

Original Article

Transboundary crisis networks: The challenge of coordination in the face of global threats

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Abstract In today's interconnected world, transboundary crises such as pandemics, ecological and financial crises are becoming both more frequent and more devastating. The transboundary nature of these threats requires actors at various administrative and geographical levels to create joint responses which, at the aggregated level, form the basis of a global crisis management network. However, the forming of such a network is challenged by ambiguity, complexity and uncertainty in terms of responsibility, cooperation and mandates. In order to overcome these deficiencies, the network should develop a delicate mix of organizational robustness and flexibility. The article explores the preconditions and functioning of such a global crisis management health network by proposing a model based on coordination systems and practices of importance to the response. The SARS outbreak in 2003 will be used to illustrate the model. The article ends by exploring the preconditions for global crisis management based on how levels of formalization may impact on the network's capacity for adaptation and coordination.

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Introduction

In 2014 Africa experienced the most widespread and deadliest outbreak of Ebola to date, affecting Guinea, Liberia and Sierra Leone. The number of countries, together with the range of international actors involved in fighting the disease, poses severe challenges for coordination in terms of decisions, information and measures undertaken. In this article,

coordination in times of widespread infectious diseases will be explored using Severe Acute Respiratory Syndrome (SARS) as a case study. The SARS outbreak was a real global health threat with 8273 known infected cases and 775 deaths (a case-fatality rate of 9.6 per cent), and 28 countries and territories affected within 10 months (WHO, 2004). In demanding the attention of political leaders, international organizations and the public worldwide, SARS illustrates the problems associated with an unfamiliar crisis or the so-called ‘virgin risk/crisis’ (Kousky *et al*, 2010) challenging decision makers’ ability to recognize and react to novelty, and develop new skills in problem diagnosis, improvisation, communication and collaborative action (Leonard and Howitt, 2007). SARS tested the mettle of leaders and the robustness of institutions and organizations as well as the ability to form joint responses at the global level. An intriguing rationale behind this study is to deepen our understanding of how pandemics, such as SARS, require the formation and operation of global crisis networks defined as ‘an instantly formed, heterogeneous configuration of organizations, varying with the kinds of events to which they have to respond’ (Baalen and Fenema, 2009, p. 279). In this respect, SARS still serves as an illustrative case in highlighting the dynamics and challenges involved in managing truly transnational crises.

There is a growing awareness among crisis management scholars that the nature of crises and the corresponding implications for crisis management are rapidly changing. This has resulted in an increased interest in defining and examining the new crisis management landscape, which has been evolving as a result of increasing global interdependence. Boin and Rhinard (2008) coined the concept of ‘transboundary threats’ to define threats with the potential to cross geographic and functional boundaries. What sets this concept apart from the more traditional crisis definitions is its emphasis on the increasingly tightly woven web of critical interdependencies, which fit badly with the administrative designs of today’s nation states that were built for more ‘classical threats’ (cf. Boin, 2009; Ansell *et al*, 2010). Transboundary crises challenge institutions and political leaders by their complex causality, non-linear change, recombination potential and cross-scale cascading dynamics (Galaz *et al*, 2011). Actions are complicated by, for example, the inabilities of local communities to respond, as well as the difficulties involved in rapidly forming informal social networks with the capacity to compensate for the lack of formal crisis management structures (Quarantelli *et al*, 2006). Even though scholars have begun to define and map the challenges to management in the wake of transboundary crises, the phenomenon is still what Boin (2009, p. 375) and Lagadec (2009, p. 474) refer to as *terra incognita* in need of both empirical research – mapping out the real-world challenges facing actors – and new theoretical venues.

This article adds to the emerging research on transboundary crisis management by discussing the preconditions for, and the functioning of, global crisis

management networks. Based on previous research the study departs from the notion that these networks ought to consist of a delicate mix of organizational robustness and flexibility (Gunderson, 1999; Folke *et al*, 2005; Duit and Galaz, 2008; Ansell *et al*, 2010, p. 204). In taking SARS as an empirical case study, this article explores the global crisis management network capacity by identifying the various systems and practices that made up the network based on their level of formalization. Further, the article discusses the implications of formalization in terms of the global networks' capacity for adaptation and coordination.

Managing Adaptability and Coordination

Crisis management can be divided into managerial subtasks such as sense making, decision making, communication and learning (Boin *et al*, 2005). This article focuses on two of these tasks – sense making and decision making – due to their importance in effective management of pandemic outbreaks (Boin *et al*, 2005). If these tasks are challenging in normal crises, they become even more so in transboundary settings where crises spread across geographical and administrative levels. The cascading nature of these crises creates various forms of mismatches, such as between the problems at hand and the actors and institutional settings designed for managing crisis responses. Further, the notion of time creates another set of mismatches, here between the speed of the event itself and actors' responses (Cumming *et al*, 2006; Ansell *et al*, 2010). Adding to the challenges is the interconnectedness between various levels, where problems at one level easily cascade to another (Termeer *et al*, 2010; Galaz *et al*, 2011). As noted by Boin *et al* (2005, pp. 56–60), it is the rule rather than the exception for crisis management to be characterized by extensive cooperation among a large set of actors, which makes effective response highly complex and challenging. Coordination becomes difficult due to such aspects as limited planning, lack of organizational design, conflicting interests, up-scaling mechanisms and unwillingness to cooperate. On the other hand, coordination is facilitated by joint problem framings, mutual dependencies and incentives to improve cooperation (Klijn and Koppenjan, 2000, p. 144). In order to quickly meet the shifting preconditions created by transboundary dynamics, actors need the ability to actively and rapidly transform existing arrangements by creating new and more suitable structures and processes (Walker *et al*, 2004; Olsson *et al*, 2006). The management tasks become even more complicated in a global crisis management network characterized by loosely coupled systems consisting of diverse actors who are responsive but to a large extent separated (cf. Weick, 1976). The loose network structure then requires actors to be capable of instant coordination with key actors as well as 'rapid reintegration of circumstances and timely reorganization of activities and course of action' (Ansell *et al*, 2010).

Coordination can basically take place in two ways: by pre-established systems with clear lines of authority or through a process of self-organization among concerned actors (Ansell *et al*, 2010, p. 203). Drawing upon Chisholm's (1992) observation, Boin *et al* (2005, p. 61) argue that coordination is in fact seldom the result of leaders' deliberate attempts to create order but emerges through a system characterized by informal channels, norms, behaviours and agreements. On the other hand, Klijn and Koppenjan (2000) underline that complex and interlinked systems composed of various networks also require some form of network management. In connection to the SARS response, Schillimeier (2008, p. 190) uses the term *cosmo-politics* to underline the delicate interplay between various administrative levels engaged in the response and the need for local practices to be conducted in the spirit of global standards, creating a cosmo-political mindset. Thus, transboundary crisis management requires both formal routine structures as well as spontaneous and informal networks. Further, these tasks and the balance between the response capabilities are different based on the crisis management challenge at hand, sense or decision making.

Methods and Material

The article relies upon case studies developed in a cross-national research project on the management of SARS in Mainland China, Hong Kong and Canada, as well as media studies and insights from the WHO operation in China (Olsson and Xue, 2011). The country case studies were conducted using a process tracing method (George and Bennett, 2004) applied to the study of crisis management from a cognitive-institutional perspective, which aims to identify actors, decisions, institutions and processes of vital importance to the crisis in question (cf. Stern and Sundelius, 2002). In addition, secondary sources and previous studies on SARS of importance to the analysis have been consulted. It should be noted that, owing to the natural 'messiness' inherent in truly transnational crises involving a large amount of varied actors, that this article does not claim to provide an exclusive list of all actors, systems, practices and processes involved.

SARS Crisis Management Systems and Practices

The empirical section describes the systems and practices of importance to the management of SARS, divided into the sense-making and decision-making tasks. In exploring existing actors, structures and practices of relevance to sense making and decision making, three levels of systems and practices were identified based on the level of formalization: low, medium (boundary spanning) and high levels of formalization. The mechanisms with high levels of formalization were pre-established everyday practices; the medium level

practices were the ones created with the explicit goal of overcoming system deficits (cf. Berkes, 2006), and the low and informal practices were the self-organizing practices that arise spontaneously in the midst of the crisis.

Sense making

In connection to the sense-making task, three sets of actors of relevance for identifying and providing information on SARS were identified throughout the global crisis management system: governmental agencies, established expert networks as well as media and new information technologies.

Formal systems

The most obvious obstacle to information sharing in the SARS case was the initial denial and cover-up by the Chinese authorities. When, in early March 2003, it was clear that the disease was a serious threat the medical staff at Beijing's hospital were briefed about the outbreak but were told not to go public with the information for fear of jeopardizing the ongoing National People's Congress (NPC) meeting in Beijing, which is the most important annual political event in China. However, despite China's claim to have the situation under control, on 12 March, WHO announced a global alert and three days later named the new disease the 'Severe Acute Respiratory Syndrome' (SARS) and issued a travel advisory. On 2 April, a travel advisory was also issued for Hong Kong and Guangdong. The Chinese government remained quiet until 9 April, when a retired military physician bravely released a written statement to several news organizations revealing that the numbers at Beijing's No. 309 People's Liberation Army hospital were much higher than previously reported. The cover-up meant that there was little reliable information available from the official Chinese government sources, which delayed the initial efforts at curbing the outbreak in China and around the globe (Zhong, 2011).

It was not just deliberate attempts to conceal information which added to the problems in the initial stage of the outbreak, but also a lack of suitable institutional arrangements and structures. This was evident in, for example, the Hong Kong Special Administrative Region (HKSAR), where, due to the lack of a formal surveillance system, the Government was forced to rely on reports from health-care providers (Shen, 2011). Modern surveillance systems were likewise lacking in Canada where health-care units relied on paper-based tracking systems that seriously hampered their ability to track the outbreak (Baalen and Fenema, 2009, p. 282). The lack of institutional structures not only affected the initial responses at the national level but also had effects on the transnational level. For example, even though there was already an agreement in place between several cities located in the Pearl River Delta of Guangdong (including the exchange of monthly statistics and information on specific

infectious diseases), the system was unable to detect the SARS outbreak. One of the reasons for why the system failed to identify the disease can be attributed to the fact that it did not allow for information exchange about diseases that were not already listed in the system, such as SARS (Shen, 2011). In general, one of the main reasons for why most organizations failed in detecting non-routine signals is that they were not designed to search for information that went beyond their everyday mandate (Cyert and March, 1963; Simon, 1976; Boin *et al.*, 2005, p. 21). Further, the system was designed to exchange information from cities participating in the agreement, which resulted in there being no such exchange between the HKSAR and mainland China's other cities and provinces outside this regional agreement. When the HKSAR received the first alarm from the media on 10 February, they tried to get information from the health authorities in Guangzhou, but the latter did not reply. The HKSAR was unable to obtain any information until they contacted the Ministry of Health in Beijing. This made the HKRS Government initially repeat the reassurances from the Chinese Government to the public in stating that the epidemic was isolated and had been brought under control. As a result, no public warning was issued on cross-border travelling in relation to the WHO announcement on 10 February stating that 350 cases had been found in Guangdong (Kaman Lee, 2007). According to Shen (2011), the lack of cooperation between the HKSAR and mainland China was not only based on structural institutional misfits. It was also the result of cultural differences and a lack of willingness to communicate with an unknown organization (cf. Drabek, 1985; Quarantelli, 1998, pp. 373–385).

WHO's most important institutional process for coordinating action on emerging diseases of international concern was the International Health Regulations (IHR). Similar to the Pearl River Delta Agreement, the main problem with the IHR was that it only required countries to report outbreaks of cholera, yellow fever and the plague.¹ Apart from WHO, pan-regional organizations also played a role in information sharing between Asian countries. Even though China had joined the regional ASEAN Disease Surveillance Network in September 2000, and the APEC Infectious Disease Strategy in October 2001, SARS made it obvious that China was not following the information sharing and response measures suggested by the networks. WHO tried to intervene by urging China to share information about the outbreak in Guangdong to its neighbouring countries on several occasions without any success (WHO, 2009, p. 11).

Cross-level mechanisms

As can be seen above, even though WHO faced difficulties related to information collection and sharing, much of WHO's success over the last decade has been due to developments in new information technologies, which has created an independence from official reports (Heymann and Rodier, 2004; Galaz, 2009). An important source of information on the SARS outbreak was the Global Public Health Intelligence Network (GPHIN) maintained by Health

Canada that searches through a variety of online sources. GPHIN provides information to WHO if required. Yet another established forum for information exchange is Global Outbreak Alert and Response Network (GOARN) consisting of 120 public health institutions around the world.

The first reports of SARS came in November 2002 when GPHIN, GOARN and the US Global Emerging Infectious Surveillance and Response System picked up reports on an influenza B outbreak in Beijing and Guangzhou. The first notification about an unusual outbreak of a pneumonia-like disease in Guangdong was received by the WHO office in Beijing on 10 February (Heymann and Rodier, 2004). Chinese authorities confirmed the reports to WHO the next day, at the same time emphasizing that the situation was under control. As a result, surveillance increased throughout the region, which led to the identification of new cases. This resulted in WHO expressing concerns to China about non-transparency on 11 March (Heymann, 2006). According to Fidler (2004, pp. 801–802), the move towards relying less on official country reports and more on unofficial sources can be illustrated by three developments. Firstly, especially against the backdrop of China's initial stonewalling, the SARS outbreak placed the spotlight on the importance of non-official information for early warnings on pending epidemic emergencies. It should also be noted that with the exception of China, other affected countries did actually inform WHO initially. Secondly, WHO managed to coordinate efforts producing surveillance information, scientific research on SARS and guidelines regarding clinical treatment. Thirdly, WHO independently issued travel restrictions and advice, which was a break from previous practices where such measures were taken with the consent of affected countries.

Informal systems

The role of the media in detection and early warning is often highlighted in relation to crises. In contrast to other actors such as governmental agencies, the media is often praised for its ability to pick up signals and contribute to information spreading across borders and nations in times of crises. However, findings from the SARS crisis showed that, the so-called 'media logic'² rather hampered the media's ability to report on a new phenomenon such as SARS, for which there was no previous point of reference. According to Deppa *et al* (2011), the media's modes of production produce four main barriers summed up as: novelty, under control, misunderstanding of panic and professional experience. The novelty and complexity of SARS created problems for the media in both picking up as well as making sense of the information available.

Adding to the problem was also the media's inherent need for official sources to confirm new problems, which tends to make journalists hostages to the official rhetoric. This is a paradox, since established sources of information (such as governmental representatives) tend to emphasize that the situation is under control (cf. Quarantelli, 1996, 2002; Scanlon, 2007, p. 83). One reason

for the Canadian media's heavy reliance upon official sources during the initial reporting period was that the media feared that alarmist reporting might lead to panic among the population. This resulted, for example, in Canadian news reports based on the Canadian Government's information. This became an obvious problem in April 2003 when the media claimed the spread of SARS to be under control in Canada, only to be followed by a second wave of outbreaks in May (Deppa *et al*, 2011; Markel and Stoney, 2011).

The problem with conflicting information was not limited to Hong Kong and Mainland China but also arose in Canada. Markel and Stoney (2011) highlighted how new information technologies with the possibility of publishing 24/7 led to incorrect information and rumours spreading. The pressure on media actors to continually report in combination with conflicting and out-of-date information led to confusion concerning fundamental issues: such as if SARS was contagious or not, how it was spread, and whether or not it was under control. Again, this is problematic given how important reliable information is for stopping the spread of rumours. In the end, the inability of Canadian authorities to communicate the crisis properly fuelled confusion among citizens. In particular, the conservative press in Canada initially downplayed the threat of SARS by arguing that the sensationalist reporting only served to increase university budgets and the number of news managers (Atkinson, 2011).

As noted by scholars in emergency and disaster management, the use of new information technology devices plays an increasing role in information exchange and self-organization (Palen *et al*, 2009). Informal information sharing was of particular importance in China where Chinese citizens played a vital role in raising awareness and putting pressure on decision makers to release official information. In the early stages of the outbreak, Short Message Service (SMS) played a vital role in information exchange in the Guangzhou area. The number of SMSs exploded after the Chinese New Year Holiday on 8 February, when 126 million text messages were exchanged over a period of three days.³ Owing to the lack of official information, personal networks became essential for people trying to confirm the information received by text messages (Tai and Sun, 2007, p. 998).⁴ In contrast, the Internet played a marginal role in the initial stage of the outbreak and only gained momentum when the disease spread to other areas in Mainland China, and in particular to Hong Kong (Tai and Sun, 2007, p. 999). However, it should be noted that unofficial information, that is denied or not confirmed by authorities, has its own problems. In this case, the fragmented information from the Internet as well as personal SMSs in combination with the Chinese government's official information (which was incomplete and sometimes even inaccurate) amplified the spread of rumours (Zhu, 2011). Consequently, this lack of trust in the information provided by the Chinese government meant there were no reliable, trustworthy and credible information sources. This is particularly troublesome in the context of infectious diseases, where incorrect and conflicting

information can prove counterproductive. According to Ma (2008), the massive amount of rumours transmitted in Mainland China during the SARS outbreak can be explained by a unique combination of Chinese culture, the restricted media environment and the use of new information technologies.

Decision making

In connection with decision making, three sets of actors were identified as essential for managing the event once detected. These were governmental administrative actors at various levels, the *ad-hoc* structures created in the midst of the crisis and finally informal expert networks.

Formal systems

What all three administrative units in the study (Canada, Mainland China and Hong Kong) had in common was the lack of existing structures for dealing with the SARS crisis. The main reasons for the difficulties encountered had to do with SARS being a new type of pandemic never seen before, which resulted in the lack of appropriate administrative structures to deal with the disease. The problems within China when SARS broke out in southern China at the end of 2002 were made worse by the lack of a unified national Chinese body for crisis management (Zhong, 2011). In the case of China, SARS challenged both the administrative structures within the government as well as between the government and the military. In order to fully understand the problems posed to China by SARS, one has to grasp the inherent complexity and inconsistencies both between different levels of government and with various governmental agencies.

China's government is organized in a largely vertical system, with five levels of government: central, provincial, prefecture, county and township. The roles and responsibilities of government are ambiguous, with many jurisdictional gaps and contradictions. Structural inefficiency, paired with often poor communication both vertically between different government levels and horizontally between different bureaucratic agencies, results in an inability to create a clear crisis management system (Zhong, 2007). One example of administrative complexity was that the hospitals in Beijing belonged to four different jurisdictions; central government, local government, the army and the armed police forces, which had no jurisdiction over each other. The divided information channels made it difficult to detect the causes of the epidemic, to identify channels of contamination and, based on that, to correctly size up the situation. In general, the crossing of functional lines created confusion due to a lack of clear roles and mandates, hampering cooperation between Chinese agencies – such as for example between the Beijing municipal level and the central government.

Local responses such as the Beijing response were hampered by the lack of a national coordinating body with the capacity and authority to coordinate Beijing's response with those of other municipalities, the central government,

the army and relevant international organizations. The situation led to bureau-political infighting throughout the system which had a negative effect on the SARS reporting system (Zhu, 2011). Further, the system remained somewhat fragmented and haphazard throughout the crisis management, where the institutional fragmentation and the lack of leadership caused difficulties in receiving information from China. Throughout the crisis, WHO received data from two sources: the epidemiological department at the Chinese Ministry of Health (MOH) and the Chinese Center for Disease Control and Prevention (CDC). Adding to the problem was the fact that information flows within the Chinese CDC were organized into central, provincial and city and municipal levels resulting in no-one having a clear overview of the situation. Not only was the international response plagued by coordination problems at the national level, but also WHO lacked a clear mandate for taking a leadership role (Deverell, 2011). After China's U-turn in April 2003, the country started to engage itself in information sharing measures within the regional frameworks such as ASEAN as well as with WHO. China did, for example, sign a joint ASEAN declaration on controlling the spread as well as contributing with funding to set up the China-ASEAN corporation programme on SARS. In collaboration with other Asian countries, measures such as establishing a hotline network for more effective information sharing as well as regional standardized measures in general were decided upon (Chan *et al*, 2009, p. 11).

Adequate structures were also lacking in HKSR where the Government tried to get around the situation by setting up various *ad hoc* structures (Shen, 2011). A similar fragmented institutional setting was prevalent in Canada's public health authority, which was multi-levelled and complex. At the time of the SARS outbreak, Ontario was the only province lacking a regional health authority, and therefore was unable to coordinate efforts for a major outbreak. Further, the division of responsibility between the local and provincial powers led to dual roles and responsibilities. To sum up, cooperation between the municipal, provincial and federal levels was characterized by confusion, conflict, duplication and inconsistency (Markel and Stoney, 2011).

Cross-level mechanisms

Owing to lack of clear leadership, the Chinese authorities were caught off guard when faced with an unfamiliar and unwelcoming phenomenon such as SARS. Instead of one leading agency with a clear mandate, the response at the central level became dependent upon *ad hoc* solutions. The crisis response was handled in accordance with the existing legal framework, which was characterized by a strict division of labour and responsibility between several central agencies affected by the crisis. There were then no legal possibilities to create a central unit that could handle the necessary strategic planning. Instead, the government had to adjust the response in accordance with the existing plans and practices originally developed for the safety of society in general. However, the *ad-hoc*

character of the response fitted well into the Government's general tendency to rely on *ad-hoc* solutions in times of threats or crises, arguing that it 'sharpens its spears at the last moment' (Zhong, 2007). Somewhat paradoxically, in this case, the Government's practice of relying on an *ad-hoc* style of management resulted in less flexibility and a compromised improvisational capacity when handling the SARS outbreak.

At the local Chinese level, the Beijing municipality only gained momentum for a response once internal coordination was organized. It was not until 23 April that the state council, China's cabinet led by Premier Wen Jiabo, decided to set up the SARS Control and Prevention Headquarters with the Vice-Premier Wu Yi as its Commander-in-Chief. This solution resulted in China finally getting a central unifying command system able to integrate various national institutions important in combating the outbreak. However, as emphasized by Zhu (2011), the command centre was dependent upon the top leaders of the country, which led to an up-scaling of the decision-making process, resulting in centralization and politicization of the operative crisis management (cf. Snyder *et al*, 1963; Rosenthal and Kouzmin, 1991; Stern and Sundelius, 2002). It should thus be noted that when the Chinese top leaders reacted in May 2003, with the nationwide launch of the Government's large-scale public health plan, the response was very effective in mobilizing resources nationwide including the public (Deverell, 2011; Zhong, 2011).

Bureau-political infighting and politicization was not only a setback in China. Even though the HKSAR Government set up a central body soon after the Prince of Wales Hospital outbreak on 14 March, not all decision-making power was centralized to the task force (even though its role grew with time). On 25 March, yet another body was set up, namely the Chief Executive's Steering Committee (CESC). In addition, the Government set up the Inter-departmental Action Coordinating Group aimed at coordinating the implementation of decisions. Altogether there were three *ad-hoc* bodies within the government dealing with the issue, which resulted in a response heavily influenced by bureau-politics. One of the main criticisms from Hong Kong residents was the Hong Kong administration's inability to issue the same information to the public. Yet this changed on 19 April, when the Hong Kong Hospital Authority (HA) and Department of Health (DH) started to hold joint press conferences as a response to such criticism (Shen, 2011).

Informal systems

The lack of functional formal structures between China and WHO caused severe problems for WHO in managing the outbreak. In practice this meant that crisis management had to be organized on an informal basis, where personal contacts and networks played an important role. The duality of the process shaped a response characterized by centre-field tensions, where the lower levels of WHO at times had different information and priorities than the

central level (cf. 't Hart, 1997). Owing to the initial denial and cover-up, China started the process with a huge trust deficit, which affected the way WHO handled the process and the amount of control they felt was needed in order to make sure that China was keeping to its obligations. WHO had a delicate mission in China since it had the task of determining if China was able to contain the outbreak on its own. At the same time, WHO had to convince the Chinese authorities that their role was to assist them (Deverell, 2011). The coordination between China and WHO was conducted through two types of meetings held between Chinese and WHO officials: formal and informal. According to one of the WHO experts in China, whereas the formal meetings were highly politicized and had a tough tone to them, the informal expert meetings had more of a friendly character where trust was created through intense and close cooperation, which substantially improved cooperation between the two parties. According to the WHO expert working closely with the Chinese team, both the Chinese and WHO experts shared the frustration with WHO central level. For example, the WHO members from the central level urged the Chinese authorities to hand over all the numbers they had regarding SARS so that WHO could do a proper analysis. This greatly upset the local WHO team members situated in Beijing, since it was obvious that WHO central level distrusted the information they had already supplied. What is interesting here is the WHO representative in the Beijing team was also frustrated by the sceptical attitude that WHO central level had towards the assessments made in Beijing, even though the WHO Beijing team were actually sitting on all of the first-hand data (Deverell, 2011).

Final Discussion

In the last and concluding section, the merits of the various systems and practices that made up the global crisis system during the SARS outbreak will summarize and discuss, based on their degree of formalization separated into sense making and decision making (see Table 1). In the following discussion, the effects of various degrees of formalization on the capacity for adaptability and coordination will be explored.

Table 1: SARS systems and practices

		<i>Type of management systems and practices</i>	
		<i>Sense making</i>	<i>Decision making</i>
Degree of formalization	High	National and transnational regulations	National/regional and local government
	Medium	Established expert network	Governmental <i>ad-hoc</i> structures
	Low	Media and new information technology	Spontaneously emerging expert networks

In terms of sense making, SARS illustrates the problem associated with relying on formalized systems in times of truly new and surprising events. The first thing slowing the early response phase down was the initial Chinese denial and cover-up. The struggle between WHO and China illustrates the risk of power games in policy networks at the global level, where international organizations and nation states have different mandates, goals and resources that influence process outcomes (cf. Klijn and Koppenjan, 2000). It should thus be noted that even though the Chinese denial and cover-up of SARS at the early stage impacted negatively on the effectiveness of the initial response, the response was still problematic due to the fact that the initial symptoms of SARS were non-specific and therefore resembled those of many other respiratory infections (such as the common cold), which made detection and diagnosis hard. Since SARS was not listed in the Chinese Law on Infectious Diseases Prevention and Treatment, the IHR or Pearl River Delta regulations, it was unable to be detected by pre-designed formalized monitoring systems. Further adding to the problem was the lack of general public health measures (such as infection control, isolation and transmission precautions) at nation state levels as well as the lack of both mental and institutional preparedness at administrative levels (cf. Parker and Stern, 2002).

To some extent, the shortcomings in the formal systems could be overcome by the boundary spanning mechanism already established by WHO aimed at expert exchange of information. The tasks undertaken by GOARN during SARS included advising WHO on global alerts and travel recommendations, the setting up of virtual laboratories at the international level, the establishment of clinical guidelines and the provision of updated information (WHO, 2003; Michelson, 2005; Ansell *et al*, 2010). The fact that the networks were already in place contributed to their success, due to the general advantage of established networks where repeated interactions work to reduce uncertainty leading to familiarity and trust between actors (Moynihan, 2008, p. 356). Informal practices in terms of new information technology also worked as a way of overcoming the deficiency inherent in the formal system by grass root information exchange, which created public awareness and eventually put pressure on the Chinese government to release correct information. The downside of the new technology information was the spreading of rumours, which tend to be particularly troublesome in times when there is a lack of official information, an issue that highlights the need to interlink formal and informal mechanisms of information sharing for effective crisis response.

Moving on to decision making, established formal structures at the national, regional and local levels lacked the design needed to deal with the outbreak. The lack of suitable administrative structures at these levels made the problem cascade to the international level, which impacted on the ability for WHO as well as other affected nations to effectively deal with the matter. As a way to overcome the administrative misfit at the national level, Canada, China and HKSAR had to rely on various kinds of boundary spanning mechanisms in the

form of *ad-hoc* administrative structures.⁵ The set-up of these structures illustrated the capacity for adaptation at the national level in bypassing malfunctioning formal structures. However, even though the creation of *ad-hoc* structures was needed in order to cope with the event, they came with a price in terms of centralization and politicization, which eventually slowed down the response. Politicization and power games were also dominating the relationship between WHO and China at the official level. At the international level, the informal network consisting of WHO officials and Chinese experts functioned as a way of mitigating the negative effects of politicization and lack of trust between WHO and China at the highest levels.

Taken together, the study highlights the problems associated with formal structures in handling new and complex problems. In times of ill-structured problems with the potential to move rapidly across functional and geographical boundaries, various types of boundary spanning mechanisms and informal networks help to mitigate the effects of stale structures and create venues for adaptability in the overall network. Further, these mechanisms also provide assistance in connecting various levels in the overall network system with one another. The system is then dependent on various network managers at different levels in the system, with the ability to bridge and interlink parts of the system and ultimately facilitate the management of these nodes. The study reveals various examples of such interlinking and bridging, in particular the role of expert networks (cf. Haas, 1992) and new information technologies in creating situational awareness.

The challenge of creating effective crisis management systems and networks is then not only the matching of structures, practices and coordination mechanisms but also to foster joint problem framing among involved actors, contributing to the avoidance of short sighted political perspectives and self-interests. The study shows how informal systems such as new information technology can support the emergence of informal networks which can function as spontaneous coordination mechanisms.

The outbreak of SARS in 2003 represents a unique case of the new type of threat facing decision makers worldwide. Yet, pandemics are just one example of such crises and more empirical research is required in order to discover similarities and differences in other types of transboundary crises, especially aimed at describing and explaining the complex interplay of various crisis management systems and practices forming the global crisis management network.

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Notes

- 1 It should be noted that SARS functioned as an important trigger in revising the International Health Regulation (IHR) in 2005 even though need for reform had been noticed earlier (WHO, 2007). According to Fidler (2004, p. 801), SARS was a breaking point away from the reliance on traditional horizontal strategies and into what he refers to as ‘global health governance mechanisms’.
- 2 The media logic was first coined by Altheide and Snow (1979) and refers to the media’s tendency to report news in a dramatic, spectacular, entertaining, simplified, narrativized and fitting-with-conventional-values manner.
- 3 The massive transmission of text messages has been pointed out as an important reason for why the Chinese Government decided to lift the censorship on SARS-related information (Tai and Sun, 2007; Ma, 2008).
- 4 According to Thornton (2009, p. 32), the text messages sent between 8 February and 10 February 2003 contained the brief message ‘Deadly flu outbreak in Guangzhou’ and prompted local officials to temporarily break their stonewalling. On 11 February, Guangdong officials held a press conference stating that 305 cases had been reported, admitting the lack of known treatment and the uncertainty about whether the outbreak had been contained or not. Owing to orders from the provincial party official on 23 February, the brief period of openness that lasted through the run up of the National People’s Congress in March came to an end.
- 5 As a result of SARS, efforts have been made in Canada, China and HKSAR to establish a unified national emergency management system. For example, in China, a systematic approach was soon taken to change the old practice of dealing with different kinds of disasters separately by different government agencies to a new one that is aimed at building an integrated national emergency management system (Xue and Zhong, 2010).

References

- Altheide, D. and Snow, R.P. (1979) *Media Logic*. Beverly Hills, CA: Sage.
- Ansell, C., Boin, A. and Keller, A. (2010) Managing transboundary crises: Identifying the building blocks of an effective response system. *Journal of Contingencies and Crisis Management* 18(4): 195–207.
- Atkinson, L. (2011) SARS and representations of the morality of quarantine in Ontario, Canada. In: E.-K. Olsson and L. Xue (eds.) *SARS – From East to West*. New York: Lexington.
- Berkes, F. (2006) From community-based resource management to complex systems: The scale issue and marine commons. *Ecology and Society* 11(1): 45.
- Boin, A. (2009) The new world of crises and crisis management: Implications for policymaking and research. *Review of Policy Research* 26(4): 367–377.
- Boin, A. and Rhinard, M. (2008) Managing transboundary crises: What role for the European Union? *International Studies Review* 10(1): 1–26.
- Boin, A., ’t Hart, P., Stern, E. and Sundelius, B. (2005) *The Politics of Crisis Management*. Beverly Hills, CA: Sage.
- Chan, L.-H., Lee, P.K. and Chan, G. (2009) China engages in global health governance: Processes and dilemmas. *Global Public Health* 4(1): 1–30.
- Chisholm, D. (1992) *Coordination without Hierarchy: Informal Structures in Multi-organizational Systems*. Berkeley, CA: University of California Press.
- Cumming, G.S., Cumming, D.H.M. and Redman, C.L. (2006) Scale mismatches in social-ecological systems: Causes, consequences, and solutions. *Ecology and Society* 11(1): 14.

- Cyert, R.M. and March, J.G. (1963) *A Behavioral Theory of the Firm*. Englewood Cliffs, NJ: Prentice-Hall.
- Deppa, J., Seaberg, A. and Yao, G.H. (2011) Early international news flow about SARS: Interconnected or unconnected? In: E.-K. Olsson and L. Xue (eds.) *SARS – From East to West*. New York: Lexington.
- Deverell, E. (2011) An analytical memoir of the WHO operation in China. In: E.-K. Olsson and L. Xue (eds.) *SARS – From East to West*. New York: Lexington.
- Drabek, T.E. (1985) Managing the emergency response. *Public Administration Review* 45(Special Issue, January): 85–92.
- Duit, A. and Galaz, V. (2008) Governance and complexity – Emerging issues for governance theory. *Governance: An International Journal of Policy, Administration and Institutions* 21(3): 311–335.
- Folke, C.T., Hahn, T., Olsson, P. and Norberg, J. (2005) Adaptive governance of social-ecological knowledge. *Annual Review of Environment and Resources* 30: 441–473.
- Fidler, D.P. (2004) *SARS: Governance and the Globalization of Disease*. Hampshire/ New York: Palgrave Macmillan.
- Galaz, V. (2009) Pandemic 2.0: Can information technology help save the planet? *Environment: Science and Policy for Sustainable Development* 51(6): 20–28.
- Galaz, V., Moberg, F., Olsson, E.-K., Paglia, E. and Parker, C.F. (2011) The institutional dimensions of cascading ecological crises. *Public Administration* 89(2): 361–380.
- George, A.L. and Bennett, A. (2004) *Case Studies and Theory Development in the Social Sciences*. Cambridge, MA: MIT Press.
- Gunderson, L. (1999) Resilience, flexibility and adaptive management – Antidotes for spurious certitude? *Conservation Ecology* 3(1): 7.
- Haas, P.M. (1992) Introduction: Epistemic communities and international policy coordination. *International Organization* 46(1): 1–35.
- Heymann, D.L. and Rodier, G. (2004) Global surveillance, national surveillance and SARS. *Emerging Infectious Diseases* 10(2): 173–175.
- Heymann, D.L. (2006) SARS and emerging infectious diseases: A challenge to place global solidarity above national sovereignty. *Annals Academy of Medicine Singapore* 35(5): 350.
- Kaman Lee, B. (2007) The HKSAR government's PR sense and sensibility: Analysis of its SARS crisis management. *Asian Journal of Communication* 17(2): 201–214.
- Klijn, E.H. and Koppenjan, J.F. (2000) Public management and policy networks: Foundations of a network approach to governance. *Public Management: An International Journal of Research and Theory* 2(2): 135–158.
- Kousky, C., Pratt, J. and Zeckhauser, R. (2010) Virgin versus experienced risks. In: E. Michel-Kerjan and P. Slovic (eds.) *The Irrational Economist: Making Decisions in a Dangerous World*. New York: Public Affairs Books, pp. 99–106.
- Lagadec, P. (2009) A new cosmology of risk and crises: Time for a radical shift in paradigm and practice. *Review of Policy Research* 26(4): 473–486.
- Leonard, H.B. and Howitt, A.M. (2007) Against desperate peril: High performance in emergency preparation and response. *Communicable Crises: Prevention, Response, and Recovery in the Global Arena* Information Age Publishing.
- Ma, R. (2008) Spread of SARS and war-related rumors through new media in China. *Communication Quarterly* 56(4): 376–391.
- Markel, D. and Stoney, C. (2011) SARS in Canada: Lessons to be learned from the greater toronto outbreak. In: E.-K. Olsson and L. Xue (eds.) *SARS – From East to West*. New York: Lexington.
- Michelson, E.S. (2005) Dodging a bullet: WHO, SARS and the successful management of infectious disease. *Bulletin of Science, Technology and Society* 25(5): 379–386.

- Moynihan, D.P. (2008) Learning under uncertainty: Networks in crisis management. *Public Administration Review* 68(2): 350–365.
- Olsson, P. *et al* (2006) Shooting the rapids: Navigating transitions to adaptive governance of social-ecological systems. *Ecology and Society* 11(1): 18.
- Olsson, E.-K. and Xue, L. (2011) *SARS – From East to West*. New York: Lexington.
- Palen, L., Vieweg, S., Liu, S.B. and Hughes, A.L. (2009) Crisis in a networked world: Features of computer-mediated communication in the April 16, 2007, Virginia tech event. *Social Science Computer Review* 27(4): 476–480.
- Parker, C.F. and Stern, E.K. (2002) Blindsided: September 11 and the origins of strategic surprise. *Political Psychology* 23(3): 601–630.
- Quarantelli, E.L. (1996) Local mass media operations in disasters in the USA. *Disaster Prevention and Management: An International Journal* 5(5): 5–10.
- Quarantelli, E.L. (ed.) (1998) Where we have been and where we might go. In: *What is A Disaster?* London: Routledge, pp. 146–159.
- Quarantelli, E.L. (2002) The role of the mass communication system in natural and technological disasters and possible extrapolation to terrorism situations. *Risk Management* 4(4): 7–21.
- Quarantelli, E.L., Lagadec, P. and Boin, A. (2006) A heuristic approach to future disasters and crises: New, old and in-between types. In: H. Rodriguez, E.L. Quarantelli and R.R. Dynes (eds.) *Handbook of Disaster Research*. New York: Springer, pp. 16–41.
- Rosenthal, U. and Kouzmin, A. (1991) The bureau-politics of crisis management. *Public Administration* 69(2): 211–233.
- Scanlon, J. (2007) Research about the mass media and disaster: Never (well hardly ever) the twain shall meet. In: D.A. McEntire (ed.) *Disciplines, Disasters, and Emergency Management: The Convergence and Divergence of Concepts, Issues and Trends from The Research Literature*. Springfield, IL: Charles C Thomas, pp. 75–94.
- Schillmeier, M. (2008) Globalizing risks – The cosmo-politics of SARS and its impact on globalizing sociology. *Mobilities* 3(2): 179–199.
- Shen, S. (2011) SARS in Hong Kong. In: E.-K. Olsson and L. Xue (eds.) *SARS – From East to West*. New York: Lexington.
- Simon, H.A. (1976) *Administrative Behavior: A Study of Decision Making Processes in Administrative Organizations*. New York: The Free Press.
- Snyder, R.C., Bruck, H. and Sapin, B. (eds.) (1963) *Foreign Policy Decision Making*. New York: Free Press.
- Stern, E.K. and Sundelius, B. (2002) Crisis management in Europe: An integrated regional research and training program. *International Studies Perspectives* 3(1): 71–88.
- Tai, Z. and Sun, T. (2007) Media dependencies in a changing media environment: The case of the SARS epidemic in China. *New Media and Society* 9(6): 987–1009.
- Termeer, C.J.A.M., Dewulf, A. and van Lieshout, M. (2010) Disentangling scale approaches in governance research: Comparing monocentric, multilevel, and adaptive governance. *Ecology and Society* 15(4): 29.
- ’t Hart, P. (1997) Preparing policy makers for crisis management: The role of simulations. *Journal of Contingencies & Crisis Management* 5(4): 207–214.
- Thornton, P.M. (2009) Crisis and governance: SARS and the resilience of the Chinese body politic. *The China Journal* 61(January): 23–48.
- van Baalen, P.J. and van Fenema, P.C. (2009) Instantiating global crisis networks: The case of SARS. *Decision Support Systems* 47(4): 277–286.
- Walker, B.H., Holling, C.S., Carpenter, S.R. and Kinzig, A.P. (2004) Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society* 9(2): 5.

- Weick, K.E. (1976) Educational organizations as loosely coupled systems. *Administrative Science Quarterly* 21(1): 1–19.
- World Health Organization (WHO) (2003) The World Health Report, 2003: Shaping the Future. World Health Organization, Geneva.
- World Health Organization (WHO) (October 2004) WHO guidelines for the global surveillance of severe acute respiratory syndrome (SARS), http://www.who.int/csr/resources/publications/WHO_CDS_CSR_ARO_2004_1/en/, accessed 1 August 2015.
- World Health Organization (WHO) (29 April 2009) Statement by WHO director-general, Dr Margaret Chan, http://www.who.int/mediacentre/news/statements/2009/h1n1_20090429/en/index.html, accessed 1 August 2015.
- Xue, L. and Zhong, K. (2010) Chapter 12: Turning danger to opportunities: Reconstructing China's national system for emergency management after 2003. In: H. Kunreuther and M. Useem (eds.) *Learning from Catastrophes: Strategies for Reaction and Response*. Upper Saddle River, NJ: Wharton School Publishing, 2009, pp. 190–210.
- Zhong, K. (2007) Crisis management in China. *China Security* 3(1): 90–109.
- Zhong, K. (2011) SARS in China: An overview. In: E.-K. Olsson and L. Xue (eds.) *SARS – From East to West*. New York: Lexington.
- Zhu, Q. (2011) SARS in Beijing – An urban response. In: E.-K. Olsson and L. Xue (eds.) *SARS – From East to West*. New York: Lexington.