Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Perception of spokespersons’ performance and characteristics in crisis communication: Experience of the 2003 severe acute respiratory syndrome outbreak in Taiwan

Shu-Yu Lyu, Ruey-Yu Chen, Shih-fan Steve Wang, Ya-Ling Weng, Eugene Yu-Chang Peng, Ming-Been Lee

School of Public Health, Taipei Medical University, Taipei, Taiwan
Indigenous Health and Preventive Medicine Research Center, Taipei Medical University, Taipei, Taiwan
Department of Journalism, College of Communication, National Chengchi University, Taipei, Taiwan
Department of Secretariat, Wan Fang Hospital, Taipei, Taiwan
Department of Psychiatry, National Taiwan University Hospital, Taipei, Taiwan

Received 19 September 2012; received in revised form 23 November 2012; accepted 10 December 2012

Background/Purpose: To explore perception of spokespersons’ performance and characteristics in response to the 2003 severe acute respiratory syndrome (SARS) outbreak.

Methods: This study was conducted from March to July, 2005, using semi-structured in-depth interviews to collect data. All interviews were audio-recorded and transcribed verbatim. A qualitative content analysis was employed to analyze the transcribed data. Interviewees included media reporters, media supervisors, health and medical institution executives or spokespersons, and social observers.

Results: Altogether, 35 interviewees were recruited for in-depth interviews, and the duration of the interview ranged from 1 hour to 2 hours. Results revealed that the most important characteristics of health/medical institutions spokespersons are professional competence and good interaction with the media. In contrast, the most important behaviors they should avoid are concealing the truth and misreporting the truth. Three major flaws of spokespersons’ performance were identified: they included poor understanding of media needs and landscape; blaming the media to cover up a mistake they made in an announcement; and lack of sufficient participation in decision-making or of authorization from the head of organization.

KEYWORDS
- crisis communication
- media relations
- severe acute respiratory syndrome
- spokesperson

* Corresponding author. Department of Psychiatry, National Taiwan University Hospital, 7 Chung Shan South Road, Taipei 100, Taiwan.
E-mail address: mingbeen@ntu.edu.tw (M.-B. Lee).

0929-6646/S - see front matter Copyright © 2013, Elsevier Taiwan LLC & Formosan Medical Association. All rights reserved.
http://dx.doi.org/10.1016/j.jfma.2012.12.005
Introduction

Crisis and emergency risk communication has become an important issue in the public health sector in recent years, due to a series of health risks ranging from bioterrorist threats (e.g., anthrax attacks), to newly emerging infectious disease outbreaks (e.g., Influenza A pandemic). The challenge of providing timely and accurate health information dissemination is highlighted, especially for public information officers/spokespersons in shaping the public response to health crises.

The well-known Crisis Emergency and Risk Communication training module, which was developed by the Centers for Disease Control and Prevention (CDC) in 2002, is recognized as a communication model of public health in emergency situations and provides a theoretical framework for research and practice. According to Crisis Emergency and Risk Communication, a spokesperson in an emergency is “to communicate information the public wants or needs to know to reduce the incidence of illness and death.” The trustworthiness and credibility of the spokesperson were also emphasized during a crisis.

Given the evidence that people will search for information and take self-protective action when facing a health threat, the importance of spokespersons in facilitating effective risk and health emergency communication is salient. As indicated by Covello, the six components of best practice in public health risk and crisis communication plan include having stakeholders as partners, listening to people’s voices, being honest and open, collaborating with credible sources, meeting the media’s needs, and communicating clearly. The selection of a credible spokesperson facilitates effective information dissemination as the public receive information from diverse sources during the uncertain and chaotic situation of a health crisis. A study of public perceptions of information sources concerning bioterrorism, before and after anthrax attacks, indicated the importance of national and regional health officials as spokespersons in this event. In response to the anthrax attacks of 2001, selecting credible spokespersons was found to be one of the challenges for the CDC, and the use of multiple spokespersons and poor message control were found to result in the loss of CDC credibility. A recent study regarding public health officials as potential spokespeople revealed that news stories containing interviews with public health officials were 15.2 times more likely to report quality information, after controlling for station affiliate or geographic location. The characteristics and performance of official spokespersons would influence the public’s actions and their perception and trust during crisis communication.

In 2003, the first serious newly emerging infectious disease of the 21st century, severe acute respiratory syndrome (SARS), struck Taiwan and spread through the health care system. Taiwan was added to the travel alert list by the World Health Organization from May 21 to July 5 of that year. Taiwan’s number of SARS cases was the third highest in the world, after China and Hong Kong.

An increase of international media coverage due to the uncertain nature and rapid spread of the SARS pandemic was observed. The SARS pandemic had a major impact on Taiwan, with the Taipei Municipal Hoping Hospital shutting down due to the occurrence of a mass infection, and large-scale community quarantine. The demand for news from the government was huge and the media scrutiny was strict. Influenced by media reporting, there was widespread fear and panic among the public.

The spokespersons’ performance in front of a television camera and with reporters would have great impacts on delivering needed and correct information for disease prevention and control. It is noted that, as a newly emerging infectious disease, the public understanding of the SARS pandemic was shaped in large part by the performance of public health officials as spokespersons for the national and local health departments as well as by the medical institutions through the daily press conference during the crisis period.

The challenge of risk communication of emerging infectious disease was one of the lessons learned from the SARS pandemic. Research on effective crisis communication merits further discussion of the performance of public health officials as spokespersons in response to a newly emerging infectious disease, e.g., the influence of the public’s compliance on self-protection action and quarantine practice. The purpose of this study was to explore the performance and characteristics of spokespersons from health agencies and medical institutions in response to the 2003 SARS outbreak, in terms of what they should not do during such a health emergency, or what they must do to make their presentation more effective.

Methods

Study design and sampling strategy

This study employed qualitative research methods by using semi-structured in-depth interviews. A purposive sampling strategy was used to recruit potential participants from various backgrounds to reflect a diversity of viewpoints, rather than population-based statistically representative samples. Potential interviewees were chosen by the research team and at expert consultation meetings, and were drawn from five professions: (1) media reporters from print newspapers, television, radio, and magazines; (2) media supervisors from print and electronic media; (3) scholars and social observers from different disciplines; (4)
health administrators: health policy makers or spokespersons from national and regional health departments; and (5) medical institution managers: heads or spokespersons from medical institutions.

Data collection

Interviewees were first recommended by the research team and expert consultation meetings, using snowball techniques to recruit additional potential participants. Informed consent was obtained from all interviewees before conducting the interviews, and several essential issues were explained to them, including the voluntary nature and the purpose of the study, why and how the interviewee had been chosen, expected duration of the interview, how the information would be kept confidential, and the use of an audio recording device and the taking of backup field notes of the interview process. In addition, to enhance the recall of the SARS epidemic, a list was made of “Taiwan 2003 SARS epidemic major news events” according to data from Taiwan Centers for Disease Control and Taiwan Central News Agency and presented it to the interviewees.

The major interview questions in this study were: “Generally speaking, how would you evaluate the performance of the spokespersons?”; “What are the essential/positive characteristics of a spokesperson that you observed or expected?”, and “What are the taboo or negative characteristics of a spokesperson that you observed or expected?”.

Given the confidential nature of the study, participants were encouraged to think deeply, speak freely, and to raise issues that were important to them and to support their responses with examples. Probing questions were used as necessary to clarify vagueness and deepen the understanding of the interviewees’ responses.

This study was conducted from March to July, 2005. Using an in-depth interview technique, face-to-face interviews were carried out by the main researcher and a well-trained interviewer. Interviews were 1–2 hours in length.

Data management and analysis

All interviews were audio-recorded and the results transcribed verbatim. Data interpretation used qualitative content analysis to analyze the interview transcribed data.

The research team reviewed interview transcripts line by line, developed a coding scheme and categorized data into several areas independently, and then compared for agreement. Each coding scheme allowed subcategories. The coding consistency was checked by two independent investigators. Disagreements were resolved through research team discussion. In addition, the frequency of each subcategory was calculated.

Results

Interviewees’ characteristics

In total, there were 35 interviewees from five different backgrounds in this study. Among the interviewees, there were twelve media reporters, seven media advisors, seven social observers, five health administrators, and four medical institution managers. The reporters were working at television stations, newspapers, or broadcast and magazine companies during the SARS epidemic. Their professional experience ranged from 2 years to 17 years. With regard to media supervisors, there were four chief or vice-chief print media editors, one terrestrial television and two cable television station chiefs. Their professional experience ranged from 9 years to 26 years. There were seven scholars or social observers including senior media people, scholars on journalism, politics, sociology, epidemiology and medical management. Their professional experience ranged from 5 years to 30 years, with five of them holding doctorate degrees, and the other two having master degrees. There were five health administration heads and four medical institution heads. The interviewees’ characteristics are shown in Table 1.

Perceptions of spokespersons’ performance

All the spokespersons during the SARS pandemic were public health officials or hospital physicians from the top official level. Among the interviewees, media reporters had intensive contacts with these spokespersons. However, the spokesperson’s performance was described as unsatisfactory by the media reporters. The three most unsatisfactory issues were identified, as follows:

1. Poor understanding of media needs and landscape.

The spokespersons having poor understanding of media needs (R4, R5, R6, R12) and of the importance of providing timely responses to the media (R5, R7).

Conflict over the wording of news headlines was also observed (R4).

“We need to condense the news headline within 20 characters [words] according to the major content of a news story. Even if you included those keywords they [spokespersons] mentioned, the headline might not be understandable… Yes, this, and related issues caused many conflicts during the interview process.” (R4)

“The media need more common [plain] information, such as how many bacteria are in one drop of saliva, this kind of information would be more likely to be reported. With regard to health education information, the possibility of it being reported is lower.” (R5)

If the spokespersons have a poor understanding of how the media operates, an accurate message cannot be delivered (R4, R6, R12).

“The operation of the electronic media is different from the print media. The electronic media delivers messages very fast, even instantly, in the case of SN [satellite news gathering]. If you said something wrong, you would know immediately, and the audience who saw it would receive the wrong message. It’s not like
the print media, which, working to longer deadlines, has the opportunity to correct it.” (R12)

“He [the spokesperson] should understand he is a communication bridge. He needs to understand his customers. His customers are us [the media]. He should be very clear about what we need, what we don’t need. But he cannot force you to deliver what he needs to be delivered. It is impossible. We have our own viewpoints.” (R6)

2. Blaming media to cover up mistakes they made in an announcement.

Media were blamed all the time by the government officials when negative news was released. The government officials would blame the media for spreading “rumors”. However, the reporters argued that there would be no news without someone having said something (R4, R6).

“He [the spokesperson] might say a few cases less, and what he provided was different from what the regional health department provided. Yes, then he might say that we misunderstood or that we wrote it down incorrectly.” (R4)

3. Lack of sufficient participation in decision-making or of authorization from head of organization.

The spokespersons need to understand what is going on and update the situation for the media. If the

| Table 1 | Characteristics of interviewees. |
|---------|----------------------------------|
| **Interviewee coding** | **Gender** | **Career experience (years)** | **Educational level** |
| Reporters | | | |
| Reporter 1 (R1) | Male | 2 | Bachelor degree |
| Reporter 2 (R2) | Female | 7 | Master degree |
| Reporter 3 (R3) | Male | 10 | Bachelor degree |
| Reporter 4 (R4) | Female | 7 | Bachelor degree |
| Reporter 5 (R5) | Female | 7 | Bachelor degree |
| Reporter 6 (R6) | Male | 17 | Bachelor degree |
| Reporter 7 (R7) | Female | 14 | Bachelor degree |
| Reporter 8 (R8) | Female | 9 | Bachelor degree |
| Reporter 9 (R9) | Female | 10 | Bachelor degree |
| Reporter 10 (R10) | Male | 5 | Bachelor degree |
| Reporter 11 (R11) | Female | 7 | Bachelor degree |
| Reporter 12 (R12) | Female | 16 | Bachelor degree |
| Journalists (media advisors) | | | |
| Journalist 1 (J1) | Male | 17 | Bachelor degree |
| Journalist 2 (J2) | Male | 26 | Master degree |
| Journalist 3 (J3) | Male | 19 | Bachelor degree |
| Journalist 4 (J4) | Male | 17 | Master degree |
| Journalist 5 (J5) | Female | 21 | Bachelor degree |
| Journalist 6 (J6) | Male | 9 | Bachelor degree |
| Journalist 7 (J7) | Male | 18 | Bachelor degree |
| Social observers | | | |
| Social 1 (S1) | Female | 15 | Doctoral degree |
| Social 2 (S2) | Male | 30 | Master degree |
| Social 3 (S3) | Male | 5 | Doctoral degree |
| Social 4 (S4) | Male | 15 | Doctoral degree |
| Social 5 (S5) | Male | 25 | Master degree |
| Social 6 (S6) | Male | 15 | Doctoral degree |
| Social 7 (S7) | Male | 20 | Doctoral degree |
| Health administrators (chiefs/directors) | | | |
| Health 1 (H1) | Male | 19 | Master degree |
| Health 2 (H2) | Male | 27 | Doctoral degree |
| Health 3 (H3) | Male | 29 | Doctoral degree |
| Health 4 (H4) | Male | 24 | Doctoral degree |
| Health 5 (H5) | Male | 29 | Master degree |
| Managers of medical institutions | | | |
| Medical 1 (M1) | Male | 33 | Medical Doctor |
| Medical 2 (M2) | Male | 28 | Doctoral degree |
| Medical 3 (M3) | Male | 28 | Medical Doctor |
| Medical 4 (M4) | Male | 22 | Doctoral degree |
Characteristics of spokespersons

In combining the perspectives from various backgrounds of interviewees, five domains of essential/favorable characteristics and another five domains of taboo/negative characteristics were identified by transcribed data analysis. The essential/favorable characteristics for spokespersons included: having professional capability, having better media interactions, involvement in policy making, having trustworthiness, and having favorable (or positive) personality and traits. It is noted that "having professional knowledge" and "good understanding of the media landscape" were most frequently mentioned by interviewees. Various personality and traits of a spokesperson were mentioned by the interviewees. However, "clearness of speech" and "openness and honesty" were the most important personal traits. In contrast, the taboo/negative characteristics of spokespersons included: inappropriate demeanor, lack of honesty/sincerity, having poor emotional control, having a political position/political bias, and having a bureaucratic style. No credibility, poor emotional control and improper demeanor were spokespersons’ taboos when interacting with the media.

Discussion

This study is noteworthy in exploring spokespersons’ performance across the various backgrounds of interviewees, and they identified positive and negative characteristics of spokespersons. Overall, three major findings emerged from this study. First, the spokespersons had poor interaction with the media, and their performance was unsatisfactory. Second, some of the favored characteristics that were perceived by the interviewees (e.g., knowledgeable and credible) were similar to those suggested in the WHO handbook for effective media communication during public health emergencies. Third, the public health officials acting as spokespersons having poor emotional control and political bias were observed during this catastrophic event.

Although public health officials as spokespersons were more likely to report quality information, the responses from the media reporters and media advisor interviewees revealed their dissatisfaction with these spokespersons.
### Table 2  Perception of spokespersons’ positive characteristics.

| Type of characteristics                             | Positive characteristics and interviewee’s coding                                                                 | Frequency of being mentioned |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------|
| Having better media interactions                     | Good understanding of the media landscape: S1, S2, S3, S7, J1, J2, J3, J4, J6, J7                                  | 19                          |
|                                                      | Understand what the media prefer: M1                                                                          |                              |
|                                                      | Maintaining good relations with the media: H2                                                                  |                              |
|                                                      | Being friendly to the media: R1, R7                                                                            |                              |
|                                                      | Confident performer with the media: H5                                                                          |                              |
|                                                      | Providing timely responses to the media: R7                                                                     |                              |
|                                                      | Constantly available by telephone to the media: J1, J2, J7                                                     |                              |
| Having professional capability                       | Having professional knowledge: R1, R2, R6, R10, R12, S1, S2, S4, S7                                              | 17                          |
|                                                      | Degree of professional knowledge: J1, J2, J3, J4, J6, J7                                                        |                              |
|                                                      | Formal qualifications in relevant field: H5                                                                    |                              |
|                                                      | Imparting a professional image: S3                                                                             |                              |
| Having favorable personality and traits              | Moderate their temper and have principles: S4                                                                  | 14                          |
|                                                      | Stable tone: S7                                                                                                |                              |
|                                                      | Self-possessed: H2                                                                                            |                              |
|                                                      | Clearness of speech (Dare to speak but with caution): R3, R4                                                   |                              |
|                                                      | Good expressive ability: R10                                                                                   |                              |
|                                                      | Precise and consistent speech: J2                                                                             |                              |
|                                                      | Charismatic: J4                                                                                                |                              |
|                                                      | A healthy appearance: J4                                                                                       |                              |
|                                                      | Calm and rational: J4                                                                                          |                              |
|                                                      | Smart: J4                                                                                                      |                              |
|                                                      | Openness and honesty: R8, R9, R11                                                                               |                              |
| Involved in policy-making                            | Participation in decision-making or authorization from head of organization: R6, S1, J3, J4, J7               | 7                           |
|                                                      | Top officials or managerial level: H1, H2                                                                        |                              |
| Having trustworthiness                               | Having trustworthiness: S1, S4, S7                                                                              | 4                           |
|                                                      | Having credibility: J7                                                                                         |                              |

### Table 3  Perception of spokespersons’ negative characteristics.

| Type of characteristics                             | Negative characteristics and interviewee’s coding                                                                 | Frequency of being mentioned |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------|
| Inappropriate demeanor                               | Pandering: R9                                                                                                   | 8                           |
|                                                      | Equivocating: J6                                                                                                |                              |
|                                                      | Unfocused, vague, imprecise: R4                                                                                |                              |
|                                                      | Overly passive/conservative: J2, J7                                                                            |                              |
|                                                      | Appears uninformed: J2                                                                                         |                              |
|                                                      | Verbose (Speaking too much or pretending to be knowledgeable): H1                                                |                              |
|                                                      | Flattering the media: H2                                                                                       |                              |
| Lack of honesty/sincerity                            | Concealing or lying: S3, J5, J6                                                                                | 7                           |
|                                                      | Not honest: R6, R8, R9                                                                                        |                              |
| Having poor emotion control                         | Not telling truth because of fear of losing their official position: J7                                         | 5                           |
|                                                      | Bad temper: S4                                                                                                |                              |
|                                                      | Angry with reporters: S7                                                                                       |                              |
|                                                      | Easily angered: J7                                                                                            |                              |
|                                                      | Overly emotional: R7                                                                                        |                              |
|                                                      | Threatening reporters: J4                                                                                     |                              |
| Having political position/political bias             | Having an obvious political angle/electioneering: S1, S3, S7                                                  | 3                           |
| Having bureaucratic style                            | Bureaucratic style: J1                                                                                         | 2                           |
|                                                      | Haughty, official style: R10                                                                                    |                              |
The conflicts during the interview process with the spokespersons were also mentioned by the interviewees. Several possible explanations for these conflicts included poor understanding of the media landscape and its needs, the inconsistency of information dissemination, and unfavorable characteristics of the spokespersons.

The media industry in Taiwan is one of the most competitive in Asia. There are currently eight 24-hour television news channels. The major source of SARS related news for the public during the SARS outbreak was television, a figure that ranged from 76.6% to 82.4%. The spokespersons may fail to understand the business aspects of the news media and the competition between media outlets, may fail to recognize newsworthiness, are unaware of the differences among various media forms (e.g., electronic and print media), and may fail to recognize the divergent approaches and goals of the news media and the public health field, all of which can lead to conflict. The public health goal is usually to acknowledge uncertainty and realize that conclusions can change from time to time based on updated scientific evidence, while the news media prefer to provide definitive answers to their audiences and readers. Also, the public health approach discounts or dismisses unsubstantiated claims, whereas the news media usually present information provided. For example, regarding SARS case statistics, reports announced at different points in time caused much confusion in the television news and print media. Furthermore, despite the media reporting of SARS being governmental scientific uncertainty and the deadlines of the media during the anthrax crisis was observed. Mebane et al. also found discrepancies between government-announced health information and news reports.

Providing timely and accurate information to the public is the key factor for successful crisis communication. However, discrepancies between national and regional health departments, and multiple spokespersons within the same agencies may influence the consistency of the information provided. For example, regarding SARS case statistics, reports announced at different points in time caused much confusion in the television news and print media. Furthermore, despite the media reporting of SARS being considered excessive, sensational, and sometimes inaccurate, the poor emotional control of certain spokespersons was one of the major causes of conflict. Those taboo characteristics for spokespersons that interviewees mentioned, such as a bureaucratic style, concealing or lying, or having an obvious political angle, may also be potential sources of conflict with journalists. This is especially the case when decisions were influenced by local political concerns and media scrutiny.

It is also important to note that even after performing an extensive literature search for similar studies, we were unable to locate a single study related to spokespersons. This may be due to the fact that SARS is a rare and unique health catastrophe, and no other country had the same level of fear or high-density of media exposure as Taiwan. Furthermore, many developed countries have established sophisticated spokesperson systems. In the United States for example, the characteristics and duties of a spokesperson have been well-defined by the CDC. Hence, more studies have been conducted related to crisis communication with regard to the trust and credibility of the government than to the evaluation of the spokesperson per se.

Limitations

There were two limitations of this study that need to be taken into consideration when interpreting the study results. Firstly, this study is a qualitative study, so the sample size is relatively small. Because the interviewees were recommended by some professionals, not obtained by random sample, it may have selection bias, the external validity of the results may have limitations, and it does not represent the viewpoint of all professionals. Secondly, the study was conducted some years after the 2003 SARS epidemic, so it may have a recall bias. We therefore provided a "2003 Taiwan SARS news events list" to help interviewees recall the SARS event. Despite these limitations, this study provided data on the perception of traits of spokespersons and criteria useful in selecting public health officials and hospital managers as spokespersons in SARS crisis communication. Possessing excellent media skills and understanding of the public and media expectations of spokespersons may help deal with possible emerging and re-emerging infectious disease outbreaks in the future.

Conclusions

In conclusion, spokespersons of health and medical institutions play an important role in media relations during a large-scale health emergency, especially for a newly emerging infectious disease such as SARS. Therefore, it is recommended that the health departments strengthen the continuing education on the issues of crisis communication, media relations and emotional management. Crisis communication is an on-going process. Media relationships need to be developed at the precrisis stage, and the lead spokesperson needs to have sufficient authority and involvement in decision making. Future studies might focus on the challenge of new media in the dissemination of information and rumor control during a health crisis.

Acknowledgments

This study was supported by the Department of Health, Executive Yuan, Taiwan [grant number DOH93-TD-H-113-007-(2)]. Special thanks to all the interviewees who participated in this study.

References

1. Kittler AF, Hobbs J, Volk LA, Kreps GL, Bates DW. The Internet as a vehicle to communicate health information during a public health emergency: a survey analysis involving the anthrax scare of 2001. J Med Internet Res 2004;6:e8.
2. Bell DM, Weisfuse IB, Hernandez-Avila M, Del Rio C, Bustamante X, Rodier G. Pandemic influenza as 21st century urban public health crisis. Emerg Infect Dis 2009;15:1963–9.
3. Grein TW, Kamara KB, Rodier G, Plant AJ, Bovier P, Ryan AJ, et al. Rumors of disease in the global village: outbreak verification. Emerg Infect Dis 2000;6:97–102.
4. Wray RJ, Kreuter MW, Jacobsen H, Clements B, Evans RG. Theoretical perspectives on public communication preparedness for terrorist attacks. *Fam Community Health* 2004;27:232–41.

5. Peng EY, Lee MB, Tsai ST, Yang CC, Morisky DE, Tsai LT, et al. Population-based post-crisis psychological distress: an example from the SARS outbreak in Taiwan. *J Formos Med Assoc* 2010;109:524–32.

6. Lowrey W, Evans W, Gower KK, Robinson JA, Ginter PM, McCormick LC, et al. Effective media communication of disasters: pressing problems and recommendations. *BMC Public Health* 2007;7:97.

7. Vaughan E, Tinker T. Effective health risk communication about pandemic influenza for vulnerable populations. *Am J Public Health* 2009;99(Suppl. 2):S324–32.

8. Reynolds B, Seeger MW. Crisis and emergency risk communication as an integrative model. *J Health Comm* 2005;10:43–55.

9. Veil S, Reynolds B, Sellnow TL, Seeger MW. CERC as a theoretical framework for research and practice. *Health Promot Pract* 2008;9(Suppl. 4):S26–34.

10. Reynolds BJ. When the facts are just not enough: credibly communicating about risk is riskier when emotions run high and time is short. *Toxical Appl Pharmacol* 2011;254:206–14.

11. Centers for Disease Control and Prevention. Crisis and emergency risk communication. 2002; p. 111 & p. 113. Available from: http://www.bt.cdc.gov/cerc/pdf/CERC-SEPT02.pdf [accessed 28.09.11].

12. Wray RJ, Becker SM, Henderson N, Glik D, Jupka K, Middleton S, et al. Communicating with the public about emerging health threats: lessons from the Pre-Event Message Development Project. *Am J Public Health* 2008;98:2214–22.

13. Covello VT, Peters RG, Wojtecki JG, Hyde RC. Risk communication, the West Nile virus epidemic, and bioterrorism: responding to the communication challenges posed by the intentional or unintentional release of a pathogen in an urban setting. *J Urban Health* 2001;78:382–91.

14. Prue CE, Lackey C, Swenarski L, Gantt JM. Communication monitoring: shaping CDC’s emergency risk communication efforts. *J Health Comm* 2003;8(Suppl. 1):35–49.

15. Levin PJ, Gebbie EN, Qureshi K. Can the health-care system meet the challenge of pandemic flu? Planning, ethical, and workforce considerations. *Public Health Rep* 2007;122:573–8.

16. Covello VT. Best practices in public health risk and crisis communication. *J Health Comm* 2003;8(Suppl. 1):5–8.

17. Pollard WE. Public perceptions of information sources concerning bioterrorism before and after anthrax attacks: an analysis of national survey data. *J Health Comm* 2003;8(Suppl. 1):93–103.

18. Freimuth VS. Order out of chaos: the self-organization of communication following the anthrax attacks. *Health Comm* 2006;20:141–8.

19. Barrett MS. Spokespersons and message control: how the CDC lost credibility during the Anthrax crisis. *Qual Res Rep Comm* 2005;6:59–68.

20. Pribble JM, Fowler EF, Kamat SV, Wilkerson WM, Goldstein KM, Hargarten SW. Communicating emerging infectious disease outbreaks to the public through local television news: public health officials as potential spokespeople. *Disaster Med Public Health Prep* 2010;4(3):220–5.

21. Lee ML, Chen CJ, Su IJ, Chen KT, Yeh CC, King CC, et al. Severe acute respiratory syndrome—Taiwan, 2003. *MMWR Morb Mortal Wkly Rep* 2003;52:461–6.

22. McDonald LC, Simor AE, Su IJ, Maloney S, Ofner M, Chen KT, et al. SARS in healthcare facilities, Toronto and Taiwan. *Emerg Infect Dis* 2004;10:777–81.

23. World Health Organization: Update 95-SARS: Chronology of a serial killer. Available at: http://www.who.int/csr/don/2003_07_04/en/ [accessed 28.09.11].

24. Heymann DL, Rodier G. SARS: a global response to an international threat. *Brown J World Affairs* 2004;10:185–97.

25. Lee ML, Chen CJ, Su IJ, Chen KT, Yeh CC, King CC, et al. Use of quarantine to prevent transmission of severe acute respiratory syndrome—Taiwan, 2003. *MMWR Morb Mortal Wkly Rep* 2003;52:680–3.

26. Lyu SY, Peng EY, Shih FY. Public perception of media reporting during the Severe Acute Respiratory Syndrome outbreak in Taiwan. *Taipei City Med J* 2007;4:668–79 [In Chinese, English abstract].

27. World Health Organization. *World health report 2003: shaping the future*. Geneva, Switzerland: World Health Organization; 2003.

28. World Health Organization. *Effective media communication during public health emergencies: a WHO handbook*. Geneva, Switzerland: World Health Organization; 2005. p. 28.

29. Lyu SY, Chang HW, Hong AI, Lin CF, Chung WC, Peng EY. Comparison of perception of severe acute respiratory syndrome among aboriginals in Taipei and other areas in Taiwan. *Taipei City Med J* 2006;3:895–906 [In Chinese, English abstract].

30. Greenwell M. Communicating public health information to the news media. In: Nelson DE, Brownson RC, Remington PL, Parvanta C, editors. *Communicating Public Health Information Effectively: A Guide for Practitioners*. Washington, DC: American Public Health Association; 2002. p. 97–114.

31. US Department of Health and Human Services. *Communicating in a Crisis: Risk Communication Guidelines for Public Officials*. Washington, DC: Department of Health and Human Services; 2002. p. 37.

32. Robinson SJ, Newsstetter WC. Uncertain science and certain deadlines: CDC responses to the media during the anthrax attacks of 2001. *J Health Comm* 2003;8(Suppl. 1):17–34.

33. Mebane F, Temin S, Parvanta CF. Communicating anthrax in 2001: a comparison of CDC information and print media accounts. *J Health Comm* 2003;8(Suppl. 1):50–82.