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Health and economic shocks of COVID-19

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Abstract
The novel coronavirus is both something old and something new. As usual, the pandemic is both health and economic shock, but the fact that it has hit China first and hardest, and its impact of health and economy broadly. This paper examines the origin and historical back occurrences of the diseases. It focuses on the demand and supply of medical resources available to victims of COVID19 and statistical forecast. Several confirmed cases and deaths took place up to April 10, 2020, in top-ten most affected countries by the disease. The top-ten countries are USA, Spain, Italy, France, Germany, China, UK, Iran, Turkey and Belgium. The pandemic impact on expected 6.7 per cent of working hours will be wiped out. Almost 1.25 billion workers are at high risk of drastic devastating increases in layoffs. The informal sector, daily wage earners, migrants, will be drastically affected and suggested proper mitigation plan.

Keywords: novel coronavirus, health and economic shock, employment and physical distance

1. Introduction
Severe acute respiratory syndrome coronavirus-2 is the causative agent of the 2019 novel coronavirus disease pandemic, which originated from Wuhan in China and has now spread to 6 continents including more than 214 countries. A coronavirus is a group of viruses categorized into alphacoronavirus and betacoronavirus, often causing cold and other mild upper respiratory tract infections in the human body. Alphacoronavirus consists of HCoV-229E and HCoV-NL63; Betacoronavirus consists of HCoVOC43 and HCoV-HKU1. Nevertheless, the rare form would be lethal such as SARS, MERS and COVID-19. SRAS-CoV, MERS-CoV and SARS-CoV-2 are betacoronavirus. However, SARSr-CoVs belong to the subgenus Sarbecovirus (previously lineage B) of genus Betacoronavirus and occupy a unique phylogenetic position. It is the most lethal Law (2020).

2. Importance
This study presents the etymology, the discovery of Coronavirus first set of estimates of predicted health service utilization and deaths due to COVID-19 and its effects of economic by day for the next four months for different countries.

3. Objectives
To understand novel Coronavirus and its historical background. To project demand for hospital services due to COVID-19 in different countries and to assess the potential economic impact of COVID-19 and proper mitigation plans.

4. Design and Setting
This study used data of confirmed COVID-19 cases, deaths by day from WHO websites and local and national governments; data on hospital capacity and utilization of different countries; and observed COVID-19 utilization data from select locations to assess statistical forecasting on death, hospital utilization against capacity by different countries, the impact of economic of COVID-19 and proper mitigation plans to make flutter curve.

5. Etymology
The name "coronavirus" is derived from Latin ***corona***, meaning "crown" or "wreath". The name refers to the characteristic appearance of virions by electron microscopies, which have a fringe of large, bulbous surface projections creating an image reminiscent of a crown or a solar corona. This morphology is created by the viral spike peplomers, which are proteins on the surface of the virus.
World Health Organisation named it COVID-19 (coronavirus disease 2019) as the name of this new disease on February 11, 2020, on the recommendation of the International Committee on Taxonomy of Viruses (ICTV). COVID-19 is a disease and virus is Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) WHO (2020). COVID-19 has become one of the most virulent, dangerous, and fatal RNA viruses known to humanity, having killed over 86 thousand people so far. Despite this massive death toll, more favourable outcomes are much more common.
As of April 9 2020, about 14 38 994 lakh positive cases have been identified, Europe stands first with759 442 the confirmed cases, followed by America, Western Pacific, Eastern Mediterranean, South-East Asia and Africa are 454 710, 115 852, 85 350, 11 576, and 8 686 respectively.
The virus mainly spreads between people through airborne droplets (such as from coughs, sneezes, spit, laughter, or talking). It can also transfer from infected surfaces to the mouth, eyes, or nose through direct contact or intermediate contact via the hands. Symptoms may appear from 3 days to 13 days after exposure or longer Reddy (2020) [23].

6. Discovery of Coronavirus
Coronaviruses were first discovered in the 1930s when an acute respiratory infection of domesticated chickens was shown to be caused by infectious bronchitis virus (IBV). In the 1940s, two more animal coronaviruses, mouse hepatitis virus (MHV) and transmissible gastroenteritis virus

(TGEV), were isolated.

Human coronaviruses were discovered in the 1960s. The earliest ones studied were from human patients with the common cold, which was later named human coronavirus 229E and human coronavirus OC43. Other human coronaviruses have since been identified, including SARS-CoV in 2003, HCoV NL63 in 2004, HKU1 in 2005, MERS-CoV in 2012, and SARS-CoV-2 in 2019. Most of these have involved severe respiratory tract infections.

According to the South Morning China Post (2020), a 55-year-old individual from Hubei province in China may have been the first person to have contracted COVID-19, the disease caused by the new Coronavirus spreading across the globe. That case dates back to November 17, 2019, and the first case was recorded on December 1 2019.

7. Review of earlier studies

Studies related to SARS

Severe acute respiratory syndrome, or SARS, is a contagious and potentially fatal respiratory illness. It first appeared in China in November 2002 and was identified in February 2003. SARS spread to over 24 countries before it was contained. Since May 2004, no new cases have been reported. From November 2002 to July 2003, there were 8,098 cases worldwide and 774 deaths. SARS is extremely contagious, and many wore face masks during the last outbreak in 2002. The SARS coronavirus (SARS-CoV) causes SARS. A coronavirus is a common form of a virus that typically causes upper-respiratory tract illnesses. The typical cold results from a kind of Coronavirus. Six different kinds of Coronavirus are known to infect humans. Four of these are common, and most people will experience at least one of them at some time in their life, James (2017) [10].

People maximize they are well-being by choosing levels of prevention and strategies concerning their constraints. A national survey by the Harvard School of Public Health Project was conducted to gauge public reaction to social distancing and other non-pharmaceutical interventions that might be enforced during a severe pandemic Blendon (2008) [3]. A study by Chris believed that activities such as governmental policies and media campaigns that urge the public to modify their behaviour in order to reduce exposure to an infectious disease are likely to reduce significantly epidemic attack rates. The closing schools mitigate an epidemic better than the provision of antiviral kits. The governmental actions of school closure are more effective although less economically efficient in preventing infections than the distribution of antiviral kits Chris Barrett (2011) [5]. Diseases that are carried in the air through coughing, sneezing or even breathing, such as measles, tuberculosis (TB), whooping cough and pneumonia. Today there are 12 million TB cases (an average of 70%). Over 1.2 million cases are added every year, and 37 000 cases of measles are reported every year Lal (2012) [13].

Studies related to MERS

Recent epidemiological models have explored various mitigation strategies for pandemic influenza in the United States. This study by Germann has shown the likely effectiveness of targeted antiviral use, low-efficacy vaccines, and nonmedical interventions such as school closure, case isolation, and household quarantine in reducing peak or cumulative illness attack rates, even for highly transmissible viruses Germann (2006) [7]. In a patient with MERS-CoV infection, the patient owned a farm with camels and goats. There were reports of illness affecting the goats, and the patient had no direct contact with animals. However, he ate goat meat and was in contact with an animal caretaker who had respiratory tract disease Buchholz (2012). The origin of SARS-COV and MERS-CoV is thought to be an animal source with subsequent transmission to humans. The identification of both the intermediate host and the exact route of transmission of MERS-CoV is crucial for the subsequent prevention of the introduction of the virus into the human population. Appropriate initial isolation of MERS-CoV patients would prevent the transmission in the healthcare setting Jaffar (2014) [11].

Studies related to sanitation

In developing countries, only 30% of household members wash their hands before preparing food or after defecation. In some countries, the rate is as low as zero World Bank, (2005). Severe health shocks such as the H1N1pandemic in Mexico led to a long-lasting improvement in health outcomes by reducing diarrhoea cases among young children. Several placeboes and robustness checks validate our difference-in-difference identification strategy and strengthen the interpretation of our estimates as causal Jorge (2017) [12]. Personal behaviour during an epidemic depends on an individual's socio-economic status as well as their perception of the epidemic in the community Fischhoff (1997) [16]. A study on sanitation, more than 87 per cent of banjaras are openly defecating at roadsides, open agricultural fields, nearby canal and bank of canal and rivers Lal (2015) [14]. The word Hygiene has evolved from the Greek term “Hygeia” which means “Goddess of Health”. Hygiene can be defined as, the science and art which is associated with the preservation and promotion of health Lal (2016) [15].

The Global Burden of Disease study (1997) estimated that in 1990, alcohol was responsible for 773 600 deaths, 19.3 million years of life lost and 47.7 million disability-adjusted life years lost worldwide. The level of harm is related to the pattern, including the level of drinking in a country, with overall mortality rising by 1.3percent for every extra litre of pure alcohol consumed per capita Naik (2013) [21]. In terms of water, there is a much more favourable scenario, as the report finds that significant progress has been made in this area as it is the first time where the number of people without improved drinking-water has dropped below 1 billion. More than half of the global population now benefits from piped water reaching their homes, and the numbers using unimproved water supplies are going down Kavitha (2013) [13]. Severe Symptoms: Headaches, Blurred and distorted vision, Cough and shortness of breath, Persistent white spots or unusual lesions on your tongue or in your mouth, Soaking night sweats, Shaking chills or fever higher than 100 F (38 C) for several weeks, Chronic diarrhoea, Persistent, unexplained fatigue, Weight loss, Skin rashes Lal (2017) [16].

Studies related to economic issues

A growing literature in economics is studying the role that information plays on health behaviours as a salient input in the production of health outcomes Cawley and Ruhm (2011). In order to plan and respond proportionately to such pandemics, public health officials need to have a systematic

assessment of the socio-economic and health impact of the disease, interventions, and other mitigation efforts Blendon (2008) [3]. Resource use estimated resource use related to the treatment of illness separately for children and adults, as well as resource use related to prophylaxis, including school closure. The findings included physician visits, hospitalizations, use of antibiotics, and use of over-the-counter medicines. For pre-vaccination and TAP, included both drug and delivery costs, Beate Sander (2009) [2].

The SARS outbreak was also perhaps the first instance of a concurrent global concern for the economic impact that might result (previous concerns, such as those surrounding Foot and Mouth disease, being national or regional). The possible economic impact of SARS was thus also the focus of various estimations and some conjecture. During the outbreak, there was a noticeable downturn in travel and tourism income for many infected countries. It was also anticipated that fear of disease would impact those industries which gather people in public places such as restaurants, cinemas and retail establishments. The adverse effects on GDP, during the SARS outbreak, were demonstrated. Both exports and tourism demonstrate some significant losses for certain Asian countries, Marcus (2008) [20].

Studies on post-disaster employment are critical. Since the urban and rural poor are dependent on their daily wages, they are the groups that are vulnerable to disasters due to the strong correlation between disaster and employment. They added that the standard of living, disposable income, savings, education, health and overall psyche of a society is determined by current levels of employment and unemployment Shama (2007) [25].

The World Bank (2014) reported that an infectious disease could exert an impact on the economy through two channels. First, a direct effect of sickness and mortality can reduce the labour supply temporarily or even permanently. Second, people's fear of contagion can result in behavioural changes where fear of contagion through contact with other people reduces the labour force participation and leads to the closure of workplaces. When an infectious disease like MERS breaks out, its possible impact on a country's labour market and in the broader economy could appear in the form of direct or indirect effects. The direct effects caused by an infectious disease include a decrease in the labour supply of vulnerable groups due to their relatively high morbidity and mortality rate or fear of contagion Lee (2004) [1].

Disasters, such as contagious diseases, can fall on us at any time in an unexpected way. Ayoung (2017) [1] conducted an empirical analysis provides information that can be used to customize policies to support regions that can be negatively impacted by the spillover of epidemics in order to respond against economic stresses. Further, he suggested that to formulate methods through which both urban and rural areas can cooperate to remedy stresses caused by disasters, and further efforts should be made to strengthen the positive aspects of the interrelation between rural and urban areas and to reduce the unexpected negative aspects of such interconnection.

8. Results and Discussion

In light of this background, the researcher is of the view that there is an urgent need to look into the various issues and ramifications beset with the health and economic shocks of a pandemic. Because of this, the researcher intended to carry out the present study.

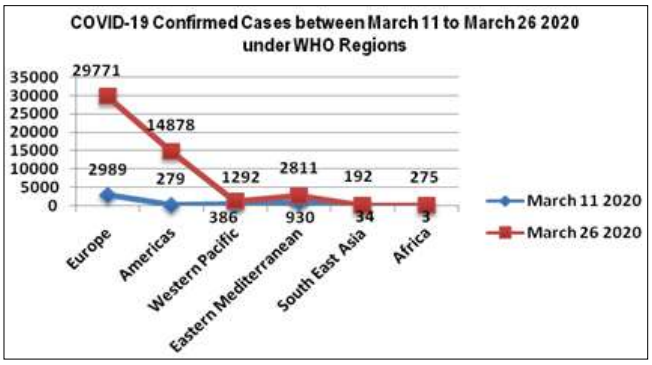

Fig 1: COVID-19 confirmed cases between March 11-26 2020 under WHO Regions

Figure-1, describes confirmed cases between March 11-26 2020 of COVID-19 under World Health Organization (WHO) regions like Europe and America have got 2989 and 279 cases respectively on March 11 2020. Western Pacific and Eastern Mediterranean region are also have got confirmed cases 386 and 930 respectively. Whereas South East Asia and Africa have just started cases and their number is 34 and three. Further, it also provides that from March 11 to March 26, 2020, within 15 days duration cases have increased ten times from 2989 to more than 29771 in Europe, more than 53 times in America region. Western Pacific and Eastern Mediterranean region have increased more than three times, whereas in South East Asia and Africa region have increased 6 and 90 times respectively.

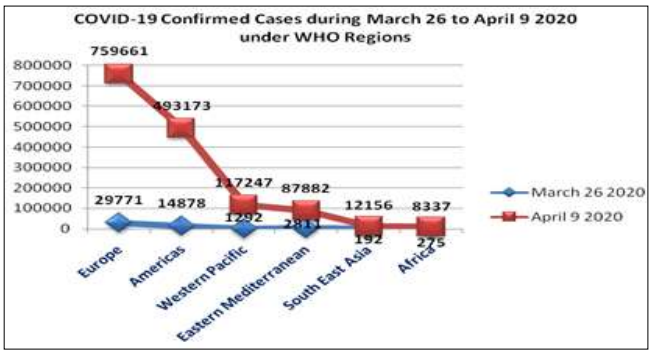

Fig 2: COVID-19 confirmed cases from March 26 to April 9 2020 under WHO Regions

Figure-2 analyzed that COVID-19 confirmed cases recorded from March 26, 2020, to April 9, 2020, within 15 days. Europe and America regions cases have increased by more than 25 and 33 folds. In the Western Pacific and Eastern Mediterranean region increased 90 and 31 folds. And in South East Asia and Africa region increased 63 and 30 folds from March 26 to April 9, 2020, under WHO Regions,

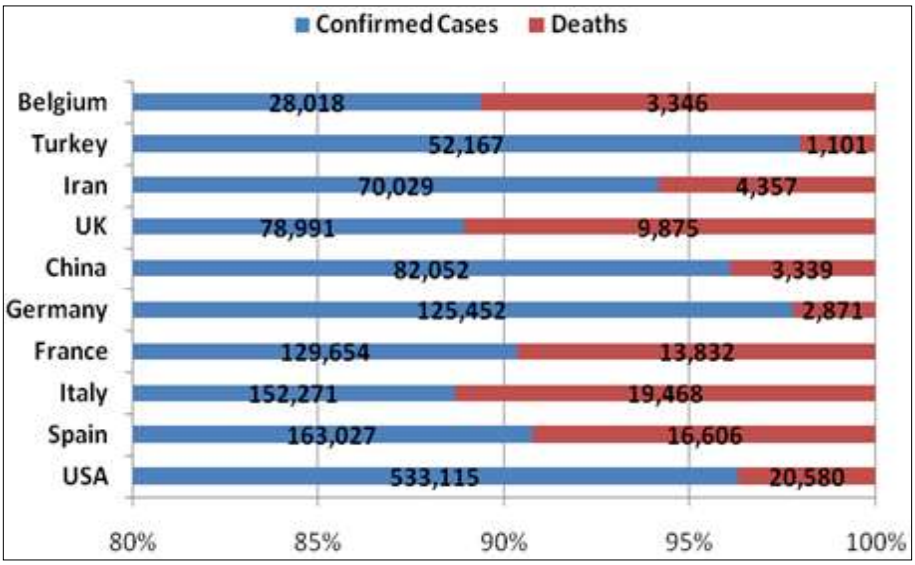

Fig 3: Top-Ten most affected Countries in the Global of COVID19

The above figure-3 provides a detailed account of the top-ten most affected countries on the global of COVID19. The number of confirmed cases and number of deaths has taken place in these ten countries in term of pandemic impact. America is the most affected country in terms of cases and number of deaths, followed by Spain, Italy, France, Germany, China, United Kingdom, Iran, Turkey and Belgium.

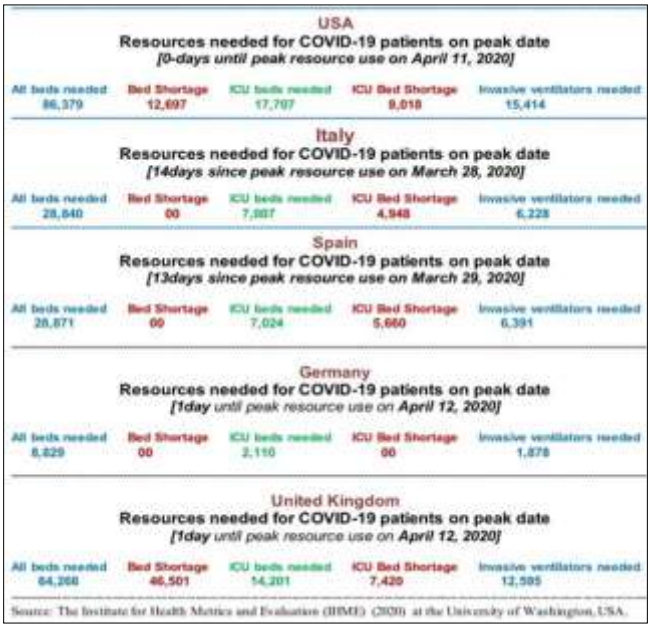

Fig 4: Projection of Resources needed for COVID-19 Patients on Peak date

The figure-4 presents the medical resources and facilities available and shortfall in different advanced countries to patients on the peak date. In the United States of America, all beds needed, beds shortfall, ICU beds needed, ICU beds shortfalls and invasive ventilators needed are 86379, 12697, 17707, 8018 and 15414 respectively. Italy and Spain have sufficient beds but shortage ICU beds and invasive ventilators 4948, 5660 and 6228, 6391 respectively. Germany has sufficient beds and ICU beds but a shortage of invasive ventilators. In UK general patient beds, IUC beds and ventilators are shortage 46501, 7420 and 12595 respectively.

Economic Impacts of COVID-19

The shock hits G7 plus China

This pandemic is different, economically speaking. Previous post-war pandemics hit nations that were at the time far less economically dominant. Moreover, those pandemics were far smaller; the number of COVID-19 case is already eight or nine times larger than the number of SARS cases. At least as necessary is one sobering fact: this time, the hardest-hit nations include the G7 plus China. Medical data changes hourly, but as of April 5 2020, the ten nations hit hardest by COVID-19 is almost identical to the list of the ten largest economies in the world (Iran and India are the exceptions). The US, China, Japan, Germany, Britain, France, and Italy are all in the top-ten most affected by the disease. While China is by far the hardest hit, the last few days have seen an exponential growth of cases in the G7 economies. Taking just the US, China, Japan, Germany, Britain, France, and Italy, they account for 60% of world supply and demand (GDP), 65% of world manufacturing, and 41% of world manufacturing exports. To paraphrase an exceptionally witty quip: when these economies sneeze, the rest of the world will catch a cold Richard (2020) [20].

Reduction in Working Hours

The globally expected 6.7 per cent of working hours will be wiped out in the second quarter of 2020 (equivalent to 195 million full-time workers). Significant reductions are foreseen in the Arab States (8.1 per cent, equivalent to five million full-time workers), Europe (7.8 per cent, or 12 million full-time workers) and Asia and the Pacific (7.2 per cent, 125 million full-time workers).

Massive losses are expected across different income groups but especially in upper-middle-income countries (7.0 per cent, 100 million full-time workers). This far exceeds the effects of the 2008-9 financial crisis. More than four out of five people (81 per cent) in the global workforce of 3.3 billion are currently affected by full or partial workplace closures.

The study assessed, 1.25 billion workers are employed in the sectors identified as being at high risk of “drastic and devastating” increases in layoffs and reductions in wages

and working hours. Many are in low-paid, low-skilled jobs, where a sudden loss of income is devastating. At the regional levels, the proportion of workers in these "at-risk" sectors varies from 43 per cent in the Americas to 26 per cent in Africa. Some regions, particularly Africa, have higher levels of informality, which combined with a lack of social protection, high population density and weak capacity, pose severe health and economic challenges for governments. Overall, for the second quarter of 2020 - from April to June - ILO believes that working hours are likely to decline by 6.7 per cent. Based on a 48-hour working week, this means that 195 million full-time workers are likely to suffer severely, ILO (2020).

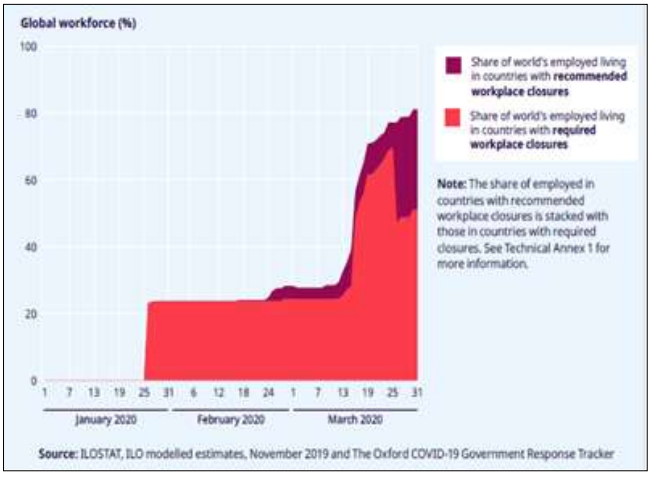

Fig 5: Employment in Countries with Workplace Closures.

The figure shows that employment in countries with mandatory or recommended workplace closures represents 87 per cent of the workforce of upper-middle-income countries and 70 per cent of the workforce in high-income countries. COVID-19 is now also impacting the developing world, where capacities and resources are severely constrained. The COVID-19 crisis is affecting the world's workforce of 3.3 billion. Sharp and unforeseen reductions in economic activity are causing a dramatic decline in employment, both in terms of numbers of jobs and aggregate hours of work.

The Informal Sector

Worldwide, two billion people work in the informal sector (mostly in emerging and developing economies) and are particularly at risk. Workers in four sectors that have experienced the most "drastic" effects of the disease and falling production are food and accommodation (144 million workers), retail and wholesale (482 million); business services and administration (157 million); and manufacturing (463 million). 1q

The impacts already being felt in India, nearly 90 per cent of people working in the informal economy, about 400 million workers in the vulnerable sector at risk of falling deeper into poverty due to the coronavirus crisis which is having "catastrophic consequences", Current lockdown measures there have impacted these workers significantly, forcing many of them to return to rural areas, and faced the risks ILO (2020).

The sectors most at risk include accommodation and food services, manufacturing, retail, and business and administrative activities. The largest sector in most developing countries, risks of food insecurity are now "emerging". This is owing to containment measures, including border closures. "Over time, workers in this sector may be increasingly impacted. The COVID-19 pandemic is disrupting global supply chains and international trade. With nearly 100 countries closing national borders during the past month, the movement of people and tourism flows have come to a screeching halt UNO (2020) [28].

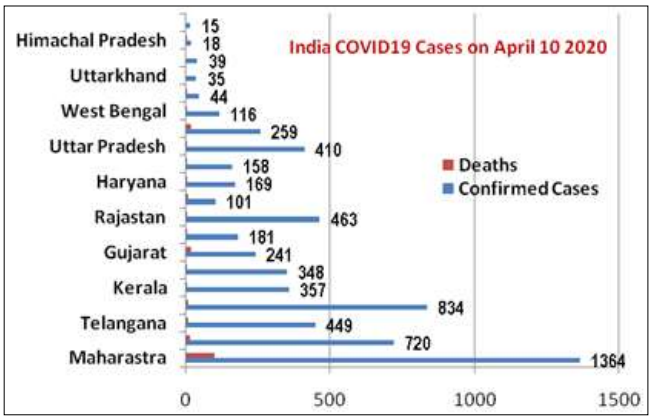

Fig 6

The figure-5, mentioned above, states that India is not a severe suffering country of COVID19 to compare with other G7 countries. However, its economy is adversely affected particularly agriculture, informal sector, daily wage earners and migrants. The cases confirmed hardly 6323 and death toll 232. India has taken an early decision to lockdown and planned safe to prevent measures to control pandemic effects.

The Proper Mitigation Plans

(1) Testing and quarantine; and 2) Social distancing to stop the spread. Draconian mitigation measures, such as total lockdown of hotspots or even entire regions and strict implementation of health advisory (stay home, good Hygiene, follow physical distance so on) can most effectively stop transmission and help flatten the curve. Public awareness, cooperation, and medical preparation are critical to achieving these goals, as per the scientific advice on Corona curve.

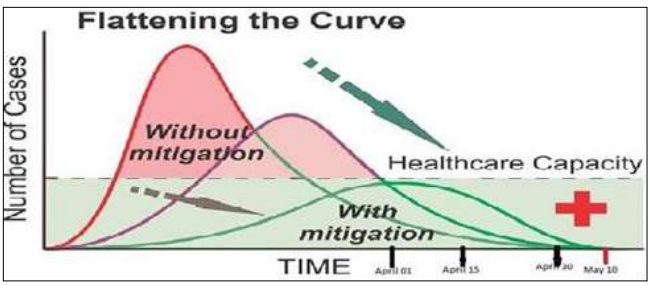

Fig 7

Social and physical distancing, alongside other health practices like washing hands and wearing masks, can save lives. These practices also help protect the people in our community who are on the front lines of this battle, like security personnel and healthcare workers. As we learned from Italy, Spain and the USA, the total number of confirmed cases is lower than the total actual cases because of limited testing. Thus, prevention efforts can have

exponential effects far beyond that of a single spread. Preventing even one infection can mean avoiding dozens or even hundreds of infections later on; these savings can accumulate and eventually stop the outbreak in its tracks Reddy (2020a) [24]

9. Conclusion and Suggestions

The global coronavirus pandemic is moving the world towards a severe and rare disaster. However, it also offers a rare chance for the global community to undertake several policy changes to not only address the short-term public health challenge but also boost the long-term growth potential for the world economy. Following preventive and protective measures like social and physical distances as well as suspected candidates have to be in quarantines are essential measures to avoid Coronavirus and making safe to the family, nation and the world.

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