Introduction to Covid-19

1. Wuhan Origin.
2. SARS vs CoV vs MERS
3. Symptoms of COVID
4. Biological spread of coronavirus - SARS-Cov 2
5. Generalisations and facts found relating to COVID
6. Testing with RT-PCR
7. Talk about infection and mortality rates
8. How xrays and AI tech can be used to recognize and treat COVID-19 – quicker & cheaper in nature.
9. We have proposed an automatic prediction of COVID-19 using a deep convolution neural network based pre-trained transfer models and Chest X-ray images. For this purpose, we have used ResNet50, InceptionV3 and Inception-ResNetV2 pre-trained models to obtain a higher prediction accuracy for small X-ray dataset.
10. Usefulness of CNN in image detection
11. **Origin of COVID-19.**

COVID-19 is an infectious disease caused by a newly discovered coronavirus. The outbreak started off in December 2019 in the city of Wuhan, China which soon turned into a pandemic due to its contagious nature. It is also called as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2).

Coronaviruses (CoV) are a family of hundreds of viruses. Most of these infect animals like bats, chickens, camels and cats generally. Occasionally, viruses infecting one species can mutate and permit them to start transmitting the virus to other species leading to a spillover. In humans, these coronaviruses have known to caused respiratory infections ranging from common cold to more deadly diseases like Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS).

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses>

<https://theconversation.com/coronaviruses-a-brief-history-135506>

1. **SARS and MERS**

Severe Acute Respiratory Syndrome (SARS) was first detected in November 2002. It bears many similarities to the current pandemic. Older people are much more likely to suffer. Although, mortality rates were higher for SARS. In 2012, there was another outbreak of a newly found coronavirus called the Middle East Respiratory Syndrome (MERS). The very first case was found in Saudi Arabia.

The difference between SARS, MERS and COVID-19 is that R0 for SARS is 3, R0 for MERS is less than 1 but the R0 for COVID-19 is 5, meaning that every infected person is likely to infect 5 other people. This shows how infectious nature of COVID-19.

The symptoms of COVID-19 can be very mild, some people may not show any symptoms at all but can infect other people. It is not as deadly as SARS and MERS.

<https://theconversation.com/coronaviruses-a-brief-history-135506>

1. **Symptoms of COVID-19**

Most common symptoms of COVID-19 are fever, dry cough and fatigue. Other symptoms which are less common in nature are headaches, nasal congestion, sore throat, loss of taste and smell, conjunctivitis and discoloration of fingers or toes.

Around 80% of the people recover without being hospitalised. The rest become seriously ill and have difficulty in breathing. Usually older people having other underlying medical problems like high blood pressure, heart and lung problems, diabetes or cancer are at a higher risk of developing serious illness. However, anyone can get the virus and get seriously ill.

1. **Biological Spread of COVID-19**

COVID-19 begins and ends in patients’ lungs, because like the flu, coronaviruses are respiratory diseases. They spread typically when an infected person coughs or sneezes, spraying droplets that can transmit the virus to anyone in close contact. Coronaviruses also cause flu-like symptoms: Patients might start out with a fever and cough that progresses to pneumonia or worse.

In the early days of an infection, the novel coronavirus rapidly invades human lung cells. Those lung cells come in two classes: ones that make mucus and ones with hair-like batons called cilia. Mucus, though gross when outside the body, helps protect lung tissue from pathogens and make sure your breathing organ doesn’t dry out. The cilia cells beat around the mucus, clearing out debris like pollen or viruses.

When phase two and the immune system kicks in, the presence of a viral invader, our bodies step up to fight the disease by flooding the lungs with immune cells to clear away the damage and repair the lung tissue.

During the third phase, lung damage continues to build—which can result in respiratory failure. Even if death doesn’t occur, some patients survive with permanent lung damage. According to the WHO, SARS punched holes in the lungs, giving them “a honeycomb-like appearance”—and these lesions are present in those afflicted by novel coronavirus, too.

<https://www.nationalgeographic.com/science/2020/02/here-is-what-coronavirus-does-to-the-body/>

1. **Facts of COVID-19**
2. Children and adolescents have been far less affected by COVID-19 and their symptoms have been almost mild.
3. The people who are most vulnerable are the healthcare workers, people over 60 years of age and people with underlying health conditions.

<https://www.who.int/westernpacific/emergencies/covid-19/information/severity>

1. **Testing with RT-PCR**

COVID-19 is detected in the upper and lower respiratory specimens of the individuals with the help of RT-PCR (real-time transcription polymerase chain reaction) test. Since the beginning of the outbreak, the availability and quantity of the testing kits have been low. The stability and reproducibility if the detection kits are being questioned. These factors play a determinant role for the accuracy of test results. In several areas, the accuracy of the kits has found to be only 50% and have to hence be repeated several times before the cases can be confirmed.

A deep learning algorithm using CT images to screen for Corona Virus Disease (COVID-19)