

การสื่อสารความเสี่ยงในสถานการณ์สาธารณสุข

รัฐระวี พัฒนรัตน์โมฬี

¹ ศูนย์ความร่วมมือองค์การอนามัยโลกด้านการป้องกันการบาดเจ็บ โรงพยาบาลขอนแก่น

*ผู้ประพันธ์บทความ

รัฐระวี พัฒนรัตน์โมฬี

ศูนย์ความร่วมมือองค์การอนามัยโลกด้านการป้องกันการบาดเจ็บ โรงพยาบาลขอนแก่น

เลขที่ 56 ถ.ศรีจันทร์ อ.เมือง จ.ขอนแก่น 40000 ประเทศไทย

อีเมล: bowling_er@hotmail.com

โทรศัพท์ที่ทำงาน: 043009900

โทรศัพท์มือถือ: 0834046246

DOI:

บทคัดย่อ

การสื่อสารความเสี่ยงและข้อความต่าง ๆ ในสถานการณ์สาธารณสุขเป็นขบวนการที่มีความสำคัญในการจัดการภาวะสาธารณสุขให้ประสบความสำเร็จ การออกแบบข้อความที่ใช้สื่อสาร ผู้ออกแบบสารควรมีความเข้าใจในทักษะการรับสารและขบวนการแปลสารของผู้รับสาร จึงจะทำให้มั่นใจได้ว่าสารที่ส่งออกไปนั้นจะส่งถึงและสร้างความเข้าใจแก่ผู้รับสาร จนกระทั่งส่งผลให้เกิดการปฏิบัติตามสารที่ส่งให้ได้อย่างเหมาะสม การสื่อสารความเสี่ยงนั้นเป็นเครื่องมือที่ใช้จัดการสถานการณ์สาธารณสุขทั้งในช่วงก่อนระหว่างและหลังเกิดภัย การสื่อสารที่มีประสิทธิภาพส่งผลให้ประชาชนเตรียมพร้อมรับ ตอบโต้และฟื้นฟูตนเองตามคำแนะนำได้ ในปัจจุบันการสื่อสารมีหลากหลายช่องทาง เช่น วิทยุ โทรศัพท์ SMS และช่องทางใหม่ๆ ได้แก่ Social media ซึ่งจัดเป็นปัจจัยที่ผู้จัดการการสื่อสารนั้นจะต้องเลือกใช้และควบคุมการใช้ให้เหมาะกับสถานการณ์เพื่อประโยชน์สูงสุดในการจัดการ Social media จัดว่าเป็นช่องทางที่ได้รับความนิยมในปัจจุบันเนื่องจากรวดเร็ว สื่อสารได้ในวงกว้างและในขณะเดียวกันก็ควบคุมได้ยาก ดังจะพบได้จากข่าวปลอมที่มักจะแพร่กระจายอย่างรวดเร็ว ส่งผลให้เกิดความเข้าใจที่สับสน เกิดความโกลาหล ซึ่งทำให้การควบคุมสถานการณ์สาธารณสุขเป็นไปได้ด้วยความยากลำบากมากขึ้น อย่างไรก็ตามการสื่อสารความเสี่ยงในทุกช่องทางยังมีความจำเป็นเนื่องจากโอกาสของการเข้าการสื่อสารแต่ละประเภทของกลุ่มคนในสังคมแต่ละกลุ่มมีความแตกต่างกันตามวัฒนธรรมและความนิยมในกลุ่มนั้นๆ เช่น ผู้สูงวัยอาจจะเคยชินการรับฟังสารจากวิทยุและโทรทัศน์ แต่วัยรุ่นนั้นติดตามข่าวสารจาก Social media มากกว่า ความหลากหลายของการสื่อสารนั้นรวมถึงการสื่อสารด้วยภาษาท้องถิ่นที่จะสร้างความเข้าใจให้กับชุมชนได้ดีขึ้น

คำสำคัญ

การสื่อสารความเสี่ยง สาธารณภัย

Crisis and emergency risk communication

Ratrawee Pattanarattanamolee¹

¹ WHO collaboration center in injury prevention, Khon Kaen Hospital

*corresponding author

Ratrawee Pattanarattanamolee

Khon Kaen hospital 56 Srichan road, Meaung district, Khonkaen, 40000

Email: bowling_er@hotmail.com

Tel: 043009900

Mobile: 0834046246

DOI:

Abstract

Communication regarding disaster risk and messages during a disaster is a vital process for success in disaster management. The message designer has to understand how people receive and interpret the message. This comprehension would make the designer produce an understandable message that will affect the action against disaster. Emergency Risk Communication can be used before, during, and after a disaster to make recommendations on how to prepare for, respond to, and recover from disaster. Currently, the methods for communication are various, such as radio, television (TV), and social media, which would be selected and controlled for the full benefit of the situation. Social media is now widely used, convenient, practical, and serves as a boarding connection. However, rumor is one of the disadvantages, which may result in confusion and a chaotic situation in disaster. Besides, multiple methods of communication are needed during disaster because of the different capacities for accessing the message depending on the culture and popularity of each recipient group. For example, while teenagers would prefer social media, older people may be prefer radio and TV. In addition, the local language message would make the message simpler to understandable.

Key word

emergency risk communication; disaster

Introduction

In the last ten years, scholars have reported that the disaster has increased in incidence, intensity, complexity, and dynamicity.¹ The results impact human life, community, and the global economic system.² For instance, the Haiti earthquake resulted in over 200,000 deaths, and cyclone Nargis resulted in around 80,000 deaths in Myanmar. Public facilities, such as hospitals, schools, and people's houses were destroyed. As a result, some people were homeless.³ The integrated disaster planning from all levels of stakeholders is necessary to deal with the current complex disaster.^{1,4} In recent literature, the local community has been a vital factor in disaster management, including early warnings, and decision making.^{5,6} The information management in disaster, including managing information flow, building awareness, disseminating early warnings and inducing an emergency response, requires the tool "emergency risk communication" in managing risks and disasters.⁷ World Health Organization (2017) defined emergency risk communication (ERC) as "an intervention performed before (as part of preparedness activities), during and after (to support recovery) an emergency to enable everyone at risk to

take informed decisions to protect themselves, their families and communities against threats to their survival, health and well-being" (p.1)⁸. The disaster agency should recognize the principle of risk communication in a crisis or emergency as an essential tool to tackle the disaster. This article will explain the principles of emergency risk communication, the role of media in emergencies, and how to make effective communications regarding an impending high impact weather threat among all-level stakeholders, including citizens, local community, local government, nongovernmental organizations (NGO), and the government.

As the number and severity of disaster increase, emergency risk communication becomes an important role in disaster management.⁶ Communication is an essential part of disaster management procedures and decision making during a disaster event.⁶ Furthermore, Emergency risk communication ensures the effective communication among all level of stakeholders. As a result, all relevant stakeholders could communicate the correct message in a timely manner. Also, the message could be understood by audiences who can react to the proper action in the emergency event.⁶ As an

illustration in Table 1, emergency risk communication would be operated from the pre-event to the post-event phase.⁹ In the pre-event phase, it is essential to reach an agreement with all partners regarding the working procedure as well as building trust with the community.⁶ In this phase, emergency risk communication would be used as a tool or process to eliminate risk, create risk awareness among all-level stakeholders, and encourage disaster preparedness.⁹ Emergency risk communication could build trust as well as it can use as an educational tool for public education toward possible risk, mitigation, preparation, and emergency response.^{7,10} For example, regular risk communication regarding earthquake preparedness in Wellington resulted in relatively high awareness and preparedness.¹¹ The public's cooperation is not only building trust with local people but also understanding how they perceive and interpret message.⁷ Although the emergency risk message was well-designed, it would fail when the communicator lacks an understanding of the target people.¹² In terms of disaster risk reduction, Infanti et al. (2013) stated that risk communication was a central part of risk management cycle as a tool for hazard identification, risk

assessment, policy development, policy implementation, and policy evaluation. As an illustration, during the pre-event phase, traditional notions of health promotion and the risk communication are suitable to both educate the public regarding potential threats and to motivate appropriate preparation and risk-reducing behaviors according to a policy that was developed based on the result of risk analysis.⁹

During the event phase, emergency risk communication plays a role as disseminating warning, situation explanation and instruction message as well as a role in processing emergency management among all stakeholders.⁹ The immediate communication could reduce the uncertainty, inform audiences to create a basic understanding of hazard (making them act appropriately), and advise timely evacuation to reduce the impact from the hazard.⁹ Public panic may exist when there is inadequate information regarding the disaster. Therefore, emergency risk communication also seeks to decrease generalized anxiety and concern among the larger public. Emergency risk message should be efficient to provide essential information and encourage their action against disaster.⁷ Therefore, an emergency

การสื่อสารความเสี่ยงในสถานการณ์สาธารณสุข

รัฐระวี พัฒนรัตน์โมฬี

¹ ศูนย์ความร่วมมือองค์การอนามัยโลกด้านการป้องกันการบาดเจ็บ โรงพยาบาลขอนแก่น

*ผู้ประพันธ์บทความ

รัฐระวี พัฒนรัตน์โมฬี

ศูนย์ความร่วมมือองค์การอนามัยโลกด้านการป้องกันการบาดเจ็บ โรงพยาบาลขอนแก่น

เลขที่ 56 ถ.ศรีจันทร์ อ.เมือง จ.ขอนแก่น 40000 ประเทศไทย

อีเมล: bowling_er@hotmail.com

โทรศัพท์ที่ทำงาน: 043009900

โทรศัพท์มือถือ: 0834046246

DOI:

บทคัดย่อ

การสื่อสารความเสี่ยงและข้อความต่าง ๆ ในสถานการณ์สาธารณสุขเป็นขบวนการที่มีความสำคัญในการจัดการภาวะสาธารณสุขให้ประสบความสำเร็จ การออกแบบข้อความที่ใช้สื่อสาร ผู้ออกแบบสารควรมีความเข้าใจในทักษะการรับสารและขบวนการแปลสารของผู้รับสาร จึงจะทำให้มั่นใจได้ว่าสารที่ส่งออกไปนั้นจะส่งถึงและสร้างความเข้าใจแก่ผู้รับสาร จนกระทั่งส่งผลให้เกิดการปฏิบัติตามสารที่ส่งให้ได้อย่างเหมาะสม การสื่อสารความเสี่ยงนั้นเป็นเครื่องมือที่ใช้จัดการสถานการณ์สาธารณสุขทั้งในช่วงก่อนระหว่างและหลังเกิดภัย การสื่อสารที่มีประสิทธิภาพส่งผลให้ประชาชนเตรียมพร้อมรับ ตอบโต้และฟื้นฟูตนเองตามคำแนะนำได้ ในปัจจุบันการสื่อสารมีหลากหลายช่องทาง เช่น วิทยุ โทรศัพท์ SMS และช่องทางใหม่ๆ ได้แก่ Social media ซึ่งจัดเป็นปัจจัยที่ผู้จัดการการสื่อสารนั้นจะต้องเลือกใช้และควบคุมการใช้ให้เหมาะสมกับสถานการณ์เพื่อประโยชน์สูงสุดในการจัดการ Social media จัดว่าเป็นช่องทางที่ได้รับความนิยมในปัจจุบันเนื่องจากรวดเร็ว สื่อสารได้ในวงกว้างและในขณะเดียวกันก็ควบคุมได้ยาก ดังจะพบได้จากข่าวปลอมที่มักจะแพร่กระจายอย่างรวดเร็ว ส่งผลให้เกิดความเข้าใจที่สับสน เกิดความโกลาหล ซึ่งทำให้การควบคุมสถานการณ์สาธารณสุขเป็นไปได้ด้วยความยากลำบากมากขึ้น อย่างไรก็ตามการสื่อสารความเสี่ยงในทุกช่องทางยังมีความจำเป็นเนื่องจากโอกาสของการเข้าการสื่อสารแต่ละประเภทของกลุ่มคนในสังคมแต่ละกลุ่มมีความแตกต่างกันตามวัฒนธรรมและความนิยมในกลุ่มนั้นๆ เช่น ผู้สูงวัยอาจจะเคยชินการรับฟังสารจากวิทยุและโทรทัศน์ แต่วัยรุ่นนั้นติดตามข่าวสารจาก Social media มากกว่า ความหลากหลายของการสื่อสารนั้นรวมถึงการสื่อสารด้วยภาษาท้องถิ่นที่จะสร้างความเข้าใจให้กับชุมชนได้ดีขึ้น

คำสำคัญ

การสื่อสารความเสี่ยง สาธารณภัย

Crisis and emergency risk communication

Ratrawee Pattanarattanamolee¹

¹ WHO collaboration center in injury prevention, Khon Kaen Hospital

*corresponding author

Ratrawee Pattanarattanamolee

Khon Kaen hospital 56 Srichan road, Meaung district, Khonkaen, 40000

Email: bowling_er@hotmail.com

Tel: 043009900

Mobile: 0834046246

DOI:

Abstract

Communication regarding disaster risk and messages during a disaster is a vital process for success in disaster management. The message designer has to understand how people receive and interpret the message. This comprehension would make the designer produce an understandable message that will affect the action against disaster. Emergency Risk Communication can be used before, during, and after a disaster to make recommendations on how to prepare for, respond to, and recover from disaster. Currently, the methods for communication are various, such as radio, television (TV), and social media, which would be selected and controlled for the full benefit of the situation. Social media is now widely used, convenient, practical, and serves as a boarding connection. However, rumor is one of the disadvantages, which may result in confusion and a chaotic situation in disaster. Besides, multiple methods of communication are needed during disaster because of the different capacities for accessing the message depending on the culture and popularity of each recipient group. For example, while teenagers would prefer social media, older people may be prefer radio and TV. In addition, the local language message would make the message simpler to understandable.

Key word

emergency risk communication; disaster

Introduction

In the last ten years, scholars have reported that the disaster has increased in incidence, intensity, complexity, and dynamicity.¹ The results impact human life, community, and the global economic system.² For instance, the Haiti earthquake resulted in over 200,000 deaths, and cyclone Nargis resulted in around 80,000 deaths in Myanmar. Public facilities, such as hospitals, schools, and people's houses were destroyed. As a result, some people were homeless.³ The integrated disaster planning from all levels of stakeholders is necessary to deal with the current complex disaster.^{1,4} In recent literature, the local community has been a vital factor in disaster management, including early warnings, and decision making.^{5,6} The information management in disaster, including managing information flow, building awareness, disseminating early warnings and inducing an emergency response, requires the tool "emergency risk communication" in managing risks and disasters.⁷ World Health Organization (2017) defined emergency risk communication (ERC) as "an intervention performed before (as part of preparedness activities), during and after (to support recovery) an emergency to enable everyone at risk to

take informed decisions to protect themselves, their families and communities against threats to their survival, health and well-being" (p.1)⁸. The disaster agency should recognize the principle of risk communication in a crisis or emergency as an essential tool to tackle the disaster. This article will explain the principles of emergency risk communication, the role of media in emergencies, and how to make effective communications regarding an impending high impact weather threat among all-level stakeholders, including citizens, local community, local government, nongovernmental organizations (NGO), and the government.

As the number and severity of disaster increase, emergency risk communication becomes an important role in disaster management.⁶ Communication is an essential part of disaster management procedures and decision making during a disaster event.⁶ Furthermore, Emergency risk communication ensures the effective communication among all level of stakeholders. As a result, all relevant stakeholders could communicate the correct message in a timely manner. Also, the message could be understood by audiences who can react to the proper action in the emergency event.⁶ As an

illustration in Table 1, emergency risk communication would be operated from the pre-event to the post-event phase.⁹ In the pre-event phase, it is essential to reach an agreement with all partners regarding the working procedure as well as building trust with the community.⁶ In this phase, emergency risk communication would be used as a tool or process to eliminate risk, create risk awareness among all-level stakeholders, and encourage disaster preparedness.⁹ Emergency risk communication could build trust as well as it can use as an educational tool for public education toward possible risk, mitigation, preparation, and emergency response.^{7,10} For example, regular risk communication regarding earthquake preparedness in Wellington resulted in relatively high awareness and preparedness.¹¹ The public's cooperation is not only building trust with local people but also understanding how they perceive and interpret message.⁷ Although the emergency risk message was well-designed, it would fail when the communicator lacks an understanding of the target people.¹² In terms of disaster risk reduction, Infanti et al. (2013) stated that risk communication was a central part of risk management cycle as a tool for hazard identification, risk

assessment, policy development, policy implementation, and policy evaluation. As an illustration, during the pre-event phase, traditional notions of health promotion and the risk communication are suitable to both educate the public regarding potential threats and to motivate appropriate preparation and risk-reducing behaviors according to a policy that was developed based on the result of risk analysis.⁹

During the event phase, emergency risk communication plays a role as disseminating warning, situation explanation and instruction message as well as a role in processing emergency management among all stakeholders.⁹ The immediate communication could reduce the uncertainty, inform audiences to create a basic understanding of hazard (making them act appropriately), and advise timely evacuation to reduce the impact from the hazard.⁹ Public panic may exist when there is inadequate information regarding the disaster. Therefore, emergency risk communication also seeks to decrease generalized anxiety and concern among the larger public. Emergency risk message should be efficient to provide essential information and encourage their action against disaster.⁷ Therefore, an emergency

risk-message designer has to understand how people perceive and interpret the message. There are several factors which affect individual's perception, decision making and action including personal experience, feelings, values, cultural beliefs and interpersonal, and societal dynamics.^{9,14} The collaboration of local community, local government and all relevant stakeholder to develop the message would be an effective way to make the message that matched to their various needs according to the concept of people-centered approach.^{6,15} In the present, there are many kinds of media, such as television, radio, newspaper, email and social media. Some of this media, such as social media, convey the information very fast, broadly and uncontrollable.⁶ This media could put more pressure emergency risk communicator because the incorrect information from various channels may disturb people's perception and action.⁸ Additionally, emergency risk communicator should concern with this confounding factor and produce a possible solution to correct fact to the audiences. Creditability is an important factor to make the audiences to trust in the message, and this trust can be maintained by providing a trustworthy message.¹⁶ This

means the message designer have to generate message depending on scientific and confidence evidence with careful analysis. Traditional one-way communication was believed to fail in an assessment of the audiences' perception. Therefore, two-way communication would be a better choice to overcome this problem.¹⁴ Importantly, message perception evaluation (from the feedback by the audience) would be a benefit for further message design.⁶

In post-event stage, emergency risk communication provides an ongoing communication regarding new understandings of risk and recovery procedures and policies for risk avoidance as well as preparedness for relapsing risk and the next coming risk.⁹ The evaluation of emergency risk communication should be conducted in term of the improvement in the next operation.⁸

The social network also significantly affects emergency risk communication because it does not only convey the message but also impacts on how people interpret and respond to the message.¹⁴ The audiences sometimes trust the information from friends, family member and community group more than the official message especially the ethnic minority group whose primary language is

not the national language in the country that they migrated.¹⁷ For example, in Australia, there were some limitations to access the emergency risk message in the audiences whom English is their second language.¹⁴ Moreover, the bonding within the community is very strong that makes them discuss broadly before making a decision. As an illustration, there was a delayed evacuation in hurricane Katrina due to the discussion in their network in African American in New Orleans, USA.¹⁷ These cultural aspects including ethnic insensitivity, racial isolation and racial bias could not be ignored.¹⁷ For instance, the Christchurch earthquakes in 2010, Maori community demonstrated the effective

communication in their community, as a consequent, there were effective message dissemination and proper action to disaster among Maori citizens even though Maori people were excluded from emergency management process.¹⁸

The invisibility of bridging and linking capital is a big challenge for emergency risk communicator to explore and establish this link in order to the effective emergency risk communication.¹⁷ For instance, the exclusion of Maori representative from emergency management may result in delaying access to Maori victims, and this consequent would not be justified according to The Treaty of Waitangi.¹⁹ The another example regarding other ethnic

Table 1 ERC function in disaster management

Phase of disaster	Emergency risk communication
Pre-disaster	Public education Making trust Fostering mitigation and preparedness
During disaster	Maintaining trust Situation report and advice Correcting rumors
Post-disaster	Fostering recovery Evaluation procedure for the next event

minority group, some experts suggested that in the community whom English is not a primary language, the approach could be made with the younger, who would understand English better and would help to disseminate the message.^{6,14} World Health Organization (2017) suggested that the representative person from the community who was trusted by the community, should be involved in planning and decision-making process and this would build a link between community and external agencies and also created a community engagement.

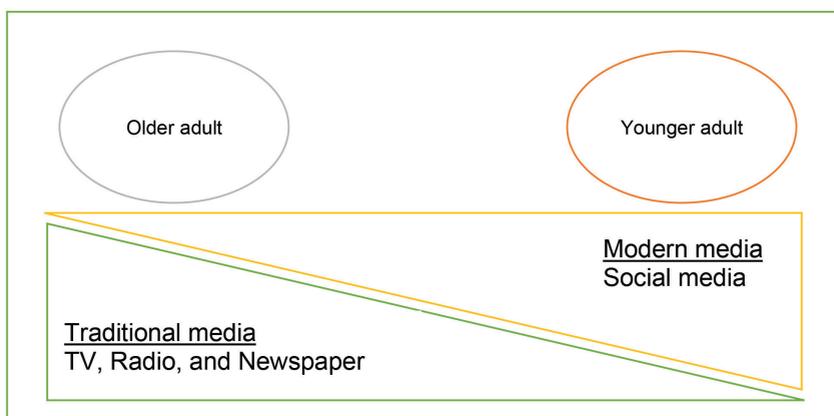
The communication methods are the way that conveyed the message from emergency risk communicator to the audiences and the relevant stakeholders.⁶ Multiple communication methods are encouraged to use as much as possible to ensure that the message will reach to every group in the community and fulfil the gap of communication.⁶ Traditionally, communicative technologies including computers, radio, television, and telephones were used for these purposes.⁵ Unfortunately, some vulnerable groups (children, the elderly, the poverty, and the disability) would be difficult to access the emergency risk information from the internet and computers. As a result, the

decrease in the preparatory information and warning message.⁵ On the other hand, World Health Organization (2017) noted there was a challenges of the changing role from traditional media (newspapers, radio and television) to the rapid transformation in communication technology, including digital media and the popularity of smart-phone usage. As a result, it changed how people access and trust health information. As shown in Picture 1, Older adult may prefer traditional, while younger adult is likely to have an information from social media. Recently, Emergency risk management agencies have increased the use of social media as a tool to connect with citizens. For example, the government of Sierra Leone selected WhatsApp (chatting application) as one of its official response channels.⁸ Even social media might be the channel that widely disseminates the rumors, it would have some advantages. Social media does not only use for monitoring the rumors, but it is also used to provide the fact that against the rumors and make a relationship with the audiences as well as making trust with the community.⁸ The integration communication between traditional communication and social media would be recommended to ensure the effective

communication that reaches to all-level audiences.⁸

For example regarding the global warming, the impending-high-impact-weather threat will occur more frequency and severity according to global warming.²⁰ The emergency management would use emergency risk communication to inform citizens and the local community to be prepared and what emergency action should be done to decrease the devastating impact from this threat.^{6,9} Emergency risk communicator should collaborate with meteorologists, local government, NGO and all relevant government agencies to develop the message which is relied on scientific evidence and cultural issue.^{9,14,17} The relationship among counterparts should be developed before the event in order to work collaboratively in disaster.⁶

Information sharing and continuous communication such regular press conference might be a good way to keep trust among all stakeholders.⁶ At the beginning, the scientific methods should be used to predict the possibility of hazard and to monitor the severity of hazard.⁹ Next, the local government should send the message to the representative of the community to evaluate the quality of the message and then collect feedback data to revise the message.⁹ The complete message should be disseminated as soon as possible to provide fact and the instruction regarding preparation and mitigation. As a result, this message could decrease the uncertainty and prevent public panic. Additionally, the selection of communication methods should choose all available-feasible methods to ensure



Picture 1 The popularity of Media between older and younger adult.

that emergency risk message could be sent to all-level citizens.⁶ Social media would be monitored to early detection of rumors and evaluate people's response to the disseminated message.⁸ Furthermore, the two-way communication might develop via social media for conveying the information, assessment of the audiences' need and examine the feedback.¹⁴ In some vulnerable group, the direct assessment should be done with the community head, and then the research might conduct if it is needed.⁸ The continuous communication would have been going on to reducing uncertainty, keeping trust and providing fact and the essential instruction until the recovery phase.⁹ Finally, the feedback that derives from emergency risk communication should be analyzed to the improvement of the operation and communicate this result to all stakeholders.

Conclusion

In conclusion, the incidents of disaster and crisis have highlighted the essential role of emergency management. Emergency risk communication is an important element in emergency management in all phases of disaster because it can be use for disaster risk management, communication during

disaster. Both traditional and modern communication are important to access people. However, two-way communication could be established via research or social media to assess the feedback and monitor the response. Trust would be maintained by listening to the audiences and providing accurate information which creates from the confidence and scientific evidence. At last, the evaluation of all working process and feedback will provide valuable information to improve the operation for the future disaster and the preparedness of community, local government, NGO and all relevant government agencies.

References

1. Blanchard BW, Canton LG, Cwiak CL, et al. Principles of Emergency Management Supplement. Published online October 1, 2007. doi:10.13140/RG.2.2.32021.93925
2. Jin D, Lin J. Managing tsunamis through early warning systems: A multidisciplinary approach. *Ocean Coast Manag.* 2011;54(2):189-199. doi:10.1016/j.ocecoaman.2010.10.025
3. Leaning J, Guha-Sapir D. Natural disasters, armed conflict, and public health. *N Engl J Med.* 2013;369(19):1836-1842. doi:10.1056/NEJMra1109877
4. Gaillard JC. Vulnerability, capacity and resilience: Perspectives for climate and development policy. *J Int Dev.* 2010;22(2): 218-232. doi:10.1002/jid.1675
5. Howard A, Agllias K, Bevis M, Blakemore T. "They'll tell us when to evacuate": The

- experiences and expectations of disaster-related communication in vulnerable groups. *Int J Disaster Risk Reduct.* 2017;22:139-146. doi:10.1016/j.ijdrr.2017.03.002
6. Palttala P, Boano C, Lund R, Vos M. Communication gaps in disaster management: perceptions by experts from governmental and non-governmental organizations. *J Contingencies Crisis Manag.* 2012;20(1):2-12. doi:10.1111/j.1468-5973.2011.00656.x
 7. Khan S, Mishra J, Lin K, H Doyle E. Rethinking communication in risk interpretation and action. *Nat Hazards.* 2017;88:1-18. doi:10.1007/s11069-017-2942-z
 8. World Health Organization, ed. *Communicating Risk in Public Health Emergencies: A WHO Guideline for Emergency Risk Communication (ERC) Policy and Practice.* World Health Organization; 2017.
 9. Reynolds B, W Seeger M. Crisis and emergency risk communication as an integrative model. *J Health Commun.* 2005;10(1):43-55. doi:10.1080/10810730590904571
 10. Edwards A. Communicating risks. *BMJ.* 2003;327(7417):691-692.
 11. Khan S. *Living in a Hazardscape: A Study of Hazards and Response in the Wellington Region, New Zealand.* LAP LAMBERT Academic Publishing; 2012.
 12. Morgan MG, Fischhoff B, Bostrom A, Atman CJ. *Risk Communication: A Mental Models Approach.* Cambridge University Press; 2002.
 13. Infanti J, Sixsmith J, Barry M, Núñez-Córdoba J, Oroviogicoechea-Ortega C, Guillén-Grima F. A Literature Review on Effective Risk Communication for the Prevention and Control of Communicable Diseases in Europe. ECDC; 2013. Accessed April 30, 2019. <http://ecdc.europa.eu/en/publications-data/literature-review-effective-risk-communication-prevention-and-control>
 14. Hanson-Easey S, Every D, Hansen A, Bi P. Risk communication for new and emerging communities: The contingent role of social capital. *Int J Disaster Risk Reduct.* Published online January 17, 2018. doi:10.1016/j.ijdrr.2018.01.012
 15. Scolobig A, Prior T, Schröter D, Jörin J, Patt A. Towards people-centred approaches for effective disaster risk management: balancing rhetoric with reality. *Int J Disaster Risk Reduct.* 2015;12:202-212. doi:10.1016/j.ijdrr.2015.01.006
 16. Kaspersen R. Four questions for risk communication. *J Risk Res.* 2014;17(10):1233-1239. doi:10.1080/13669877.2014.900207
 17. Eisenman DP, Cordasco KM, Asch S, Golden JF, Glik D. Disaster Planning and Risk Communication With Vulnerable Communities: Lessons From Hurricane Katrina. *Am J Public Health.* 2007;97(Suppl 1):S109-S115. doi:10.2105/AJPH.2005.084335
 18. Phibbs S, Kenney C, Solomon M. Ngā Mōwaho: an analysis of Māori responses to the Christchurch earthquakes. *Kōtuitui N Z J Soc Sci Online.* 2015;10(2):72-82. doi:10.1080/1177083X.2015.1066401
 19. New Zealand immigration. *The Treaty of Waitangi | New Zealand Now.* Published November 28, 2018. Accessed May 5, 2019. <https://www.newzealandnow.govt.nz/living-in-nz/history-government/the-treaty-of-waitangi>
 20. IPCC. *Climate Change 2014: Synthesis Report.* The intergovernmental panel on climate change; 2014. https://www.ipcc.ch/site/assets/uploads/2018/02/AR5_SYR_FINAL_SPM.pdf