

Teaching Disaster Site Medical Support in Indonesia

Jen Heng Pek, MBBS, MCEM, MMED; Hui Min Kang, MBBS, MCEM, MMED;
Venkataraman Anantharaman, MBBS, FRCP, FAMS, FRCSEd

ABSTRACT

Preparation is key to dealing with the rising number of disasters occurring globally. Teams may be inexperienced, but they cannot be inadequately prepared. Rescue providers must be equipped with knowledge, skills, equipment, and supplies to manage the complex demands of a disaster. To bridge the gaps in disaster management training, the Singapore Health Services, in collaboration with the University of Hasanuddin, developed a tailored training program for the teaching of medical support at the disaster site in Indonesia. This project was conducted in Makassar for participants in the province of South Sulawesi. Over the 2-year period, the project benefitted 301 participants, with 73 identified to become Master Trainers to take over local ownership and leadership of the program. The Master Trainers would continue the training of new participants, as well as work within their agencies and with each other to bring about changes to significantly improve disaster management in Indonesia.

Key Words: disaster medicine, education, public health professional, international cooperation

Swift and effective response is necessary for natural disasters, global terrorism, and new infectious disease epidemics, which have been on the rise over the past 50 years.¹ The burden of casualties and caring for affected victims will continue to increase. The United Nations Office for Coordination of Humanitarian Affairs has estimated that 88 million people will require humanitarian assistance globally every year.² Disaster management includes the preparation, response, recovery, and mitigation phases directed at minimizing the negative consequences following a disaster. However, undefined roles, lack of clarity regarding chain of command, and poor leadership often lead to misunderstanding and chaos when a disaster happens.³ Therefore, preparation is key; teams may be inexperienced, but they cannot be inadequately prepared. Preparedness is necessary with regard to organizational readiness, communication and coordination, as well as resource availability and professional engagement.⁴ These may be achieved either by exposure to many disasters or proper training programs.⁵ Because disasters occur infrequently, training programs are important and necessary. Rescue providers, managers, and organizations should be equipped with the knowledge, skills, and attitudes needed when responding to the complex demands of a disaster to ensure an effective response.⁶⁻⁸ Without a good foundation in disaster management, an unprepared response would limit its effectiveness, hindering surge capacity and negatively impact health outcomes of the affected population.⁹

The objective of this paper is to document the development and conduct of a training program for the teaching of medical support at the disaster site in Indonesia by the Singapore Health Services (SingHealth), in collaboration with the University of Hasanuddin (UnHas), the largest tertiary institution of higher learning in the eastern part of Indonesia.

REPORT Background

Indonesia is the fifth largest country in the world with a population of 210 million on an area of over 5400 kilometers made up of nearly 17 000 islands and islets. Indonesia is often known as the *land of disasters* due to a long history of natural and man-made disasters. Natural disasters that have afflicted Indonesia include floods, earthquakes, and volcanic eruptions. The great tsunami of 2004 affected the northern and western areas of Sumatra, resulting in severe destruction of settlements and large numbers of deaths. Indonesia has more volcanoes than any other country with 129 active ones making up part of the Pacific ring of fire.¹⁰ Seventy volcanic events have been reported since 1900 with 18 840 deaths, with an average dead to injured ratio of 2.53.¹¹ Man-made disasters that have occurred in Indonesia included airplane crashes, bombing incidents, and riots. There have been at least 37 airplane crashes in Indonesia over the last 3 decades.¹² The Bali bomb attack in 2002 claimed over 200 lives, with casualties sustaining major burns

and blast injuries.¹³ There was also a period of relative political turmoil and civil unrest in many parts of the country from 1997 to 2012.

The challenges for medical care in the aforementioned situations include gaining access to the casualties, providing initial life support and medical support at the disaster site, ensuring a timely and safe evacuation to an appropriate hospital, as well as continuing care that follows the acute disaster and extends through the recovery period. In some situations, health facilities may be damaged, further limiting access to medical care and resources.

Statutes and Regulations for Disaster Management in Indonesia

The “Government Regulation of the Republic of Indonesia Number 21 of 2008 concerning Disaster Management” sets the basis for the major efforts to mitigate the effects of disasters occurring in Indonesia.¹⁴ This document also provides the framework for the involvement of a multiplicity of agencies in disaster response and the essentials of the health care response system.

Efforts at Addressing Management of Disasters in Indonesia

The National Disaster Management Authority (*Badan Nasional Penanggulangan Bencana* [BNPB]) and Disaster Preparedness Brigade (*Brigade Siaga Bencana* [BSB]) are in charge of coordinating disaster management efforts for the whole country. BNPB provides guidance and standardized disaster management efforts for prevention, response, rehabilitation, and reconstruction based on Indonesia’s laws and regulations. BNPB established District Disaster Management Agencies (*Badan Penanggulangan Bencana Daerah*) for disaster planning and management, as well as the coordination of incident response mechanisms with other disaster response agencies in the various districts within Indonesia. BNPB reports to the State President and also provides information to community disaster management personnel. Finally, BNPB accounts for the utilization of donations and other forms of support from national and international sources so that these resources are accessed in a fair and equitable manner.

BSB, consisting of 10 to 15 doctors from each selected state hospital, aims to positively impact casualty outcomes in disasters by creating elements of prehospital and hospital health services. The team was trained in the handling of emergencies, as well as a variety of life support programs such as Advanced Trauma Life Support, Advanced Cardiac Life, and Emergency First Aid. During a disaster, BSB functions under the head of the local health office and would be deployed to the disaster site for the management of disaster victims. BSB also carries out needs assessment for disaster-related health problems

and conducts epidemiological surveillance for the infectious and sanitation-related diseases.

Defining Disaster Site Medical Support

The greatest impact of any disaster is expected within the first few hours of the event – during the Golden Hour of Disaster. Prompt response during this time would maximize survival and set the community on the path toward recovery and rehabilitation. Shortcomings in this response could result in adverse outcomes, including a large number of casualties and chaos. The medical service would be responsible for saving lives and getting injured people on their feet and back to a useful role in society in as short of a time as possible. This role would begin from the moment someone sustains an injury at the disaster site. Therefore, disaster site medical support focuses on the initial life and limb saving treatment provided at the disaster site with a prompt and safe evacuation to an appropriate hospital for definitive treatments and rehabilitation. It encompasses the care provided at the disaster site from the time of disaster to the evacuation of casualties to the hospitals.

Previous Courses for Disaster Site Medical Support in Indonesia

Two courses were available for the teaching of medical support at the disaster site. The Medical First Responders Course was promoted by the Program for Enhancement of Emergency Response and sponsored by the Office of Foreign Disaster Assistance under the United States Agency for International Development. However, attempts to train large numbers of health care workers and volunteers were dismal with an inadequate number of instructors. Furthermore, there was no standardization of disaster-site response teams either from hospitals or from voluntary agencies.

The Hospital Organization for Preparedness in Emergencies was specifically developed to address the need for preparedness of hospitals to continue functioning during earthquakes, and included components that were relevant to the building of safe hospitals, structural integrity of hospital buildings, and the engineering aspects of hospital construction. Some concepts of overall organization and medical support at the disaster site were also covered in the program. However, only a small number of senior hospital leaders were trained in the program, and translation of the lessons learnt into actual practice for local disasters did not materialize.

Needs Assessment in Indonesia

A study trip was conducted in February 2014 by SingHealth, together with UnHas, to Makassar, the capital of the province of South Sulawesi. In addition, a standardized questionnaire was sent to 27 health care facilities and health-related organizations to collect data on the status of disaster preparedness. The key findings relevant to the provision of medical support at the disaster site are summarized in [Table 1](#).

TABLE 1

Key Findings from a Needs Assessment

1. There was an absence of a single coordinating authority for activation and management of health services and other agencies involved in a disaster response.
2. There was a lack of collaboration between health services and other agencies involved in a disaster response as their roles were not defined.
3. There was an absence of any unified medical support structure at the disaster site.
4. There was a lack of uniformity in the contribution to medical support at the disaster site by different hospitals and agencies.
5. There was a lack of standardization in manpower response and logistics items carried by teams for medical support at the disaster site.
6. There was a long response time of teams from activation to arrival at the disaster site.
7. There was inadequate first aid or rescue training of lay uninjured survivors.
8. There was an absence of a defined system of casualty evacuation, leading to a delayed and often inappropriate casualty evacuation to hospitals.
9. There was inadequate training to equip medical teams with the necessary knowledge, skills, attitudes, and organization required when responding to the disaster site.

TABLE 2

List of Stakeholders

- A. University of Hasanuddin
- B. Medical Services
 1. Public and private hospitals
 2. Community clinics
 3. Training centers
 4. Red Cross
- C. District Disaster Management Agency
 1. *Badan Penanggulangan Bencana Daerah*
- D. Rescue Service
 1. *Badan Search and Rescue Nasional Makassar*
- E. Military
- F. Police

Development of a Training Program for Disaster Site Medical Support

Key findings collected during the phase of needs assessment were used to create the curriculum and the associated models for training and evaluation. Numerous meetings were also held with the stakeholders (Table 2) to seek advice and clarification about various roles and processes regarding the disaster site medical support in Indonesia, as well as to obtain their buy-in and support. This was essential to the development of an effective training program and would facilitate relationships with the stakeholders, thus strengthening connections within the community.¹⁵ International best practice principles were then adapted to create a localized training program relevant for Indonesia.¹⁶⁻²⁰

TABLE 3

Curriculum for Disaster Site Medical Support Training Program**A Basic Concepts**

1. Disaster terminology, definitions, and the disaster management cycle
2. Types of disasters afflicting Indonesia and the impact of disasters
3. The time-critical nature of injuries suffered during disasters
4. The disaster environment

B Disaster Planning

1. Roles and competencies required in the initial phase of disaster management
2. Existing agencies in Indonesia for disaster management
3. Planning for disasters

C Disaster Site

1. Concepts in organization of the disaster site
2. Medical support elements for the disaster site – sources and integrated management
3. The First Aid Post
4. Command, control, and communications in disasters

D Service Support and Logistics

1. Casualty evacuation principles in disasters
2. Safe transport to hospitals
3. Medical support needs in special disaster situations
4. Medical logistics in disaster-site operations
5. Clinical skills for disaster-site care

This training program, focusing on medical support at the disaster site, was intended for health care workers, including doctors, nurses, and allied health care personnel, from the various health care institutions in the province of South Sulawesi. A selected group of participants were identified as Master Trainers based on recommendations by local agencies, as well as their attendance and performance at all training sessions. The purpose of identifying these Master Trainers was to train and equip them to become instructors so that this project could be handed over and be sustained by a local team.

Curriculum

The curriculum was designed to address competencies required for disaster site medical support, with a focus on casualty management at the disaster site (Table 3). From the curriculum, a 2-day training program was designed to allow course participants from a variety of backgrounds to develop knowledge, skills, and attitudes for disaster management in an incremental manner. The course also provided a platform for networking among participants from various agencies to be engaged in discussions regarding disaster management in Indonesia.

Training Program

The training program (Supplement) consisted of 4 main modules. The first module on basic concepts of disaster was taught with the use of didactics. Local examples were used to make the contents relevant. Small-group tutorials were then

conducted to consolidate facts about general aspects of disasters and their effects in Indonesia.

The second module on disaster planning covered the roles, responsibilities, and required competencies of existing disaster-response agencies in Indonesia. This module was delivered with use of didactics, followed by interactive group discussions. Course participants were provided with opportunities to reflect on how existing agencies could use available resources to enhance their roles and interactions during the disaster management process, as well as whether the reorganization of response agencies could create better functional units that would be more responsive in disaster situations. This was followed by a presentation of a response plan to a disaster scenario. Participants had to present their plan, principal considerations, the resources required, as well as any potential challenges and alternative options. The teams were encouraged to critique and question each other to maximize the learning value of these presentations.

The third module was on disaster-site matters, which covered the principles of establishing cordons, the functions of and resources of each cordon, as well as the overall command and control. The medical support in each zone, which was centrally coordinated through the setting up of a Disaster Site Medical Command, was emphasized.

The fourth module was on the specific aspects of medical support at the disaster site such as activation of medical support teams, disaster triage, setting up of first-aid posts, communications, logistics, and psychological and forensic support. Practical exercises on these topics were conducted as either small group discussions, interactive role playing, short practical field exercises, or simply revision tutorials.

Last, the training also included a brief overview of the requirements for hospital organization of medical support and coordination of health services in the community. A post-course, multiple-choice test and feedback questionnaire were also administered at the end of the course.

Schedule of Courses

Seven courses were conducted from May 2014 to February 2016. While the first 2 courses were conducted by the SingHealth faculty, the subsequent courses saw the local team taking on incremental responsibilities when conducting the course. The final course of this project was conducted by the local team and audited by the SingHealth faculty. This approach would prepare the local team to take over and disseminate the program across Indonesia.

RESULTS

The effectiveness of this project was determined by the number of participants, their evaluation of the training program, as

well as the number of participants trained by the Master Trainers after the project was handed over to the local team. Over the 2-year period of this project, the courses gained popularity, with local agencies expressing interest to take over ownership of the program. A total of 301 participants successfully completed the training program, far exceeding the project's target of 200 participants. Across all 7 runs of the training program, the median proportion of participants who evaluated the training program as being "useful," "good," "effective," and "well-organized" at each course was 100% (Range, 88.6–100%). The content was also accepted to be relevant for the participants. The feedback was positive, regardless of the team of instructors, attesting to the quality of the content and delivery of this standardized disaster training program.

Furthermore, a total of 73 Master Trainers were trained, once again exceeding the project's target of 50. The Master Trainers further underwent a Disaster Medicine Instructor Course and a Disaster Exercise Preparation and Implementation Course to better prepare and equip them in training and facilitating the learning of others. UnHas subsequently selected a core group from amongst the Master Trainers to coordinate further implementation of the disaster site medical support training in the province and other parts of Indonesia.

At the time of writing, the Master Trainers have trained 5233 participants in disaster site medical support and community response across Indonesia. The Master Trainers have also helped organize disaster exercises with other disaster response agencies.

DISCUSSION

SingHealth, in collaboration with UnHas, has developed a disaster management training program focused on the provision of medical support at the disaster site, tailored for Indonesia. This 2-year educational process began with a needs assessment conducted with the local stakeholders of disaster management. A curriculum aimed at addressing the requirements of local disaster management was developed. The program provided a platform to bring people together across professions, organizations, and nations for cooperation and coordination as they established academic and workplace partnerships for disaster management.

There have been conflicting opinions on standardized disaster management training programs. Proponents claim that these programs ensure quality and uniformity of training, facilitate international cooperation, provide transparency, guide those involved in disaster management, and allow for evaluation and continual upgrade.^{16,21} Opponents express concerns about the perceived inflexibility imposed by standards. The training program designed for Indonesia adopted a standardized approach and yet allowed flexibility in requirements to ensure relevance when reaching out to the participants.

Consideration was given to ensure that the costs of managing the program were kept low. The Disaster Training Curriculum Project, funded by the European Union's Seventh Framework Program recommends the use of state-of-the-art methods for the training of disaster management education.²² However, instead of depending on technology involving expensive manikins and other high-technology forms of simulation, this project emphasized on the training of trainers, focusing on the details of conduct of the training program. High-technology-based training systems would not have been sustainable in the local Indonesian environment as it would be for any of the major communities prone to disasters. The translation of pertinent concepts in disaster management to practical training was a challenge, but it was also what made the training popular. Simulation sessions, small group discussions, and practical exercises were superior to traditional teaching methods such as didactic lectures for disaster management.²³ Therefore, these were incorporated, where possible, to reinforce key principles and enhance learning for participants. The utilization of different teaching methods, also known as *blended learning*, was identified to be the most cost-effective and suitable approach for disaster medicine training.^{22,24}

A post-course assessment using a theory test was used to evaluate the candidates' understanding and retention of key disaster management principles and for certification. Given the relatively short training duration, evaluation of the participants was important for them to understand key concepts that they could bring back for practice and eventual implementation in their individual organizations and agencies. Assessments also enhance motivation during the learning phase as participants would be able to better appreciate their current deficits. Post-assessment, all participants were taken through the various test questions so that they could better appreciate the answers they should have provided in the event that they had their answers wrong.

Despite the successful conduct of the training program in Indonesia, there were challenges and barriers that the teams needed to overcome, providing an opportunity to foster greater collaboration and build closer relations among all involved. These would also be useful considerations when developing future projects of the same nature.

First, there was a less than expected attendance in some of the courses, initially. This was attributed to a no-show on the part of participants, as they could not be released by individual agencies owing to work commitments. This matter was taken up with the local agencies who agreed to provide protected time to allow participants to attend the training. A no-show rate of at least 20% was used when projecting subsequent courses. The SingHealth team also conducted make-up courses during subsequent visits. Both strategies allowed the project to achieve the intended targets.

Language was a major issue in the initial conduct of the program. While the use of interpreters and translation of the course materials helped overcome this, it slowed down the pace of the program during these initial phases. In the later phases, with the training material being translated to Bahasa Indonesia and the trained local faculty taking on a greater share of the training roles, understanding was much greater.

The ownership of this project was handed over by the SingHealth team to UnHas. As a premier teaching institution, UnHas was in the best position to coordinate such programs and monitor standards of conduct. In addition to running the courses, UnHas also set up a Disaster Training Secretariat that allowed the Master Trainers to come together frequently to get updates and share knowledge and expertise. To effectively impact and improve the current climate of disaster management in Indonesia, participants who have mastered the core concepts and competencies must retain the information and work with their and other agencies to adopt the best practices in disaster response to improve health outcomes during a disaster. This local leadership and ownership would be an essential precursor to structural reform.²⁵

Finally, the outcomes of this project were limited to a number of participants, their perspective of the training program, as well as the dissemination of the training program by Master Trainers. While we had hoped that the knowledge, skills, and attitudes learned would translate into actual behaviors and practices that would positively impact medical response and health outcomes during a disaster, we were currently not able to provide further insight on these long-term practical outcomes.¹⁷ However, the Disaster Training Secretariat would be in an optimal position to perform ongoing evaluations of participants and their agencies, as well as gather data about practical outcomes following a disaster response.

CONCLUSION

In order to enhance the provision of medical support at the disaster site, this project developed a localized training program for health care providers in Indonesia. It was successfully conducted by SingHealth and UnHas, with support from major stakeholders in disaster management in South Sulawesi, Indonesia. The program, which was relevant and well received by the participants, exceeded training targets. The project was subsequently undertaken by the local team consisting of Master Trainers who continued to disseminate the training program across Indonesia, reaching more than 5000 participants to date, attesting to the program's effectiveness in equipping and empowering the locals to take charge of their training in disaster site medical support. Further observations would be necessary to determine the impact of this project on medical response at the disaster site and health outcomes in the event of a disaster.

About the Authors

Department of Emergency Medicine, Sengkang General Hospital, Singapore (Dr Pek) and Department of Emergency Medicine, Singapore General Hospital, Singapore (Drs Kang, Anantharaman).

Correspondence and reprint requests to Jen Heng Pek, Department of Emergency Medicine, Sengkang General Hospital, 110 Sengkang E Way, 544886 Singapore (e-mail: pek.jen.heng@singhealth.com.sg).

Supplementary material

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