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## Covid-19's Impact on Healthcare

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Covid-19's Impact on Healthcare

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BIS 437 Senior Project

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### Abstract

Covid-19 is a highly infectious virus that has drastically impacted healthcare systems across the world. This virus had such a unique makeup that modern-day medicine did not have an answer for it and the impact it'd have on the population as it rapidly swept across the planet. Due to the severity of this virus, effects can be seen regarding supply shortages, healthcare staff shortages, and everyday PPE requirements. Even by looking past the humanitarian effects caused by Covid-19, the financial burden on the healthcare systems cannot be ignored. Although this pandemic is generally viewed as a negative part of history, some positives did come from the ramifications of it including telemedicine and its rise to becoming a significant part of our future of healthcare. Though experts believe the Coronavirus is in a decline, the pandemic will have lasting effects throughout the healthcare systems for a long time.

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## Introduction

Covid-19, formally known as coronavirus, is an incredibly contagious virus that the world was not ready for. From the moment it first started making its way across the world people started to realize that this is not like any virus they have ever been alive for. Even then, nobody could have guessed that this virus would create a global pandemic that impacts the entire world for the next few years in the ways that covid-19 did. From the PPE requirements to the slow shipping times, even to the “5,705,754 deaths” worldwide people knew this was one of the worst pandemics in the history of the planet but even then, people still did not realize some of the ways the coronavirus will forever change healthcare (*Who coronavirus ((COVID-19)) dashboard, 2022*). Covid-19's impact on healthcare goes far beyond what most people know due to changing the standards for the delivery of care for patients, forcing healthcare providers to develop telemedicine, as well as the major changes to the revenue cycle of healthcare. Many people believe this virus was all bad for healthcare, because of some of the major issues such as staff shortages, healthcare facilities forcing employees to get the vaccine, and even the increased healthcare cost, but I believe once you take a deeper dive into things the positive changes far outweigh the negatives.

## How it All Began

The entire coronavirus pandemic began back in December 2019 in Wuhan, Hubei Province, China (Shoham, 2020). Many experts of the field think that Covid-19, also known as SARS-CoV-2 was first developed in a species of bats. According to an article on WebMD, many believe that the virus was spread from the bat to patient zero at Wuhan's meat markets where animals are killed fresh to order (Bhargava, 2021). Scientists presume that due to how viruses rapidly change that the high population of the market allowed the virus to spread to the first

covid-19 positive human. Although this seems very possible, other experts believe the virus was started in a completely different way. Another theory was that the virus was first leaked at the Wuhan Institute of Virology's lab (Shoham, 2020). This lab happens to be a place where a group of highly specialized scientists work together to develop vaccines. It's believed that the leak may have occurred at this lab where it infected one of these experts. It's impossible for anyone to know which one of these two conspiracy theories is the one where this virus began. Regardless of which is true, the virus began to spread rapidly. At the time it started to spread, no one realized just how deadly this virus would end up being. This lack of awareness helped aid the virus in spreading as quickly as it did. On January 20<sup>th</sup>, 2020, Thailand, Japan, and South Korea all confirmed positive covid-19 cases (Taylor, 2020). According to the same article, on the very next day, the United States confirmed their first positive cases which occurred from a person returning to the United States from a trip in Wuhan, China. Throughout the next few weeks, positive cases were popping up all over the country. According to Yale School of public health, by the end of March, 2020 there were 351,731 positive covid cases worldwide with 15,374 deaths (Jeannette, 2020). Due to the nature of the rapidly spreading virus, many states started to limit when and why people could leave their houses. They also started to mandate that people wore surgical masks or N95 masks when in public. Before too long, basically every state had certain mandates for their state residence. Many employers began to close shop for the remainder of the government mandates. This is when a lot of the major issues of the pandemic began.

### **What is Covid-19?**

The coronavirus as we know it is an incredibly contagious respiratory virus. The main way covid-19 spreads is when an already covid positive patient exhales they release droplets that

contain the SARS-CoV-2 virus (*How Coronavirus Spreads, 2021*). A couple of different things can happen from this point forward. The most common is an uninfected person will breathe in this covid particle from the air which means this person now has had contact with the coronavirus. Another way this virus can be spread is when an uninfected individual has the covid-19 droplet on their hand and then proceeds to touch their eyes, mouth, or even nose. Once a person becomes infected with the covid-19 virus they can begin to have some of the signs and symptoms associated with this virus. Although some people will be asymptomatic, the main symptoms include sore throat, dry cough, fever, chills, shortness of breath and some people will even lose their sense of smell and taste (*Symptoms of Covid-19, 2021*). Some infected people will experience far worse symptoms. Not every infected patient is at the same exact risk. The CDC states that older adults over the age of 65 are at a higher risk of being hospitalized and even dying as a result of this virus. In addition to this, people with various heart diseases, lung diseases, diabetes, and even a weakened immune system are also at huge risk of getting infected, as well as experiencing the worst of covid-19 (*Who's at higher risk of serious symptoms, 2022*). In extreme cases, patients may begin to experience acute respiratory distress syndrome which is a type of lung failure that can force a patient to be put onto a ventilator in order to be able to breathe (*How Covid-19 Affects the Body, 2021*). This is where the problems began.

### **How Does the Virus Affect the Body?**

Covid-19 enters the body through the nose and mouth. The virus attaches to the cells in the nose and replicates to spread further in the body. The body's immune system should kick in

and attack this foreign virus. However, if the immune system is unsuccessful in this fight, the virus will move down the trachea into the lungs. It is in the lungs that this virus can become deadly. As previously stated, the immune system plays a vital role in protecting the body against covid-19. However, the immune system can overreact to the virus which is called a cytokine storm. In a cytokine storm, the immune cells attack healthy tissue which can result in blood clots and blood pressure drops (*How COVID-19 Affects the Body*, 2021.) In severe cases of covid-19, first responder cells are slow to respond in the presence of the virus. These cells typically respond quickly when they sense a virus. Therefore, it is suggested that in severe cases of covid-19, a compromised immune system is the reason for the most severe cases of covid-19. When covid-19 reaches the lungs, the virus attacks the cells that line the alveoli which affects the patients' oxygen levels. Patients may develop pneumonia if fluid fills these alveoli. As previously stated, acute respiratory distress syndrome may develop in severe cases of covid-19. This condition may require ventilators to help breathe and can be fatal. There is little evidence about how covid-19 affects the heart, but it is thought that heart failure and abnormal heart rhythms may be a result of the body's response to infection. Strokes and seizures have also been seen in patients with covid-19. This could be due to organ failure and oxygen deprivation caused by the virus. New research suggests that covid-19 can infect brain cells, which means covid-19 is suggested to have a direct impact on the brain.

Covid-19 test results could be given in minutes or days depending on where and when patients got tested. Many clinics experienced backlogs in the tests which required patients to wait days to weeks to receive their results. By this time patients would already be halfway done with their quarantine. There are two types of tests people can get: antibody tests and diagnostic tests. The antibody tests tell if the patient had previously contracted covid-19. The diagnostic tests,

antigen, and molecular tests tell if the patient currently has the virus. Molecular tests, also known as PCR tests, are said to be the gold standard test, but they do take longer. When the molecular tests are taken within 5 days of the onset of symptoms, they are positive ninety percent of the time. This test is done by swabbing the patients' nose and throat. Rapid PCR tests are available, and the results can be seen within hours. Antigen tests have an increased risk of false negatives, meaning the test doesn't detect the virus, but the person does have the virus in their body. The test most likely detects a false-negative if the virus is present in low amounts in the body. A major problem that was seen at the beginning of the pandemic was that test results took too long for patients to receive. This caused another problem because if someone was negative, they still had to stay home from work or school to avoid spreading the virus to others because they didn't have their results back to confirm whether they had the virus or not. This caused many financial problems for families as well as staff shortages throughout many professions, especially healthcare workers.

### **Financial Issues Surrounding Healthcare Workers**

One of the biggest issues people faced during the early parts of the pandemic was having to miss work due to becoming covid positive. This is an issue that impacted not only healthcare workers but basically every single employee in the country. Most companies had the same requirements. Once someone became symptomatic or tested positive, the employee was to not come to work. In order for the employee to come back to work, they must wait 14 days from the date symptoms began or the positive test was taken. If an employee wanted to come back for the 14 days, they were required to show proof of a negative covid-19 test and depending on the company, sometimes two negative tests. According to the CDC, an estimated, "42.7% of adults aged 18 and over missed at least 1 day of work" (*Loss of work - research and development*

*survey*, 2021). Many of these absences were caused by covid-19. Missing work meant not getting paid which in turn became a crisis for many people. A lot of people know they couldn't afford to wait out the entire 14 days, so they knew they needed to test negative on a covid test. Many people rushed to get tested. Due to the limited supply of covid tests, many places began to run out. As noted by a news station out of Indiana, "Indiana uses about 50,000 rapid tests per week but is only guaranteed to receive 11,000 a week at this moment" (Garbacz, 2022). But why such a shortage? One of the biggest reasons for the shortage of the rapid covid test was that when covid started to surge the companies that made the test failed to fully anticipate how much demand there would be for them (Ding, 2020). Due to the lack of tests, many employees were forced to wait out the 10-14 days required by their company. Many Americans began to struggle financially.

"Louisville landlords reported rates of around 25 percent in April which meant around a quarter of their tenants did not pay their monthly rent in full" (Ryan, 2020). It got to the point where some companies stopped charging late fees on late payments. On March 27<sup>th</sup>, 2020, Former U.S. President Donald Trump signed the CARES Act into law due to the economic fallout due to COVID-19. The CARES act was around 2 trillion dollars used for emergency funding to give relief to households, businesses, and even healthcare providers, among others (*What's in the cares act? here's a summary*, 2020). This helped many people in the short term catch up on a few bills, but many people were still scared to be infected with covid-19 and risk missing work. Healthcare facilities were forced to change PPE requirements to help protect healthcare workers from becoming infected with covid-19.

### **Personal Protective Equipment Requirements**

Covid-19 changed healthcare in many ways including the employee's personal protective equipment requirements while inside the facilities. The most common change that occurred as a result of the virus was the mask requirement. Employees and visitors are required to wear a face-covering while inside of the facility. When patients are engaged in patient care, N95 masks, as well as face shields, are to be worn. According to Connecticut Biotech, N95 masks block around 95% of pollutants in the air, whereas regular surgical masks block around 50% (*N95 mask vs regular mask, 2020*) This was to reduce the spread of the virus. Another change was the six feet rule. With this rule staff and visitors are to stay at least six feet from others when able to. The purpose of this is because if an individual sneezes or even coughs, a tiny droplet containing the virus is projected into the air, and if within six feet, the person has an increased chance of breathing in the covid infected droplet according to the World Health Organization (Rogers, 2020). Another change healthcare facilities made to help the spread of the virus was the addition of temperature checks as well as covid questionnaires when entering the facility. Staff would check employees' and visitors' temperatures to make sure people entering the building did not have a fever. Fever is one of the most common symptoms of coronavirus. The objection of the questionnaire was to make sure people entering did not have any possible contact with people infected with the virus. Both additions were to add another layer of protection to help reduce the spread of the virus within the facility. New cleaning protocols were also added to help with reducing the spread rate of the virus. The main change with the protocols was the new addition of aerosol-generating procedures (*Healthcare Facility Cleaning and Disinfection Guide, 2020*). This was to kill the virus particles more effectively. Facilities also decided to close cafeterias which made reducing the spread of the virus easier. One of the major changes healthcare facilities made was changing the visitor policies. Depending on the facility, policies restricted

visitors to one per patient but most facilities did not allow any visitors. This significantly impacted the labor and delivery unit. Pregnant patients were only allowed one visitor during their stay at the hospital. This change impacted many patients' ability to have family there to support them during the birth of their child. This also impacted families of the patients who were in critical condition. Patients who were close to death had to still follow the same restrictions. In a time when death rates were skyrocketing, it is easy to see the impact this had. Some of the biggest results from visitor restrictions came in nursing homes. Nursing homes and long-term care facilities reported at least 82,000 covid-19 deaths by the end of October 2020 (Rivas, 2020). Due to the age and average health of patients in these facilities visits were completely restricted. Many patients in nursing homes are not able to move around much. The highlight of their days is visits from their families. These covid restrictions took what these patients looked forward to away. Many of these residents began to feel isolated which led to emotional and in some cases behavioral issues. According to facility employees, there was a major increase in patients with a "lack of appetite" (Rivas, 2020). These changes throughout healthcare facilities impacted employees, patients, and even their families. Even though facilities did everything they could to slow the spread of the virus, the virus continues to infect people at an increasing rate.

### **The Death Count Continues to Increase**

New positive covid cases started to pop up left and right. Hospital emergency rooms were beginning to flood with patients coming in due to covid-19 related issues. It didn't take long before they realized they could not keep up due to limited supplies, staff, and even hospital rooms. According to the CDC, during the very beginning of the pandemic, hospital emergency departments were seeing nearly four times more patient visits (Hartnett, 2020). Hospitals began to prepare for the increased number of covid-19 patients. Hospitals designated covid rooms for

patients that were confirmed positive. In the covid units were negative pressure rooms. These rooms were designed to make certain that the coronavirus particles could not spread throughout the hospital byways of the ventilation systems and even the AC units of the facilities (Dyer, 2020). These special rooms were an extra layer of protection from further spreading of the virus. These rooms quickly ran out. Eventually, hospitals began to fill up. Most hospitals' covid-19 units rapidly began to overflow into other units of the hospital. Some hospitals were even forced to shut down other units just to make room for the surge of covid patients. On top of this, healthcare facilities began to run low on important supplies. Some of the supplies that hospitals started to run low on were gloves, surgical masks, N95 masks, and gowns. These supplies are crucial in protecting hospital staff from becoming infected with the virus. Without these PPE items, there would be a higher chance of spreading this virus which would make this pandemic worse than it is. The main reason for this shortage of these supplies is the pandemic caught most hospitals flat-footed (Finkenstadt, Handfield, Guinto, 2020). Nobody expected there to be a surge of patient admissions quite like this. Another incredibly important medical device that was much needed by covid-19 patients began to have a shortage issue as well. This device is known as a ventilator. A ventilator is a device that is used to help patients with severe respiratory conditions which impacts a person's ability to breathe on their own. Basically, a ventilator's job is to move air in and out of the patient's lungs so that the patient's body can circulate oxygen throughout the body. Without this device, many of the covid patients would die due to respiratory problems. Hospitals normally have a bunch of these devices but due to this pandemic, many ran out. Due to the extreme demand for this device many hospitals would not be able to get more ventilators delivered to them fast enough. There was no easy way to mass-produce these devices. These devices are made up of hundreds of tiny parts which are produced by companies located

throughout the world. With the nature of this pandemic and how it's impacted companies, there weren't any answers. Currently, there was not any way to cure this virus quickly. The only thing doctors could do was treat symptoms and hope the virus would leave the body before it got too bad. If it was bad enough, patients would not be able to breathe. Due to the shortage of ventilators, many of these patients would end up passing away. 385,000 deaths related to covid-19 were reported in 2020 in the United States. In late November 2021, the United States had already seen the same number of deaths as the year prior. Things needed to change.

### **Mandates**

Death numbers continued to rise. Parts of the country have had to order mobile morgues in order to have enough space for bodies as the covid-19 deaths have made it to where morgues have reached their capacity (*Central Florida Hospitals forced to order mobile morgues to deal with Covid Death overflow, 2021*). As the pandemic continued to get worse, the government knew something had to be done. The United States government determined that each state would release its own mandates. In Kentucky on March 11<sup>th</sup>, 2020, a mandate was released which would suspend all out-of-state travel. In addition to this, that same mandate advised everyone to postpone all social gatherings until further notice (*Kentucky's response to covid-19, 2020*). On the very next day, an executive order was put out that closed all K-12 schools except for virtual classes. These were just the first of many mandates to come. On March 16, 2020, yet another executive order was released to ban all dining in restaurants and bars. Acute healthcare facilities, psychiatric, and even senior care facilities were all mandated to restrict visitors. On March 19<sup>th</sup>, 2020, the Kentucky government banned all mass gatherings. On the 22<sup>nd</sup> of March, the biggest mandate yet was made official. This mandate stated that all in-person retail businesses that are not life-sustaining will close until told they are allowed to reopen. A day later an executive order

was sent out to prohibit all non-urgent medical procedures. On top of that, all non-life-threatening businesses were told to close. At this point, all the businesses that were allowed to stay open during this part of the pandemic were essential businesses. The remaining businesses and healthcare facilities left open were required to have rules for wearing masks as well as social distancing rules. These mandates would completely change everything for the time being. Due to there not currently being any vaccinations or other ways to fight the spread of the virus the government did what it needed to do to slow the spread. Not a lot changed in the coming months. It was not until December 11<sup>th</sup>, 2020, that the world's first covid-19 vaccination was approved for emergency use (*FDA approves first COVID-19 vaccine*, 2021). Since the United States Food and Drug approval process takes so long to complete, they were able to get the vaccination cleared with an Emergency Use Authorization. EUA's are in place so that the FDA has a process to get medications or vaccinations approved for safe use during emergencies or pandemics like this virus. The FDA still must determine if the vaccination is effective in preventing the virus, understand the risk of the vaccination and prove it is safe for humans before a EUA will be approved. There was a sign of hope that things may start going back to normal soon. After nearly a year, there was finally something that could potentially slow the virus' spread. Many people got vaccinated. Studies show the risk of passing away because of this virus if unvaccinated was around 11 times greater (McPhillips, 2021). The same study from the United States Center for Disease Control and Prevention also showed that if unvaccinated you were 19 times more likely to be hospitalized due to the virus when compared to the population that was vaccinated. Still, many people were strongly against getting this vaccination. The government soon began to talk about potentially requiring it. This led to a lot of healthcare facilities mandating all employees to get the vaccine. This caused a huge uproar.

### **Healthcare Staff Shortages**

Possibly the biggest way covid-19 impacted healthcare was creating staff shortages. According to an article, around 12 percent of healthcare workers got laid off while 18 percent of staff quit throughout the pandemic (Galvin, 2021). The coronavirus caused huge revenue losses to many healthcare facilities. This is just one of the reasons healthcare workers began to be let go. Due to the severity of the virus, many healthcare services were closed. This caused a lot of those staff members in those departments to be relocated to different departments or be laid off. A larger number of these staff members decided the risk of being exposed to covid then bringing the virus home to their families was not worth the risk. There were ramifications to some of the staff members that did decide to keep working throughout the pandemic. According to an article written by Dr. Auerbach, between March and May 2020, around 6% of adults who were hospitalized due to covid were hospital workers (Auerbach, 2020). These infected healthcare workers were forced to miss many days if not a few weeks of work. This made the staffing issues worse. Hospitals and other healthcare facilities were forced to deal with this pandemic and surge of patients with limited staff. This understaffing started to take a toll on the workers. Healthcare essential workers began to experience burnout. Burnout can be defined as, “emotional, mental, and even physical exhaustion that is caused by prolonged amounts of stress often caused by overworking yourself” (*Burnout*, 2022). ABC News released an article that states that “around 6 out of 10 healthcare workers agreed that the pandemic has burned them out” (Romero, 2021). Other than being overworked, healthcare workers were faced with increased amounts of difficult decisions as well as having to worry about the spread of the virus (Leo et al., 2021) In addition to this, these workers also were exposed to an increased number of patient, colleague, and family deaths. These are just a few of the numerous reasons burnt-out staff decided to leave the

healthcare field during the covid-19 pandemic. Healthcare administrators knew something had to be done to slow the spread of the virus between staff which caused the current shortage of staff to become worse. Healthcare facilities began to get things in place for a mandate requiring all staff to be fully vaccinated from covid-19. Healthcare administrators knew in order to slow the spreading of the virus, they had to risk losing staff. According to data from Fox, around 30 percent of healthcare workers around the country are unvaccinated (The Wall, 2021). This number needed to be lower to give facilities a chance to slow the infection rate of staff. This vaccination mandate caused many more healthcare workers to quit or be terminated. Staff did not like the idea of their workplace deciding what is put into their body. Hospitals experienced another huge decrease in staff. This caused many facilities to start looking elsewhere for patient care workers. Facilities decided their best chance of obtaining staff was to start trying to bring in traveling nurses. The issue with this is travel nurses get paid significantly more than facilities' current staff. This is because facilities must give incentives for people to travel from where they live to come to hospitals to help them out. Travel nursing pay increased to almost "twice what their pre-pandemic wages were" (Carrazana, 2022). As staff nurses became aware of what financial benefits to going to traveling positions were, they began to leave. This is an issue that impacted healthcare's ability to retain staff during the pandemic and will continue to impact the field for years to come.

### **Telehealth**

Of all issues, covid-19 caused, access to healthcare was one of the areas where its impact was felt the most. Due to the severity of the virus, most non-urgent healthcare needs were an afterthought. Unless someone had an emergency medical issue, there was no way to get into a healthcare facility to see a provider. This was all a way to reduce the spread of the virus. Even

dating back to before the virus started, the need to come into healthcare facilities for the treatment of different illnesses led to the unnecessary chance of spreading that illness to other people. Some medical illnesses even make it hard for a patient to be able to get to a healthcare facility due to the symptoms of the condition. This resulted in a problem that took until the coronavirus to solve. Telehealth was first introduced as a Medicare service back in 2002 but it was not until covid-19 closed many healthcare facilities that the use of it became common practice within healthcare options (Boyers, 2020). Telehealth gave people a way to get in touch with healthcare providers without having to worry about going into a healthcare facility.

Telehealth had many uses. One of the most common ways providers use telehealth is for patient visits. With the use of video calling with healthcare providers, patients can have virtual visits which allow for a close to the traditional patient to a provider visit. This type of visit is very beneficial for patients with chronic health conditions such as cancer, heart disease, diabetes, and even patients with mental health illnesses (Boyers, 2020). Another way telehealth proved to be an asset for healthcare was when it was used to gather health information. Telehealth could be used to gather demographics, medical history, and lab results, then send them to other healthcare providers or even different healthcare facilities. This allows healthcare patient data that prior to telehealth would take weeks to obtain to now be instantly available. Another way providers take advantage of telehealth is by using it to do remote patient monitoring. This means a patient could be given wearable items such as blood pressure cuffs and blood glucose monitors which would sync with an app that could allow the patients' healthcare provider to view patient vitals and other patient data in real-time (*Telehealth: What it is, the problems it solves, and how it's used in healthcare*, 2021). This allows providers to get important patient data and intervene, if necessary,

without the patient needing to come into a healthcare facility for a visit. The introduction of telehealth will change healthcare forever.

### **Pros of Telehealth**

Telehealth has improved many aspects of healthcare. One of the biggest improvements it has made is how it's increased availability. Telehealth has helped make healthcare that might not be within driving distance of your home, much easier to access. This is especially important for people who live in rural areas. Studies show that 76 percent of people prefer to have access even if it means no in-person visit (Gupta, 2020). By making it possible to have visits with a healthcare provider right from your living room, telehealth has helped decrease the cost for the average visit. Saving money on gas helps too. A poll by the Commonwealth Fund found that more than two-thirds of U.S. adults say that their potential out-of-pocket costs would figure prominently in their decision to get care if they had coronavirus symptoms" (Tikkanen, 2020). "In-person telehealth visits average around 176 dollars a visit whereas a telehealth virtual visit normally will average anywhere from 40 to 50 dollars" (Gupta, 2020). Telehealth visits also have a lower overall no-show rate. In-person no-show rates are estimated at about 9% compared to the 5.8% of telehealth visits (Boyers, 2020). Telehealth virtual visits are especially beneficial for patients with viruses such as covid-19. Due to being at home for the visit, healthcare providers do not have to worry about the possible spreading of the virus. Similarly, high-risk patients with compromised immune systems have a decreased risk of being infected with dangerous illnesses when using telehealth at home. In addition to that, patients suffering from limited mobility or issues finding transportation can find benefits with virtual telehealth visits. During the covid-19 pandemic, telehealth helped facilities with limited resources. Masks, gowns, and other PPE were running low, and reducing the total face-to-face encounters of staff to patients helped save

supplies for emergency situations. This was critical for healthcare facilities supporting the shortages caused by the coronavirus. Another positive of telehealth is that providers were able to keep in touch with patients on a more frequent basis. Due to having a place for providers to message patients and vice versa allowed communication without having to schedule an appointment. Telehealth was especially beneficial for healthcare providers and facilities. Providers that began implementing telehealth were able to decrease overhead costs as well as appointment times which would result in increased revenue (*Telehealth: What it is, the problems it solves, and how it's used in healthcare*, 2021). Although telehealth presented many improvements to healthcare, it had some flaws.

### **Negatives of Telehealth**

It's easy to see what makes telehealth an incredible change for the future of healthcare but even something so good has issues of its own. One of the most obvious negatives is the need for technology. "Telehealth is typically done through video calls so it's a requirement to have access to a device which would run these services" (Boyers, 2020). This would mean that some of the more vulnerable patient population, as well as some severely at-risk patients, would not have access to technology that would allow for telehealth access. Patients without the correct devices would still need to go in for in-person visits. In addition to that, some of the patients that do have the correct devices would still need to learn how to use the software to gain the benefits of telehealth. This would be something that would really impact the older population who might not be as familiar with newer technology. Another issue of telehealth is the need for a connection. For a telehealth visit to take place, a device would need to be connected to Wi-Fi or another form of internet. This would mean that connectivity issues during the visit could impact the quality of care or in some cases the access to the visit. Providers often use nonverbal body

language during the in-person visit which through telehealth could be missed. This is something that also impacts the ability to a proper patient assessment. Healthcare providers use a physical assessment to gain a better understanding of a patient's condition. One of the biggest disadvantages of telehealth is the lack of ability for providers to do a full patient physical assessment. On top of this, patients would still need to be in person for many different diagnostic assessments. These include but are not limited to, various imaging, urine, virus, bacterial, and even blood testing. This means that in some cases there's no way around in-person visits. There are issues with telehealth but the positives far out way the negatives. Telehealth without a doubt will continue to play a major part in the future of healthcare.

### **Changes to Roles within Healthcare**

#### **Pharmacist**

The Covid-19 pandemic caused many changes to healthcare. One of these ways it changed healthcare was by changing the roles of some healthcare positions. Pharmacists felt this role change as much as anyone in healthcare. "Pharmacists have arguably sacrificed as well as adapted just as much as any other health care professional in the wake of COVID-19" (Gombos, 2021). According to an article in Pharmacy Times, "Their roles in facilities have evolved to include the implementation of widespread prescription delivery services in many pharmacies, educating patients virtually, performing COVID-19 testing out of pharmacy drive-throughs, as well as preparing and administering the COVID-19 vaccine" (Gombos, 2021). Each one of these additions to the pharmacist role is significant and helps drastically in continuing to provide efficient care to patients. With Telehealth surging due to the virus's rapid spreading, pharmacists are beginning to use telemedicine to educate patients virtually. This is important because it gives patients a way to have their medication questions answered by a pharmacist without having to

worry about face-to-face contact. “Pharmacists are a great resource for patients who have questions about drug interactions, vaccines, and testing (Bonner, 2020). Telepharmacy allows patients to have this communication with their pharmacist in a safer way, with patients located in the comfort of their home which helps with keeping the public and pharmacists safe,” says Dr. Sandra Leal, who is Tabula Rasa HealthCare executive vice president of SinfoniaRx (Bonner, 2020). This kind of patient education is extremely vital in a time when so many patients have so many questions. Pharmacist testing for Covid-19 at pharmacies has also been essential. On April 8th, 2020, “The Department of Health and Human Services guidance clarified that pharmacists can, in theory, order and administer a diagnostic test for COVID-19, without involving a doctor or nurse practitioner.” (McCook, 2020). Being able to increase the accessibility of Covid testing has been one of the most impactful changes to the pharmacist’s role during the pandemic. According to an interviewed pharmacist, he estimates that he does “more than 200 covid-19 testing swabs a day” (Balick, 2020). By increasing the pharmacist’s role to be able to do covid testing it has allowed many more people the chance to get tested due to more accessibility. In addition to covid testing, pharmacists now have the ability to administer the Covid-19 vaccination. Pre-Covid, pharmacists were already able to administer some vaccines but with them now able to administer the new Covid-19 vaccine it helps with the surge of people looking to become vaccinated. On top of being more accessible, being able to get the covid-19 vaccine at pharmacies has other advantages. One of the advantages is that some pharmacies offer the vaccine at a much lower and more convenient price than other healthcare facilities. In addition to that, for some people, a pharmacy might be more conveniently located. One of the more important things that make access to the vaccination at the pharmacy significant is that most pharmacies do not require appointments. This makes it so that someone can get the vaccination

when they want, instead of having to wait days to weeks like at other healthcare facilities. Also, due to being an expert in pharmacology, pharmacists may offer more expertise with patient education about the vaccination which could, in turn, decrease some patients' hesitancy of becoming vaccinated (Turcu-Stiolica et al., 2021). Pharmacists changing roles significantly helped with the accessibility of covid testing as well as vaccinations in a time when it was hard to find quick access to these things.

### **The Increased Need for Contact Tracing**

One of the most difficult parts of the pandemic was knowing if you've been in contact with anyone that has covid-19. This is where contact tracing comes in. According to the CDC, "Contact tracing is part of the process of supporting patients and warning contacts of exposure in order to stop chains of transmission" (Contact tracing for covid-19, 2022). Contact tracing is meant to help reduce the spread of the virus. The process of contact tracing starts with a patient getting a positive covid-19 test back. "All close contacts to the patient with a positive COVID-19 test should be notified of their exposure within 24 hours of contact elicitation" (Contact tracing for covid-19, 2022). These people can be contacted by the health department via phone call, text, email, and in some cases, in person. Once these people are contacted the contact tracer will interview the close contact. They will try to see if that close contact person is experiencing any symptoms of covid, and they will also educate the person on the risks of infection from the virus. On top of that, the contact tracer will assess the person's home as well as social factors to make sure the patient will be able to comply with the self-quarantine policies. After that, contacts who agree to self-quarantine will receive active daily monitoring through real-time communication via phone call to check on basic covid-19 symptoms as well as temperature. If daily monitoring is not possible due to various reasons, the contact tracer will explain to the person how to self-

monitor. The last step of the process is called the closeout. During this part, the close contact might have finished their 14 days in quarantine or test negative. If at any time after the close out the patient becomes in close contact again or begins to experience symptoms, the whole process will start again. One of the issues with contact tracing was due to the number of contacts, the entire process took a long time. Some close contacts might never get a call due to how behind contacting tracing was. "In Fulton County, GA., chief epidemiologist Fazle Khan says, they have 130 people on their contact tracing team which was as many as they've ever had but even this was not enough to keep up with the 44,000 cases in this county that have yet to be contact traced" (Simmons-Duffin, 2022). The Centers for Disease Control also reported that, "the country would never have enough staff doing contact tracing to contain the rapid spread of the SARS-CoV2 virus" (Simmons-Duffin, 2022). This is evidence of just how in-demand contact tracers were during the pandemic.

### **Healthcare Collaboration**

In a pandemic as severe as covid-19 is, teamwork in healthcare facilities was at an all-time high. This was a challenging task due to the already burnt-out healthcare staff. "The impact of the virus demanded new ways of working together through healthcare organizations and healthcare delivery while at the same time trying not to put extra strain on healthcare workers" (Anjara et al., 2021). This collaboration would prove necessary to help reduce the spread of the virus as well as keep patient care as effective yet efficient as possible. "Collaboration at its most basic, is a process by which multiple individuals, including clinicians and non-clinicians, departments, or entire hospitals come together to share information, identify gaps in performance, and even develop solutions to improve care" (Howard, 2022). One advantage of effective collaboration is that the hospital is able to locate areas of improvement by the people

who are delivering the patient care. Another advantage of collaboration is it can help decrease the impact of staff shortages. An example of this is if you have an experienced emergency room physician, the doctor can help by seeing a couple of patients in intensive care or other departments. By doing this, the physician is able to help take some of the burdens off the departments they are helping out in. One hospital even had “local medical students call residents to talk and offer reassurance during these tough times. For the residents, this helped to decrease their loneliness and social isolation and for the students, it was a lesson in empathy” (How 1 health care team improved covid-19 nursing home care, 2020). Collaborations like this are what helped healthcare facilities the most. Covid-19 has taught healthcare facilities that in tough times, it's better to unify with each other to act as a single system rather than separate healthcare facilities. Sometimes with the bad, comes good.

### **Healthcare Screeners**

With the hospitals needing to reduce the spread of the virus came a new role within the healthcare system: screeners. When staff or patients are entering a healthcare facility, they are greeted by a Covid Screener. A covid Screeners' main purpose is to reduce the chance of the covid virus getting into the facility. The first thing these staff members will do is make sure people entering the building have the proper personal protective equipment according to the facility's policies. Once the screener can confirm that the person has the proper PPE on, they will take their temperature. This is to check if the patient has a fever. Fever is one of the most common Covid-19 symptoms. For someone to be allowed into most facilities, they must have a temperature lower than 100.4 degrees Fahrenheit. Once the person is confirmed to have a normal temperature, the Covid screener will then ask if the person is experiencing any common Covid-19 symptoms. On top of this question, they will ask if the person has been out of the country

within 14 days as well as if the person has been around anyone that's tested positive for the virus. If negative for all the questions. The person should be allowed into the hospital or other healthcare facility. Due to the rapid spread of the virus, covid-19 screeners are regarded as the most important role in the hospital for stopping the spread of the virus in the facility.

### **The Revenue Cycle in Healthcare**

Healthcare's revenue cycle was hit as severely as anything throughout the pandemic. In order to understand what changes were made, you first must understand what exactly the revenue cycle is. The revenue cycle begins way before the patient shows up at a healthcare facility for a service. The first step of the healthcare revenue cycle is pre-registration. This is the part where the patient fills out paperwork for the healthcare facility so that the facility can get all the necessary information from the patient. Demographic information, as well as insurance information, are two important pieces of information that are obtained during this step. Registration is the next part of the cycle. During this step, co-pays are collected and the patient's address, phone number, date of birth, guarantors, and insurance information are checked to confirm they are 100% correct. During this step, all necessary signatures are obtained from the patient. If any mistakes are made during pre-registration or registration, the entire revenue could be delayed which makes this the most vital part of the entire cycle (Carney, 2021). The next step of the revenue cycle is called charge capture. During this step, all the charges for the healthcare service are captured onto a bill and then submitted to the insurance (Kay, 2019). This step is crucial to ensure the facility will be fully reimbursed for the service. After this step is complete, there is a review to confirm that the patient's insurance plan does in fact provide the necessary coverage for the service the patient will receive. The main purpose for this part of the cycle is for

the insurance companies to determine if the treatment recommended for the patient is appropriate (Kay, 2019). There are many different services done within healthcare that can make it hard for insurance to be able to know which exact service to bill for. This is where medical coding takes place. During this part of the process, the descriptions of procedures, the condition of patients as well as the services used are put into a specific code (Kay, 2019). These codes are used by insurance companies to create claims as well as for billing the patients. These claims then need to be submitted. By submitting claims quickly and making sure they are accurate, delays can be prevented, and more revenue can be collected. The next step consists of, “hospital staff analyzing the payment that was received by the insurance” (Carney, 2021). If an error is caught, the claim would be sent to a clearinghouse which would review then clear the claim so it can be sent back to the payer for the error to be edited. If a claim is approved, it will be applied. This means the healthcare facility would now be able to collect payment reimbursement for the patient service. “The most common issues that happen during this part of the cycle are underpayments, denials, and even non-payments” (Kay, 2019). The final step of the revenue cycle for healthcare facilities is patient collections. This is considered the most difficult part of the entire cycle. This is because, during this part of the cycle, the facilities collect payments of the remaining balance of the patient’s service cost. The revenue cycle is a complicated process that only got more complicated during the covid-19 pandemic.

### **The Virus’s Impact on the Revenue Cycle**

One of the ways the pandemic impacted the healthcare systems is through the revenue cycle. The virus was causing revenue loss for many reasons. “The American Hospital Association (AHA) reported that healthcare facilities are losing more than \$50 billion per month with the possibility of around 1-1.2 billion U.S. dollars per day” (R1 RCM, 2021). Things had to

change. The virus caused many things throughout the revenue cycle to have to change in order to help with some of these losses. One of the biggest reasons changes to the revenue cycle needed to be made was because of the surge of telehealth visits. The increased implementation of telehealth during the pandemic was just one of the many ways the virus impacted the revenue cycle throughout healthcare. “An estimated 9 million Medicare patients received care through telehealth visits which totaled around 1.7 million virtual visits in April alone” (LaPointe, 2020). This caused issues because at the time there weren't procedures in place for some of the kinds of telehealth visits that were taking place which made billing and coding very difficult. “Some insurance companies billed telehealth visits as if they were the same as in-person whereas others did not” (West, 2020). Medical coders were not on the same page as the insurance company's due to not knowing exactly how to code for some of these new covid-19 related visits and treatments. Covid-19 forced the introduction of new codes specifically for this virus. According to an article, “on April 1<sup>st</sup>, 2020, the first new ICD 10 emergency code which is for 2019-nCoV acute respiratory disease would now require providers to use code Z03.818 for exposure to COVID-19 was released” (Drella, 2021). Many new codes followed. As many people were having to stay home due to mandates, some employees dealing with the revenue cycle were forced to have to do their job remotely. Many issues arose because of this. In order to be able to bill from home, all employees would need to have remote access to the billing and coding software systems. With this came the need for specific equipment to stay efficient with their work. Another problem was dealing with regulations, the Health Insurance Portability and Accountability Act being the biggest. “HIPAA is in place to ensure the privacy and security of any demographic individually identifiable information that can be used to identify a patient” (*Hipaa Basics; Hipaa Made Easy*, 2021). Doing parts of the revenue cycle remotely led to

challenges surrounding HIPAA. These same HIPAA challenges impacted telehealth visits. Information technology security teams were set in place to help monitor and test security to ensure privacy within the system. Once visits and treatments were successfully coded and sent to insurance, more problems were found. Medicare had too many changes to what could and what could not be something that could be billed (West, 2020). In addition to that another change with Medicare is the cash flow. "This change with cash flow would help so that organizations can receive accelerated or advance payments from Medicare in some scenarios, which by taking advantage of these cash flow changes, organizations can minimize issues related to covid-19" (West, 2020). Another major issue of the revenue cycle caused by the virus was the collection of money from patients. "An estimated 27 million people could lose their insurance through their job due to job loss" (R1 RCM, 2020). This added difficulty for people to have visits and get treatment because they had no insurance to help cover some of the costs. The virus has caused financial hardship to many people which makes it harder for some to pay bills. Out of all the ways covid-19 impacted the U.S. healthcare systems, the way it forced the revenue cycle to have to change was one of the most impactful. Another significant change because of the virus happened to the delivery of care within healthcare.

### **Increase in Medication Prices**

Medications are one of the largest medical costs in most households. "Medication prices have continued to rise throughout the Covid-19 pandemic, and pharmaceutical companies have increased prices for 832 drugs which is an average of 4.5% increase already in 2021, according to a report by GoodRx, which tracks prices for nearly 4,600 medications" (Gantz, 2021). As a comparison, in 2020 it was reported that "639 drug prices increased an average of 6% according to GoodRx" (Gantz, 2021). A lot of the medication prices that were increased were "commonly

used in intensive care units, lifesaving cancer drugs, blood pressure medications as well as some that are being used to treat COVID-19 or are being tested for use to combat the illness, according to a new report” (Bunis, 2020). This is an issue because, during the hard financial times of the pandemic, patients who are needing expensive medication are becoming more aware of the cost when purchasing medications. The financial burden of the virus made it even more difficult for many people who have lost job-based insurance or experienced a drop in their income due to the pandemic (Gantz, 2021). People started to have mixed feelings on whether they were for or against pharmaceutical companies. This was mainly because many people believed these companies lacked empathy due to the continuation of the price increase despite being in the middle of a pandemic. Other people understood that the increased prices to research medications and manufacture these drugs had increased costs during these times. In January 2020, “only tobacco companies had a worse public opinion rating than the pharmaceutical industry, according to the Harris Poll” (Anderson, 2021). A year later, there was a 30% increase up to “62% of people who had a positive opinion of drug companies,” compared to the year before (Anderson, 2021). During a time when so many people were so concerned for their health, there was an increased demand for medications. “The uncertainty of coronavirus caused a big increase in purchasing of medications around the world, driving demand to an unprecedented high” (Bookwalter, 2021). In addition to this, the pandemic caused many drug manufacturers to shut down in order to help reduce the spread of the virus. This created a medication shortage. A big cause of the supply shortage of medications is due to a lack of raw materials needed to manufacture these drugs. It’s reported that “about 80% of the raw materials for drugs are imported from abroad” (Bookwalter, 2021). This means the United States is highly dependent on other countries for the materials needed to manufacture medical drugs. This could be one of the

big factors in the driving up of drug prices by these pharmaceutical companies. This is also a contributing factor to why medications within the United States have a higher cost than in other countries. Remdesivir, a medication that's been approved to treat hospitalized coronavirus patients, will cost more than \$3,000 per patient. This is at least 33 percent more than the company is charging for the same medication in other countries" (Bunis, 2020). This not only affects patients but also impacts healthcare facilities. It's estimated that "drug prices for hospitals are expected to increase by around 3.09% in 2022" (Muoio, 2022). Rapidly increasing medication prices are hurting a lot of hospitals' ability to lower the cost of care. The increase in medication prices continues to be one of the many ways covid-19 has impacted healthcare.

### **Fighting the Virus**

The surge of the covid-19 virus left hospitals and other healthcare facilities searching for a way to help treat covid-19 positive patients. Personal protective equipment and mandates can only do so much toward stopping the spread of the virus. Doctors report, "The most important thing someone can do to protect yourself from Delta, Omicron, or any COVID-19 variant is to get fully vaccinated" (Katella, 2022). The problem with this is many people feared the vaccines. They believed that due to how quickly the process of getting the vaccines into the market was, many people thought the vaccination can be bad for a person's health. "Scientists fear that the pools of unvaccinated people around the world will present a greater risk for the emergence of new variants of covid-19" (Mallapaty, 2021). A poll done by Monmouth University confirmed what this scientist feared, "1 in 5 Americans remain unwilling to get the COVID-19 vaccine" (Soucheray, 2021). According to a study done by The Mayo Foundation for Medical Education and Research, as of April 2022, 65.9% of Americans in the United States have been fully vaccinated against Covid-19 whereas 77.4% have received at least one dose (*U.S. COVID-19*

*vaccine tracker*, 2022). In addition to this, some people also believed that natural immunity is more effective than vaccination. “Getting one of the COVID-19 vaccinations is a safer and a much more dependable way to build an immunity to this virus than trying to become naturally immune” (Centers for Disease Control and Prevention, 2021). What vaccine is the best? Let’s take a dive into each of the approved Covid-19 vaccines in the United States.

## **Vaccines**

The first vaccine that was approved for use in the United States was the Pfizer vaccine. The Pfizer-BioNTech vaccine was the first COVID-19 vaccine to receive FDA Emergency Use Authorization back in December 2020 and then was approved for full Food and Drug Administration approval back in August 2021 (Katella, 2022). With the Pfizer vaccination, it is two doses to be considered fully vaccinated. Once you get the first dose, you wait 21 days before you receive the second. Some of the possible side effects of this vaccine are, “Pain, redness, or swelling at the site where the shot was administered, tiredness, headache, muscle pain, chills, fever, as well as a possibility for nausea” (Katella, 2022). Pfizer is a new type of vaccine which uses mRNA technology. “This works by sending host cells within the body instructions for making copies for a spike protein. The person’s cells then will recognize that this protein is not supposed to be there which will cause the immune system to activate immune cells as well as begin producing antibodies for the copied spike protein. By doing this, the body will now be able to recognize and fight the real COVID-19 molecules if they enter the body” (FDA, 2022). An FDA study reports that the Pfizer vaccine has around a “95% efficacy”, but after some data on real-world effectiveness for adults, it shows that the effectiveness will decrease over time (Katella, 2022). “As of April 18, 2022, over 336 million Pfizer-BioNTech COVID-19 vaccine doses had been administered throughout the United States” (*Vaccines for covid-19*, 2021). As

reported by Oregon.gov, out of 117,495 people who became infected by covid after getting the Pfizer vaccination, 2,589 were hospitalized, and 636 of these people passed away (Oregon.gov., 2022). Soon after the Pfizer vaccine got approval for use in the United States, so did another vaccine.

A week after Pfizer got approved for emergency use, so did the Moderna Vaccine. In January of 2022, the FDA granted Moderna full approval. Similar to the Pfizer vaccine, you will need two doses of the Moderna vaccine to be considered fully vaccinated. The difference between the two is after the first dose with Moderna, you must wait 28 days before receiving the second. Like the Pfizer vaccine, Moderna is an mRNA vaccine that will send the body's cells instructions for making a spike protein that will allow the immune system to recognize it (Katella, 2022). Once this process is finished, the immune system will be able to recognize a covid-19's spike protein and will attack it. The side effects of Moderna are the exact same as the Pfizer vaccination due to being a similar type of vaccine. If a person receives the vaccine and experiences any of the symptoms, they should not be worried as they normally will go away within a few days. Research has shown Moderna to be just as effective as the Pfizer vaccine which is about 95% effective against the COVID-19 virus. According to the CDC, as of February 7, 2022, more than 205 million doses of Moderna COVID-19 Vaccine have been administered in the United States of America" (*Vaccines for covid-19*, 2022). A study done by WebMD, when comparing Moderna versus Pfizer, "the Moderna vaccine conferred a 21% lower risk of infection as well as a 41% lower risk of hospitalization" (Preidt, 2021). As reported by Oregon.gov, "out of 973,071 people who got fully vaccinated by the Moderna vaccine, 61,535 became infected with COVID-19. Of the people that tested positive for covid, 1,772 got admitted

into a hospital and 387 passed away” (Oregon.gov., 2022). Although Moderna, as well as Pfizer vaccines, were highly effective, another vaccine made its way into the United States.

In February of 2021, the Food and Drug Administration approved the COVID-19 vaccine, Johnson and Johnson. This vaccine was unlike Pfizer and Moderna because instead of needing two doses, with the Johnson and Johnson you only need one dose to be fully vaccinated. Due to being only one shot, the Johnson and Johnson vaccine was much easier to distribute and was quickly regarded as the most convenient vaccine to get. The Johnson and Johnson vaccine was a carrier-type vaccine that worked differently than Pfizer or Moderna. “Scientists engineered a harmless adenovirus as a shell to carry genetic code on the spike proteins to the cells. The shell or the code will not make you sick, but once the code is inside the cells, the cells produce a spike protein to train the body’s immune system, which creates antibodies and memory cells to protect against an actual SARS-CoV-2 infection” (Katella, 2022). The possible side effects after receiving the Johnson and Johnson vaccine are very similar to Pfizer and Moderna. Johnson and Johnson did not work as hoped. During Spring 2021, the government put a stop to the administration of this vaccine due to concerns over a possible association with a rare blood clot disease. Although this was quickly lifted, the CDC would advise people to get Pfizer or Moderna over Johnson and Johnson due to their concerns. Of the 17 million people who received the Johnson and Johnson, 54 cases of blood clots were reported, 36 of those people were cared for in an intensive care unit, and nine people of these people would die (Katella, 2021). Johnson and Johnson proved to be the least effective vaccine in the United States with a 67% efficacy (FDA, 2022).

## **Treatments**

Although there is not a clear favorite medication for treating COVID-19 in the United States, there are some options. One of these options is monoclonal antibody treatments. These can be given via IV or as a series of shots. The purpose of these treatments is to help with boosting your body's ability to fight the SARS-CoV-2 virus. "Monoclonal antibody treatments are able to block the SARS-CoV-2 virus from entering cells in your body as well as limiting the amount of the virus that can be inside your body" (Possible treatment options for covid-19, 2022). These treatments are good for patients who are at high risk for developing serious covid-19 symptoms due to the possibility of the treatments being able to help reduce the severity of the symptoms. The most important part of receiving monoclonal antibody treatments is that the treatment must be given within the first 7 days of when symptoms first begin to appear. Possible side effects of this type of treatment can include rashes, itching, nausea as well as vomiting. In a study done by Mayo Healthcare, "bamlanivimab monotherapy also known as monoclonal antibody treatment, is estimated to have a 40% to 60% reduction in hospitalization as well as a significant reduction in the rates of intensive care unit admissions and death" (O'horo, 2021). The effective rate of this type of treatment makes this a solid option for the management of COVID-19.

In addition to Monoclonal Antibody Treatment, another option for the treatment of COVID-19 is Remdesivir. Another name for Remdesivir is Veklury. This medication must be given to a patient within the first 7 days that the first COVID-19 symptom appears. Remdesivir has been shown to decrease a covid-19 positive patient's chance of hospitalization or death by 87%. Although the effectiveness of the medication is significant, it also has its drawbacks. Remdesivir takes much more time to administer due to being a drug infusion that must be given intravenously (Huang, 2022). In addition to this, the medication has substantial upfront costs

which may remove this as an option for some patients. For these reasons, many healthcare providers are using Remdesivir as a last resort. According to an article, “a healthcare system in Utah has treated only about 15 early COVID-19 patients with Remdesivir so far” (Huang, 2022). As for now, Remdesivir remains an option when other treatment types are not effective.

If a patient in the hospital requires supplemental oxygen, then the medication Baricitinib might be a good option for the management of COVID-19. Baricitinib, also known as Olumiant, is a medication that works by “blocking Janus kinase which is one of our body’s signaling proteins which is heavily involved in the inflammatory response to infections such as COVID-19” (Hempel, 2022). It’s also noted that this medication might inhibit the virus from entering the body (*Possible treatment options for covid-19*, 2022). Baricitinib should be used in moderately ill patients and critically ill hospitalized patients. In a study, out of a total of 2,659 patients that were hospitalized due to COVID-19, once given Baricitinib, 95% showed signs of improvement or a decrease in the severity of the symptoms. Common side effects associated with this medication include body aches, difficulty in breathing, headaches, runny nose, sore throat, as well as possible tiredness (Hempel, 2022). At a cost of roughly \$1,500 per patient paired with some of the severe side effects, many providers are not sure if it makes sense to use this medication for the management of COVID-19.

If Baricitinib is not a suitable fit for a patient’s treatment of the virus, maybe Tocilizumab is. Tocilizumab also known as Actemra can be used for a patient who requires supplemental oxygen or is currently receiving corticosteroids (*Possible treatment options for covid-19*, 2022). This medication has shown a decrease in hospitalized patients’ risk for death due to COVID-19. Tocilizumab is a significant treatment option because not only is it available for adults, but it also is an option for pediatrics. In the Empacta trial, “Actemra reduced the risk

of COVID-19 death by 44%” (Liu, 2020). Tocilizumab or Actemra’s route of administration is via a 60-minute intravenous infusion. The most common side effects of this medication are upper respiratory tract infection, such as a sinus infection or the common cold, headache, hypertension, increases in the levels of certain liver enzymes, and injection site reactions (*Possible treatment options for covid-19*, 2022). Although this medication is not a common choice of providers due to not being fully FDA approved, it remains an effective option in the fight against COVID-19 during this pandemic.

One of the most controversial treatment options for the treatment of COVID-19 is Ivermectin. Ivermectin was developed in the 1970s to treat parasitic infections in animals (Aeschlimann, 2021). Many people refuse to use this medication as a treatment for COVID-19 due to what the medication was originally used for. What many people do not know is that Ivermectin is also FDA-approved for human use. Ivermectin was approved in 1987 to treat river blindness. Since becoming FDA approved, Ivermectin has prevented an estimated 600,000 cases of this type of blindness ((Aeschlimann, 2021). During the COVID-19 pandemic, many people were reporting that Ivermectin helped manage the virus. The findings of this medication being effective against covid-19 were significant largely because of its easy administration, how readily available it is as well as the low cost. The negatives were that Ivermectin actually has not shown any scientific proof of being effective against the COVID-19 virus. After studies of the medication’s effectiveness were released, it was quickly withdrawn after scientists found serious flaws within the study (Aeschlimann, 2021). In addition to that, Doctor Waleed Javaid reported, “even though all medications have a potential for side effects, the risks of taking a parasite-killing drug may be higher than others” (Tamkins, 2021).

There are many different options when it comes to Covid-19 vaccines as well as treatment options for managing the virus. When picking which vaccine or even medication for covid-19 treatment it's best to know every option as well as the differences between them all. The effectiveness of each significantly depends on each individual person. According to providers, the best way to reduce the chance of being hospitalized due to the COVID-19 virus is to make sure you're fully vaccinated.

### **Changes in EMS**

One of the most critical parts of healthcare happens pre-hospital. Emergency Medical Service is done by medical professionals that can provide urgent treatment and/or stabilization of patients with serious injuries or illnesses as well as transportation of the patient to the most appropriate healthcare facility for further treatment. EMS is one of the most critical parts of healthcare and if done effectively, can significantly increase a patient's chance of survival in a lot of cases. EMS workers strive to get patients to the appropriate facilities as quickly as possible while still being able to initiate life-saving measures if needed. EMS management as well as hospital administrators are constantly trying to improve how quickly these critical patients get the care they need. Then came Covid-19. The virus impacted already struggling agencies. "It's reported that on average, over 18% of their EMS frontline workers have contracted the COVID-19 virus with around 27% of their workforce having to quarantine at some time during the pandemic" (*How covid-19 has impacted our nation's EMS agencies*, 2020). EMS personnel worked to stay ahead but the virus made it nearly impossible to be as efficient as pre-virus.

### **Dispatching the Crews**

Emergency medical service starts the moment a 911 call comes into the dispatching center. When a person with an emergency calls 911, the call is transferred to a dispatch center where the call is picked up by an EMS dispatcher. The purpose of the dispatcher being there is to start by getting the patient's chief complaint, the address of the emergency, and other basic demographic information so they can correctly page out an ambulance to the scene. This is one of the most important steps in the entire process of getting that patient to the hospital. The dispatcher needs to be able to be quick, yet super precise. The address must be paged correctly to the EMS crew, so they know exactly where they need to go. The dispatcher also gets a quick brief reason for the emergency call from the caller. This is incredibly important so that the crews can have a basic rundown on what needs to be done once on scene. This step is also vital because the crews need to know if special personal protective equipment might be required for the run. For example, they could need a special type of respirator or even eye protection. On top of that additional resources such as firefighters or police could also be needed on the scene. When Covid-19 started to rapidly spread, the process of the dispatch had to change so they could help protect the EMS crews. Emergency Medical Service dispatchers would now be asked to ask the caller covid-related questions to help identify the possibility of the patient having the virus. The first question they would ask is, "Have you or anyone you are in close contact with tested positive for covid in the last 14 days?" Another one of the questions would be, "Have you or anyone you've been in close contact with traveled outside of the country in the last 14 days." In addition to that, another example of a question they could ask would be, "Are you or anyone you have been in close contact with experiencing coughing, fever, chills, or difficulty breathing?" This added step would only delay the time it took to page the crews. In addition, the extra time to put on the necessary PPE would increase the time it took for these first responders to be able to

get to the scene of the emergency. On the outside looking in, this small amount of additional time required for the questions and the time for putting on the PPE does not seem significant, but with patients experiencing an acute myocardial infarction, stroke, various traumas, et cetera, each additional second can decrease the patient's chance of survival.

### **Response time and patient care**

“Emergency medical service crews’ ability to respond to calls increased to around 12 minutes, compared to around two minutes in the pre-COVID-19 era, and with extreme cases extending to around two hours wait time” (Amiry & Maguire, 2021). A lot of this increase is a result of the increase in call volume. During the virus’ peak in 2020, medical emergency calls surged causing a disruption in some EMS dispatch centers as well as causing significant delays in emergency crews’ response. According to an article, “in New York City, EMS call volume jumped from a daily high of 4000 calls to over 7000 calls” (Amiry & Maguire, 2021). “Increased call volume and an increase in complex medical situations from COVID-19 put pressure on already short-staffed EMS” (*‘running calls around the clock’: FEMA ambulances assist depleted EMS crews*, 2022). Many EMS workers quit due to stress and burnout due to covid-19.

According to a survey of 258 EMS organizations across the country, “The pandemic has made it difficult to hire and even harder to retain EMTs and paramedics” (McCausland, 2021). The shortage of frontline workers made the volume of runs just much more difficult to control. Covid-19 caused many of these calls to become more complex than pre-covid. A big reason for this is the fear of becoming infected with the virus. PPE protocols were constantly being updated. During the dispatcher’s questions, if the caller was experiencing any covid symptoms or had said yes to any of the virus questions, crews would take the appropriate measure to ensure the crew’s safety. New and updated protocols would help force the donning of the appropriate

personal protection equipment by EMS personnel when they were preparing for a run they've been paged for. "Donning PPE is a time-consuming procedure that impacts the response times of ambulances" (Amiry & Maguire, 2021). This was significant because crews had to don the proper PPE, which would delay their response to high acuity patients and could potentially decrease the chance of patients surviving their medical emergency. Something else that could decrease a patient's chance of surviving a severe acute medical issue is many hospitals began to run out of hospital beds due to the surge of hospital admissions.

### **Choosing the Destination**

An additional way covid-19 impacted emergency medical services is when the personnel were determining what hospital would be best for the specific patient. Pre-covid, EMS crews would determine which hospital a patient would go to depending on what medical emergency the patient was having. For example, if a patient got into a bad motor vehicle accident, you'd want to make sure that patient went to a trauma hospital with enough resources to correctly treat that patient. This pandemic changed the way EMS crews picked the hospital for each patient. Due to covid outbreaks hospitals would decline certain types of patients due to limited resources and a shortage of staff workers. In some areas, there were preset hospitals you'd take patients if the covid-19 virus was suspected. These were normally hospitals with more resources. These hospitals quickly filled up causing a lack of beds for covid patients. Covid-19 patients would then be left with the option of staying home, going to a hospital that might not have the appropriate resources to help treat them, or possibly going to a hospital with covid capabilities that might just be far away. "In some cities, a patient transport to a hospital that normally takes 8 minutes would now take an hour due to hospitals being at limited capacity" (Amiry & Maguire, 2021). These far transports would cause an even bigger response delay for patients waiting for

the already struggling EMS crews. These increased delays would become so significant that some critical patients would be deceased before the EMS crew was able to get to the scene. “In Texas, the on-scene pronounced death rate increased by 164%, while in New York City, the death rate climbed to six times above baseline when compared to the numbers pre-covid” (Amiry & Maguire, 2021). “More than 40,000 people in England who called for an ambulance with a medical condition such as a stroke or a heart attack, waited more than an hour and 40 minutes for an ambulance in November 2020,” according to an article (Murray, 2022). In the same article, a person they interviewed stated they had called EMS 6 different times in the long wait for an ambulance while their mom was having a stroke. It’s also worth noting that there was a, “48% increase in non-transports for April 2020” (Satty et al., 2021). This is because people feared going to the hospital due to the chances of being infected with the virus. This would mean many people would call EMS to get as much at-home treatment as they could get. All of this is evidence that surging hospital admissions were one of the biggest impacts the virus had on EMS.

### **After the Run**

Some of the impacts Covid-19 has on emergency medical services does not have a direct impact on patients but are still significant for the EMS agencies and personnel. When an EMS crew goes on a 911 run, they fill out a patient care report (PCR). In this patient care report, they put the patient’s name, demographics, the reason for the 911 call, patient assessment, patient care interventions as well as a narrative going over the entire encounter with each patient. The purpose of the PCR is it allows each run to be documented accurately for the purpose of billing as well as for record if needed in the future. During this pandemic, there were some changes to the patient care reports for some companies. On iPCR, a major documentation software program of EMS, a section was added for EMS crews to be able to document exactly what PPE was used

by the EMS personnel as well as what PPE was used by the patient. In addition to that, a section was added so that crew members can document if the patient has been experiencing any of the covid-19 symptoms, if they've been in contact with any covid positive people as well as if the patient has been out of the country in the last 14 days. All of these additions were used for the purpose of contact tracing for the virus. One of the other important sections that were added to some companies' patient care reports was for the crews to put what was used to disinfect the ambulance after the run. Once a 911 call concludes, the ambulance crew members clean and disinfect the entire inside of the ambulance as well as the supplies used during patient care. New disinfecting techniques were added to help stop the spread of the virus. The first step of the new disinfecting protocols for an ambulance is to open the rear doors of the ambulance. Crews would then use approved for covid-19 disinfecting spray or wipes to wipe down everything in the back of the ambulance. Once everything was wiped down the crew would use an "aerosol-generating procedure" (*First Responders*, 2020). The purpose of this would be to spray the entire back of the ambulance to disinfect and kill the virus molecules. This is a time-consuming process. The covid-19 virus, "increased the time it would take to clean and prepare the ambulance for the next 911 transport once a patient was dropped off at the hospital" (Taigman, 2020). This only increased the delay in responding to 911 calls.

### **People Fear calling EMS for Help**

"During the pandemic, many emergency and non-emergency patients were reluctant to call 911 or seek medical attention, due to the fear of becoming infected with the Covid-19 virus" (Amiry & Maguire, 2021). Some people were so worried about contracting the virus that they would rather bear the consequences of calling for help, even if it had possible life-altering consequences. A study concluded that "throughout the duration of the pandemic, the use of

ambulances has risen, but the use of EMS for severe medical conditions such as various heart conditions, strokes, acute abdominal diseases, etc., has declined” (Mandal, 2020). In this same study, they state that they believe the decline in most of these critical patients calling 911 is a result of a fear of infection from the virus. “As of June 30, 2020, an estimated 41% of adults in the United States have reported having delayed care or have even avoided medical care during the pandemic because of concerns about COVID-19, including 12% who reported having avoided emergency care altogether” (Czeisler, 2020). Patients not calling 911 during significant medical issues has led to an increase in the number of deaths at the scene (Mandal, 2020). According to an article, “Deaconess Hospital’s ER in Washington saw a 13% decrease in 911 calls for medical transport in March of 2020” (Lind, 2020). During the same month, an EMS official reports that the number of EMS calls to patients’ residences where people have died has doubled (Reinburg, 2020). Patients’ fear of the virus has proven to impact EMS in a significant way.

### **Financial Impact on EMS Agencies**

Emergency Medical Services are feeling the impact of the pandemic financially. According to NAEMT, “at least 66% of responding EMS agencies have been negatively impacted financially by the pandemic” (*How covid-19 has impacted our nation’s EMS agencies*, 2020). A major reason for this is the drastic increase in medical supplies. One of the biggest price increases can be seen in personal protective equipment. “EMS agencies have reported increased price gouging when purchasing PPE supplies” (*How covid-19 has impacted our nation’s EMS agencies*, 2020). Some PPE was up over 50% of the price it was pre-covid. Things such as N95 masks, gloves, face shields as well as gowns have almost doubled in price during the pandemic due to price gouging. EMS agencies struggled. Due to a lack of government

funding, many companies struggled to stay in business. In the Daily Mail West Virginia, Chris Hall, an executive director of EMS Coalition within the state reported, “Without additional support to help EMS providers, many communities may face the loss of emergency ambulance service” (Casto, 2022). Many of these emergency medical service companies began applying for government funding. It’s reported that over 50% of EMS agencies applied for federal, state, or even local grant funding but were denied (*How covid-19 has impacted our nation’s EMS agencies*, 2020). On September 29, 2021, The Department of Health and Human Services announced a new application cycle for \$25.5 billion in COVID-19 provider funding (*Application open: COVID-19 provider relief funding*, 2021). This funding would help many small rural agencies stay on their feet. This funding is the reason many of these EMS agencies were able to make it through the worst of the pandemic.

### **Mental Health in Healthcare Workers**

Covid-19 impacted healthcare in many ways, but one of the biggest impacts of the virus happened to be with the negative mental health of frontline healthcare workers. According to a study, they “reported moderate and high levels of stress, anxiety, depression, sleep disturbance, and burnout” (Danet, 2021). “34.6% of respondents experienced depressive symptoms” (Shreffler, 2020). This was a huge issue. This wasn’t an easy fix for healthcare facilities due to the many reasons the workers were feeling this way. 76% of healthcare workers with children reported that they were worried about exposing their child to COVID-19, and on top of that, 47% were worried that they would expose their older family members” (*The mental health of healthcare workers in COVID-19*, 2020). Many of these frontline workers would end up quitting their jobs due to this exact reason. In addition to this, due to the already existing healthcare worker shortages, many of the employees felt they were never able to have family time. “Among

people with children, around half of them reported a lack of quality time and are unable to support their children” (*The mental health of healthcare workers in COVID-19*, 2020). This led to many workers to begin to experience symptoms such as stress, and anxiety, some began to have issues sleeping, and some even experienced depression. “During the COVID-19 outbreak, a relatively high prevalence of anxiety (24.94%), depression (24.83%), and sleep disorders (44.03%) was reported” (Leo, 2021). It did not stop with only mental health issues. Many healthcare workers began to experience covid-19 related symptoms. According to reports, “Common symptoms were fever (85%), cough (80%), weakness (70%), chest distress (7%), hemoptysis (7%), headache (7%), and diarrhea (7%)” (Shaukat, 2020) Due to these conditions many of the healthcare workers had to miss time from work making the shortage of workers even more of an issue. An estimated 18% of health care workers have quit their jobs during the COVID-19 pandemic,” and many of these quit due to mental health issues (Galvin, 2021). This meant healthcare worker shortages remained one of the biggest issues caused by the virus.

### **Covid's Impact on the Future of healthcare**

#### **Change in Healthcare Workers Pay**

A positive take away from the COVID-19 pandemic is healthcare workers are finally getting an increased pay that they deserve. Due to the stress the virus puts on registered nurses, “nurse turnover rates have increased to around 22% in 2020 which is an increase from the 18% turnover rate the year before” (Fox business, 2021). With the turnover rates of healthcare staff being so high, healthcare employers are forced to increase pay to stay competitive and keep staff in the facilities. On top of the pay increases given by these employers, “some are offering nurses additional time off and more schedule flexibility which can combat burnout and on top of that, other non-salary perks to help try to retain staff” (Evans, 2021). How much of an increase in pay

are staff receiving? In 2019, the median salary of Certified Nursing assistants in the United States was 30,720 U.S. Dollars. This increased to roughly 32,050 in 2020, then to 33,710 in 2021 (Salary.com, 2022). In 2022, a Certified Nursing Assistant's salary is projected to increase by 4.3% which would make it an average of 33,710 dollars for the year. As for Registered Nurses, in 2019 the average median salary in the United States was 77,460 USD. This increased the next year to around 80,010 then up to 81,780 in 2021. It projected for Staff Registered Nurses Salary to increase roughly "2.6% during 2022" (Salary.com, 2022). "The demand for registered nurses has risen so high that many nurses have been able to make an even better living by leaving hospital payrolls and instead hopping between temporary jobs that are seeking emergency staffing", hospital recruiters and executives say (Fox Business, 2021). These temporary jobs are called travel nursing. Travel nursing is a contract-based job that allows nurses to go to facilities that have a high demand for staff. In return these nurses will normally be compensated well. What draws a lot of staff nurses to becoming a traveling nurse is how much more money they can make. Reports show, "travel nurses now can be paid between \$5,000 and \$10,000 per week compared to the median staff nurse which makes \$1,400 a week on average (Yang & Mason, 2022). On top of this significant pay increase, many of the travel nurses get a weekly stipend to help pay for housing and food while they are under their temporary contract. In 2020 traveling grew 35 percent compared to the previous year and is expected to grow by an additional 40 percent in the upcoming years (Yang & Mason, 2022). With the good comes the bad and the same can be said with travel nursing. Although there are many good things about the travel nursing position, there are also some negatives. One of the big downsides of this type of nursing is due to being on contract for limited time, there's not much room to advance within the company. This basically means the nurse on contract won't have much chance of moving up to

any type of management role while on contract. Another aspect that some people might look at as a negative is when deciding where to travel to, the nurse must choose a place that's currently looking for travel nurses so it's possible that options of the different locations might not interest that person. On top of this, due to having to pick from what's available, the nurse might spend the entire contract away from their family. Being away from family made the already burnt-out nurse who was dealing with the virus even more stressed. Even with these negatives, travel nursing is a great way for healthcare facilities to get staff to help their staff shortages.

### **Has Covid-19 Impacted Medical Students Coming into Healthcare?**

The Covid-19 virus has impacted many aspects of healthcare. One of the biggest impacts can be felt with the healthcare worker shortage. Healthcare facilities depend on brand new nurses and other providers coming out of school to help fill in open roles within the facility. The issue is the pandemic has impacted medical students that are still in their programs. Due to the rapid spread of the disease, almost all colleges and programs were forced out of face-to-face education and had to switch to virtual education. This was to help protect students as well as the professors from becoming infected with this virus. Covid-19 placed added stress on a lot of students which resulted in a decrease in mental health. "77% of students reported in a study stated that their academic performance was impaired by emotional or mental difficulties due to the pandemic" (Lewis, 2021). Data showed that 96.7% of the students used in the study had a decrease in academic performance because of the COVID-19 lockdown" (Mahdy, 2020). Some students may be able to adjust to the virtual learning but some struggle significantly. Lectures are pretty easy to turn virtual, whereas labs and clinical hours are a challenge due to the lockdown. Hands-on clinical experience is vital in the development of the student as they become healthcare professionals. How students will now receive these hands-on experiences is up to each individual

program. According to the Texas Board of Nursing, “during the 16-week semester, a predetermined number of clinical hours will be built in with a 50% simulation limit for these hours” (Texas Board of Nursing, 2020). This ultimately means that in Texas, a nursing student can only obtain half of their clinical hours online while they must wait until hands-on in person clinical hour to restart to obtain the rest. This can cause a delay in many medical program’s graduation timeline. “Due to COVID-19 it’s reported 13% of students have delayed graduation, and on top of that 40% have lost an internship, or job offer” (Aucejo et al., 2020). This is significant because with the already struggling healthcare facilities, the lower number of graduates will impact hospital’s ability to recruit new healthcare providers.

### **Preparation and Training Changes**

Covid-19 caught many people off guard. Not many were caught more off guard than the healthcare system. When Covid-19 began to spread throughout the country, many healthcare facilities were not able to perform patient care as effectively as pre-covid. This can be caused by many things. Personal protective equipment and other medical equipment shortages are the most obvious. In addition to that, many hospitals did not have plans set in place to handle a pandemic like this. “The COVID-19 pandemic exposed many failures in global and U.S. domestic preparedness and implementation” (Bollyky, 2020). “To better prepare for the next crisis, and future waves of the current one, the United States will need to devote considerable political capital and economic resources to reducing the domestic and global vulnerabilities that jeopardize individual, national, and global health security” (Bollyky, 2020). When covid-19 started its spread throughout the country, the government wasted many weeks which could have been used to help implement virus testing and contact tracing, social-distancing policies, and isolation, quarantine, and other public health interventions to help reduce the rate of spreading

infections. Studies show, “The United States could have cut death rates by 83 percent in the first months and if just one week earlier the proper precautions took place, mortality would have still dropped by 55 percent,” according to these researchers (Bollky, 2020). Due to the exposure of the lack of preparedness and training of healthcare facilities, the United States Government as well as healthcare officials will use what they have learned from this pandemic to better prepare themselves for the future.

### **New Outlook on Healthcare Workers**

The covid-19 pandemic has brought awareness to the need for efficient and reliable healthcare. Due to the severity of this virus, many people were forced to seek treatment whether this was for them or someone else. This has many people seeing healthcare workers in a more positive way than ever. Healthcare workers are in the public eye more than ever, and people appreciate the work they are doing to help treat patients during such a hard time. “The initial wave of support had the public sending cards, care packages, and even creating music” (Goodwin, 2021). Companies have continued to show their appreciation for the essential frontline workers by various ways including giving free or discounted food, as well as many other store discounts. A survey found that 69% of Americans believe that healthcare workers are trustworthy, and 64% found doctors to be trustworthy professionals as well as 85% of Americans believe that nurses’ honesty and ethical standards are “very high” or “high” (Goodwin, 2021). This is significant for the future of healthcare because healthcare workers will now get the respect they have always deserved.

The future of healthcare has changed drastically due to the covid-19 pandemic. The United States will now be better prepared to handle any future pandemic. Healthcare facilities have increased healthcare workers’ pay which should help with retaining hospital staff which

may help with the healthcare worker shortages. Through the implementation of telemedicine, healthcare is now as accessible as it's ever been.

### **How Different Countries of the World Fared Against Covid-19**

The United States of America made a lot of changes throughout the country to be able to help stop the spread of the COVID-19 virus as well as survive the pandemic. Although the country did end up slowing the spread of the virus through the mandates and other government choices, much of the pandemic's impact could have been less severe if handled differently. According to a study, "The United States could have cut death rates by 83 percent in the first months and if just one week earlier the proper precautions took place, mortality would have still dropped by 55 percent (Bollky, 2020). "In my book, I think of the U.S. as having the worst outcomes," said Jennifer Nuzzo who is a Johns Hopkins epidemiologist who co-led the pandemic preparedness index" (Ellerbeck, 2021). How does the United States of America's covid-19 response compare to countries around the world? A study done by Health Analytics shows that many of the countries with the best healthcare systems in the world did statistically worse with reducing covid-19 spread. In the United States, more than one million people have died and over 81 million have been infected (Wani, 2022). In addition to that, France which ranked at No 8 in the world has suffered over 25 million infections, the fourth highest in the world, and 142,506 deaths, which would be tenth highest in the world (Wani, 2022). "Italy whose healthcare system also ranks among the highest has recorded around 15 million infections, ninth highest in the world, and 159,784 fatalities, eighth highest in the world" (Wani, 2022). Not many countries had a worse virus response than Peru. Peru had by far the most COVID-19 deaths per million people at 6,132 deaths every 1,000,000 people (Howell, 2022). The closest country to Peru would be Bulgaria at 4,765 deaths per 1,000,000 people. On the flip side of things, the three countries with

the lowest deaths per 1,000,000 people are Burundi, Vanuatu, and China according to a study. Burundi has the lowest with 3.10 deaths per million, Vanuatu was just behind with 3.18 deaths per million and China was right behind both with 3.21 deaths per million people. One notable thing China did was as soon as Covid-19 began its rapid spreading, a very quick lockdown was implemented that lasted 76 days and public transport was suspended (Howell, 2021). This rapid action taken by China's government helped China keep covid-19 deaths low. The one thing every country can take away from this pandemic is the best way to help prevent or reduce the impact of any future pandemic like this one is to be prepared.

### **Conclusion**

The Covid-19 pandemic impacted the United States of America healthcare system as much as anything has in the past. Covid-19's impact on healthcare goes far beyond what most people know due to changing the standards for the delivery of care for patients, forcing healthcare providers to develop telemedicine, as well as the major changes to the revenue cycle of healthcare. Although a lot of Covid-19's impact was bad, a lot of the changes made due to the virus will make healthcare better going forward. One of the best changes to healthcare is the increased implementation of telehealth. The ability to have more access as well as quicker access to providers is something that will change the way many people look at healthcare. The U.S. government can now look back at how they went about starting mandates which can only help the readiness and preparation in case another virus like this ever hits the country again. In addition to that, the incredible dedication of healthcare workers has shown the country how important they are with the success of the healthcare systems in the country. On top of that, the increased roles of some providers as well as the collaboration required to make it through the pandemic is something that will only help hospitals and other facilities treat patients which

should create a much more efficient and effective patient care going forward. Many people believe this virus was all bad for healthcare due to some of the major issues but after it's all said and done, the negatives that the virus brought forced positive changes to happen. Maybe the full impact of the pandemic has not been completely seen. What we do know is healthcare was able to change things that will only help the way healthcare is used in the future.

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