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Scales of governance: the role of surveillance in facilitating new diplomacy during the 2009-2010 H1N1 pandemic

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Scales of governance:

The role of surveillance in facilitating new diplomacy during the 2009-2010 H1N1 pandemic

Abstract

The 2009-2010 H1N1 influenza pandemic has highlighted the importance of global health surveillance. Increasingly, global alerts are based on 'unexpected' 'events' detected by surveillance systems grounded in particular places. An emerging global governance literature investigates the supposedly disruptive impact of public health emergencies on mobilities in an interdependent world. Little consideration has been given to the varied scales of governance - local, national and global - that operate at different stages in the unfolding of an 'event', together with the interactions and tensions between them. By tracking the chronology of the H1N1 pandemic, this paper highlights an emergent dialogue between local and global scales. It also draws attention to moments of national autonomy across the global North and South which undermined the WHO drive for transnational cooperation.

Keywords: event, surveillance, technologies, public health diplomacy, governance

Introduction

In a speech to the WHO Executive Board on 18 January 2010, Director-General Margaret Chan reviewed progress in public health during the first decade of the twenty-first century and outlined some of the challenges ahead. In relation to the ongoing H1N1 pandemic influenza outbreak, she drew attention to the importance of global health surveillance:

> 'This is the first pandemic to occur since the revolution in communications and information technologies. For the first time in history, the international community could watch a pandemic unfold, and chart its evolution, in real time.' (WHO, 2010a).

In an age of rapid disease spread, facilitated in large part by widespread aeromobility, emphasis has been placed on international cooperation in 'detecting and responding to unusual outbreaks, wherever and whenever they might occur' (Ingram, 2009: 1; Budd et al, 2011). One aspect of this cooperation has been the international community's increased use of, and reliance on, event-based information systems such as the Global Public Health Intelligence Network (GPHIN) and HealthMap. Whilst traditional indicator-based surveillance routinely report *cases* of disease, usually on a weekly or monthly basis, event-based surveillance aims to rapidly detect, report and assess public health *events*, including clusters of disease and rumours of unexplained deaths. Significantly, event-based systems make judgements about disease risk by monitoring often unverified media sources. Within the extensive literature on the event, this paper is informed by Anderson and Adey's observation that events may emerge unexpectedly and threaten to disrupt the 'complex interdependencies' that are associated with mobility in the modern world (2012: 27; Cabinet Office, 2004; Dillon, 2007; Barker, in press). These events may take the form of infectious disease outbreaks, terrorist attacks, civil unrest and weather-related

emergencies (Anderson and Adey, 2012). Crucially, they are located in specific places, detected by information systems, and communicated to other systems to form a *network*. As a consequence, these places assume a particular significance, as information about the event is broadcast to subscribers to these systems, including international institutions, such as the WHO.

Within the wider surveillance literature, the expansion and deployment of these global networks have been discussed in relation to cross-border mobilities (Adey, 2009; Amoore and Hall, 2009), medical diagnostics (Thacker, 2005; Bauer and Olsen, 2009), bioterrorism (Parry, 2009; Calain, 2007), and public health events (Baker and Fidler, 2006; Castillo-Salgado, 2010). Yet, little consideration has been given to the operation of individual surveillance systems. Equally, within the domain of global governance, there has been a dearth of analysis into the ways in which the WHO and its member states use the 'informal' information supplied by these systems to make judgements about the spread and severity of global disease outbreaks. In this article, we place the activity of these systems within the context of the 2009-2010 H1N1 pandemic, considering how disease risk comes to be represented, and acted upon, across local, national and global scales of governance. Using Margaret Chan's call for 'new' international health diplomacy, we draw attention to the importance of places, often situated in countries of the global South, in providing the source material for specific global alerts, and we examine the subsequent responses by member states across the global North and South.

Our analysis was informed by policy documents, working papers and pandemic preparedness plans produced by the WHO and individual countries. Reference was made to current epidemiological literature. Empirical data was obtained via personal communications with public health officials based at GPHIN, the WHO and within the UK.

This included information relating to volume of articles retrieved, classification of risk, issuing of alerts and further developments of the system. Finally empirical material on the H1N1 pandemic was obtained from HealthMap, an open-access event-based system, dispatches from national regulatory bodies such as the Centres for Disease Control and Prevention (CDC) and news organisations, for example, *BBC News Online*. The data collection from this combination of sources facilitated analysis of the operation of global surveillance networks and the nature of global public health governance.

Biosecurity and technological openness

In recent years, 'biosecurity' - defined by Braun as 'political responses' to the 'unpredictability of molecular life' (2007: 19) - has become a prominent site of enquiry as scholars have sought to understand various forms of expertise and practices through which disease threats are articulated and managed (King, 2004; Collier and Lakoff, 2008; Bingham et al, 2008; Ingram, 2010). Biosecurity operations are enacted within what Bingham et al describe as a 'complex geography' where 'states and locales are increasingly asked to conform to what is regarded (in the metropolitan core) as a safe world' (2008: 1529). According to this perspective, it is the 'centralised expertise', often located in the countries of the global North, that press for 'globalising biosecurity practices' (Bingham et al, 2008: 1529), seeking 'maximal cooperation from all countries' (Ingram, 2009: 2). In leading this drive for cooperation, transnational institutions, such as the WHO, the UN Food and Agricultural Organization (FAO) and the World Bank have been perceived as enacting measures that, arguably, focus unduly on 'problems' in the global South (Brown and Bell, 2008; King, 2002).

This cooperative endeavour, within a supposedly imperial frame, is an outcome of a global approach to more broadly defined 'health security' that emerged in the late 1990s and

which extended beyond infectious diseases to consider also threats to human health posed by bioweapons and radiation leaks (Ingram 2009: 1). At the turn of the twenty first century, the development of global surveillance networks began to change profoundly practices of health security at national and transnational scales. These networks electronically monitor online news sources and, in the case of 'syndromic surveillance', non-diagnostic information (Fearnley, 2008: 1615)[1]. Following the September 2001 terrorist attacks, the widespread collation of such 'informal' information became a significant component of 'bioterrorist 'early-warning' systems' (Parry, 2009: 1; Fearnley, 2008). During the 2003 Severe Acute Respiratory Syndrome (SARS) outbreak, this new form of technological surveillance also assumed a specific significance in detecting the onset of epidemics.

We contend that the SARS outbreak did not solely act as a catalyst for the development of more sophisticated global surveillance systems (Blench, 2008a). The event also demonstrated how global mobility, facilitated in particular by a far-reaching global airline network, enabled hundreds, if not thousands, of human pathogens to circulate the world's airways (Budd et al, 2009). It was this epidemic which highlighted, for the first time, a global 'epidemiological vulnerability', when the SARS coronavirus spread rapidly along major airline routes to infect localities in over 25 geographically spread countries, including Hong Kong, the UK and Canada (Budd et al, 2009: 427; Bowen and Laroe, 2006).

The speed of the infectious disease transmission, juxtaposed with its highly disruptive impact on urban populations, demonstrated the significance of far-reaching *globalised* surveillance networks in detecting early signs of emerging infectious disease. It also highlighted the need for more advanced preparedness across national and global scales

[1] According to Fearnley, 'nondiagnostic information' includes pharmaceutical sales, emergency room triage logs and 911 calls (2008: 1615).

(Collier and Lakoff, 2008; Fearnley, 2008). Rather than tackling specific dangers, preparedness is concerned with 'generic capacities that will enable responses to a broad spectrum of contingencies' (Ingram, 2010: 296; Fearnley, 2008). At a national scale, preparedness planning has been guided by the framework documentation published by the WHO and adopted by its member states (WHO, 2009a). For example, the UK's *Pandemic Flu: a national framework*, published in 2007, detailed various interventions including the stockpiling of drugs, and the imposition of restrictions on internal travel and public gatherings (Cabinet Office and DH, 2007). When one focuses on this national scale, it is apparent that, notwithstanding the drive for global cooperation led by the WHO, practices vary widely between countries, implying that internationally-imposed frameworks for health security may be 'more precarious and prone to breakdown than we usually give credit' (Bingham and Hinchliffe, 2008: 190). The SARS outbreak demonstrated, nevertheless, that, through the influence of global surveillance networks and the information that they supplied, consistencies could be identified in the timing of the interventions by individual states. Building on Ingram (2010), we argue that these networks have come to play an important mediating role in the spaces between preparedness and response.

Global surveillance networks: from 'informal' information to issuance of alerts

Although event-based surveillance networks have been examined in relation to geopolitical debates concerning the expansion of sovereign power (Braun, 2007; Weir and Mykhalovskiy, 2010), little investigation exists into their role in shaping the interactions between different scales of governance as an infectious disease event emerges. We address this by analysing the *operation* of these networks, including the practices they deploy, and their role in converting informal information, derived from particular places, to

globally significant alerts, arguably 'disrupt[ing] national boundaries' of outbreak notification (Mykhalovskiy and Weir, 2006: 42).

On the global scale, several authors have documented the role of networks such as GPHIN in the detection of rare but high-impact outbreaks (such as SARS and H5N1 ('Avian') influenza) (Weir and Mykhalovskiy, 2006, 2010; Zong and Zeng, 2006). According to Keller et al (2009), almost all major disease epidemics investigated by the WHO over the last decade were first identified through these sources. The WHO claim these networks have proven to be particularly effective in detecting outbreaks among populations that 'do not access health care through formal channels' (2008a: 4). Consequently, biosecurity practices, notably alerts, have become ever more embedded in the work of global surveillance systems. Reports gathered by systems such as GPHIN, coupled with China's concealment of information during the early stages of the SARS outbreak, provided the impetus in 2005 for approval of the WHO's revised International Health Regulations (IHR). The IHR - which came into effect in June 2007 - gave the WHO a legal basis for greater intervention in the affairs of member states to enable, at least ostensibly, more effective global public health governance (WHO, 2008b). Whereas the previous IHR only named a list of notifiable diseases, the revised Regulations formed another part of the global health security apparatus, with coverage extended to all 'public health emergencies of international concern' (WHO, 2008b). Although Article 6 imposed 'obligations' member states to 'notify' WHO of 'all events' that may constitute such an emergency (WHO, 2008b: 1), Article 9 of the IHR permitted the WHO to take account of information from sources other than official notifications and consultations, allowing it legally to override any national government that tried to suppress data concerning communicable disease. Within the context of international openness, 'informal' information on isolated disease outbreaks occurring in various places was granted a new authority.

Whilst the gathering of media reports does not necessarily require international cooperation, subsequent global public health interventions do. In February 2007 the sense of a ‘new’ era in public health governance was made explicit when, in a speech given shortly after her appointment as Director-General, Margaret Chan argued that the WHO needed to go further in its preparations for public health emergencies of international concern. Collaboration among member states had broken down during ‘recent events’, not only due to China’s concealment of SARS, but also as a result of Indonesia’s withholding of H5N1 virus samples from the WHO in a dispute over proprietary rights to vaccines (Fidler, 2008). In both instances, the consequences of a lack of cooperation had been harmful to global public health. Accordingly, Chan argued that lessons needed to be learnt and applied through a ‘new’ international health diplomacy. Effective global public health governance required a combination of technological and diplomatic openness.

GPHIN and the WHO: towards technological and diplomatic openness

GPHIN, arguably the most longstanding global event-based surveillance system, underpins the WHO's commitment to 'technological openness'. Over the last decade, it has played a prominent role in alerting key public organisations to major disease outbreaks, opening up local ill-health clusters to international scrutiny. A subscription-based network, it was established in 1997 to provide ‘relevant unverified information on disease outbreaks and other public health events’ (Blench, 2008b). In claiming to monitor on a global scale, it gathers data from local, national and transnational media sources in nine languages. Sources of information include websites, news wires and local and national newspapers (Keller et al, 2009: 690). According to Blench, approximately 15% of retrieved articles are automatically ‘published’, 20% are trashed and the remaining 65% are put forward for human analysis (2008b). The degree of risk posed by an event is indicated by the

assignation of an alert by a GPHIN analyst. Keller et al report that alerts are deemed necessary for events that 'might have serious public health consequences' and they are sent 'immediately' to GPHIN users (Keller et al, 2009: 691). Our correspondence with GPHIN officials[2] confirmed that all alerts are published after analysis and that, if articles are published automatically, an analyst has an opportunity to review them post-publication and assign an alert. It is this human analysis process, demonstrating the importance of interpretation and judgement in the grading of risk, which distinguishes GPHIN from other surveillance systems such as HealthMap and EpiSPIDER (Keller et al, 2009: 693). In this local-global interchange, national decision-making structures are bypassed.

For the WHO to issue an alert, however, a further set of verifications are desirable, ostensibly involving the state as part of a detailed event management process. The first stage of this procedure comprises screening against criteria based on the IHR (2005). Significantly, the second step involves requesting verification from the affected member state and 'any other sources' (WHO, 2008c: 9). In effect, technological openness is not enough. Although the WHO initiates its risk assessment procedure 'as soon as an event is identified', it 'generally will not consider an assessment complete until official information is received' [from the member state] (WHO, 2008c: 10). Consequently, requests for verification are issued, usually to a country's National IHR Focal Point (NFP) - purportedly 'accessible at all times' (WHO, 2008b: 8) - before being logged on a central database. According to the WHO, the NFPs are its 'official' information source, comprising scientific researchers located in universities and government agencies within member states (WHO, 2008c: 10).

[2] Personal communications 13/01/10, 29/01/10 and 17/06/10.

The complexity of this event management process in practice can be illustrated by analysis of the interactions between the WHO and its NFPs. In the UK, information on these exchanges was gathered through the authors' communication with senior UK public health officials, whose positions involved regular liaison with the WHO and contact with members of the UK government during WHO-designated Public Health Emergencies of International Concern (PHEICs). Under the IHR, a 'function[..]' of the NFP is to send 'urgent communications' relating to PHEICs to the WHO-designated IHR Contact Points (WHO, 2008b: 11). Although not an obligation, interviews conducted by the authors highlighted the value of joint working between senior UK public health officials based in the NFP and the WHO. Such collaboration was often through personal contacts cultivated over several years. These connections were regarded as fundamental to the sharing of information during the early spread of the H1N1 pandemic influenza virus within the UK border.

Accordingly, the role of unofficial data – from news sources, health professionals and personal contacts identified within member states – is significant in facilitating the WHO's global health governance. By its own estimation, more than 60% of the WHO's initial outbreak reports originated from such 'unofficial informal sources' (WHO, 2010b). In the UK, a senior public health official stated that event-based surveillance systems were fundamental for 'flagging up' potential infectious disease outbreaks overseas and giving indications of subsequent spread[3]. Cooperation with the WHO was deemed, therefore, to be highly desirable. Thus, effective global public health governance, led by the WHO, requires high quality, yet 'informal', event-based information from surveillance networks, together with communications from member states, via both statutory mechanisms such

[3] Personal communication, 15/02/11.

as the NFPs and through less formal personal contacts. The operation of these interactions is examined through case study evidence.

Case study: 'informal' information and H1N1 in Mexico

The 2009-2010 H1N1 pandemic – the first influenza pandemic since 1968 - was particularly significant as it represented a 'test case' for the WHO's new pandemic alerting structure. From its initial reporting in parts of Mexico at the beginning of April 2009, the outbreak caused the WHO steadily to raise the level of alert from Phase 3 to Phase 6 (on 1 June 2009). Pandemic 'phases' – used to 'provide a framework to aid countries in pandemic preparedness and response planning' (WHO, 2009a) – have been a feature of WHO influenza guidance. Although subject to some change, the phase structure has consistently included a description of key characteristics – the existence of which, we contend, is often based on 'informal' information provided by surveillance networks - and a list of measures to be taken by the WHO. Actions are also recommended, though not prescribed, for national authorities (WHO, 2009a).

That individual countries should exercise a degree of initiative in pandemic planning is not inconsistent with WHO guidance (WHO, 2009a). Our interview with a senior UK health official strongly endorsed this notion of discretion[4]. Indeed, the official believed that certain jurisdictions were too ready to 'borrow' WHO phases and await its instructions, rather than developing pandemic preparedness plans that reflected their own strategic needs[5]. Analysis of the timing and sequence of alerts in relation to the H1N1 pandemic influenza demonstrated that one outcome of this display of individual discretion was heated debate between the WHO and some of its member states. Examination of the chronology of the pandemic and the spatialities involved illustrate that, whilst the networks of surveillance

[4] Personal communication, 15/02/11.
[5] *Ibid*.

were profoundly important in shaping the WHO's alerting process, a complex set of interactions existed within member states in which a sense of globally shared responsibility competed with national interests. In particular, there were key moments when the WHO pandemic alerting, and advice on cooperation, were constrained by member state practices of preparedness. In this section, we highlight three such moments.

i. Period until 29 April 2009 (initial alerting of influenza activity)

As early as 30 March 2009, reports of an outbreak were purportedly being processed from a range of places (Veratect, 2009). On 1 April 2009, HealthMap located a local media report in the Mexican newspaper *La Jornada*, declaring that a respiratory illness had 'sickened up to 60% of residents' in La Gloria, Veracruz (HealthMap, WWW; Brownstein et al, 2009: 2156). On 2 April 2009, a second report, published in the Mexican magazine *Proceso*, described the possible role of Granjas Carroll, a US-owned pig farm, also located in Veracruz, in the epidemic (Brownstein et al, 2009: 2156). This account, and subsequent media broadcasts within Mexico, reported that residents in these specific locations suspected the source of illness to be related to manure 'lagoons' sited at that particular farm, resulting in two deaths and 400 people being taken ill (HealthMap, WWW).

According to Brownstein et al (2009), a GPHIN report to the WHO, sent on 10 April 2009, on articles detailing an outbreak of acute respiratory illness in Veracruz prompted the global institution to contact the Mexican authorities for further information (see also, Harris, 2009). GPHIN was seen, therefore, to act as mediator, transmitting information from localities in Mexico to the WHO. Following further verification from Mexico, the WHO was able to respond with its first disease outbreak notice on 24 April 2009. A day later, the Director-General formally declared the event a 'public health emergency of international

concern’ (WHO, 2009b). On 27 April 2009, the WHO raised the level of pandemic alert to Phase 4 'medium to high'. Two days later it was increased to Phase 5 'high to certain’.

During this initial, complex, period the WHO began explicitly to issue advice to member states on public health interventions, based on the need for global cooperation. It counselled that ‘all countries intensify surveillance for unusual outbreaks of influenza-like illness’ (WHO, 2009b) and stated that it was ‘not recommending any travel or trade restrictions’ (WHO, 2009c). This advice was repeated in a series of, initially almost daily, updates issued from 26 April 2009. In effect, the WHO sought to mitigate fears of damage to tourism and trade that had been a motivation for member states to conceal previous disease outbreaks (Giesecke, 2000).

Yet, the actions of certain countries went well beyond this, militating against speedy compliance with the notion of global governance (Gostin, 2009). China, for example, required incoming passengers to report flu-like symptoms at ports of entry when arriving from H1N1-affected areas (*BBC News*, 2009). Singapore was one of many countries that deployed thermal scanners to screen air passengers on arrival, whilst Japan increased the use of pre-existing scanners at Narita International Airport (*Reuters*, 2009a). Moreover, and in direct contravention of WHO advice, measures were introduced aimed at restricting travel. On 28 April, Cuba became the first country to suspend flights to Mexico, an action that had been adopted by a number of tour operators across Europe, including Thomson and Thomas Cook (Bone et al, 2009). Other member states - such as the UK, Australia, France and Switzerland - advised against 'non-essential' travel to Mexico (Bone et al, 2009). These actions proved contentious. The UK's travel advisory - issued against Mexico on 27 April 2009 by the Foreign and Commonwealth Office - resulted in strong debate

within government as to its efficacy[6]. Moreover, some academics asserted that Mexico – stigmatised by negative media coverage and by references in certain quarters to the outbreak as 'Mexican Flu' (Gostin, 2009: 2377) - was being 'singled out […] for all the wrong reasons' (Condon and Sinha, 2009: 21).

ii. 29 April 2009 – 10 June 2009 (WHO alert at Phase 5)

This period represented the peak of global and, arguably, national media coverage of the H1N1 outbreak (Warren et al, 2010). During this Phase, GPHIN was retrieving a total of 30,000 articles a day[7], a considerable increase on the 4,000 articles collected on a 'normal' day (Brownstein et al, 2009). The retrieved articles were geo-coded, although, according to GPHIN, this was not always accurate due to errors on the part of the news publishers[8]. Nevertheless, this attempt to ground the initial reporting of the event in particular places was significant. It gave specificity to the H1N1 outbreak and facilitated the tracking of its geographical spread - from Mexico and the US, to Canada and then Spain (WHO, 2011). Whilst this locational reporting could be used by certain countries to discriminate against selected others, arguably it also influenced the subsequent actions of the WHO which sought to harmonise and integrate national approaches to biosecurity (Bingham et al, 2008). Indeed, the WHO signalled the importance it attached to global cooperation when it combined with the FAO, the OIE and the World Trade Organization to issue a joint statement on the H1N1 virus, declaring that the consumption of pork posed no sanitary risks (WTO, 2009).

At this time, it was reported that 20 countries had banned meat imports from Mexico, Canada and the US (Gostin, 2009). Key instigators included China and Russia, two of the

[6] A number of senior UK public health officials disagreed with the advisory, not least because it conflicted with the guidance being given at the time by the WHO (personal communication, 08/03/11).
[7] GPHIN official, personal communication, 13/01/10.
[8] GPHIN official, personal communication, 17/06/10.

world's largest pork importers, together with a number of South East Asian countries such as Indonesia, Thailand and the Philippines. Yet, our research failed to locate any national plans in this region explicitly sanctioning trade embargos, other than those relating to avian influenza (Philippines, 2005; Indonesia, 2006; Japan, 2007; Thailand, 2007). Additionally, social distancing measures were sporadically introduced in a number of states. For example, schools were closed in parts of the US and in the UK (Gostin, 2009), in line with pandemic preparedness documentation published in those jurisdictions (Cabinet Office and DH, 2007: 81-2; US, 2005: S4-18-S4-19).

The efficacy of these national actions has been questioned. For instance, whilst China claimed that its virus-containment efforts appeared to have been 'an amazing success' (Yanzhong, 2010), WHO recommendations advised against entry and exit screenings as it did not believe they would help reduce the spread of the disease (WHO, 2009d). Cowling et al (2010) reported that the implementation of entry screening policies coincided with an average 7-12 days' delay in local transmissions of H1N1 in comparison with countries that did not implement entry screening. Yet it was also noted that, in countries where entry screening policies were in place, 'the majority of cases were identified through the local health care system after arrival' (Cowling et al, 2010: 7). School closures also proved controversial. In the US, the CDC quickly reversed its position on imposing this sanction (Gostin, 2009), whilst in the UK the timing of such shutdowns generated local hostility (Warren et al, 2010).

iii. 11 June 2009 – 09 August 2010 (Phase 6 'pandemic in progress')

The final moment began with the WHO's formal declaration of pandemic Phase 6 on 11 June 2009 and concluded its announcement on 10 August 2010 that 'we are now moving into the post-pandemic period' (WHO, 2010c). On declaring the onset of pandemic Phase

6, Margaret Chan gave general guidance to member states, requesting that those with little or no cases ‘remain vigilant’, whilst countries experiencing widespread transmission focus on ‘appropriate management of patients’ (WHO, 2009e). The WHO also advised countries to continue to implement their preparedness plans (WHO, 2009f). Ironically, it became clear that some national plans contained measures which conflicted with WHO guidance. The inconsistency in the advice received and the practices that followed was stark.

For instance, pork import bans remained in place, in some cases for several months. Russia did not withdraw its embargo until October 2009 (*Reuters*, 2009b), China’s ban continued until late November 2009 (Niu and Miles, 2009) and Indonesia’s H1N1-related prohibition persisted until February 2010 (Ekawati, 2010). At the same time, China continued to quarantine travellers throughout summer 2009 in spite of international criticism (Metzl, 2009). According to Yanzhong (2010), memories of SARS and the high 'political and economic stakes' faced by Chinese politicians in the run-up to the 60th anniversary of the 'People's Republic of China', helped justify their 'aggressive' response to the H1N1 pandemic. Therefore, the financial and diplomatic costs (in terms of strained relations with Mexico, Canada and, potentially, the WHO) were, for Chinese government leaders, 'secondary' to the projection to their population of an image of 'a caring government fully in charge' (Yanzhong, 2010). These illustrations of the deliberate flouting by member states of global guidance demonstrated the challenges faced by the WHO in securing cooperation in the face of individual national interests.

Discussion

The global spread of infectious disease is a critical twenty-first century concern. The outbreak of H1N1, the first pandemic outbreak for over 40 years, provided an early test of

the operation of event-based surveillance systems which had been transformed following the 2003 SARS epidemic. It also opened to scrutiny the WHO's new disease reporting and verification framework, established under the IHR (2005). In the context of a contemporary global focus on anticipation and preparedness, examined earlier in this paper, our discussion centres on: (i) the spatialities of public health surveillance, and the efficacy of the subsequent global response to the H1N1 outbreak; (ii) the diversity of member state pandemic planning and biosecurity practices. We argue that, whilst surveillance systems opened up a space for interaction between local and global scales, the complexities engendered by manifold national pandemic preparedness and response measures 'intervened' in some instances to 'disrupt' the smooth implementation of global public health governance.

i. Spatialities of public health surveillance

As Margaret Chan pointed out, the ongoing 'revolution in communications and information technologies' had assigned heightened significance to the work of global public health surveillance systems (WHO, 2010a). In enabling the rapid retrieval of 'informal' information across a range of localities, data collected through these mechanisms has been used by the WHO and its member states to anticipate threats which, to use Ingram's phrase, 'do not yet exist' (2010: 296). In the process, the surveillance systems act as intermediaries, facilitating a local-global dialogue. The technologies are largely deployed and developed by organisations in the global North, yet their success is dependent on the reporting of events in places across the global North and South. Moreover, decisions made by these systems to issue alerts are, in the main, dependant on uncovering largely 'informal' information broadcast through local press reports, news wires and online sources such as discussion sites (Grein et al, 2000). In the case of H1N1, our research has demonstrated that, through a process of 'verification', this information became 'formalised' and

established a basis for issuing global alerts. Thus, implicit in this local-global interaction, was detailed analysis derived from information in the public domain, on what was said rather than what was left unsaid. Undoubtedly, there will be selectivity in the reporting process and a partiality in the information derived.

Significantly, by the time of the 2009-2010 H1N1 outbreak, the IHR (2005) permitted the WHO to act on 'informal' outlets, such as locality-based information retrieved by global surveillance networks. Arguably, this enhanced the scope of the WHO to issue global public health alerts without necessarily requiring national verification and to secure member state cooperation in global pandemic preparedness. At the same time, the WHO emphasised that its pandemic preparedness guidance was intended 'to inform and harmonize', rather than replace, member state preparedness and response 'before, during and after an influenza pandemic' (WHO, 2009a: 9).

This public diplomacy aside, in seeking to drive global cooperation, the WHO's authority was undoubtedly constrained. It remains dependent on access to surveillance systems, the receptiveness of member states to verification of 'informal' information and the strength of informal professional networks between member states and the WHO. In our case study, it was clear that the WHO could acquire information from a number of surveillance systems. Furthermore, although it could act without member state cooperation, the WHO publicly praised the Mexican government for demonstrating 'responsibility and transparency' in responding to its enquiries and in sharing its virus samples with WHO Collaborating Centres (CDC, 2009; *Daily Telegraph*, 2009; Harris, 2009). Cooperation did exist between the WHO and selected member states over *verification* of this public health emergency. However, the joint working was complex. It involved anticipation of – and preparedness for – an event (an influenza pandemic) that had not yet been detected in

some countries. Moreover, for the WHO, the imperative to establish a bridge between preparedness, and response, arguably shaped its interpretation of the information it received from event-based systems. Significantly, during the onset of the H1N1 pandemic, there followed widespread debate in academic and policy circles over what should be a proportionate response (Brown, 2009).

Subsequent to its declaration of an influenza pandemic in June 2009, the WHO was criticised for the 'delay' in its response (Brown, 2009). Conversely, when the outbreak proved to be less severe than initially feared, it was accused of 'overstating' the dangers posed by the pandemic. Indeed, a draft report commissioned by the Council of Europe accused the WHO of 'lacking transparency' (Bosely, 2010). In particular, questions were raised in that document, and elsewhere, about conflicts of interest among members of WHO advisory groups and expert committees, with many individual members understood to have received funding from pharmaceutical companies that manufactured antivirals and influenza vaccines (Bosley, 2010; WHO, 2010d). Although the WHO-commissioned Review[9] found no evidence of malfeasance, the controversy was a reminder of the complexities involved in engaging stakeholders from technology companies, vaccine manufacturers and national governments in affecting global response to a pandemic (WHO, 2011).

ii. Diverse national biosecurity practices

Hinchliffe and Bingham (2008) have noted the varied national measures involved in the operation of biosecurity. Moreover, WHO pandemic preparedness guidance grants member states the right to develop their own national plan. Our case study research indicated that these plans did not appear to exist in certain countries, including Russia and

[9] The IHR Review Committee comprised a group of 'external' experts, not employed by the WHO. It first met in April 2010.

China[10]. There were also instances where individual countries went beyond global pandemic guidance and, in doing so, undermined and challenged the WHO. If the collection of 'informal' information by the WHO, via systems such as GPHIN, permitted a local-global dialogue which by-passed national governments, the imposition of control actions allowed national imperatives to be reasserted.

In extending beyond WHO advice, certain member states – particularly those most affected by the 2003 SARS outbreak - engaged in practices perceived to be exclusionary (Gostin, 2009). For example, in East and South East Asia, several countries not only imposed trade embargos, passenger health checks prior to disembarkation and thermal image scanning at major airports, but also implemented varying degrees of quarantine (China, Hong Kong and Singapore) and, in at least one instance, maintained a database of foreign visitors (Thailand) (Budd et al, 2010). These measures proved in the main to be of limited use. Although China credited its 'stringent' quarantine practices with postponing community-level transmission of the virus, their duration was criticised (Metzl, 2009). Moreover, little evidence supported the use of thermal image screening to calculate passenger temperature as a means of identifying travellers suffering from fever (Nuzzo, 2009). In addition, in order to 'secure' their borders, a number of countries explicitly acted *against* global guidance. For example, legally contentious pork embargos were imposed - initially against Mexico and parts of the US and Canada – by 20 countries including Russia, China, Philippines and Indonesia (Gostin, 2009). In spite of consistent WHO advice from late April 2009 (WHO, 2009g), travel advisories were also enacted by various states, including China, Hong Kong, Argentina and Cuba (Gostin, 2009).

[10] Personal communications with relevant WHO regional offices and, where possible, appropriate national government agencies (21/12/10, 18/01/11, 19/01/11).

There is evidence, therefore, that in seeking to anticipate the virus, independent actions by some WHO member states and, with this, the stigmatisation of certain others, challenged the authority of the WHO. Whilst the IHR (2005) provided the WHO with a legal basis for requesting the withdrawal of these unilateral measures, there is no indication that the WHO exercised this redress during the 2009-2010 H1N1 influenza pandemic. If global health security is indeed a projection of the 'neocolonial' global North interests as Weir and Mykhalovskiy (2006, 2010) argue, then it is being undermined by selected member states in the global South. Equally, global governance is being challenged by a range of countries across both hemispheres. Thus, whilst Braun argues 'biological existence' in the global South is ever more subject to biosecurity projects that 'seek to pre-empt risk through new forms of sovereign power', we contend that there is scope for autonomy, and independent biosecurity practices by individual countries, within what some critics may perceive as a new manifestation of 'empire' (2007: 25). Granted, the consequences of this autonomy have not been overlooked. Indeed, the WHO Review suggested that the 'impact' of the unilateral border measures adopted by member states be assessed, with a view to producing tighter 'guidance for future events' (WHO, 2011: 14).

Conclusion

The use of event-based surveillance systems raises new questions about scales of global public health governance. The space between preparedness for, and responses to, global infectious diseases is occupied by 'informal' information gathered by surveillance networks on real-time events. Technologies deployed by systems such as GPHIN are fundamental in identifying, and drawing global attention to, an 'event', situated in particular localities, bypassing national borders in the process. As a consequence of this technological openness, particular locations occupy important positions in the reporting process, and WHO member states are no longer able to withhold information on an 'event' that is in the

public domain. National autonomy is reasserted, nevertheless, through the control actions deployed. Moreover, as the experience of Mexico demonstrated, whilst surveillance systems ascribe a new status to the locality, in practice particular places, including entire countries, can be stigmatised through negative representations in the media and the deployment of punitive national health security measures.

Whilst health geopolitics literature has focused on national-global relationships, such as those between the US, WHO and the global South, we argue that, during the onset of the 2009-2010 H1N1 pandemic, alternative national interventions were at play. Rather than global health security representing a projection of global North interests, space remained for the exercise of national sovereignty and control. In this supposedly new era of international health diplomacy, the drive for global health governance has prompted a complex range of technological interactions, diplomatic engagements and biosecurity practices across local, national and global scales.

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