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SYNDICATE PRESENTATION ON  
**THE EPIDEMIC CURVE AND ITS IMPLICATIONS EMPHASIZING  
ON COVID -19**

**PRESENTED BY**

SYNDICATE GROUP- A

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**AIM**

1. The aim of this syndicate presentation is to provide adequate knowledge on epidemics/ pandemics, pandemic curve and Covid - 19 while emphasizing on preventive measures that should be taken in each stage to flatten the curve.

**OBJECTIVES**

1. To give an introduction on pandemics, epidemics (epidemic curves and its stages) and outbreaks.
2. To provide an adequate understanding on COVID - 19.
3. Discuss the preventive measures that can be used at each stage of COVID- 19.
4. Diagnosis and Treatment
5. Introduction to “NEW NORMAL LIFE”.

## **INTRODUCTION OF COVID-19**

1. The main intention of this syndicate presentation is to talk about the pandemic we are badly experiencing today. Since there is a delay in finding a vaccine, this COVID-19 has ravaged humanity signaling the end of the world.
2. But, before reaching at that final state, this disease has many negative influences on social, economic, political and security issues of more than 220 countries and territories including Sri Lanka.
3. Normally, a virus is an obligate parasite that must infect a cell and use its organelles in order to reproduce. They carry either DNA or RNA, and have a protein coat. A virus has a high mutation rate, which helps it to survive and boost its resistance to antiviral drugs.
4. The 2019 novel corona virus; COVID 19 is a newly emerged virus that is making a substantial impact on mankind and threatens global stability and security due to its dramatic spread.
6. The virus was identified as the cause of and epidemic of respiratory tract illness which was first detected in in Wuhan, Hubei Province, China.
7. This is a RNA virus which got its name from the way that it looks under a electronic microscope. This virus consists of a core of genetic material

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surrounded by an envelope with protein spikes. This gives it the appearance of a crown.

8. Until recently, most people never have heard of Corona Virus. But it has been recognized for over 50 years. Earlier common cold viruses such as Rhino Virus and Adeno Virus were identified.

9. This new Human virus was discovered in the 1960s by scientists in United Kingdom and United States. Then it was named as B 814.

10. This novel virus is named by the World Health Organization as “Severe Acute Respiratory Syndrome Corona Virus – 2 and the disease caused by it is named as COVID 19.

11. Corona viruses are zoonotic, meaning that the viruses are transmitted between animals and humans. It probably started in animals but is now spreading between people.

12. To the best of our understanding the virus is primarily spread through contact and respiratory droplets and furthermore airborne, fomite, fecal-oral, blood borne, mother to child and animal to human transmission.

### WHAT IS A PANDEMIC

13. The word pandemic comes from the Greek pandemos meaning “pertaining to all people.” The Greek word pan means “all” and the Greek word demos means “people.”

14. An epidemic usually affecting a large proportion of the population, occurring over a wide geographic area such as a section of a nation, the entire nation, a continent or the world is called **a pandemic**.

15. It is the worldwide spread of a new disease.

16. Throughout history, there have been a number of pandemics, such as smallpox, tuberculosis, influenza, etc.

17. One of the most devastating pandemics was the Black Death, which killed over 75 million people in 1350.

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18. The most recent pandemics include the HIV pandemic as well as the 1918, 2009 H1N1 pandemics and COVID-19 pandemics.
19. Besides humans, pandemics can also occur in important agricultural organisms (livestock, crop plants, fish, and tree species) or in other organisms.

### Features of pandemic

20. Pandemics are usually caused by a novel infectious agent, an infectious agent that is newly capable of spreading rapidly, or both.
21. The death toll in a pandemic is generally higher than that in an epidemic. It can also lead to more social disruption, economic loss, and general hardship.
22. Increased travel and mobility have increased the likelihood of new diseases spreading.
23. Antibiotic resistance increases the risk of future pandemics.
24. A disease or condition is not a pandemic merely because it is widespread or kills many people; it must also be infectious.
25. For instance, cancer is responsible for many deaths but is not considered a pandemic because the disease is not infectious or contagious.

### Common causes for pandemics

26. Pandemic is usually caused by a new virus strain or subtype that becomes easily transmissible between humans.
27. Due to bacteria that become resistant to antibiotic treatment.
28. Sometimes, pandemics are caused simply by a new ability to spread rapidly, such as with the Black Death.
29. Pandemics arise when humans may have little or no immunity against a new virus. Often a new virus cannot spread between people, but if it changes, or mutates, it may start to spread easily. In this case, a pandemic can result.

Fatality from a pandemic depends upon:

1. The number of people who become infected.



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2. The severity of disease caused by the virus (its virulence).
3. The vulnerability of affected populations.
4. The effectiveness of preventive steps.

### why covoid become pandemic

1. This is the first pandemic caused by a coronavirus.
2. It is caused by SARS-COV-2.
3. Speaking at the COVID-19 media briefing, the WHO Director-General said:
4. “WHO has been assessing this outbreak around the clock and we are deeply concerned both by the alarming levels of spread and severity and by the alarming levels of inaction.
5. We have therefore made the assessment that COVID-19 can be characterized as a pandemic.
6. Pandemic is not a word to use lightly or carelessly.
7. It is a word that, if misused, can cause unreasonable fear, or unjustified acceptance that the fight is over, leading to unnecessary suffering and death.
8. Describing the situation as a pandemic does not change WHO’s assessment of the threat posed by this virus.
9. It doesn’t change what the WHO is doing, and it doesn’t change what countries should do.
10. We have never before seen a pandemic sparked by a coronavirus.
11. This is the first pandemic caused by a coronavirus.
12. And we have never before seen a pandemic that can be controlled, at the same time.”

### **01.West African Ebola epidemic: 2014-2016**

- Ebola ravaged West Africa between 2014 and 2016, with 28,600 reported cases and 11,325 deaths. The first case to be reported was in Guinea in December 2013, then the disease quickly spread to Liberia and Sierra Leone. There is no cure for Ebola, the virus may have originated in bats.

### **02.Zika Virus epidemic: 2015-present day**

- The impact of the recent Zika epidemic in South America and Central America won't be known for several years. The Zika virus is usually spread through mosquitoes of the *Aedes* genus, although it can also be sexually transmitted in humans. While [Zika](#) is usually not harmful

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to adults or children, it can attack infants who are still in the womb and cause birth defects.

### **0.3H1N1 Swine Flu pandemic: 2009-2010**

- The 2009 swine flu pandemic was caused by a new strain of H1N1 that originated in Mexico in the spring of 2009 before spreading to the rest of the world. In one year, the virus infected as many as 1.4 billion people across the globe and killed between 151,700 and 575,400 people, The 2009 flu pandemic primarily affected children and young adults, and 80% of the deaths were in people younger than 65.

### **04.SARS:2003**

- First identified in 2003 after several months of cases, Severe Acute Respiratory Syndrome is believed to have possibly started with bats, spread to cats and then to humans in China, followed by 26 other countries, infecting 8,096 people, with 774 deaths.
- SARS is characterized by respiratory problems, dry cough, fever and head and body aches and is spread through respiratory droplets from coughs and sneezes.

### **05.AIDS pandemic and epidemic: 1981-present day**

- AIDS has claimed an estimated 35 million lives since it was first identified. HIV, which is the virus that causes AIDS, likely developed from a chimpanzee virus that transferred to humans in West Africa in the 1920s. The virus made its way around the world, and AIDS was a pandemic by the late 20th century.

### **06.First Cholera Pandemic:1817**

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- The first of seven cholera pandemics over the next 150 years, this wave of the small intestine infection originated in Russia, where one million people died. Spreading through feces-infected water and food, the bacterium was passed along to British soldiers who brought it to India where millions more died. The reach of the British Empire and its navy spread cholera to Spain, Africa, Indonesia, China, Japan, Italy, Germany and America, where it killed 150,000 people. A vaccine was created in 1885, but pandemics continued.

**07.Spanish Flu: 1918-1920**

- The avian-borne flu that resulted in 50 million deaths worldwide, the 1918 flu was first observed in Europe, the United States and parts of Asia before swiftly spreading around the world.

**08. The Black Death 1350**

- From 1346 to 1353 an outbreak of the Plague ravaged Europe, Africa, and Asia, with an estimated death toll between 75 and 200 million people.
- Responsible for the death of one-third of the world population, this second large outbreak of the bubonic plague possibly started in Asia and moved west in caravans.
- Thought to have originated in Asia, the Plague most likely jumped continents via the fleas living on the rats.

**09.American polio epidemic:1976**

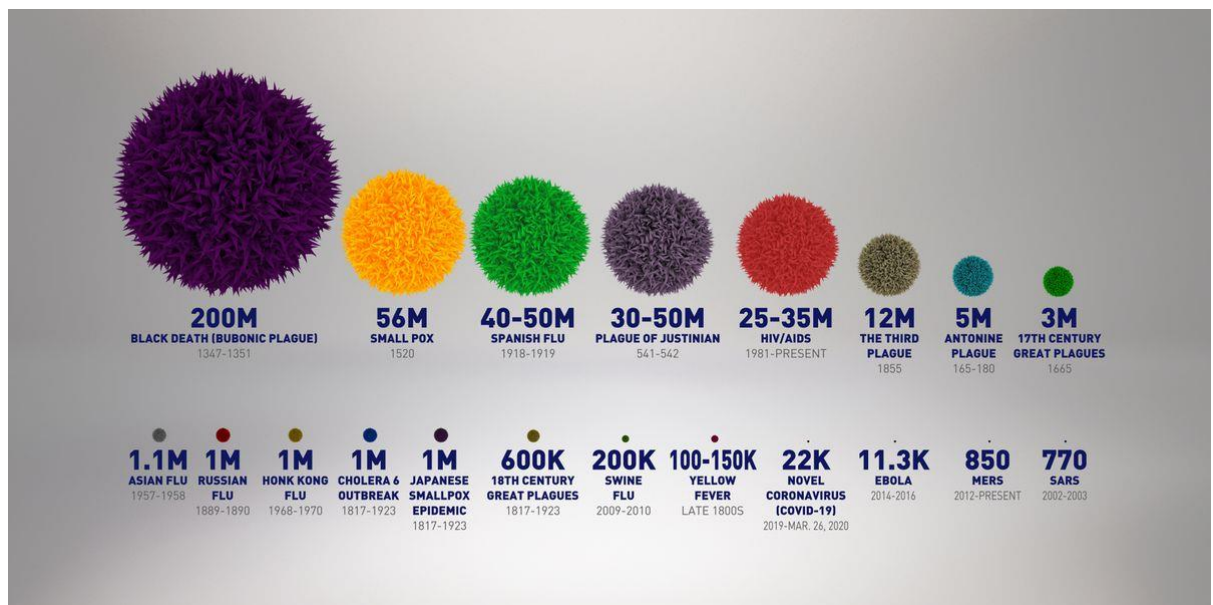
- A polio epidemic that started in New York City caused 27,000 cases and 6,000 deaths in the United States. The disease mainly affects children and sometimes leaves survivors with permanent disabilities.

### 10. Asian Flu: 1957-1958

- Starting in Hong Kong and spreading throughout China and then into the United States, the Asian flu became widespread in England where, over six months, 14,000 people died. A second wave followed in early 1958, causing an estimated total of about 1.1 million deaths globally, with 116,000 deaths in the United States alone. A vaccine was developed, effectively containing the pandemic.

### 11. The Great Plague of London: 1665

- In another devastating appearance, the bubonic plague led to the deaths of 20 percent of London's population.



## **EPIDEMIC CURVE**

### What is 'Epidemiology'?

Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems.

### The Epidemiological Curve

An epi curve is a visual display of the onset of illness among cases associated with an outbreak. The epi curve indicates the following;

- Time trend of the outbreak, that is, the distribution of cases over time
- "Outliers," or cases that stand apart from the overall pattern
- General sense of the outbreak's magnitude
- Inferences about the outbreak's pattern of spread
- Most likely time of exposure

An epi curve can also be used to make inferences about an outbreak's most likely mode of spread, suggesting how a disease is transmitted. Transmission occurs in the following ways:

- Point source
- Continuous common source
- Person-to-person spread (propagation)

#### **1. Point Source outbreak,**

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In a Point Source outbreak persons are exposed over a brief time to the same source, such as a single meal or an event. The number of cases rises rapidly to a peak and falls gradually.

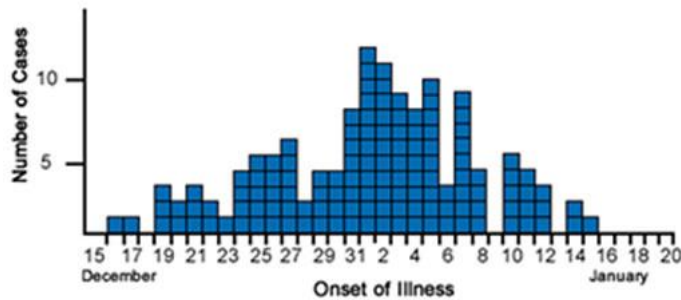
The majority of cases occur within one incubation period of the disease.

### 2. Continuous Common Source outbreak,

In a Continuous Common Source outbreak persons are exposed to the same source but exposure is prolonged over a period of days, weeks, or longer.

The epi curve rises gradually and might plateau.

### Salmonellosis Cases Exposed to Contaminated Salami by Date of Onset, United States, December 2009 – January 2010

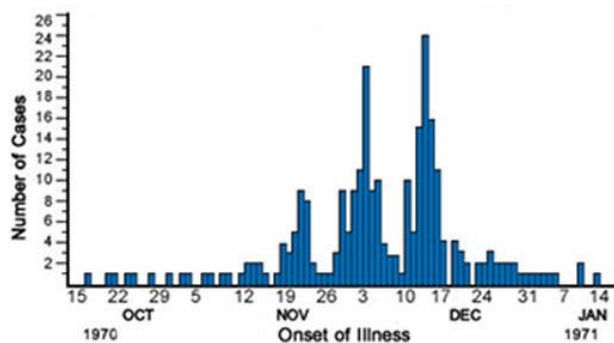


### 3. Propagated Outbreak

In a propagated outbreak, there is no common source because the outbreak spreads from person-to-person.

The graph will assume the classic epi curve shape of progressively taller peaks, each being one incubation period apart.

### Measles Cases by Date of Onset in Aberdeen, South Dakota, October 15, 1970 – January 16, 1971



Of course, the shape of an epi curve rarely fits any of these descriptions exactly.

For propagated outbreaks, the shape might show overlapping waves of cases that obscure subsequent peaks, and peaks might diminish more slowly over time.

You can, however, get a general sense about the mode of spread of an outbreak from its epi curve.

## Epidemic curve of COVID-19 patients, Sri Lanka

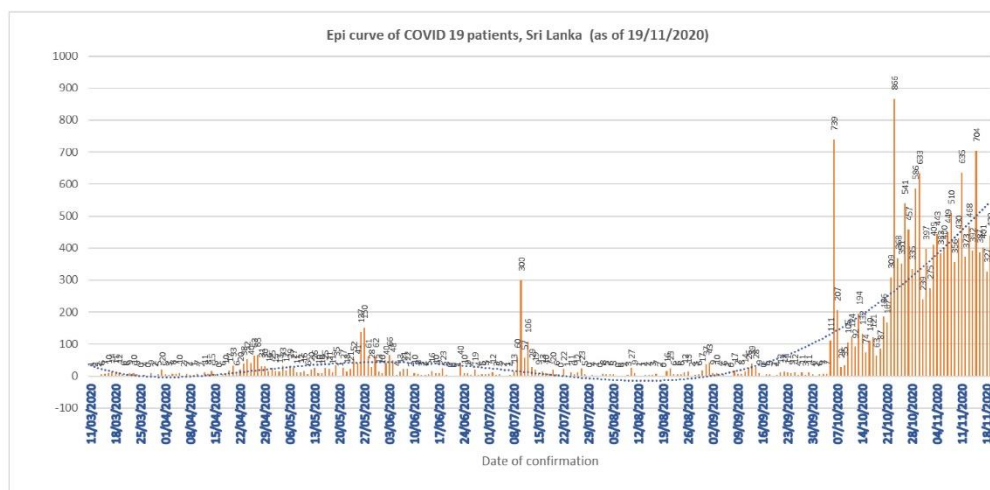


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## Epidemiologic Triangle

1. The Epidemiologic Triangle, sometimes referred to as the Epidemiologic Triad, is used in addressing the three components that contribute to the spread of disease: an external agent, a susceptible host and an environment that brings the agent and host together.

2. Since different diseases require different balances and interactions between these three factors, it's critical to fully assess each component in order

to develop effective control and prevention measures. The components of the Epidemiologic Triad are,

A. The Agent

i. The agent is the pathogen, including a virus, bacterium, parasite or other microbes. According to the CDC, the concept of an agent has been widened to include both chemical or physical causes of disease or injury.

ii. Usually, an agent's presence can be enough to cause disease. However, a variety of factors can influence whether or not exposure to the agent will directly result in disease. That's why it's important to consider the other vertices on the Epidemiologic Triangle before making a final assessment.

B. The Host

i. The host is the organism who is exposed to and harbor a disease. Sometimes, the host may not show any signs of illness and could be unaware that they have the disease.

ii. Sets of risk factors, including age, gender, hygiene practices and genetic composition can influence a host's susceptibility to an infectious agent.

iii. Typically children, the elderly and people with compromised immune systems are more susceptible to becoming a host.

C. The Environment

i. The last component in the Epidemiologic Triangle is the environment.

ii. This refers to any extrinsic factors that can influence exposure and susceptibility.

iii. Environmental factors may include physical aspects like climate, biologic aspects like animals transmitting agents and socioeconomic factors like crowding or lack of sanitation.

### Stages of the Epidemic curve

An epidemic can be either a point source epidemic or a continuous source epidemic. The epidemic curve also varies according to the above types.

These are the 4 stages of an epidemic spread



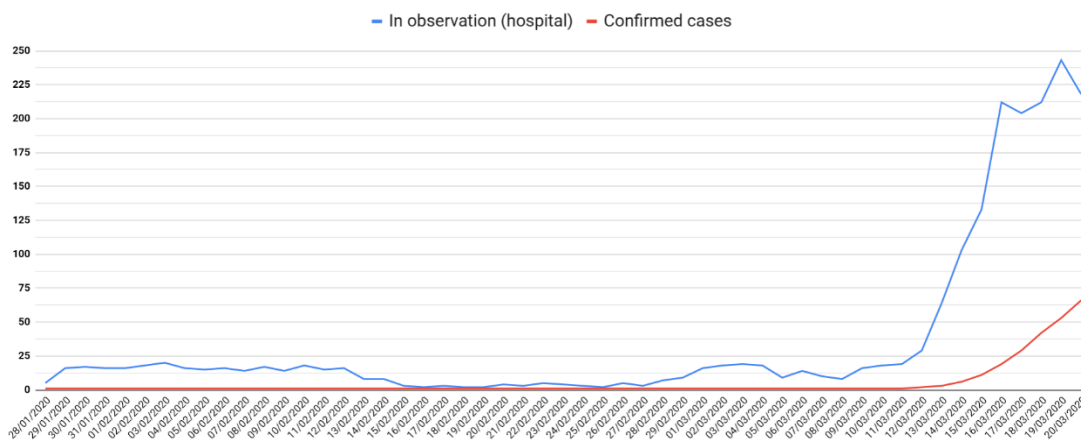
- 1: No cases — No reported cases Stage
- 2: Sporadic cases — One or more cases, imported or locally acquired Stage
- 3: Clusters of cases — Most cases of limited transmission linked to chains of transmission of either being exposed to a family member being exposed (family cluster) or to neighbors or other close contacts (village clusters) Stage
- 4: Community transmission — Cases without an epidemiologic link are common in the community

Each stage must be countered using specific prevention methods and medications.

### Epidemic graphs

The vertical axis is the y-axis and shows the dependent (or y) variable, which, in epidemiology, is usually a frequency measure such as number of cases or rate of disease.

### Epidemic graph of COVID-19 in Sri Lanka



### **27/01/20: PATIENT ZERO**

*In medical science, the index case or the first documented patient in a disease epidemic within a population.*

Patient Zero was a Chinese national who had come to Sri Lanka as a tourist.

According to the Epidemiologic unit report on the 28th of January, she arrived "2 weeks ago" - so that's possibly the [28-14] = 14th of January.

While the rumor mill went ham, the Ministry of Health's Epidemiologic Unit swung into action, putting people under observation.

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They also contributed to slowing fake news around COVID-19 and Patient Zero - some of our earliest factchecks on the subject, for instance, were directly from Dr. Sudath Samaraweera, the Chief Epidemiologist at the Ministry of Health.

At the start they had five other people under observation, 2 of them Sri Lankan.

They started adding more while Patient Zero underwent treatment.

Their reports show the first to be put under observation were people from the hospital that P-Zero had been at.

Patient Zero was discharged on 19/02/2020.

## **PREVENTION**

### Prevent COVID-19 as an individual

#### Wash your Hands

- Wash your hands often with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, or sneezing. It's especially important to wash:
  - Before eating or preparing food
  - Before touching your face
  - After using the restroom
  - After leaving a public place
  - After blowing your nose, coughing, or sneezing
  - After handling your mask
  - After changing a diaper
  - After caring for someone sick
  - After touching animals or pets
- If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. Cover all surfaces of your hands and rub them together until they feel dry.
- Avoid touching your eyes, nose, and mouth with unwashed hands.

#### Avoid close contact

- Inside your home: Avoid close contact with people who are sick.
  - If possible, maintain 6 feet between the person who is sick and other household members.

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- Outside your home: Put 6 feet of distance between yourself and people who don't live in your household.
  - Remember that some people without symptoms may be able to spread virus.
  - Stay at least 6 feet (about 2 arms' length) from other people.
  - Keeping distance from others is especially important for people who are at higher risk of getting very sick

Cover your mouth and nose with a mask when around others

- You could spread COVID-19 to others even if you do not feel sick.
- The mask is meant to protect other people in case you are infected.
- Everyone should wear a mask in public settings and when around people who don't live in your household, especially when other social distancing measures are difficult to maintain.
  - Masks should not be placed on young children under age 2, anyone who has trouble breathing, or is unconscious, incapacitated or otherwise unable to remove the mask without assistance.
- Do NOT use a mask meant for a healthcare worker. Currently, surgical masks and N95 respirators are critical supplies that should be reserved for healthcare workers and other first responders.
- Continue to keep about 6 feet between yourself and others. The mask is not a substitute for social distancing.

Cover coughs and sneezes

- Always cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow and do not spit.
- Throw used tissues in the trash.
- Immediately wash your hands with soap and water for at least 20 seconds. If soap and water are not readily available, clean your hands with a hand sanitizer that contains at least 60% alcohol.

Clean and disinfect

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- Clean and disinfect frequently touched surfaces daily. This includes tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks.
- If surfaces are dirty, clean them. Use detergent or soap and water prior to disinfection.
- Then, use a household disinfectant.

Monitor Your Health Daily

- Be alert for symptoms. Watch for fever, cough, shortness of breath, or other symptoms of COVID-19.
  - Especially important if you are running essential errands, going into the office or workplace, and in settings where it may be difficult to keep a physical distance of 6 feet.
- Take your temperature if symptoms develop.
  - Don't take your temperature within 30 minutes of exercising or after taking medications that could lower your temperature, like acetaminophen.

Prevent COVID-19 as a government

- Stockpiling adequate medical supplies for patient management

Stockpiling adequate antivirals and vaccines are a necessity and should not pose a problem, that said, procurement of safe and effective vaccines in an emergency situation will not be an easy task and the government should have a plan for this and make available adequate financial recourses.

- Adequate human resource and capacity building planning

Trained human recourses need to be available across disciplines i.e., epidemiology, clinical medicine, laboratory, logistics, and disaster. Appropriately sized and trained rapid response teams within the health sector i.e., doctors, nurses, epidemiologists, veterinarians, and laboratorians. Therefore, the availability of healthcare workers and their knowledge of an outbreak response needs to be assessed.

- Vigilant Surveillance and Response for Rapid containment

A well-gearred health system should consist of competencies in managing the disease, and strong surveillance, prevention of the onset of new diseases, and a risk-communication system. Risk communication refers to the real-time exchange of information, advice, and opinions between all stakeholders.

Surveillance describes the observance of the magnitude and patterns of infectious diseases, predicting epidemic trends, early detecting outbreaks, and discovering EIDs. These activities are necessary to respond promptly and adequately. Sri Lanka receives technical assistance from the WHO and relevant partners to improve and integrate multi-sectoral surveillance data, enhance the capacity to rapidly detect and respond to developing biological threats, by connecting systems capable of linking information.

- Towns and cities have been locked down and large gatherings banned.
- Restrictions have been imposed on travellers from hard-hit areas.
- Major sporting events, carnivals and events have been postponed or cancelled.
- Cancel all public meetings.
- Declare a state of emergency.
- Avoid visiting hospitals and other medical facilities unless they need medical care.

Methods Sri Lanka has used to prevent COVID-19

- Rational use of Personal Protective Equipment (PPE) and infection prevention and control of COVID-19
- Use of masks as a measure to prevent COVID-19 infection
- Home care for patients with respiratory symptoms
- Hand hygiene and hand sanitizers
- Disposal of dead bodies and autopsy practice guide: COVID-19 related deaths
- Environmental surface disinfection during the COVID-19 outbreak
- Frequently asked questions and myths: Infection prevention and control related to COVID-19

Why Sri Lanka were able to prevent COVID-19 in 1<sup>st</sup> wave while other countries got failed?

- Sri Lanka has been successful so far, compared to most countries in the world, in the fight against Covid-19. The mind-numbing figures of death and infection streaming in from many parts of the globe are not being reflected in Sri Lanka. An infection rate of around 700 with 7 deaths in a population of over 21 million are figures to arouse excitement.
- Sri Lanka reacted rapidly to early warnings of a new virus strain issued by the Chinese and WHO authorities while most Western countries carried on unconcerned, believing, and perhaps even hoping, that it was only a problem for China. The Sri Lankan government rapidly mobilized its limited resources despite the prevailing uncertainties, with the state funded health service responding with impressive efficiency and the security establishment being marshalled with speed.
- Sri Lanka's state-funded universal health care service possessed considerable but unheralded expertise in managing deadly diseases, having eliminated malaria and polio, grappled successfully with AIDS, SARS, H1N1, Chikungunya and

MERS and was substantially containing Dengue. In 2005, it avoided the much-anticipated epidemics following the Indian Ocean tsunami.

- Taking the initiative and acting proactively, prior to 27 January, the Ministry of Health of Sri Lanka had instructed the Quarantine Unit at the Bandaranaike International Airport, Colombo, to screen passengers for suspicious symptoms. Additionally, the ministry warned that infants, children, pregnant women, the elderly and people who suffer from chronic diseases, among other issues, should avoid visiting crowded places.
- A 22-member National Action Committee was set up by the Ministry to address the various aspects of Covid-19. The Department of Immigration and Emigration also informed all construction sites with Chinese resident visa holders to restrict their Chinese employees to their respective workplaces and lodgings.
- On 27 January, the first confirmed case of the virus was reported in Sri Lanka, a 44-year-old Chinese woman tourist from Hubei Province who had been screened at the Bandaranaike International Airport and was detected with a high fever. She was immediately isolated at the National Institute of Infectious Diseases. The lady recovered fully and returned home on 19 February.
- Following the first case, the demand for face masks in the country soared. As a result, the country's drug regulatory agency instituted price controls on face masks. 33 Sri Lankan students and families were also evacuated from Wuhan on 1 February and quarantined at a centre established at a military facility at Diyatalawa. They were released after two weeks quarantine period on 14 February.
- With the situation in China deteriorating and signs of the virus spreading to other countries at a frightening speed, more stringent restrictions were adopted, curtailing the freedom of movement and speech. Individual freedoms were restricted, but



the common good of the people and the limited ability of the country to cope with a widespread epidemic began to dominate thinking. Sri Lanka also began restricting entry into the country.

- Since the first week of March, passengers coming from Italy, Iran, and South Korea were required to be quarantined for two weeks at one of two facilities. On 10 March, 186 people (164 Sri Lankan nationals, 20 Italian nationals, and 2 South Korean nationals) were placed under quarantine in Batticaloa. Following further developments, the country suspended on arrival visas for tourists on 11 March. A massive awareness-raising campaign was launched using the radio, TV and even private phones. The public reaction has been supportive.
- The military had rapidly established more quarantine centres around the country and have been praised for their efficiency and the excellent facilities. As of 23 March, forty-five quarantine centres had been built in the country by the Sri Lanka Army. The private sector made available large but unoccupied hotels to house people being quarantined. Nearly 3,500 people have been isolated in the quarantine centres which number also includes 31 foreigners from 14 countries.
- Schools, universities and workplaces were closed. Transport ground to a halt. The agricultural sector was affected by little or no collection of the harvest. The impact on the economy has been massive.
- But 28 April, around 700 confirmed cases had been reported in Sri Lanka with only 7 deaths. The statistics are impressive. Sri Lanka is planning to relax the restrictions by 11 May. That was the end of 1<sup>st</sup> wave.

In Various stages of the epidemic curve what are the methods can be taken to prevent it before reaching the next level?

Stage 1: No cases

Describes a situation with no reported cases in the country and multiple introductions and/or community transmission elsewhere in Europe. At this stage, the main objective for public health measures should be to enable rapid detection and isolation of individual cases to prevent domestic transmission chains, and to prepare for the response once cases are detected in the country.

#### Stage 2: Sporadic

Describes a situation with multiple introductions but limited local transmission in the country. Despite the introductions there is no apparent sustained transmission (only second generation cases observed or transmission within sporadic contained clusters with known epidemiological links). In this situation, the objective is containment of the outbreak by blocking transmission opportunities, through early detection of imported and locally-transmitted COVID-19 cases in order to try to avoid or at least delay the spread of infection and the associated burden on healthcare systems. Delaying the start of local transmission will allow the current influenza season to end, freeing up some healthcare capacity.

#### Stage 3: Clusters of cases

Describes a situation with increasing number of introductions and of more widespread reports of localized human-to-human transmission in the country (more than two generations of cases outside of sporadic clusters with known epidemiological links). In this situation, the objective remains to contain where practicable and otherwise slow down the transmission of the infection. This will increase the time available for development, production and distribution of PPE and effective therapeutic options, and would play a crucial role in reducing the burden on the healthcare system and other sectors, particularly if wider transmission of COVID-19 is delayed beyond the ongoing influenza season. A reduced burden would also allow for more time to increase laboratory capacity, and increase surge capacity in healthcare services. All these measures will facilitate effective treatment of infected patients [44]. Rapid collection and analysis of epidemiological and virological data will enable targeting of measures in this scenario and later.

#### Stage 4: Community transmission

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Describes a situation with localized outbreaks, which start to merge becoming indistinct. In this scenario, there is sustained human-to-human transmission in the country (more than two generations of cases outside of sporadic clusters with known epidemiological links) and an increasing pressure on healthcare systems. The objective at this stage is to mitigate the impact of the outbreak by decreasing the burden on healthcare systems and protect populations at risk of severe disease. At the same time, operational research should guide developing better and more efficient diagnostic and treatment options.

## **DIAGNOSIS AND TREATMENT**

To diagnose COVID 19 we need to do tests. Testing is important to identify those who are infected so that patients can be isolated and onward transmission is prevented and their contacts followed up. There are different type of diagnostic tests available. Some diagnostic tests detect infection and others detect an immune response.

### **THE IMMUNE RESPONSE TO COVID -19 INFECTION**

Corona virus have four structural proteins: the spike, nucleocapsid, envelope, membrane. During an infection the body's immune system makes antibodies that behind themselves to the structural proteins and neutralize the virus. The spike and the nucleocapsid are the main proteins which trigger an antibody response in humans. The most important antibodies in the response are IgM and IgG. IgM antibodies are produced first during response.

### **WHAT DO THE DIAGNOSTIC TESTS FOR COVID-19 DETECT**

#### 1. The virus:

- Viral RNA detected by molecular testing (RT-PCR test)
- COVID-19 viral antigen detected by Antigen test

#### 2. The immune response

- Antibodies against COVID-19 antigen detected by Antibody test

### **RT-PCR TEST (REVERSE TRANSCRIPTASE POLYMERASE CHAIN REACTION)**

Polymerase chain reaction is a process that amplifies a small, well defined segment of DNA many hundreds of thousands of times, creating enough of it to analyze. In RT-PCR first uses reverse transcription to obtain DNA, followed by PCR to amplify that DNA, creating enough to be analyzed. A fluid sample is collected by inserting a long swab in to your nostrils and taking fluid from the back of your nose (nasopharyngeal swab) or inserting a long swab in to the back of your throat or spitting in to a tube to get saliva sample. Disadvantages RT-PCR tests take time and are a costly affair because of its elaborate kit and requires trained staff and labs. Advantages are give accurate results, tests directly for the virus and high specificity rate.

### **ANTIGEN TEST**

The COVID 19 test detects certain proteins in the virus. These tests can produce results in minutes. Because these tests are faster and less expensive than PCR tests, antigen tests may be more practical to use for large numbers of people. First you should collect the sample using nasopharyngeal swab then immerse the nasopharyngeal swab sample in to extraction tube. Then add 3 drops of the processed sample in to the sample well. After 20 min if the sample is positive appear a red line on the control line and a gray green line on the test line. In the conjugate pad these protein particles bind to labeled monoclonal antibody. Then antibody antigen complex continues to move to the right of the strip to the test line. The test line is covered by immobile

SARS COV 2 antibodies and this prevent the lateral movement and if the nucleo capsule protein is present the test line indicate red. If no nucleo capsule proteins present line will not indicate positive. And another line appears next to the test line called control line and it contains labeled antibodies that bind to other antigens normally on the pharynx. Then that line become red and that reveals this test is valid test.

### **ANTIBODY TEST**

A serological blood test is used to detect antibodies in response to the infection. These antibodies last in the body for some time after the infection has passed. Therefore, these tests can inform who has been infected in the past. As the first step blood sample and buffer are added to the test well. Any antibodies contained in the sample will start to flow down the strip. At the conjugation pad marked COVID 19 antigens bind to antibodies. Then this complex continues to move to the right of the strip. In the M line there are Anti human IgM antibodies which prevent the lateral movement of COVID 19 IgM and antigen complex. This causes to IgM line positive. Likewise, if the COVID 19 IgG present that causes to make red the G line. It becomes a valid test when the control line indicate red. Accuracy of this test is very low.

### **TREATMENT**

There is currently no specific treatment for coronavirus. Antibiotics do not help, as they do not work against viruses. While several drug trials are ongoing there is currently no proof that hydroxychloroquine or any other drug can cure or prevent COVID 19. The misuse of hydroxychloroquine can cause serious side effects and illnesses and even lead to death. Micronutrients, such as vitamins D and C and zinc, are critical for well-functioning immune system and play a vital role in

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promoting health and nutritional wellbeing. But these mineral supplements cannot cure COVID 19. Vaccine development is a lengthy and expensive process which normally takes more than years

## **OUTLINE OF THE PRESENTATION**

1. Definitive introduction to COVID 19 virus, reasons to consider it as a pandemic
2. To give an idea about the origin history morphological and physiological factors of SARS 2 COVID 19 virus.
3. To provide information about the epidemic curve its definition and qualitative data according to COVID 19.
4. Stages of the epidemic curve and comparing the strategies used by each country and the results of each methods.
5. The diagnosis tests, their effectiveness and treatment methods.
6. To emphasis the prevention methods that should be most effective in order of controlling spreading in each phase of the pandemic.
7. To educate about the “New normal life” and why it is crucial to adopt to this new concept of lifestyle.



### **The New Normal Life After Covid-19 Pandemic**

Oxford dictionary defines the new normal as an event, or status, or era that previously was unfamiliar, or atypical situation that has become standard, or usual, or expected. Covid-19 pandemic which was first discovered on 17 November 2019 in the Hubei province China it has spread all over the world as a pandemic. Still there is no absolute cure or a vaccine for this disease. It has been almost a year since the most of the world disengaged with the normal lifestyle. Even though human find a cure to this disease we cannot predict what sort of virus or

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pandemics that could be happening in the future. We cannot stop the production or the markets forever. People have to fulfil their needs somehow.

The new standard is to ensure the rapid reaction of the society and organizations and the “Adapting effectively to transition”. This will ensure that the planet is better prepared for the future. Re-emergence after each shock, or crisis or global challenge, with a stronger role.

“The new normal life” is a new concept that is given as a solution for above problems. Basically, concept is to normalize the lifestyle of human in order of preventing future communicable diseases. The changes that has to be made can be categories under 2 categories,

### **1. Personal hygienic measures.**

### **2. Industrial preventive methods.**

#### **1. Personal hygienic measures.**

“prevention is better than cure” as per the above quote it is always better to do everything to be prevented than hoping for a cure. Covid-19 is a communicable disease it is speeded easily a person to person. So, the main strategy that must be used must be increasing personal sanitary methods. These preventive methods must be practiced,

- Avoid the 3Cs: spaces that are closed, crowded or involve close contact.

Crowded spaces or gatherings must be avoided because Covid-19 is a highly contagious disease. In crowded and inadequately ventilated spaces where infected people spend long periods of time together in close proximity, the chances of having COVID-19 are greater. These conditions are where the virus tends to spread more effectively by respiratory droplets or aerosols, so it's much more important to take precautions.

- Meet people outside.

Covid-19 is speeded through air. Better to interact people in a open air rather than closed small area which the virus can be high in quantity.

- Regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water.

Must establish hand washing points in public places as much as possible and people must practice hand washing as a habit.

- Avoid touching your eyes, nose and mouth.

People must start using face masks, face shields, goggles that are medically approved as a day to day wear. Better if they considered it as a part of their attire. There are new products arising that has better protection.

- Cover your mouth and nose with your bent elbow or tissue when you cough or sneeze.
- Clean and disinfect surfaces frequently especially those which are regularly touched

Usage of personal sanitizers must be high.

**2.Industrial preventive methods.**

The main challenge that government or businessmen has is to re-establish production sector and handling employment under the safety measures. The planet has seen a number of unprecedented paradigm changes in since the early days of 2020

About any business line, from massive demand increases in some industries to huge demand increases in some industries.

Absolute reduction of demand in other nations. The planet is getting used to it and the multiple generations. “The New Normal Life” is an era full of challenges and instability, where agility, curiosity, risk mitigation, learning by exploring, learning by doing, but with focus, would be the norm for both survival and competitiveness. These ae some methods that can be used,

- Increase quantity of the employees to work from home

This is the most safest method that can be used for employees. There is no contamination and no interactions with other employees. Empirical economics literature suggests that there are theoretical reasons to associate both higher and lower wages to teleworkers with respect to ‘traditional workers. So, this concept of work from home is still ambiguous and under debate. Recent researches in USA have found that teleworkers in the USA earn a higher wage than the other workers, but results vary by occupation, gender, parental status, and teleworking intensity.

- I. As we discuss the pros and cons of this concept the most prominent factor is that 0% possibility to get infected by co- workers. Social interactions are also remarkably less. Because of that the competency to get infected is very low.
- II. Less expenses for both employees and management. From the employees’ point of view specially cost of travelling is reduced and other expenses such as dining and wardrobe are also very less compared to working from the work station. For the management sector the expenses for the work establishments and other related expenses are low.
- III. Productivity is high as the employees have no interruptions. They are able to adjust the appointments as they are comfortable. High productivity can be expected

There are some disadvantages also

- I. Work capability depends on equipment’s. Recent studies conducted in the USA also find a high correlation between high income levels and high-speed Internet, thus meaning that work from home is easier for relatively rich people. Communication with the co- workers may be less effective than a normal working environment.
- II. Less social interactions can do a negative impact on workers psychological status too.As human are considered as social creatures the separation from society for a long time can decrease individuals productivity too. Researches have shown that it can develop depression and anxiety with in workers because of these conditions.

The chart below shows the positive shift of work from home according to mean value of feasibility and Gini index

Group of employees	Mean value		Gini index	
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	<b>UE</b>	<b>UPE</b>	<b>UE</b>	<b>UPE</b>
Total sample	258.86	97.98	0.004	0.004
Male	473.03	233.81	0.004	0.004
Female	111.02	-33.66	0.002	0.001
Aged	375.75	270.6	0.005	0.008
Aged 36–50	24.07	-82.64	0.001	0.001
Aged 51–64	496.3	250.78	0.007	0.005
Non-graduated	131.15	153.17	0.003	0.003
Graduated	410.91	167.95	0.005	0.000

UE = Unconditional effect

UPE = Unconditional positive effect

## **METHODOLOGY**

Following methods and strategies will be followed and included in the presentation.

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1. Internet, electronic media, articles and written documents were used in collecting data. The data are represented in both qualitative and quantitative aspects in the relevant areas for better understanding of mentioned information.

2. After studying the relevant literature, a presentation will be conducted which will include relevant photographs, videos, audio, clip art etc....

3. A media briefing on COVID 19 will be done.

4. A verbal description about each slide will be presented and a script will be provided before the presentation.

**CONCLUSION**

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**REFERENCES**

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**DS COMMENTS**