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AN OVERVIEW GLOBAL STUDIES ON CORONAVIRUS PANDEMIC (COVID-19)

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Abstract

A virus is a sub microscopic infectious agent that replicates only inside the living cells of an organism. Viruses can infect all types of life forms, from animals and plants to microorganisms, including bacteria and achaea. This year 2020, The world is facing yet another dangerous virus called as Coronavirus Disease 2019 or better known as COVID-19 which is an infectious disease caused by severe acute respiratory syndrome coronavirus (SARS-CoV-2). It was first identified back in December 2019 situating in Wuhan, China, and has resulted in an ongoing pandemic which affects majority of the countries. The common symptoms of this COVID-19 includes fever, cough, fatigue, shortness of breath, and loss of smell and taste. COVID-19 clearly affects a lot of people where countries took measurements to issue an immediate lockdown or movement control order. Many sectors were terribly affected for the past 3 months where a lot of them lost their jobs as the pandemic severely hit most of the country's economic activities. This studies are made to identify the industries which severely affected due to this pandemic and how bad the major economic activities affected due to this pandemic. From the findings five sectors are badly effected such as Tourism (Hotels & Aviation sectors), Entertainments, Retails (marketplace & restaurants), Sports and Financial market sectors. The finding and outcome of this paper will be useful as a knowledge for people on COVID-19 impacts in a country.

Keywords: COVID-19,Virus, Pandemic, Lockdown

1.0 INTRODUCTION

Coronaviruses are a group of related viruses that cause diseases in mammals and birds. In humans, coronaviruses cause respiratory tract infections that can be mild, such as some cases of the common cold (among other possible causes, predominantly rhinoviruses), and others that can be lethal, such as SARS, MERS, and COVID-19[1],[2].

According to previous history pandemics like COVID-19 strike with eerie precision, every 100 years. For example in 1720, the Plague, in 1820, Cholera outbreak, in 1920, Spanish flu, in 2020 Chinese coronavirus. There is a theory that every 100 years, a pandemic happens. At first glance, nothing seems strange, but the accuracy with which these events take place is scary."

Coronavirus are a family of viruses that will cause illness such as respiratory diseases or gastrointestinal diseases. The Respiratory disease can be classified from the common cold to

more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) which was first identified in Saudi Arabia back in 2012 and Severe Acute Respiratory Syndrome (SARS-CoV) which was first identified in Southern China back in 2002. Novel Coronavirus (nCoV) is new discovered strain which has not been identified ever in humans previously. Coronavirus got its name from the way how they look under the microscope and all the type of coronavirus was determined by the scientists and was given the name. Coronaviruses are zoonotic which means that the viruses are transmitted between animals and humans. It has been determined that MERS-CoV was transmitted from dromedary camels to humans and SARS-CoV from civet cats to humans. The source of the SARS-CoV-2 or better known as COVID-19 is yet to be determined, but investigations are ongoing to identify the zoonotic source to the outbreak[3],[4].

Coronavirus Disease (COVID-19) was first identified in late December 2019 which was believed to be originated from the Huanan seafood wholesale market in central Wuhan which has resulted in an ongoing pandemic. This Virus is believed to be the infectious disease caused by a newly discovered strain of coronavirus, a type of virus known to cause respiratory infections in humans. The common symptoms includes fever, cough, fatigue, shortness of breath, and loss of smell and taste. While the majority of cases result in mild symptoms, some progress to acute respiratory distress syndrome (ARDS) possibly precipitated by cytokine storm, multi-organ failure, septic shock, and blood clots. The time from exposure to onset of symptoms is typically around five days, but may range from two to fourteen days [2].

COVID-19 is primarily spread between people during close contact which most often spread via small droplets produced by coughing, sneezing and talking. A Research as of June 2020 has shown that speech-generated droplets during talking may remain airborne for tens of minutes. Less commonly, people may become prone of getting infected by touching a contaminated surface and then touching their face. It is most contagious during the first three days after the onset of symptoms, although spread is possible before symptoms appear, and from people who do not show symptoms. The standard method of diagnosis the COVID-19 is by real-time reverse transcription polymerase chain reaction (rRT-PCR) from a nasopharyngeal swab or better known as Swab Test. Swab Test will be taken and send to the lab for test and the results will be given as soon as the test is done. Chest CT imaging may also be helpful for diagnosis in individuals where there is a high suspicion of infection based on symptoms and risk factors; however, guidelines do not recommend using CT imaging for routine screening [4].

Recommended guidelines suggests to prevent infection by having frequent hand washing habit, maintaining physical distance from others (especially from those with symptoms), quarantine (especially for those with symptoms), covering coughs, and keeping unwashed hands away from the face. Health officials also stated that medical-grade face masks, such as N95 masks, should only be used by healthcare workers, first responders, and those who directly care for infected individuals. The 3-ply surgical mask has also been suggested by the Health officials which has been proven to be as effective as an N95 mask in preventing viral infections like influenza. It helps to reduce the virus and germs. The three-ply material is made up of a melt-blown material placed between the non-woven fabric. The use of cloth face

coverings such as a scarf or a bandana has been recommended by health officials but not encouraged in public settings to minimise the risk of transmissions [5].

According to the World Health Organization (WHO), there are no vaccines nor specific antiviral treatments for COVID-19 yet to be discovered by the scientists at this moment. Management involves the treatment of symptoms, supportive care, isolation, and experimental measures are been decided by each of the Country's Government with guidelines prepared by The World Health Organization (WHO). COVID-19 outbreak has been declared as a public health emergency of international concern on 30 January 2020 and a pandemic on 11 March 2020 [5],[6]

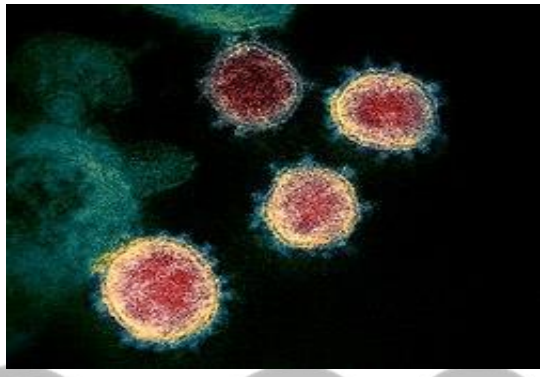

Figure 1: Diagram of False color transmission electron microscope

2.0 Signs and Symptoms

Fever is the most common symptom of COVID-19, but is highly variable in severity and presentation, with some older, immunocompromised, or critically ill people not having fever at all. One of the study stated that only 44% of people had fever when they presented to the hospital, while 89% went on to develop fever at some point during their hospitalization. Someone without fever is also not assured that they are free from the Virus.

Other common symptoms are cough, loss of appetite, fatigue, shortness of breath, sputum production, and muscle and joint pains. Symptoms such as nausea, vomiting, and diarrhoea have been observed in varying percentages. Less common symptoms include sneezing, runny nose, sore throat, and skin lesions. Some cases in China with only chest tightness and palpitations was presented initially. A decreased sense of smell or disturbances in taste may occur. Loss of smell was a presenting symptom in almost 30% of confirmed cases in South Korea. Figure 2 shows the comparison between Covid-19,Flu and Cold[2].

As is common with infections, there is a delay between the moment a person is first infected and the time he or she develops symptoms. This is called as the incubation period. The typical incubation period for COVID-19 is five or six days, but it can range from one to fourteen days with approximately ten percent of cases taking longer. An early key to the diagnosis is the

tempo of the illness. Early symptoms may include a wide variety of symptoms but infrequently involves shortness of breath. Shortness of breath usually develops only within several days after initial symptoms. Shortness of breath that begins immediately along with fever and cough is more likely to be classified as anxiety rather than COVID-19. The most critical days of illness tend to be those following the development of shortness of breath[5].

A minority of cases do not develop noticeable symptoms at any point in time. These asymptomatic carriers tend not to get tested, and their role in transmission is not fully known. Preliminary evidence suggested they may contribute to the spread of the disease. In June 2020, a spokeswoman of WHO said that asymptomatic transmission appears to be "rare," but the evidence for the claim was not released till today. The next day, WHO clarified that they had intended a narrow definition of "asymptomatic" that did not include pre-symptomatic or paucisymptomatic (weak symptoms) transmission and that up to 41% of transmission may be asymptomatic. Transmission without symptoms does occur[6].

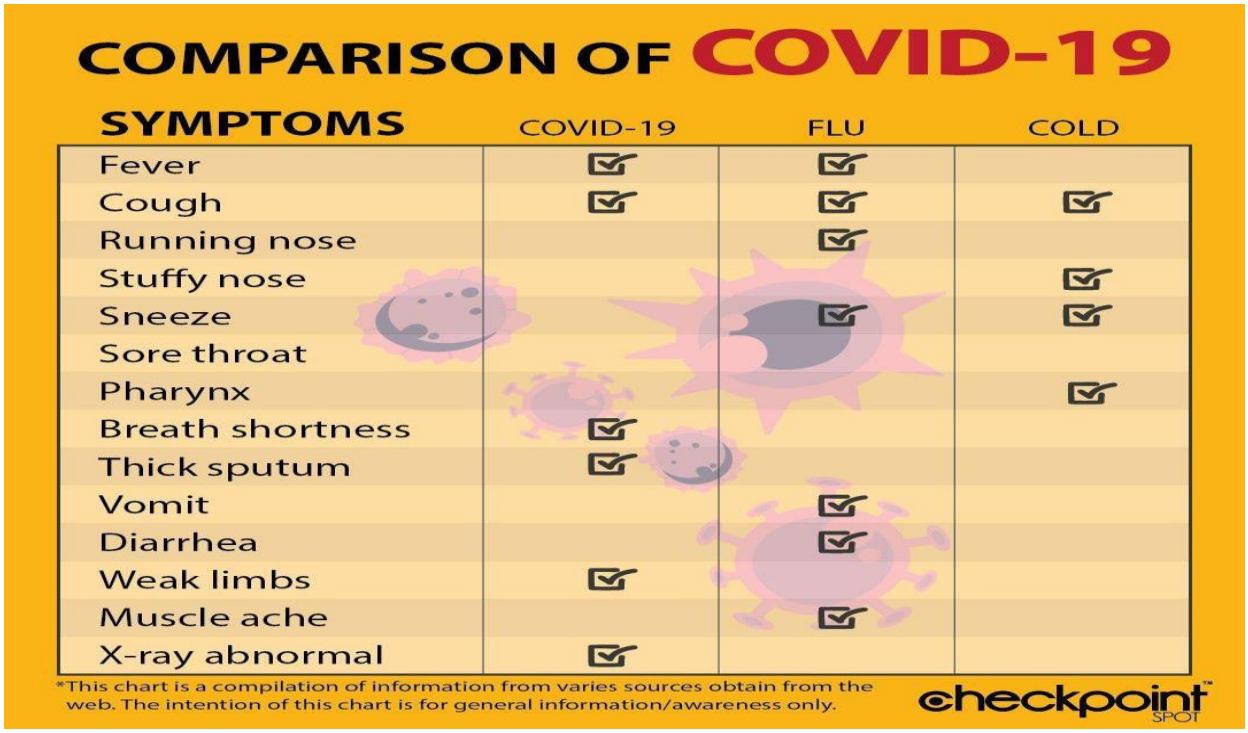

Figure 2: Comparison chart between Covid 19, Flu and Cold

2.1 Complications

Complications may include pneumonia, acute respiratory distress syndrome (ARDS), multi-organ failure, septic shock, and the worst scenario which is death. Cardiovascular complications may include heart failure, arrhythmias, heart inflammation, and blood clots. A study published in The New England Journal of Medicine concluded that "the risk for severe COVID-19 was 45% higher for people with type A blood than those with other blood types[2]

Approximately 20-30% of people who present with COVID-19 have elevated liver enzymes reflecting liver injury. Neurologic manifestations include seizure, stroke, encephalitis, and Guillain–Barré syndrome (which includes loss of motor functions). Following the infection, children may develop paediatric multisystem inflammatory syndrome, which has symptoms similar to Kawasaki disease, which can be fatal[2]

2.2 Transmission

COVID-19 spreads primarily when a people are in close contact and one person inhales small droplets produced by an infected person (symptomatic or not) coughing, sneezing, talking, or singing. The WHO recommends 1 metre (3 ft) of social distance, The U.S. CDC recommends 2 metres (6 ft). People can transmit the virus without showing symptoms, but it is unclear how often this happens. A June 2020 review found the likelihood of those infected that are asymptomatic to be 40-45% [2].

People are most infectious when they start to show symptoms (even mild or non-specific symptoms), but may be infectious for up to two days before symptoms appear (pre-symptomatic transmission). They remain infectious an estimated seven to twelve days in moderate cases and an average of two weeks in severe cases.

When the contaminated droplets fall to floors or surfaces they can, though less commonly, remain infectious if people touch contaminated surfaces and then their eyes, nose or mouth with unwashed hands. On surfaces the amount of active virus decreases over a period of time until it can no longer cause infection, and surfaces are thought not to be the main way the virus spreads. It is unknown what amount of virus on surfaces is required to cause infection via this method, but it can be detected for up to four hours on copper, up to one day on cardboard, and up to three days on plastic (polypropylene) and stainless steel.

Surfaces are easily decontaminated with household disinfectants which kill the virus outside the human body or on the hands. Disinfectants or even bleach are not a treatment for COVID-19, and cause health problems when not used properly, such as when used inside the human body.

Not only that, Sputum and saliva carry large amounts of virus as well. The virus may occur in breast milk, but it's unknown whether it's infectious and transmittable to the baby. COVID-19 is still a new disease, and many of the details of its spread are still under investigation. It spreads easily between people to be detailed easier than influenza but not as easily as measles. Estimates of the number of people infected by one person with COVID-19 (the R0)

have varied widely. The WHO's initial estimates of the R0 were 1.4-2.5 (average 1.95), however a more recent review found the basic R0 (without control measures) to be higher at 3.28 and the median R0 to be 2.79 [6]

2.3 Diagnosis

The WHO has published several testing protocols for the disease. The standard method of testing is real-time reverse transcription polymerase chain reaction (rRT-PCR). The test is typically done on respiratory samples obtained by a nasopharyngeal swab; however, a nasal swab or sputum sample may also be used. Results are generally available within a few hours to two days. Blood tests also can be used, but these require two blood samples taken two weeks apart, and the results have little immediate value. Chinese scientists were able to isolate a strain of the coronavirus and publish the genetic sequence so laboratories across the world could independently develop polymerase chain reaction (PCR) tests to detect infection by the virus. As of 4 April 2020, antibody tests (which may detect active infections and whether a person had been infected in the past) were in development, but not yet widely used. The Chinese experience with testing has shown the accuracy is only 60 to 70%. The US Food and Drug Administration (FDA) approved the first point-of-care test on 21 March 2020 for use at the end of that month.

Diagnostic guidelines were released by Zhongnan Hospital of Wuhan University suggested methods for detecting infections based upon clinical features and epidemiological risk. These involved identifying people who had at least two of the following symptoms in addition to a history of travel to Wuhan or contact with other infected people: fever, imaging features of pneumonia, normal or reduced white blood cell count, or reduced lymphocyte count. A study asked hospitalised COVID-19 patients to cough into a sterile container, thus producing a saliva sample, and detected the virus in eleven of twelve patients using RT-PCR. This technique has the potential of being quicker than a swab and involving less risk to health care workers (collection at home or in the car) [2].

Along with laboratory testing, chest CT scans may be helpful to diagnose COVID-19 in individuals with a high clinical suspicion of infection but are not recommended for routine screening. Bilateral multilobar ground-glass opacities with a peripheral, asymmetric, and posterior distribution are common in early infection. Subpleural dominance, crazy paving (lobular septal thickening with variable alveolar filling), and consolidation may appear as the disease progresses.

In late 2019, the WHO assigned emergency ICD-10 disease codes U07.1 for deaths from lab-confirmed SARS-CoV-2 infection and U07.2 for deaths from clinically or epidemiologically diagnosed COVID-19 without lab-confirmed SARS-CoV-2 infection[2]

Figure 3: Demonstration of a nasopharyngeal swab for COVID-19 testing

Figure 4: CDC rRT-PCR test kit for COVID-19

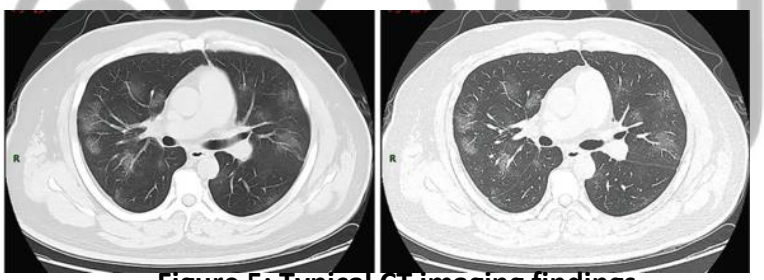

Figure 5: Typical CT imaging findings

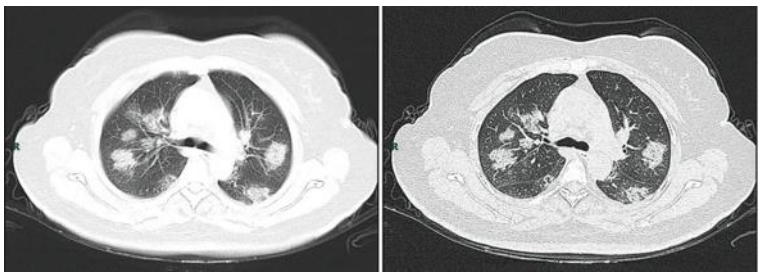

Figure 6: CT imaging of rapid progression stage

3.0 Countries Impacted the most with COVID-19

As per 3 July 2020, The total COVID-19 cases all around the world stated in www. worldometers.com is a total of 11,034,055 cases consisting of 215 countries. The country which is impacted the most till date is United States of America with 2,839,301 cases in total and 131,545 deaths reported. Next up after United States of America, is Brazil who is on the 2nd position of countries which badly impacted due to COVID-19 with a total of 1,502,424 cases and 62,045 deaths reported. After Brazil, The Country that is at 3rd position of badly impacted due to COVID-19 is Russia with 667,883 cases and 9,859 deaths reported. The country in 4th position is India with 633,381 cases and 18,320 deaths reported. After India,

Spain is at the 5th position with 297,183 cases and 28,368 deaths reported. Figure 6 is the table of statistics consisting of First 30 Countries with the Total Number of Cases, Total Deaths, Total Recovered, Active Cases of COVID-19 and Number of Population for each of the country[7]

#	Country, Other	Total Cases	Total Deaths	Total Recovered	Active Cases	Population
	World	11,034,055	525,159	6,187,122	4,321,774	
1	USA	2,839,301	131,545	1,191,892	1,515,864	331,012,864
2	Brazil	1,502,424	62,045	916,147	524,232	212,566,422
3	Russia	667,883	9,859	437,893	220,131	145,934,960
4	India	633,381	18,320	383,936	231,125	1,380,048,586
5	Spain	297,183	28,368	N/A	N/A	46,754,922
6	Peru	292,004	10,045	182,097	99,862	32,972,385
7	Chile	284,541	5,920	249,247	29,374	19,116,840
8	UK	283,757	43,995	N/A	N/A	67,887,996
9	Italy	240,961	34,818	191,083	15,060	60,461,036
10	Mexico	238,511	29,189	142,593	66,729	128,936,700
11	Iran	235,429	11,260	196,446	27,723	83,994,819
12	Pakistan	221,896	4,551	113,623	103,722	220,885,011
13	Turkey	202,284	5,167	176,965	20,152	84,341,594
14	Saudi Arabia	201,801	1,802	140,614	59,385	34,814,036
15	Germany	196,738	9,064	181,000	6,674	83,785,708
16	South Africa	168,061	2,844	81,999	83,218	59,310,064
17	France	166,378	29,875	76,802	59,701	65,274,533
18	Bangladesh	156,391	1,968	68,048	86,375	164,694,619
19	Colombia	106,110	3,641	44,531	57,938	50,884,429
20	Canada	104,772	8,642	68,347	27,783	37,743,411
21	Qatar	98,653	121	88,583	9,949	2,807,805
22	China	83,542	4,634	78,499	409	1,439,323,776
23	Egypt	71,299	3,120	19,288	48,891	102,331,672
24	Sweden	70,639	5,411	N/A	N/A	10,099,585
25	Argentina	69,941	1,403	25,224	43,314	45,197,263
26	Belarus	62,997	412	49,909	12,676	9,449,297
27	Belgium	61,727	9,765	17,073	34,889	11,589,926
28	Indonesia	60,695	3,036	27,568	30,091	273,531,943
29	Ecuador	59,468	4,639	28,032	26,797	17,643,190
30	Iraq	56,020	2,262	29,600	24,158	40,219,503

Figure 7: Statistics of the First 30 countries which is badly impacted due to COVID-19 [7]

As the COVID-19 threatens the global civilization, the governments are introducing various forms of lockdowns with India, China, France, Italy, New Zealand and being United Kingdom some of the countries to have implemented some of the most restrictive mass quarantines. It is being reported that more than a third of the planet's population is under some form of restriction as the World Health Organization calls on "all countries to continue efforts that have been effective by implementing preventive measure in limiting the number of case and slowing the spread of the virus."

The most recent studies produced by the Institute for Social and Economic Research (ISER) at the University of Essex suggest that more than half of the jobs in different sectors of the United Kingdom economy are at risk. With nearly seven million jobs under question if lockdown continues for months ahead of us, the consequences could be damning. The New York Times is reporting that COVID-19 crisis has pushed more than 16 million American out of work in three weeks' time. The experts from Northwestern, Stanford, the University of Chicago and Boston University are predicting the sharpest economy contraction since 1946.

Strict limitations, quarantines and restrictions have resulted in a business slowdown and shutdown with some industry branches suffering more than others. And as the world awaits the COVID-19 vaccine in anticipation, here is the list of 5 industries that have been most affected by coronavirus lockdowns [8].

3.1.1 Tourism

The travel and tourism industry has been severely affected by COVID-19. As soon as the World Health Organisation (WHO) have declared it a pandemic, the countries around the world have started closing borders and inducing transport limitations. Moreover, people themselves are avoiding travel unless necessary. Therefore, the leisure industry has been negatively impacted as summer resorts went through lockdowns and closures. Moreover, the airline industry is another closely related branch to suffer from coronavirus spread. Global airlines could lose no less than $113 billion in sales if the virus continues to spread according to the International Transport Association [8].

3.1.2 Sports

The dramatic spread of the pandemic has led to sports events across the planet being postponed and ultimately cancelled. The 2020 Summer Olympics have been rescheduled to 2021, while the 2020 UEFA European Championship - originally planned to be held across 12 different countries and as many cities - has also been pushed to next summer. Sports suspensions have had a significant impact on the entertainment aspect of the industry but the fans of football, basketball, Formula 1 and other sports are not the only ones affected. The COVID-19 spread has also hit people working in the industry and surrounding industries as well, such as sports betting. Sports bookmakers are as eager as fans and supporters to see the end of the pandemic which will most likely result in sports competitions being held behind closed doors for quite some time [8].

3.1.3 Entertainment

With large gatherings seen as triggering points for virus spreads, sports competitions are not the only leisure sector adversely affected by the virus. Disney and Universal Studios have shut down theme parks indefinitely as self-isolation gains pace across the world. Concerts, music festivals, movie theatres and art galleries have all taken a huge hit during these difficult times. Fortunately, some of these sub-industries have found a way to override the virus by moving their operations online. Art galleries and museums are opening their virtual doors to the world, while the musicians are gathering in relief concerts ad performances [8].

3.1.4 Retail, Marketplaces, Restaurants

Malls and shopping centers belong to the same category. The retail industry and its social aspect have been affected as people distance themselves from crowded spaces. People are ordering their necessities online and doorstep delivery has now blossomed. Restaurants and marketplaces are trying to make the most of hyperlocal delivery with food, medicine, grocery etc. all gaining momentum. Contact-less delivery and doorstep drop-offs are becoming a huge thing at the moment [8].

3.1.5 Fintech

Financial markets as a whole are expected to sustain the biggest blow during the pandemic. The Fintech sector has suffered a drop in all-level transactions as people keep spending less as lockdowns become tighter. A low transaction rate has led to a major dip in the value of cryptocurrencies such as Bitcoin or Ethereum. At the same time, regular currencies are going through major shifts as well. Foreign exchange market has been experiencing dramatic swings. Similar scenarios have been played in stock exchanges and oil markets. Panicked investors have reacted and nations around the globe have been forced to spend in order to tackle the global fallout [8].

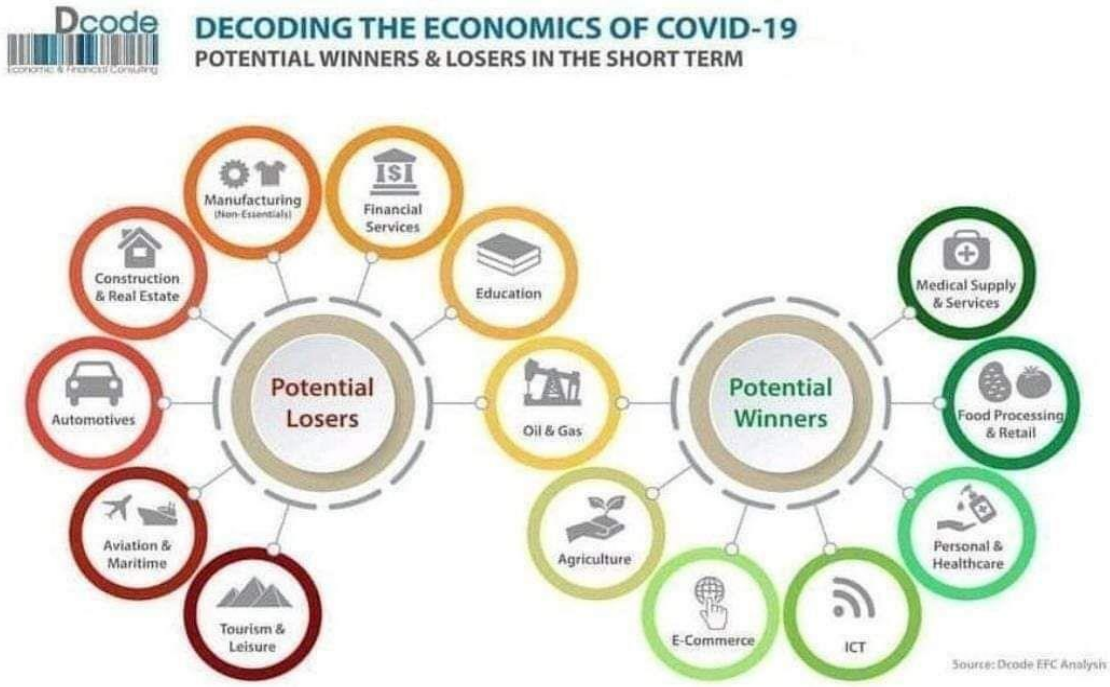

Figure 8: Diagram of decoding of economics in various sector due to Covid-19 [8]

4.0 Prevention

A COVID-19 vaccine is not expected at this moment till 2021 at the earliest. The US National Institutes of Health guidelines do not recommend any medication for prevention of COVID-19, before or after exposure to the SARS-CoV-2 virus, outside the setting of a clinical trial. Without a vaccine been delivered to the public, other prophylactic measures, or effective treatments, a key part of managing COVID-19 is trying to decrease and delay the epidemic peak, known as "flattening the curve". This is done by slowing the infection rate to decrease the risk of health services being overwhelmed, allowing for better treatment of current cases, and delaying additional cases until effective treatments or a vaccine become available. “Flattening the curve" method is right now considered as one of the best controlled way to overcome this Pandemic [6],[7]

Preventive measures should be followed by the People to make sure chances of getting infected will be kept minimal. This to make sure that the chances of infection will be reduce which includes staying at home, wearing a mask in public, avoiding crowded places, keeping distance from others, washing hands with soap and water often and for at least 20 seconds, practising good respiratory hygiene, and avoiding touching the eyes, nose, or mouth with unwashed hands.

The US Centres for Disease Control and Prevention (CDC) and the World Health Organization (WHO) recommend individuals wear non-medical face coverings in public settings where there is an increased risk of transmission and where social distancing measures are difficult to maintain. This recommendation is meant to reduce the spread of the disease by asymptomatic and pre-symtomatic individuals and is complementary to established preventive measures such as social distancing. Face coverings limit the volume and travel distance of expiratory droplets dispersed when talking, breathing, and coughing. Many countries and local jurisdictions encourage or mandate the use of face masks or cloth face coverings by members of the public to limit the spread of the virus [2]{6}

Masks are also strongly recommended for those who may have been infected and those taking care of someone who may have the disease. When not wearing a mask, the CDC recommends covering the mouth and nose with a tissue when coughing or sneezing and recommends using the inside of the elbow if no tissue is available. Proper hand hygiene after any cough or sneeze is encouraged to make sure that the person won't get infected if he/she touches their face immediately after coughing or sneezing[5].

Social distancing strategies aim to reduce contact of infected persons with large groups by closing schools and workplaces, restricting travel, and cancelling large public gatherings. Distancing guidelines also include that people stay at least 6 feet (1.8 m) apart. After the implementation of social distancing and stay-at-home orders, many regions have been able to sustain an effective transmission rate ("Rt") of less than one, meaning the disease is in remission in those areas[2]

The CDC also recommends that individuals wash hands often with soap and water for at least 20 seconds, especially after going to the toilet or when hands are visibly dirty, before eating and after blowing one's nose, coughing or sneezing. The CDC further recommends using an alcohol-based hand sanitiser with at least 60% alcohol, but only when soap and water are not readily available. For areas where commercial hand sanitisers are not readily available, the WHO provides two formulations for local production. In these formulations, the antimicrobial activity arises from ethanol or isopropanol. Hydrogen peroxide is used to help eliminate bacterial spores in the alcohol is "not an active substance for hand antisepsis". Glycerol is added as a humectant.

Those diagnosed with COVID-19 or who believe they may be infected are advised by the CDC to stay home except to get medical care, call ahead before visiting a healthcare provider, wear a face mask before entering the healthcare provider's office and when in any room or vehicle with another person, cover coughs and sneezes with a tissue, regularly wash hands with soap

and water and avoid sharing personal household items. This method will help to keep an individual from getting the COVID-19 infection at minimum risk [2].

5.0 Conclusion

From the detailed analysis, we can conclude that COVID-19 is a Pandemic which basically impacted not only human lives but also many countries economy very severely. This Pandemic had put many countries on Lockdown and till date the number of people who are infected with the Virus is keeping on increasing where there is not even one COVID-19 Vaccine been produced successfully. Many of the Countries has taken different measures to make sure the people are protected from COVID-19 such as Implementing Standard Operating Procedure (SOP) for the Industrial Sectors, Schools, Colleges, Restaurant and other facilities. Peoples are also required to follow the prevention steps such as Wearing a Mask when going out, Practice Social Distance, sanitize your hand often and other precautions to make sure the risk of getting the infection kept at minimum. Besides this there are much lesson we learn from this outbreak such as we can do business online, use cashless payment in daily life, good to have social distancing, we can increase number of internet user, the important of Big Data, drone can be used as delivery tool, focus on local economy, Agriculture as source of local economy, produce more food crops and livestock- make use of our empty land, we can preserve mother nature, we have time to spent with your family members and be always clean because cleanness is utmost tool for healthy life.All this procedures can be classified as new normal for this era. By following the steps and adhering to all the rules and precautions been given by each of the respective authority, COVID-19 Pandemic can be overcome successfully. Further analysis can be adapted for future research on COVID-19 Vaccine Development.

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