

CAN NON-PHARMACEUTICAL INTERVENTIONS CONTAIN THE SPREADING OF NOVEL CORONAVIRUS SARS-COV-2 IN THE ASIA PACIFIC COUNTRIES?

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ABSTRACT

A novel coronavirus, namely SARS-CoV-2, has emerged rapidly and overspread worldwide, causing a pandemic disease, COVID-19. Until now, no pharmaceutical interventions specific to the COVID-19 infection has been proven effective. In these circumstances, non-pharmaceutical interventions, for example, banning local and international flights, national lockdowns of cities, social distancing, self-isolation, home-quarantine, the closure of schools and universities, closure of government and private offices, banning of mass gatherings would play a vital role in minimizing the basic reproduction number (R0) in expected level. Many Asia Pacific countries, Bangladesh, China, India, Iran, Nepal, New Zealand, Pakistan, and Vietnam, adopt, practice, and implement those non-pharmaceutical interventions and have success stories. Thereby, non-pharmaceutical interventions can contain the virus's spreading, which further reduces long waiting for the healthcare system's hospitalization and burden.

KEYWORDS

Novel coronavirus, SARS-CoV-2, non-pharmaceutical interventions

INTRODUCTION

The novel coronavirus SARS-CoV-2, which causes COVID-19, challenged the world. [1] In December 2019, COVID-19 had been emerged rapidly in China and later all over the world. Due to the overspread globally, the World Health Organization (WHO) declared COVID-19 infection as a pandemic disease. Without vaccines and restricted medical capability to treat the disease, non-pharmaceutical interventions (NPI) are the most crucial

strategy to put down the pandemic. [2] Within a short period, the universe has seen an unprecedented infection and mortality rate in some countries, especially in Brazil, France, India, Italy, Spain, UK, and the USA. Because of a devastating infection rate, the policymakers, the leaders, and the governments could not decide which intervention would be effective earlier. Few Asian countries like Hong Kong, Singapore, South Korea, and Taiwan have previous experience handling infectious diseases such as SARS virus-mediated infection. That is why they responded

immediately and took proper steps to contain the novel coronavirus from spreading. They were successful in preventing the spread of this novel coronavirus to a great extent. The countries who successfully contain the spreading of the novel coronavirus initiated and implemented various non-pharmaceutical interventions, for example, banning local and international flights, regional and national lockdowns of cities, social distancing, self-isolation, home-quarantine/institutional quarantine, the closure of schools and universities, closure of government and private offices, banning of mass gatherings, public events, meetings, conferences, and indoor party, etc. These interventions are aiming to minimize the basic reproduction number (R0). Furthermore, the hospital will not be overwhelmed with many COVID-19 patients, reducing the mortality rate.

MATERIALS AND METHODS

We searched different research-based websites to find out relevant information. The top searched engine was Google Scholar, PubMed, and Science direct. During searching, we included Novel coronavirus, SARS-CoV-2, non-pharmaceutical interventions, and reproduction number keywords. We gave recently published articles emphasis.

DISCUSSION

The Covid-19 illness caused by SARS-CoV-2 is overwhelming health care systems globally. [3,4] So far, person-to-person transmission from the infected individual with no or mild symptoms has been demonstrated. [5,6] That is why, to manage a viral infectious disease, usually pharmaceutical interventions such as vaccines, antiviral drugs, and investigational drugs play an important role in containing and prevent the spreading and treatment of virus infections. However, non-pharmaceutical interventions can also crucially help in a crisis, proved during the pandemic of novel coronavirus SARS-CoV-2. The following interventions would be recommended to any country as a standard non-pharmaceutical approach to contain the virus spreading.

BANNING LOCAL AND INTERNATIONAL FLIGHTS

Commercial airlines play a vital role in spreading viral infection during pandemics. During the first phase of the pandemic, several countries benefited by banning local and international flights. The number of infectious people that travel inside a country enforced travel abridgments in

the Wuhan city of China. [7] New Zealand is the most prominent for doing this intervention. [8] The US president also canceled flights carrying non-US citizens from the Schengen Area, the United Kingdom, Ireland, China, and the Islamic Republic of Iran. [9] An example from the Newfoundland province of Canada showed that banning international flight is a more effective intervention than fully reopening and quarantining the incoming population in managing the pandemic situation. [10]

IMPOSING LOCKDOWNS OF CITIES

The best example of a locking city is Wuhan, China, where the novel coronavirus spread worldwide. The town was locked so that no one can enter or leave the city. [11] Likewise, Germany's government has strictly announced restrictions as one of the lockdown measures so that people cannot make a group of 3 or more in a public place. [12] As a result, the death rate in Germany was less than her counterparts.

ROLLING LOCKDOWN

Sometimes intermittent lockdown could contain viruses spreading in local cases. For example, Pakistan is a densely populated country. For opening the economy, they need to resume everyday life and imposed lockdown again, recommended by the WHO. [13] Bangladesh also implemented this type of strategy for economic revitalization. [14]

SOCIAL DISTANCING

In the past disease epidemics, social distancing has been efficient for suppressing human to human transmission and mitigating morbidity and mortality. [15,16,17,18,19,20] A control strategy simulation suggested that tightly regulated social distancing can reduce the number of cases during peak time. [21] Both New Zealand and Australia have reduced COVID-19 spreading by a government-driven social distancing strategy. [22] On the other hand, Sweden's government is not tightly recommending a social distancing strategy. [23] However, the number of infected people is increasing day by day. Thus, enforcement and adherence to tighter control of social distancing may decrease the spread of COVID-19 in the upcoming days. [24]

CLOSURE OF SCHOOLS AND UNIVERSITIES

As part of non-pharmaceutical interventions, most schools, colleges, and universities all over the world closed during the early outbreak of the COVID-19 disease. But Australia and Sweden did not complete their school's closure. [25] However, closing schools' policy saves many students from

being infected and thereby helps reduce reproduction numbers.

CLOSURE OF GOVERNMENT OFFICES

Some countries encourage home offices, whether others increase the holidays to contain the spread of the virus. As a preventive measure, Bangladesh's government took immediate action by declaring the offices' public holidays for a certain period. [26] This intervention curbed the

reproduction number to a great extent in the densely populated countries in the world.

BANNING OF MASS GATHERINGS

According to WHO, a mass gathering could spread a disease that is a threat to public health. [27] Some European countries such as France, Germany, Italy, and Spain imposed strict restrictions to stop mass gathering. In contrast, Portugal, Switzerland, and the UK partially restricted the mass gathering. [28]

TABLE 1: NON-PHARMACEUTICAL INTERVENTIONS MEASURES TAKEN BY THE DIFFERENT COUNTRIES.

TYPES OF NON-PHARMACEUTICAL INTERVENTIONS	NAME OF THE COUNTRY	REFERENCE
Banning/Suspending local and international flights	New Zealand, US, Hubei province (China), Vietnam, Nepal	[8], [9], [11], [29], [30]
Imposing lockdowns of cities	New Zealand, Hubei province (China), Nepal	[8], [11], [33]
Rolling lockdown	Pakistan, Bangladesh	[13], [14]
Social distancing	Hubei province (China), New Zealand, Vietnam, Italy	[11], [22], [29], [34]
Closure of schools and universities	New Zealand, Hubei province (China), Vietnam, Italy	[8], [11], [32], [34]
Government public holidays	Bangladesh	[26]
Limiting of mass gatherings	New Zealand, Hubei province (China), Vietnam, Italy, Nepal	[8], [11], [29], [31], [34], [35]

CHALLENGES FOR GLOBAL NORTH AND SOUTH COUNTRIES FACING THE WAVES OF COVID-19

After successfully containing the first wave of COVID-19, many countries face the outbreak of a second or third wave. The policymakers are cautious now for the economic losses taking place during the first wave. One of the main features of the second wave of COVID-19 is that the infected population's average age is lower than the first wave of infections. [36] Nevertheless, non-pharmaceutical intervention plays a crucial role in containing novel coronavirus spreading. In the case of Australia, social distancing curbed the rate of infection in the state of Victoria. However, a quarantine breakdown among family gathering speeded further infection into the community during the second wave. [37] This incident indicated that

early social distancing intervention could reduce the rate of infection. An analysis said that the second wave would pose new challenges for the African countries because of the emergence of more contagious strain in South Africa and the UK. The surge will be dangerous for the resource-constraint African countries due to a lack of capacity for testing the novel coronavirus. [38] The global north countries, for example, Italy, faced a harsh economic consequence during the first wave of COVID-19. However, governmental, and non-governmental approaches to overcome the monetary crisis were possible due to hand allocation. [39] On the other hand, the global south, including most African countries, cannot respond like Italy because of fewer resources.

SIGNIFICANCE OF THIS REVIEW WORK

Non-pharmaceutical interventions are powerful strategies to contain the spreading of novel coronavirus SARS-CoV-2. We have seen far fewer infections and death in the Asia Pacific countries than in other parts of the world. The genetic difference, as well as cultural behavior, is responsible for making it possible. Typically, in Asian countries, kissing, hugging, and handshaking is absent in public functions. It could have some impact on reducing the rate of infections. The interventions described here can be implemented in any country to contain the COVID-19 diseases in the community, minimize hospitalization cases, and, most importantly, decrease the mortality rate.

CONCLUSION

At the time of writing no COVID-19 specific antiviral drugs have been approved by the US Food and Drug Administration (FDA). However, some antiviral drugs have emergency use authorization from the FDA. In these circumstances, non-pharmaceutical interventions could be a remedy for all countries around the globe. Moreover, when the vaccine is available in the market, many developing and under-developing countries may not afford it or will not be available in their hands within the expected time. In the meantime, they can adopt and implement non-pharmaceutical interventions to minimize R0 numbers, which the Asia Pacific countries have done. Thereby, they can contain the spreading of the novel coronavirus, which further reduces long waiting for hospitalization and the healthcare system burden.

COMPETING INTEREST

The authors declare no conflict of interest. The authors are solely responsible for the writing and content of this article.

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