Frequently Asked Questions: COVID-19 and Tuberculosis

Version 1, 25 March 2020. This version supersedes previous versions

The novel coronavirus-19 (nCoV-19) or severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a new coronavirus that was only recently discovered in 2019. The virus causes coronavirus disease 2019 (COVID-19).

Tuberculosis (TB) is caused by *Mycobacterium tuberculosis*, a bacterium known since 1882 when it was discovered by Dr Robert Koch, but there is historical evidence of TB in humans for thousands of years.

The following questions are answered in this document:

1. What are the similarities between COVID-19 and TB?

TB is airborne, which means they cause an infection in humans by being inhaled, or breathed in. TB bacilli can stay airborne for up to 6 hours, but their concentration is decreased by the movement of air (open windows, well ventilated spaces), and exposure to direct sunlight, which can kill them. Inhaling the TB bacilli can cause infection, and so being in close contact with someone who has TB disease, especially with symptoms such as cough, will increase the risk of being infected.

It is now clear that SARS-CoV-2 is spread by droplets, not aerosols. When someone sneezes or coughs, the droplets containing SARS-CoV-2 can become airborne immediately. The routes of transmission for droplet spread infections can be when it is inhaled while it is still airborne or when people come into contact with virus-containing droplets that fall onto a surface. Evidence to date shows that SARS-CoV-2 can survive on surfaces for several hours, which is why the focus has been on hand-washing to remove the virus after touching an infected surface. This is also why people should limit touching their face, in particular their mouth, nose and eyes, which can serve as an entry point to the rest of the body.

When we look at the infectivity of an agent, we usually refer to the reproductive number (R_0 value) which can describe the transmission of an infectious disease. The R value gives a value of how many people a person with an infection can pass the infection on to.

Although the data for SARS-CoV-2 are still emerging, the early data indicate that the basic reproduction number (R_0) is 2.2. This means that each person with COVID-19 can pass the infection on to an additional 2.2 individuals. The R_0 value for TB in low-incidence countries can be below 1, so there may be little chance of infecting others. However, in low-income settings with a high TB burden, the R_0 value for TB has been as high as 4.3 in China (2012) and 3.55 in Southern India (2004 to 2006). The R_0 value for TB is variable as it is also affected by other factors such as environmental conditions and the health of population, so in settings with more TB in general, crowded living conditions and risk factors such as malnutrition and HIV, the R_0 value is higher.

Once a person breathes in the TB bacilli, there are many variables that can affect the risk of developing TB infection and disease. These include:

- age (being an infant or young child, younger than five years old or being elderly, older than 60 years)
- immunosuppression, such as from HIV infection or severe malnutrition
- having other comorbidities, such as diabetes
- being a smoker or having a high alcohol intake

These variables can also make a person more likely to have severe TB and more likely to have a poor outcome (possibly even death).

For COVID-19, the risk of developing disease is not yet so well-known, but evidence to date suggests that older age and having comorbidities, such as hypertension, diabetes and coronary heart disease, are important risk factors of a poor outcome. It is not yet clear whether having comorbid lung disease like TB, or other infections such as HIV, will increase the severity of COVID-19 if infected with SARS-CoV-2, but there is increasing evidence that having chronic respiratory disease increases the chance of poor outcomes with COVID.

Both COVID-19 and TB cause respiratory symptoms – cough and shortness of breath. Both cause fever and weakness. One of the biggest differences is the speed of onset. TB

symptoms do not tend to occur immediately after infection and when they develop, are of a gradual onset, often over a period of weeks or longer, unlike COVID-19, where symptoms can occur within a few days.

TB usually has a period of time where bacteria are present in a person but the person is well and not infectious to others. During this time, the person has TB infection (sometimes referred to as latent TB), which has the potential to become TB disease in the future. Thus, a person exposed to TB bacteria may: become sick within weeks (likely due to a weakened immune system); sick after years of carrying the bacteria when the immune system becomes weakened and cannot fight off the disease anymore; or infected but never sick. (For more information on TB infection, The Union offers an open access online course here in English, with French and Spanish versions coming soon).

Currently, symptoms of COVID-19 may appear 2-14 days after exposure, if symptoms ever arise, with a median incubation period of 5 days, similar to that of SARS. It is not known if there is a latency period with SARS-CoV-2.

a. Comparison of TB and COVID-19

	Tuberculosis	**COVID-19**
How it is spread	Airborne	Droplet spread
How it is diagnosed	Sputum tests for those with cough. Other samples depending on symptoms	Nasal swabs and/or sputum tests
Pathogen	*Mycobacterium tuberculosis complex*	Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)
Infectiousness	Range from less than 1 to up to 4 people infected per one person with TB	Currently average of 2.2 people infected per one person with COVID-19
Prevention	Prevention measures include TB preventive therapy for those with known contacts with TB and good respiratory hygiene measures	Social distancing, good respiratory hygiene measures and handwashing with soap for at least 20 seconds
Treatment	Antibiotics. Drug-sensitive TB 4 antibiotics for 6 months. Drug resistant TB treatment, antibiotics	Supportive treatments currently. Many drug trials under way

	for 9-24months	
Vaccine	BCG has some protective effects, particularly for children	No

2. How deadly is COVID-19 compared to TB?

The data regarding COVID-19 are changing daily (check the WHO Situational Dashboard for the latest figures), but the number of deaths due to COVID-19 are increasing daily. About 1.5 million people died from TB in 2018 and, of this total, over 250,000 were HIV positive. This relates to more than 4,000 deaths a day due to TB.

Mortality (death) rates determine the frequency of deaths in a specified population during a specified interval of time. With a novel disease like COVID-19, however, mortality rates are unreliable at this point in time due to a variety of factors. The COVID-19 mortality estimate may be unknown as we do not know exactly how many cases there are. This is due to underreporting and people with minimal or mild symptoms not being tested, and therefore not being factored into the total number of confirmed cases. This subsequently makes mortality estimates difficult. Some reports estimate mortality rates for COVID-19 anywhere from 1.5 to 20 percent, 20 percent being one of the highest estimates at the centre of the outbreak in Wuhan, China. In contrast, untreated TB has an average mortality rate of 45 percent. However, TB is not only preventable but treatable, and the global success rate reported by the WHO for those who started TB treatment in 2018 was 85 percent.

Thus, TB is technically deadlier than COVID-19, though one must consider the diseases themselves and other risk factors: age, HIV status, the quality of the body's immune systems, etc. People with active, untreated TB are far more likely to die than even the highest projected mortality estimates for COVID-19, making it critical to address prevention and treatment options for TB. The advantage for TB is that we do have treatments that work, including for drug-resistant forms of TB. We also have treatments for the TB infection stage to prevent a person from becoming unwell with TB.

The co-infection of TB and COVID-19 is still being discussed, but there is the possibility both could exacerbate the natural symptoms of the other and have negative impacts on a person's health.

3. I am taking TB treatment, is there any guidance or recommendations for what a person on TB treatment should do if they get infected with COVID-19?

Currently there is no recommended drug treatment for COVID-19 and it is currently being managed by addressing a person's symptoms. There is a large therapeutics trial, the SOLIDARITY trial, which may give more details on drug treatments for COVID-19 and many smaller trials are also underway. There is no vaccine currently to protect against COVID-19.

It is important that if you are experiencing mild symptoms that are similar to those of COVID-19, that you continue taking your TB treatment in order to completely cure your TB. There is no evidence currently that TB medications increase your risk of developing COVID-19.

If you are diagnosed with COVID-19, let the healthcare provider know that you are on TB treatment and inform your TB care provider. If you are started on any treatment for COVID-19, your care provider can check to make sure there are no interactions with other medications.

4. What symptoms should I look for to know if I have either TB or COVID-19, given that some of the symptoms are the same?

As discussed above, the symptoms of COVID-19 can be similar to those of TB, with fever, cough and shortness of breath among the symptoms, but there is usually a difference in the speed that the symptoms start. COVID-19 symptoms are likely to be of a more recent onset.

If you come into contact with someone known to have either TB or COVID-19, that increases your chance of having these diseases. Additionally, if you have been to an area with high TB rates or high rates of COVID-19, this information can also help your care provider in finding out the cause of your symptoms.

If you are unwell and are showing the above symptoms and have a positive contact or travel history for either TB or COVID and/or have risk factors for either as outlined above, it is important that you are tested for both TB and COVID. When you visit the healthcare facility, let them know your symptoms and any risk factors you may have for either TB or COVID-19 so they can ensure the appropriate infection prevention and control measures can be implemented while the diagnosis is sought. (Infection prevention and control is the term that is used to help protect infections from being spread and includes things like hand washing, ensuring adequate space around someone with symptoms and barriers like masks and gloves.)

Tests for TB usually include testing sputum for TB bacteria. COVID-19 tests require either an upper respiratory nasopharyngeal (nasal) swab or a sputum test. If there are respiratory symptoms, a chest X-ray may be required to further refine the diagnosis and/or establish the severity of the illness.

In countries that have a high burden of TB, it is particularly important that people continued to be screened and tested for TB with tests for SARS-CoV-2offered in line with the national guidelines.

5. I have recovered from TB, am I at greater risk of getting infected with COVID-19?

As COVID-19 is so new, there are no data currently on if those with or who have a previous history of TB are more at risk of worse outcomes. However, COVID-19 affects the lungs, and as we know that there is usually some left-over damage in the lungs following TB

disease, which may put you at increased risk of developing more severe COVID-19 symptoms.

People who have had TB, particularly those who may have required lung surgery or who have been diagnosed with post-TB lung disease should consider limiting their exposure to high risk environments - this depends on your national situation with regards to the likelihood of COVID-19 circulating in your community. The key ways to protect yourself from COVID-19 include:

- Regular hand-washing using soap and water or an alcohol-based hand rub
- Social distancing - maintain at least 1 metre (3 feet) distance between yourself and anyone who is coughing or sneezing.
- Good respiratory hygiene by covering your mouth and nose with your bent elbow or tissue when you cough or sneeze, then disposing of the used tissue immediately.
- Avoid touching your face, mouth or eyes

In addition to the advice regarding regular handwashing, regular cleaning of surfaces and practising social distancing measures, some of the ways to protect yourself include keeping in good general health. It has been shown that tobacco use (including tobacco smoking, vaping and using e-cigarettes) are at in increased risk of developing a more severe COVID-19 disease. If you do use tobacco products, it would be recommended to stop – this will not only protect you from severe COVID-19 disease but will be good for your lung health in general and also protect you from TB.

6. Do I need to wear a mask?

Wearing a mask presents a barrier for the spread of both TB and COVID-19 as masks stop them being distributed into the air if being worn by someone who has symptoms or being inhaled by or touched by others in the immediate environment.

Masks have been used in TB infection prevention and control for many years to reduce the risk of further spread of TB amongst family members of the affected person, the community and healthcare workers. For TB, as there is an effective treatment available, once a person is on the right treatment the risk of infecting others rapidly decreases and there is often no need to wear a mask.

For COVID-19, the WHO recommends that masks be worn by persons with symptoms but discourages healthy people from wearing masks in general. There is some evidence from China that voluntary wearing of masks by healthy or asymptomatic people in the community can help decrease the spread of COVID-19.

Mask wearing is part of a package of infection prevention and control interventions, and in isolation is likely to have a minimal impact on transmission of TB or COVID-19. If you are at risk and in a high burden context (for either TB or COVID-19), adding mask wearing to regular hand washing, social distancing, and cough hygiene practises may offer additional protection.

7. How will the TB response be affected?

There are guidelines regarding the management of TB in emergencies that can help countries plan to ensure that TB services remain operational. It is very important that national TB services continue and that people have access to diagnostic services, treatments and support services for TB during this time of COVID-19. Given the impact that COVID-19 has had in countries with increasing cases, there are a number of risks for the TB response.

- National TB programme staff being drafted into the COVID-19 response, creating staff shortages or increased workloads
- National laboratory and diagnostic services focusing on COVID-19 activities, such that TB laboratory tests like rapid molecular tests and cultures are delayed and there is limited access to chest X-rays
- Drug stock-outs and procurement issues. As global transport networks are reduced and countries involved in the manufacture of TB medications are affected, there may be delays in the procurement chain. If health systems are overwhelmed or there are staff shortages, stock management may be de-prioritised.
- Social distancing measures and national quarantine measures may interrupt treatment support and TB contact tracing measures.

These are all risks that national TB programmes, WHO, donors and implementing partners need to work together to plan for and put in strategies to avoid.

WHO has issued the following information note regarding TB care services and COVID-19.

8. Do I need to stockpile my TB medicines?

There are concerns regarding global supply of medications. Currently, none of the first-line TB drugs are being used for the management of COVID-19, and as such there is not expected to be a re-directing of the medications themselves to people with COVID-19. High burden TB countries should have procurement and supply management systems in place to ensure adequate supplies of TB medications and timely ordering of new drugs to avoid stock outs. International procurement agencies, such as the Stop TB Partnership's TB Global Drug Facility, are working with governments to ensure TB supply chains are not affected.

If you are on TB treatment, you should continue to take your medication as prescribed and keep your appointments with your care provider for medication refills. Given the rapidly evolving situation for COVID-19, when you next have an appointment with your care provider, it would be worth discussing options for medication refills if national quarantine measures are put in place.

9. What alternatives are available to ensure people in treatment for TB can continue to be given the proper support and supervision if directly observed therapy (DOT) is restricted due to social distancing and national quarantine measures?

Social distancing is a type of measure used by public health officials to slow down or stop the spread of a disease, especially to allow healthcare systems a chance to ensure care can be offered to everyone who needs it. For social distancing, people are advised to stay at least one metre (three feet) away from each other to limit the spread of COVID-19, prompting many officials worldwide to cancel large scale events and gatherings in order to mitigate the spread of disease.

In many TB programmes, the daily observation of a person with TB taking medications is part of the treatment package for people with TB. Where daily observation of treatment is being recommended as a standard of care, it should be not only for the recording of medication adherence, but to check for any side effects or issues with the treatment as well as offering support to the person with TB.

While the spread of COVID-19 continues, models of care that involve regular close contact may need to be reconsidered, particularly if national quarantine measures are put in place. There are alternatives to daily observed therapy (DOT), which can include self-administered therapy (SAT) and support utilising digital platforms such as video-observed therapy (VOT) and other mobile phone-supported adherence strategies, such as 99DOTS. There is increasing evidence that these, when implemented as part of a comprehensive package of care, can have the same outcomes as DOT and are often a more patient-centred approach to care. While some of these systems require time and digital/mobile technologies to be implemented, TB programmes with large numbers of people using DOT should consider what options can be implemented in a short period of time, including prioritising DOT for those who need more support through their treatment and moving the majority to SAT.

If DOT approaches have to be quickly withdrawn from people on TB treatment due to national quarantine procedures, it is vital that TB programmes have a system in place to continue to support people on TB treatment, to ensure that any side effects from the medications can be addressed as well as support any psycho-social issues.

10. I keep reading about new treatments and novel ways to protect yourself from COVID-19, how do I know if they are true?

SARS-CoV-2 is a very new virus and we are learning new things about it every day with regards to how it spreads, how we can protect ourselves from it, treatments that may be able to prevent you from falling ill or treat you if you become unwell with COVID-19. The best way to check the information that you are reading or that is being shared is to check reputable websites. The WHO updates its website daily with information on all aspects of COVID-19 (here). The United States Centers for Disease Control and Prevention (CDC) website also has regular updates on COVID-19 (here). These websites are reputable and trustworthy sources for the latest evidence and knowledge with regards to COVID-19

11. What can I do to reduce stigma related to COVID-19 and other communicable diseases?

We have learned from our experience with TB of the effects of stigma on people with or at risk of disease and the importance of the language we use when describing the illness. We have seen the similar use of stigmatising language by the media and others when discussing people who have COVID-19. It is important that we adhere to the language guidance issued by WHO, which mirrors many of the lessons we have learned in TB to minimise stigma experienced by people affected by COVID-19.

Stigma can be one of the most powerful barriers to delivering prevention, treatment and care to those most in need, and can negatively affect those with the disease, as well as their caregivers, family, friends and communities. It is important that we refer to the virus by its name, not by the place of origin or the region that the virus initially affected.

Person-centred language is language that respects and empowers people, putting the person before the disease. For example, say “person with COVID-19” or “person showing symptoms of COVID-19” rather than using phrases like “COVID-19 victims” or “suspected cases”. The language we use shapes our understanding of the situation, and it is essential that we avoiding blaming others or ostracising a person who may be ill with disease. Read the WHO’s guidance on stigma for more information.