

Controlling Pandemics: Solutions to Prevent the Next Pandemic

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Abstract

COVID-19 has been a major issue in most countries throughout the world with 213 countries being affected till date due to the disease. The pandemic has raised concerns over the healthcare facilities available in various countries and question the government decisions made during this period of outbreak. Despite having the best healthcare facilities several countries across Europe and America have found it difficult to contain the disease outbreak questioning the available solutions to contain an area. This paper focuses on presenting information on solutions available to control outbreaks in order to prevent another pandemic occurring in the future. The paper also highlights the strategies and plans implemented by various governments who have been successful in combatting the disease with minimum damage. By using available resources such as technology, scientific innovation and digitalized healthcare this paper focuses on providing solutions which are already available to be utilized in the right manner.

Keywords: Social distancing; Pandemics; COVID-19; Digital healthcare; UHC

Background: After the emergence of the first cases of COVID-19 in the Wuhan Province of China most countries were not concerned by the fact there is a new disease emerging. A lot of attention was put into how the disease might have started rather than focusing on controlling the spread of the disease. This negligence led to more cases being reported globally and eventually led to the WHO declaring it as “a Public Health Emergency of International Concern on 30th January 2020” a month after the first reported case and finally declared COVID-19 as a pandemic on March 12th 2020 [1].

Currently 213 countries are affected by the disease with over 6 million reported cases and nearly 400,000 deaths caused by the disease. Pandemics have occurred previously and several countries have been affected, in the case of COVID-19 the world was not prepared for a disease of this magnitude. The WHO defines a global pandemic as “pandemics are for the most part disease outbreaks that become widespread as a result of the spread of human-to-human infection [2]”.

Spanish flu back in 1918-1920 was one of the deadliest pandemics the world has faced till date with over half a billion being affected by the disease and nearly 100 million people died due to this [3]. The 2nd pandemic of the 19th century gave rise in the form of Asian Flu in 1957 where over a million deaths were recorded during this period. The next emergence of a pandemic came in the form of H1N1 Swine Flu in 2009 with a reported 1.4 billion people affected by the disease and within a short span the next pandemics emerged in the form of Ebola and Zika Virus most recently [4].

With constant occurrences in pandemics occurring globally one has to really question the steps and measures taken to prevent this from occurring. Most the pandemics which were mentioned have caused a massive impact financially and led to several issues within communities who are still suffering due to that. In the modern era with machinery and robots overpowering human in most sectors the world still has no solution in dealing with a pandemic, this is mainly due to the gaps between the healthcare sector and global health policies designed for respective countries.

Countries such as Vietnam, New Zealand and Sri Lanka have been able to successfully find solutions and strategies that has helped reduce the community spread of COVID-19 and been a driving force in trying to solve the crisis caused by the pandemics. Whereas the countries who are financially driven with all the modern technology available have been suffering badly due to the disease. Currently United States of America is the most affected country followed by Brazil, Russia, Spain, United Kingdom and Italy making up the top most affected countries [5]. Despite having the financial status, infrastructure and technology most of these countries have failed in containing the spread of COVID-19.

During pandemics almost every country is affected badly due to the overall economic impact and damage caused by the disease. After a pandemic the poverty levels is estimated to rise with increased unemployment rates, inequality and increased cost of living which can directly impact the living population and the lead to even further complications on the long term [6-7].

This article focuses on identifying potential methods and ideas that can be implemented in the future to prevent or limit the damage caused by pandemics. By conducting an extensive research analysis of articles available online these ideas are extracted and summarized with the potential implications and advantages of implementing them.

Literature Review

Strengthening Public Health Systems: Universal health coverage is one of the main factors that can limit the spread of a pandemic, nearly 50% of the World's population do not receive the treatment they require and nearly 100 million people are pushed into poverty due to expenses imposed on themselves each year [8]. This is a major issue in several low- and middle-income countries with constant issues being raised due to this. Although the SDG goal 3 (good health and well-being) focuses on trying to reduce this by the end of 2030 the chances of everyone getting access to free health care is a goal out of reach currently.

To improve the overall healthcare systems in the respective countries, government and institutions needs to make changes to provide more funding towards improving healthcare systems. According to the OECD data released in 2019 indicates the United States spends the highest share of GDP on their healthcare services whereas most the African countries such as Somalia, South Sudan and Angola are a few [9,10]. If more than 1% of the GDP is not invested into the healthcare system the WHO predicts more than 5 billion people will not have adequate healthcare services by 2030 [11].

If countries have difficulties in using the budget of GDP into the healthcare systems, alternative options such as traditional remedies are a more viable and cheaper alternative. Most Asian countries are heavily reliant on traditional medications as a cheaper alternative to the western medications and scientifically there are several researches that have proved that these medications can improve the overall quality of life. There is a significant saving and cost efficiency generated by using herbal plants to provide medications which will only promote the sales globally in countries without these medications. Countries such as India, China, Japan and Sri Lanka have been using traditional medicine to treat several conditions related to NCD's over generations and found it to be as effective as western medications [12].

Another way of improving the overall healthcare facilities within the country is to partner with NGO's and volunteer service providers who tender the projects for a lower cost that would be affordable and long lasting. Several NGO's relies on using products which are designed and produced within the country which would remove the tariffs and extra taxes imposed on the products [13].

Establishing a Global Health Monitoring Service:

One of the lessons learnt from the COVID-19 pandemic is the necessity to feed in information throughout the world instantly. Despite the WHO country office in China stating the rise of a new strain of virus in Wuhan, not many healthcare professions or hospitals understood the complications and severity of the disease.

Digitalizing healthcare is essential in the current generation, with social media and smartphones being an integral part of daily life messages and news can be passed on quickly so everyone is notified of the problem. This is part of the SDG goals 3.8.1 but still is yet to be active in most countries as the policy is relatively new for most countries to instantly adapt [14]. By having a common platform or web-based service integrated with health organizations worldwide instant updates, symptoms and clinical features can be mapped into one platform that would be able to collective collect data. With data science advancement being made in the current field of science, artificial intelligence and machine learning can be used to understand the disease trend patterns and provide an early warning or precautionary measures to be taken based on the data entered into the systems. According to Adam [15], this also would reduce the political interference and prevents chances of corruption in the country as all the updates are instantly available for the public and government institutions across the world will have to follow the same protocol for their respective countries making it almost impossible for money to be spent illegally.

Having data also provides extensive chances for researchers to have access to data and publish articles which would provide better insights and findings for the research communities to understand various outbreaks and provide early solutions that could prevent pandemics or outbreaks in the future [16,17].

e-Healthcare Systems

E-healthcare systems have been widely used in most high-income countries, where insurance providers and hospitals establish direct links with the patients in tracking the healthcare records, patient bills and personal information. Smart cards are widely used across the United States, Canada and several European countries to minimize the paperwork and hospital time, this method has had a fair share of its issues and privacy concerns but still continues to be an easier method in accessing healthcare facilities [18]. Applying these measures will take time and will cost a lot of money but will be a useful way for a long-term investment plan. Most individuals suffering from various conditions do not visit hospitals due to the travelling time and cost per visitation involved with insurance providers providing flexible and affordable plans with the integration of the government many lives can be saved [19]. An example of this initiative being promoted can be observed among South Asian countries where digital immunization data, healthcare bills and prescriptions are being generated to reduce the travelling and make healthcare accessible from home.

Bridging Gaps between Poverty and Education

For the three above processes to be carried out in a smooth manner, people need to be educated and have the basic needs to use the online resources. Education and equality is one of main areas of concern since the time of Industrial Revolution where only people who can afford have access to most of the facilities while the others are kept waiting.

Doctors in most low-income countries have been constantly helped by the NGO's around the world, with WHO playing a key part in educating the doctors and providing the experience needed to handle situations such as the COVID-19 pandemic. Even though they have the support and educational qualifications the gap between obtaining resources and technological

advancements in these countries have led to pandemics spreading fast in these regions. Ebola and Zika Virus are examples of this where the disease outbreak led to several million people being affected due to this [20]. To bridge the gap between technology and education in these regions investors and innovative solutions needs to be put into action, a study carried out by Lewis [21] indicated that development of the IT sector in these regions would improve communication between healthcare workers and patients by at least 30%. Another study by Vivarelli [23] stated that due to the lack of opportunities available for innovation and research in low- and middle-income countries, technological advancement and bridging knowledge gaps is a major burden.

Educational systems need to be established in these countries that supports the modern day needs with increasing knowledge gathered by the people there is less issues in trying to educate and teach them general practices. Africa being one of the least development regions in the world has above 70% access to smartphone facilities in the region [24] thus showing that use of social media can be used towards educating and informing individuals of how the world is responding and measures they can take to prevent any chances of a pandemic. Increasing online based jobs is another option which these countries can adapt where most of the daily wage laborer's will be forced into learning a new system to work in allowing them to educate themselves better to earn a higher income.

Promoting Safe Hygiene Practices

Personal hygiene is one of the overlooked areas when it comes to most individuals, a lot of people neglect this resulting in various infections being spread. A modern-day example is COVID-19, the WHO has prioritized personal hygiene as an area that needs to be followed on a regular basis to prevent any chance of the spread of the disease.

By following proper hygiene practices several diseases can be controlled with minimum contamination establishing a disease avoidance system in case of future novel disease outbreaks [25]. For children this is an essential practice as it would minimize the spread of the disease, most children are considered to be active carriers as they are exposed to the environment and are constantly spending their time outdoors. The importance of hand sanitation was stressed by Freeman in 2013 [26] stated that proper hygiene practices are required to eliminate and eradicate neglected tropical diseases to prevent outbreaks in the future.

Although several researchers have stressed the point of the importance of safe hygiene practices not everyone has been following them mainly due to the fact none of them realize the importance of hand sanitation. To promote and educate the vulnerable and uneducated population the respective governments of countries need to proactively make decisions which would make these practices an essential day-to-day routine. Using infographic content, brochures, videos and advertisements most governments have been able to educate and teach people in this current pandemic. This needs to be followed on the long term run as well to ensure people are well equipped and educated to prevent another outbreak to follow the footsteps of COVID-19 [27].

In recent years the use of video games on smartphones, tablets and laptops have been used to educate people and remind them to follow hygiene practices. This is being applied across several food delivery service providers in many European countries and could be implemented globally as well [28,29].

Research and Development in Healthcare

Very few countries invest heavily on research in healthcare sector where countries with high GDP and financial stability are able to invest and promote the healthcare facilities in the region. In countries with corruption, political instability and poverty this is difficult to be implemented due to the financial crisis faced by them.

Organizations such as WHO, UN and UNICEF have been continuously funding these regions and providing the maximum efforts to enhance the R&D sector but most countries neglect the purpose of these funding's and focus on investing them onto problems which have been studied in the past. Research ideas needs to be collected from various sectors and students from high school to university levels and the most influential and modern research ideas needs to be selected to expand the scope of the study. This can be done using online webinars, hackathons and research ideas pitching sessions to promote ideas and innovations, "Universal Methods of Design Expanded and Revised" written by Hanington explains the modernization of research and how countries have developed over the years using these ideas [30]. By promoting innovation and realistic problem-solving solutions in research industry several countries can bring out the best researchers who will aid in development of the country and promote educational changes that will address future issues. Elon Musk and his ventures are an example of how research ideas and innovations can be implemented, the most recent being the SpaceX launch.

Discussion

Pandemics have been a global concern with at least one outbreak being observed in a decade, the period between 2010-2020 has seen four major outbreaks that has required the attention of the entire world and COVID-19 being the most devastating of all. The above six pillars are solutions which can be used to limit the damage caused by pandemics in the world and are potential solutions based on articles available online.

United States and United Kingdom despite having all the six pillars required to combat the pandemic were unable to limit the spread of the disease. USA holds the most cases for the COVID-19 crisis currently and with prevailing situation the cases are going to cause more fatalities in the region. The main reasons for these countries being unable to stop the disease is due to delayed responses despite having all the facilities required to combat the disease, in UK the negligence and late response led to an outbreak of cases and deaths in region which was heavily criticized by the public [31]. In USA lack of management and constant rise in cases led to increased cases reported in the critical care units of the hospitals leading to record rise in cases over the past two months and increased cases being reported among the minorities and black American population [32,33].

Digital healthcare records did provide instant updates which were used in tracking down population and limiting the spread across the country, South Korea were able to use AI and GPS tracking to find COVID-19 affected individuals and their close contacts [34]. In the case of USA and UK this methodology was not followed instead heavily reliant on testing the patients directly, there is also a concern that medical insurance companies over charge for the services they provide [35]. This has been a major concern across the globe in the digital healthcare sector where a lot of families have been overpaying their healthcare bills due to high insurance charges have their monthly incomes wiped off due to this. Although digitalizing healthcare might be a solution in monitoring patients, if the right management and cost effective planning is not provided most individuals would prefer the old fashioned pay-in per visit [36].

Pandemics are meant to have long term damages and several generations have seen this impact the economy as well as the income over the decades. With the COVID-19 pandemic this would cause an extra burden for everyone involved, specially the people who rely on daily wages, there has been a surge in domestic violence, physical abuse and increased reported cases of online abuse during this period [37]. Moreover, there are higher chances of people dying from poverty and famine during this period of lockdown, an early estimate indicates a 5% increase in poverty in the upcoming months and could increase further in several countries with increasing cases [38]. This pandemic has also highlighted the inequality spread across the top nations, where in UK the policy makers protect the rich community and ignore the poor resulting in millions being affected by poverty [39]. The same scenario is being observed in New York city, despite being one of biggest commercial cities worldwide a rise in inequality is being observed during this crisis where testing is only being done on selected populations [40].

Novel diseases will be continuing to rise in the upcoming years with new infectious diseases being discovered on a regular basis, to manage outbreaks the entire world needs to unite and find solutions that would not only enhance the response and preparedness in facing the disease. In any crisis the poor and low-income countries suffer the most whereas COVID-19 showed us lessons in which developed countries can be affected as well if the right policies and steps are taken to prevent disease spread.

Conclusion

The study is limited in providing recommendations and potential solutions to control a pandemic situation based on available literature and research carried out till date. However, this review is to imply the solutions that would address the needs of the low- and middle-income countries during future pandemics.

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