



Review Article

RISE OF COVID 19 PANDEMIC: MANAGEMENT STRATEGIES AND EFFECT ON HUMAN HEALTH AND WEALTH

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ABSTRACT

The world is currently witnessing a pandemic crisis caused by SARS CoV-2 having its origin in Wuhan, China. Transformation from epidemic to pandemic within a very short time-gap resulting in massive global mortality has created a sudden global deadlock affecting both human health and wealth. Clinical symptoms expressed by affected patients include dry cough, dyspnea, fever, bilateral lung infiltration and ultimately severe acute respiratory distress in advanced stages. The disease is spread over 150 countries and termed as COVID-19 by the World Health Organization (W.H.O). As per W.H.O report on 2nd May 2020 there are over 3000000 infected cases distributed throughout the globe claiming more than 200000 lives. Mortality rate is accelerating at high speed and presently crossing 6%. The entire global healthcare system is exposed and found to be inadequate to mitigate the deadly virus. At present there is no medicine or vaccine available or clinically proven for COVID-19 management. However, the global research spotlight is now focused on development of drugs or vaccine against the virus. This has created a long pipeline of such agents which are now under preclinical or clinical evaluation stage. Some existing drugs are also under efficacy evaluations against COVID-19 whereas some are allowed to be used as a prophylactic measure. WHO has framed clear guidelines for all countries to manage the spread of the virus and these are being implemented through existing government & regulatory bodies of specific countries. The present work will give detailed outline on the pandemic spread, transmission mode, therapeutic strategies and its impact on day to day human life.

Keywords: COVID19, epidemic, pandemic, SARS CoV-2, drugs, vaccines, human health and wealth.

INTRODUCTION

In current scenario Corona virus (SARS- CoV2) is a global threat. Corona virus is not new, it has a diverse family. It causes number of diseases from animals and human also. In case of human it causes the severe respiratory tract infection. It is very common in SARS CoV1. This was first notified in 2002 and diagnosed in China¹. It was transmitted through the human Cov1. After a long 10 years it was again hunted the human world and now the epicenter was Middle East. This disease was called (MERS-CoV)². This was more danger than SARS CoV1. The mortality rate was more than 50% in case of MERS- CoV³. It belongs to the family of *Nidovirales* order. After this W.H.O analyzed everything regarding the new virus and found around 1650 active infected cases that were conformed in laboratory and more than 550 people were reported dead⁴⁻⁵. So that incident was a nightmare for most of the scientist since 2012. These viruses actually infected various human cell and also the animal host cell and replicates. As per the reports some of the major proteins play an important role in case of the replication mechanism. Corona viruses belong to the family named *Coronaviridae* in the *Nidovirales* order⁶. In the virus structure there is a crown like structure in the spike of the virus so that the name was selected as corona virus. It is not very small in size; it has a size range of 65-125 nm in diameter⁷. It contains a single stranded R.N.A with a size 26-32 kbs in length. There are two subdivision or sub families in coronaviridae family, they are *coronavirinae* and *torovirinae*. It is also divided in to four groups they are *Alpha coronavirus*, *Beta coronavirus*, *Gamma coronavirus* and *Delta coronavirus*⁸.

This alpha corona virus mainly causes infection to animals (Bat). Whereas beta corona viruses cause infection with a broad range of mammals mostly rat, human beings (SARS-CoV, HCoV-OC43, HCoV-HKU1, and MERS-CoV, Murine coronavirus (MHV) and Bovine Coronavirus (BCoV). Gama coronaviruses mainly infects the bird. The last one delta corona viruses were created 2012. It also infects mammals and birds. Most of the cases in SARS- CoV1, MERS-CoV, or H1N1 one thing are very common that is the pulmonary tract infection or the respiratory failure, and mortality. It is more lethal in case of old age people, and the people who are continuing with Asthma. After the first phase of the infection in 2019 at the end of the year in 31st December 2019, in Wuhan, China some people were infected with a new virus where the first stage was flu like syndrome with coughing and sneezing. Gradually, it turned to a severe uncontrollable pneumonia⁹. It was spreading like its own. China understood that the disease was very much contagious, but within this phase 4634 people were died and 85077 people were infected in China, after the first diagnosis in Wuhan. It was reported that this corona virus is the β group corona virus¹⁰. A group of researchers in China they diagnosed it the Wuhan virus, and then it was named Novel corona virus (2019-nCov). It was then named COVID 19 or SARS- Cov2 by the International Committee on Taxonomy of Viruses (ICTV). This SARS CoV1 has the past record that it killed more than eight thousand people all over the world with a mortality rate more than 9%. But this time it increases its power and infected till more than twenty lakh people in all over the world and killed more than one lakh fifty thousand people with a mortality rate more than 7.5%. The overall scenario

is really worrisome. Till now there is no vaccine in the world. Some of the research institution and leading pharmaceutical companies are working day and night for invention of a new vaccine. But it will take time. In India the killer virus already affects all over the country and more than twenty thousand people were affected and diagnosed active COVID19 patients. Whereas more than six hundred fifty people were already reported dead. In India the health system is following the guidelines of W.H.O and I.C.M.R. There are different opinions regarding the transmission of the COVID 19. It was spread somehow from the SARS(CoV2) infected bat to human due to consuming food and from infected human to human with the droplets of sneeze and cough. As such there is no treatment of SARS-CoV2, but some of the drugs are in clinical trial. As per W.H.O and I.C.M.R hydroxychloroquine is using with Azithromycin combination. Already it was reported a remarkable record against the COVID 19. India has already sent hydroxychloroquine to the COVID 19 affected countries. This review further elaborates regarding the brief history, origin of the virus, treatment, epidemiology and also its affects to human health and wealth.

BRIEF HISTORY ON COVID 19

Millions of people died due to the pandemics of terrible infectious disease all over the world. One of the well-known names was plague in Asia and in Spain Spanish flu influenza that also killed a million of people and became pandemic. In mid-1970 human race was infected with the deadly viruses named Herpes and viral pneumonia. Then time to time AIDS, Dengue all these viral diseases also infected the world. The last three decades had seen the emergency condition with almost 40 new pathogen most of them are viruses. After that in modern time some new diseases like Nipah, Ebola and the severe acute respiratory syndrome (SARS) are involving in the destruction of human kingdom. So, we are not out of danger. In 2019 the COVID 19, a highly infectious disease was originated from China and it spreads around 150 countries with in a very short time. So, human population continues under threats. According to the report in 1960, corona virus was first identified¹¹. As per the report of a group of scientists, more than 500 patients were identified with flu like syndrome¹². Around 20 peoples were confirmed with corona virus infection with the application of PCR (Polymerase chain reaction) technique. According to reports till 2002, corona virus was treated as normal; the mortality rate was nearly zero. But after that the scenario had become changed and this corona virus was started to spread to different countries like Singapore, Taiwan, and Hong Kong, America¹³. It was reported that a lot of positive case was identified due to the infection of severe acute respiratory syndrome (SARS)/Corona and more than 1000 death was notified all over the world in 2003¹⁴. So, this year was a nightmare for the scientist and associate. After that scientists were

trying to identify the problem, and they had identified a new entity that is Corona virus. Till 8100 people were confirmed with corona virus infection in 2003¹⁵. In 2004 WHO and centers for disease control and prevention declared the ‘State Emergency’. In another report in Hong Kong, around 50 people were infected in flu like syndrome where 30 people were tested corona positive. In 2012 several people of Saudi Arab were reported positive of corona virus and many of them were died¹⁶. That means that virus become a lethal weapon to the human races. In December 2019 corona or COVID 19 was again infected a lot of people in China, Wuhan. Most of them had the common symptom that was flu, sneeze, and cough. After that the number of infected patients became increased, and Wuhan became epidemic. And China became the epicenter of COVID 19. Around 3500 infected patients were died due to corona infection and more than 85000 people were affected in China. But it did not stop here, with in a very short time this corona become pandemics. Till now more than 25,541,380 people were affected across the globe; around 150 countries are suffering in this infectious disease. More than 8,52,000 people were died due to the infection of COVID 19. Till now America, Italy, Spain and Germany are more affected and average more than 20000 people were died in these countries. In our country more than 25,89,682 people are already affected and more than 49,980 were died. In India most of the people were infected due to the close contact with the corona positive patient. In the first stage in India most of the people with a COVID 19 positive had a travel history mostly from America, China and also from Europe.

Pandemic history of COVID 19 spreading

The virus was first reported in China, Wuhan on 31st December 2019, most of the patients had the symptom of pneumonia. 44 patients were detected with in a very short interval in 3rd January 2020 (**Table 1**). After 72 hours China announced that they found a new virus named COVID 19 from Wuhan city sea food market¹⁷. As per the Chinese scientific committee this virus is very contagious. After that on 13th January 2020 ministry of health confirmed that 1 patient was confirm positive in Thailand who was from China. Within a short time Japan also confirmed one Covid positive patient who had a travel history in China. The disease was spreading from China to different countries. On 20th January South Korea confirmed one positive case of Covid 19. On 23rd January the whole world astonished because the first case was confirmed in USA. After that Vietnam reported one positive Covid confirm case who has no recent travel history in China. Slowly this disease became pandemics. From 24th January to 1st February at least 10 more countries were infected by this deadly virus they are like Singapore, Australia, Spain, Cambodia, Germany, Sri lanka etc.

Table 1: Spreading history of Corona from China to different countries from 31st December 2019 to 1st February 2020

SI No	Date (Ranges)	Affected Countries
1	31 st December 2019 to 20 th January 2020	China, Korea, Japan, Thailand, Italy
2	21 st January to 26 th January 2020	America, Malaysia, Australia, France, Vietnam ¹⁸
3	27 th January 2020 to 30 th January 2020	Srilanka, India, Philippines Cambodia, Germany, Spain
4	31 st January 2020 to 1 st February 2020	Russia, Spain, Sweden, UK

Report of W.H.O regarding COVID 19

World health Organization (W.H.O) has already announced that COVID 19 is pandemic. It has already spread more than 140 countries. According to W.H.O in 2019 December 31st in Wuhan

China, some people were diagnosed with flu like syndrome with sneeze and cough and in order it became a severe pneumonia where the shortness of breathing is very much common. After a short time interval, it was announced that the virus was originated from Wuhan fish market somehow.

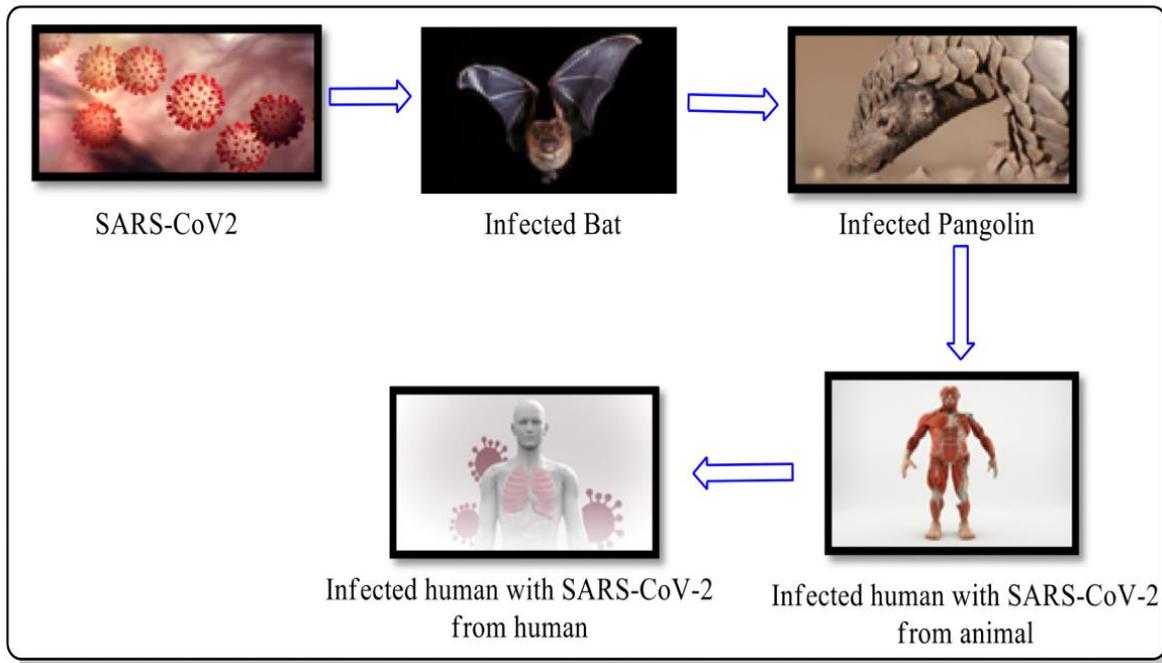


Fig 1: Transmission of SARS- CoV-2 according to W.H.O

Though there was no evidence of the supporting documents. Of course, some review article was published with the report ¹⁹. Between 31st December 2019 to the mid of January 2020 it was only within China and partially affects some of the Asian countries like Singapore, Vietnam, Japan, Korea etc. Peoples from different countries were travelled in international flight from one country to another. That was the first source of infection and some people were actually the carrier of the viruses. Gradually with in the February 2020 the virus almost spread throughout the world. The symptom of the infection was same mostly like flu, cough, sneeze and also the shortness of breath. After observed that, World health Organization took a step that was to stop the international flight from 11th March 2020. But within that time in china the mortality of the disease became increased around 3500 people were died in china and more than 85000 people were affected due to the COVID19 infection²⁰. So, WHO has decided to isolate the infected people from healthy people and also advise to follow the guideline ²¹. In between this time Italy was affected

very badly more than 20,000 people were announced dead and more than 90000 people were hospitalized with a severe condition (**Table 2**). For a while the expert from WHO was reported that the virus may not be alive after the temperature increases more than 28°C. But in a short period, it had also affected Iran and more than 2500 people were announced death, so everything was unstable. With Iran, COVID 19 also infected Spain badly more than 23000, people announced dead. Our country was also in that race, more than 15000 people were affected, and more than 500 people were died till (**Fig 2**)²². But the situation is worse in America more than 35000 people were died and more than 200000 people were infected in this disease ²³. So, for so long mostly the viral diseases affected the developing countries much but in these occasional also affects the rich countries. Tough W.H.O has given a ton of guidelines, but this disease is too contagious to handle. Due to that it is pandemic already as per W.H.O. In the whole world more than 2400000 people were affected and more than 150000 people were died (**Fig 3**)²⁴.

Table 2: List countries affected most by COVID 19 as per W.H.O

Sl No	Jan to April mid	Total death (Approx)	Name of the countries
1	1.1.2020- 15.4.2020	30000 to 35000	America
2	1.1.2020- 15.4.2020	20000 to 22000	Italy
3	1.1.2020- 15.4.2020	18000 to 20000	Spain
4	1.1.2020- 15.4.2020	17000 to 19000	France
5	1.1.2020- 15.4.2020	13000 to 15000	United Kingdom
6	1.1.2020- 15.4.2020	4000 to 5000	Germany
7	1.1.2020- 15.4.2020	5000	China
8	1.1.2020- 15.4.2020	2500	Iran
9	1.1.2020- 15.4.2020	2000	Turkey
10	1.1.2020- 15.4.2020	500	India

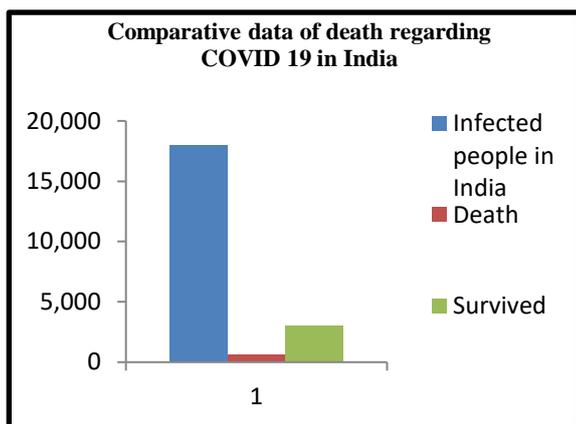


Fig 2: Statistics of death in India as per W.H.O

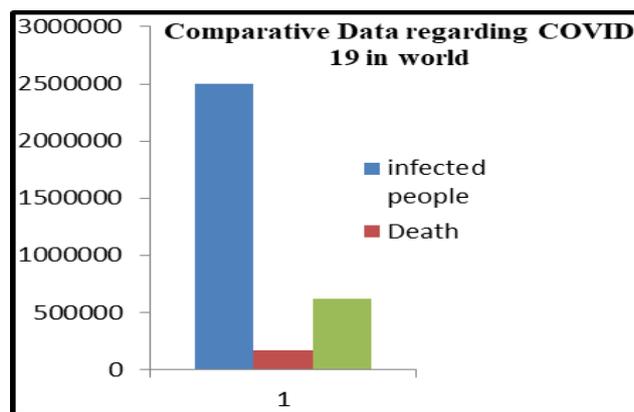


Fig 3: Statistics of death across the world as per W.H.O

But also, there is some good news reported from WHO that is more than 630000 people has already survived. World health Organization has announced about the transmission of this deadly disease. Basically, the transmission had happened due to the family clusters, and also for breaking the rule like not using the sanitizer, or not using the mask. All over the world more than 70 % cases are very nominal to moderate as per the diagnosis. 20 % cases are very severe, rest of 10 % is critical²⁵. This disease has a pattern, it is killing patients with an age between 50 -70 more. The mortality rate is very high in this age. Comparatively younger age has less mortality rate. Whether the mortality rate is remarkably low in case of children²⁶. The onset of action of the virus last between 7 – 12 days if it is infected moderately, if it lasts for more than 14 days it becomes severe to critical. WHO consolidates its basic guidance in different countries with four sections; those who has no cases like travel history, infection etc, no contact with infected persons, those with a scattered cases, those with a clusters like family transmission, relative, and last one is important those with the transmission stage or community transmission (Fig 4). For all same guideline was proposed. The objective was primarily to break the chain of community transmission and to save the millions of lives of people. For the first three cases W.H.O advised to all the countries to take the precautionary measurement, testing, isolation and maintain the social distance. But the last one is dangerous, and it is nearly impossible to control the community spread²⁷. In case of

community spread as per the guideline each of the contacted people should be monitored and isolated. They need the rapid testing. But in India we have 130 crore people, so for this a huge number testing is required, which is nearly impossible. So, many countries mostly Asian countries had taken a step that to stop down everything more than a month to break the chain of COVID 19. The global economy is also in danger as per the report of W.T.O (World Trade Organization) and Organization for Economic Cooperation and Development (OECD)²⁸. So there will be a financial crisis across the world due to the threats of COVID 19. WHO had already done a two days meeting regarding the research and innovation regarding the treatment of COVID 19 on 11-12th Feb 2020 with the expert in Geneva²⁹. In this meeting the discussion was regarding the treatment, research fund, gaps in research and also the infrastructure of the health systems³⁰. After that meeting W.H.O prepared the interim guideline for fighting against this deadly disease. Advised to all use the mask, maintain the social distancing, using hand sanitizer with a minimum 70% alcohol. W.H.O launched some online course also for the general introduction and the epidemiology of COVID 19 for the health care staff. They already prepared a list of medicines, tools and the essential commodity package for all over the world for taking care of COVID 19 patients³¹. W.H.O had made a discussion regarding the effective vaccine against SARS-CoV-2 on 30th January 2020, and they were able to conclude the meeting with a light of hope and specified five promising candidates for vaccine³².

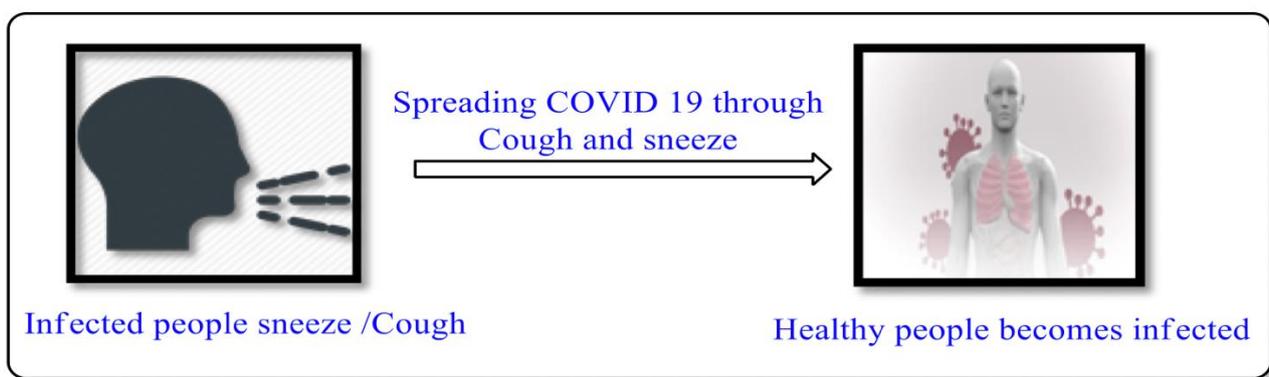


Fig 4: Transmission via airborne droplets (Human to Human)

EPIDEMIOLOGY OF COVID 19

The study of epidemiology helps us to know about transmissibility, severity, and other features of COVID-19. There are three phases to describe the epidemiology of COVID-19.

The first four cases were identified with “pneumonia of unknown etiology” in Wuhan City, Hubei Province, China on 29th December 2019, which were linked to a local Wholesale Seafood Market. This local outbreak by exposure with some sort of contact

history, associated with the Wholesale Seafood Market was marked as the first phase³³.

The second phase was started outside Wuhan on 13th January 2020 with total confirmed cases of 41. It was indicated by spread of the virus within hospitals rapidly and by person-to-person transmission (close-contact transmission). The number of affected people was increased without contact of wildlife exposure or visiting Wuhan and maximum cases of infection were identified among medical people. The disease spreads from Wuhan to other areas in this phase³⁴⁻³⁵.

The third phase was started on 26th January 2020 which was detected by the mass infection with rapid expansion of disease. On 10th February 2020 it was shown that several clustered cases accounted for 50-80% of all confirmed cases in Beijing, Shanghai, Jiangsu, and Shandong³⁶. On 30th January 2020 the number enhanced, and the WHO declared this epidemic a Public Health Emergency of International Concern (PHEIC). On 11th March, 2020, WHO declared Novel Coronavirus Disease (COVID-19) outbreak as a pandemic and reiterated the call for countries to take immediate actions and scale up response to treat, detect and reduce transmission to save people's lives³⁷.

It was clear that the COVID-19 infection happens through exposure to the virus, and both the immunosuppressed and normal population appear susceptible. Some studies have reported that the patient age group was between 25 to 89 years. Most of the adult patients were between 35 to 55 years, and the number of child patients were less than adult³⁸⁻³⁹. It was also identified that people and people with cardiovascular, diabetes, respiratory, carcinoma disease may be at risk because of poor immunity.

As the effective reproductive number (R) of COVID-19 (2.9) is determined to be higher than SARS (1.77) at the early stage, the COVID-19 has been found to have higher levels of transmissibility and pandemic risk than the SARSCoV⁴⁰. The average incubation period of COVID -19 was reported to be 4.8 ± 2.6, ranging from 2 to 11 days and 5.2 days (95% confidence interval, 4.1 to 7). The average incubation period of COVID -19

is 7 days, ranging from 2 to 14 days as per Chinese health authorities⁴¹.

TREATMENT OF COVID 19

Currently, there are no drugs or other therapeutics approved by the US Food and Drug Administration to prevent or treat Coronavirus Disease-2019 (COVID-19)⁴². A number of FDA approved drugs have been studied in randomized controlled trials for COVID-19 and claimed to may be potential. However, Chloroquine sulfate (CQ) and Hydroxychloroquine sulfate (HCQ) is the first only two drugs which have been allowed by FDA for treatment of COVID-19⁴³⁻⁴⁵ and they are currently used as first-line treatment drugs in most of the countries⁴⁶. Previously, Chloroquine sulfate (CQ) and Hydroxychloroquine sulfate (HCQ) are oral prescription drugs that have been used for treatment of malaria and certain inflammatory conditions⁴⁷.

Now, Hydroxychloroquine and chloroquine are under investigation in clinical trials for pre-exposure or post-exposure prophylaxis of SARS-CoV-2 infection, and treatment of patients with mild, moderate, and severe COVID-19. Remdesivir, Hydroxychloroquine, Chloroquine and several other drugs (e.g., investigational antivirals, immunotherapeutic, host-directed therapies) are still under investigation in clinical trials or are being considered for clinical trials of pre-exposure prophylaxis, post-exposure prophylaxis, or treatment of COVID-19 in the United States and worldwide by Centers for Disease Control and Prevention (CDC)⁴⁸⁻⁴⁹.

The present treatment strategies for SERS-CoV-2 (COVID-19)

At present, treatment provided to the affected individuals are mainly symptom based including isolation, oxygen therapy, fluid management, and antibiotics treatment for secondary bacterial infections (Fig 5)⁵⁰⁻⁵¹. Different institutions and research organizations have issued several guidelines for the diagnosis and treatment of novel coronavirus, none of which recommended specific drugs for COVID-19. Some class of pipeline drugs for the treatment of COVID-19 are given below (Table 3):

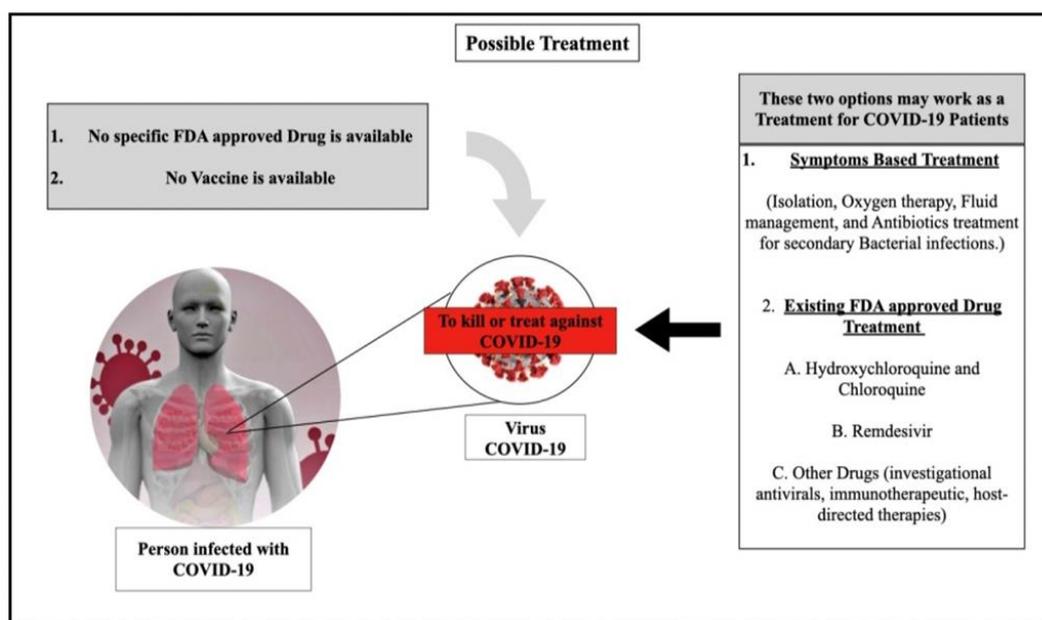


Fig 5: Treatment strategies for SERS-CoV-2 (COVID-19).

Table 3: Classification of some pipeline drugs for the treatment of COVID-19

Sl no.	Class of Drugs	Name of the Drugs	Past evidence	Reference
1	Antiviral drugs	Nucleoside analogues: Remdesivir, Ribavirin Protease inhibitors: Lopinavir/ritonavir Broad-spectrum antiviral: Interferon (IFN) Arbidol (umifenovir) RNA polymerase inhibitors: Favipiravir	Effective against SARS and MERS. Effective against SARS-CoV-1 both in vitro and human studies, approved for HIV-1 treatment. Inhibition of protein synthesis, inactivation of viral RNA, and enhancement of phagocytic and cytotoxic mechanisms. Influenza antiviral drug Broad-spectrum anti-viral against influenza, arenavirus, bunyavirus and filovirus	52-54 55-56 57 58 59-60
3	Anti-inflammatory drugs	JAK-STAT inhibitors: Baricitinib	Approved drug for rheumatoid arthritis	61
4	Immunotherapy	Convalescent plasma therapy Monoclonal antibodies: Tocilizumab, Sarilumab Eculizumab	Virus-neutralising antibodies which will act as a passive antibody therapy. No data on SARS or MERS. (Tocilizumab reduced fever and oxygen requirement in COVID-19, approved for rheumatoid arthritis.)	62 63
5	Corticosteroids	Methylprednisolone		64
6	Antimicrobial agents	Azithromycin		65
7	ACE inhibitors or angiotensin II type I receptor blockers (ARB)			66-67

Other consideration for Immunity boosting

AYUSH - Ministry Of Health, Govt. of India; recommended Ayurveda's immunity boosting measures for self-care during COVID 19 crisis and medicinal plant extracts for treating COVID-19⁶⁸⁻⁶⁹.

For promotion of immunity and help in improving the respiratory symptoms AYUSH - Ministry of Health, Govt. of India; has also published some References for Interventions of different AYUSH systems of medicines⁷⁰.

In literature, some Chinese medicinal plants showed potential results against SARS-CoV, so these plants may work as treatment against SARS-CoV-2,

1. Glycyrrhizin, an active component of liquorice roots, could effectively inhibit the replication of SARS- associated CoV in-vitro⁷¹.
2. Hesperetin, is a natural predominant flavonoid found in citrus fruits. Hesperetin dose-dependently suppresses the cleavage activity of the 3C-like pro- tease (3CLpro) of SARS-CoV in cell-free and cell-based assays⁷².
3. Baicalin, Baicalin, is a flavone isolated from *Scutellaria baicalensis*. It has been shown that baicalin has antiviral activity against 10 clinical isolates of SARS-CoV by neutralisation tests⁷³.

Ongoing clinical trials

As 20 May 2020, according to National Institute of Health, U.S. National Library of Medicine, there are 692 Clinical Trials registered for treatment of COVID-19⁷⁴. Different biotechnological companies, Research institutes have applied for clinical trials to repurpose existing drugs as well as to develop vaccines and drugs to fight against the fast spreading COVID-

19. The major drugs undergoing clinical trials that might have the potential to treat this viral infection are Hydroxychloroquine (in Phase-3), Remdesivir, Lopinavir/ritonavir, Hydroxychloroquine and Azithromycin.

EFFECTS OF COVID 19 ON HUMAN HEALTH AND DEVELOPMENT

Effects on Human health

In most cases, it has been seen that poor and underdeveloped population suffer from communicable diseases. But, outbreak of COVID-19 in developed countries proves that developed people possess not so immunity that they can fight against this disease⁷⁵.

Most of the man-made activities including deforestations, construction of buildings, globalization of food, high density of populations, migration of people, and increasing international travel, hamper the balance of eco-system which may lead to rapid spread of infectious disease⁷⁶.

Frequent climate changes have an effect on human health including increasing air pollution, excessive heat, irregular rainfall, extreme weather changes, as well as through meteorological changes that decrease quality of water, reduce food security and modify vector-borne disease⁷⁷.

Meanwhile, COVID-19 has created major effects on mental health of children and teenagers. Not only them but also adults have been suffering from anxiety about coming unknown situation. But child mental state should be taken care in pandemic situation because they have been bereaved as well as facing family issues like deferment of household income, unemployment of family members which may have effect on wellbeing of children and teenagers⁷⁸. Self-quarantine is the best way to prevent the disease. So, social distancing must be

maintained in this emergency. Eventually, so many negative psychological effects including anger, confusion, post-traumatic stress symptoms, infection fears, boredom, and frustration have been noticed in human beings during quarantine ⁷⁹.

Effect of COVID 19 on global economy

The financial system of all affected countries including developed, developing and underdeveloped has been crushed by the pandemics. The United Nations has stated that the pandemics threaten national security ⁸⁰. It has been disclosed that COVID-19 has been enhancing human mortality rate as well as poverty⁸¹. The economical imbalance have been observed to have a negative effect of resilience, fiscal resource, autonomy, reach and responsiveness, and legitimacy. Now, national security and State power are on threat due to this pathogen-induced disease ⁸².

Several industries in PR China, Republic of Korea and other countries had to be closed down because of huge number of cases of COVID-19. The industrial production, trade and tourism of PR China have been affected due to interruption of international supply chain ⁸³. The global stock market has been demolished automatically. This pandemic is a global threat to the global economy as stated by both World Trade Organization (WTO) and Organization for Economic Cooperation and Development (OECD) since the financial crisis of 2008-2009.

The economic relationship between developed and developing countries will adversely affect due to prolonged restrictions of trade and investment channels⁸⁴. The United States and the European Union (EU) will minimize imports of consumer goods from developing countries due to reduced consumer spending. In addition, there will be disruption of global supply chains. Incidentally, the pandemic has also adverse impact on the global tourism industry. Both domestic and international travel have been ceased as most of the countries have closed their borders ⁸⁵.

CONCLUSION

In conclusion this COVID 19/ SARS CoV2 infection has no answer still. It remains same mysterious and unknown biological matters till now. There is no treatment also regarding this SARS-CoV2. A huge number of patients are also cured from this danger but as per the report most of the cases are survived due to self-immunities and also some supporting drugs. But this virus SARS-CoV2 not only just destroy our health care system it also creates the way we should develop the health care structure specially for fighting against the highly contagious disease. Due to these diseases the whole world economy was affected. It affects specially the developing countries as well as the rich countries also. Still the doctor's nurses and the health care staff of all countries are fighting against the COVID 19. It has killed a huge number of people within a short period. W.H.O has prepared already a list of countries which are in red zone. U.S.A is at top of the list. W.H.O has also directed that due to this incident at least for a time period no travelers are allowed to travel to different countries. Scientists are trying to invent the vaccine against the SARS CoV2. But all are in clinical trial stage. At this time the only thing that can save us that is the social distancing. People should be more cautious regarding this. Otherwise it will be very tough to control this pandemic. Health workers need more and more protection. Scientific committees need innovation to fight with this. World economy is in danger. There is a chance of lacking job in market. Employee may be sacked from their post. So, in one world we will be in serious trouble. The only hope is as per some researcher the plasma therapy is working against the COVID 19. So, it can play an important role to fight against this.

But lastly, we will have to prepare for any kind of disaster. We have to fight and win.

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REFERENCES

1. Zhong NS, Zheng BJ, Li YM, *et al.* Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong, People's Republic of China, in February 2003. *The Lancet* 2003;362(9393):1353–8.
2. Cui J, Li F, Shi ZL. Origin and evolution of pathogenic coronaviruses. *Nat Rev Microbiol* 2019;17(3):181–92.
3. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and corona virus disease-2019 (COVID-19): the epidemic and the challenges. *Int J Antimicrob Agents* 2020; 55(3): 105924.
4. World Health Organization. Laboratory testing for coronavirus disease 2019 (COVID-19) in suspected human cases: interim guidance, 2 March 2020.
5. Rahman A, Sarkar A. Risk factors for fatal middle east respiratory syndrome coronavirus infections in Saudi Arabia: analysis of the WHO Line List, 2013– 2018. *Am J Public Health* 2019;109(9):1288–93.
6. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *The Lancet* 2020; 395(10223): 470-473.
7. Riou J, Althaus CL. Pattern of early human-to-human transmission of Wuhan 2019 novel coronavirus (2019-nCoV), December 2019 to January 2020. *Eurosurveillance*. 2020;25(4). <https://doi.org/10.2807/1560-7917.ES.2020.25.4.2000058>
8. Lu R, Zhao X, Li J, Niu P, *et al.* Genomic characterization and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *The Lancet* 2020; 395(10224): P565-574.
9. Peiris J, Guan Y, Yuen KY. Severe acute respiratory syndrome. *Nat Med* 2004; 10 (12): S88–97.
10. Shereen MA, Khan S, Kazmi A, Bashir N, Siddique R. COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research* 2020; 24: 91–98.
11. Centers for Disease Control and Prevention (CDC). Update: Outbreak of severe acute respiratory syndrome--worldwide, 2003. *MMWR Morb Mortal Wkly Rep*. 2003;52(12):241–6.
12. World Health Organization. Coronavirus never before seen in humans is the cause of SARS– update 31. Geneva: The Organization; 2003.
13. Lederberg J. Medical science, infectious disease, and the unity of humankind. *JAMA*. 1988; 260(5): 684-685.
14. World Health Organization. Naming the coronavirus disease (COVID-19) and the virus that causes it. Geneva: WHO; 2020.
15. Prakash TN. COVID-19: Impact on health of people & wealth of nations, *Indian J Med Res* 2020; 151(2): 121-123.
16. [Zhu N, Zhang D, Wang W, *et al.* A Novel Coronavirus from Patients with Pneumonia in China, 2019. *N Engl J Med* 2020; 382: 727-33.

17. World Health Organization. WHO Statement Regarding Cluster of Pneumonia Cases in Wuhan, China Geneva 2020 [updated 9 January 2020 and 14 January 2020].
18. Kumar D, Malviya R, Kumar Sharma PK. Corona Virus: A Review of COVID-19. *EJMO* 2020;4(1):8–25.
19. Chatterjee P, Nagi N, Agarwal A, et al. The 2019 novel coronavirus disease (COVID-19) pandemic: A review of the current evidence. *Indian J Med Res* 2020; 151(2): 147-159.
20. Ramadan N, Shaib H. Middle East respiratory syndrome coronavirus (MERS-CoV): A review. *Germes* 2019; 9(1): 35-42.
21. World Health Organization. WHO Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020. WHO; 2020. Available from: <https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020>, accessed on February 17, 2020.
22. World Health Organization. Situation report-24. Geneva: WHO; 2020.
23. McIntosh K, Kapikian AZ, Turner HC, Hartley JW, Parrott RH, Chanock RM. Seroepidemiologic studies of corona virus infection in adults and children. *Am J Epidemiol* 1970; 91(6): 585-92
24. Hu B, Ge X, Wang LF, Shi Z. Bat origin of human coronaviruses. *Virol J* 2015; 12: 221.
25. Hunter C, Wei X. Wuhan seafood market pneumonia virus genome assembly, chromosome: Wholegenome. GenBank;2020. Available from: <http://www.ncbi.nlm.nih.gov/nuccore/LR757995.1>, accessed on February 16, 2020.
26. World Health Organization. Statement on the Second Meeting of the International Health Regulations. Emergency Committee regarding the outbreak of novel corona virus (2019-nCoV); 2020. Available from: [https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-corona-virus-\(2019-ncov\)](https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-corona-virus-(2019-ncov)), accessed on February 17, 2020.
27. Gralinski LE, Menachery VD. Return of the corona virus: 2019-nCoV. *Viruses* 2020; 12(2): pii: E135.
28. Wang D, Hu B, Hu C, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel corona virus-infected pneumonia in Wuhan, China. *JAMA* 2020 Feb 7, doi: 10.1001/jama.2020.1585.
29. Coronavirus COVID-19 Global Cases by Centre for Systems Science and Engineering, JohnsHopkinsUniversity;2020. p.1. Available from: <https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>, accessed on February 13, 2020.
30. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report - 39. Geneva: WHO; 2020.
31. Battagay M, Kuehl R, Tschudin-Sutter S, Hirsch HH, Widmer AF, Neher RA. 2019-novel Coronavirus (2019-nCoV): Estimating the case fatality rate – A word of caution. *Swiss Med Wkly* 2020; 150: w20203.
32. World Health Organization, IFRC, UNICEF. COVID19 stigma guide. Geneva: WHO; 2020.
33. Li Q, Guan X, Wu P, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *N Engl J Med* 2020; 382:1199-1207
34. Chan JFW, Yuan S, Kok KH, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet* 2020; 395, 514–523
35. Liu, YC, Liao CH, Chang CF, Chou CC, Lin YR. A locally transmitted case of SARS-CoV-2 infection in Taiwan. *N Engl J Med.* 2020 Mar 12; 382(11): 1070-1072.
36. Li, L. et al. (2020) An update on the epidemiological characteristics of novel coronavirus pneumonia (COVID-19). *Zhonghua Liu Xing Bing Xue Za Zhi* 41, 139–144
37. WHO Director-General's opening remarks at the media briefing on COVID19 -March 2020
38. Medical expert group of Tongji hospital. Quick guide to the diagnosis and treatment of pneumonia for novel coronavirus infections (third edition). Herald Med. 2020. <http://kns.cnki.net/kcms/detail/42.1293.r.20200130.1803.002.html>. Accessed 2 Feb 2020.
39. Wang C, Wang X. Prevalence, nosocomial infection and psychological prevention of novel coronavirus infection. *Chin General PractNurs.* 2020;18: 2–3.
40. Liu T, Hu J, Kang M, et al. Transmission dynamics of 2019 novel coronavirus (2019-nCoV). *BioRxiv*2020; doi: <https://doi.org/10.1101/2020.01.25.919787>.
41. National Health Commission of People's Republic of China. Prevent guideline of 2019-nCoV.2020.<http://www.nhc.gov.cn/xcs/yqfkdt/202001/bc661e49b5bc487dba182f5c49ac445b.shtml>. Accessed 1 Feb 2020.
42. Information for Clinicians on Investigational Therapeutics for Patients with COVID-19, Centers for Disease Control and Prevention (Updated April 25, 2020), <https://www.cdc.gov/coronavirus/2019-ncov/hcp/therapeutic-options.html>.
43. Sahin AR, Erdogan A, Agaoglu PM, et al. 2019 Novel coronavirus (COVID-19) outbreak: a review of the current literature. *EJMO* 2020; 4(1):1–7.
44. Zhang Y, Xu J, Li H, Cao B. A novel coronavirus (COVID-19) outbreak: a call for action. *Chest* 2020; 157(4): e99-e101.
45. Coronavirus (COVID-19) Update: Daily Roundup March 30, 2020, FDA news release (March 30, 2020), <https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-daily-roundup-march-30-2020>.
46. Gautret P, Lagier JC, Parola P, et al. Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial. *Int J Anti- microb Agents* 2020:105949.
47. Gao J, Tian Z, Yang X. Breakthrough: Chloroquine phosphate has shown apparent efficacy in treatment of COVID-19 associated pneumonia in clinical studies. *BiosciTrends* 2020; 14(1):72-73.
48. Get the Facts About Coronavirus, Centers for Disease Control and Prevention, <https://www.cdc.gov/coronavirus/2019-nCoV/index.html>
49. National Center for Immunization and Respiratory Diseases (NCIRD), Centers for Disease Control and Prevention, <https://www.cdc.gov/ncird/index.html>
50. Jin YH., Cai L, Cheng ZS, et al. A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). *Military. Med. Res.*2020; 7(1): 4.

51. Zumla A, Hui DS, Azhar EI, Memish ZA, Maeurer M. Reducing mortality from 2019-nCoV: host-directed therapies should be an option. *Lancet* 2020; 395: 35–36.
52. Lo MK, Jordan R, Arvey A, et al. GS-5734 and its parent nucleoside analog inhibit Filo-, Pneumo-, and Paramyx-oviruses. *Sci Rep* 2017; 7:43395.
53. Brown AJ, Won JJ, Graham RL, et al. Broad spectrum antiviral remdesivir inhibits human endemic and zoonotic deltacoronaviruses with a highly divergent RNA dependent RNA polymerase. *Antiviral Res* 2019; 169:104541.
54. Jones BM, Ma ES, Peiris JS, et al. Prolonged disturbances of in vitro cytokine production in patients with severe acute respiratory syndrome (SARS) treated with ribavirin and steroids. *Clin Exp Immunol* 2004;135(3):467–73.
55. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA* 2020; 323(13): 1239-1242.
56. Meynard JL, Moinot L, Landman R, et al. Week 96 efficacy of lopinavir/ritonavir monotherapy in virologically suppressed patients with HIV: a randomized non-inferiority trial (ANRS 140 DREAM). *J Antimicrob Chemother* 2018;73(6):1672–76.
57. Arabi YM, Shalhoub S, Mandourah Y, et al. Ribavirin and interferon therapy for critically ill patients with Middle East respiratory syndrome: a multicenter observational study. *Clin Infect Dis* 2020; 70(9): 1837-1844.
58. Khamitov RA, Loginova S, Shchukina VN, Borisevich SV, Maksimov VA, Shuster AM. Antiviral activity of arbidol and its derivatives against the pathogen of severe acute respiratory syndrome in the cell cultures. *VoprVirusol* 2008;53(4):9–13.
59. The Efficacy of Lopinavir Plus Ritonavir and Arbidol Against Novel Coronavirus Infection (ELACOI). <https://clinicaltrials.gov/ct2/show/NCT04252885>.
60. Guo, D. Old weapon for new enemy: drug repurposing for treatment of newly emerging viral diseases. *Virology*. 2020 Feb 11, DOI: 10.1007/s12250-020-00204-7. [Epub ahead of print].
61. Wang J. Fast Identification of Possible Drug Treatment of Coronavirus Disease-19 (COVID-19) through Computational Drug Repurposing Study. *J Chem Inf Model*. 2020 May 4. doi: 10.1021/acs.jcim.0c00179. [Epub ahead of print]
62. Stebbing J, Phelan A, Griffin I, et al. COVID-19: combining antiviral and anti-inflammatory treatments. *Lancet Infect. Dis* 2020; 20(4): 400-402.
63. van Griensven J, Edwards T, de Lamballerie X, et al. Evaluation of convalescent plasma for Ebola virus disease in Guinea. *N Engl J Med* 2016;374(1):33–42.
64. Lai CC, Liu YH, Wang CY, Wang YH, Hsueh SC, Yen MY, et al. Drug treatment options for the 2019-new coronavirus (2019-nCoV). *Biosci Trends* 2020 Jan 28. <https://doi.org/10.5582/bst.2020.01020>.
65. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020; 395:497–506.
66. Gautret P, Lagier JC, Parola P, et al. Clinical and microbiological effect of a combination of hydroxychloroquine and azithromycin in 80 COVID-19 patients with at least a six-day follow up: A pilot observational study. *Travel Medicine and Infectious Disease* 2020; 34: 101663.
67. Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir Med* 2020;8(5): 475-481.
68. Guan WJ, Ni ZY, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med* 2020; 382(18): 1708-1720.
69. Ayush.gov.in, Ministry of AYUSH, Government of India. © 2020 <https://www.ayush.gov.in/>
70. Ayurveda's immunity boosting measures for self care during COVID 19 crisis, Ministry of AYUSH, Government of India <https://www.ayush.gov.in/docs/123.pdf>
71. Advisory from ministry of ayush for meeting the challenge arising out of spread of corona virus (COVID-19) in India, Ministry of AYUSH, Government of India <https://www.ayush.gov.in/docs/125.pdf>
72. Cinatl J, Morgenstern B, Bauer G, Chandra P, Rabenau H, Doerr HW. Glycyrrhizin, an active component of liquorice roots, and replication of SARS-associated coronavirus. *Lancet* 2003;361(9374):2045–6.
73. Lin CW, Tsai FJ, Tsai CH, et al. Anti-SARS coronavirus 3C-like protease effects of Isatis indigoticaroot and plant-derived phenolic compounds. *Antiviral Res* 2005;68(1):36–42.
74. Chen F, Chan KH, Jiang Y, et al. In vitro susceptibility of 10 clinical isolates of SARS coronavirus to selected antiviral compounds. *J Clin Virol* 2004;31(1):69–75.
75. COVID-19 is an emerging, rapidly evolving situation. U.S. National Library of Medicine, <https://clinicaltrials.gov/ct2/results?cond=COVID-19>
76. Tandon PN, COVID-19: Impact on health of people & wealth of nations, *Indian J Med Res* 2020; 151(2): 121-123.
77. Tandon PN. Health scenario in India. Hope for a better future. *Bhartiya Vidya Bhavan*, Pune; 2002.
78. Crimmins A, Balbus J, Gamble JL, et al. The impacts of climate change on human health in the United States: a scientific assessment. *Global Change Research Program*: Washington, DC, USA, 2016. 312 pp. <http://dx.doi.org/10.7930/JOR49NQX>
79. Lee J. Mental health effects of school closures during COVID-19, *Lancet*, Published online April 14, 2020 [https://doi.org/10.1016/S2352-4642\(20\)30109-7](https://doi.org/10.1016/S2352-4642(20)30109-7).
80. Brooks SK, Webster RK, Smith LE, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence, *Lancet* 2020; 395: 912–20.
81. Davies SE. National security and pandemics. Available from: <https://www.un.org/en/chronicle/article/national-security-and-pandemics>, accessed on February 29, 2020.
82. The World Bank. People, pathogens and our planet: The economics of one health. Available from: <http://documents.worldbank.org/curated/en/612341468147856529/Peoplepathogens-and-our-planet-the-economics-of-one-health>, accessed on February 29, 2020.
83. Wilson J. Bio threats - infectious diseases and national security. Available from <https://nationalsecurityforum.org/2017/02/14/3403/>, accessed on February 29, 2020.

84. CNA. COVID-19 to cost world tourism at least US\$22 billion. Available from: <https://www.channelnewsasia.com/news/business/covid-19-to-cost-world-tourism-at-least-us-22-billion-12478066>, accessed on February 28, 2020.
85. World Economic Situation and Prospects: April 2020 Briefing, No. 136.

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