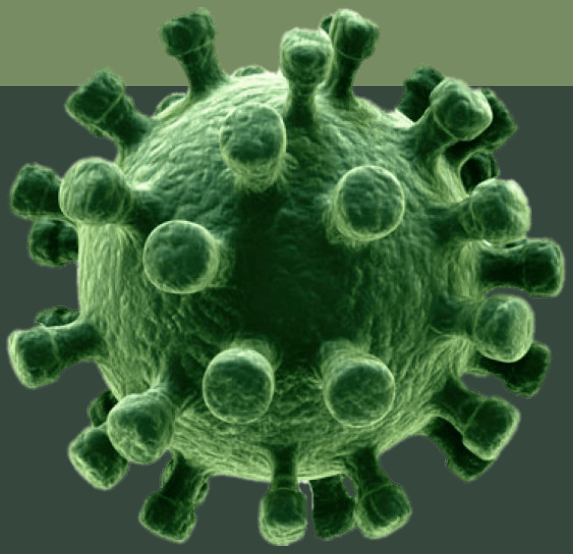
COVID-19



DISPELLING THE MYTHS

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Introduction

My name is Dr. Muzzammil Ali. I am a Critical Care doctor who works in the United Kingdom. I am writing this in the midst of COVID-19 pandemic. As a Critical Care doctor, I am in direct contact with very sick patients who have been tested positive for COVID-19. Many of these patients need help with their breathing. They have to be put into a coma and connected to a breathing machine. As time progresses, they may also require help with their other organs including their heart and kidneys.

This pandemic has certainly triggered a tremendous amount of fear and anxiety. There is panic buying and a lot of misinformation being spread on social media. The truth is that we still do not know much about this virus. A lot of what you hear may not necessarily be true.

The purpose of writing this short ebook is to highlight the key facts about this infection using published medical literature. I will try my best to clarify any medical jargon so that you will be able to have a firm grasp about this condition. Knowledge is power, and the more you have, the better prepared you will be to protect yourself, your loved ones, your country and the world.

Disclaimer

As with many things in medicine, new data and evidence changes the way we practice. Therefore the more we understand about COVID-19 during this pandemic, the more informed we will be to treat this condition. As a result, it is possible that in the future, some of the information in this book will be out-dated.

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What are the coronaviruses?

The coronaviruses are a large group of viruses. You can think of them as one big family. The word 'corona' means crown. This is because all coronaviruses have the appearance of a crown when you look at them under a microscope.

Even though they all have crowns, each one is different from the other. Some coronaviruses cause mild disease, whereas others cause severe, even deadly, disease. **COVID-19** is one of the coronaviruses that can cause severe disease.

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How did covid-19 come about?

There is some suspicion that COVID-19 is a **zoonotic** infection. This means that it is a disease that was transmitted from animals to humans. Some sources postulate that these animals may be bats or pangolins.

How is covid-19 spread?

Once a human is infected with the virus, it is now spread primarily from human to human.

There are two ways that this can happen:

1. **Aerosolized droplets**. This is the main way that it is transmitted. For example, if someone who has the infection coughs, viral particles are released into the air. These can enter the lungs of someone else that is in close proximity.

2. **Physical contact** e.g. shaking hands. If you have viral particles on your hand, then you can transfer them to another person through physical contact. In some cases this virus can also affect the gastrointestinal system and result in diarrhoea. If someone does not practice good toilet hygiene, then they can also spread the infection in this way through physical contact.

It is worth mentioning that many people may be infected with the virus, but have no symptoms. They feel healthy and normal. These people are referred to as **asymptomatic carriers**. They can still transfer the virus but will be oblivious that they are doing so.

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What symptoms would you have if you had covid-19?

Remember that you may be an asymptomatic carrier and have no symptoms.

The symptoms of COVID-19 can be a combination of the following:

- **Constitutional symptoms**: Fever, muscle aches and headache

- **Upper respiratory symptoms**: Runny nose and sore throat

- **Lower respiratory symptoms**: Shortness of breath and cough (sometimes with sputum)

- **Gastrointestinal symptoms**: Diarrhoea, nausea and vomiting

The majority of infected people have a combination of constitutional symptoms and lower respiratory symptoms. There are few rare and unusual presentations that are emerging e.g. chest pain.

How to you test for covid-19?

At present there are two ways to test for COVID-19:

1. **Upper respiratory tract testing**: swabs of the nose and throat which test for the COVID-19 virus

2. **Lower respiratory tract testing**: sputum samples to test for the COVID-19 virus

It is worth mentioning that a single negative test does not mean you are negative for COVID-19. This is for two reasons:

- Early in the disease, there is not enough virus to be detected. Therefore you may test negative because your **viral load** (or viral level) is too low.
- The test itself has a **sensitivity** of 75%. What this means is that testing for COVID-19 is not very accurate right now. As a result, there may be people who test negative for the infection but still actually have the infection.

Therefore even if a test is negative but you suspect COVID-19, then a person should be treated as though they have COVID-19 e.g. isolation. Later on they should be tested again for it.

Why is this virus so harmful?

The **alveoli** are a part of the lungs that is of utmost importance for breathing. It is at the alveoli that oxygen from the air gets into our blood, and we remove the waste product, carbon dioxide, from the blood into the air.

When a person is infected with COVID-19, the virus damages the alveoli. As a result, a person will not be able to get enough oxygen into the blood, or eliminate enough of the carbon dioxide from the blood. This is one of the reasons why infected people need help with their breathing.

In some instances, the body reacts to the virus by generating a huge **immunological response** to fight it off. Although this is a necessary response by the body, it can cause the development of low blood pressure and damage to some tissues. In these instances, infected people may also need help to increase their blood pressure and to support their kidneys that may be damaged.

What are the stages of this illness?

There are two different stages of the illness:

1. **Replicative Stage**: This occurs in the first week after being infected. This is where the virus replicates to increase its viral load. Sometimes the viral load is too low at the beginning to be detected. During this stage, a person may have mild symptoms.

2. **Adaptive stage**: After the first week, the immune system may fight back with a bang. This is where the huge immunological response that we spoke about happens. Because of the associated low blood pressure and features of tissue damage, an infected person will be pretty sick at this stage, and can deteriorate quite quickly.

What are the risk factors for becoming sick with this condition?

The following factors put you at an increased risk for becoming unwell with this virus:

- Older age
- Male sex
- Pre-existing medical conditions particularly:
    - Breathing problems such as chronic obstructive pulmonary disease (COPD)
    - High blood pressure
    - Ischemic Heart Disease e.g. angina, previous heart attacks
    - Strokes
    - Diabetes Mellitus

If you fall into any of the above, you will be at an increased risk, and therefore will need to take even more precautions to prevent getting infected with this virus.

How do people do when they are infected?

Figures vary but the vast majority of infected patients (over 80% of people) do not get significantly unwell and do not require hospitalization. They are either asymptomatic carriers, or simply have a mild illness that can be managed at home.

Of the sicker people who need hospitalization:

- 10-20% are admitted to intensive care (critical care) for observation and support of their failing organ systems
- 3-10% require mechanical ventilation via a breathing machine
- 2-5% die

What other investigations are performed?

In addition to being tested for COVID-19, an infected person may also have a variety of other tests performed. These include:

- **Blood tests**: These help to monitor the disease process and the impact of damage to other tissues. Some blood tests can also be valuable in helping to **prognosticate** people. What this means is that certain blood tests may suggest the possibility of future improvement, or future deterioration.

- **Imaging**: This may include X-rays, CT-scanning and ultrasound, particularly of the lungs. This helps to determine the degree of lung damage by the virus and from the immunological response.

How it is treated?

No treatment exists for COVID-19 at present. Many drugs are being trialled to see if they can work including antivirals, antibodies and drugs that modify the immune system.

The management of infected people is therefore based on supportive measures, usually in a high-dependency or intensive care unit.

Supportive treatment essentially means to support organ systems as they start to deteriorate:

- If someone is struggling with their breathing, then you put them on a breathing machine
- If someone has low blood pressure, you give them fluids and strong medication to improve their blood pressure
- If someone has damage to their kidneys, you give them a period of dialysis to remove waste from the body
- If someone develops another infection, then you treat them with antibiotics or with antifungals

The hope is that with these measures, the body will have time to fight off the virus.

What are the predictors of poor clinical outcome?

The following are significant predictors of poor clinical outcome:

- Older age
- Many medical conditions
- How sick a person is on admission to hospital, or to the intensive care unit
- Certain features on blood tests and on imaging

Precautions

There are quite a few things that you can do to reduce the spread of this infection:

1. Wash your hands frequently with an alcohol-based hand rub or with soap and water. This kills viral particles that may be on your hands.

2. Avoid touching your eyes, nose and mouth. Your hands may have touched surfaces that are contaminated with viral particles. If you touch your eyes, nose or mouth, the virus can enter your body.

3. Maintain social distancing between yourself and anyone, particularly if they are coughing or sneezing. This reduces the risk of viral particles entering your lungs. If someone in your home has symptoms, let them practice self-isolation e.g. separate bedroom and bathroom.

4. If you are coughing or sneezing, cover your mouth and nose with your bent elbow or with a tissue. Dispose of the used tissue immediately.

5. Avoid unnecessary trips outdoors, particularly to places where you will be in close contact with people.

6. If you have fever, cough and/or difficulty breathing, seek medical care early over the phone, according to your local guidance.

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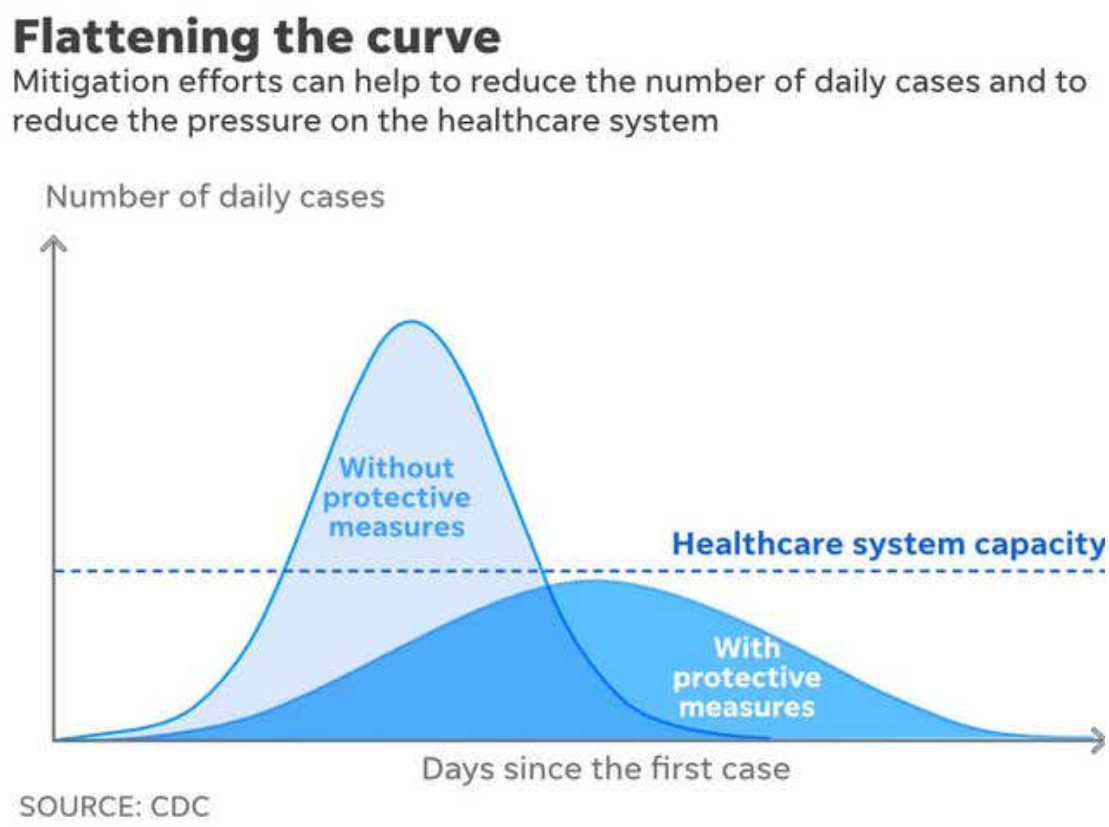
Flatten the Curve

By practicing the measures that we just spoke about, you reduce the spread of COVID-19 and the burden to a healthcare system that is not equip to manage the sheer number of possible admissions:



Closing Remarks

Please keep yourself and your love ones safe.

Search for the blessings during these tough times and I guarantee that you will find many.

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