

Key considerations: quarantine in the context of COVID-19 (February 2020)

This brief sets out practical considerations relating to the design and impact of measures that restrict human movement patterns in the context of COVID-19. These measures include: **quarantine**, in which individuals who have been exposed to a communicable disease are separated from others for the duration of the disease's incubation period; **isolation**, in which individuals with a communicable disease are separated from others for as long as they are infectious; and **social distancing**, in which individuals or large groups of people are restricted from gathering.¹ Measures may be **mandatory** (governmentally required and enforced) or **voluntary** (not required but recommended by government or developed and implemented at the community or individual level).

During the current COVID-19 outbreak, a variety of movement-restricting measures have been introduced to limit spread of the virus. Wuhan (the epicentre of the outbreak) and other affected cities in China have been subjected to restrictions that prevent travel in or out of those areas, and similar measures have subsequently been applied in other countries with confirmed cases. Many countries have quarantined travellers returning from China and self-quarantine has also been encouraged. On-going assessments of the impact of quarantine on COVID-19 must be prioritised, including the impact of different types of quarantine in different geo-political territories on transmission and containment and the levels of associated social acceptance.

In light of the evolving outbreak and after the WHO Global Research and Innovation Forum: Towards a Roadmap for the novel Coronavirus (February 2019), this brief was developed for SSHAP by Anthrologica. It was reviewed by colleagues at the Institute of Development Studies, the London School of Hygiene and Tropical Medicine and WHO. The brief is the responsibility of the Social Science in Humanitarian Action Platform.

Summary considerations for quarantine and movement restriction

- Principles of ethics and human rights should be taken into account when planning quarantine interventions.
- To reduce panic and emotional distress and improve compliance with preventative measures, official sources must provide clear, up-to-date, transparent and consistent guidelines, information and verbal messages about quarantine measures and how to mitigate infection during the quarantine period.
- When planning and implementing quarantine measures, the focus for communities should be on social responsibility. Constructive engagement with local communities and trusted public authorities, both formal and informal, is essential for the implementation of quarantine measures that will be acceptable, well understood and therefore more likely to succeed. Enforced response measures and lack of dialogue with affected communities can result in fear, resistance and non-compliance.
- Governments have a responsibility to ensure minimum standards to mitigate potential disease transmission while at the same time ensuring individuals under quarantine are provided with equitable support services, including health care, financial, social and psychosocial support services, and basic needs such as food, water and other essentials.
- The needs of vulnerable populations should be prioritised in the structure of and communication about quarantine measures. In the context of COVID-19 this includes the elderly and those with co-morbidities who are more vulnerable to severe disease.
- Various factors affect different population's levels of willingness and ability to comply with quarantine measures, including how it is introduced and enforced and its impact on socio-economic life. Perceptions of risk, authority and responsibility and the degree to which populations consider there is a need for quarantine are also influential.
- Cultural, political, economic and geographic factors will affect the efficacy of quarantine and its potential to contain infectious disease. In order to better understand such factors, rapid assessment of the local context is invaluable. Assessments should evaluate both the drivers to effective quarantine and the potential barriers to and negative impact of quarantine in a given location. Such information would help in the design of the most appropriate measures, taking into account the potential economic, social and psychosocial impacts on both general populations and specific population groups.
- It is important to understand community and political power dynamics and local histories of quarantine in a given location. In some places, quarantine may be susceptible to being used, or perceived as being used, to curtail political opposition, reinforce discrimination and infringe on personal freedoms.

Lessons from previous restrictions on movement during outbreaks

Quarantine has been used for many centuries as a strategy to control epidemic diseases that threaten to spread nationally or internationally, with the first formal system being documented in Italy during the 14th century plague epidemic.² Measures can be mandatory, voluntary or coerced; there may be top-down measures led by the state or bottom-up measures driven by the community or individuals. In some cases, a combination of strategies will be used. The following sections present lessons and recent examples of measures introduced in different contexts with varying efficacy. Factors that may contribute to successful implementation and outcomes are highlighted.

Factors influencing compliance: Compliance is a prerequisite for successful and effective public health interventions; however, it is affected by numerous factors that differ across situations and cultures. Given that quarantine and social distancing measures are enacted on still-healthy populations, gaining acceptance or buy-in can be more challenging than for interventions targeting sick patients. Some known factors influencing individual-level compliance include understanding of the health threat, trust in leaders, personal risk assessment, social and cultural norms, social and familial obligations, life circumstances, and work and financial concerns.³ Community and individual acceptance is improved through efforts aimed at voluntary compliance as opposed to compulsory measures. While negative perceptions of compulsory measures differ by culture and context, support for social distancing measures across many groups and cultures decreases with increased enforcement methods.^{4,5} Credibility, based on trust in those issuing directives, will differ between and within countries, regions and populations and will be influenced by their particular histories and experiences of citizen-authority relations. Prior experiences with discriminatory policies and structures may have implications for compliance with quarantine measures.^{3,4}

Personal risk assessment and the perceived efficacy of quarantine will also play a role in individual decisions around compliance. Research has shown that the more concerned people are about a health threat, the more willing they are to change their behaviour.⁵ Perceived risk will be largely influenced by how a disease is interpreted, local case numbers and public health communication strategies and messaging.³ Social and cultural norms and values also play a role in individual compliance and should be taken into consideration. Societies differ greatly in terms of their ideals regarding collectivism versus individualism, and effective public health messaging should take this into account. Further, the acceptability of methods for quarantine and social distancing differs across cultures, and public health initiatives should seek to fit into the context in which they are being implemented.⁵ The influences and behaviours of an individual's social networks and the reactions of family, friends, peers, trusted community leaders and well known figures (e.g., celebrities) may all impact decisions regarding compliance.³ In addition, obligations to care for family members may play a large role in an individual's decision to comply with quarantine measures if the measures inhibit their ability to fulfil these obligations.

Compliance with public health interventions is also dependent on people's ability to understand available information and to follow the implemented measures.³ Individuals must have the necessary resources to comply; people without enough stored food or the means to obtain it may find it more challenging to follow guidelines that restrict their movement to go out to work and buy food.⁶ People may also need to reassurance that they will be supported to access important commodities such as regular prescription drugs should quarantine measures be enacted.⁵ Levels (and perceived levels) of preparedness can influence individual and community compliance, and planning and familiarity with the actions to be taken during a quarantine event can affect a community's response.³ Previous experience with quarantine measures is also likely to impact attitudes towards quarantine, either positively or negatively.

Ethical and human rights concerns: In North America, the quarantine measures implemented in 2003 for the SARS epidemic were the first used in over fifty years and incited heated debates concerning the ethics and legality of quarantine.⁷ While quarantine raises ethical concerns, including its historical legacy as a discriminatory practice and the degree to which burdens are disproportionately distributed across an affected population, the fundamental tension of quarantine is between individual and population rights.^{8,9} The dilemma for public health officials (and for those under quarantine) is that such measures effectively ask individuals to assume the burden of protecting the collective. Quarantined individuals assume a greater risk that they will become infected; they face hardships if they are not provided with adequate resources to meet their daily needs; and they may have unequal access to care in the event that they do become ill. For those in home quarantine, the risk of an infected individual further infecting family members is a significant factor. As a consequence, it is incumbent on public health officials to provide sufficient accurate and actionable information as well as effective resources so that individuals under quarantine can protect themselves and their family members from infection. Those resources are context-dependent but may include, disinfection and/or handwashing supplies, and methods of communicating with people outside a quarantine zone.^{5,10,11} In the current outbreak masks are not recommended for quarantined persons in most circumstances.¹²

Despite the curtailment of personal liberty, most democracies' public health laws permit quarantine under warranted conditions.¹³ Ethical considerations could include, for example, 1) the measure is necessary, effective and has scientific rationale; 2) the measure is proportional and creates the least infringement; 3) humane supportive services are in place; and, 4) there is public justification.⁹ In countries with other forms of government, the state may have fewer legal limitations on its ability to impose and enforce quarantine, and may impose it on a more general determination that the benefits to the collective outweigh individual rights in a given situation.

Information, misinformation and fear around measures restricting freedom: A study following the SARS outbreak in Toronto in 2003 concluded that individuals are more likely to trust authorities and to comply with home quarantine

protocols if they are provided with clear, consistent, relevant, practical and actionable information. Inconsistent or ineffective messaging and mistrust of information sources led some people to not comply.³ The lack of clear and accessible guidelines on how to reduce the risk of infection at home added to a perception of danger and fear. Further, many health workers learnt about their own quarantine orders through media coverage, which caused feelings of anger and resentment.¹⁰

Preferred and accessible communication methods, language and dialect preferences, and levels of education and literacy should all be taken into account when considering how to communicate information about quarantine measures to affected and at risk populations.³ Further, there is more likely to be public acceptance for quarantine measures when the public at large is engaged in open dialogue on the ethical use of restrictive measures, and when collaboration occurs with communities and local leaders.^{7,3,14} Granular differences in attitudes and perceptions should also be taken into account when designing communication strategies.

Different approaches to quarantine

Top-down approaches

Top-down approaches can involve mandatory measures or advisories issued by state authorities for individuals to take voluntary action. Mandatory measures include state-imposed home quarantine or curfew; mandatory detention in designated spaces such as hotels, hospitals, observation units or detention centres; quarantine of whole areas, communities or cities; and social distancing measures such as state-enforced restriction of mass gatherings, cancellation of public events, closure of mass transport systems, travel bans and restrictions, and the closure of schools, hospitals, workplaces, places of entertainment and residential buildings.^{10,14,15}

Mandatory home quarantine: Taiwan, China and Singapore imposed mandatory home quarantine during the 2002-2003 Severe Acute Respiratory Syndrome (SARS) outbreak. The quarantines were strictly enforced including use of surveillance cameras and harsh penalties for non-compliance,¹⁶ but the success of the quarantines was likely attributable in part to the high value placed on social responsibility, with individual rights secondary to the communal or national good.¹ As such, strict enforcement worked together with cultural notions of responsibility, leading to general acceptance of the measures introduced. In Taiwan, compliance was also likely to have been aided by the fact that food was delivered to quarantined people three times a day. In Singapore, the state aimed to mitigate its coercive measures by delivering transparent and consistent risk messaging to educate the public about the reasons for quarantine, to reduce stigma, and attended to the financial, emotional, and social needs of those in quarantine.¹⁷ In contrast, during the Ebola outbreak in Sierra Leone in 2014-16, inadequate and delayed deliveries of food and water and limited assistance in identifying and treating cases made the enforcement of mandatory quarantine difficult and likely limited its effectiveness.¹ For home quarantine, individuals must be well informed about how to avoid infection at the household level and provided with materials to enable them to take appropriate action.

Mandatory quarantine in designated establishments: These measures have been used on multiple occasions to segregate known or potential contacts of infected persons, including people arriving from an affected area. For example, during the West Africa Ebola outbreak (2014-16) Nigeria, building on the experience of polio, tailored quarantine arrangements to the specific needs of affected individuals, to good effect. Instead of being asked to self-quarantine at home, affected individuals were quarantined in a designated observation unit due to their specific shared living arrangements (in student dormitories) and professions (that required close contact with numerous people). Crucially, Lagos state had the resources to establish the observation unit and adequately care for the people housed there.¹⁸ Reports suggest that both communications and the specifics of this form of quarantine were vital. When people are provided with adequate living arrangements, meals, health and psychological care, as well as timely and accurate information about their situation and associated risks, higher levels of acceptance of and compliance with measures are reported.¹⁹

Area quarantine: Restrictions applied to entire areas, communities or cities have been used with mixed success. During the early phase of the Ebola outbreak in Liberia (2014-16), an area quarantine was imposed on West Point, a township in Monrovia home to 120,000 people. After the initial identification of confirmed cases, the Liberian army cut West Point off from the rest of the city, putting up razor wire and preventing population movement. Residents were informed that the area would be under quarantine for a minimum of 21 days but there was no public consultation. The community was unable to source adequate food and water, lost income as a result of not being able to access their workplaces and could not access healthcare. Limited resources were provided to isolate and care for suspected cases and contacts. When people reacted by attempting to escape the area, the army responded using live bullets. The quarantine did not help to contain transmission and was abandoned after 10 days. Following the event, President Ellen Johnson Sirleaf concluded that the quarantine had been a mistake, and asserted, "*Now I know that people's ownership, community participation, works better in a case like this. I think that experience will stay with us.*"⁹

In other instances, however, community quarantine was more successful. In Bong County, for example, authorities engaged local leaders to inform the community about Ebola and secure their cooperation. Residents of Mawah village (population of approximately 800 people) were restricted from moving in and out of the village and when concerns were raised about food and medicine shortages and the need for psychosocial support, these were rapidly addressed. Taking

the time to involve community members as well as informing them and working through trusted local leaders who could act as an effective liaison between the community and district health authorities helped to implement an effective community quarantine.²⁰

Social distancing: Schools in Liberia, Guinea and Sierra Leone were closed during the Ebola outbreak of 2014-15, with millions of students losing at least a year of education due to the closures. Mindful of the impact this would have on its young people, the government of Sierra Leone offered lessons via radio and television.²¹ Programmes were hampered by limited radio reception / access to televisions, and were viewed by students as a poor substitute for school, but was appreciated as a serious effort by the government.²² The ramifications of school closure extended beyond education; for example increased rates of teenage pregnancy were attributed to students not being in school in Liberia.²³

Workplace closures have not been widely implemented in response to outbreaks because of the associated social and economic costs. In Australia, modelling exercises suggested that workplace closures would be moderately effective in spreading the curb of influenza, but that one third of businesses would have to be closed in order to have a meaningful effect. The cost benefit ratio of public health gains and economic impact must be carefully assessed.¹⁵

Other measures such as closure of public entertainment venues, restrictions on public gatherings and sporting events have been tried in various contexts, e.g. the 2003 SARS outbreak in Beijing.^{24,25} It is difficult to ascertain the impact of these social distancing measures, because they tend to be introduced as part of a suite of interventions.^{24,25}

Voluntary measures guided by state or international advisories: International or state advisories can urge the public to self-impose home quarantine, isolation or curfew, or restrict travel and movement. Modelling has shown voluntary self-quarantine for contacts of infected individuals to be a moderately effective and acceptable measure, although it does present an increased risk of transmission within the household if one of the family members has been exposed to the disease and particularly if individuals share quarters and/or bathrooms.^{15,26}

Bottom-up approaches

During a disease outbreak, local communities often develop their own ways to contain disease spread.²⁷ It is important that there is understanding and effective communication between external actors (e.g. from government or international response) and communities so that top-down advice or measures can work in synergy with locally-led practices.

Community-led mandatory home and area quarantine: Research conducted following the 2000-01 Ebola outbreak in Uganda revealed that the Acholi people follow a set of rules in the event of a dangerous infectious disease. Their action is biomedically sound and involves isolating patients in a house on the edge of the community, with no visitors allowed except a previous survivor of the disease who will feed and care for the patient. Houses and villages with cases of the disease must identify themselves using long poles of elephant grass, and everyone in the village should limit their movements to within their own house or village. Prescriptive eating practices are also followed, particularly around meat.²⁸ Such a system, based on prior experience, may work well in situations of strong community cohesion and where leaders are trusted and respected.

During the Ebola outbreak in Liberia (2014-16), local leaders in some communities developed a voluntary approach under which contacts limited their movements and made themselves available for daily temperature checking, and outsiders were asked to be identified as soon as they arrived in the neighbourhood. Leaders and local 'Ebola task forces' provided food and water to community members. Research indicated that state-enforced total quarantine was less socially acceptable to community members than self-determined action.²⁹ Examples such as this, and similar experiences in Sierra Leone, show that diverse local public authorities including informal institutions such as chiefs', youth and women's organizations) can lead effective quarantines.³⁰

Voluntary home quarantine and movement restriction: This can be driven by individual fear of infection, by social pressure and by common sense. The Internet and social media have been shown to be influential in exerting social pressure on contacts to voluntarily limit their movements or stay at home. During the H1N1 outbreak, overseas Chinese students started an online grassroots risk management movement, in which they urged fellow students to postpone their return to China and/or to self-quarantine upon arrival in the country. Thousands of internet posts were made by people in mainland China identifying the first few imported cases of H1N1 and admonishing them for being 'selfish'. Blogs, discussion forums, instant messaging sites and social networking sites were used by 400 million Chinese people to gather and share information and called for returning travellers to take a number of measures before and after travelling to China, including keeping travel tickets in case contact tracing was needed.³¹ This shifted the burden of surveillance to the individual rather than the authorities, while appealing to China's collectivist ideal of subsuming individual interests for the motherland and community. As such, it proved highly effective in encouraging many overseas students to postpone their return travel to China and for people to take self-determined action.^{14,31}

It has been well documented that in some situations individuals have chosen voluntary home quarantine as a response to social avoidance or discrimination directed at groups of people associated with a disease. Described as 'coerced quarantine', this was reported in the United States and Canada as a result of the SARS outbreak in 2003, when people of Asian descent 'chose' to stay at home to avoid racial targeting and hate speech.¹⁴

Ramifications of quarantine and other movement restrictions

Social impact: Interventions involving movement restrictions can have a large social impact as they disrupt daily lives. The acceptability of any intervention is dependent on the local context, the patterns of interactions and practices affected and the degree of social importance attributed to them. The cancellation of mass gatherings can affect a range of events, from entertainment and sporting fixtures to sanctified religious observances, weddings and funerals that may be perceived as having serious consequences if not performed. Changes imposed on commonly observed customs, such as handshaking and kissing, may be acceptable in some contexts but not others where such restrictions may contribute to social uncertainty.⁶ Interventions that restrict movement of certain groups or individuals can exacerbate existing social tensions, fuel fear and mistrust, and lead to stigmatisation and discrimination. In the past, public health measures have sometimes been used as justification for implementing coercive measures against certain groups.²⁹ Even when this is not the case, measures leading to disempowerment of communities and particular groups may be perceived as oppressive and incite resistance, especially in areas with current or recent experiences of violence and insecurity and amongst marginalised groups.²⁹ Messaging and media can also fuel the stigmatisation of individuals and population groups blamed as being responsible for spreading disease, including travellers, groups with practices and customs seen to be high risk, and exposed populations including healthcare workers and quarantined individuals.^{17,31,32}

Migrants: Migrants often lack the same rights, social support structures and local resources as other residents of an area, and quarantine may further limit migrants' access to their normal support structures and services. In China, for example, the household registration system classifies migrant workers from other areas of the country as temporary residents and maintains their permanent registration in their original area of residency.³³ Their status as temporary residents grants them limited access to services.³⁴ Migrant workers currently quarantined in Wuhan and other Chinese cities may have less access to healthcare services than other residents.

Psychosocial impact: There are numerous factors that influence wellbeing and mental health during an infectious disease outbreak, however research shows that quarantine, particularly for long periods (more than 10 days) can cause high levels of psychological distress.³⁵ In studies on quarantine to control SARS in Canada and Taiwan, symptoms of post-traumatic stress disorder and depression were frequently observed with longer quarantine periods and economic hardship being associated with increased prevalence.^{36,37} People placed under quarantine often report anxiety and distress due to fear of contagion, as well as isolation, loneliness, anger and negative feelings associated with perceived or real stigmatisation.^{3,10,38,39} These sentiments are amplified if information and communication are inadequate.¹⁰ It has been well documented from a variety of outbreaks and geographic locations that people asked to identify contacts for quarantine feared resentment, were afraid of infecting family, friends and colleagues and that their feelings of discomfort were compounded by a lack of access to resources such as books, music and toiletries.³⁸ Data suggest that access to social support, positive neighbourhood relationships and access to clear information about disease are important protective factors against mental illness in quarantine conditions.^{10,37} It is important for people in quarantine to have access to adequate psychosocial support from someone they trust and who are well informed about the situation. Support may be provided via telephone or other communications technology if in-person support is deemed to be too high risk. Access to newspapers and television may help people to maintain a sense of connectedness with the outside world, although the circulation of misinformation in the media (as discussed above) may be problematic.¹⁰

Economic impact: Quarantines can have immediate negative financial consequences that disproportionately impact lower socioeconomic groups.² Without protections, income loss may become a significant barrier to compliance. In Toronto during the SARS outbreak in 2003, loss of income was one of the main reasons for noncompliance with quarantine measures.³ During a 2006 survey on attitudes around social distancing and quarantine measures conducted in Hong Kong, Singapore, Taiwan and the United States, 40-66% of respondents indicated they would be very worried about not getting paid for time away from work or losing their job or business.^{3,5} School closures may require parents to remain home or pay for childcare.⁴⁰ Individuals may also face expenses for healthcare and preventative measures, and as resources in quarantined areas become scarce, prices may increase, as has been recently reportedly occurring in Wuhan.¹¹ Measures such as income protection, sick leave, telecommuting and staggered shifts can reduce the economic impact of quarantine,⁴¹ as can provision of financial aid to people impacted by the disease.¹⁷ It is important to ensure access to affordable prevention and healthcare services as well as supplies to individuals and families being asked to suspend their personal liberties for the public good.

Businesses also experience predominantly negative economic impact as a result of quarantine; employee absences reduce productivity and social distancing measures reduce business exchanges. Which industries are hardest hit depends on the outbreak. For example, while the avian flu epidemic had a minimal impact on the global economy, it resulted in an index drop in the price of meat and poultry in China of more than RMB 40 billion.⁴²

The global macroeconomic impact of quarantine is harder to estimate. Formal quarantine and voluntary self-quarantine can depress tourism, travel and retail sales. The impact of SARS was estimated at USD 30-100 billion globally, with estimated decreases of 1% and 0.5% GDP in China and Southeast Asia respectively.⁴² Nonetheless, modelling of outbreak scenarios has found that while there are high direct and indirect costs associated with social distancing measures, these are generally far less than the costs of an uncontrolled epidemic, and in some instances such measures may be the most effective strategy for limiting disease spread.^{40,43} Timing has also been found to be an important factor for cost-effectiveness. If a quarantine measure is appropriate and effective for a given disease, the earlier it is implemented the more effective and potentially cost saving it may be.⁴³

Contact

If you have a direct request concerning the response to COVID-19, regarding a brief, tools, additional technical expertise or remote analysis, or should you like to be considered for the network of advisers, please contact the Social Science in Humanitarian Action Platform by emailing Olivia Tulloch (oliviattulloch@anthrologica.com) and Santiago Ripoll (s.ripoll@ids.ac.uk). Key Platform liaison points include: UNICEF (nnaqvi@unicef.org); WHO (faferom@who.int); IFRC (obretta.baggio@ifrc.org); and GOARN Research Social Science Group (nina.gobat@phc.ox.ac.uk).



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