

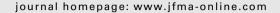
Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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.



Available online at www.sciencedirect.com

SciVerse ScienceDirect





ORIGINAL ARTICLE

Perception of spokespersons' performance and characteristics in crisis communication: Experience of the 2003 severe acute respiratory syndrome outbreak in Taiwan



Shu-Yu Lyu a,b, Ruey-Yu Chen a,b, Shih-fan Steve Wang c, Ya-Ling Weng a,d, Eugene Yu-Chang Peng a, Ming-Been Lee b,e,*

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

KEYWORDS

crisis communication; media relations; severe acute respiratory syndrome; spokesperson 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.

^a School of Public Health, Taipei Medical University, Taipei, Taiwan

^b Indigenous Health and Preventive Medicine Research Center, Taipei Medical University, Taipei, Taiwan

^c Department of Journalism, College of Communication, National Chengchi University, Taipei, Taiwan

^d Department of Secretariat, Wan Fang Hospital, Taipei, Taiwan

^e Department of Psychiatry, National Taiwan University Hospital, Taipei, Taiwan

^{*} 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).

Conclusion: Spokespersons of health and medical institutions play an important role in media relations during the crisis of a newly emerging infectious disease.

Copyright © 2013, Elsevier Taiwan LLC & Formosan Medical Association. All rights reserved.

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),¹ to newly emerging infectious disease outbreaks (e.g., Influenza A pandemic).² The challenge of providing timely and accurate health information dissemination is highlighted,^{3–5} especially for public information officers/spokespersons in shaping the public response to health crises.^{6,7}

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. 8–10 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." 11 The trustworthiness and credibility of the spokesperson were also emphasized during a crisis. 11

Given the evidence that people will search for information and take self-protective action when facing a health threat, 12 the importance of spokespersons in facilitating effective risk and health emergency communication is salient. $^{6,13-15}$

As indicated by Covello, 16 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.¹⁷ In response to the anthrax attacks of 2001, selecting credible spokespersons was found to be one of the challenges for the CDC, 18 and the use of multiple spokespersons and poor message control were found to result in the loss of CDC credibility. 19 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. 20 The characteristics and performance of official spokespersons would influence the public's actions and their perception and trust during crisis communication.^{7,13}

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. ^{21,22} 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. ²³

An increase of international media coverage due to the uncertain nature and rapid spread of the SARS pandemic was observed.²⁴ 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.^{21,25,26} The demand for news from the government was huge and the media scrutiny was strict. Influenced by media reporting, there was wide-spread fear and panic among the public.²⁶

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.²⁷ 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)

602 S.-Y. Lyu et al.

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 spokespeople'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 SNG [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

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 institution	ons		•		
Medial 1 (M1)	Male	33	Medical Doctor		
Medical 2 (M2)	Male	28	Doctoral degree		
Medical 3 (M3)	Male	28	Medical Doctor		
Medical4 (M4)	Male	22	Doctoral degree		

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)

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

604 S.-Y. Lyu et al.

spokespersons have not participated sufficiently in decision-making or lack authorization from the head of organization, this makes the media feel disrespected (R7, R12).

"Every time he [the spokesperson] appeared, he should at least provide certain information to make the public feel secure. Or at least have a moderate level of professional knowledge in the relevant field. Because the public are already in a panic, if the spokesperson is less knowledgeable than you, or you feel he is incorrect, by using common sense to make a judgment... how can he make the public feel that he is trustworthy?" (R12)

From the media advisor interviewees' observation, the spokespersons failed to use accurate words and disseminate consistent information. Also, some could not accept the fact that certain spokespersons were easily angered (J7) and/or threatening media reporters (J4), and spoke in a bureaucratic style (J1). In addition to the necessity of having professional knowledge and good media relations, the social observer interviewees emphasized the importance of "having trustworthiness" (S1, S4, S7) and "avoiding an obvious political angle" (S1, S3, S7).

Some interviewees from health departments and medical institutions mentioned the importance and necessity of assigning a spokesperson for crisis communication. If the spokesperson disseminated an inaccurate message, the impact would be very large.

"No matter whether they are the head of the institution or a spokesperson, they should be careful in their speech, make sure everything is certain before the announcement, and be conservative with regard to speculation. Otherwise, the negative impact will be tremendous." (M2)

"Having knowledge is the most important thing. Having sufficient knowledge may decrease the public's panic." (M4)

Interviewees from the medical institutions emphasized that the spokesperson should have sufficient professional knowledge, yet the interviewees from the health departments also emphasized knowledge regarding media interaction. Furthermore, whether having a moderate degree of professional knowledge instead of expert knowledge, they should be considered as competent, especially when facing the uncertainty of newly emerging infectious diseases.

- "...should have formal qualifications in the relevant field, but also have media competence." (H5)
- "...should speak within the authorization from head of organization and avoid being verbose." (H1)

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.

The expectation of spokespersons' characteristics varied because of the different backgrounds of the interviewees. From the perspective of media reporters, media advisors, and social observers, the spokespersons of health departments and medical institutions should have professional knowledge, a good understanding of the media landscape, and be open and credible. "Concealing or lying" and "having an obvious political angle/electioneering" were the most serious taboos for spokespersons.

Regarding the selection criteria of a spokesperson in health departments and medical institutions, the top-level people in their organizations are the key factor. It was found that they regarded spokesperson as an important role, and paid considerable attention to the importance of media relations. Some interviewees from health departments thought that the spokespersons should maintain good relations with the media, possess good media interaction skills, and understand what the media needs. By contrast, issuing exclusive news, flattering the media, and being verbose were inappropriate behaviors for spokespersons.

The essential/positive and taboo/negative characteristics of spokespersons are indicated in Tables 2 and 3.

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. ²⁸ 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 spokespeople were more likely to report quality information, ²⁰ the responses from the media reporters and media advisor interviewees revealed their dissatisfaction with these spokespersons.

Type of characteristics	Positive characteristics and interviewee's coding	Frequency of being mentioned
Having better media interactions	Good understanding of the media landscape:	19
	S1, S2, S3, S7, J1, J2, J3, J4, J6, J7	
	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	Moderate their temper and have principles: S4	14
and traits	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	7
	of organization: R6, S1, J3, J4, J7	
	Top officials or managerial level: H1, H2	
Having trustworthiness	Having trustworthiness: S1, S4, S7	4
	Having credibility: J7	

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	
	Not telling truth because of fear of losing their official position: J7	
Having poor emotion control	Bad temper: S4	5
	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	

606 S.-Y. Lyu et al.

The conflicts during the interview process with the spokespeople 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 spokespeople.

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%.²⁹ The spokespeople 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.³⁰ Also, the public health approach discounts or dismisses unsubstantiated claims, whereas the news media usually present two or more points of view. 30 These approaches are important during a health crisis. There are various types of news media, including television, radio, print, and Internet. Their nature in terms of requirements and news deadlines are different, yet the need of journalists to fill space and time remains the same.³¹ The conflict between governmental scientific uncertainty and the deadlines of the media during the anthrax crisis was observed. 32 Mebane et al³³ also found discrepancies between governmentannounced 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, 26 the poor emotional control of certain spokespersons was one of the major causes of conflict. Those taboo characteristics for spokespeople 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.¹¹ 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

- 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.
- 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.
- Grein TW, Kamara KB, Rodier G, Plant AJ, Bovier P, Ryan MJ, et al. Rumors of disease in the global village: outbreak verification. *Emerg Infect Dis* 2000;6:97–102.

- 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.
- 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.
- 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.
- Vaughan E, Tinker T. Effective health risk communication about pandemic influenza for vulnerable populations. Am J Public Health 2009;99(Suppl. 2):S324—32.
- Reynolds B, Seeger MW. Crisis and emergency risk communication as an integrative model. J Health Comm 2005;10: 43-55.
- 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. *Toxicol Appl Pharmacol* 2011;**254**:206–14.
- 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.
- 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.
- 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.
- 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.

- 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.
- 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.
- 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].
- 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.
- 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, Newstetter 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.