COVID-19 101: A beginner's guide

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CONTENTS

Section 1: The novel coronavirus.

- COVID-19 is an abbreviation of “Coronavirus Disease 19”.
- Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus that causes COVID-19.
- “19” refers to 2019, the year that human-to-human transmission of the virus was first recorded.

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Section 2: The origin of SARS-CoV-2.

- The origin of SARS-CoV-2 is not 100% clear.

- The virus is believed to have a zoonotic origin.

- Viruses with zoonotic origins originate in nonhuman animals, but then make a ‘jump’ from infecting the host nonhuman animal to infecting humans.

- SARS-CoV-2 is believed to have originated from bats, and the first human case was linked to a ‘wet’ market in Wuhan, in the Hubei province of China.

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Section 3.1: The parts of the body impacted by COVID-19.

- COVID-19 is a respiratory illness, preying heavily on the lungs and respiratory system.
- Unfortunately, COVID-19 attacks many other parts of the body too.
- In this section, we will outline some of the additional organs and bodily systems that have been found to be affected by COVID-19.
- Note, however, that these descriptions are not universal to all individuals infected with COVID-19.
- Each COVID-19 case is unique, and individual health factors matter greatly in an individual's prognosis.

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Section 3.2: The parts of the body impacted by COVID-19.

The following symptoms have been reported in the following organs and systems in COVID-19 patients.

- The brain: strokes, seizures, confusion, and brain inflammation.
- The eyes: conjunctivitis, inflammation of eye membrane.
- The nose: loss of the sense of smell.
- The lungs: inflamed alveoli (air sacs) causing diminished oxygen uptake and labored breathing, coughing.

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Section 3.3: The parts of the body impacted by COVID-19.

- The heart & cardiovascular system: promotion of blood clots, heart attacks, myocarditis (heart inflammation), arrythmia (irregularities in the heartbeat).
- The liver: reports of liver issues in hospitalized COVID-19 patients.
- The kidneys: reports of kidney issues in hospitalized COVID-19 patients.
- The intestines: possibility of virus infection in gastrointestinal tract, diarrhea.

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Section 4.1: The symptoms of COVID-19.

- COVID-19 symptoms are varied, and more are being learned about everyday.
- Some symptoms may appear in mild cases, some may appear in more severe cases, others may appear and then disappear, and certain symptoms may not appear at all.
- Each individual is different, with varying health conditions, and therefore the symptoms will manifest differently.

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Section 4.2: The symptoms of COVID-19.

The following are mild, common symptoms of COVID-19, according to the Centers for Disease Control and Prevention (CDC), and the World Health Organization (WHO):

- Fever, chills.
- (Dry) Cough, shortness of breath, difficulty breathing.
- Fatigue.
- Headache, muscle ache, body ache.
- Sore throat, runny nose.
- Nausea, vomiting, diarrhea.
- Loss of sense of smell, taste.

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Section 5.1: Slowing the spread.

There are two simple yet powerful ways to dramatically slow the spread of the COVID-19 in a population:

1. Mask-wearing.

2. Social (or physical) distancing.

We will elaborate on both measures on the following pages.

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Section 5.2: Slowing the spread.

- A facemask is a piece of protective equipment for the face that protects the mouth and nose from intake of viral particles.
- A facemask protects the individual wearing it from infection as well as protecting others around the individual.
- The greater the number of people that wear a facemask, the lower the risk of virus transmission from person-to-person.
- A study of US service members who congregated in a close setting where there was a COVID-19 outbreak found that mask-wearing helped reduce the risk of infection by 70%.

Section 5.3: Slowing the spread.

- Social distancing refers to keeping a minimum of 6 feet or 2 meters of space (approximately 2 arms' length) away from individuals when outside of your home.
- This is to minimize the risk of catching the virus through respiratory droplets or aerosols that linger in the air.
- Both measures are effective, however, doing them together is the most effective way to avoid infection with COVID-19.

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Section 6: Basic reproduction number (R0).

- The ‘basic reproduction number’ or ‘R0’ (pronounced “are-nought”) is a measure of the infectiousness of a virus.
- It shows the number of individuals who will be infected by one case of the virus.
- It assumes: (1) No individual has been vaccinated against the virus. (2) No individual has taken measures to slow the spread of the virus. (3) No individual has been previously infected and/or is immune to infection.
- The R0 of COVID-19 is estimated to be 1.5-6, meaning that one individual with COVID-19 will spread it to anywhere from 1.5 to 6 other individuals.
- This R0 ranks highly among known infectious diseases, meaning that COVID-19 will spread very rapidly in a population if no preventative measures are taken.

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Section 7.1: The ways that COVID-19 spreads.

There are three ways in which COVID-19 can spread from human-to-human:

(1) direct contact with an infected individual or with a surface that contains viral particles.

(2) respiratory droplets exhaled by an infected individuals that linger in the air in the air.

(3) aerosols that are smaller and last longer in the air over further distances than respiratory droplets.

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Section 7.2: The ways that COVID-19 spreads.

- The best way to avoid infection through contact with viral particles on surfaces is to disinfect surfaces, and to wash and sanitize your hands as frequently as possible.
- The best way to avoid infection through direct contact and respiratory droplets is to wear a mask if social distancing is not possible.
- The best way to avoid infection through contact with aerosols is to socially distance as much as possible because of the ability of aerosols to linger longer and travel farther in the air compared to respiratory droplets.

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Section 8.1: The two types of COVID-19 infection.

- An individual infected with COVID-19 can be either symptomatic or asymptomatic.
- Symptomatic individuals show symptoms of the virus, such as coughing, sneezing, or coming down with a fever.
- Asymptomatic individuals do not show symptoms of the virus; however, these individuals are still as capable as symptomatic individuals of spreading COVID-19 to others.
- Asymptomatic individuals can infect everyone they encounter without knowing they are doing so.

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Section 8.2: The two types of COVID-19 infection.

- The CDC and WHO made early estimates that 25% of COVID-infected individuals are asymptomatic.
- This high percentage means it is critical that we always wear masks and socially distance when outside of our homes.
- Even if someone is infected but asymptomatic, the chance of that individual spreading the virus with a mask on is dramatically reduced.

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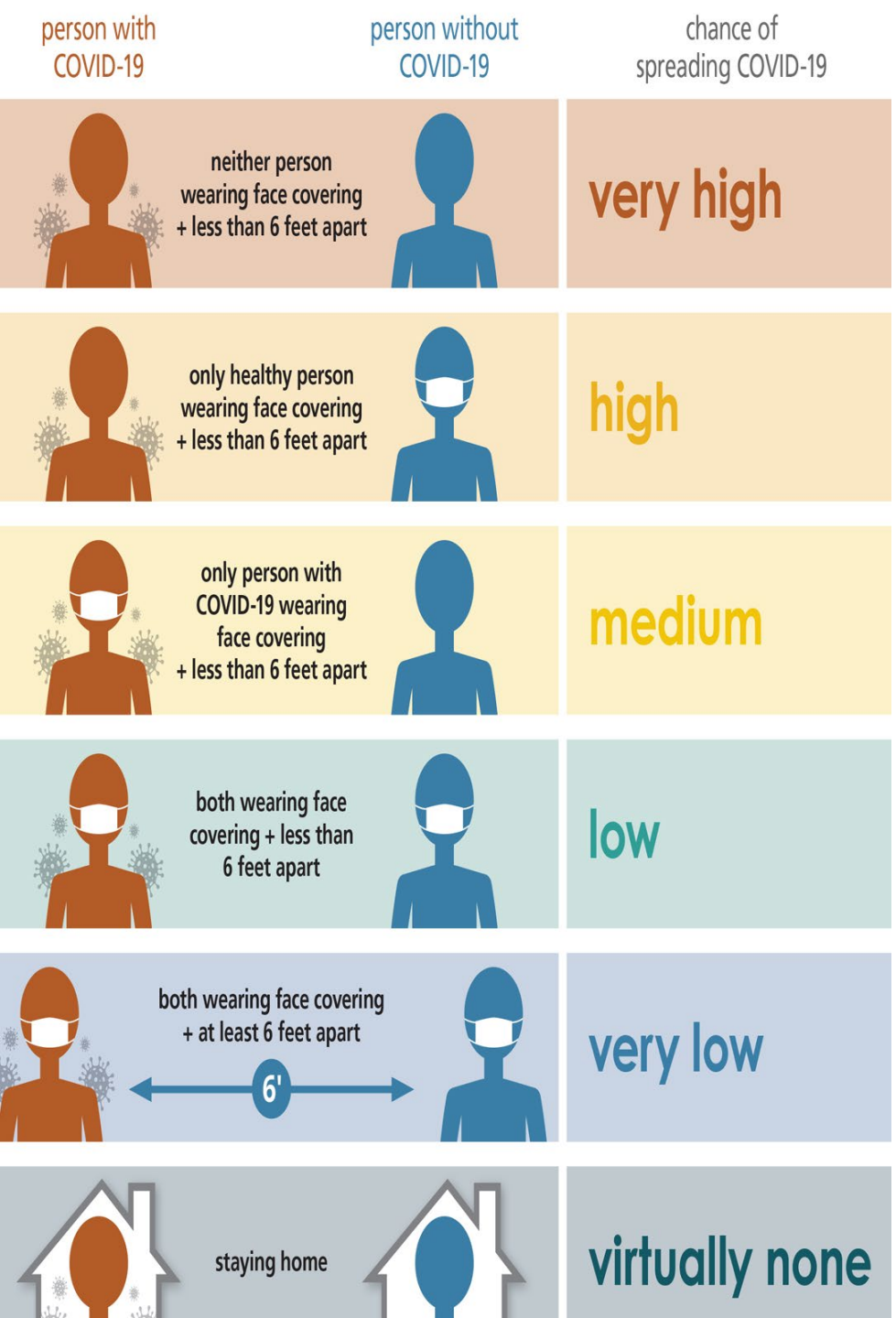

- This infographic shows the protective power of mask-wearing and social distancing, and how that power increases as both are done increasingly.
- The topmost panel shows that two individuals, neither of whom is wearing a mask or social distancing, are almost guaranteed to spread the virus if one of them is infected.
- When the infected individual wears a mask, the risk lessens.
- When both individuals wear a mask, the risk lessens even more.
- When both individuals wear a mask and socially distance, the risk decreases still further.
- When both individuals simply stay at home and avoid contact entirely, the risk is nonexistent.

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Section 9: The incubation period of COVID-19.

- The incubation period of a disease is the period between when you are first infected and when you first start showing symptoms.
- COVID-19 has an incubation period between 2 and 14 days.
- This means that you can be infected with the virus and not begin showing symptoms until 2 days to 14 days after infection.
- According to the CDC, 50% of infected individuals show symptoms within 4-5 days.
- It appears that infected individuals can spread the virus 2-3 days before they show symptoms and are most contagious 1-2 days before they show symptoms.

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Section 10.1 : The present state of COVID-19.

- COVID-19 has evolved from a localized outbreak of a novel virus to a global pandemic.
- 217 countries and territories have reported cases of COVID-19.
- Though it has wreaked havoc primarily on the health of millions, it has had devastating secondary economic and social impacts.
- The following page will list the top 10 countries with the greatest number of COVID-19 cases and the case numbers.
- The page after will list the top 10 countries with the greatest number of COVID-19 deaths and the death tolls.

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Section 10.2: The present state of COVID-19.

The following 10 countries, in decreasing order, have the highest number of COVID-19 cases:

1. United States: 14,502,143 cases.
2. India: 9,608,211 cases.
3. Brazil: 6,533,968 cases.
4. Russia: 2,410,462 cases.
5. France: 2,334,626 cases.
6. United Kingdom: 1,710,378 cases.
7. Italy: 1,709,991 cases.
8. Spain: 1,684,647 cases.
9. Argentina: 1,454,631 cases.
10. Colombia: 1,352,607 cases.

* Note: the data presented above are correct as of December 5th, 2020 and are compiled from Johns Hopkins University and Worldometer.* Return to contents page

Section 10.3: The present state of COVID-19.

The following 10 countries, in decreasing order, have the highest number of COVID-19 deaths:

1. United States: 280,581 deaths.
2. Brazil: 175,964 deaths.
3. India: 139,700 deaths.
4. Mexico: 108,863 deaths.
5. United Kingdom: 61,111 deaths.
6. Italy: 59,514 deaths.
7. France: 55,073 deaths.
8. Iran: 50,016 deaths.
9. Spain: 46,252 deaths.
10. Russia: 42,228 deaths.

* Note: the data presented above are correct as of December 4th, 2020 and are compiled from Johns Hopkins University and Worldometer.*

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Section 11.1: COVID-19 mortality.

- COVID-19 is a disease that exploits other weaknesses in the bodies of those it infects.

- Individuals who are co-morbid with COVID-19 and other underlying medical conditions, such as (but not limited to) chronic kidney disease, cancer, hypertension, or Type 1 diabetes mellitus, are more likely to develop a severe incidence of COVID-19.

Section 11.2: COVID-19 mortality.

Here we present the data from 197, 432 COVID-19-associated deaths as percentages, broken down by age group:

- Ages 0-4: 48 deaths (< 0.1%).
- Ages 5-17: 105 deaths (0.1%).
- Ages 18-29: 1,047 deaths (0.5%).
- Ages 30-39: 2,540 (1.3%).
- Ages 40-49: 5,959 (3%).
- Ages 50-64: 29,418 (14.9%).
- Ages 65-74: 41,125 (20.8%).
- Ages 75-84: 53,223 (27%).
- Age 85 and above: 63,967 (32.4%).

* Note: the data presented here are sourced from the CDC

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Section 11.3: COVID-19 mortality.

- The key takeaway from the data presented previously is that the incidence of mortality increase with age.

- This is primarily because older individuals tend to have more underlying health conditions and are more likely to have impaired or weakened immune systems, both of which significantly worsen a COVID-19 patient's prognosis.

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Section 12.1: The long-term effects of COVID-19.

- Even after an individual no longer has COVID-19, the course of infection can unfortunately leave lingering medical impacts.
- Again, it is important to note that different individuals may experience some of these lasting impacts, and other individuals may experience none because they make a full, impact-free recovery.

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Section 12.2: The long-term effects of COVID-19.

The following are some of the lasting, long-term impacts reported in COVID-19 patients:

- Fatigue, shortness of breath, cough.
- Joint, chest, and/or muscle pain.
- Intermittent fever, headaches.
- Heart palpitations.

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Section 12.3: The long-term effects of COVID-19.

- Concentration issues, cognitive issues, memory issues (often called ‘brain fog’).

- Inflammation of the heart muscle, lung abnormalities.

- Acute kidney injury.

- Rashes, hair loss.

- Issues with taste and smell, sleep issues.

- Depression, anxiety, mood changes.

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Section 13.1: Doing your part.

- Because of the inescapable reality of COVID-19 and the global presence of the disease, every individual everywhere has a critical role to play in ending the pandemic.
- The following are commonsense, everyday steps you can take to do your part in the fight against COVID-19:

• Wear a facemask. The science supporting the use of facemasks in mitigating the spread of COVID-19 is resounding.

• Wearing a mask protects yourself and those around you.

• Mitigating the spread also helps healthcare workers and systems that have historically become overwhelmed and overburdened during the pandemic.

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Section 13.2: Doing your part.

- Practice social distancing whenever possible, but especially when not at home.
- Keep 6 feet/2 meters away from other individuals as much as possible.
- Obtain coronavirus-related information from reliable sources (for example from the CDC, the WHO etc.).
- Coronavirus misinformation is rife so double-check the sources of your information and data.

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Section 14: FACT or FICTION

This final section is called “FACT or FICTION” will consist of pages in pairs and will be structured as follows:

- The first page will describe a common trope, myth, or piece of (mis)information that has been prominent in public discourse about COVID-19.
- The second page will clarify whether the listed information is correct and factual (FACT) or is untrue and/or unsupported by current scientific evidence (FICTION).
- Our hope is that this section will not only clear up misconceptions that feed into a growing problem of misinformation but will also encourage you to think critically of new information when you evaluate it.

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OR

FACT

“There is no 100% effective cure for COVID-19.”

FICTION

OR

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FACT

FACT

FACT

FACT

This is true. There are several drugs and therapeutic agents that have been proven to be clinically effective, on a case-by-case basis, against COVID-19, and there are several vaccines that are being clinically tested and rolled out that have impressive efficacy rates in preventing COVID-19. However, there is no 'miracle drug' or 'cure' that completely guarantees prevention from or treatment for COVID-19.

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OR

FACT

“Certain individuals with certain <u>non-medical</u> characteristics (such as having Asian ancestry) can more easily transmit or be infected with COVID-19.”

FICTION

OR

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FICTION

FICTION

FICTION

This is absolutely untrue. Any individual's non-medical characteristics, such as creed, color, religion, or sexual orientation, have no bearing on their ability to acquire or transmit COVID-19.

Treating individuals differently because of such a false belief is discriminatory.

FICTION

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OR

FACT

“Facemasks restrict breathing, cause blood oxygen levels to drop, and cause a dangerous build up of carbon dioxide in the blood.”

FICTION

OR

FICTION

FICTION

None of the three claims in the statement are true. Breathing is perfectly functional while wearing a mask. The level of oxygen in your blood remains normal, and carbon dioxide does not build up to dangerous levels in your blood. The only possible discomfort may be some claustrophobic feeling because of the mask itself, but it has no physiologically damaging effects.

Masks are safe and are a critical tool in mitigating COVID-19 infection and spread.

FICTION

FICTION

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OR

FACT

“COVID-19 is just like the common cold and is not that deadly. It is not that big of a deal.”

FICTION

OR

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FICTION

FICTION

FICTION

FICTION

This is untrue. COVID-19 does share some symptoms with the seasonal flu (influenza virus) such as a cough, fatigue, and a fever, but there are many other critical factors that separate the two conditions. The COVID-19 death rate is higher than the death rate of the seasonal flu, and there is currently no widely-available vaccine for the general public for COVID-19, whereas there is a flu vaccine available.

OR

FACT

“Children are immune to COVID-19. They can’t get the virus or transmit it to others.”

FICTION

OR

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FICTION

FICTION

This is untrue. While children do experience milder COVID-19 symptoms in general compared to adults, children are also entirely susceptible to COVID-19 infection and are able to spread it to others, symptomatically or asymptomatically.

Therefore, children should also be helped by adults to take necessary preventative measures to avoid infection with COVID-19.

FICTION

FICTION

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Glossary.

- **Aerosol(s):** a droplet exhaled by an individual that can contain viral particles. Aerosols stay in the air longer than respiratory droplets, are larger than respiratory droplets, and can travel farther in the air than respiratory droplets.
- **Asymptomatic:** an individual infected with COVID-19 who is showing no symptoms of the virus but is capable of infecting others.
- **Basic reproduction number (R0):** a mathematically-determined value of how many infections will be generated by one individual infected with a virus. The R0 of COVID-19 is estimated to be 1.5-6.
- **Centers for Disease Control and Prevention (CDC):** a federal agency of the United States government responsible for public health in the United States and across the globe.
- **COVID-19:** An abbreviation of 'Coronavirus Disease 19'.
- **Incubation period:** the duration of time between when an individual is first infected with a virus and when the individual first shows symptoms of infection. The incubation period of COVID-19 is between 2 and 14 days.
- **Isolation:** keeping someone confirmed to be infected with COVID-19 away from others to prevent viral spread.
- **Prognosis:** the predicted course and outcome of a disease for an individual.
- **Quarantine:** keeping someone who was in close contact with a second individual infected with COVID-19 away from others.
- **World Health Organization (WHO):** an agency of the United Nations that works toward elevating and improving global public health.
- **Virus:** a living particle that cannot reproduce by itself. Viruses invade living cells as hosts and use the cell to reproduce their genetic material.
- **Respiratory droplet(s):** a droplet exhaled by an individual that can contain viral particles. Compared to aerosols, respiratory droplets are larger, travel less far in air, and linger in air for a shorter duration.
- **SARS-CoV-2:** the coronavirus strain responsible for causing COVID-19.
- **Symptomatic:** an individual infected with COVID-19 who is showing symptoms of the illness, such as (but not limited to) coughing and a fever.

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