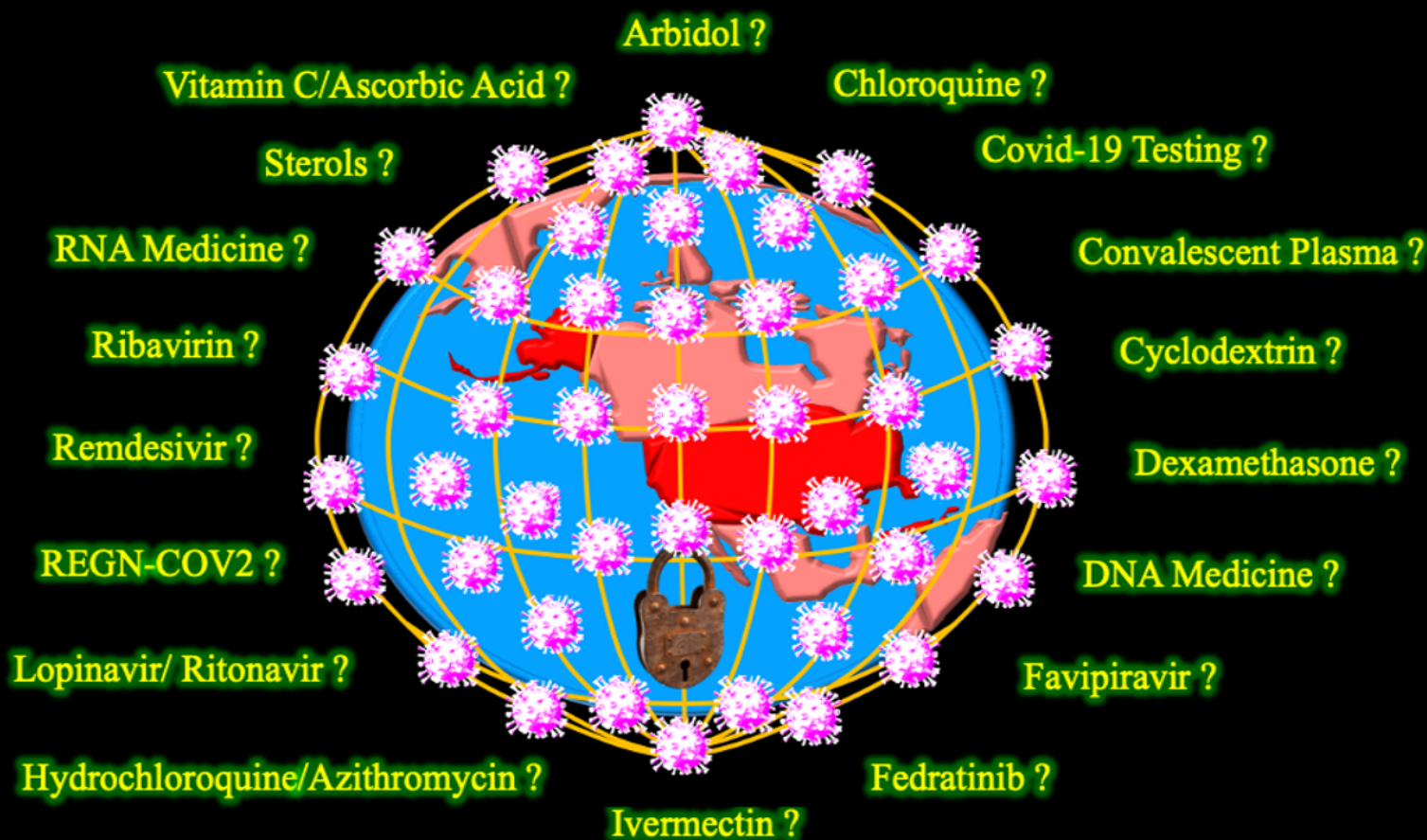




Science Documents[®]



Fear of coronavirus locks down the world
and resets activities on the earth

Resilience in COVID-19 Chaos in New York

An Unprecedented Experience as a Frontline Health Care Professional

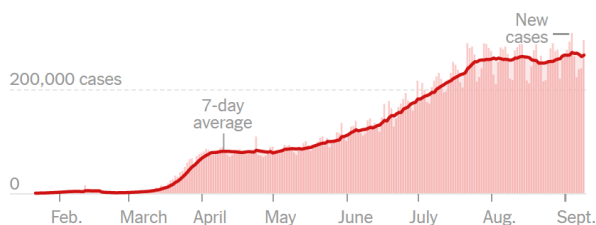
Murtuza Tameem*, M.D., Hospitalist

Medical Director of Eva's Village, Board of Director for New Jersey American Society of Addiction Medicine, New Jersey, USA

*Corresponding Author: murtuzatameem@gmail.com

WITH almost 28 million confirmed cases and more than 870,000 deaths worldwide, COVID-19 has caused a huge burden on healthcare, economics, and government systems. In New Jersey, where I work as a hospitalist, a total of more than 195,000 cases and around 16,000 deaths have been reported. While there are stories of recoveries, cases in the United States continue to increase per day.

COVID-19 is the disease caused by the novel coronavirus identified as SARS-COV-2. First detected and identified late last year, COVID-19 was declared as a global pandemic by the World Health Organization (WHO) in March 2020. Today, at least 188 countries have reported cases of the disease.



	TOTAL REPORTED	ON SEPT. 9	14-DAY CHANGE
Cases	27.9 million+	293,475	+5% →
Deaths	904,728	6,330	+8% →

Includes confirmed and probable cases where available

Fig. 1. Graph showing the trend in the number of COVID-19 cases worldwide, from February to September 2020 (Source: *The New York Times*, 2020).

The transmission of the virus is primarily via respiratory droplets. These droplets are released when an infected person coughs, sneezes or talks. The virus may then gain access to another person's mucous membranes via the eyes, mouth, or nose. Infection may also occur if another person's hands get contaminated by the virus by touching surfaces, and then touching their face.

To prevent the transmission of the COVID-19 virus, the WHO and the Centers for Disease Control and Prevention (CDC) have recommended preventive health measures. These protocols include frequent handwashing, wearing of masks and observing social distancing. Proper handwashing with soap, lasting for at least 20 seconds,

destroys the membrane of the virus and killing it in the process. Wearing of masks and maintaining social

distance prevent the transmission of the respiratory droplets from one person to another. Surgical and N95 masks are recommended, especially for health care workers. For the general public, the use of cloth masks is advised, given that medical-grade masks are not always available. Social distancing requires people to stay at least 6 ft. from one another. People are also urged to stay at home, in the effort to reduce the number of people in public places such as malls, restaurants, and parks. There is no approved vaccine yet for COVID-19 but everyone is encouraged to get pneumococcal and flu vaccines. Doctors and scientists have noted that adults who have received their pneumococcal and flu vaccines had less COVID-19 complications and lower mortality.

Working in the Frontline

Since the onset of the COVID-19 pandemic, I have been working as a hospitalist at St. Joseph's Regional Medical Center here in New Jersey. Together with a pulmonologist and an infectious disease specialist, I made rounds every day at the hospital, checking up on patients infected with COVID-19. Almost all of our hospital wards were dedicated to COVID-19 patients. From my usual load of 15 patients a day, I saw 40-50 patients every day, all are either confirmed or suspected cases COVID-19.

COVID-19 is characterized by symptoms such as fever, cough, and difficulty of breathing. These symptoms may be accompanied by diarrhea, body aches, and loss of smell or taste. Hallmark features, or the symptoms that distinguish COVID-19 from other respiratory illnesses, have not yet been identified. The most common serious manifestation of COVID-19 is pneumonia, marked by decreased oxygen levels and extensive lung involvement. A number of complications have been observed, such as acute respiratory distress syndrome (ARDS), acute cardiac injury, kidney injury, inflammatory responses, and thromboembolic events leading to stroke and other neurological complications.

During my rounds, I have encountered severe clinical manifestations of COVID-19 that I have never

seen myself in my years of practice. There are patients who look fine but when you check their oxygen saturation levels, you'll get values such as 50% or 60%; time and time again these patients had silent hypoxemia. In such situations, I know that they are already hypoxic and that they need to be stabilized, they would first be started on

Nasal cannula, then oxy mask, Non rebreather mask with 100% oxygen and soon after I would find myself escalating to High Flow Nasal cannula providing upwards of 40L of oxygenation; eventually after failure of this I would find myself at the head of patient's bed in order to do an emergency intubation. Upon intubation, the clinical outcomes significantly decrease. Few patients may recover, but majority of them do not survive. Each day, I pronounced deaths with a heavy heart; during the height of pandemic, unfortunately the only few minutes I would have to myself calling a patient's family member to inform them their family member was no longer among us. There were days I made that call sometimes 5 or 6 times a day, a repeatedly daily in my 12 hour and 7 days every other week schedule.

Management of patients are currently centered on oxygen supplementation and giving remdesivir and low-dose dexamethasone. A recently published preliminary report on the efficacy of remdesivir as treatment for COVID-19 showed that the median recovery time of patients who received remdesivir was 11 days. Meanwhile, the placebo group had a median recovery time of 15 days. A total of 1059 patients participated in this study, wherein 538 patients were given remdesivir while 521 patients were in the placebo group (Beigel, Tomashek, Dodd, & Mehta, 2020). The data regarding the use of dexamethasone was more promising. Preliminary results on the administration of dexamethasone to COVID-19 patients reveal that out of 2104 patients who received dexamethasone, 482 patients (22.9%) died within 28 days since the start of the study. This percentage is lower than the group which received usual care, as 1110 patients (25.7%) out of 4321 died within the same period of time (The RECOVERY Collaborative Group, 2020). Another medication that is currently being assessed for severe COVID-19 management is tocilizumab. A recently concluded study reported that patients who were treated with tocilizumab had a lower mortality rate of 7%, compared with the 18% death rate patients who received standard care (Guaraldi, et al., 2020).

However, as mentioned, the clinical course of COVID-19 is far from simple. The respiratory, renal, cardiac, and neurological complications listed above are very common in patients infected with COVID-19. I have seen patients with thromboembolism despite giving prophylactic anticoagulation. Elevated levels D-dimers, a marker for thrombosis, have been recorded. As early as March, we have been starting patients on therapeutic anticoagulation, this would include heparin, lovenox or one of the NOAC like Eliquis.

We also started giving convalescent plasma to patients with worsening signs and symptoms. The use of convalescent plasma is actively being studied in the management of COVID-19. I am working with Mayo Clinic in conducting a study on the use of convalescent plasma in COVID-19 patients. As the lead principal investigator of the study, I have seen numerous COVID-19 patients who have received convalescent plasma. The study is still in progress and patients from different hospitals are being included in the study. Nearly 90,000 convalescent plasma have been administered through various patients around the country under the expanded Access program as per FDA. Some preliminary data from the Mayo Clinic study organized by NIH suggest that patients who were given convalescent plasma within three days of diagnosis had a mortality rate of 8.7% over the course of 7 days. This is significantly lower than the 11.9% mortality rate of patients who received plasma after four or more days. However, it is still difficult to conclude the definite role of convalescent plasma in COVID-19 management, as the preliminary study did not include a placebo-controlled group (Joyner, et al., 2020).

COVID-19 has not spared the members of the healthcare workforce. Nurses and other hospital personnel started getting sick. Other specialists were prohibited from coming to the hospital as almost all facilities have been dedicated to managing COVID-related cases. Moreover, supplies of protective personal equipment (PPE), masks, and gloves are running low. Before the pandemic, each nurse monitors at most 5 patients per day. But now, each nurse who comes to work is assigned to monitor 20-25 patients a day. This increase in work-load due to diminished number of healthcare workers has led to fatigue – physically, mentally, and emotionally.

Keeping Eva's Village Safe

My responsibility as a family physician does not end in the hospital, as my duty includes ensuring the safety of the community, in particular, the Eva's Village in Paterson. Eva's Village is a health and social organization that is committed in providing care for people who are burdened with poverty, addiction, hunger, and homelessness. Through services such as medical care, halfway house, simple soup kitchen, recovery, and behavioral programs, Eva's Village is a home to marginalized individuals.

As early as January, when reports of the novel coronavirus emerged, I already initiated meetings with the

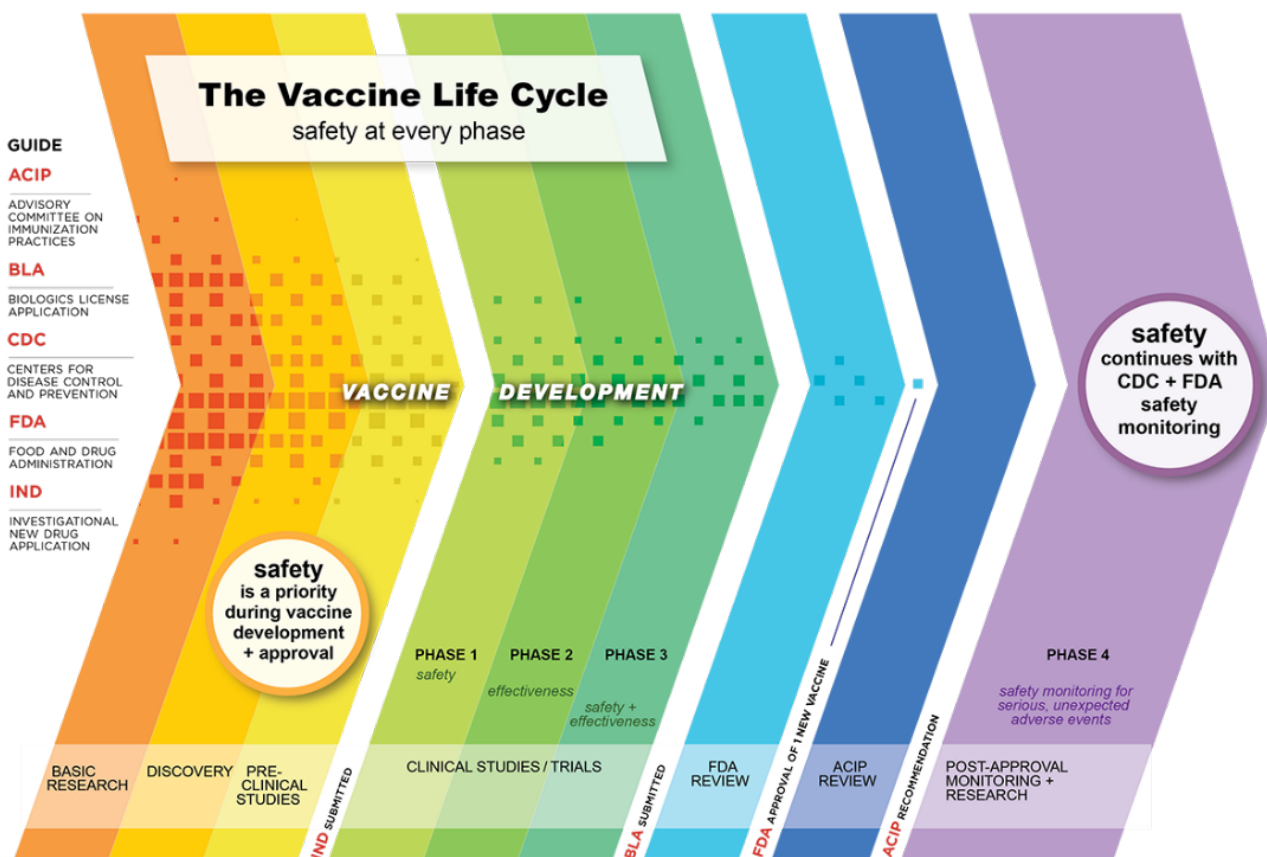


Fig. 2. The vaccine development process. The journey towards developing a safe and effective vaccine takes months to years of tedious research and clinical studies (Source: CDC, 2020)

administrators of Eva's Village with the goal of protecting the community from the virus. Most of our patients in Eva's Village have pre-existing health conditions such as diabetes, blood pressure, hepatic failure, and renal diseases. Moreover, many patients are battling substance addiction, and mental illness. Certainly, we are managing a high-risk population. Therefore, it is of prime priority to prevent the transmission of the virus. We formed a 3-phase plan on what to do when the virus hits the state, the county, and the shelter. We had the virus under the radar, and we made plans how to impose the preventive protocols. I was then appointed as the Medical Director of Eva's Village and thus I have this huge responsibility to keep the shelter safe.

We implemented strict health protocols such as proper hand hygiene, wearing of masks, and social distancing to stop the spread of COVID-19. At first, it was really a challenge to impose these preventive measures. People in the shelter are reluctant and are not informed about the consequences of the disease. However, through constant patient education, we were successful in implementing these protocols. On top of that, in an effort to strengthen our defense against the co-morbid effects of COVID-19, we plan to administer pneumococcal and flu vaccines to

all the residents and staff members at Eva's Village. Although we have limited resources, we have managed to put up testing, quarantine, and isolation facilities to prevent the spread of the disease. We also continued providing food to those who are struggling with homelessness. Instead of gathering people in our cafeteria, we made the adjustment of providing packed lunches to people who are in need.

Adjustments were also made regarding the medications of patients under my care at Eva's Village. For instance, I had to modify the treatment plan of patients who require intramuscular medication assisted therapy for substance abuse. Before the pandemic, these patients used to visit my clinic every month for their vivitrol shots. Now, these patients had to be shifted to oral medications to reduce their risk of exposure in my clinic. As the director of the New Jersey branch of the American Society of Addiction Medicine, I coordinated closely with other specialists in New Jersey with the management protocols for patients battling substance addiction during the pandemic.

We continue to provide quality health care and assistance to our residents despite the current health crisis. With our efforts at Eva's Village and the resilience and cooperation

of our patients, we are able to keep the threat of COVID-19 at bay.

Moving Forward

The COVID-19 pandemic has brought challenges not only to the medical community but to the economic and political sectors as well. Far too many lives and livelihoods have been lost. The development of a COVID-19 vaccine is ongoing, with more than 150 studies in progress around the world. However, vaccine development generally takes years before being declared safe and effective for use. Out of the studies currently being done, only 3 vaccines have been approved for early or limited use – 2 from China and one from Russia. But all of these 3 vaccines have been approved without the results of Phase 3 trials. Health experts have declared that expediting the process may lead to dangerous health risks. Strictly speaking, we don't know if a safe and effective vaccine will be available in the coming months. Perhaps

it would take a year, maybe two? There is no certainty. Yet I remain optimistic. I am hoping that we have all learned from this health crisis. I hope that the WHO and the CDC become more proactive in launching global health efforts and implement better communication strategies in managing emerging infections. I look forward to a united, integrated effort among countries in battling health crises. Developed nations must come together to champion health programs as these would benefit not only their respective countries but the entire world.

From our standpoint, the future may seem bleak, but I choose to have the courage and resilience to become a facilitator of help for the community and the country.

References:

1. Beigel J, et al., Mehta A: Remdesivir for the Treatment of Covid-19 — Preliminary Report. 2020, *N Engl J Med* 1-12.
2. CDC: Vaccine Safety: Overview, History, and How It Works. Retrieved from Centers for Disease Control and Prevention: <https://www.cdc.gov/vaccinesafety/ensuringsafety/history/index.html>
3. Guaraldi G, et al., Mussini C: Tocilizumab in patients with severe COVID-19: a retrospective cohort study. 2020, *Lancet Rheumatol*, 2:e474-84.

4. Joyner M, et al., Casadevall A: Effect of convalescent plasma on mortality among hospitalized patients with COVID-19: initial three month experience. 2020, *medRxiv preprint*.
5. The New York Times. *Covid World Map: Tracking the Global Outbreak*. (2020, September 10), <https://www.nytimes.com/interactive/2020/world/coronavirus-maps.html>
6. The RECOVERY Collaborative Group: Dexamethasone in hospitalized patients with Covid-19 — Preliminary Report. 2020, *N Engl J Med* 1-11.

