Two Crises, One Strategy: A Comparative Analysis of Polio and COVID-19 Response Strategies

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ABSTRACT

Polio and COVID-19 are contagious diseases that affect the world to varying degrees. In America, both viruses overwhelmed communities and terrorized the public. Polio's peak epidemics in America during the early to mid-1950s and the COVID-19 pandemic, starting in 2020 but slowly ending in 2023, were shortened through similar restrictions and fundraising efforts by the American public and government. There are many similarities between the government's handling of these two viruses regarding campaigns and quarantines. Public health fundraisers for funding and vaccination for polio were related to the future movements for COVID-19. In addition, lessons learned from polio's time about social restrictions helped the government enforce successful and effective constraints for COVID-19. The resemblance of the management between the poliovirus and the coronavirus highlights the importance of understanding the similarities between different viral infections and how this can help with future outbreaks.

Introduction

Polio emerged during challenging times in American history and was often overshadowed by major events such as the World Wars and influenza epidemics. However, in the 1950s, when polio cases surged, fear of polio trailed closely behind the top fear of nuclear war or decimation (Williams, 2013). Several fundraisers were launched to finance vaccine research. Meanwhile, rigorous confinement rules were enforced on the American public to contain the virus. Finally, after the vaccine was created, campaigns used multiple tactics to encourage the public to vaccinate themselves against polio.

Similarly, the government had strict procedures and rules for quarantine to curb the spread of COVID-19. Furthermore, various campaigns were used to promote vaccination, and certain media helped dispel misunderstandings or false beliefs about the vaccine(s). This paper will explain the history of polio and COVID-19. Afterward, it will explain and draw conclusions on how the government handled these two viruses in a related manner.

Polio

Polio is a highly contagious disease that is caused by the poliovirus. It is spread through contact with objects or people infected with poliovirus. There are three different types of strains - abortive, non-paralytic, and paralytic polio. Abortive cases happen to 5% of people who have polio, meaning they either have symptoms similar to the flu for a few days or do not showcase any symptoms. Non-paralytic polio happens to 1% of people, and although it doesn't cause paralysis, this strain of polio causes more intense, severe symptoms than abortive cases. Finally, paralytic cases are very rare, causing paralysis and more extreme symptoms than the previous two strains (*Polio - Symptoms and Causes*, 2023). For this variant, the virus reaches the spinal cord and/or brain, causing paralysis, loss of function in the limbs, or meningitis, brain/spinal cord inflammation. Polio can result in death if paralysis spreads to the respiratory muscles.

Additionally, even if a person recovers from polio or paralysis, they might develop a post-polio syndrome, which can cause weakness in the once-paralyzed places (*What Is Polio?*, 2023; Williams, 2013).

Polio History

Supposed to date back to times as late as 1500 BC, polio has possibly been recorded in ancient Egyptian stone steles. One such engraving displays a priest named Ruma with a withered leg, indicating a possibility of polio (Henry, 2019). The first medical recording of polio was in 1789 when English physician Michael Underwood noted that his patients would have "debility of the lower extremities," usually preceded by a fever (Creviston, 2022). In the mid-1800s, Jakob von Heine, a German orthopedist, described in detail and attributed the cause of his patients' paralysis to spinal cord swelling, finally recognizing polio as a disease. During the Sweden polio epidemics of 1887, Swedish pediatrician Karl Medin observed that polio was not randomly occurring and confirmed there were certain symptoms before paralysis. In the early 1900s, Ivar Wickman, another pediatrician working under Medin, researched and deduced that polio spread through contact with those infected. Some cases, Wickman found, could have little to no symptoms, but they still had the virus. It just didn't reach their nervous system. However, those people could still spread the poliovirus, despite being asymptomatic. In 1908, Karl Landsteiner, a professor in pathology, began researching and testing bacteria filters on infected monkeys. However, the bacteria filters didn't work as the monkeys became paralyzed. Consequently, Landsteiner correctly surmised that a virus must cause polio because viruses are smaller than bacteria (Williams, 2013). This provided future scientists with the knowledge that the cure would have to be a vaccine.

On April 12, 1955, the first polio vaccine, made by Jonas Salk, was declared safe and effective (*U-M School of Public Health Polio Vaccine*, 2005). It used an unorthodox technique of killing the virus before using it as a vaccine, known as an inactivated vaccine. It didn't offer as much protection as a standard vaccine, which had a live virus and had to be taken 2 to 3 times before it gave full immunity (Alfaro-Murillo et al., 2020). Although polio cases dropped in the US over the next few years, another virologist named Albert Sabin decided to create an oral vaccine, one with a live virus. His vaccine wasn't widely used in the US, so it wasn't until 1961 that his vaccine finally began to be heavily used in foreign countries (*Polio*, 2022; Williams, 2013).

COVID-19

COVID-19, or the coronavirus disease of 2019, is another disease caused by the severe acute respiratory syndrome coronavirus 2, or the SARS-CoV-2. It is contagious and spreads airborne or through droplets when an infected person sneezes, coughs, or breathes. It mainly infects the respiratory system but could affect other organs. Symptoms can vary from asymptomatic to mild to severe and affect certain groups more than others. Some examples are older or younger people as well as people with chronic organ diseases. For mild cases, symptoms can include a sore throat, fevers, headaches, shortness of breath, and/or loss of smell. In severe cases, trouble breathing, organ failure, pneumonia, blood clots, heart problems, and/or death can result (*Coronavirus Disease 2019 (COVID-19) - Symptoms and Causes*, 2022). Long COVID-19 can sometimes happen, where respiratory symptoms reappear in people who had contracted COVID-19 (*COVID-19 and Your Health*, 2020).

COVID-19 History

On December 12, 2019, some people in Wuhan, China, exhibited respiratory pneumonia-like symptoms, but the normal treatments didn't work well. More cases of this odd illness continued to appear throughout December and through

January, when it was finally recognized that the illness was a new strain of coronavirus. More information about this virus is posted online, and shortly after the first reported death of the novel coronavirus, it was found to be contagious from person to person. As the month unfolded, the virus spread to neighboring countries, including Thailand, Japan, and Korea, in addition to other countries farther off, such as America. Travel restrictions become stricter, and quarantines and lockdowns are imposed on those with coronavirus. Cases and deaths increased through February, and the illness gets the name "COVID-19." On March 11, 2020, WHO, the World Health Organization, officially proclaimed that COVID-19 was a pandemic, and vaccine research and testing started shortly afterward. Schools and other public places began to shut down around America as mask mandates were implemented. Variants of COVID-19 emerged, including the Beta in October 2020 and the Delta, which were also discovered in October 2020 but became more widespread in mid-2021 (*CDC Museum COVID-19 Timeline*, 2022). On December 20th, the Food and Drug Administration (FDA) approved two mRNA vaccines for COVID-19. Many other vaccines were created to target strains or manufactured with different techniques. Some examples of vaccines came from companies including Pfizer-BioNTech, Moderna, Johnson & Johnson, and Novavax (*Coronavirus*, 2023).

Campaigns

During the COVID-19 pandemic and the polio epidemic, the government began using campaigns to encourage the public to vaccinate or donate. These movements utilized several strategies to convince people to help support the cause of making and taking vaccines to prevent the spread of both viruses.

Media

Multi-media was one of the most prominent ways of educating and persuading the public. Whether using posters or radio coverage, the media helped spread the message of polio and vaccination all over America. During COVID-19, news, the internet, and social media helped spread information, updates, and common misunderstandings about the newly developed vaccines.

Media: Polio

In America, polio campaigns in the 1900s often utilized media to spread information and persuade people. Perhaps most famous of all the campaigns for polio was the National Foundation of Infantile Paralysis, also known more commonly as the March of Dimes. This organization was determined to raise money for research by asking multiple individual households to donate a few dimes to the White House. During this process, the March of Dimes also used various media, such as posters and radio, to encourage the viewers or listeners to contribute to the campaign (Bains, 2021).

They would employ children to base the posters on, making the viewer sympathize and pity the paralyzed kids. By using more innocuous-looking kids and age groups, the March of Dimes inspired the public to support and donate to the campaign even more (Neklason, 2021). Additionally, polio campaigns would resort to using well-known figures to support their cause. People such as Franklin D. Roosevelt, Johnny Cash, Elvis Presley, and Marilyn Monroe would support the cause through permission to be publicized for the March of Dimes. The media often includes pictures or public vaccination events to influence their fans and the public to follow their lead (Brink, 2021).

Finally, newspaper and radio coverage spread information about polio and vaccines. They would report many events, from deaths to survivor stories to the release of Salk's vaccine. The news played a huge part in informing the public of current events. Although some newspapers would have incorrect or unreliable information, they provided several opinions and knowledge to the public (Neklason, 2021; Ujifusa, 2021).

Media: COVID-19

The time differences between the polio epidemic and the COVID-19 pandemic matter, especially in terms of media. Media for COVID-19 is mainly online, whether digital newspapers, websites, or social media. In the early beginning of the pandemic, how COVID-19 spread was unknown, so many stopped buying physical newspapers. Yet, people still needed information to monitor how the world was. As a result, digital newspapers and news on the TV or radio became important services for people to read or hear about news.

Social media and texting apps were other platforms that supplied information while connecting and persuading the public. Social media helped people stay engaged with the community and others while messaging apps allowed relatives and friends to stay in touch despite quarantine restrictions. Social media, such as Facebook or YouTube, kept many busy or stimulated with new skills or activities to try while quarantining. Additionally, these platforms helped encourage vaccination or donations for a vaccine. Celebrities would be shown being vaccinated to inspire others to follow (Aldrich, 2022; Paúl, 2021).

However, these platforms helped misinformation about COVID-19 and the vaccines become widespread. Since people from all over the world have access to social media, information spreads easily and is often accepted as true without any fact-checking. For instance, when COVID-19 vaccines came out, posts on social media would discourage people from taking them, claiming that there were negative side effects or that it was untested. Yet, some credible news sources would attempt to dispel the misinformation. Eventually, government and employer mandates required vaccination, forcing many to vaccinate (Nyilasy, 2020; Tekip & Susarla, 2022).

Vaccination Efforts

After vaccines were introduced into the equation, many people rushed to get them, scared by the effects of the viruses. Not only would they need to be mass-produced by pharmaceutical companies, but they would need to be distributed among the public. As a result, many vaccination drives were set up for the American public to ensure the vaccines were accessible to everybody. This helped curb the spread of both viruses.

Efforts taken by the government and the public to set up vaccination drives helped curb the spread of both viruses. For polio, costs were lowered and the vaccines were sometimes distributed among schoolchildren. In addition, during the COVID-19 pandemic, there were several vaccination drives and requirements for vaccination records.

Vaccination Efforts: Polio

After the polio vaccine was introduced to the equation, many people rushed to vaccinate themselves, scared by paralysis and their or their relatives' health. During this time, there was only one type of polio vaccine, the inactivated polio vaccine. The job of mass-producing a vaccine was assigned to different pharmaceutical companies but would still need to be distributed to the public.

Salk understood that polio vaccination rates wouldn't increase as fast without low costs, so to ensure that everybody was vaccinated, he declared that there would be no patent for the inactivated polio vaccine. As a result, the cost of vaccination was lower, and more people could afford to become vaccinated (*How Much Money Did Jonas Salk Potentially Forfeit by Not Patenting the Polio Vaccine?*, 2012). Although Salk's vaccine came out first, Sabin's vaccine was cheaper and more efficient to manufacture and inject. Sabin also refused to patent the oral polio vaccine. Today, Sabin's vaccine helps polio rates decrease globally, while Salk's is used in more developed countries. However, during the 1950s, as polio panic was rampant, most Americans were focused on getting vaccinated, though there was much debate and disadvantages for both vaccines (Alfaro-Murillo et al., 2020).

In addition, to increase the efficiency of vaccination, officials and volunteers helped set up vaccination drives. For example, Salk's vaccine would be distributed in doctor's offices while Sabin's would be given in clinics on Sundays, known as "Sabin On Sunday." Schools were another vital way vaccination rates could increase. By targeting young schoolchildren, the rates of polio decreased dramatically, and polio began fading from the list of feared diseases. Salk's vaccine would have to be injected through syringes, and children would often have to be pulled out of class. Sabin's, on the other hand, was more efficient and would have the vaccine disintegrate into a sugar cube so children

could just swallow the cube. The cheap and quick vaccination methods helped decrease the time and effort needed to vaccinate the American public (Ujifusa, 2021; Hall & Grubbs, 2021).

Vaccination Efforts: COVID-19

For COVID-19, there was more hesitation for some groups. However, vaccines were made widely available to anyone who wanted them. Using drive-through vaccinations was an efficient choice for many people. These drive-throughs would be set up in various locations, such as hospitals, parking lots, and other centers where people could receive the vaccine with a low risk of catching COVID-19 (Asgary et al., 2021).

In addition, many pharmaceutical companies undertook the hard yet important task of creating a vaccine. After lots of research and trials testing the novel vaccines, several companies succeeded and had their vaccines approved for use. This allowed more flexibility for people with different incomes, locations, and opinions (*Coronavirus*, 2023).

Operation Warp Speed was one campaign to help make and distribute COVID-19 vaccines as fast as possible. It was launched by the United States and called upon many companies, such as the ones listed above. The government and those companies helped accelerate the creation of COVID-19 vaccines as well as the circulation of them (U.S. Government Accountability Office, 2021).

Quarantine Restrictions

Cleanliness

Staying clean during the pandemic and epidemics was key to preventing the viruses from seeping into households. Using the simpler but more effective way of washing hands to physically covering the mouth, many ways were used to stop the spread of polio and/or COVID-19.

Cleanliness: Polio

The irony of the polio epidemic lies in why it made a comeback after the year of 1916. After getting the poliovirus through contact with a dirty or contaminated object, poor hygiene can lead to the poliovirus entering the mouth and, therefore, the digestive system. From there, the virus could reach the nervous system, causing any conditions to escalate, possibly into death. However, during the epidemics, especially during the 1950s, sanitation practices helped promote polio cases as people weren't being exposed to polio in any way. Therefore, many, especially those in the middle or high classes who had more access to clean food and water than the poor, contracted polio when it began making a comeback (Williams, 2013).

However, all this could be prevented if people continuously clean to stop polio from possibly spreading. In addition, ensuring that no droplets from an infected person somehow entered their mouth would also keep polio from spreading. As a result, during the peak epidemics, many people would try to keep good hygiene to prevent polio from creeping into their households. By avoiding unsanitary conditions, food, and water, many were able to avoid polio's reach (Tucker, 2020).

Cleanliness: COVID-19

One major difference between the COVID-19 pandemic and the polio epidemic in the 1900s was that while polio had a history, COVID-19 was a novel disease unknown to the entire world. This meant scientists had less time to discover the details of COVID-19, including how it spread, what it targeted, and its symptoms. Once they found that the coronavirus was airborne and targeted the respiratory system, the mask became a primary invention to stop inhalation of

any droplets or air containing the virus. Before the pandemic, masks existed in America mainly for surgery. The surgical mask would evolve into cloth masks and N-95s, which were more protective. All over the world, masks were worn to battle the virus entering the body. As a result, masks became an important shield and symbol of the pandemic, protecting people from COVID-19 (*Can Face Masks Protect against the Coronavirus?*, 2023).

While masks helped prevent droplets from entering one's respiratory system, proper and consistent cleansing of the hands could stop the spread of the virus to the mouth through contact. During the pandemic, hand sanitizer played a key role in helping the general public avoid catching COVID-19, as it was deployed in many public areas so that people may clean their hands before and after touching something or eating. Although soap and water are and were a more effective way to wash the virus off, hand sanitizer allowed anybody to clean their hands anywhere. Through the use of hand sanitizer, many people were able to prevent getting COVID-19 (Prajapati et al., 2022).

Closure of Public Areas and Quarantining

Possibly the most effective way to hinder the spread of the viruses in public was quarantining and restrictions. Implementing restrictions, especially in public areas, and quarantining infected people helped limit the spread of COVID-19 and polio.

Closure of Public Areas and Quarantining: Polio

Polio is spread from person to person through contact or through contaminated food or water. As a result, when polio cases skyrocketed, many tried to avoid public spaces, where people tended to gather. Polio cases would escalate in the summer, earning the heat season the nickname of "polio summers." Concerned officials would shut down fairs, parks, pools, and other spaces while people would avoid parties, meetings, or anything else requiring close proximity. Parents, scared for their children's health, refused to let their kids meet up with others or even go outside. Everybody tried to social distance and avoid others (Janssen, 2020; Tucker, 2020).

Additionally, people with polio would be transferred to hospitals and isolated. These isolation wards would separate the infected from the general population, including their relatives. They would be taken from their activities, regardless of their age, and be put into a ward for safety. Some families would try to visit, while others missed out on huge parts of their lives (*History of Polio: Outbreaks and Vaccine Timeline*, 2022).

Many would try to escape cities for the mountains, where they believed it was harder to get polio. However, as people began migrating to the countryside, several areas and towns restricted traveling through and stopping there. Many of these towns were placed near major highways, so when they closed down, those roads would become blocked, causing even more traffic. Restrictions were implemented, especially on children, as polio was usually associated with young kids or teenagers. Some states would even require official health certificates for people, especially those with children, to pass through. Yet, during polio peaks, travel was highly restricted for everybody (Williams, 2013; *New Haven Museum» Polio Travel, 1916*, 2020).

Closure of Public Areas and Quarantining: COVID-19

After a pandemic was declared for COVID-19, people began to avoid public areas and began social distancing. This became a common term, usually referring to keeping a distance from others, most commonly 6 feet. Soon, though, many began staying at home, and officials began shutting down schools, restaurants, malls, and other public places where the virus could spread easily. In addition, there were isolation wards or rooms in hospitals to separate the infected from the public, including their families. These prevented the virus from spreading even more (van Dijk et al., 2021).

For some, they would attempt to migrate to suburban or rural areas. This was to reduce any risks of catching the virus in an urban area. Several places enforced travel restrictions to limit the spread of COVID-19 to their community. Severe travel restrictions were placed globally to prevent COVID-19 from spreading. However, it reached

almost every corner of the world. Although it reached almost every corner of the globe, severe travel restrictions were placed globally to prevent COVID-19 from spreading (Oum & Wang, 2020).

Conclusion

As Mark Twain once stated, history never repeats itself, but it does often rhyme. This idea is clearly shown through how the U.S. government and the public handled the polio epidemics and the COVID-19 pandemic. While there are defining differences, both viruses impacted and scared the American public. Yet, through vaccination and fundraising campaigns and quarantine restrictions, polio and COVID-19 were suppressed and mitigated. The March of Dimes for polio and Operation Warp Speed for COVID-19 show how campaigns using the public and government's collaboration helped stop both viruses. Although different platforms of media were utilized, they played a key role in spreading information and awareness to the public on recent data or news. Quarantining restrictions during both times helped contain the virus, and maintaining good hygiene, such as handwashing for both viruses and mask-wearing for COVID-19, prevented them from infecting more people. The experiences gained from the polio epidemic helped the government and the public respond to the COVID-19 pandemic. The undeniable similarities between how the government and the public handled both viruses led to the lesson that understanding and learning about history can help other generations use similar strategies to prevent and control future outbreaks.

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