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Quarantine in COVID-19 Pandemic: A Narrative Review

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ABSTRACT

Coronavirus is a rapidly emerging infectious disease of respiratory tract which has been declared a pandemic by World Health Organization. The virus spread quickly between close contacts or through coughing and sneezing of the infected person. A few months after the first case was reported in Wuhan, China, the disease quickly turned into a pandemic. World health experts are already actively searching for a cure or vaccine for this disease, but before that, many countries around the world are considering mass quarantine measures as a method to combat its spread. This necessitates application of strict measures to control this pandemic. As of now there is no treatment to cure this disease. Therefore prevention of spread of disease remains the mainstay of combating it. One of the emergency public health measures that have been used extensively to control this pandemic is quarantine. Even though on long term basis, quarantine may have its advantages and disadvantages which has to be considered when practicing the same. This review focuses on rational behind the quarantine, its indications, the set-up or infrastructure required and the ethical implication for quarantine. It also reviews the psychological impact of quarantine and its effectiveness as a public health measure.



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INTRODUCTION

The coronavirus also known as COVID-19 is freshly discovered infectious disease (Zhu and Zhang, 2019). This was originated in the small city of CHINA named Wuhan on 20 December and

becomes communicable around the globe. On January 30 it was announced as Public health emergency of International concern and Pandemic on 11 March (Wilder-Smith and Freedman, 2020).

During the first three days virus is highly contagious symptoms appear after the onset. This virus can spread through countless ways some of them are small droplets result by sneezing, talking, coughing (Upshur, 2003). The droplets do not travel in the air for longer distance they usually fall on the ground or other surfaces. Infection can also occur through touching a contaminated surface and by same hands touching the nose, eyes, face. Close contact or mass gathering is primary source of spread of this virus (CDC, 2020).

Preventive measures include repeated and thorough hand washing with the help of sanitizer (alcohol based hand rub) or with regular soap and water,

maintaining social distancing 3feet (1meter) distance, proper use of mouth mask to avoid further spread of infection. Self-quarantine should be done in case of the possibility of contact with infected person ([Coronavirus, 2020](#)).

What is Quarantine?

Quarantine is the process of separation and restriction of movement of persons for those who have not acquired the symptoms of illness, also who are suspected to have been exposed to infection containment area for the purpose of preventing transmission of diseases ([Nussbaumer-Streit et al., 2020](#)). Persons are usually quarantined in their homes, school, or hospitals but they may also be quarantined in community-based facilities. The quarantine can be practised upon the individuals who are exposed to public gathering or to persons who have recently travelled to a foreign countries or international travel ([Brooks et al., 2020](#)).

1. An individual/group of persons.
2. A broader population- or area -level basis.
3. Making boundaries around a particular region (cordon sanitaire) or the locking down of local community borders with laws to inhibit movement from one place to another are its example.

Classification of quarantine

A) Based on willingness

1. Voluntary quarantine (self-quarantine)
2. Mandatory quarantine

B) Based on place of quarantine

1. Quarantine in a private residence
2. Quarantine in hospital
3. Quarantine in a public institution
4. Quarantine in other places (cruise ships)

C) Based on type of people quarantined

Quarantine of groups can be explained as quarantine of mass population, those individuals who have been come across to the similar source of disease (e.g. mass gathering, institutions, airports, flights temples, school, and offices).

Working Quarantine can be explained as to health care people who are present at higher risk or professions that are sound famous for the spread of

Communicable disease such as nursing staff, dentist, hygienist or workers, who may be present in homes or private clinics facilities during non-working hours.

Community-wide Quarantine can be explained as closing of community or society borders, making boundaries around a confined area (cordon sanitaire).

Historical Perspective of Quarantine

In ancient age segregation and separation of sick people, temporary or otherwise has been mostly recognised as one of the important measures to limit the spread of disease. Isolation of people with leprosy and making them live alone was a common practice ([Gensini, 2004](#)). The modern concept of preventive quarantine is seen in 14th century pertaining to plague wherein officials issued the so called 'trentina' the Italian number 30 for isolation period of 30 days ([Lippi and Conti, 2002](#)). Ships were anchored for 30 days before docking if they were coming from infected or suspected to be infected sites. The word quarantine comes from 'quaranta' the Italian number forty ([Matovonic, 1969](#)). This was the period of separation for land travellers. This duration was considered sufficient for the disease to manifest if the people were infected. With time and advancement of science, the modes of transmission were identified for various infectious diseases. Therefore with updated understanding of a disease, the laws and guidelines pertaining to quarantine were amended time to time on scientific basis ([Live in Indonesia, 2020](#)).

In International Maritime signal flags on ships, which use plain colours like yellow, green, and even black flags have been used to symbolizes the disease in both ships and ports, with the yellow colour having an extended historical model, as a colour of representation for houses of infection diseases, prior to its use as a maritime marking for the disease. It is also known as the "yellow jack" name derived or represent from yellow fever. Cholera ships have also represented yellow flag. The plain yellow flag perhaps derives its letter symbol for its primary use in quarantine, but this flag in modern times indicates the opposite—a ship that declares itself free of quarantinable disease, and requests boarding and inspection by Port State Control to allow the grant of free pratique ([CDC, 2020](#)) like Diphtheria, Tuberculosis, Yellow Fever, Infectious Mononucleosis, Plague, Smallpox and Cholera. There is difference between Quarantine and Isolation as Isolation is done for those who test positive for the screening test or show signs and symptoms of the disease and thus infected whereas those who has come across

in direct contact with a known case of communicable disease and are completely asymptomatic at the moment are quarantined to separate them from others considering that they might develop the disease after completion of the incubation period of the pathogen. Isolation segregates patients and this allows treating them exclusively.

The Ethics of Quarantine

It ceases the sequence of spread because of its minimum possible effect to infect others if individual is not in public gathering. It allows the person under observation to be recognized and directed toward suitable care if the symptom becomes characteristic (Parment and Sinha, 2020).

There are 4 principles that need to be met before applying quarantine measures. These are

1. The Harm principle- to follow the principle of quarantine the disease should be spreading from person to person or through close contact.
2. Least Restrictive or Coercive Means- Quarantine should be followed by people themselves without the force of government for the purpose of achieving disease control.
3. Reciprocity principle- Society should provide people with proper quality of food, shelter, clothing and emotional support, keeping them encouraging in their workplaces, and not differentiated against them in return of curtailing their liberties for the good of others.
4. The transparency principle- In the context of COVID-19 the government as appealed for Janta curfew is a classical example of transparency the government applied for 1 day quarantine by giving the information of its pros and cons (Harris and Holm, 1995).

Indications/ Considerations for Quarantine

Introducing measures in the primary stage of breakout may retard the spread of infection in a particular area or in red zone area (number of cases are high) will delay the peak of a spread where local transmission is going on. If quarantine not implemented properly, it also adds additional sources of spread of infection and circulation of a disease. From the reference or literature of the ongoing COVID-19 breakout, the WHO strategy of spread of infection incorporates the quick identification of disease cases with rapid testing and their separation and proper medical care either in a COVID centre, isolation wards or at home. World health organisation suggested that any contacts with patients with COVID-19 must be quarantined for at minimum 14 days

from the previous time they were in contact with the patient including close contact in the range of 1 meter for more than 15 minutes of known COVID-19 patients. They contact with known COVID-19 patient can occur in following circumstances like a) Health care workers providing necessary medical care with patients of COVID-19. b) Remain in the same place as COVID-19 patient and sharing common places like household things, public places like schools, colleges etc. c) Moving in public transport or vehicles used for COVID-19 patient in any emergency or other situations.

Arrangement requisites for Quarantine

1. For quarantine, people should be placed 1 meter apart with proper ventilation, comfortable single rooms with proper facilities (that is, sanitary should be provided). Bed should be placed 1 meter apart if single or private rooms are not available.
2. Appropriate infection control measures such as proper ventilation, filtration, sanitation, waste management must be provided.
3. People who are quarantined must maintain a social distancing of 1 meter in between all the people
4. Adequate housing with suitable facilities of water, food, clothing, and hygiene facilities; protection from pets and insects.

Adequate professional therapeutic medical treatment and health care should be provided. Communication in a known language should be provided so that those individuals who are quarantined can easily understand the explanation about their rights, and services that will be made accessible, for a particular time period to which they need to be quarantined and what are the consequences if they get ill or get infected additionally, contact information for their local government help or local support should be given.

1. Professional facilities should be given for quarantined people.
2. Individual under isolation which undergoes clinical medical screening or other tests for public health purposes.
3. Communication with family members must be provided for maintaining mental health of patient and family and friends.

4. For proper information, news and a good source of entertainment good access to the internet server; TV, Radio should be provided.
5. Health exercises such as yoga or physical exercises should be available for maintaining physical and mental health.
6. Older aged people and younger aged children must provide special additional awareness because of their higher risk for serious COVID-19.

Accommodation regarding quarantine includes home quarantine with proper ventilation, sanitary, hotels, dormitories, other facilities like catering to groups, suitable conditions for safe and successful quarantine are being met (World Health Organization, 2020).

Psychological impact of Quarantine

Studies had showed psychological impacts vary with the duration of quarantine. Impact of longer durations (more than 10 days) of quarantine includes Anger, Mental stress, Post-traumatic stress symptoms, and Neglecting behaviours.

Impact of shorter durations (less than 10 days) of quarantine (Hawryluck *et al.*, 2004) Loneliness or social isolation, Frustration (Blendon *et al.*, 2004), Insufficient supplies (Pellecchia *et al.*, 2015), Insufficient information and Boredom.

Stresses Post Quarantine

Financial failure can be one of the greatest difficulty during quarantine when individuals are not able to work or do any professional activity with no pre-planning; the outcome appear to be longer period of time (Pellecchia *et al.*, 2015). From some reviewed previous studies, the economic failure as an outcome of quarantine impact significant socio-economic discomfort and was one of the predisposing factor for symptoms of psychological disorders such as anxiety and angry for longer period of time after quarantine. Individual who are under quarantined and minimum incomes might need supplemental levels of support during quarantine working for one's self people who are unable to work or salaried staff.

Effectiveness of Quarantine

The effectiveness during the duration of outbreak around the world and in the city like Hong Kong, unlike other region in the world which have massive travellers from mainland china, concluded that spread to decrease. Understanding the effect of control measur to decrease the transmission in Hong Kong may provide new opportunity to understand

how an outburst can be suppressed with the help of Quarantine and other measures such as isolation, social distancing, are being used to reduce the spread of the disease (Yuan, 2020). Till date there is no effective treatment or vaccine of COVID -19 so restriction measures along with quarantine plays an effective role along with closing of school, or public places or social distancing. So ultimately it can be said that

1. While examining the patient, additional aspects of precautionary measures to perform various procedures and to disinfect the surgical field were discussed (Nimbalkar *et al.*, 2020).
2. Some drugs can be used to treat covid 19 and should be tested by some clinical Trials (Reche *et al.*, 2020).
3. Quarantine will be very helpful until the right vaccines and drugs are available (Patel *et al.*, 2020).

CONCLUSION

Quarantine is preventive medicine to control the spread of infectious diseases. Like a coin, even quarantine has two sides. Therefore, quarantining people is a major step with its pros and cons, appropriate communication is the key to alleviate the fear, anxiety and stigma associated with quarantine. None the less, this effective tool should be judiciously used to maximize the benefits and minimise the setbacks it brings with it.

Conflict of interest

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