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# Is Pandemic Flu a Security Threat?

**Christian Enemark**

Most infectious diseases do not attract heightened political attention because their effects are mild, they are familiar to physicians, or their geographic occurrence is limited. A particular disease might be deemed a security issue, however, when its effects impose or threaten to impose an intolerable burden on society. That burden can be measured in terms of morbidity and mortality, but also in terms of the way in which a disease is perceived by those who fear infection. The disease described by the World Health Organisation (WHO) as 'the most feared security threat' today is pandemic influenza.<sup>1</sup> The next pandemic could cause illness and death on a large scale, over a wide area, in a short space of time. Such a prospect arguably sets this disease apart from the many others that may be regarded simply as health issues, and some Western governments have started to frame pandemic influenza as a threat to national security. According to the US pandemic plan, a 'necessary enabler of pandemic preparedness' is that this be viewed 'as a national security issue'.<sup>2</sup> The 'National Security Strategy of the United Kingdom' assesses an influenza pandemic as the 'highest risk' civil emergency.<sup>3</sup> And under the Australian pandemic plan, which emphasises 'maintenance of social functioning',<sup>4</sup> Australians are to receive the best possible health care 'commensurate with the maintenance of a safe and secure society'.<sup>5</sup>

Historical experience indicates that the world is overdue for an influenza pandemic, and a virus with pandemic potential – H5N1 avian influenza,

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which emerged in late 2003 – is still out of control. Past pandemics were all the more damaging because they took the world by surprise; however, the stakes are still high in the twenty-first century because increased human interconnectedness facilitates the global spread of disease. In the first identifiable pre-pandemic phase of human history, it makes sense to be thinking seriously about how best to prepare and respond. Yet as some governments move to prioritise this health issue by framing it in security terms, two risks emerge: firstly, that emergency responses implemented at the domestic level might do more harm than good; and secondly, that placing too great an emphasis on the health and security interests of individual states might detract from the need for long-term international cooperation on resisting pandemic influenza.

### **A pandemic in waiting?**

The avian influenza virus known as H5N1 first appeared in Hong Kong chicken farms in 1997 and killed six out of 18 people infected when the virus jumped species. Although the properties of the virus were not well known at the time, the killing of all poultry in Hong Kong's markets and farms was a precaution that may well have averted a larger human outbreak of the disease. Thereafter, H5N1 was largely forgotten, but did not disappear. On 12 December 2003 South Korea's chief veterinary officer advised the World Organisation for Animal Health that a large number of chickens on a farm near Seoul had suddenly died of avian influenza. By early January 2004, reports were emerging of a 'mysterious disease' that had killed thousands of chickens in southern Vietnam.<sup>6</sup> In the months that followed, the influenza virus (by then identified as H5N1) swept through Asia, forcing authorities to cull tens of millions of domestic poultry. After the virus infected wild, migratory birds at Qinghai Lake in central China in mid 2005, it rapidly spread westward into Europe, India, the Middle East and Africa. By the end of 2008, H5N1 outbreaks in birds had occurred in 48 countries.<sup>7</sup>

The significance to human health of this avian-influenza strain lies in its potential to mutate into a form capable of sustained person-to-person transmission. H5N1 has repeatedly managed to infect humans, and every instance of this is a potential mutation opportunity. By late 2008 there had

been 387 confirmed cases of human H5N1 infection across 15 countries since late 2003, including 245 deaths, for a global average case-fatality rate of around 63%.<sup>8</sup> To date, disease in humans has been caused by close contact with infected birds. In May 2006, however, a cluster of six deaths from H5N1 infection within one Indonesian family prompted an urgent WHO investigation, and a subsequent statistical study indicated that human-to-human disease transmission had probably occurred.<sup>9</sup> The world is presently at Phase 3 (of six phases) of the WHO pandemic-alert scheme: there are human infections with a new influenza subtype, but no confirmed human-to-human spread. The overarching public-health goals at this point are to ensure rapid characterisation of the new virus, and early detection and notification of and response to additional cases of human infection. Phase 6 would be the influenza pandemic itself: increased and sustained human-to-human transmission in the general population. The overarching public-health goal at that stage would be to minimise the impact of the pandemic.<sup>10</sup>

The worst pandemic of the twentieth century was the 1918 'Spanish Flu', which the WHO estimates killed 40–50 million people worldwide.<sup>11</sup> Subsequent pandemics in 1957 and 1968 were much less deadly, causing two million and one million deaths respectively.<sup>12</sup> The conservative estimate of the WHO, using epidemiological modelling based on 1957 data, is that a future influenza pandemic would cause 2–7.4m deaths worldwide.<sup>13</sup> However, another estimate based on 1918–20 data has predicted 62m deaths.<sup>14</sup> Concern about the severity of the next pandemic deepened after evidence emerged in 2005 that the Spanish Flu was caused by an avian influenza virus (H1N1) which, like H5N1, adapted to infect humans.<sup>15</sup>

The US government's 'Community Strategy for Pandemic Influenza Mitigation' designates five categories of pandemic influenza. All categories assume an illness rate among the total US population (around 300m) of 20–40%, with the mildest (Category 1) compared to seasonal influenza. This category has a case-fatality rate of less than 0.1%. A Category 2 pandemic would resemble the 1957 and 1968 influenza pandemics with a case-fatality rate of 0.1–0.5%. The worst-case scenario, a Category 5 pandemic comparable to the 1918 Spanish Flu, would have a case-fatality rate of 2%. Projected numbers of US deaths (less than 90,000 for Category 1 and over 1.8m for

Category 5) are based on the assumption of an unmitigated pandemic without intervention.<sup>16</sup> Based on this scheme, all things being equal, the predicted likelihood of any individual dying of an influenza infection during a pandemic would be 0.02–0.8%. This low risk of dying would presumably be reduced further by effective disease-control interventions.

The above figures indicate that an influenza virus in pandemic form would not generate case-fatality rates anywhere near as high as have been seen with bird-to-human H5N1 infections. Beyond mortality predictions, however, the health damage from pandemic influenza would be manifested more broadly in widespread non-fatal illness and general concern about infection. The WHO anticipates illness affecting around 25% of the world's population, or more than 1.5 billion people.<sup>17</sup> The essence of the global public-health challenge posed by pandemic influenza would thus be scarcity of resources. As the pandemic caused waves of outbreaks in humans lasting 1–2 months in a given region, completing its global spread in 8–12 months or less,<sup>18</sup> there would be a large number of sick people over a large geographical area, all requiring care during a short time period. The human and material resources for health care, which are usually stretched even in ordinary times, would be rapidly overwhelmed. In the event of a pandemic, the vast majority of those who fell ill would be able to recover with little

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*An influenza pandemic would cause immense economic disruption*

or no medical assistance, but many others, seriously affected, would require prolonged hospitalisation, extensive drug treatment and sustained attention from well-trained medical professionals to survive.<sup>19</sup>

Alongside high levels of illness and death, an influenza pandemic would cause immense economic disruption. An Australian study has estimated that a mild pandemic would result in 1.4m deaths and cost the global economy \$330bn in lost economic output.

The worst-case scenario was 142m dead and a loss to the global economy of \$4.4 trillion.<sup>20</sup> Still, as grave as the health and economic consequences of a pandemic could be, there is reason to consider whether this threat can and should be framed in the politically supercharged language of 'security'.

### **Pandemic influenza and national security**

The idea of linking health and security concerns as a matter of academic analysis and public policy has received support from two directions. In one camp, members of the public-health sector have adopted the language of security as a means of rallying political support and financial resources to address neglected health issues. For example, since the publication of the 1994 UN Human Development report, the notion of 'human security' has included 'health security'.<sup>21</sup> And the World Health Report of 2007 advocated the pursuit of 'global public health security', defined as 'the activities required, both proactive and reactive, to minimize vulnerability to acute public health events that endanger the collective health of populations living across geographical regions and international boundaries'.<sup>22</sup> Meanwhile, there are those within the security sector who argue that the impact of particular health challenges is serious enough to warrant the prioritisation traditionally accorded to the use of armed force. Infectious diseases have long been highly relevant to military operations. In April 2003, for example, when Canada's health minister suggested that Canadian Forces medical staff could help relieve pressure on Toronto hospitals then treating patients with severe acute respiratory syndrome (SARS), the military replied that the removal of such vital personnel would delay a major deployment to Afghanistan.<sup>23</sup> Another traditional dimension of military concern with infectious diseases is outbreaks resulting from human agency, and there is an abundance of literature on state and non-state interest in biological weapons.<sup>24</sup>

The most conspicuous issue in contemporary academic and policy literature linking infectious diseases to security is HIV/AIDS. The passage in 2000 of UN Security Council Resolution 1308 was the first time a health issue had been officially framed as an international security concern. The resolution expressed particular concern about the potential adverse effects of HIV/AIDS on UN peacekeeping missions, but it also stressed more generally that this disease, 'if unchecked, may pose a risk to stability and security'.<sup>25</sup> Analysis of HIV/AIDS by international-relations scholars typically spans a range of issues, from how the disease is undermining military capacity to how it is impoverishing millions and destroying social structures vital to

internal state security.<sup>26</sup> Such arguments have been embraced in government circles as well. For example, HIV/AIDS featured prominently in an influential US National Intelligence Council report on the implications for the United States of global infectious-disease threats.<sup>27</sup> Other, more recent academic analysis of the links between health and security includes the work of Mely Caballero-Anthony on SARS, and Sara Davies and Alexander Kelle on international health governance.<sup>28</sup> With regard to pandemic influenza specifically, however, there have been few thoroughgoing attempts at analysing this disease in security terms.<sup>29</sup>

A case for framing pandemic influenza as a security issue can be made with reference to the potential societal consequences and likely perceptions of this threat to human health. In addition to the effects of human and economic losses, the two key elements in the security equation are speed and dread. With respect to the former, the widespread damage caused by a pandemic would seem all the worse because it happened so quickly. On this point, it is worth considering why it is that military threats are traditionally accorded the highest priority among national concerns. For Barry Buzan, the answer lies in the swiftness with which the use of armed force can inflict major undesired changes. 'Military action', he writes, 'can wreck the work of centuries in all other sectors. Difficult accomplishments in politics, art,

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governments*

industry, culture and all human activities can be undone by the use of force.'<sup>30</sup> More generally, for Richard Ullman, the essence of a security threat is 'an action or sequence of events that ... threatens drastically and over a relatively brief span of time to degrade the quality of life for the inhabitants of a state'.<sup>31</sup> Ole Waever defines a security problem as something that can, in a particularly rapid or dramatic fashion, undercut the political order within a state, deprive it of the capacity to manage by itself, and thereby 'alter the premises for all other questions'.<sup>32</sup> Just

as states fear military conflict because so many national achievements could be quickly undone, so too an influenza pandemic would set back hard-won economic gains and potentially undermine trust in government. And like the all-consuming effort of prosecuting a war, defeating the flu would

become a first-order issue for governments. This argument is reflected, for example, in the US pandemic plan which includes the statement: 'In terms of its scope, the impact of a severe pandemic may be more comparable to that of war or a widespread economic crisis than a hurricane, earthquake, or act of terrorism'.<sup>33</sup>

Related to the speed of an influenza pandemic is the dread it would instil as it raised both the individual fear of infection and the collective fear of contagion. Such dread could compromise the day-to-day human interactions which sustain modern societies: civilised humankind functions and survives largely because people have contact with and depend upon one another. The US government has warned that

absenteeism across multiple sectors related to personal illness, illness in family members, fear of contagion, or public health measures to limit contact with others could threaten the functioning of critical infrastructure, the movement of goods and services, and operation of institutions such as schools and universities. A pandemic would thus have significant implications for the economy, national security, and the basic functioning of society.<sup>34</sup>

A pandemic-influenza virus would produce symptoms unfamiliar to most people, and the anxiety this generated would likely be compounded by the inability of medical professionals to provide adequate treatment. By inspiring dread, pandemic influenza is arguably likely to generate a level of societal disruption disproportionate to the health burden it poses. All things being equal, any given individual is extremely unlikely to succumb to pandemic influenza, yet the gap between real and perceived risk is likely to remain as a foundation for framing the threat as a security issue. Paul Slovic and his co-authors, writing in 1980 about risk perceptions, observed that '[society] appears to react more strongly to infrequent large losses of life than to frequent small losses'.<sup>35</sup> They identified 'dread' as a 'higher-order' characteristic of risk which, they argued, correlated closely with a strong societal desire for risk reduction.<sup>36</sup> The 2002 World Health Report referred to these findings and acknowledged, 'the higher the dread

factor levels and the higher the perceived unknown risks, the more people want action to reduce these risks, including through stricter government regulation and legislative controls'.<sup>37</sup> Fear is disproportionately evoked by certain characteristics of threats, including involuntary exposure, unfamiliarity, and invisibility,<sup>38</sup> and a pandemic-influenza virus would exhibit all of these.

Historical experience suggests strongly that the speed and dread of pandemic influenza would indeed endanger internal state security. When a fast-spreading and unfamiliar disease inspires fear within national populations, the social contract under which citizens rely on governments to protect them during times of crisis is subjected to severe pressure. The SARS outbreak of 2003 provided a glimpse of this phenomenon when, in parts of China, there were riots caused by rumours of government plans to establish local SARS-patient isolation wards.<sup>39</sup> In 1994 an epidemic of plague in the Indian city of Surat engendered such terror that a quarter of the population fled within four days. This exodus, as Peter Chalk observed, 'fuelled an unprecedented level of anxiety across India, with fear and ignorance combining to freeze out even basic inter-personal sentiments of caring and civility ... So great was this national hysteria that the Delhi government was forced to bring in a police Rapid Reaction Force to effectively quarantine Surat.'<sup>40</sup> Such incidents demonstrate the panic caused when populations imagine a disease out of control, and where governments are seemingly incapable of securing the safety of their citizens.

Although it is impossible to predict precisely how the public would behave in response to the next influenza pandemic, it is clear that some governments expect severe social disruption as national health systems come under unprecedented pressure. In the United Kingdom, for example, contingency plans for a pandemic include posting police at doctors' surgeries and health clinics to stop panicking crowds from stealing medication.<sup>41</sup> And in the United States, the Department of Defense (DoD) plan for pandemic influenza includes the provision: 'When directed by the President, DoD will provide support to civil authorities in the event of a civil disturbance'.<sup>42</sup> It is anticipated that 'breakdowns in public order' might occur

as health care facilities are overwhelmed with those seeking care and treatment for themselves or family members; as persons vie for limited doses of vaccines and antiviral medications; as supply-chain disruptions cause shortages in basic necessities; as individuals attempt to leave areas where outbreaks have occurred or where containment measures are in place.<sup>43</sup>

Such extraordinary use of military force in a domestic context is but one reflection of how a government might perceive pandemic influenza as having national-security significance, although such action also carries the risk of generating unintended adverse consequences. It is conceivable, for example, that the sight of troops on the street might exacerbate rather than assuage popular anxiety. More generally, the risk of approaching pandemic influenza as a security issue is that this could lead to emergency responses which are ineffective, counterproductive or unjust.

### **Risks of the national-security approach**

As infectious diseases have made their way gradually onto the national-security agendas of governments in such places as the United States, the United Kingdom and Australia, some scholars have warned against the downsides of such a move. Susan Peterson, for example, has argued that public-health advocates might generate unwanted effects by appealing to the 'high politics' of security because this implies that 'human health is less important than, and can be justified only in terms of its impact on, security'.<sup>44</sup> Rebecca Katz and Daniel Singer observe that, while health professionals may welcome the higher profile and greater resources, approaching a health issue in security terms 'may ... put relatively greater emphasis on the views of those outside the health community and potentially alter the approach to solving the problem'.<sup>45</sup> And Colin McInnes and Kelley Lee find it ironic that some public-health officials have emphasised the security implications of infectious diseases as a means of pushing health higher on policy agendas because this has resulted in 'increased concern, not for shifting patterns of health and disease of world populations as a whole, but for selected infections that potentially threaten the privileged few'.<sup>46</sup>

In a seminal paper published in 2006, Stefan Elbe considered the ethical implications of ‘securitising’ a specific disease: HIV/AIDS.<sup>47</sup> Elbe acknowledged that linking HIV/AIDS to security ‘could accrue vital economic, social, and political benefits for millions of affected people by raising awareness of the pandemic’s debilitating global consequences and by bolstering resources for international AIDS initiatives’.<sup>48</sup> An example might be the US President’s Emergency Plan for AIDS Relief (PEPFAR). The original plan (announced in 2003) allocated \$15bn over five years for HIV/AIDS treatment, prevention and care, and the recent 5-year PEPFAR renewal brings an additional \$48bn.<sup>49</sup> At the same time, Elbe warned of the risk that ‘framing the issue as a security issue pushes responses to the disease away from civil society toward the much less transparent workings of military and intelligence organizations, which also possess the power to override human rights and civil liberties – including those of persons living with HIV/AIDS’.<sup>50</sup>

Elbe’s observations on the difficulty of reconciling health and security interests are relevant to pandemic influenza. Elevating pandemic influenza to the security agenda may serve to attract priority political attention, a higher level of resource allocation for public health, and the implementation of emergency-response measures. Given the scale and nature of the threat in question, these benefits should not be lightly dismissed. Nevertheless, it is incumbent on those within and outside government who would frame a pandemic in security terms to acknowledge the risks that accompany such a move.

### *Domestic responses*

From a technical standpoint, pandemic influenza is fundamentally an issue of human health, and employing the tools of medicine and public health would be the most useful mode of response. The methods and institutions of ‘security’ are not necessarily compatible with these tools. Katz and Singer have observed that ‘characterizing a health issue as a security threat often results in it being addressed through programmes and policies developed for law enforcement rather than public health’.<sup>51</sup> This could, for example, distort public-health ethics. Many interventions intended to stop the spread of disease – compulsory isolation, enforced quarantine, and restrictions on

travel – could infringe individuals' civil and political rights. On the other hand, it could be sensible to impose some restrictions on the freedom of individuals in the interests of avoiding or mitigating what could be a disaster for many. Human rights are not absolute: international human-rights law has long recognised that 'public health may be invoked as a ground for limiting certain rights in order to allow a state to take measures dealing with a serious threat to the health of the population'.<sup>52</sup>

The legitimacy of restrictions invoked for public-health purposes, which may also be framed in security terms, need to be measured according to the latest and best-available scientific findings. However, historical experience indicates that populations can react to a disease outbreak without regard to science, and governments can respond in a manner contrary to public-health principles. During India's experience with bubonic plague from 1896 to 1914, the intrusion of British colonial authorities into the domain of private life was both aggressive and unprecedented. It involved entering homes, meddling with caste and religious practices, and regulating disposal of the dead. The effect of such intervention was often to intensify and quicken the panic occasioned by the disease itself. This in turn provoked fierce resistance, riots, mob attacks on Europeans, and even the assassination of British officials.<sup>53</sup> Admittedly, these efforts to formulate an effective plague policy were hindered by general ignorance about the causes and transmission modes of the disease as well as possible methods of treatment. Today, by contrast, a lot more is known about the microorganisms that cause infectious diseases, so popular fears may be lessened by the knowledge that effective medical treatment is available. Nevertheless, the emergence of diseases hitherto unknown to science has seen people and governments reverting to reactions based more on fear than evidence. Regarding state responses to HIV/AIDS, Elbe has observed periods of great insensitivity involving people living with HIV being 'ostracized and even persecuted by some states for their illness'.<sup>54</sup> He argues that framing the disease as a national-security threat 'risks fuelling such exclusionary and dehumanizing responses and could

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*The effect of intervention was often to intensify the panic*

serve as an implicit legitimization of any harsh or unjust “emergency” policies that states may adopt in relation to persons living with the virus’.<sup>55</sup> Elbe’s observations on HIV/AIDS are a warning that security-oriented, emergency measures to address infectious-disease threats must not in themselves curtail human rights to the point that such measures become illegitimate and counterproductive.

However, specific policy lessons learned from the experience of responding to HIV/AIDS are not readily applicable to pandemic influenza. This is because the two diseases have very different effects. HIV is hard to transmit and incubates within the body for a long period. Moreover, there is no vaccine available. By contrast, a pandemic-influenza virus transmits easily, has a very short incubation period, and can be protected against through vaccination. These differences generate unique response challenges. Responses to an influenza pandemic, once underway, generally fall into two categories: pharmaceutical (vaccines and antiviral drugs) and non-pharmaceutical (infection control and social distancing). The implementation of these responses may involve suspending or curtailing individuals’ human rights, and the scarcity of resources is likely to require the prioritisation of medical benefits for some people over others. Arguably, the overall aim of promoting the greater good of society by way of public-health intervention justifies such violations and inequities when disaster would otherwise result. The important task is then to limit appropriately the occasions on which seemingly draconian public-health measures are invoked in the name of security.

Governments preparing for an influenza pandemic tend to focus on non-pharmaceutical responses as the most immediate. This is unsurprising as antiviral drugs to treat influenza and prevent its spread are in short supply, and a vaccine would not be available for several months after a pandemic virus started to spread. Non-pharmaceutical interventions for pandemic mitigation recommended by the US government include isolation in the home or a healthcare setting of all persons with confirmed or probable pandemic influenza; voluntary home quarantine of members of households with confirmed or probable influenza cases; dismissal of students from school and closure of childcare programmes; and the use of social-distancing measures

to reduce contact between adults in the community and workplace, including cancellation of large public gatherings.<sup>56</sup>

Although the value of non-pharmaceutical responses to pandemic influenza is uncertain, governments may seek to maximise such responses in circumstances where nothing else is available to them. As Kelley Lee and David Fidler warn, 'public officials may feel compelled to adopt measures to demonstrate to domestic constituencies that they are "doing something"'.<sup>57</sup> This was certainly the case in 2003 when governments confronted the new threat of SARS by implementing strict societal controls. As a consequence of the fact that no specific vaccine or treatment for SARS existed, the only interventions that seemed effective were those that minimised human contact. Transmission of SARS was quickly discovered to be containable using basic measures such as isolation of all infected patients and quarantine of close contacts, but government action also extended to the closure of inter-state borders and the use of military personnel to assist in enforcing containment orders.<sup>58</sup> In China, the legal and policy measures implemented to combat SARS were among the strictest in the world. Anyone who knowingly spread the disease could have faced capital punishment, and those who broke quarantine or evaded compulsory medical examination or treatment, and accidentally passed on the illness, faced up to seven years' imprisonment.<sup>59</sup> In Singapore the government instituted prison terms and large fines for anyone who broke quarantine.<sup>60</sup>

There is a risk that governments approaching pandemic influenza as a security issue may look to the SARS experience as a precedent for imposing similarly strict controls. It is important to note, however, that non-pharmaceutical measures such as quarantine and isolation are unlikely to be as effective against influenza as, in hindsight, they were against SARS. This is largely because the microorganisms that cause the diseases behave differently: influenza is far more contagious than SARS, has a shorter incubation period, and can be transmitted before the onset of symptoms.<sup>61</sup> Advice commissioned by the WHO on responding to pandemic influenza goes so far as to state that 'forced isolation and quarantine are ineffective and impractical'.<sup>62</sup> Furthermore, it is a common misconception that individual states can turn themselves into fortresses against pandemic influenza by

closing their borders.<sup>63</sup> Indeed, border protection is emblematic of a narrow, national-security mindset being applied to a microbial threat that is inherently transnational in scope. Travel restrictions are unlikely to have much effect on the spread of a pandemic virus and are probably not practicable in most countries. During previous influenza pandemics, the screening and quarantining of travellers at international borders did not substantially delay the arrival of the pandemic, and similar policies today, 'even if they could be implemented in time and regardless of expense, would doubtfully be more effective in the modern era of extensive international air travel'.<sup>64</sup> On this point, it is worth noting that 35m people were screened for SARS at airports in four Asian countries in 2003, and not one case of the disease was detected.<sup>65</sup> Mathematical modellers have predicted that the pursuit of 'border security' through travel restrictions and health screening would bring negligible benefits.<sup>66</sup> Such an overly state-centric, security-oriented approach would also be expensive to implement and likely to generate immense opportunity costs in terms of reduced trade and travel.

If extraordinary efforts and additional resources are to be directed to responding to the threat of pandemic influenza, it makes more sense for governments to place greater emphasis on pharmaceutical responses as these are more promising for disease-control purposes. Of immediate use are antiviral drugs which, if taken shortly before or after a person is exposed to an influenza virus, can prevent that person from becoming infected and spreading the disease to others. A vaccine matched to the pandemic-influenza virus would take several months to produce once the pandemic commenced, but thereafter would be the single most effective defence. The trouble with pharmaceutical approaches, however, is that individual states cannot deploy them at will within their territory in the way they can non-pharmaceutical defences. Rather, states, as well as non-state entities, must compete in a global market for antivirals and vaccines. Under these circumstances, even the wealthiest states are unlikely to acquire as much medicine as they require as soon as they require it. As for the developing world, where 96% of all pandemic-influenza deaths are predicted to occur,<sup>67</sup> pharmaceutical defences are for the most part unaffordable or inaccessible.

In circumstances where non-pharmaceutical measures implemented domestically are of limited utility, and where acquiring national stockpiles of pharmaceuticals is difficult, a focus on national interest alone is inadequate. Against the worldwide threat of pandemic influenza, public health and security need also to be pursued cooperatively. The risk of placing too great an emphasis on the interests of individual states is that this might detract from the international openness and cooperation necessary to resist pandemic influenza most effectively in the long term.

### *International cooperation*

The problem of reconciling traditional, state-based notions of security with challenges that are transnational in nature arose during the 1990s debates over 'environmental security'. Among those most stridently opposed to broadening the security agenda to include environmental degradation was Daniel Deudney. He argued, firstly, that pursuing national security and solving environmental problems are processes so fundamentally dissimilar that they cannot possibly fall under the single heading 'environmental security'.<sup>68</sup> Secondly, he insisted that employing the language of security to address environmental challenges could be counterproductive: 'For environmentalists to dress their programmes in the blood-soaked garments of the war system betrays their core values and creates confusion about the real tasks at hand.'<sup>69</sup> A decade later, addressing the issue of infectious diseases and referring to Deudney's warnings, Susan Peterson argued that linking an issue to security may raise awareness, 'but it likely also will hinder much of the cooperation that ... public health advocates seek and that the disastrous humanitarian and development effects of [infectious diseases] demand.'<sup>70</sup> Similarly, for Harley Feldbaum and his co-authors, one of the reasons why the humanitarian objectives of the health field do not fit readily into the perspective of national security is that 'global health works for the benefit of all people within and across states, while national security prioritises the needs of one state over the needs of others'.<sup>71</sup>

In the World Health Report of 2007 the WHO declared that 'a truly effective international preparedness and response coordination mechanism cannot be managed nationally'.<sup>72</sup> This resonates with a basic principle

contained in the 1946 WHO Constitution: 'The health of all peoples is fundamental to the attainment of peace and security and is dependent upon the fullest co-operation of individuals and States'.<sup>73</sup> Under the newly promulgated International Health Regulations (2005), states must notify the

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WHO of cases of 'human influenza caused by a new subtype' because these are 'events that may constitute a public health emergency of *international concern*' (emphasis added).<sup>74</sup> However, recent experience suggests that the pursuit of national self-interest can sometimes hinder the international cooperation necessary to address a transnational health threat. Calculated government opacity with the potential to jeopardise human health beyond national borders was a problem during the SARS outbreak of 2003. When people in southern China started succumbing to a mystery illness at the end of 2002, the initial response of the

Chinese government was to deny the existence of a problem and to refuse offers of assistance from international health authorities. After 15 March 2003, when the WHO issued its first global warning about the SARS virus, China's government-controlled media was prohibited from reporting on the warning.<sup>75</sup> Not until 2 April 2003 was the WHO allowed to visit Guangdong Province to confirm that the alert it had received, nearly two months before, was consistent with cases of an entirely new disease by then appearing in hospitals around the world. When this became known, China was roundly criticised for not cooperating earlier with the WHO, as this failure to act may have allowed SARS to spread further. By the time the outbreak was declared over in July 2003, the disease had spread to 30 countries and killed 774 out of 8098 people infected.<sup>76</sup>

China's initial response to SARS demonstrated how the withholding of information only compounds the damage from a fast-spreading infectious disease, hinders the task of containing an outbreak, and heightens the risk posed to other countries. However, Indonesia appeared not to have heeded this lesson when, in January 2007, it started withholding samples of H5N1 influenza virus from the WHO Global Influenza Surveillance Network (GISN). This was a major blow because virus samples must be supplied

in a timely fashion for the GISN to serve its purpose of alerting countries to the emergence of influenza strains with pandemic potential. Indonesia, as the country most heavily afflicted by human H5N1 infections, is the most important source of information on the virus's properties and behaviour. The Indonesian government claimed that the WHO was transferring viral samples to pharmaceutical companies to make influenza vaccines for which the Indonesian people would have to pay an unacceptably high price. According to Indonesian Health Minister Siti Supari, the current global vaccine-supply scheme, which delivers doses almost exclusively to the developed world, is 'more dangerous than the threat of an H5N1 pandemic itself'.<sup>77</sup> In an attempt to secure an affordable vaccine supply in the event of an influenza pandemic, Indonesia subsequently commenced negotiations to sell H5N1 virus samples exclusively to the US-based company Baxter International.<sup>78</sup> At a meeting with WHO officials in March 2007, the Indonesian health minister sought assurances that her country would get a vaccine if a pandemic occurred. Indonesia subsequently agreed to negotiate on resuming the supply of virus samples to the WHO, subject to the agency seeking Indonesia's authorisation before sharing these with other researchers.<sup>79</sup>

The refusals by China and Indonesia to cooperate with the WHO and its member states are a warning against placing too much emphasis on national self-interest when dealing with the threat of pandemic influenza. The risk of deeming this threat a national-security issue is that a country will adopt a fortress mentality. Such an approach is futile against a disease that is impervious to political barriers. Rather, if pandemic influenza is to be resisted effectively into the long term, states need to act in their collective interest. There are some promising indications that wealthier countries are directing attention and resources beyond their own borders to protect themselves and others against pandemic influenza. The goals of the International Partnership on Avian and Pandemic Influenza, announced by US President George W. Bush in September 2005, include elevating the avian-influenza issue on national agendas; coordinating efforts among donor and affected nations; mobilising and leveraging resources; increasing transparency in disease reporting and improving surveillance; and building local capacity

to identify, contain and respond to an influenza pandemic.<sup>80</sup> At a conference in Beijing in January 2006, the world's major aid donors led by the United States and the European Union pledged \$1.9bn towards preventing an influenza pandemic. About half of this sum was to be spent in Vietnam, Laos, Cambodia, Indonesia and Thailand on strengthening disease surveillance, improving laboratory and health services, and boosting the communication capacity of these countries.<sup>81</sup> An additional \$406.1m was pledged at an international conference in New Delhi on 4–6 December 2007.<sup>82</sup>

Another example of extraordinary political commitment at the international level arose in response to Indonesia's drastic action on H5N1 virus samples. At the Sixtieth World Health Assembly in May 2007, the WHO member states passed a resolution requesting that the organisation 'establish an international stockpile of vaccines for H5N1 or other influenza viruses of pandemic potential, and to formulate mechanisms and guidelines aimed at ensuring fair and equitable distribution of pandemic influenza vaccines at affordable prices in the event of a pandemic'.<sup>83</sup> In combination with pledges of financial aid from the developed to the developing world, this gesture may indicate that states recognise the paramount importance of international cooperation against an emerging microbial threat that transcends political borders. However, it remains to be seen if the spirit of cooperation will withstand the ravages of a pandemic itself. If individual states do choose to see this as a national-security crisis, the emergency-response measures implemented should support rather than subvert the public-health interests of other states.

\* \* \*

If H5N1 or some other influenza subtype mutates into a form transmissible between humans, the result could be illness and death on a large scale, over a wide area, in a short space of time. Fearing swift and severe economic disruption, a loss of public confidence, and the undermining of societal functioning, governments may choose to frame pandemic influenza as a first-order issue of national security, one which would alter the premise for all other activity. The United States, Britain and Australia are already

moving in this direction. In adopting such an approach there is potential to rally political support for improving and mobilising public-health resources. However, there is also a risk that addressing a health issue in security terms will lead to emergency responses which are ineffective, counterproductive or unjust. Overzealous non-pharmaceutical responses to a pandemic, such as forced quarantine and border screening, would likely have little effect in controlling the disease yet could undermine human rights and exacerbate economic losses. In addition, it is important to look beyond the vulnerability of individual states and their purely domestic actions taken in response. Appealing to national security may be a good way of focusing national attention and resources. However, given the transnational reach of this potential microbial threat and the increasing interdependence of states, the greater part of the solution must lie in international cooperation. To resist pandemic influenza most effectively in the long term, all states have a collective interest in sharing health information, improving local public-health capacity, and expanding the global supply of influenza vaccine.

## Notes

- 1 World Health Organisation, *A Safer Future: Global Public Health Security in the 21st Century*, World Health Report 2007 (Geneva: World Health Organisation, 2007), p. 45.
- 2 *Implementation Plan for the National Strategy for Pandemic Influenza* (Washington DC: Homeland Security Council, 2006), p. 18.
- 3 'The National Security Strategy of the United Kingdom: Security in an Interdependent World', United Kingdom Cabinet Office, 19 March 2008, p. 14, [http://interactive.cabinet-office.gov.uk/documents/security/national\\_security\\_strategy.pdf](http://interactive.cabinet-office.gov.uk/documents/security/national_security_strategy.pdf).
- 4 Australian Department of Health and Ageing, *Australian Health Management Plan for Pandemic Influenza* (Canberra: Commonwealth of Australia, 2006), p. 19, [http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-pandemic-ahmppti.htm/\\$file/AHMPPTI.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-pandemic-ahmppti.htm/$file/AHMPPTI.pdf).
- 5 *Ibid.*, p. 51.
- 6 'Mysterious Disease Kills Thousands of Vietnamese Chickens', *Sydney Morning Herald*, 7 January 2004, <http://www.smh.com.au/articles/2004/01/06/1073268033540.html>.
- 7 World Organisation for Animal Health, 'Update on Avian Influenza in Animals (Type H5)', 4 December 2008, [http://www.oie.int/downld/AVIANINFLUENZA/A\\_AI-Asia.htm](http://www.oie.int/downld/AVIANINFLUENZA/A_AI-Asia.htm).
- 8 World Health Organisation, 'Confirmed Human Cases of Avian Influenza A (H5N1)', 10 September

- 2008; [http://www.who.int/csr/disease/avian\\_influenza/country/en/](http://www.who.int/csr/disease/avian_influenza/country/en/).
- 9 Yang Yang, M. Elizabeth Halloran, Jonathan D. Sugimoto and Ira M. Longini, 'Detecting Human-to-Human Transmission of Avian Influenza A (H5N1)', *Emerging Infectious Diseases*, vol. 13, no. 9, September 2007, p. 1351.
  - 10 World Health Organisation, *WHO Global Influenza Preparedness Plan: The Role of WHO and Recommendations for National Measures Before and During Pandemics* (Geneva: World Health Organisation, 2005), p. 2.
  - 11 World Health Organisation, 'Ten Things You Need to Know about Pandemic Influenza', 14 October 2005, <http://www.who.int/csr/disease/influenza/pandemic10things/en/>.
  - 12 *Ibid.*
  - 13 *Ibid.*
  - 14 Christopher J.L. Murray, Alan D. Lopez, Brian Chin, Dennis Feehan and Kenneth H. Hill, 'Estimation of Potential Global Pandemic Influenza Mortality on the Basis of Vital Registry Data from the 1918–20 Pandemic: A Quantitative Analysis', *The Lancet*, vol. 368, no. 9554, 23 December 2006, pp. 2211–18.
  - 15 Jeffery K. Taubenberger, A.H. Reid, R.M. Lourens, R. Wang, G. Jin and T.G. Fanning, 'Characterization of the 1918 Influenza Virus Polymerase Genes', *Nature*, vol. 437, no. 7060, 6 October 2005, pp. 889–93. Notwithstanding these findings, it is important to acknowledge that mutation of H5N1 into a pandemic form is not certain to occur. At present, the virus attaches to cells in the lower respiratory tract of humans. It is possible that a feature of this particular virus may prevent it from ever attaching to cells in the upper respiratory tract and thus transmitting easily to others through coughing and sneezing. See Debby van Riel, Vincent J. Munster, Emmie de Wit, Guus F. Rimmelzwaan, Ron A.M. Fouchier, Ab D.M.E. Osterhaus and Thijs Kuiken, 'H5N1 Virus Attachment to Lower Respiratory Tract', *Science*, vol. 312, no. 5772, 21 April 2006, p. 399.
  - 16 US Department of Health and Human Services, 'Community Strategy for Pandemic Influenza Mitigation', February 2007, <http://www.pandemicflu.gov/plan/community/commitigation.html>.
  - 17 World Health Organisation, *A Safer Future*, p. 16.
  - 18 Klaus Stöhr and Marja Esveld, 'Will Vaccines Be Available for the Next Influenza Pandemic?', *Science*, vol. 306, no. 5705, 24 December 2004, p. 2195.
  - 19 Jaro Kotalik, 'Preparing for an Influenza Pandemic: Ethical Issues', in Michael J. Selgelid, Margaret P. Battin and Charles B. Smith (eds), *Ethics and Infectious Disease* (Malden: Blackwell, 2006), p. 97.
  - 20 Warwick McKibbin and Alexandra Sidorenko, *Global Macroeconomic Consequences of Pandemic Influenza* (Sydney: Lowy Institute for International Policy, 2006).
  - 21 UNDP, *Human Development Report* (New York: United Nations Development Programme, 1994), pp. 27–8.
  - 22 World Health Organisation, *A Safer Future*, p. 5.
  - 23 Shannon Selin, 'The Security Implications of SARS', *CANCAPS Bulletin*, no. 37, 2003, p. 10.

- <sup>24</sup> Recent publications include Susan Wright, 'Terrorists and Biological Weapons: Forging the Linkage in the Clinton Administration', *Politics and the Life Sciences*, vol. 25, no. 1-2, March-September 2006, pp. 57-115; Reynolds M. Salerno and Lauren T. Hickok, 'Strengthening Bioterrorism Prevention: Global Biological Material Management', *Biosecurity and Bioterrorism*, vol. 5, no. 2, June 2007, pp. 107-16; Nicholas A. Sims, 'The Future of Biological Disarmament: New Hope after the Sixth Review Conference of the Biological Weapons Convention', *Nonproliferation Review*, vol. 14, no. 2, July 2007, pp. 351-72. The use of influenza virus for biological-warfare purposes, highly unlikely but not impossible, is beyond the scope of this article.
- <sup>25</sup> United Nations Security Council, UNSCR 1308, 17 July 2000, <http://daccessdds.un.org/doc/UNDOC/GEN/N00/536/02/PDF/N0053602.pdf>.
- <sup>26</sup> See, for example, P.W. Singer, 'AIDS and International Security', *Survival*, vol. 44, no. 1, Spring 2002, pp. 145-58; Gwyn Prins, 'AIDS and Global Security', *International Affairs*, vol. 80, no. 5, October 2004, pp. 931-52; Stefan Elbe, *Strategic Implications of HIV/AIDS*, Adelphi Paper 357 (New York: Oxford University Press for the International Institute for Strategic Studies, 2003); Alan Dupont, *East Asia Imperilled: Transnational Challenges to Security* (Cambridge: Cambridge University Press, 2001), pp. 212-27; Harley Feldbaum, Kelley Lee and Preeti Patel, 'The National Security Implications of HIV/AIDS', *PLoS Medicine*, vol. 3, no. 6, June 2006, pp. 0774-78; Colin McInnes, 'HIV/AIDS and Security', *International Affairs*, vol. 82, no. 2, March 2006, pp. 315-26.
- <sup>27</sup> National Intelligence Council, 'The Global Infectious Disease Threat and its Implications for the United States', <http://www.wilsoncenter.org/topics/pubs/Report6-3.pdf>, January 2000.
- <sup>28</sup> Mely Caballero-Anthony, 'Combating Infectious Diseases in East Asia: Securitization and Global Public Goods for Health', *Journal of International Affairs*, vol. 59, no. 2, Spring 2006, pp. 105-27; Alexander Kelle, 'Securitization of International Public Health: Implications for Global Health Governance and the Biological Weapons Prohibition Regime', *Global Governance*, vol. 13, no. 2, April-June 2007, pp. 217-35; Sara E. Davies, 'Securitizing Infectious Disease', *International Affairs*, vol. 84, no. 2, March 2008, pp. 295-313.
- <sup>29</sup> Julian Palmore, 'A Clear and Present Danger to International Security: Highly Pathogenic Avian Influenza', *Defense and Security Analysis*, vol. 22, no. 2, June 2006, pp. 111-21; Christian Enemark, *Disease and Security: Natural Plagues and Biological Weapons in East Asia* (London: Routledge, 2007), pp. 41-58.
- <sup>30</sup> Barry Buzan, *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*, 2nd ed. (London: Harvester Wheatsheaf, 1991), p. 117.
- <sup>31</sup> Richard Ullman, 'Redefining Security', *International Security*, vol. 8, no. 1, Summer 1983, p. 133.
- <sup>32</sup> Ole Wæver, 'Securitization and Desecuritization', in Ronnie D. Lipschutz (ed.), *On Security* (New

- York: Columbia University Press, 1995), p. 52.
- 33 *Implementation Plan for the National Strategy for Pandemic Influenza*, p. 2.
- 34 *Ibid.*, p. 1.
- 35 Paul Slovic, Baruch Fischhoff and Sarah Lichtenstein, 'Facts and Fears: Understanding Perceived Risk', in Richard C. Schwing and Walter A. Albers (eds), *Societal Risk Assessment: How Safe is Safe Enough?* (New York: Plenum, 1980), p. 209.
- 36 *Ibid.*, p. 211.
- 37 World Health Organisation, *World Health Report 2002: Reducing Risks, Promoting Healthy Life* (Geneva: World Health Organisation, 2002), p. 32.
- 38 Jessica Stern, 'Dreaded Risks and the Control of Biological Weapons', *International Security*, vol. 27, no. 3, Winter 2002–03, p. 102.
- 39 Erik Eckholm, 'SARS is the Spark for a Riot in China', *New York Times*, 29 April 2003, p. A1.
- 40 Peter Chalk, 'Disease and the Complex Processes of Securitization in the Asia-Pacific', in Mely Caballero-Anthony, Ralf Emmers and Amitav Acharya (eds), *Non-Traditional Security in Asia: Dilemmas in Securitization* (Aldershot: Ashgate, 2006), p. 127.
- 41 Stewart Tendler, 'Flu Doctors to be Given Police Guards', *Times Online*, 2 November 2005, <http://www.timesonline.co.uk/article/0,,25149-1853843,00.html>.
- 42 Department of Defense, *Department of Defense Implementation Plan for Pandemic Influenza* (Washington DC: Office of the Assistant Secretary of Defense for Homeland Defense, 2006), p. 16.
- 43 'Implementation Plan for the National Strategy for Pandemic Influenza', p. 153.
- 44 Susan Peterson, 'Epidemic Disease and National Security', *Security Studies*, vol. 12, no. 2, December 2002, p. 51.
- 45 Rebecca Katz and Daniel A. Singer, 'Health and Security in Foreign Policy', *Bulletin of the World Health Organization*, vol. 85, no. 3, March 2007, p. 233.
- 46 Colin McInnes and Kelley Lee, 'Health, Security and Foreign Policy', *Review of International Studies*, vol. 32, no. 1, January 2006, p. 11.
- 47 Stefan Elbe, 'Should HIV/AIDS Be Securitized? The Ethical Dilemmas of Linking HIV/AIDS and Security', *International Studies Quarterly*, vol. 50, no. 1, March 2006, pp. 119–44.
- 48 *Ibid.*, p. 120.
- 49 Nellie Bristol, 'US Senate Passes New PEPFAR Bill', *The Lancet*, vol. 372, no. 9635, 26 July 2008, p. 277.
- 50 Elbe, 'Should HIV/AIDS Be Securitized?', p. 128.
- 51 Katz and Singer, 'Health and Security in Foreign Policy', p. 234.
- 52 'Siracusa Principles on the Limitation and Derogation Provisions in the International Covenant on Civil and Political Rights', *Human Rights Quarterly*, vol. 7, no. 1, 1985, p. 6.
- 53 Rajnarayan Chandavarkar, 'Plague Panic and Epidemic Politics in India, 1896–1914', in Terence Ranger and Paul Slack (eds), *Epidemics and Ideas: Essays on the Historical Perception of Pestilence* (New York: Cambridge University Press, 1992), pp. 8–10, 204.
- 54 Elbe, 'Should HIV/AIDS Be Securitized?', p. 128.

- 55 *Ibid.*
- 56 US Department of Health and Human Services, 'Community Strategy for Pandemic Influenza Mitigation'.
- 57 K. Lee and D. Fidler, 'Avian and Pandemic Influenza: Progress and Problems with Global Health Governance', *Global Public Health*, vol. 2, no. 3, July 2007, p. 226.
- 58 Elizabeth M. Prescott, 'SARS: A Warning', *Survival*, vol. 45, no. 3, Autumn 2003, p. 218; *World Health Report 2003: Shaping the Future* (Geneva: World Health Organisation, 2003), p. 77.
- 59 Jacques deLisle, 'SARS, Greater China, and the Pathologies of Globalisation and Transition', *Orbis*, vol. 47, no. 4, Fall 2003, p. 598.
- 60 Ann Mongoven, 'The War on Disease and the War on Terror: A Dangerous Metaphorical Nexus?', *Cambridge Quarterly of Healthcare Ethics*, vol. 15, no. 4, October 2006, p. 412.
- 61 World Health Organisation Writing Group, 'Nonpharmaceutical Interventions for Pandemic Influenza, International Measures', *Emerging Infectious Diseases*, vol. 12, no. 1, January 2006, p. 83.
- 62 *Ibid.*, p. 88.
- 63 See, for example, Athol Yates, 'Close Airports or Pandemic Influenza Will Fly In', Australian Homeland Security Research Centre, August 2007, [http://www.homelandsecurity.org.au/files/airport\\_closure\\_flu.pdf](http://www.homelandsecurity.org.au/files/airport_closure_flu.pdf).
- 64 WHO Writing Group, 'Nonpharmaceutical Interventions for Pandemic Influenza, International Measures', p. 86.
- 65 'Comments from the Center for Biosecurity of UPMC on the National Strategy for Pandemic Influenza: Implementation Plan', *Biosecurity and Bioterrorism*, vol. 4, no. 3, 2006, p. 322.
- 66 Peter Caley, Niels G. Becker and David J. Philp, 'The Waiting Time for Inter-Country Spread of Pandemic Influenza', *PLoS ONE*, vol. 2, no. 1, art. e143, January 2007.
- 67 'International Health Regulations: the Challenges ahead', *The Lancet*, vol. 369, no. 9575, 26 May 2007, p. 1763.
- 68 Daniel Deudney, 'The Case against Linking Environmental Degradation and National Security', *Millennium*, vol. 19, no. 3, December 1990, pp. 462–65.
- 69 *Ibid.*, p. 475.
- 70 Peterson, 'Epidemic Disease and National Security', p. 46.
- 71 Harley Feldbaum, Preeti Patel, Egbert Sondorp and Kelley Lee, 'Global Health and National Security: The Need for Critical Engagement', *Medicine, Conflict and Survival*, vol. 22, no. 3, July–September 2006, p. 196.
- 72 World Health Organisation, *A Safer Future*, p. 66.
- 73 World Health Organisation, 'Constitution', 1946, [http://www.who.int/entity/governance/eb/who\\_constitution\\_en.pdf](http://www.who.int/entity/governance/eb/who_constitution_en.pdf).
- 74 World Health Organisation, '58th World Health Assembly, International Health Regulations (2005)', 2005, <http://www.who.int/csr/ihl/WHA58-en.pdf>.
- 75 Yanzhong Huang, 'Mortal Peril: Public Health in China and its Security Implications', *Health and Security Series* (Washington DC: Chemical and Biological Arms Control Institute, 2003), p. 69.
- 76 World Health Organisation, 'Summary of Probable SARS

- Cases with Onset of Illness from 1 November 2002 to 31 July 2003', 26 September 2003, [http://www.who.int/csr/sars/country/table2003\\_09\\_23/en/](http://www.who.int/csr/sars/country/table2003_09_23/en/).
- <sup>77</sup> Dennis Normile, 'Indonesia to Share Flu Samples Under New Terms', *Science*, vol. 316, no. 5821, 6 April 2007, p. 37.
- <sup>78</sup> John Aglionby and Andrew Jack, 'Indonesia Blames WHO for Bird Flu Deal', *Business Day Online*, 8 February 2007, <http://businessdayonline.com/?c=125&a=111127>.
- <sup>79</sup> 'Indonesia Edges Closer to Sharing Bird-Flu Samples', *Nature*, vol. 450, no. 7170, 26 November 2007, p. 599.
- <sup>80</sup> US Department of State, 'US Government Support to Combat Avian and Pandemic Influenza', 4 June 2007, <http://www.state.gov/r/pa/scp/86190.htm>.
- <sup>81</sup> Margaret Harris Cheng, 'Cash Boost for Avian Influenza Exceeds Expectations', *The Lancet*, vol. 367, no. 9507, 28 January 2006, p. 289.
- <sup>82</sup> 'Chair's Summary', New Delhi International Ministerial Conference on Avian and Pandemic Influenza, December 2007, available at <http://www.delmincon.com/>.
- <sup>83</sup> World Health Organisation, 'World Health Assembly Closes', 23 May 2007, <http://www.who.int/mediacentre/news/releases/2007/wha02/en/index.html>. Implementing the WHO plan to increase the global supply of vaccine is estimated to cost \$3–10bn: World Health Organisation, *Global Pandemic Influenza Action Plan to Increase Vaccine Supply* (Geneva: World Health Organisation, 2006).