

Case Studies

on Safe Hospitals

in the South-East Asia Region



**World Health
Organization**

Regional Office for South-East Asia

Case Studies

on Safe Hospitals

in the South-East Asia Region

INDIA | INDONESIA | NEPAL | SRI LANKA



World Health
Organization

Regional Office for South East Asia

India

Building back better:

Gujarat in the aftermath of the 2001 earthquake

Background

A massive earthquake shook India's Gujarat state in January 2001. It affected not only the population but also the health facilities. The district hospitals, community health centres, primary health centres, sub-centres and thousands of Anganwadi centres in the affected districts were either entirely destroyed or damaged and rendered nonfunctional. Health professionals in the worst-affected districts were themselves suffering from trauma and injuries.



Evaluation of health sector response

In the aftermath, the Government of India took the lead, and NGOs and international agencies lent a hand in the response. An evaluation was conducted, and a number of successful features of the response and recovery phases were identified:

- Successful health sector coordination allowed for timely execution of response, with no overlapping of activities and resource allocation
- Effective partnership between the government, private sector, NGOs and UN agencies
- Joint planning for resource needs, including medical supplies
- Integration of vertical health programmes



Rehabilitation and reconstruction phase

During the rehabilitation and reconstruction phase, several measures were taken to ensure that hospitals are safer in emergencies in the future. Among them are:

- Systematic survey of health facilities
- Vulnerability and impact analysis of health facilities
- Rehabilitation of health facilities, including repair, strengthening, new construction as per new revised norms of earthquake safety, and retrofitting
- Guidelines developed for buildings according to earthquake seismic zones
- Seismic zoning of the state of Gujarat
- Linkages established with the departments for creating awareness and training about safe building practices and mitigation measures
- Launching of joint community-level awareness programmes
- School training and mock drills



The Gujarat example shows that health safety initiatives should not only involve bricks and mortar but also ways to make health centres integral to the future health and medical needs of the vulnerable population.

Rebuilding after a disaster will always be a learning experience. The Gujarat earthquake of 2001 had its own lessons, especially in the rebuilding of its health facilities.

Hospital location

After the earthquake, all new locations were chosen nearest to the community and work to ensure practical involvement of the community and provide knowledge about the facilities which were designed and built with seismic-resistant design inputs.

Hospital design

More space was provided in the designs for seismic movements. Soil testing for building and the uniform application of building codes were ensured.

Structural safety

Care was taken at the foundation and plinth stage to safeguard against possible hazards. Easy access routes were introduced and the quality of material used checked intensively.

Nonstructural concerns

Separate electrical circuits were installed with higher capacity to meet the demand of the new health facilities. Proper lighting was provided in critical areas. Lightning conductors, proper telecommunication cabling connections, and sufficient water storage capacity for at least 15 days, were kept in mind during reconstruction.

Health services

All the health centres now have an operations plan for hazards, including provision for essential medicines; emergency procedures were also put in place. Pre-hospital emergency medical care has been introduced to handle all health emergencies.

Health sector and health facility preparedness

A Health Action Plan for preparedness was initiated for the state by the Department of Health. Simulation exercises have been conducted for each health centre. Also completed: contingency plan, identification of all agencies for contact and communication, and a plan of action for procuring medicine and sourcing suppliers and equipment in an emergency.

Linking with other sectors

Soon after the earthquake, the Gujarat state Disaster Management Act, 2003 was promulgated. It created an authority that devolves power and responsibility to functionaries at district headquarters, state and local authorities, police and the community and the private sector to act in the event of a disaster.

Engaging the community

Advocacy materials have been widely disseminated on (a) emergency preparedness; (b) epidemiology; (c) disaster warning; and (d) safety measures. Information was published and distributed with the help of NGOs, WHO, the state government of Gujarat, the United Nations Development Programme (UNDP), and community volunteers following the earthquake on various issues including response, recovery and rehabilitation.

Appropriate training involving community members with provisions for clear roles, cooperation and accountability have now been established and rehearsals have also been conducted.

Indonesia

Restoring functionality:

Critical actions after volcanic eruption and earthquake

Background

Indonesia is the world's largest archipelagic nation and is surrounded by major geological faults. The country experiences several major earthquakes throughout the year. Major seismic events in the recent past include the earthquakes and tsunami of 26 December 2004; the Nias Island earthquake in March 2005; Yogyakarta in May 2006; and Bengkulu in September 2007. Throughout the year there are also several earthquakes that occur with an intensity below 5.5 Richter scale, and some that are above that level but have a less destructive impact.

Interventions

Against this backdrop, Indonesia has managed several emergencies and disasters of seismic origin and has improved the response through the years. Health facilities have also been a focus of risk mitigation efforts, and their success lies not only in structural interventions but also nonstructural and preparedness efforts.

In the recent past we have seen the following developments:

- Decentralization of disaster management efforts through Regional Crises Centres
- Structural and nonstructural mitigation measures in health facilities in key hospitals in the country





- Development of methodologies that incorporate architectural typology of the buildings in Indonesia
- Standard Operating Procedures and guidelines developed and utilized
- Strengthened training programmes for health-care staff covering preparedness, response and recovery under the framework of Disaster Risk Reduction

Event

Yogyakarta Earthquake in the background of Mount Merapi activity:

Sarjito Hospital is the provincial level referral and teaching hospital attached to Gajamada University in Yogyakarta. Before the earthquake, being a teaching hospital, staff were involved in various emergency and disaster-related capacity building activities, albeit on an *ad hoc* basis.

On 17 April 2006, Mt. Merapi, one of the world's most active volcanoes, located in Yogyakarta, started to show signs that an eruption was seemingly imminent. A Joint Emergency team formed by the Ministry of Health and WHO was sent to Yogyakarta to initiate operational planning and coordination. This was done in close collaboration with the Provincial Health Office (PHO) and hospitals, District Health Offices (DHO) and hospitals, Gajamada University and partner agencies. The contingency plan was modified and preparations made for a volcanic eruption and possible related earthquake. This started two weeks before the major earthquake hit Yogyakarta. Triage, emergency parking lots, evacuation sites and temporary emergency wards were identified, along with additional resources needed to combat mass casualties. Since the hospital staff were on mission to respond to the volcanic eruption, assisting health facilities and mobile clinics around the volcano, a hospital in-house drill for mass casualty management was not implemented.

A 6.9 earthquake struck central Java on the morning of 27 May 2006, and left approximately 1.8 million people homeless. The MOH reported 6736 dead and 134 396 injured. Across three affected districts, 251 health facilities (from hospitals to health subcentres) were damaged to varying degrees.

At first, patients in the Sarjito Hospital were evacuated and tents were erected outdoors to receive casualties. An emergency medical team from Jakarta arrived around 6:30 p.m. They met with the directors of the hospital, and an engineer from the team began evaluating the structural and nonstructural components of the hospital. About two hours later, it was decided that the hospital was safe and patients could be moved back into the hospital. A decision had to be made at that time between evacuation of patients to other referral hospitals or to use Sarjito Hospital. The MOH and hospital teams decided to re-operationalize Sarjito Hospital and to evacuate only those who need additional specialized services. Emergency triage for earthquake casualties was started and all six operating theatres activated; they started operations six hours after the earthquake. By 1 June, the facility had returned to normal.

A number of lessons were learned from this experience, and hospital officials have developed a disaster plan and provided training to staff. The HOPE (Hospital Preparedness for Emergencies) course has been developed by several institutions and is being implemented in Indonesia to further expand the network of prepared health facilities.

HOPE (Hospital Preparedness for Emergencies) is a four-day course that addresses the structural, nonstructural, organizational and medical concerns of health facilities in order to develop and implement well-designed plans that increase their capacity to respond effectively to emergencies. The course consists of 23 interactive lectures and six exercises.



HOPE is part of the Program for Enhancement of Emergency Response (PEER), which was developed by the United States Agency for International Development in collaboration with Johns Hopkins University, the National Society for Earthquake Technology-Nepal and a team of experts from the Asia Pacific region. The course has been tested and delivered in the following countries in the South-East Asia Region : Bangladesh, Indonesia, India, and Nepal.

The first HOPE course in each country is intended for medical experts with expertise in the field of emergency medicine and disaster preparedness and serving as faculty or lecturers. The first course in each country is intended to train future HOPE instructors. Subsequent HOPE courses are intended for members of hospital disaster-planning committees, including hospital administrators, hospital engineers, emergency room physicians, nurses and hospital planning staff.

Upon completion of the course, participants will be able to:

- describe the relationship between hospitals and disasters
- apply a method of judging or qualifying seismically functional/operational components of a hospital
- simulate a mass casualty incident, addressing the various roles and responsibilities
- discuss the basic requirements in the medical aspects of managing mass casualties and to demonstrate stress debriefing
- apply concepts learned in on-site medical care to specific situations
- prepare an outline of a hospital disaster preparedness plan including response and recovery.

In line with training, protocols are very important as well. A Decision-Making Support System after an emergency is being institutionalized in Indonesia and has the following features:

- Within 30 minutes after the earthquake, hospital staff must finish the evaluation regarding whether the hospital building is safe.
- This is done using the visual rapid assessment form developed for Indonesia.
- The result of the assessment will be used by the hospital management to make the very important decision whether to move the patients or continue normal operation.
- Clear lines of command and communication are set up using standard operating procedures and through Regional Crisis Centres.

Staff and key managers and decision-makers need to know and be trained in this process.

Various staff in the hospital (eg health workers, administrators) need to be adept in

- *Preparedness planning*
- *Evacuation skills*
- *Assessing rapidly if structures are safe for the patients and health workers to re-enter*
- *Implementing all preparedness and contingency plans*
- *Ability to request specific needs and to coordinate and manage emergency medical teams from other health facilities to provide effective intervention*

Nepal

From assessment to action:

Strengthening preparedness in Nepal

Vulnerability assessment

- Nepal is highly prone to disasters, particularly earthquakes, which claimed more than 11 000 lives in the twentieth century alone.
- The Kathmandu Valley Earthquake Risk Management Action Plan suggests that as many as 60% of the buildings in the area would be likely to be heavily damaged if the scale of the ground motion of the 1934 earthquake were repeated today.
- An earthquake mass casualty scenario for the Kathmandu Valley showed that for an intensity MMI¹ VIII (Modified Mercalli Intensity Scale) earthquake:
 - Number of deaths is estimated to be between 750 and 22 500
 - Number of injuries will range from 3750 to 112 500

¹ A level VIII on the MMI puts damage as slight in specially-designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. The Modified Mercalli Intensity Scale compares earthquake effects from one location to another, or from one earthquake to another.



Action taken

Several hospitals were assessed rigorously in 2001 and Patan Hospital showed good resilience to earthquakes. The hospital had done the following to strengthen itself against potential earthquakes:

- Drafted a hospital emergency plan in 1995–1996
- The emergency plan is tested annually by a disaster drill
- Mass-casualty mock drill conducted
- Civil society organizations and health officials worked together in a simulated rescue chain from incident site to emergency ward
- Measures taken to reduce seismic risks by building in compliance with earthquake resistance standards
- A detailed proposal for a comprehensive structural assessment and design drawing was done to accurately estimate the cost of retrofitting existing structures




Lessons learned

- Structural retrofitting and nonstructural measures can save lives and significantly increase the reliability of health services.
- It is easier to mobilize the non-binding support of external development partners than it is to obtain donor commitment to contribute to cost-intensive structural interventions.
- Concerns about health sector disaster risk reduction had their origins in local institutions, which was one of the key factors in the success achieved.



The Patan Hospital shows that awareness can trigger assessments, assessments result in planning, and planning leads to mitigation, ultimately contributing to minimizing the consequences of living with earthquake risks in the country.



Since 2002, in order to strengthen response capacities in any emergency, the Ministry of Health with assistance from the WHO Nepal country office and WHO-SEARO organized several rounds of Mass Casualty Management (MCM) training programmes and simulation exercises for health workers and first responders in Kathmandu, Pokhara, Bharatpur and other districts. These training programmes included full-scale mock drills simulating major disaster scenarios (e.g. earthquake, road traffic accidents, air crash etc). These activities have been organized systematically and conducted regularly.

Main objectives of the MCM training and mock drills are to:

- (1) Enhance the health system's pre-hospital emergency response capability by focusing on intersectoral collaboration, victim stabilization, triage and disaster logistics.
- (2) Enhance hospital emergency preparedness to deal with mass casualties following the MCM principles.
- (3) Strengthen communication, coordination and collaboration among the key stakeholders to respond to mass casualties.

Specific objectives:

- (1) Expose participants to a simulated health emergency and to the principles of mass casualty management such as disaster logistics, triage and medical evacuation.
- (2) Support institutionalization of the mass casualty management system in the hospitals and health institutions and promote mock drills.

Skills Acquired:

- (1) Learn how to set up pre-hospital facilities to prioritize and stabilize victims.
- (2) Define the roles of key actors and institutions in health sector emergency response.
- (3) Clarify the lines of command and establish clear lines of communication.
- (4) Test the functionality of the triage system.
- (5) Practice the principles of medical evacuation.
- (6) Examine the strengths and weaknesses of the existing disaster response system.

Sri Lanka

Applying what you know:

Training in action

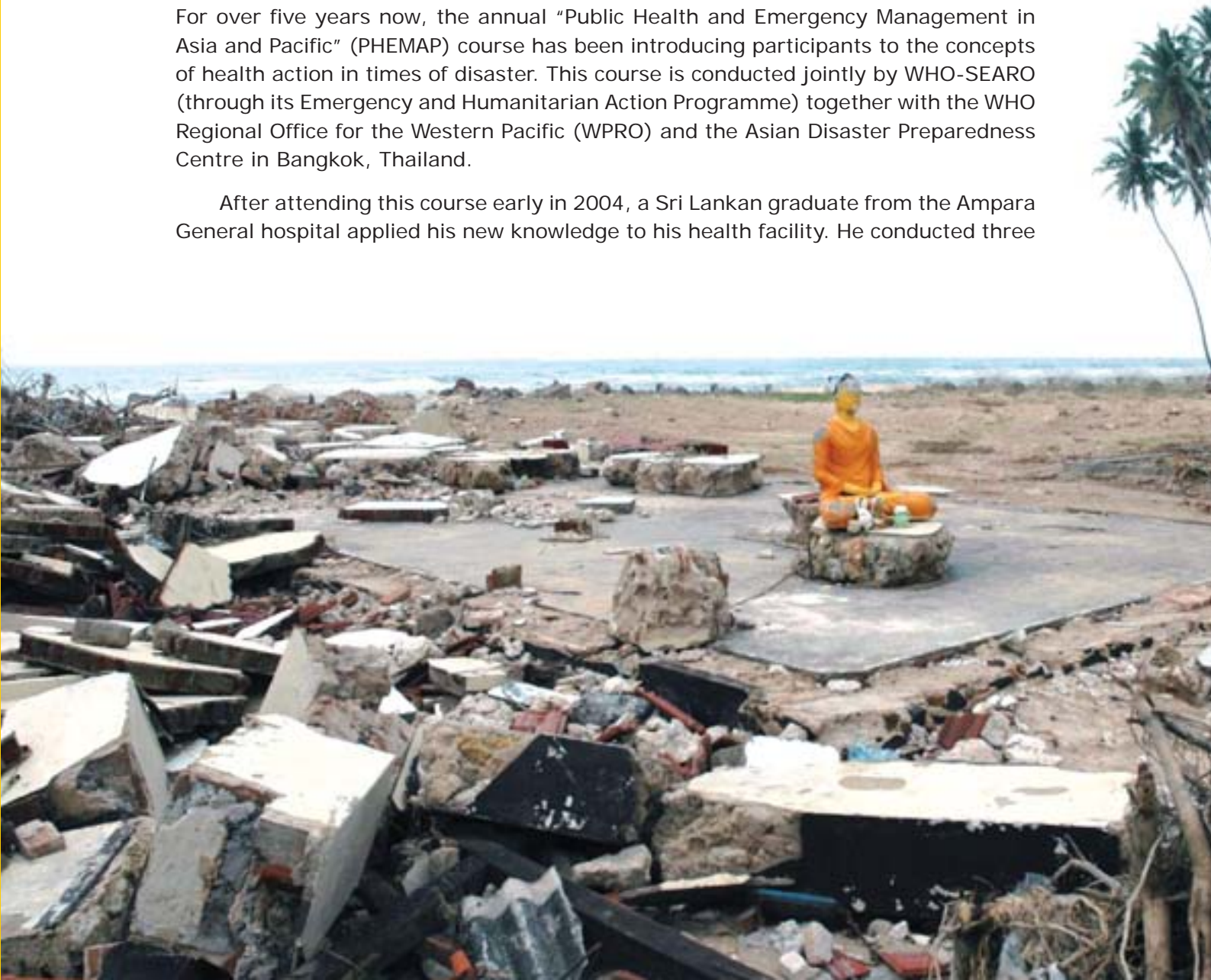
Event

The earthquake and tsunami of 26 December 2004 killed 12 500 people in Sri Lanka's Ampara district. Ampara General Hospital was the tertiary care institution in Sri Lanka that managed the highest number of tsunami victims. Fortunately, training in disaster preparedness and response had just been completed.

Preparedness

For over five years now, the annual "Public Health and Emergency Management in Asia and Pacific" (PHEMAP) course has been introducing participants to the concepts of health action in times of disaster. This course is conducted jointly by WHO-SEARO (through its Emergency and Humanitarian Action Programme) together with the WHO Regional Office for the Western Pacific (WPRO) and the Asian Disaster Preparedness Centre in Bangkok, Thailand.

After attending this course early in 2004, a Sri Lankan graduate from the Ampara General hospital applied his new knowledge to his health facility. He conducted three



workshops in Ampara General Hospital for medical consultants, medical officers, nurses, paramedics and minor employees. The course increased the participants understanding of natural and man-made disasters, disaster management and its cycle, community participation, triage, pre-hospital casualty management and accident/emergency (A/E) care.



WHO-SEARO and WHO-WPRO and the Asian Disaster Preparedness Center jointly developed the PHEMAP curriculum in 2001 and implemented the first PHEMAP interregional course in 2002. Since then, eight other Interregional courses have been conducted. PHEMAP's goal is to strengthen national capacities for managing health risks of emergencies.

The PHEMAP course is specifically designed for people who play critical health emergency management and coordination roles. The interregional PHEMAP course makes them familiar with the principles and practice of policy-making, risk management, emergency response and recovery planning, international standards and regional cooperation. After the course, they are expected to be able to adopt roles as a programme manager and operations coordinator by applying tools and processes, such as capacity assessment and development, information management, incident management, and risk communication to improve emergency health, environmental health, mass casualty management, feeding and nutrition, emergency medical systems, psychosocial support and communicable disease control.

The course has benefited emergency health coordinators in national and provincial health ministries, health-care facility managers and WHO health emergency management programme focal points. Teaching staff and representatives of academic institutions who are involved in health emergency management education would also benefit from this course.

There have been 103 graduates of the course from the South-East Asia Region. The focus is now to support national PHEMAP courses, and Course Coordinator Workshops for PHEMAP have also been held. Sri Lanka has taken up adaptation and delivery of national PHEMAP courses with the University of Peridinya.

The following were achieved after these workshops:

- Internal and external triage for disaster management
- Opening of a disaster management commanding centre
- Opening of a new accident and emergency treatment unit
- Training of the community in dealing with disasters

Impact

As a result of the preparedness measures, when the tsunami struck on 26 December 2004, the Ampara General Hospital staff were well aware of what their duties were. A total of 1015 patients were admitted to the hospital immediately after the tsunami. More than 4000 patients received treatment from the outpatient department. Of these, only 17 died in the aftermath of the tsunami.



Due to the preparedness measures put in place in advance, the hospital was well able to manage any scale of disaster, including the 2004 tsunami.



**World Health
Organization**

Regional Office for South-East Asia
World Health House
Indraprastha Estate,
Mahatma Gandhi Marg,
New Delhi-110002, India
Email: eha@searo.who.int
Website: www.searo.who.int