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Public Health Strategies to Mitigate the Next Pandemic

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ABSTRACT

The coronavirus disease 2019 (COVID-19) outbreak caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has resulted in more than 6 million deaths as of July 2022, making it the most significant global health crisis since 1918 (Ritchie et al., 2020). On March 11, 2020, the World Health Organization (WHO) classified the COVID-19 outbreak as a pandemic due to its rapid spread around the world (Cascella et al., 2022). Many countries were unprepared for such a pandemic, which resulted in a loss of life as well as economic and political consequences for all countries. In response to the pandemic, nations used a variety of strategies. While some measures were highly effective at combating the pandemic, others were not. To reduce the negative impact of an unmitigated viral spread, governments must prepare for the next pandemic. In addition to hospitals and medical workers, the COVID-19 outbreak also affected the economy, mental health, and education (Muller et al., 2020; Talevi et al., 2020; Thorbecke, 2020). This proposal suggests a plan to enhance weak governmental responses with actionable steps such as implementing mandatory mask use, stay-at-home orders, testing and contact tracing procedures, immunization against the virus, and enhancing public awareness.

Introduction

Coronavirus disease 2019 (COVID-19) is a highly contagious viral respiratory disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Cascella et al., 2022). The virus has resulted in widespread mortality, causing over six million deaths as of July 2022, making it the most significant global health crisis since the 1918 influenza pandemic (Ritchie et al., 2020). COVID-19 was first reported in Wuhan, Hubei Province, China, in late December of 2019 with infected individuals displaying symptoms of cough, fever, and fatigue (Wu et al., 2020). The virus spread rapidly throughout the world, resulting in the World Health Organization (WHO) classifying it as a pandemic on March 11, 2020 (Cascella et al., 2022). COVID-19 is transmitted between individuals during periods of close contact (within 6 feet) via respiratory droplets released during coughing, sneezing, breathing, singing, or talking (*How coronavirus spreads*, 2021). Symptoms can appear 2-14 days after a person is exposed to the virus, and this period is also known as the incubation period (Velavan & Meyer, 2020). Although COVID-19 is a risk to anyone, older adults are especially susceptible to severe illness (Velavan & Meyer, 2020).

Permanent damage is possible from COVID-19. Lasting health effects can range from breathing problems to heart complications, chronic kidney impairment, stroke, and Guillain-Barre syndrome, which causes temporary paralysis (*Covid-19: Long-term effects,* 2022). Long-COVID and post-COVID conditions can also be permanent effects of COVID-19 (*Long Covid or post-covid conditions,* 2022). It can also have long-term effects such as fatigue and fever (Bull-Otterson et al., 2022).

This disease took the world by surprise, and not all countries were properly equipped to deal with such a pandemic and the resulting loss of life and its economic and political implications. Each country responded to the pandemic in different ways, some less effective than others. The end of the pandemic is slowly approaching, but the work is not over. Governments must start preparing for the next pandemic to significantly reduce human costs caused by the unmitigated viral spread. The COVID-19 pandemic took a toll on hospitals and medical workers, the mental health of the public, the economy, and many others (Muller et al., 2020; Talevi et al., 2020; Thorbecke, 2020). To

address the weaknesses in global COVID-19 responses, this proposal presents a plan to strengthen governmental responses to COVID-19 and save lives such as establishing mask mandates, instating lockdowns, testing and contact tracing, vaccination, and raising awareness.

Recommendation 1: Masks

A practical and effective method to reduce the spread of respiratory diseases is mandating masks that protect both the wearer and individuals in close contact with an infected individual by reducing the transmission of infected respiratory droplets (Swain, 2020). The three most popular masks used in America were cloth masks, surgical masks, and disposable respirators, such as N95 masks (De Silva et al., 2020). A study measured the change in humidity while wearing different types of masks to determine if wearing masks protects from airborne viruses. Because the virus spreads through airborne respiratory droplets, the reduction in relative humidity increase around the individual when wearing a mask will prove that it can limit the spread of the virus. The tests established that well-fitted masks stop the spread of humidity, which can help prevent infection (Swain, 2020).

Another study identified that states with mask adherence levels greater than or equal to 75% of the population had lower rates of COVID-19 transmission in the ensuing months (Fischer et al., 2021). The most effective type of mask is the N95 mask, which blocks 95% of particles (De Silva et al., 2020). Because of their high level of effectiveness, however, N95 masks are difficult to obtain and more expensive, so surgical masks are an acceptable alternative because they typically contain three layers: an outer water repellant layer, a middle filter, and an inner absorbent layer (De Silva et al., 2020). Cloth masks can be used as well, but are less effective, and old t-shirts are the best material from which to make them (De Silva et al., 2020).

These studies indicate that during a pandemic, masks should be required in all shared/public spaces outside the home with other people present and in all situations when social distancing is not possible. N95 masks should be worn in highly crowded areas where social distancing is not possible and in high-risk work areas, such as hospitals. The general public should use surgical masks in daily situations such as buying groceries or working in an office. Cloth masks should be used when none of the alternatives can be used. People must wear masks over their mouths and noses, and the masks must be well-fitted.

During the COVID-19 pandemic, mask mandates were prematurely lifted because people didn't adhere to them, and this caused more infections and less consistency between states and counties (Fischer et al., 2021). To combat this, public health officials should not loosen up requirements unless cases are on a steady decline for at least 3 weeks and when at least 60% of the population is vaccinated (Chow, 2021). In addition, businesses, schools, and workplaces should be encouraged to require masks to force adherence to mask mandates.

Recommendation 2: Lockdowns

Lockdowns are another critical strategy for combating the next pandemic because they can reduce the transmission of the virus (Hale et al., 2021). Lockdowns can vary in effectiveness, primarily due to variable rates of compliance and "lockdown fatigue." Because of this, health officials must analyze the SARS-COV-2 transmission and mortality rates before initiating a lockdown (Radcliffe, 2022). Transmission data can be collected locally or nationally depending on the type of lockdown to be instituted. If cases are on a steep incline, it is imperative to instate a government-enforced lockdown or stay-at-home order for at least 1 month as stronger government measures are proven to reduce the number of pandemic-related deaths (Hale et al., 2021).

Additionally, compliance drops as more time passes due to fatigue and a lowered perceived risk, so health officials should highlight the importance of lockdowns and not give people a false sense of safety (Banuri, 2020). Lockdowns are very efficacious strategies to use to combat pandemics because they prevent close contact. It is advantageous to implement lockdowns as early as possible (Islam et al., 2020). Establishing lockdowns, especially long-

term ones, can have many social and economic costs that must be considered (Talevi et al., 2020; Thorbecke, 2020). For instance, during the beginning stages of the COVID-19 pandemic, many individuals experienced mild to moderate mental disturbances, and some experienced depression, anxiety, and even post-traumatic stress disorder (PTSD) (Talevi et al., 2020).

Additionally, the economic burden of this pandemic was 1.4 trillion US dollars which is more than the burden of all cardiovascular diseases ($1.1 trillion) or all chronic respiratory diseases ($400 billion) (Chen et al., 2021). Furthermore, 41.3% of businesses temporarily shut down because of the pandemic, and 1.8% had to close permanently (Bartik et al., 2020). The shutdowns occurred because businesses depending on in-person interactions made less revenue, forcing them to lay off workers and close their doors (Bartik et al., 2020). Unemployment also increased, making it so that fewer people had disposable income to spend money and stimulate the economy (Thorbecke, 2020). The government must invest time and money into the economy. Monthly stimulus checks and support for small businesses are essential to stimulate the economy and lessen unemployment. They also should fund mental health programs and resources to support the public during mentally-taxing lockdowns.

Recommendation 3: Testing and Contact Tracing

Developing testing kits and contact tracing technology is vital to slow the spread of diseases. For the COVID-19 pandemic, viral tests were used to identify infected individuals. Antigen tests and Nucleic Acid Amplification Tests (NAAT) are the most common and reliable tests (*Covid-19 testing: What you need to know,* 2022). Using this type of test can prove that one has the virus and must self-isolate, lessening the number of people the virus could be transmitted to by an infected individual (*Covid-19 testing: What you need to know,* 2022). The test also informs asymptomatic individuals that they must quarantine to not infect anyone else (Aleta et al., 2020).

Testing can, quite literally, save lives, and it is quick and painless (*Why covid-19 testing is the key to getting back to normal,* 2020). By conducting testing and tracking contacts, the pandemic can be attenuated and managed (Aleta et al., 2020). Additionally, contact tracing rapidly and efficiently can help control the transmission of a virus in the initial stages of a pandemic as well as contribute to bringing it under control over time (Hellewell et al., 2020). Contact tracing is most effective when an app is used because if one is infected, the app can automatically notify anyone in recent close contact with them (Ferretti et al., 2020). Although officials cannot force individuals to download these apps and allow them to record locations, they can explain how they help slow the spread of the virus (Ferretti et al., 2020). Those who are opposed to this should try their best to keep track of places they go and/or people with whom they have had close contact (Hellewell et al., 2020).

When lockdowns aren't in place, students attending school in-person should test three times a week (Chin et al., 2020). In addition, nurses, doctors, and anyone else in high-risk environments/workplaces should test 4 times a week. Anyone working in-person jobs should test once every week, and people should test before attending large gatherings of ten people or more (Chin et al., 2020). Health officials in the area should make sure that a majority of households have test kits as well as provide sufficient quantities of tests to local pharmacies.

Recommendation 4: Vaccination

The use of vaccines is vital to mitigating pandemics. Tens of millions of lives were saved by vaccines during the COVID-19 pandemic (Watson et al., 2022). An estimated 14.4 million lives were saved between December 8, 2020, and December 8, 2021, because of the vaccines (Watson et al., 2022). Vaccinations are essential to reestablishing normalcy following stringent lockdowns (Trigle, 2021). As of now, there are two major vaccine types available to protect against COVID-19 in the United States: The messenger RNA (mRNA) vaccine, which uses genetically engineered mRNA to instruct cells on making S proteins, and the viral vector vaccine, which uses vectors to deliver part of the virus that instructs the cell to produce S proteins also (*How do different types of covid-19 vaccines work?,* 2022).

It took less than a year for COVID-19 vaccines to be developed, which is significantly faster than the average (5-10 years) for developing a vaccine (*Vaccine research & development*, n.d.). The vaccine was developed so rapidly because researchers already had some knowledge of SARS-CoV-2 from researching previous coronaviruses, coordinated global efforts, a substantial amount of funding, and the fact that mRNA vaccines were already being researched at the time (Solis-Moriera, 2021).

The success of the COVID-19 vaccine shows that research and collaboration are fundamental to preventing pandemics and lessening their negative impacts (Mortara et al., 2022). For vaccines to prevent as many deaths as possible, key groups must be vaccinated first. These key groups include those at high risk of having severe symptoms and/or dying from the virus, essential workers, the elderly, and other vulnerable populations (Ismail et al., 2020). Vaccine availability will increase, and thereby more people will be able to get vaccines, making it possible to mandate vaccination (Ismail et al., 2020). Students attending school in person should be vaccinated or be tested three times a week minimum. Nurses and doctors should be vaccinated or be tested four times a week minimum, and, if a majority of people at a large gathering are unvaccinated, everyone should test before attending (Dusto, 2022). Furthermore, hospitals, pharmacies, and schools should administer vaccines and educate the public about how getting vaccinated will help them (Dusto, 2022).

Recommendation 5: Raising Awareness

In this day and age, technology is widely available to everyone, and with it, comes access to valuable information as well as misinformation (Gupta et al., 2020). Misinformation about the COVID-19 pandemic was harmful because some media was encouraging the public to disregard messages from health officials and entities such as the CDC. It was also spreading inaccurate information, primarily on social media, about the pandemic as well as engaging in and promoting erroneous practices (Tasnim et al., 2020). Some examples of misinformation were conspiracies that COVID-19 was not real, COVID-19 was created as a scam by big pharmaceutical companies, and the United States military created and exported the virus to China (Lynas, 2020). All of these claims spread rapidly despite the lack of evidence backing them (Lynas, 2020).

Getting vaccinated, adhering to lockdowns, and wearing masks have all been polarizing issues in the United States. This polarization creates an echo chamber that makes it easier for people to be manipulated (Levy, 2021). As a result of the ever-changing and evolving policies, mistrust in the government and the healthcare system in the United States also increased during the pandemic as people thought officials were being inconsistent (Sullum, 2021). For instance, National Institute of Allergy and Infectious Diseases Director Anthony Fauci gave many mixed messages about masks and vaccines (Olsen, 2021). In fact, in early March 2020, Dr. Fauci told Americans that masks weren't needed saying that wearing masks led to people touching their faces more often. Later, the CDC mandated masks and Fauci even recommended wearing two masks (Olsen, 2021).

Contradictions like this can make the public lose trust in the government and health officials, causing them to turn to alternate, sometimes less truthful sources, for their information (Simmons-Duffin, 2021). To lower the toll of the next pandemic, health officials must create and execute an improved communication strategy. First, officials can share stories of people who have been infected and their families to build empathy. Sharing stories can also show how real the threat of obtaining the virus is. Furthermore, it can convince others to get vaccinated and adhere to mask mandates/stay-at-home orders to keep themselves and their loved ones safe (Butovskaya et al., 2021). Empathy also brings people together, and such trust-building can heal some of the wounds caused by the polarizing media (Butovskaya et al., 2021).

Next, state/county/city officials can incentivize the public to vaccinate with monetary rewards or raffles (Brewer et al., 2022). Well-publicized initiatives can aid efforts to achieve herd immunity (Brewer et al., 2022). Lastly, the public should be well-educated and informed about the pandemic. Medical professionals, public health officials, and scientists should be given platforms (such as the news or publicized on social media) to provide the public with actionable, transparent, and trustworthy information (Mheidly & Fares, 2020). Moreover, public health websites

should be promoted, and posts of public health officials/entities should be promoted (Mheidly & Fares, 2020). Popular social media sites should also be monitored, and false information should have a warning or be taken down (Mheidly & Fares, 2020). If this strategy is executed, the public will be more accurately informed about the pandemic. Trust will be built, and there will be consistency in messaging.

Conclusion

The deadly SARS-CoV-2 virus took the world by surprise in 2020. As the world is dealing with the ramifications of COVID-19 and its variants, one thing is certain - another pandemic is inevitable. To mitigate the next pandemic, officials must start preparing for it now. Wearing and requiring masks, establishing lockdowns, manufacturing testing kits and creating contact tracing technology, developing vaccines, and educating the public about the virus are all strategies imperative for the attenuation of the effect of the next global pandemic. All of these proposals require the support of public health officials. Public health officials can spread important messages and initiate the appropriate protocols in their states/counties/cities, but trust is needed for the public to adhere to the guidelines. Before the next pandemic, public health officials and entities must build trust and be straightforward, so the public adheres to health guidelines.

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