The Effect and Public Perception of Health Code and Quarantine Measures on the COVID-19 Pandemic in China

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Abstract. Measures for preventing the spread of COVID-19 are crucial for public health, specifically when the specific cure is not available temporarily. As the pandemic's epicentre, China responded to the outbreak by promoting certain strategies against the virus, including health code, and quarantine measures. Health code identifies and highlights individuals potentially at risk of exposure to the virus, thus preventing them from entering public spaces to further transmit it. The system's strength is obvious, the integrated system allows easy access, real-time monitor the health status, and quick verifying when visiting public areas. However, the system is still challenging for unconnected groups and elderly populations, also limiting daily life when the system mistakenly separates healthy individuals into yellow and red codes. The citizens' feedback against the system varies, with some supporting its necessity and others having privacy concerns. Quarantine measures impede face-to-face communication among the population, reducing the transmission rate of the virus. Several benefits could be highlighted: efficiency, protection of the vulnerable, and flexibility. On the other hand, severe economic and psychological impacts are exerted on the society. While most still support the policy, many people are dissatisfied with the policy concerning the huge impact on their daily lives.

Keywords: Health code, quarantine, COVID-19.

1. Introduction

The COVID pandemic, triggered by SARS-CoV-2, emerged in December 2019, Wuhan, China, requests global measures to control its spread. Countries introduced various policies, such as quarantine, contact-tracing measures, and mask mandates. Among these measures, the promotion of mobility restriction methods such as quarantine, lockdown, and health codes are crucial due to the absence of specialised anti-viral drugs.

As the original epicentre of the pandemic, China quickly responded to the outbreak by promoting mobility restriction measures to curb the transmission of the virus, such as health codes and quarantine policies. Health code is a crucial contact-tracing measure for the identification of people potentially at risk of COVID-19 exposure. This coloured code has been widely adopted by approximately 900 million people in 300 cities [1]. Another measure that the governments have proposed is the quarantine method, various policies are implemented such as central quarantine upon entry, national lockdown, and self-isolation at home, all contributing to the prevention of infection. While the efficacy of these measures is preserved, they are often complained of as being inconvenient. The public's attitude towards these measures is extremely polarised, with different viewpoints on both sides. Some argue that the traumatic experience causes lasting injuries to their mental health. The essay aims to discuss the efficacy of mobility restriction methods by investigating the benefits, drawbacks, and public perception of each measure, using health codes and quarantine methods as examples.

2. Health Code

2.1. Benefits

During the COVID pandemic, China's prevention and protection strategy relied heavily on health code, a contact-tracing app established in the foundation of two predominant software: WeChat and

Alipay [1]. Integrating the health code system into widespread applications significantly lowers the access difficulty for the vast majority. Hence, the convenience of the system allows Chinese citizens with mobile devices to access at any given time or place, implying flexibility and convenience for the vast majority, minimizing the disruption and interruption to the daily routine of health code users.

The probability of falsifying information is also prevented and eliminated by binding the health code with GPS and the personal information of an individual. The health code system coalesces the Global positioning system (GPS), allowing the government department to estimate the transmission risk of an individual by aggregating personal information such as ID number, vaccination status, and latest nuclear acid test results [2]. The health code updates instantaneously at midnight, ensuring all populations at high or medium potential risks are monitored and controlled proactively in real-time.

The system provides easy accessibility and high portability, while associated with personal information such as ID, and name. This allows the staff in specific institutions to verify the health status and personal information of an individual who is visiting the specific public spaces efficiently by scanning them. Hence eliminates the possibility of falsified information, leading to better control and the spreading of the disease. In addition, the data is real-time updated, ensuring only individuals with a low potential risk of infections at the moment enter the public space.

2.2. Conundrums

Despite the widespread of the internet modern days, there are still populations in low-income areas that remain uncovered or unserved either because of their social and economic status or the limitation to technology access. These unconnected and underserved areas may face issues that limit and hinder their accessibility to online healthcare resources, specifically health codes which are available in more connected areas. This is a vital factor affecting the user coverage which may lead to harder controlling the spreading of the COVID-19 virus. In addition, ethical considerations may also arise due to the unfairness when comparing the resource accessibility between unconnected groups and connected groups. The normal life routine of the unconnected groups' is curbed due to the absence of a health code, prohibiting the unconnected groups from entering public areas.

Some challenges of health codes that older adults encounter stem from lack of daily uses in modern technology; for the older generation, attention and learning are essential when using health codes, consuming extra time and energy. Having issues with the health code also hinders them from entering public spaces such as supermarkets, healthcare infrastructures, or public transportation. These obstacles heavily restrict the variety of daily activities that the elderly can perform, limiting their access to any necessary activities and services. Causing social isolation as well as postponing the health care for this at-risk group.

When an individual has a yellow or red coloured health code for this, there is the consequent risk of social isolation from their surrounding communities because they have been deemed unsafe to be around due to suspected poor health. For those people, that situation can lead to anxiety and stress. The mental state deteriorates, and the experience of exclusion and isolation can be intensified. In some cases, technical issue arises causing the health code system to mistakenly allocate individuals with low infectious risk to red or yellow code.

2.3. The Public Perception for Health Code

People's freedom of movement is decided by the coloured health code that has been allocated to 300 cities and above, with over 900 million users across the country [1]. While some maintain a negative attitude towards health codes, some view this technology from a more optimistic point of view. These individuals believe that the functions and applications of the health code system could be significantly broadened. Some believe that the functions and uses of the health code could be expanded, and features such as online consultations and medical appointments etc. could be incorporated and merged into the system [3]. Many others proposed the idea of eliminating the original system by developing the health code into a separate health care service code or public service code [3].

Despite the majority strictly following the heath code policy that the government have proposed, some voices of dissent and criticism still arise due to the privacy concerns of massively collecting private data including ID numbers. For instance, In May 2020, the Hangzhou Municipal Health Commission suggested a proposal for incorporating health codes into everyday activities, a health score will be assigned to each based on their daily exercise, sleeping time, quantity of smoking etc. [4]. However, this proposal quickly sparked public opposition and resistance. In a survey conducted on Weibo regarding public opinion on the permanent health code, 6020 participants voted objection out of nearly 7000 participants, accounting for 86.5% of the total votes [5].

3. Quarantine and Lockdowns

3.1. Benefits

Ideally, implementing the isolation or quarantine measure could effectively control the spread of infectious diseases by reducing the opportunities for the pathogen to move from person to person. Separating the infected individuals or those potentially at risk enables the exposure to the disease of healthy individuals to be significantly diminished. The method also enables to control of the disease in each or specific area, preventing the disease from reaching to further broader. In addition, due to the lack of cures and vaccines for COVID-19 when the virus is new, quarantine is the most rapid and suitable measure to keep the spread of the disease under control [6].

The isolation policy could protect vulnerable populations or susceptible populations effectively, such as elderly populations, and individuals with weakened immune systems. By separating the susceptible population in daily life, the risk of exposure for these groups is significantly reduced. This policy seems to be an individual loss, but it collectively safeguards the community, especially preventing vulnerable populations from experiencing severe disease [6].

Isolation and quarantine methods could be adaptive and flexible concerning the severity and characteristics of a certain city. Different cities could propose different quarantine policies most suitable to their economic status and current situation. For instance, In December 2021, Beijing's quarantine measure targeting citizens returning abroad includes the following: 14 days of central quarantine followed by 7 days of home/central quarantine, plus 7 days of health monitoring. While Shanghai's policy slightly differs from Beijing's: 14 days of central quarantine followed by 7 days of home health testing [7]. Expect for the mandatory 14 days of central quarantine, each city or province could alter its policy concerning the economic and epidemic situation. The flexibility of the isolation policy could allow it to adapt to different situations along the period of the pandemic.

3.2. Conundrums

Implementing the quarantine policy for travelling may lead to severe economic decline in the city or even nationwide. Data have shown that the economic growth in China has fallen by 3.8% suddenly [8]. Restriction policies on business travellers may result in delayed commercial trade. Such decline may then lead to a devastated economy. In addition, the quarantine policy also limits the development of tourism, economic destruction will occur for cities that rely heavily on tourism as a main income strategy.

Quarantine policies significantly decreased the market demand, causing a considerable quantity of job losses. During quarantine periods, multiple businesses and schools closed and started teleworking and online classes to respond to the national policy. The closure causes profound effects such as a devastated production chain, decreased market demand, and declined economic status. Firms and agencies become illiquid, which further leads to job losses.

Long-term Quarantines and isolation could potentially have detrimental impacts on the psychological health of certain individuals, particularly for children, and the elderly [9]. For instance, a study has shown that the possibility of demanding mental health services for children who have experienced quarantine is five times greater than for those who do not experience it [10].

3.3. Public perception

Quarantine policy is designed to prevent the spreading of contagious diseases by limiting populations' mobility. Considering both the effectiveness and detrimental effects, people preserve various attitudes toward the policy. Overall, China's quarantine policy has been supported by the majority of the population. Research has found that most of the population preserves a positive attitude toward the reasonability of quarantine, considering 92% of them show a supportive attitude toward the government should issue punishments for those who refuse to follow the law [11]. This indicates these populations' supportive perspective; they consider the safety of the vast majority as the most vital factor when they justify the rationality of the quarantine policy.

However, there are still some voices that hold an adverse attitude as well. While the method could be effective in preventing the spreading of COVID-19, it still significantly interrupted the normal life of most people. Some admit that experiencing the quarantine and lockdown period interrupts their normal lifestyle, including social activities, working opportunities, and study efficiency. People experience mental breakdowns due to a lack of social activities. In some more severe cases, some individuals may develop psychological disorders due to long-term isolation. Lowered study efficiency due to the application of online classes, as well as job losses because of the devastated economy. They consider more on psychological health, the rights of freedom that each person holds, and economic issues when justifying quarantine policy.

4. Conclusion

The COVID-19 pandemic requires multiple global measures to prevent it from spreading, due to the absence of specific drugs at the initial of the outbreak, mobility restrictions measures are crucial for preventing the virus from spreading from person to person. Health codes as a method for curbing the mobility of citizens, allow low access difficulty, real-time monitoring, and convenient verifying, while quarantine methods protect the majority and the vulnerable populations. Despite the efficiency of these measures, some conundrums still exist for both measures. Public response to the measure was mixed, with some supporting the essentialness of the strategy, others holding an adverse opinion due to privacy concerns and severe impact on daily routine.

As the world gradually adapts to the pandemic, the outlook of these policies remains a vital problem. By investigating new possibilities and new advancements of these measures, human populations could either benefit from better preparedness for the next pandemic, and creative innovations to elevate daily life.

With the experience of COVID-19, the health code could be refined for more advanced preparedness for the next pandemic. For instance, enhance the data security system, preventing private data such as name and ID number from being leaked. Health code systems could also be preserved in the health infrastructure to enable a rapid response to new outbreaks. A more streamlined version could be developed for older generations who have fewer technology skills.

Also, relevant departments could refine and optimize the quarantine based on the feedback of citizens. For example, elevate the support system in the central quarantine building, such as providing financial aid, and mental health care to reduce the dissatisfaction and psychological issues of individuals. The government can also stockpile essential resources such as medicine, masks, and gloves for quarantine individuals, preventing resource shortages due to the great demand for such resources.

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