

## New and updated Cochrane summaries for COVID-19

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**What is the best way to support resilience and mental well-being in frontline healthcare professionals during and after a pandemic?**

**How accurate are routine laboratory tests for diagnosis of COVID-19?**

**Do physical measures such as hand-washing or wearing masks stop or slow down the spread of respiratory viruses?**

**What is the best way to support resilience and mental well-being in frontline healthcare professionals during and after a pandemic?**

Authors: Pollock A, Campbell P, Cheyne J, Cowie J, Davis B, McCallum J, McGill K, Elders A, Hagen S, McClurg D, Torrens C, Maxwell M

### **What is 'resilience'?**

Working as a 'frontline' health or social care professional during a global disease pandemic, like COVID-19, can be very stressful. Over time, the negative effects of stress can lead to mental health problems such as depression and anxiety, which, in turn, may affect work, family and other social relationships. 'Resilience' is the ability to cope with the negative effects of stress and so avoid mental health problems and their wider effects. Healthcare providers can use various strategies (interventions) to support resilience and mental well-being in their frontline healthcare professionals. These could include work-based interventions, such as changing routines or improving equipment; or psychological support interventions, such as counselling.

### **What did we want to find out?**

First (objective 1), we wanted to know how successfully any interventions improved frontline health professionals' resilience or mental well-being.

Second (objective 2), we wanted to know what made it easier (facilitators) or harder (barriers) to deliver these interventions.

### **What did we do?**

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We searched medical databases for any kind of study that investigated interventions designed to support resilience and mental well-being in healthcare professionals working at the front line during infectious disease outbreaks. The disease outbreaks had to be classified by the World Health Organization (WHO) as epidemics or pandemics, and take place from 2002 onwards (the year before the severe acute respiratory syndrome (SARS) outbreak).

### **What did we find?**

We found 16 relevant studies. These studies came from different disease outbreaks - two were from SARS; nine from Ebola; one from Middle East respiratory syndrome (MERS); and four from COVID-19. The studies mainly looked at workplace interventions that involved either psychological support (for example, counselling or seeing a psychologist) or work-based interventions (for example, giving training, or changing routines).

Objective 1: one study investigated how well an intervention worked. This study was carried out immediately after the Ebola outbreak, and investigated whether staff who were training to give other people (such as patients and their family members) 'psychological first aid' felt less 'burnt out'. We had some concerns about the results that this study reported and about some of its methods. This means that our certainty of the evidence is very low and we cannot say whether the intervention helped or not.

Objective 2: all 16 studies provided some evidence about barriers and facilitators to implement interventions. We found 17 main findings from these studies. We do not have high confidence in any of the findings; we had moderate confidence in six findings and low to very low confidence in 11 findings.

We are moderately confident that the following two factors were barriers to implementation of an intervention: frontline workers, or the organisations in which they worked, not being fully aware of what they needed to support their mental well-being; and a lack of equipment, staff time or skills needed for an intervention.

We are moderately confident that the following three factors were facilitators to implementation of an intervention: interventions that could be adapted for a local area; having effective communication, both formally within an organisation and informal or social networks; and having positive, safe and supportive learning environments for frontline healthcare professionals.

We are moderately confident that the knowledge and beliefs that frontline healthcare professionals have about an intervention can either help or hinder implementation of the intervention.

### **Key messages**

We did not find any evidence that tells us about how well different strategies work at supporting the resilience and mental well-being of frontline workers. We found some limited evidence about things that might help successful delivery of interventions. Properly planned research studies to find out the best ways to support the resilience and mental well-being of health and social care workers are urgently required.

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**How up-to-date is this review?**

This review includes studies published up to 28 May 2020.

**How accurate are routine laboratory tests for diagnosis of COVID-19?**

Authors: Stegeman I, Ochodo EA, Guleid F, Holtman GA., Yang B, Davenport C, Deeks JJ, Dinnes J, Dittrich S, Emperador D, Hooft L, Spijker R, Takwoingi Y, Van den Bruel A, Wang J, Langendam M, Verbakel JY, Leeftang MMG

**What are routine laboratory tests?**

Routine laboratory tests are blood tests that assess the health status of a patient. Tests include counts of different types of white blood cells (these help the body fight infection), and detection of markers (proteins) that indicate organ damage, and general inflammation. These tests are widely available and in some places they may be the only tests available for diagnosis of COVID-19.

**What did we want to find out?**

People with suspected COVID-19 need to know quickly whether they are infected so that they can self-isolate, receive treatment, and inform close contacts.

Currently, the standard test for COVID-19 is usually the RT-PCR test. In the RT-PCR, samples from the nose and throat are sent away for testing, usually to a large, central laboratory with specialist equipment. Other tests include imaging tests, like X-rays, which also require specialist equipment.

We wanted to know whether routine laboratory tests were sufficiently accurate to diagnose COVID-19 in people with suspected COVID-19. We also wanted to know whether they were accurate enough to prioritize patients for different levels of treatment.

**What did we do?**

We searched for studies that assessed the accuracy of routine laboratory tests to diagnose COVID-19 compared with RT-PCR or other tests. Studies could be of any design and be set anywhere in the world. Studies could include participants of any age or sex, with suspected COVID-19, or use samples from people known to have – or not to have - COVID-19.

**What we found**

We found 21 studies that looked at 67 different routine laboratory tests for COVID-19. Most of the studies looked at how accurately these tests diagnosed infection with the virus causing COVID-19. Four studies included both children and adults, 16 included only adults and one study only children. Seventeen studies were done in China, and one each in Iran, Italy, Taiwan and the USA. All studies took place in hospitals, except one that used samples from a database. Most studies used RT-PCR to confirm COVID-19 diagnosis.

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Accuracy of tests is most often reported using 'sensitivity' and 'specificity'. Sensitivity is the proportion of people with COVID-19 correctly detected by the test; specificity is the proportion of people without COVID-19 who are correctly identified by the test. The nearer sensitivity and specificity are to 100%, the better the test. A test to prioritize people for treatment would require a high sensitivity of more than 80%.

Where four or more studies evaluated a particular test, we pooled their results and analyzed them together. Our analyses showed that only three of the tests had both sensitivity and specificity over 50%. Two of these were markers for general inflammation (increases in interleukin-6 and C-reactive protein). The third was for lymphocyte count decrease. Lymphocytes are a type of white blood cell where a low count might indicate infection.

### **How reliable are the results?**

Our confidence in the evidence from this review is low because the studies were different from each other, which made them difficult to compare. For example, some included very sick people, while some included people with hardly any COVID-19 symptoms. Also, the diagnosis of COVID-19 was confirmed in different ways: RT-PCR was sometimes used in combination with other tests.

### **Who do the results of this review apply to?**

Routine laboratory tests can be issued by most healthcare facilities. However, our results are probably not representative of most clinical situations in which these tests are being used. Most studies included very sick people with high rates of COVID-19 virus infection of between 27% and 76%. In most primary healthcare facilities, this percentage will be lower.

### **What does this mean?**

Routine laboratory tests cannot distinguish between COVID-19 and other diseases as the cause of infection, inflammation or tissue damage. None of the tests performed well enough to be a standalone diagnostic test for COVID-19 nor to prioritize patients for treatment. They will mainly be used to provide an overall picture about the health status of the patient. The final COVID-19 diagnosis has to be made based on other tests.

### **How up-to-date is this review?**

We searched all COVID-19 studies up to 4 May 2020.

**Do physical measures such as hand-washing or wearing masks stop or slow down the spread of respiratory viruses?**

Authors: Jefferson T, Del Mar CB, Dooley L, Ferroni E, Al-Ansary LA, Bawazeer GA, van Driel ML, Jones MA, Thorning S, Beller EM, Clark J, Hoffmann TC, Glasziou PP, Conly JM

**What are respiratory viruses?**

Respiratory viruses are viruses that infect the cells in your airways: nose, throat, and lungs. These infections can cause serious problems and affect normal breathing. They can cause flu (influenza), severe acute respiratory syndrome (SARS), and COVID-19.

**How do respiratory viruses spread?**

People infected with a respiratory virus spread virus particles into the air when they cough or sneeze. Other people become infected if they come into contact with these virus particles in the air or on surfaces on which they have landed. Respiratory viruses can spread quickly through a community, through populations and countries (causing epidemics), and around the world (causing pandemics).

**How can we stop the spread of respiratory viruses?**

Physical measures to try to stop respiratory viruses spreading between people include:

- washing hands often;
- not touching your eyes, nose, or mouth;
- sneezing or coughing into your elbow;
- wiping surfaces with disinfectant;
- wearing masks, eye protection, gloves, and protective gowns;
- avoiding contact with other people (isolation or quarantine);
- keeping a certain distance away from other people (distancing); and
- examining people entering a country for signs of infection (screening).

**Why we did this Cochrane Review**

We wanted to find out whether physical measures stop or slow the spread of respiratory viruses.

**What did we do?**

We searched for studies that looked at physical measures to stop people catching a respiratory virus infection. We were interested in how many people in the studies caught a respiratory virus infection, and whether the physical measures had any unwanted effects.

**Search date:** This is an update of a review first published in 2007. We included evidence published up to 1 April 2020.

**What we found**

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We identified 67 relevant studies. They took place in low-, middle-, and high-income countries worldwide: in hospitals, schools, homes, offices, childcare centres, and communities during non-epidemic influenza periods, the global H1N1 influenza pandemic in 2009, and epidemic influenza seasons up to 2016. No studies were conducted during the COVID-19 pandemic. We identified six ongoing, unpublished studies; three of them evaluate masks in COVID-19.

One study looked at quarantine, and none eye protection, gowns and gloves, or screening people when they entered a country.

We assessed the effects of:

- medical or surgical masks;
- N95/P2 respirators (close-fitting masks that filter the air breathed in, more commonly used by healthcare workers than the general public); and
- hand hygiene (hand-washing and using hand sanitiser).

### **What are the results of the review?**

#### **Medical or surgical masks**

Seven studies took place in the community, and two studies in healthcare workers. Compared with wearing no mask, wearing a mask may make little to no difference in how many people caught a flu-like illness (9 studies; 3507 people); and probably makes no difference in how many people have flu confirmed by a laboratory test (6 studies; 3005 people). Unwanted effects were rarely reported, but included discomfort.

#### **N95/P2 respirators**

Four studies were in healthcare workers, and one small study was in the community. Compared with wearing medical or surgical masks, wearing N95/P2 respirators probably makes little to no difference in how many people have confirmed flu (5 studies; 8407 people); and may make little to no difference in how many people catch a flu-like illness (5 studies; 8407 people) or respiratory illness (3 studies; 7799 people). Unwanted effects were not well reported; discomfort was mentioned.

#### **Hand hygiene**

Following a hand hygiene programme may reduce the number of people who catch a respiratory or flu-like illness, or have confirmed flu, compared with people not following such a programme (16 studies; 61,372 people). Few studies measured unwanted effects; skin irritation in people using hand sanitiser was mentioned.

#### **How reliable are these results?**

Our confidence in these results is generally low for the subjective outcomes related to respiratory illness, but moderate for the more precisely defined laboratory-confirmed respiratory virus infection, related to masks and N95/P2 respirators. The results might change when further evidence becomes available. Relatively low

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numbers of people followed the guidance about wearing masks or about hand hygiene, which may have affected the results of the studies.

**Key messages**

We are uncertain whether wearing masks or N95/P2 respirators helps to slow the spread of respiratory viruses.

Hand hygiene programmes may help to slow the spread of respiratory viruses.

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

Kind regards

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