Original Article

Studying Communication Problems for Emergency Management of SARS and H7N9 in China

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Abstract

Background: Severe Acute Respiratory Syndrome (SARS) and Influenza A virus Subtype H7N9 (H7N9) have both had a great impact on China in the 21st century, causing significant negative impacts on health, the economy, and even global security. The control efforts for SARS were heavily criticized, the H7N9 response, 10 years later was acknowledged to be much better. **Aims:** This article explores communication for emergency management of SARS in 2003 and H7N9 in 2013 in China, to provide useful evidence for government and practitioner on management improvement for infectious disease outbreaks response in China and international community in the future. **Methods:** This study uses a qualitative case study approach, including in-depth interviews, literature review, and document, to analysis the emergency management of SARS in 2003 and H7N9 in 2013 in China, identified the problems of communication with the emergency management process for SARS and H7N9. **Results:** The control efforts for SARS were slow to be mobilized and were heavily criticized and generally considered to be suboptimal, as the poor handling of SARS exposed serious communication problems in the then emergency management system processes. The H7N9 response, 10 years later, was acknowledged to be much better. **Conclusion:** Communication is very important in the prevention and control of infectious diseases. From SARS to H7N9, the progress had been made in information disclosure.

Keywords: Emergency management, H7N9, infectious disease, information communication, Severe Acute Respiratory Syndrome

Introduction

In the past 15 years, China has suffered many public health crises caused by disease outbreaks such as SARS in 2003 and H7N9 in 2013. SARS and H7N9 have both had a great impact on China in the 21st century, causing significant negative impacts on health, the economy, and even global security. SARS, in particular, highlighted global connectedness and the great threat that pandemics present.

Since the SARS outbreak in 2003, China has established and strengthened national and local surveillance systems to prevent and control diseases and has also expanded its laboratory capacity.[1,2] In addition, China's collaboration and communications with the World Health Organization (WHO) and International Scientific Communities have been increased and strengthened.[3]

SARS coronavirus and the H7N9 virus share some similarities: both can lead to severe disease; there are still no specific antiviral drugs or vaccines for them; worldwide, people of all ages have little protective immunity; and both diseases presented a global epidemic and potential pandemic threat.[4,5] However, China's experiences of emergency management for epidemics have varied, the control efforts for SARS were problematic and the disease spread globally in 2003,[6] while the H7N9 response was highly praised and the disease did not spread widely in 2013.[7]

This article explores the emergency management of SARS in 2003 and H7N9 in 2013 in China, identified the communication problems with the emergency management process for SARS and H7N9, in order to provide useful evidence for government and practitioner on management improvement for emerging infectious disease outbreaks response in China and international community in the future.

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Methods

Data collection

We collected data for this research from the peer-reviewed literature, secondary statistical data, and face-to-face in-depth interviews.

The review drew on a wide range of data sources, including books, journal articles, government documents, policy reports, and conference papers. Most books were searched for in the Griffith University Library Catalog. Journal article searches were made from the Library Catalog, and reference lists of retrieved articles and textbooks, and electronic literature databases, such as ScienceDirect, PubMed, Medline, Health and Medical Complete (ProQuest), and Web of Science. The initial research produced hundreds of sources related in some way to the research. All the sources were first screened for relevance from their titles and abstracts. Only sources that addressed some aspects of this research were included.

In this research, statistics of SARS and H7N9 cases, deaths, and costs were collected from the government reports from the national and local Centers for Disease Control and Prevention (CDC), government departments, and published research literature.

Semi-structured in-depth interviews were conducted with 26 key stakeholders including officers from the WHO, Food and Agriculture Organization of the United Nations, National Health and Family Planning Commission (NHFPC), Ministry of Agriculture, as well as experts from local health departments, agriculture departments, CDCs, hospitals, and journalists who have experience of SARS and/or H7N9 in the key cities of Beijing, Shanghai, Guangzhou, and Hangzhou, that were most affected by SARS and/or H7N9.

We interviewed the key informants about their experience of and reflections on the emergency management of the SARS and H7N9 events and problems and suggestions concerning emergency management of infectious disease outbreaks. The interviewed officers and experts were identified through informal networks of colleagues, existing organizations and networks, and consultations with key informants.

Ethics approval

Interviews were carried out only when informed consent was obtained from the respondents. We received ethical approval from the Griffith University's Ethics Committee (Protocol Number ENV/63/14/HREC).

Results

Emergency management and communication problems of Severe Acute Respiratory Syndrome in China in 2003

Emergency management of Severe Acute Respiratory Syndrome

The first SARS case was noticed in Guangdong on November 16, 2002. Initially, the government did not recognize the severity of the SARS epidemic and did not inform the public promptly, and SARS patients and their close contacts were not isolated, enabling the virus to spread quickly.[8] At the start of the outbreak, to maintain the local social stability and to guarantee local economic development, the Guangdong government took its traditional approach of management of a crisis event: the real epidemic information was kept confidential, even though the health department management had taken action internally.

On January 2, 2003, the day the Guangdong provincial health department received the Heyuan report; it sent the deputy director of the medical school from Guangzhou Institute of Respiratory Diseases, to lead an expert panel to investigate. On the 2nd day, the investigation team wrote reports, identifying a local outbreak of unexplained pneumonia with certain infectivity. After half a month, Zhongshan city began to report patients with fever of unknown etiology in three hospitals in the city and medical staff became infected. The Guangdong province organized the same expert panel to investigate again. The same team leader wrote a report of the unexplained pneumonia survey in Zhongshan city on January 21. He named the disease "SARS," indicating an unknown etiology and high rate of infections.[9] This report proposed prevention measures and isolation in hospital for suspected cases.

In March 2003, the outbreak spread outside Guangdong Province to Beijing, Hong Kong, Hanoi, and Toronto. The WHO issued a global warning, and the WHO and other international organizations also took action, instigating global mobilization and action. The Chinese government began to face pressure to make a more commensurate response but lacked adequate recognition of the severity of the epidemic situation. It still responded only passively and did not inform the public of the real domestic epidemic situation.

By April 20, the Chinese government was dealing with the SARS crisis and instigated more active prevention and control measures. The Premier of China warned against the covering up of SARS cases and demanded the accurate, timely, and honest reporting of the SARS situation.[10] The government utilized its administrative control of local cadres, improved its gathering of information from localities and the disclosure of that information, improved its control measures, and actively coordinated bureaucracies and local administration in SARS management. Under the unified leadership of the State Council, it established an epidemic reporting system. This allowed the central emergency leading group to obtain timely and accurate SARS epidemic information and to deal with the questions more effectively.[11] At the same time, prevention and control measures were released through the mass media, and the media began to widely report relevant epidemic prevention and control information. Communication pathways between the government and the public were established, and information collection was unobstructed outside the system, which led to improved control. Gradually, social order recovered and panic subsided.[12] This largely constructive change in the interaction between the center and localities helped China to bring SARS under control within 2 months.

Communication problems of the emergency management process for Severe Acute Respiratory Syndrome

The SARS epidemic of 2003 had a deleterious effect on China's international reputation due to the government's problematic response to it. The poor handling of SARS exposed serious communication problems in the then emergency management system processes.

Governments at all levels in China had been used to keeping information regarding disasters and serious incidents secret, and this practice resulted in misjudgment of the situation and erroneous decision making.[13] In the early part of the outbreak in 2003, just after the Spring Festival in Guangzhou, there had been rumors about the disease and citizens had panicked and hoarded white vinegar and the drug *Radix Isatidis*. However, officials did not release any authoritative information, and even though some media were aware of the pandemic, they strictly abided by the requirements of Chinese news reporting and considered that they must not take the liberty of reporting SARS unless given permission to do so. As mentioned by an international officer:

> *"I think the information was not open during SARS outbreak, and there were lots of rumors everywhere."*

Delays of more than 2 months in reporting the first cases of SARS caused distrust and an inadequate response. As mentioned by one media journalist:

> *"The Propaganda Department controlled and did not allow us to have an interview. We had no way to find the information except hearsay" [in SARS]).*

Despite the rapid development of the SARS epidemic, formal authoritative information release was limited, leading to gossip circulating. The pressure on local government was immense. On February 11, Guangzhou, Foshan, Zhuhai government and health authorities had to hold a press conference, when they provided simple reports about the situation. However, the theme of the press conferences was that the epidemic had been brought under control-"you don't have to panic" was the message. Information such as infection pathways, clinical characteristics, and treatment was not widely communicated. As mentioned by a hospital doctor:

> *"I felt that the dangers and treatments of SARS were not made clear at that time."*

As mentioned by a media journalist:

> *Whatever I asked, they (government sector offices and hospital doctors) always ignored me and didn't want to tell (me any information).*

Following this, when the local media began to report on the development of the SARS epidemic situation, the main point of this communication was that the epidemic situation was under control. At that time, SARS had been identified in Hong Kong, but Guangzhou media was required not to report the information by the publication administration department of Guangdong Province.

The NHFPC still claimed that "China is safe" at a news conference on April 2. The lack of an information disclosure system had significant consequences for Beijing and other provinces, as targeted measures were not taken to prevent its spread. As a result, SARS spread out of Guangdong, to Beijing, and all over China.

There was only one source of information for the SARS incident, through press conferences, through traditional media such as newspapers and television. At the beginning of the outbreak, some local governments failed to communicate with the public, leading to panic, and loss of government credibility. In early 2003, Guangdong people started buying up *Radix Isatidis*. There were scattered local reports about buying the drug in Heyuan, Zhongshan, and other places, but then the local government denied rumors through the local media. Further, the Health Bureau Disease Control officials of Guangdong province said that they had not received any reports on this pneumonia outbreak and that the observed increase in the number of colds was due to the weather.

As the government reporting of the epidemic situation was not transparent, and local governments hid the truth,[14] the health sector could not truly grasp the dynamics of the epidemic situation and could not prepare adequately for SARS. The timeliness of the reports of the epidemic situation and disease monitoring was inadequate. In the early stages of the SARS event, individual cases took an average of 8–9 days from their onset to be reported. This delay led directly to the slow response and enhanced the transmission. The outbreak escalated after March, and even though the Ministry of Health (MOH) released epidemic information in early April, subsequent investigation found that the epidemic information provided was still not accurate. Further, some army medical institutions in Beijing had not reported case information to the local health administration department, which meant that the MOH was working without comprehensive epidemic information.

Emergency management and communication problems of H7N9 in China in 2013

Emergency management of H7N9

After the outbreak, the NHFPC and the China CDC collected a wide range of epidemic and related information through a variety of channels, organized military and local health departments and agricultural and forestry experts to carry out health risk assessments, and enhanced the prevention and control measures of the implementation of pneumonia monitoring with unknown cause, epidemiological investigation, and etiology of the management of treating and analyzing patients and close contacts. These combined measures effectively prevented the spread of the epidemic.

Provinces also carried out risk assessments of the epidemic situation following the outbreak. This timely disclosure of risk assessments helped medical workers to understand the epidemic situation. Risk warnings and risk management advice played a positive role in guiding professional staff.

The outbreak of H7N9 was regarded as a public health emergency event in China in 2013. As the isolation and treatment and medical observation of the close contacts are important measures to control and prevent the epidemic, isolating patients and tracking close contacts of cases were the most important tasks for all levels of government, hospitals, or CDCs. Epidemiological investigations of human cases of the avian influenza H7N9 virus showed that most patients had a history of recent exposure to poultry or a visit to a live poultry market.[15] This risk factor was established early in the epidemic, and hence an important measure was to close the live poultry trading markets. After the compulsory implementation of these shutdown measures, the spread of the virus was quickly controlled.[16] Shanghai, Jiangsu, Zhejiang, and other provinces closed their live poultry markets in a timely manner, which played a significant role in the control of the epidemic. After the epidemic spread to Guangdong and other provinces, the local governments enacted disinfection measures and closure of the live poultry markets, which further hindered the disease spread. Following Shanghai closing the city's live poultry market on April 6, the number of new cases declined rapidly and no new cases occurred after April 14. This coincided with the time when the rest of the nation was at the peak of the epidemic.

The CDC sequenced the genes of the virus on March 19, soon after the first confirmed case. All suspected cases in China were diagnosed by March 30, and the WHO was informed of all Chinese cases on March 31, 2013. From the first recognition of the outbreak, the WHO collaborated with China's NHFPC in National Risk Assessments and press conferences.[17]

The Chinese preference for fresh ingredients in the diet and the habit of buying and butchering live poultry at the market increased the chance of being exposed to the virus and provided favorable conditions for the spread of avian influenza virus. To this end, the government strengthened health education and the dissemination of related knowledge, in order to reduce the chance of population exposure. As mentioned by a CDC expert:

> *"The information of the H7N9 was announced relatively promptly, so it was relatively smooth for us to do some work."*

Communication problems of the emergency management process for H7N9

Great progress had been made in information disclosure and epidemic surveillance by the Chinese government as shown by the management of H7N9 avian influenza in 2013. Compared to SARS, 10 years earlier, the government's response was more timely and transparent and the public behaved more rationally. As mentioned by two international officers:

> "*During H7N9, because the information was more promptly disclosed, there was more transparency. We trusted the information.*"

> "*I think the information of H7N9 was more open, more transparent than SARS. It was reliable.*"

However, some problems and deficiencies in the epidemic prevention and control were identified by the interviewees and the literature reviews.

The release of the information of the epidemic situation was still a problem which the H7N9 event exposed. To reflect the commitment to strengthen supervision the local governments by the central government, "a mechanism of step-by-step reporting and release by the nation" was implemented in the delivery of information in public health events.[18] Local governments tend to be more careful about accuracy when reporting to higher levels.

Although the government departments, hospitals, and CDCs at all levels completed the disclosure and announcement of the epidemic information within the time limits prescribed by law, there was a delay of 39 days from the treatment of the patient to the confirmation of the epidemic situation. Since the early period of the epidemic is critical for effective prevention and control, this delay could have been dangerous. Fortunately, H7N9 did not have person to person transmission, so a greater spread of the epidemic did not occur.

Some information not based on science was released by governments and this also affected the public's trust. Some provincial health departments had said that *Radix Isatidis* could prevent H7N9 bird flu, but its true effectiveness had not been confirmed at the time.[19] There was also resistance from some sectors to the release of information. Some local and even the national poultry industry associations and enterprises, sent open letters and appeal letters to all levels of governments requesting that "reports of every H7N9 case should be stopped." They believed that no hypernormal measures had been taken for viral hepatitis and tuberculosis whose infectivity and death probability ranked higher than H7N9 influenza virus, and they argued this was not fair to the employees involved and the industry.

Discussions and Conclusion

China's emergency management of the two epidemics of SARS in 2003 and H7N9 in 2013 varied. Despite the similarities of SARS and H7N9, and that mortality of H7N9 was much higher than SARS, control efforts for SARS were slow to be mobilized and were heavily criticized and generally considered to be suboptimal, as the poor handling of SARS exposed serious communication problems in the then emergency management system processes. During the early stages of SARS, there was no listening to the public as the officials withheld information. In the later stage, the national government used the Chinese media to gain public support for the SARS response, including posters and publications with the slogans "Declare War on SARS" and "Activate the whole Party, mobilize the entire populace, win the war of annihilation against SARS." In contrast, during the H7N9, the media gave daily reports of the epidemic, and there was heated discussion about H7N9 in the media. The Chinese government also paid special attention to interacting with the public, by creating public accounts

on WeChat, timely updating of epidemic information, giving timely responses, and countering rumors on social media, such as microblogs. Overall the responses to H7N9 indicated that the different agencies received regular feedback from the public and that the agencies were responsive to the public's needs. From SARS to H7N9, the progress had been made in information disclosure and epidemic surveillance. Although there have been many improvements in the management of H7N9, there remain some problems and deficiencies of information disclosure in the epidemic prevention and control.

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Conflicts of interest

There are no conflicts of interest.

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