricting visitors, and providing easy access to handwashing facilities.

A lack of PPE, or PPE that was of poor quality, was a serious concern for healthcare workers and managers.

They also highlighted the need to adjust the amount of supplies as infection outbreaks continued.

Healthcare workers believed that they followed IPC guidance more closely when they saw the value of it. Other healthcare workers felt motivated to follow the guidance because of fear of infecting themselves and their families, or because they felt responsible for their patients. Some healthcare workers found it difficult to use masks and other equipment when it made patients feel isolated, frightened or stigmatised. Healthcare workers also found masks and other equipment uncomfortable to use. The workplace culture could also influence whether healthcare workers followed IPC guidelines or not.

Across many of the findings, healthcare workers pointed to the importance of including all staff, including cleaning staff, porters, kitchen staff and other support staff when implementing IPC guidelines.

How up-to-date is this review?

We searched for studies that had been published up to March 2020.

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This review includes evidence published up to 12 March 2020.

If you have any questions or comments with regard to the above document please feel free to contact me.

Kind regards

Dr Vanessa Jordan PhD

New Zealand Cochrane Fellow

Cochrane New Zealand

Academic Co-ordinator: PoplHlth 711: Systematic reviews and Meta Analysis

Department Obstetrics and Gynaecology

Auckland University

Private Bag 92019

Auckland 1142

New Zealand

Ph. +64 9 9239490

Fax +64 9 303 5969

Mobile: 027 540 2212

E-mail: v.jordan@auckland.ac.nz