

## CHAPTER ONE

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### TRAVEL IN A SMALL WORLD

*SARS, globalization and public health laws*

Late in 2002 reports of a life-threatening atypical pneumonia of unknown cause emerged in Guangdong Province in southern China. This disease, which we now know as Severe Acute Respiratory Syndrome (SARS), became the subject of a global alert by the World Health Organization (WHO) in March 2003, as reports of cases came in from China, Hong Kong and Vietnam (WHO 2003a).

Facilitated by international air travel, the spread of SARS quickly became a global phenomenon. By the end of July 2003, WHO had confirmed 8,098 cases of SARS, with 774 deaths across 29 countries (WHO 2003b). Clusters of cases were reported in China, Hong Kong, Taiwan, Singapore, Vietnam and Toronto in Canada (Tsang et al. 2003; Lee et al. 2003; Pang et al. 2003; Poutanen et al. 2003; WHO 2003b; 2003c). In an effort to stem the spread of SARS, WHO issued travel advice for some of the most affected areas (WHO 2003c, 10).

As the crisis unfolded, various guidelines were issued in an effort to halt the spread of the disease (e.g. WHO 2003d). Images of face masks, reports of quarantine and the growing number of infections and deaths from around the globe all contributed to a growing sense of panic. Yet with a concerted international effort the spread of SARS was limited and eventually halted. On 5 July 2003, WHO announced that human-to-human transmission of SARS had been interrupted (WHO 2003e).

This chapter reviews the impact of the SARS crisis and evaluates its significance in terms of global responses to the challenges posed by infectious diseases. The chapter also considers the role of the *International Health Regulations* in providing a legal framework for responses to disease outbreaks. Finally, this chapter will consider whether the SARS crisis advanced global preparedness for the next pandemic.

## INFECTIOUS DISEASE IN THE GLOBAL VILLAGE

History provides us with some dramatic examples of the impact that a new infectious disease can have when it meets human populations with little or no immunity to the disease. In the Americas, Australia, Africa and the Pacific, indigenous populations were decimated in the years following the arrival of Europeans who brought with them germs and diseases such as smallpox, to which the local populations had no immunity (Diamond 1998, 210-4). Of course, European populations have not been immune to the ravages of infectious disease either. One-quarter of Europe's population was lost in the mid-fourteenth century to bubonic plague (id., 202), while the influenza epidemic at the end of the First World War killed an estimated twenty-one million people worldwide (ibid.). Furthermore, exposure to new tropical diseases, such as malaria and yellow fever, presented serious challenges to European attempts to colonize tropical areas (id., 214). Humanity has a long history, both in fighting infectious diseases and in searching for effective treatments or cures.<sup>1</sup>

Infectious diseases continue to reshape human society. Estimates from WHO indicate that in 2001 there were 14.7 million deaths caused by infectious diseases, a figure which accounted for 26 percent of total global mortality (Kindhauser 2003, 6). AIDS, tuberculosis and malaria combined accounted for 39 percent of deaths due to infectious diseases. These three diseases led to 5.6 million deaths in 2001. When the 5.8 million deaths from diarrhoeal disease and respiratory infections are also counted, five diseases caused 78 percent of the total infectious diseases burden (ibid.). Many of these diseases impact disproportionately on the world's poorest countries.

Seen in the context of these figures the SARS crisis may appear relatively unimportant. Yet SARS caught the world's attention precisely because of its potential to disrupt the populations and economies of the developed world, and can thus be seen in contrast to the diseases of the developing world:

Everywhere, in the papers and on the internet, were images of commuters in Asia wearing surgical masks and empty airplanes and marketplaces. These images speak volumes, for in parts of the world where tuberculosis and AIDS and malaria reap their grim harvest of 6 million lives a year, there are not many trains, airplanes, or even masks.  
(Farmer and Campos 2004, 247)

The significance of SARS is, also, its role as an indicator of the world's preparedness for the next global pandemic. Unlike other outbreaks of infectious disease that have eventually burned out, been geographically limited or susceptible to modern drugs or vaccines, the SARS epidemic was characterized by ready human-to-human transmission, the global spread of the disease (facilitated by international air travel), and the lack of any effective treatment or vaccine (Fidler 2004, 6). In this context then, "SARS posed a public health governance challenge the likes of which modern public health had not previously confronted" (ibid.).

New diseases continue to emerge while older diseases are increasingly resistant to the drugs used to treat them and threaten to reemerge as major health problems. In

the latter decades of the twentieth century “over 30 new diseases – including AIDS and Ebola haemorrhagic fever – were detected for the first time” (Kindhauser 2003, 56). In 2004-5 outbreaks of avian flu in Asia have caused international concern about the potential for a new influenza pandemic (Barclay and Zambon 2004). Seen against this backdrop, SARS has been described as “the first severe and readily transmissible new disease to emerge in the 21st century” (WHO 2003c, 1). In this sense SARS may yet prove to be a great leveler, reminding us of the limits of our knowledge and ability to control microbes, and providing an impetus to even greater research on infectious diseases.

International trade and travel have long been mechanisms for the spread of infectious disease. In the era of globalization, the increase in international trade and travel has created an explosion of “microbial traffic” (Frenk and Gómez-Dantés 2002, 95), which has the potential to disrupt human health and society. In this age of global integration, outbreaks of infectious disease in one country can spread rapidly to other countries and even countries with sophisticated health infrastructures are not immune. As a Canadian report noted, “SARS has illustrated that we are constantly a short flight away from serious epidemics” (National Advisory Committee on SARS and Public Health 2003, 10). Being able to respond to outbreaks of infectious disease and assisting in capacity building of other countries to enable them to detect and respond to infectious disease is not only a global responsibility but “also a matter of enlightened self-interest” (*ibid.*).

International travel was clearly one of the contributing factors in the spread of SARS. In the days before air travel, international travel often meant weeks or months at sea. An outbreak of an infectious disease on board generally resulted in the ship being quarantined on its arrival in port.<sup>2</sup> With international air travel the time needed for an infectious disease to spread from one country to another is only as long as a trip on an airplane (Frenk and Gómez-Dantés 2002, 95). When we combine this potential with the number of airline journeys each year,<sup>3</sup> the difficulties in containing the spread of infectious diseases within the global village become apparent. The modern context for infectious diseases is evident from a comparison between two diseases: “It took smallpox centuries just to cross the Atlantic; a few weeks after arriving in Hong Kong from Guangdong, SARS had already spread to 30 countries on five continents” (National Advisory Committee on SARS and Public Health 2003, 197).

#### IMPACT ON HEALTH SYSTEMS

SARS provided a dramatic reminder, not only of the ability of diseases to spread internationally, but also of the need for health systems to have the capacity to respond to emerging crises with flexibility and efficiency. For developing countries in particular, new infectious diseases can overwhelm already burdened public health systems.

The speed with which SARS spread, its infective nature and the seriousness of the disease meant that the health systems in those areas that experienced clusters of

cases were put under unusual strain (Cameron, Rainer and Smit 2003). This strain on health systems was exacerbated by the fact that in the early stages of the crisis many health workers themselves contracted the disease (*ibid.*; National Advisory Committee on SARS and Public Health 2003, 41; Pang et al. 2003, 3217). Health professionals were faced with the challenges of responding to increasing numbers of patients who were being struck down by a new mystery illness, as well as concern for colleagues who became ill and concern that their own families might become ill with the disease (Cameron 2003, 513; National Advisory Committee on SARS and Public Health 2003, 41).

In addition to striking health professionals, the SARS crisis also placed strain on other resources within the health infrastructure. Early symptoms of the disease are similar to those of other respiratory diseases, making early diagnosis difficult, which in turn placed further demands on health systems (National Advisory Committee on SARS and Public Health 2003, 1). Demand for surgical masks, gowns, gloves, thermometers and disinfectant all increased dramatically (Pang et al. 2003, 3217). In addition, in Beijing “76 new ambulances, 79 new radiograph machines, and 759 mechanical ventilators were acquired” and 123 fever clinics were set up at Beijing hospitals (*ibid.*).

The capacity to mobilize both health professionals and health resources rapidly in response to emerging health crises, whether from infectious disease or from other causes, is a vital element in the successful and rapid resolution of any health crisis. A report on Canadian responses to SARS indicated that the crisis “has reinforced the need for surge capacity” within the health system (National Advisory Committee on SARS and Public Health 2003, 102). The development of such capacity “is predicated on adequate professional resources, a depth of skill sets and overcoming jurisdictional legislative and regulatory barriers to allow, for instance, medical practitioners and health professionals to act outside their licensing jurisdiction in emergencies” (*ibid.*).

#### SARS AND THE GLOBAL ECONOMY

The SARS crisis highlighted both vulnerabilities and strengths in the global economy. The interaction of individuals, upon which so much domestic and international business depends, was reshaped at the height of the crisis. Within affected countries both official quarantine measures and general concern over the risk of infection served to limit the movement of people and impact upon domestic economies. SARS had the potential to impact on the global economy through declines in consumer demand, through reduced confidence “in the future of affected economies,” and through increased costs related to disease prevention (Lee and McKibbin 2003, 4).

In Beijing all public entertainment venues were closed on 26 April 2003. “By the time these places began opening again during the second week in June, 3500 public places had been closed” (Pang et al. 2003, 3219). Schools closed on 24 April with some not reopening until July (*ibid.*). The economic impact of such disruption is

substantial. According to a Canadian report on SARS, “Estimates based on volumes of business compared to usual seasonal activities suggest that tourism sustained a \$350 million loss, airport activity reduction cost \$220 million, and non-tourism retail sales were down by \$380 million” (National Advisory Committee on SARS and Public Health 2003, 211).

However, it was not only tourism and travel-related companies that suffered. Businesses from unaffected areas that traded with affected areas also suffered. As fear of SARS kept people at home in affected areas, restaurants, shops and other businesses saw a decline in their business, a decline which in some cases also impacted on their suppliers from other unaffected areas (Bradsher 2003). During 2003, the fragile structure of the global economy was revealed as the SARS crisis hit harder.

#### PUBLIC HEALTH LAWS

Governments in countries affected by SARS were faced with the need to respond quickly so as to limit the spread of the disease within their populations. The screening of airline passengers for signs of illness and stories of quarantine were the images that captured media attention. Even in unaffected countries, governments responded by ensuring that public health laws were adequate to meet the challenge of SARS. In Australia, which was relatively unaffected by SARS, the federal government made SARS a quarantinable disease,<sup>4</sup> while state governments also amended their public health legislation to ensure that SARS was covered.<sup>5</sup>

With the reemergence of quarantine as a control measure in affected areas, the SARS crisis highlighted the tensions that can exist between public health and private rights (Mitka 2003). The history of quarantine tells the story of these tensions. With SARS and other new infectious diseases, quarantine is again being considered as a potentially important public health tool and the ethical issues raised by such measures are also receiving attention (ibid.). Surveillance, contact tracing, and travel restrictions, as well as isolation and quarantine, were important public health tools in the efforts to control the SARS outbreak and these measures also have implications for the rights of individuals (Gostin, Bayer and Fairchild 2003; Singer et al. 2003).

Despite the common use of these tools in SARS-affected countries, it is important to remember that “public health measures are embedded in broader sociopolitical contexts” of individual countries and reflect differing conceptions of the balance between the rights of individuals and governments (Gostin, Bayer and Fairchild 2003, 3231). While germs may not recognize borders, passports are, as Fidler (2004, 17) reminds us, “political phenomena,” and “The politics of passports drive how human societies respond to the threats germs pose.”

The SARS crisis of 2003 provides us then with an opportunity not only to reflect upon the efficacy of health measures and their success in limiting the spread of the disease, but also to reflect upon the legal and ethical issues that arise in the implementation of public health measures both domestically and in terms of their interface with the international community. Of course, in many respects it is easy to

reflect upon these measures after the crisis has passed. There is, after all, perfect vision in hindsight. Yet, precisely because public health measures reflect the interface between the powers and duties of states and individuals (Gostin 2000), the manner in which public health measures are applied will make important statements about the value of individual rights within the community (Gostin, Bayer and Fairchild 2003).

Effective public health laws support the social structures and public policies that facilitate good health (Reynolds 1995, 1-2). Indeed law and the legal process have been described as “the inseparable companion of the public health process” (Reynolds 2004, 3). Effective public health laws also need to be able to respond to public health crises. In the wake of SARS and with heightened concerns over public health and national security, debates over public health and the relationship between individual rights and community interests have reemerged. While public health laws have traditionally reflected the tensions between public health and the liberty of individuals, during the latter part of the twentieth century these debates were recast and human rights and public health came to be seen as harmonious rather than in conflict (Childress and Bernheim 2003, 1196). As we reconsider the efficacy of our public health laws in the face of new twenty-first century challenges, we will also need to make key decisions about the nature of public health and the relationship between health and human rights (Gostin, Bayer and Fairchild 2003; Childress and Bernheim 2003).

#### GLOBAL PUBLIC HEALTH RESPONSES

The SARS story is one of both the successes and the failures of international public health. It is a story of international co-operation and collaborative scientific effort in the face of a major new global health challenge. However, it is also a story of the failure of existing international public health laws to respond adequately to the challenges posed by new infectious diseases such as SARS.

The potential for epidemics of infectious disease, the need for rapid and effective public health responses and the potential for disease outbreaks to have a serious impact on the economies of affected areas all lie at the heart of the challenge of developing effective global responses. Along with the globalization of public health (Yach and Bettcher 1998a; 1998b), we need the globalization of public health laws (Fidler 2002). It is in the interest of all members of the international community to ensure that our global networks and regulations are adequate to respond to emerging crises.

The speed of modern air travel adds a new dimension to the association between trade, travel and disease by allowing disease to spread more rapidly and more widely than was previously possible. This global nature of modern infectious disease has required global responses. In 2000, the World Health Organization brought together 112 existing networks into the Global Outbreak Alert and Response Network (GOARN) to maintain surveillance over infectious disease outbreaks (WHO 2003c, 4). GOARN has developed *Guiding Principles for International Outbreak Alert and*

*Response*, which operate with the aim of improving international co-ordination to support local efforts by partners in GOARN.<sup>6</sup> “From January 1998 through March 2002, WHO and its partners investigated 538 outbreaks of international concern in 132 countries” (WHO 2003c, 4). In addition, WHO has used the Global Public Health Intelligence Network (GPHIN) since 1997. GPHIN is a computer application which searches Internet sites for reports of disease (id., 4). There are significant benefits associated with GPHIN as it not only provides an early alert system for outbreaks of disease, but “also allows WHO to step in quickly to refute unsubstantiated rumors before they have a chance to cause social and economic disruption” (id., 5).

In response to the SARS outbreak, WHO sent teams of experts and equipment to countries requesting assistance. At the same time, based on the model of its influenza network, WHO established a virtual network of eleven leading laboratories through a shared website and teleconferences to work on identification of the cause of SARS and a reliable diagnostic test (WHO 2003c, 5). In the case of SARS, international scientific efforts led to the speedy identification of a coronavirus as the cause of SARS (Ksiazek et al. 2003; Drosten et al. 2003; Holmes 2003). Coronaviruses are not new to humans. Indeed up to 30 percent of human colds are caused by coronaviruses (Holmes 2003, 1949). However, it would appear that the coronavirus associated with SARS is new to humans. It probably came from a non-human host and developed the ability to infect humans (id., 1950). The link between diseases in animals and diseases in humans is not new. Many diseases that affect humans have evolved from diseases affecting animals or birds (Diamond 1998, ch 11). SARS is simply a recent example of this.

WHO also played an important role in the SARS crisis by issuing travel advisories for affected areas. The move to issue travel advisories was an important change for WHO since previously travel advisories had only been issued by individual countries (National Advisory Committee on SARS and Public Health 2003, 202; Fidler 2004, 137). Noting that “the effects of the travel advisories have been profound on the economies of targeted countries” (ibid.), a Canadian report on SARS concluded that “If WHO is to continue issuing advisories, clear criteria and a process for notice must be developed by agreement among member states” (id., 203).

The speed with which the international scientific community responded to the emergence of SARS indicates that globalization of the knowledge and information economies can provide positive outcomes for public health. Modern telecommunications, the use of the Internet, videoconferencing, webcasts and the international media all played important roles in disseminating information both to the scientific community and the general public and facilitated international scientific collaboration that led to rapid responses and collaborative research (Gerberding 2003; Drazen and Champion 2003). In 2003 WHO noted that “For continued progress against SARS, it is essential that we nurture the spirit of the unprecedented, global collaboration that rapidly discovered the novel virus and sequenced its genome” (WHO 2003f).<sup>7</sup>

## THE INTERNATIONAL HEALTH REGULATIONS

The *International Health Regulations* (IHR) (WHO 1983) provide a framework for international public health law. In 1851 the first International Sanitary Conference was held in Paris following epidemics of cholera in Europe between 1830 and 1847. Between 1851 and the end of the nineteenth century there were ten conferences and eight conventions addressing the international spread of infectious diseases (WHO 2002, 1). Most of these international sanitary conventions did not come into effect, although conventions dealing with cholera and plague were adopted in 1892 and 1897 respectively (ibid.). In 1902, the International Sanitary Bureau was established and L'Office International d'Hygiène Publique was established in 1907 with a permanent secretariat in Paris (id., 2). The *International Sanitary Regulations* were adopted by WHO Member States in 1951. The Regulations were renamed the *International Health Regulations* in 1969 and, with modifications in 1973 and 1981, have been in force since (ibid.).

The Foreword to the IHR states that their purpose “is to ensure the maximum security against the international spread of diseases with a minimum interference with world traffic” (WHO 1983). Under the current IHR, WHO Member States are required to notify WHO of cases of yellow fever, plague and cholera. The IHR also set out requirements for health and vaccination certificates for travelers from infected to non-infected areas as well as health measures to be taken in relation to ships and aircraft and at ports and airports. The IHR set out the maximum measures that may be taken by WHO Member States during outbreaks of cholera, yellow fever and plague. In setting out the maximum measures that can be taken, the IHR provide a “template” for protective measures to ensure that other countries do not over-react and impose measures which are beyond those necessary from a public health perspective (WHO 2002, 3).

Unfortunately, the IHR have limited effectiveness. The current IHR rest on “an optimistic philosophy that infections can be stopped at borders by regulation of travellers, aircraft, and cargoes” (Nicoll et al. 2005, 322). The IHR focus on the spread of infectious diseases and do not address the prevention and control of infectious diseases by a state within its own borders (ibid; Fidler 2004, 33). Furthermore, since they only apply to three diseases – cholera, plague and yellow fever – the IHR do not apply to other infectious diseases that may also have serious implications for international public health. “Thus, the only international agreement on infectious diseases binding on WHO member states has been irrelevant to the SARS outbreak” (Fidler 2003a). Yet the current IHR have other shortcomings as well: they are dependent on affected countries making official notifications to WHO of cases of disease; there are few mechanisms in the IHR to foster collaboration between WHO and countries affected by diseases with the potential to spread internationally; the IHR lack mechanisms to encourage compliance by Member States; and WHO does not have the power to proscribe measures which will limit the international spread of disease (WHO 2002, 3).



Even before the outbreak of SARS, WHO had begun the process of revising the IHR. At its 56<sup>th</sup> annual meeting in 2003 the World Health Assembly adopted a resolution on the revision of the International Health Regulations in which the Assembly urged Member States *inter alia* “to give high priority to the work on the revision of the International Health Regulations and to provide resources and cooperation necessary to facilitate the progress of such work.”<sup>8</sup> At the same meeting, the World Health Assembly adopted a resolution on SARS, which acknowledged, *inter alia*, “that the control of SARS requires intensive regional and global collaboration, effective strategies and additional resources at local, national, regional and international levels.”<sup>9</sup> The Resolution urged Member States *inter alia*

to commit fully to controlling SARS and other emerging and re-emerging infectious diseases, through political leadership, the provision of adequate resources, including through international cooperation, intensified multisectoral collaboration and public information.<sup>10</sup>

In May 2005 the World Health Assembly approved new *International Health Regulations*. These Regulations will come into force in 2007, two years after the date they were approved by the Assembly. Under the new *International Health Regulations*, Member States are required to assess public health events within their territory using an algorithm contained in the IHR. A Member State is required to notify WHO “of all events which may constitute a public health emergency of international concern within its territory” (Article 6(1)). Cases of certain listed diseases, including SARS and smallpox, must be notified to WHO. Other events must be assessed in terms of the seriousness of their public health impact, whether the event is unusual or unexpected, whether there is a significant risk of international spread, and whether there is a significant risk of international trade or travel restrictions.

The requirement under the revised IHR for notification of a “public health emergency of international concern” is an important development towards a new, more relevant IHR. The experience with SARS is also perhaps cause for cautious optimism. Although the IHR did not require countries to notify WHO of cases of SARS, “virtually all countries afflicted by SARS notified WHO of cases rapidly, continuously, and transparently” (Fidler 2004, 133).

Significant challenges remain. The huge disparities in health and health infrastructure that exist between countries continue to undermine the ability of countries to respond rapidly and effectively to outbreaks of infectious disease. In this sense then, the revised IHR must be simply a first step in a “process of health norm internalization and capacity building, bridging the gap between international goals and real-world public health preparedness” (Gostin 2004, 2627).

## CONCLUSION

The SARS crisis of 2003 provided the international community with a wake-up call on the speed with which new infectious diseases can emerge, spread rapidly and

develop into international public health crises. With the crisis having passed there is now the opportunity to reflect upon both domestic and international public health laws and to assess their adequacy for future health emergencies. The revision of the IHR and their new focus on public health emergencies of international concern is an important move away from specific diseases and towards a more flexible and responsive regulatory framework for infectious diseases. Yet this is only a small step towards global preparedness. Reducing the global burden of infectious diseases, particularly in developing countries, focusing on building public health infrastructure and capacity, and strengthening the frameworks for scientific collaboration and public health research are also vital steps towards an effective global response. Globalization does lead to an increased sharing of health risks in relation to infectious diseases. Only time will tell whether our domestic and international public health measures and public health laws will be adequate to respond to the next global health emergency in ways that are both effective and able to strike a balance between individual and community interests.

#### NOTES

*An earlier version of this paper was presented at the 28<sup>th</sup> International Congress on Law and Mental Health in Sydney, Australia (2003). I am grateful to the conference participants for their comments and suggestions.*

1. See for example, Edward Marriott's (2002) history of the search for the cause of plague and Fiammetta Rocco's (2003) history of quinine.
2. On the history of quarantine, see Fidler (2004, 27-9).
3. "According to World Tourism Organization data, approximately 715 million international tourist arrivals were registered at borders in 2002 (preliminary data)" (National Advisory Committee on SARS and Public Health 2003, 16).
4. *Quarantine Amendment Proclamation 2003 (No 1)* (Cth).
5. See e.g. *Public Health Amendment (Severe Acute Respiratory Syndrome) Regulation 2003* (NSW).
6. World Health Organization, Global Outbreak Alert & Response Network, available at: <<http://www.who.int/csr/outbreaknetwork/en/>> (Last accessed: 24 January 2005).
7. For discussion of patenting and SARS see Rimmer (2004).
8. World Health Assembly, Resolution 56.28, para 3(1). Available at: <[http://www.who.int/gb/ebwha/pdf\\_files/WHA56/ea56r28.pdf](http://www.who.int/gb/ebwha/pdf_files/WHA56/ea56r28.pdf)> (Last accessed: 4 May 2005).
9. World Health Assembly, Resolution 56.29, preamble. Available at: <[http://www.who.int/gb/ebwha/pdf\\_files/WHA56/ea56r29.pdf](http://www.who.int/gb/ebwha/pdf_files/WHA56/ea56r29.pdf)> (Last accessed: 4 May 2005).
10. *Id.*, para 1(1). For further discussion of this Resolution, see Fidler (2003b).

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