

Comparison of public health measures taken during Spanish flu and COVID-19 pandemics: A Narrative Review

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ABSTRACT

The similarity of the consequences of COVID-19 reminded us of the destruction caused by the Spanish flu over a century ago and led us to find similarities in the way the two pandemics were handled. PRISMA Guideline was followed for a systematic search to identify eligible published articles. Information about the public health measures adopted during both the pandemics was taken from literature. It was found that there are parallels between the two pandemics in terms of general unpreparedness, attitudes of the community and government, and various policy issues. All the measures implemented in 2020 were the same as those implemented in 1918-1919, with the same trend, uncertainty, early relaxing, and rapid reversals. Even from a scientific standpoint, all the elements were already known. All the issues such as social isolation, intra-family spread, personal protective equipment, medicine types (quinine, aspirin, anti-inflammatories, etc.), immunization requirements, and so on had already been addressed. No doubt, we do have technology today at our disposal for managing the spread of the disease and even spread awareness among people much easily. We also have taken many steps forward in the world of globalization, which make the progression and spread of the pandemic very fast as well. Both factors tend to counter each other and hence make timely public health intervention as important (if not more) today as it was yesterday. When possible, approaches and goals should be found on scientific facts and include ethical input. Finally, we must take careful notice of past local and national lessons to avoid repeating the mistakes done in the past. The development of a strategy ahead of time that includes all levels of government health infrastructure and outlines clear lines of duties and functions is critical. The main objective of this article was to compare the public health measures undertaken during the pandemic of Spanish Flu and the pandemic of COVID-19, and assess the similarities and differences in the public health measures taken during these pandemics. The correlation of the public health measures and the outcomes was assessed and the implication of this article was to be pandemic-ready in the future.

Keywords: COVID-19 pandemics, public health measures, Spanish FLU

Introduction

The world Health Organization (WHO) declared the COVID-19 outbreak as a public health emergency of worldwide concern on January 30, 2020, and began classifying it as a pandemic in

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March 2020 to highlight the seriousness of the situation and to urge all governments to take action in detecting illness and preventing spread. The announcement made by WHO on March 7, 2020, "Responding to community spread of COVID-19," states that preventing COVID-19 from spreading is through the development of coordination mechanisms not only in health, but also in areas such as transportation, travel, commerce, finance, security, and other sectors that encompasses the entirety of society.^[1] The consequences of the disease reminded us of the

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destruction caused by the Spanish flu over a century ago and led us to find similarities in the way the two pandemics were handled. The Spanish Flu of 1918–19 was the deadliest pandemic in history, killing more than 50 million people. Even as we deal with the current pandemic of COVID-19, the public health implications of the Spanish flu pandemic remain unclear.^[2]

In the absence of a vaccine, public health interventions are the first line of protection against an outbreak. This can be attributed to the fact that globalization, urbanization, and the increase in the density of population have made controlling a pandemic difficult.^[3] Every variant of the virus will not have a vaccine and public health interventions assume paramount importance in such conditions. Implementation of these interventions need to be done at grassroot levels. The role of primary health care centers, family physicians, and general practitioners is significant in these situations. This review article focuses on and compares the public health measures undertaken during the pandemics of Spanish Flu and COVID-19, and also discusses relevant updates in the pandemic preparedness strategy to attenuate the effects of pandemics in the future.

The following measures are currently being used to handle pandemics:

Social distancing

The goal of social distancing is to decrease interactions between people in a larger population where individuals may be contagious but haven't been detected and hence not isolated, particularly important when the disease spreads due to close contact.^[4] This is not limited to maintaining a safe distance while in public. It includes closing schools, colleges, offices, avoiding public gatherings, and measures like encouraging online shopping instead of physically going to the market.^[5] Traffic restrictions, the cancellation of social events, and home quarantine have all been linked to a decrease in the degree of transmission.^[6]

Quarantine

Quarantine is the restriction of activities or separation of persons who are not unwell, but may have been exposed to an infectious agent or disease, with the goal of monitoring their symptoms and guaranteeing early diagnosis of cases. Quarantine itself comes from the Italian word 'Quaranta,' which means forty. This is because, ships coming at the Venice port in fourteenth-century Italy from other plague-infected ports had to anchor and wait for 40 days before disembarking their surviving passengers, which was a common public health norm.^[5] Prior research states that quarantine is the most efficient approach for reducing both the number of infected and the number of deceased.^[6,7] To ensure success, quarantine should be implemented as soon as possible and combined with other public health initiatives.^[8]

Isolation

Isolation is the exclusion of sick people with infectious diseases from non-infected people to protect the latter group. It is most

commonly seen in hospitals.^[4] Isolation of the infected people helps in slowing down the transmission of the disease.

Use of face masks

The purpose of the face mask is to prevent transmission of the virus by containing the secretions of the people.^[5] Face masks should be used in the community in addition to, not instead of, other prevention measures including physical separation, staying home while sick, respiratory etiquette, meticulous hand hygiene, and avoiding touching the face, nose, eyes, and mouth.^[9]

Others

If these steps are deemed inadequate, 'community-wide containment' might be necessary. Community-wide containment is a strategy for reducing personal interactions in a community, area, or country, except allowing limited contacts to ensure essential supplies.^[4] This community-wide containment took place in India as the Janata Curfew and the Lockdown in India in the initial days of the spread of the disease. Mass quarantining of disease "hot spots" could be implemented to prevent the disease from spreading to other areas in future waves.^[10] This was also implemented in India in the form of micro-containment zones and containment areas. Mass communication and community education through various media was promoted, which supplemented the aforementioned measures.^[11]

Public Health Measures taken during Spanish Flu Pandemic

The 1918 influenza epidemic was a major social and health event that resulted in a high rate of morbidity and mortality in the general population. The fast onset of symptoms, the spread to large groups of people, and the lack of information about the causal agent were all factors that combined to make the flu a serious public health problem.^[12] The importance of quarantine as a public health measure was strongly proven during the influenza pandemic of 1918.^[13] The most prominent example comes from the United States, in Philadelphia, where the first case was discovered on September 17, but societal measures to limit the spread, such as restricting crowds in public locations, were implemented on October 3, when there were 40 deaths per 100,000 people. Unfortunately, the subsequent steps were ineffective, and by the middle of October, the number had risen to 250/100,000 persons. In St. Louis, Missouri, the first case was discovered on October 5, and social restrictions were imposed on October 7, and both the number of patients and the rate of mortality were kept low.^[5] Another interesting example comes from Milan where the then Head Physician of the Municipality proposed some public health measures to prevent the spread of disease. In Milan, murmurs of Spanish influenza prompted Guido Bordoni Uffreduzzi (1859–1943), the Municipality's chief physician, to intervene. On a collective basis, it was suggested to isolate the sick, to avoid overcrowding, especially in communities and the surroundings. Individually, it was suggested that people avoid unnecessary contact with the sick and convalescents, as

well as unnecessary travel while attempting to maintain daily routines as much as possible. It was suggested that people wash their hands multiple times a day and use a moderately acting disinfectant mouthwash to safeguard their oropharynx.^[14]

The simplest of treatments, such as the abundance of air in the environment where the sufferers are located, were thought to have a positive outcome and were implemented.^[15] The study submitted by the Committee formed by the Paris Medical Academy for the prophylaxis of influenza was mentioned in the *BMJ* of November 2, 1918. They include personal hygiene measures such as mouth washing and gargling twice a day with a glass of warm water containing a solution of chlorine soda, as well as population-related measures such as overcrowding prevention, tramway and railway carriage washing and disinfection, and school closure.^[16] Another unique measure was put in place at St Paul: Elevators were no longer authorized in buildings with fewer than six floors. Due to the close confines and lack of fresh air, elevators were deemed as areas where influenza may quickly spread.^[17] Sanitation laws were enacted, which required restaurants and bars to sterilize their plates and cups, as well as prohibit roller towels and common drinking glasses in public restrooms. A health teaching campaign involving school teachers (who were out of work), postal workers, and Boy Scouts was also held.^[18] Nurses too played a central role in the management of the pandemic. Retired nurses were called back to lend their help in the handling of the pandemic. New spaces were opened up for the sufferers of the disease.^[19]

Finally, summing up the major public health measures, as analyzed by newspapers back in the day, we can say that measures such as the closure of schools and postponement of the start of the academic year, disinfection of facilities, quarantines, isolation, suspension of public celebrations, disinfection and hygiene, border control, suspension of railway communications, and the development and use of various vaccinations and serums to immunize the people were adopted; plasma was also termed to be an effective measure for the treatment of Spanish Flu-caused-pneumonia.^[20] The spread of Spanish flu was slowed by identifying suspicious cases through surveillance and voluntary and/or enforced quarantine or isolation. Because no vaccinations or antivirals were available at the time, these public health initiatives were the only effective weapons against the disease.^[21] Local health departments implemented public health interventions such as providing free soap and clean water to the poor; services for the removal of human waste, the inspection of milk and other food products; prohibiting spitting in the street, which slowed the spread of pocket spittoons; and newspaper and leaflet advertisements touting the therapeutic benefits of water.

Public Health Measures taken during COVID-19 Pandemic

In general, preventive measures in terms of community medicine consumed are voluntary or self-quarantine, mandatory quarantine, hand hygiene, isolation, personal protective

equipment, school measures/closures, social distancing, workplace measures/closures.^[5] After the implementation of multifaceted public health measures (including but not limited to intensive intracity and intercity traffic restriction, social distancing measures, home confinement and centralized quarantine, and improvement of medical care) in Wuhan, the number of incident COVID-19 cases were reduced, and the situation was under better control.^[6] India also has put stringent measures such as a lockdown in place to manage the pandemic. India took a technological, social, and legislative approach, which was instrumental in flattening the curve of the disease in the early stages.^[22] However, Sweden has adopted a surprising approach to the pandemic. It looks to be a significant outlier in its public health policy by imposing only very minimal mandates—closure of high schools and colleges alone and prescribing isolation for symptomatic persons and those over 70 years old.^[23] Singapore adopted a resource-intensive containment effort based on the symptoms and travel history of suspicious patients. Despite this cost-containment effort, it was recognized that some COVID-19 individuals with little symptoms might be admitted to the general ward at first. As a result, our hospital prioritized social distancing initiatives across the board.^[24] Some countries have had the best success because they adopted early restrictions and robust testing measures. For instance, New Zealand adopted a “go hard, go early” approach, in which the government responded quickly to signals of community spread.^[25] Despite an early epidemic, South Korea was able to flatten the curve by thorough testing, contact tracing, and widespread mask use. Even in a single country, state policies have varied, which ultimately led to a variation in the number of cases. For instance, different states in the United States of America have responded differently to the pandemic. Outbreaks have been comparatively less in states like New York that have made greater attempts to contain the virus as compared to states like North Dakota, which did little to control the spread of the disease initially.^[25] Although convalescent plasma has been shown to be effective in the treatment of several viral infections in the past, its application in the context of COVID-19 is still controversial.^[20] In fact, the Indian Council of Medical Research has dropped plasma therapy from COVID-19 Management Guidelines.

What Changed and What did not Change: A Comparison of Approaches

There are parallels between the two pandemics in terms of general unpreparedness, attitudes of the community and government, and various methods. All the measures to be implemented in 2020 are the same as those implemented in 1918–1919, with the same trend, uncertainty, early relaxing, and rapid reversals. Even from a scientific standpoint, all the elements (such as social isolation, intra-family spread, personal protective equipment, etc) were already known.^[14] No doubt, we do have the technology today at our disposal for managing the spread of the disease and even spread awareness among people much easier. We also have taken many steps forward in the world of globalization, which makes the progression and spread of the pandemic very fast as well. Both factors tend to counter each other and hence make timely public health intervention as

important (if not more) today as it was yesterday. A difference in the testing facilities is also present between the two pandemics. Testing was not available during the deadly Spanish Flu pandemic because we didn't know what caused it at the time.^[26] The major difference between the two pandemics has been the development of vaccines. Researchers attempted to produce a vaccine during the 1918–1919 pandemic. A number of vaccinations were investigated against *Bacillus influenzae* (now known as *Hemophilus influenzae*), as well as pneumococcus, streptococcus, staphylococcus, and *Moraxella catarrhalis* bacteria. These bacterial vaccinations had little chance of preventing the pandemic, which was caused by a novel strain of the influenza A virus, as we now know.^[27]

On the contrary, the development of a vaccine for the COVID-19 pandemic was in fact a race against time. Within a year and a half of the commencement of the pandemic, India fast-tracked the approval of three COVID-19 vaccinations: Covishield from the Serum Institute in Pune, Covaxin from Bharat Biotech, and Sputnik V, a Russian vaccine. Countries all over the world have started full-fledged vaccination drives. Israel was the first country to demonstrate that vaccines had a widespread impact. The U.S. has administered 89.3 doses for every 100 people.^[28] Another major difference between the two pandemics was that the health education and awareness platforms have been enormous during the recent pandemic, considering that it is the age of social media. Press was the only source of widespread information dissemination during the Spanish flu pandemic. Today, the public health and hygiene measures can reach far and relatively inaccessible areas very easily; but the downside was, it also spread rumors and panic very fast. Another aspect of technology during this pandemic was that the development of Apps like the Arogya Setu App made contact tracing efficient and fast, greatly reducing disease transmission. Also, the App showed the availability of hospital beds and oxygen beds for patients to be admitted. In addition, this pandemic of 2020 had the boon of technology, when home-based care and treatment were possible without physical consultation due to telephonic and video consultation. Concepts of telemedicine and e-consultation have flourished and have had numerous benefits during these tough times. All of this technological assistance was certainly not in place during the Spanish-flu outbreak. Figure 1 compares the availability of health related resources during the COVID-19 pandemic and the Spanish Flu pandemic.

Conclusions

The choice of strategy should be region-specific and factors like compliance of the population and awareness among the public are some factors that will influence the strategy chosen for a region. Periodic assessment and revision of the strategy will prove beneficial over a longer duration. Public health should be put above social and economic concerns. Finally, 'such measures can be reduced' is an issue that demands more research. Patterns in the timing and severity of second waves in 1918, however, appear to have significant implications. This means that till we have an effective vaccine in hand, we need to deploy efficient pharmaceutical interventions to keep the pandemic under control.

Finally, every country and government should be ready for any medical emergency and be able to handle it efficiently by getting their priorities right. This is especially applicable to primary healthcare providers who are the first point of contact for many patients. Their role becomes even more significant and important when we aim to spread awareness and ensure the interventions reach the grassroots level. The general physicians are the link between the public health policy and the public. They should be made aware of the intricacies of pandemic management and interventions so that they can effectively disseminate the information. This will only strengthen our healthcare system as community medicine forms the core of any healthcare system.

Recommendations

When possible, approaches and goals should be founded on scientific facts and include ethical input. Finally, we must take careful notice of past local and national lessons in order to avoid repeating the mistakes done in the past. The development of a strategy ahead of time that includes all levels of government health infrastructure is critical. Stakeholders must be consulted on surge capacity and community containment plans, and an agreement must be reached. The healthcare systems are generally overwhelmed at the peak of a pandemic. Therefore, it is important to analyze as to what extent we would require a particular healthcare intervention and enhance its production in the nascent stages of the pandemic. It is also important to have an additional buffer of healthcare staff that could potentially reduce the burden on the frontline medical staff at the height of the pandemic. Family physicians having adequate medical knowledge can be trained in pandemic management *per se*, and they will be the best additional buffers. They could be trained to work in the hospitals or in special departments like the Emergency Department, Intensive Care Unit, and so on and will be a formidable buffer during pandemics. Thus, it will reduce the chances of having overburdened healthcare workers.

Summary

- There are parallels between the two pandemics in terms of

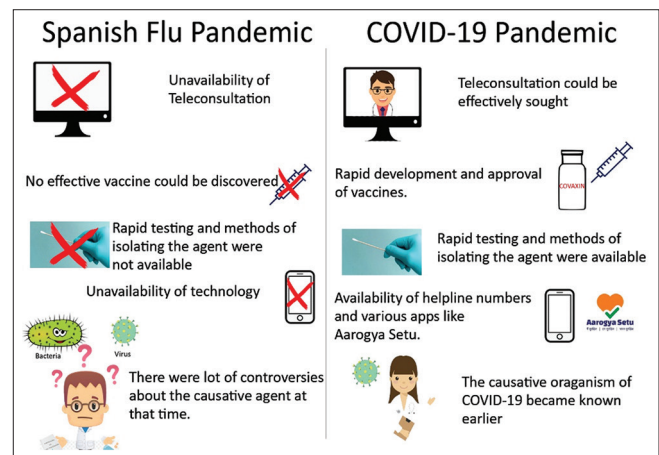


Figure 1: Comparison of availability of resources during the COVID-19 pandemic and the Spanish Flu pandemic.

general unpreparedness, attitudes of the community and government, and various methods.

- The major differences between the two pandemics has been the development of vaccines and availability of technology (apps like Arogya Setu app, e-consultation, etc).
- We do have the technology today at our disposal for managing the spread of the disease and spreading awareness among people much easier, but we also have taken many steps forward in the world of globalization, which makes the progression of the pandemic very fast as well. Both factors tend to counter each other and hence make timely public health intervention very important.
- The general physicians are the link between the public health policy and the public. They should be made aware of the intricacies of pandemic management and interventions so that they can effectively disseminate the information.
- It is also important to have an additional buffer of healthcare staff (trained family physicians) who could potentially reduce the burden on the frontline medical staff at the height of the pandemic.

Ethical considerations

No human or animal participants were involved in the study. Ethical approval was not required for this study.

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Conflicts of interest

There are no conflicts of interest.

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