

WITH UNCLAIMED Ebola victims on the streets of towns and villages in West Africa, orphans ostracised and abandoned and an ever-increasing death toll, it is inevitable that comparisons are made with past epidemics. Public statements from frustrated aid agencies and health officials on the current and potential impact of this epidemic are increasingly echoed by western political rhetoric, tinged with a xenophobic edge. In such a context, historical references, however misconstrued, are unsurprising, as age-old practices of mass isolation and quarantine, with all their medieval connotations, are given a 21st-century repackaging.

Quarantine never left the lexicon of available public health measures and it returned to the public eye during the SARS crisis of 2003. But such a controversial measure, the temporary isolation of suspected carriers of a disease, merits further analysis in terms of past practice, along with perceived and actual effectiveness.

In West Africa today there are many kinds of quarantine in place. Most drastic have been attempts at placing entire neighbourhoods and districts under lockdown. Given the media presence, Freetown and Monrovia, capitals of Sierra Leone and Liberia, respectively, have produced particularly vivid examples, although large rural areas, notably those abutting the borders around Guinea, have been equally dramatic. More broadly still, some airlines have suspended flights to the region, a trend that, if it continues, would resemble an international quarantine over affected West Africa. Beyond the impracticality of such measures, as well as the human and economic implications, there are numerous historical precedents that indicate why such actions may be counter-productive in containing Ebola.

### More harm than good

There is limited and far from definitive research on quarantine effectiveness and far too many other factors at play that are difficult to ascertain from the historical record. Yet while present understanding about the pathology and transmission of hostile pathogens is far advanced on centuries past, there are some basic conclusions that can be made. For example, it is fairly certain that isolating a healthy population alongside an unhealthy population risks causing more harm than good, especially when access to food, water and medical care is taken into account. For quarantine to be successful, it requires perfect compliance and transmission without symptoms. In the case of Ebola, the former is highly unlikely and the latter is simply not the case.

Easier to trace are the economic and social consequences of isolating large numbers of people in the interest of public health. Mass quarantine inevitably spreads mistrust and historically has been open to abuse. Such perceptions are amplified when seemingly healthy individuals are targeted or stigmatised, particularly when already marginalised or economically disadvantaged. Compounding a tricky equation in determining the public good is the experience of quarantine being periodically used as a convenient policing or political tool.

While the term quarantine originates from the time

# Gold, fire and gallows: quarantine in history

As the Ebola outbreak in West Africa continues its dreadful march, **Duncan McLean** looks at the 600-year-old practice of isolating individuals and communities in order to bring an end to epidemics and assesses the effectiveness of such measures.



Plague on their houses: 14th-century English engraving on the Black Death.

of the Black Death, the application of what amounted to quarantine laws has existed at least since the Plague of Justinian in the sixth century AD. Earlier still, the Old Testament and the writings of Hippocrates refer to measures aimed at avoiding contact with those who are ill, or with the potential to become so. This is an important question of semantics that needs clarification, particularly as isolation and quarantine are at times used interchangeably. Isolation refers to the medical seclusion of individuals already infected with a contagious disease, as opposed to restricting the movement of those who pose an unconfirmed risk.

Despite hazy explanations over the spread of disease, medical confinement of the ill had been established long before the second plague pandemic emerged in the Mediterranean in 1348. An obvious example is documented through the establishment of leprosaria, or leper colonies, around 19,000 of which are estimated to have existed in Europe by the 13th century. Long-term isolation of the 'unclean' was expected to reduce the risk of contagion, even if the nature of transmission was misunderstood. Indeed it was not until the 20th century that the infectious nature of Hansen's Disease (historic leprosy) was definitively established.

The great contribution of the Black Death as regards disease control was the formal, if frequently ad hoc, establishment of control measures in an attempt to limit exposure to infectious disease. So while many leprosaria were being transformed into lazarettos or pest houses for those dying of plague, broader preventative measures were introduced to limit the impact of the disease. The 'Italian model' of plague control, essentially the first health boards, subsequently replicated elsewhere in Europe, eventually came to deal with matters such as sanitation, destruction of clothing, fumigation and the collection and burial of corpses.

The modern understanding of quarantine dates from the actions of one of these preventative initiatives, that of the Rector of the Venetian colony of Ragusa (modern Dubrovnik) in 1377. All ships coming from suspected plague sites were required to anchor outside the port harbour for 30 days while awaiting clearance to dock. Later expanded to 40 days (*quaranta*), land travellers were also included. The basis of the duration is open to historical debate, possibly related to the Hippocratic precepts for the recovery or death from acute illness, or in reference to biblical events. Regardless, the dual objective was clear: protection of health along with safeguarding the network of trade on which the region's wealth depended.

Closely related to the development of quarantine was that of the *cordon sanitaire*. Protective lines would be established, often by armed guards, designed to keep an epidemic in or out of a specified area. An oft-repeated example of this practice was the voluntary isolation of the Derbyshire village of Eyam during a plague outbreak in late 17th-century England. External supplies were left at stone boundary points in exchange for disinfected coins. Eventually three quarters of its 350 inhabitants would perish. Plague did not spread to the surrounding district. More

ambitiously, the Habsburgs maintained an armed *cordon sanitaire* between Austria and the Ottoman Empire for a century up until 1871, an action which they credited for the absence of plague in their territory.

Whether in reference to those specific examples or more generally, it is notoriously difficult to evaluate preventative measures such as quarantine or a *cordon sanitaire* in restricting the spread of plague. Despite generally being based on the false hypothesis of 'pestilential air' being responsible for all communicable disease, miasmatic theory at least served to reduce airborne infections. However, ignorance about the role of either rats or fleas meant that the benefits of quarantine risked being incidental.

### Towards a turning point

Attempts at isolating plague victims and their families in homes until death or recovery, or barring entry and exit en masse, ran contrary to the ancient maxim of *Cito, Longe, Tarde* ('Leave quickly, go far away and come back slowly'), assuming one possessed the means. Consequently, it is unsurprising that draconian measures were necessary to enforce plague regulations, quarantine-related and otherwise. Essential tools in the arsenal included funds to pay administrative costs, fire to burn dubious goods and purify the atmosphere and gallows to maintain order: 'gold, fire, and gallows', as a Sicilian physician astutely summarised during an outbreak in 1576.

Given the choice of starving under isolation, the loss of all worldly possessions for fear of contamination, or condemnation to a near certain death in a pest house, resistance to plague regulations was inevitable. Initially, minorities were targeted as harbingers of disease, pogroms against Jews having been well documented. The risk of disorder and breakdown eventually turned towards the regulations themselves and the authorities who espoused them, at times more dangerous than the disease itself. More ominously still, without reasonable compliance with quarantine measures, attempts at evasion actually facilitated the spread of plague.

As the practice of quarantine spread, both in the Old World and New, a gamut of illnesses was added to the list of those surveyed. Typhus and smallpox were seen as threatening to the lucrative Slave Trade, especially after 17th-century epidemics occurred in Havana, Cartagena, Rio de Janeiro and Portobello. Smuggling and bribery increased as vessels attempted to circumvent quarantine regulations. Falsified bills of health were likewise prized as a means to avoid weeks at harbour in pestilential ships.

With racist constructs having determined yellow fever as a threat to white populations, quarantine became standard practice in cities and plantations of the western hemisphere, mirroring developments in Mediterranean and Atlantic Europe. In the US, repeated outbreaks of yellow fever led to federal quarantine legislation in 1878. The 'Yellow Jack' flag had long since become ubiquitous in port cities, notably those receiving seaborne traffic originating in the West Indies.

It was the waves of 19th-century cholera epidemics ►

## *The dual objective of quarantine was the protection of health along with safeguarding the network of trade*

that led to an increase in quarantine regulations. Transport technology was already reducing travel time, whether by land or by sea, facilitating the speed at which new pathogens could interact with susceptible hosts. As the administrative and bureaucratic branches of the state grew larger, recourse to quarantine was reinforced as a first line of defence. Perceptions of quarantine as a nuisance, open to abuse, gave way to calls for standardisation, a frequent subject of debate in international sanitary conferences scattered over the course of the century.

Politics was never far from the surface, a notable example being the quarantine debates around the opening of the Suez Canal in 1869. French and British prerogatives had more to do with securing regional hegemony than limiting the spread of infectious disease. The more subtle – and nefarious – side of quarantine regulations can be seen in an increase in police powers and suspension of personal liberties. If the French Revolution propagated ideas of individual rights, strict sanitary measures were a convenient tool unleashed on undesirables. Immigrants were frequently seen as a menace, although marginalised populations generally, be they beggars, prostitutes or the unwashed masses, were considered a threat to healthy urban populations.

A turning point in the application of quarantine came with the advent of germ theory in the late 19th and early 20th centuries. This did not remove population restrictions from public health initiatives but it did prompt greater nuance. Debate over quarantine efficacy by contagionists and anti-contagionists became irrelevant, at least as far as the mosquito or cholera bacillus was concerned, and individual patterns of disease propagation could be addressed separately. Lazarettos were transformed into health stations, not just symbolically but in practical terms, as the distinction between stages of illness became apparent.

By the time of the influenza pandemic of 1918-19 many of the old quarantine measures were considered outdated and eventual attempts at halting transmission came too late. The chaos that followed the First World War, with millions of troops and refugees returning home, provided ideal conditions for the spread of the virus. More striking was the resurgence of quarantine measures during the 2003 SARS crisis. Despite the evolution in transport technologies, or perhaps because of them, the traditional system of quarantining the potentially ill returned, along with the medical isolation of the sick. Punishment for breaking quarantine went so far as the death penalty in China, while familiar complaints of discrimination and stigmatisation were widespread.

In describing the experience of immigrants with infectious disease to the US, medical scholar Howard Markel writes that 'medical scapegoating may be transformed into a mentality of quarantine'. Not only is disease the enemy but so are the human beings that are potentially infected. While efforts understandably focus on halting an epidemic, this is often done at the neglect of those

with the most acute medical needs. This seems a particularly apt description of the current Ebola epidemic in West Africa. Medical needs are obviously not ignored entirely; the infection of at least 400 health workers provides depressing evidence of those most at risk (beyond family members of the victims themselves). But the broader emphasis has clearly been on halting the epidemic, even if such efforts are counter-productive.

### Stigmatisation and discrimination

Under such circumstances the concept of quarantine has returned to prominence. Yet if the measure has historic benefits – it has remained a pillar of disease control over 600 years – there is a dark side to it. Stigmatisation and discrimination accompany quarantine measures. And the greater the mistrust of the health authorities, the greater the chance individuals will evade quarantine and surveillance measures, inadvertently contributing to the spread of disease. Such suspicions manifested themselves most clearly with the murder of a health team in southern Guinea this September, accused of intentionally spreading Ebola. Though quarantine is intended to limit the breakdown of social order, the effect can be the opposite.

Aside from the ethical and social issues that accompany mass quarantines, repressive public health measures in the present outbreak are also a result of recent history. Both Liberia and Sierra Leone have many more soldiers than doctors, so a military response reflects the means available, however misguided. Meanwhile, animosity towards the Guinean government from communities where the epidemic originated certainly predates Ebola. Most telling is the need for governments to be seen to be responding irrespective of doubts about the effectiveness of quarantine: incurable diseases frequently provoke an overreaction, as it is often better to be seen to do something, even if that something is irrelevant or worse.

A similar conclusion can be drawn from the international response. Cancelling flights may reassure the public from afar but will hinder the response on the ground, weaken governments and slow delivery of aid. More worryingly, the urge to flee under such circumstances will make those infected more creative and correspondingly more difficult to track. Confusion, fear and hysteria, whether manifested locally, internationally or through the media, are the most difficult elements to overcome.

Quarantine is still with us. Given its checkered past, the assumption that the indiscriminate seclusion of healthy and sick individuals will be effective gives pause for thought. As three West African states teeter on the brink of economic and political collapse, controlling the epidemic will require more than token gestures while keeping the region quarantined at arms length.

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**Protection?**  
Rubber boots at a Médecins Sans Frontières medical centre, Monrovia, October 18th, 2014.

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