

Emergency & Humanitarian Action

# FOCUS



Volume 5, September 2010

## Earthquakes

Earthquakes: Lessons ▶  
from Haiti

Public Health Impact ▶  
of Earthquakes

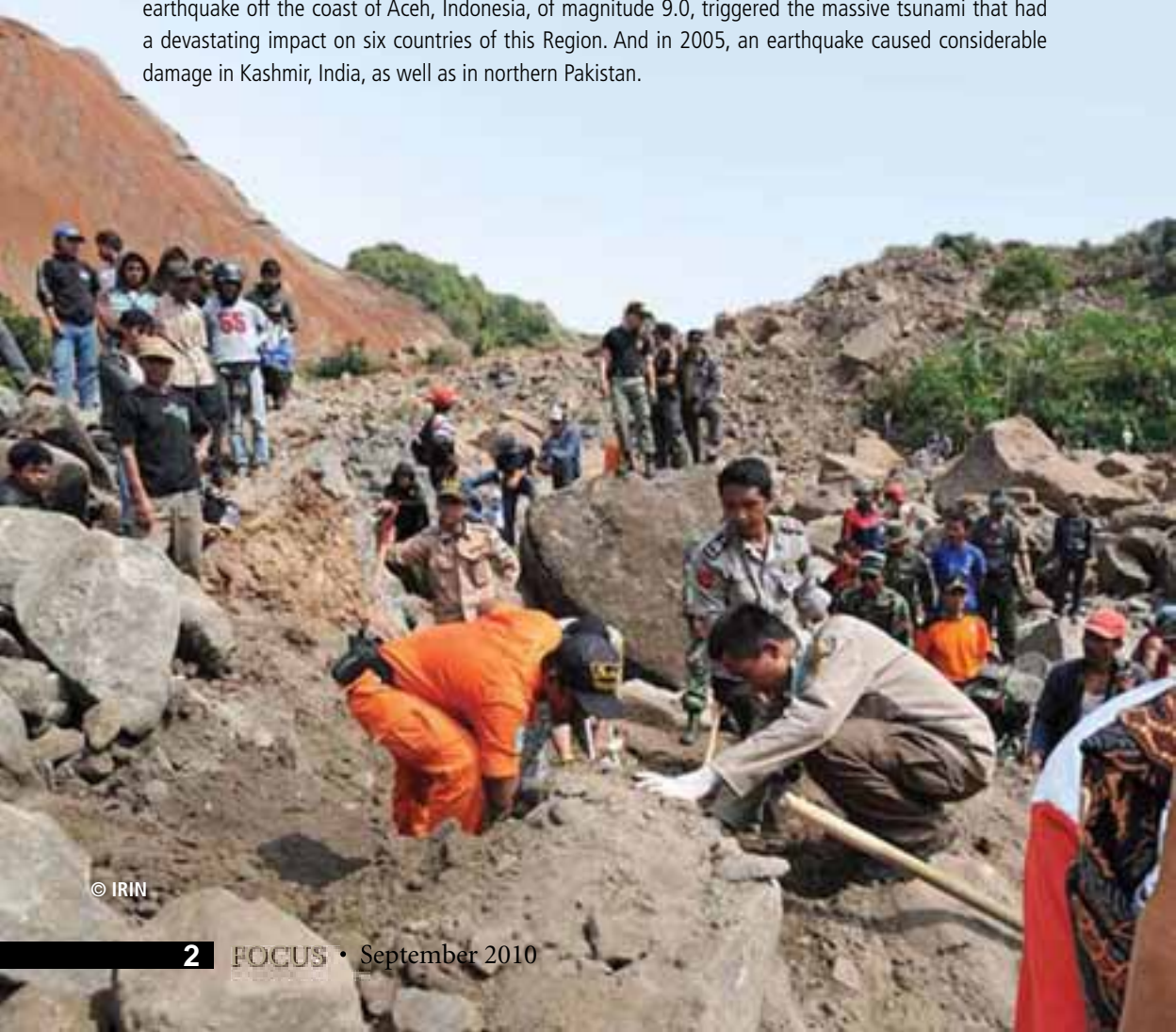
Primary Healthcare ▶  
in Emergencies

## LETTER FROM THE EDITOR

**S**ince ancient times, man has feared the devastation caused by earthquakes. At one level, little seems to have changed over centuries. According to the United Nations Strategy for Disaster Risk Reduction, earthquakes have been the deadliest natural disasters in the past decade, accounting for 60 per cent of all deaths.

Indeed, this year, the world has witnessed a series of devastating earthquakes. On 12 January 2010 an earthquake of magnitude 7.0 devastated the small Caribbean country of Haiti, killing more than 222 000, injuring another 300 000, and displacing millions. A month later, on 27 February 2010, Chile was shaken, in every sense, by a massive earthquake of magnitude 8.8, which displaced more than two million people. In April China experienced a 6.9-magnitude earthquake which left over 400 dead.

The WHO South-East Asia Region is particularly susceptible to such disasters. Earthquakes are so frequent in Indonesia that anything below a magnitude of 5.0 is rarely considered serious. Last year, more than 1120 people died in Padang, West Sumatra, following an earthquake of magnitude 7.6. In December 2004, an earthquake off the coast of Aceh, Indonesia, of magnitude 9.0, triggered the massive tsunami that had a devastating impact on six countries of this Region. And in 2005, an earthquake caused considerable damage in Kashmir, India, as well as in northern Pakistan.

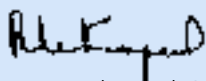


All the countries along the Himalayan range are at high risk of earthquakes. Nepal, which last suffered a major earthquake in 1934, is expecting another “big one”, as is northern India. Bangladesh and Myanmar are also at risk – they are close to the meeting point of the Indian, Eurasian and Myanmar tectonic plates.

The eight most populous cities on earthquake fault-lines are Tokyo, Mexico City, New York, Mumbai, Delhi, Shanghai, Kolkata and Jakarta. Thus four of these happen to be in the South-East Asia Region.

Earthquakes are feared because they are so unpredictable. Yet, as we often hear, “earthquakes don’t kill, buildings do”. If we are aware of the risks, and have buildings that are disaster-resilient, the human impact can be minimal. That is why WHO is campaigning to build hospitals that are safe from disasters.

In this issue of *Focus*, we look at how we can learn and absorb the lessons from previous responses to earthquakes so that we can be better prepared in this Region in the future



Poonam Khetrupal Singh  
Deputy Regional Director





# WHY EARTHQUAKES OCCUR: THE BASICS

Like a giant jigsaw puzzle, the top layer of the earth consists of several interlocking pieces. But unlike a jigsaw, these pieces keep slowly moving around, sliding past one another and bumping into each other. In technical terms, the 'puzzle pieces' are called tectonic plates, and their edges are the plate boundaries.

Earthquakes occur on these plate boundaries, when two blocks of earth (two of these 'puzzle pieces' to use the analogy) suddenly slip past one another. The surface where they slip is called the fault. The location below the earth's surface where the earthquake starts is called the hypocentre and the location directly above it on the surface of the earth is called the epicentre.

This happens because the edges of the plates are rough, and very simply put, a part of it sometimes gets stuck to another plate while the rest of the plate keeps

moving. Finally, when the plate has moved far enough, the edges 'unstick' as the force of the moving blocks 'pulls' and finally overcomes the friction of the jagged edges. This releases the stored up energy, which radiates outward from the fault in all directions in the form of seismic waves like ripples on a pond. The seismic waves shake the earth as they move through it and there is an earthquake.

The size of the earthquake is called its magnitude. Scientists also talk about the intensity of shaking from an earthquake, and this varies depending on where you are during the earthquake. The WHO South-East Asia Region is at high risk of earthquakes. Four of the eight most populous cities on earthquake fault lines - Mumbai, Delhi, Kolkatta and Jakarta - are in the Region.

(Source: <http://earthquake.usgs.gov/learn/kids/eqscience.php>)

# The Padang Earthquake: structures, people and resilience

By Dr Roderico Ofrin

**O**n 30 September 2009, a 7.6 Richter scale earthquake struck West Sumatra Island in Indonesia. Nine districts/municipalities in the province were severely affected, including its most populous city, Padang.

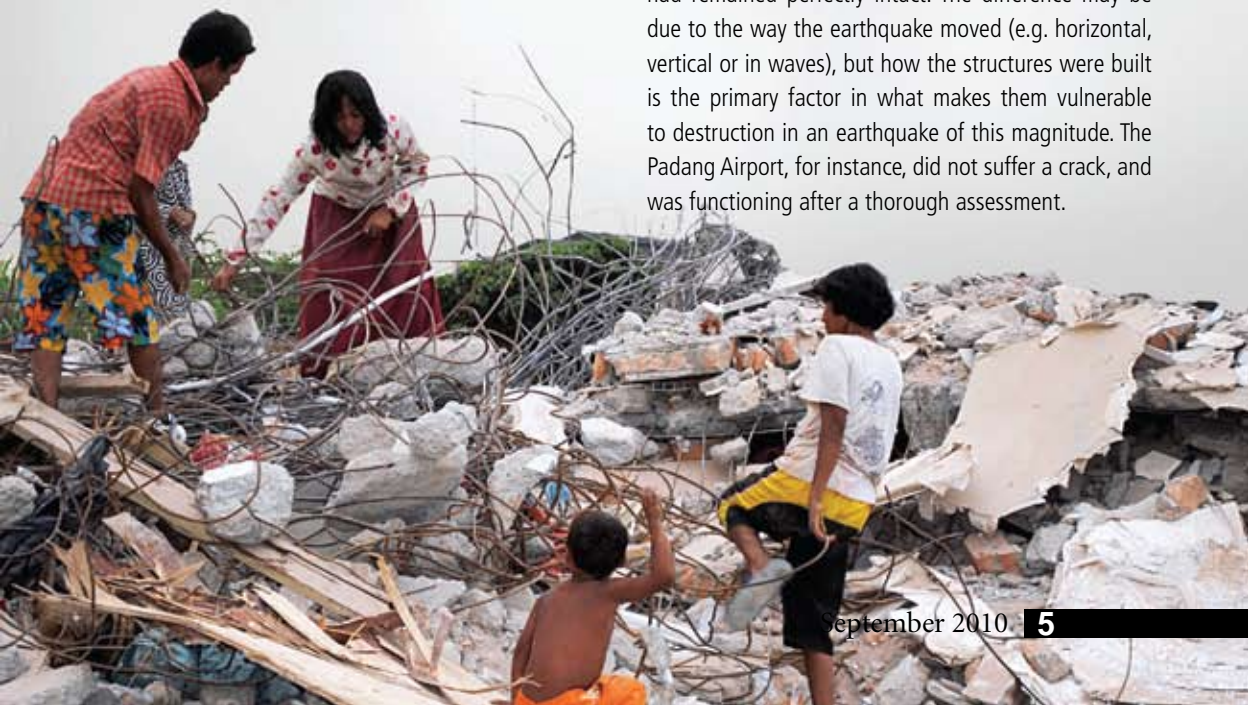
The quake was felt across several provinces such as North Sumatra, Riau, Bengkulu, Lampung, and Jakarta, and even as far as Singapore and some parts of Malaysia. The Government of Indonesia immediately declared a two-month "Emergency Phase" and welcomed international assistance for the relief efforts. An estimated 1120 people died and more than 800 people suffered major injuries, with another 2700 suffering minor injuries.

In addition, more than 100 000 buildings and structures suffered severe damage—among them many health facilities: 10 hospitals, 53 community health centres (*Puskesmas*), 137 supporting community health centres (*Pustu*) and 15 village clinics (*Polindes*), and two pharmaceutical warehouses collapsed.

But statistics cannot fully describe the impact on the ground. On my visit there 10 days after the event, clearly visible in the hills were landslides caused by the earthquake. A large strip of earth contrasted with the surrounding vibrant green. It looked very much like a waterfall except that it was all soil, loosened by the earthquake, that had cascaded down the forested hills of West Sumatra.

Moving around the city of Padang, it was clear to me that damage was severe. One of the main hospitals, Dr M. Djamil Hospital, was badly damaged, its outpatient department totally collapsed. Patients were treated in a makeshift tent outside the hospital, as the hospital was overcrowded. Power lines and the clean water network had failed, exacerbating the hospital's difficulties, while shortage of diesel fuel affected the running of generators.

The impact of the earthquake varied across Padang. Right next to totally collapsed buildings—stores, offices, health facilities, homes—were structures that had remained perfectly intact. The difference may be due to the way the earthquake moved (e.g. horizontal, vertical or in waves), but how the structures were built is the primary factor in what makes them vulnerable to destruction in an earthquake of this magnitude. The Padang Airport, for instance, did not suffer a crack, and was functioning after a thorough assessment.



In any such disaster, it may not always be possible to avoid structural damage, but preparedness and organizing people is key to saving lives. The S Yodardo hospital, where preparedness plans and evacuation plans were in place, was partially damaged but continued to function. From the outside, everything seemed to be fine, but when one in some parts of the complex one saw that the damage was moderately severe. However, the hospital had very clear preparedness and response plans in which staff had been drilled. An ICU, obstetric and paediatric wards and admission and emergency room services were correctly shifted outdoors with tents and existing equipment. This is an example of how investing in people and their capacities as part of preparedness goes a long way to serving the community in time of need.

The community health centre of Alai is another example. I spoke with some of the health staff (in my broken Bahasa Indonesia), and it was clear that they were trained in what to do during an emergency. Only one wall had a small crack, and part of the ceiling of the records room fell. Otherwise, the structure was fully intact and functional, serving the basic health needs of the people of Padang.

In any disaster, the extent of the damage to buildings critically affects response and recovery: homes, social service infrastructure, and buildings housing businesses and establishments from which people draw their livelihoods can impact the speed at which a community can recover. If these are damaged severely, recovery will take more time and more resources. In the case of Padang, there was enough capacity in the system to buffer the losses due to the earthquake. Nonetheless, extra resources were needed to address any further health gaps, which can help avoid further morbidity and mortality due to injuries or subsequent illness brought about by lack of access to basic human needs as water and food supply chains.

Throughout history earthquakes have occurred unpredictably, but sometimes strike vulnerable places repeatedly over time. Indonesia is one such high-risk country, where several small earthquakes can strike in a single year; it has also witnessed some of the world's most severe earthquakes in the past decade. Investing in capacity-building to make communities disaster-resilient goes beyond the health sector. Whether big or small, a disaster kills both directly and indirectly by disrupting lifelines that support populations, and the emotional as well as financial impact are enormous. Preventing such destructiveness is a major step that can protect the gains made in development.



# The Haiti Earthquake in 2010 and its Implications in Nepal

By Ms Hyo-Jeong Kim

**O**n 12 January 2010 the earthquake that struck Haiti devastated the nation of nine million people in 35 seconds. The last death toll showed more than 230 000 people dead, 300 000 people injured and more than 2 000 000 million people affected. The scale of the event that struck one small island nation in the Caribbean was bigger than the effect of the Asian Tsunami that struck five countries in South-East Asia in 2004.

Following the earthquake, the international community surged forth with humanitarian support in all domains—personnel, equipment, supplies and financial aid. The relief operations are still ongoing with the view to enable the country to recover adequately enough for the government and the people to be able to sustain themselves.

This event not only highlighted the suffering that can be inflicted on human society by a natural disaster but also showed the importance of being ready to cope with such disasters. Nepal, lying on an active Himalayan fault-line and with a long history of earthquakes, has often been cited as the country having the highest likelihood of an earthquake of devastating proportions. Unlike Haiti, Nepal is a landlocked country surrounded by the Himalayas to the north and the Indian Gangetic plains to the south. Should a similar event occur in Nepal, it can be assumed that help will not be able to reach from outside of the country for some period of time after the occurrence.

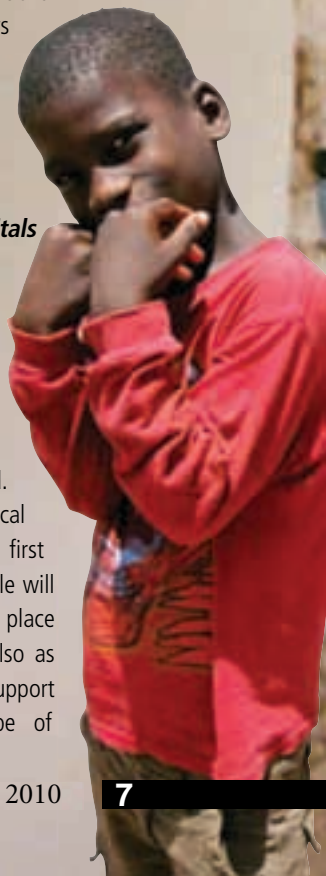
Luckily such an event has not happened yet, and this gives the country an opportunity to prepare itself before anything happens. We cannot stop a natural event from striking, but we can be better prepared to deal with the consequences both by reducing the level of damage and being prepared to respond.

## Disaster risk reduction

In Nepal, numerous consultations have been held to discuss ways to reduce the risk of disasters in the country. In the health sector, this focused on the following key four areas:

### **1. Building codes for hospitals**

In Port-au-Prince, the capital of Haiti, 8 out of 11 major public hospitals were destroyed and/or damaged. This led to delays and confusion in bringing health-care services to those affected. Hospitals are the most critical facilities, especially in the first phase of an emergency. People will use hospitals not only as a place to get health services, but also as a source of psychological support where they can have hope of



finding and being reunited with loved ones. As such, it is imperative to have hospitals that can withstand large-scale earthquakes and other hazards.

In Nepal, the building code for hospitals was introduced in 2004. However, many of the hospitals were built before this date. This, compounded with inadequate monitoring, could mean that the hospitals in Nepal will not be able to withstand large-scale earthquakes. It is essential to have a strong monitoring system for the implementation of the building code in all new buildings and for those that were built before 2004 in order to assess them and conduct non-structural as well as structural strengthening of hospital buildings in particular.

## **2. Health staff preparedness**

Health staff are essential in the aftermath of a disaster. A hospital may be left standing after an earthquake but without health staff there can be no health care provided by it. In Haiti, and in other large-scale disasters, often health staff themselves were hurt, displaced or killed. This leads to a large shortage of health workers at a time when they are most needed.

Also, health workers are often not aware or trained about how to react and respond to such disasters. Used to working in a fairly routine system, health workers find it difficult to adapt and function just as efficiently in times of chaos and disruption.

To prevent both from happening, health workers must be trained to be able to respond to disasters. A hospital emergency preparedness plan must be in place, with clear instructions about the distribution of responsibilities during an emergency and non-routine use of the hospital/health facility premises. Training on personal safety should also be provided to the health workers.

## **3. Community-based readiness**

Studies conducted in disaster areas have shown time and again that the first responders are invariably the community members. This was the case in Haiti too, where the community was already at work to get those trapped in the rubble out well before the search and rescue teams arrived. The community plays a key role in ensuring that the first and basic care services are provided, and in providing psychosocial support to those affected. Both areas involve health, especially in the first response phase. In Nepal, the district chapters of the Red Cross in more than 60 districts (out of 75) have been trained to provide first-aid support. Such activities should continue and be strengthened, and additional training provided in giving psychosocial support. This will alleviate the burden placed on hospitals and health facilities, allowing them to focus and prioritize their cases more effectively.



#### **4. Strengthening the overall health system**

Emergency preparedness and disaster risk reduction measures need to be incorporated into the national health system strategy. Disaster risk reduction is not a stand-alone task to be performed by “emergency workers”. It is a concept that must be embedded in all sectors of health, and be a special component of the overall health system strategy of a country. In Haiti, one of the issues that is being highlighted is that many private hospitals and health facilities went bankrupt due to the sudden introduction of free health-care services following the earthquake in a country where all health care was fee-based. Having emergency health financing measures in place could prevent such instances from having a negative impact on the country’s economy.

#### **Preparedness for operations**

Preparedness for operations and response will also help to alleviate suffering by ensuring quick and efficient delivery of health-care services to the affected population. The following are some key areas to be considered:

##### **1. Clear lines of command and control**

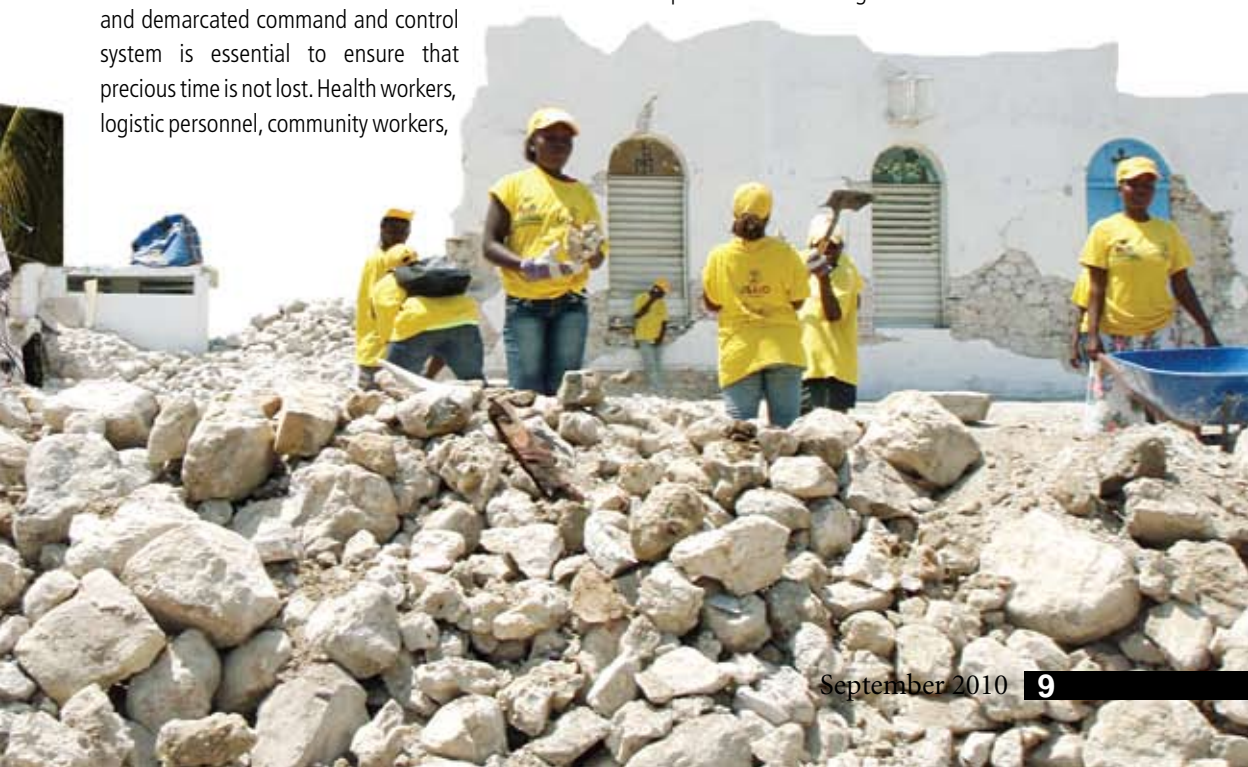
In times of disaster response, a clear and demarcated command and control system is essential to ensure that precious time is not lost. Health workers, logistic personnel, community workers,

the military, etc. must be controlled and coordinated along a clear line of command to avoid confusion in the immediate aftermath of a disaster. Haiti highlighted the need to have such measures in place before the actual event happens, since in the absence of the same there was great confusion and pandemonium. In Nepal, standard operating procedures (SOPs) are currently being developed for the health sector. This will give a clear picture of the command structure as well as outline the roles and responsibilities of each division of the Ministry of Health and Population in times of disasters.

##### **2. Coordination**

Along with clear lines of command, robust coordination measures are essential to avoid confusion. In Haiti, there was a colossal influx of external partners into the country after the earthquake with all of them trying to provide the maximum relief support. In Nepal, the Disaster Health Working Group – the coordinating body within the Ministry of Health and Population – is active. The health cluster is also in place. Having these mechanisms in place will allow actors to respond faster to an emergency.

Another point to be considered is the need to have separate coordinating mechanisms between the



central/national level and the sub-national levels. The sub-national levels are for area-specific operations. In Haiti, since the capital city was affected, the central-level coordinating mechanism had to play the dual role of responding to events in the country as well as in Port-au-Prince. This led to overburdening of the coordination system. In order to avoid this from happening in such an eventuality in Nepal, the role of the central and subnational coordinating mechanisms will need to be clearly defined.

### **3. Communication and Information management**

The communication system was down for a full two hours after the earthquake in Haiti. A considerable amount of valuable and necessary information which was needed for the rehabilitation and post-earthquake operations was lost in the buildings that had collapsed since much of it was paper-based. Both these consequences led to delays in response. In Nepal, the geographical and structural similarities with Haiti warn us about the possibility of a similar aftermath. It is essential to have an alternative communication system in place as well as a secondary and even tertiary repository of information (possibly located outside the country) to ensure that essential information is not lost and can be made available to those who need it without delay.

### **4. Stockpiling of essential drugs and supplies**

In Haiti, evaluation has showed that the large stockpile of certain drugs and supplies was key to providing health-care services at the earliest. Due to the tougher geographical terrain, it may be even more difficult to bring supplies into Nepal at such times. It is therefore essential to stockpile essential drugs and supplies in the country at strategic locations. The kind of supplies needed in the different disaster scenarios must be given careful consideration. Earthquakes will lead to injuries among people such as many fractures, implying that splints will be needed in large quantities.

### **Human resources**

Lastly, health is an area that relies heavily on human resources. It is important to ensure that the human resources are able to cope with the situation and function in difficult circumstances. Staff security measures must be considered carefully, and a proper evacuation system put in place to evacuate those health staff who have been affected. Psychosocial support must be provided to staff, who are likely to be both physically fatigued and mentally affected by the suffering that they will relentlessly encounter in the aftermath of an earthquake. Living and working conditions must be organized and the minimum necessary measures provided to ensure that staff are able to function in their areas of expertise competently in a post-disaster situation.



# Learning from Past Disasters A Continuous Journey

By Dr Bipin Verma

In a country of India's size, natural disasters are a regular feature – floods, cyclones, landslides, earthquakes, to name a few. In the two decades from the 1970s to the 1990s, the approach was to react to a disaster after it had occurred. However, in the 1990s, the approach changed as the importance of preparedness was increasingly recognized. From the 1990s till now, the emphasis has been on preparedness for disasters.

Recognizing disaster management to be a national priority, the Government of India initially set up a high-powered committee in August 1999 to make recommendations for a national disaster management plan and suggest mitigation mechanisms. The Gujarat

earthquake of 2001, where almost 20 000 people died according to official figures, further underscored the urgent need for such a mechanism, and a national committee was established. The Tenth Five-Year Plan document also had, for the first time, a detailed chapter on disaster management. Similarly, the Twelfth Finance Commission of India was also mandated to review the financial arrangements for disaster management.

In the interim, the country was preparing for more effective responses to disasters in different ways. In 2000, "disaster rescue" teams were established nationally, with similar structures in each state, to conduct search and rescue operations immediately after a disaster.





The tsunami of 2004 was a watershed. Following the lessons learnt from that event, on 23 December 2005 the Government of India enacted the Disaster Management Act, which envisaged the creation of the National Disaster Management Authority (NDMA), headed by the Prime Minister of India, and State Disaster Management Authorities (SDMAs) headed by the chief ministers of the states, for an integrated approach to disaster management in India.

The Disaster Management Act, 2005 has mandated the constitution of a National Disaster Response Force

(NDRF), a specialist response force, for the purpose of specialized response to natural and man-made disasters. This force will function under the National Disaster Management Authority which has been vested with its control, direction and general superintendence. This will be a multidisciplinary, multiskilled, hi-tech force for all types of disasters capable of insertion by air, sea and land.

In the health sector too, there has been progress. Mobile health hospitals have been established, and made a big difference in saving lives during the Kashmir earthquake of 2005. Contingency plans have been put in place, and tools have been developed for better practice, with standards and indicators.

Consequently, compared to previous decades, the response to a disaster like an earthquake is immediate. From an ad hoc responses we have moved to a planned reaction. Natural disasters continue to occur, but with better response fewer lives are being lost.





# Public health impact of Earthquakes

By Dr Nagi Shafik

**E**arthquakes are among the most unpredictable natural disasters people can experience. With no warning at all, tens of thousands of people are put in danger during an earthquake. Despite all the scientific progress in seismology, achieving high standards of life safety during earthquakes globally is yet to be achieved.

Between 1999 and 2009 earthquakes alone caused more than half a million deaths worldwide.

The accelerated urbanization in seismically active parts of the world aggravates the vulnerability of such areas to earthquakes leading to a higher number of deaths and injuries.

Industrial storage facilities for hazardous material may explode or leak during an earthquake. Damage at a nuclear power plant could lead to widespread radioactive contamination. Pipelines carrying natural gas, water and sewage can also be expected to be disrupted.

Worldwide, more than one million earthquakes occur each year, or an average of about 2 each minute.

## Health problems related to earthquakes

### 1. Deaths resulting from major earthquakes can be instantaneous, rapid, or delayed:

	Causes
<b>Instantaneous death</b>	Severe crushing injuries to the head or chest, external or internal haemorrhage, or drowning from earthquake-induced tidal waves (tsunamis).
<b>Rapid death</b> (within minutes or hours)	Asphyxia from dust inhalation or chest compression, hypovolemic shock, or environmental exposure (e.g. hypothermia).
<b>Delayed death</b> (within days)	Dehydration, hypothermia, hyperthermia, crush syndrome, wound infections, or post-operative sepsis. Pulmonary edema from dust inhalation may also be a delayed cause of death.

### 2. Medical care:

- The broad pattern of injury is likely to be injuries with minor cuts, bruises, lacerations and contusions requiring medical attention only at outpatient-level.
- The next most frequent reason for seeking medical care is simple fractures not requiring operative intervention. A minority will require hospitalization, including skull fractures with intracranial haemorrhage, cervical spine injuries and damage to internal organs.
- A large number of patients require acute care for nonsurgical problems such as acute myocardial infarction, exacerbation of chronic diseases such as diabetes, hypertension and anxiety, and other mental health problems such as depression.
- Some survivors might develop disability requiring long-term rehabilitation for years to come.
- The population over 60 years of age, children between 5 and 9 years of age, women and the chronically ill also seem to be at an elevated risk for injury and death during and after an earthquake.

2. Meet the critical needs of water and sanitation.
3. Ensure food security.
4. Provide health/safety education to people.
5. Conduct surveillance for communicable disease and injuries, and follow-up contact information.
6. Initiate effective environment control measures.

### Epidemics could occur after an earthquake due to:

1. Rupture of water sanitation infrastructures;
2. Interruption of public health services such as immunization;
3. Interruption of vector control initiatives for mosquitoes & rodents.

**Post-disaster sanitation measures combined with efficient disease surveillance systems are sufficient to prevent epidemics.**

## Public health priorities following an earthquake

1. Reduce and prevent further deaths, injuries and illnesses through:
  - Verifying the status of health-care facilities and provide emergency medical care.
  - Addressing emergency maternal and infant health needs.
  - Ensuring continuity of care for chronic patients.

### Sources:

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# The World's Most Devastating

# Earthquakes

This table lists some of the world's most severe earthquakes recorded in history in which the toll has been more than 50 000.

Date	Location	Deaths	Magnitude on Richter Scale	Description
27 July 1976	Tangshan, China	255 000 (official)	7.5	Damage extended as far as Beijing. With unofficial figures estimating the toll to be much higher, this is probably the highest death toll from an earthquake in the last four centuries and the second highest in recorded history.
26 Dec. 2004	Sumatra	227 898	9.1	<p>This is the third largest earthquake in the world since 1900 and is the largest since the 1964 Prince William Sound, Alaska, quake. The earthquake and subsequent tsunami displaced approximately 2 million in 14 countries in South Asia and East Africa.</p> <p>The earthquake was felt with the greatest intensity in Banda Aceh, followed by Meulaboh and Medan, Sumatra, and in parts of Bangladesh, India, Malaysia, Maldives, Myanmar, Singapore, Sri Lanka and Thailand. The tsunami caused more casualties than any other in recorded history. Subsidence and landslides were observed in Sumatra. A mud volcano near Baratang, Andaman Islands, became active on December 28 and gas emissions were reported in Arakan, Myanmar.</p>
12 Jan. 2010	Haiti	222 570	7	<p>According to official estimates, 222 570 people died, 300 000 were injured and 1.3 million displaced with 97 294 houses destroyed in the Port-au-Prince area and southern Haiti. This includes at least four people killed by a local tsunami in the Petit Paradis area near Leogane. Tsunami waves were also reported at Jacmel, Les Cayes, Petit Goave, Leogane, Luly and Anse a Galets.</p> <p>Uplift was observed along the coast from Leogane to L'Acuil and subsidence observed along the coast from Grand Trou to Port Royal. The earthquake was felt throughout Haiti and the Dominican Republic and even as far as southern Florida, northern Colombia and northwestern Venezuela.</p>

16 Dec. 1920	Haiyuan, Ningxia (Ning-hsia), China	200 000	7.8	<p>This resulted in total destruction in the Lijunbu-Haiyuan-Ganyanchi area. Over 73000 people were killed in Haiyuan county alone. A landslide buried the village of Sujiahe in Xiji county. Nearly all the houses collapsed in the cities of Longde and Huining.</p> <p>It was felt from the Yellow Sea to Qinghai (Tsinghai) Province and from southern Nei Mongol (Inner Mongolia) to central Sichuan (Szechwan) province. About 200 km (125 miles) of surface faulting was seen from Lijunbu through Ganyanchi to Jingtai. There were a large number of landslides and cracks in the ground. Some rivers changed course.</p>
1 Sep. 1923	Kanto (Kwanto), Japan	142 800	7.9	<p>'The Great Tokyo earthquake' caused extreme destruction in the Tokyo-Yokohama area. Subsequent firestorms burned about 381 000 out of the more than 694 000 houses that were partially or completely destroyed. Nearly 2 metres (6 feet) of permanent uplift was observed on the north shore of Sagami Bay and horizontal displacements of as much as 4.5 metre (15 feet) were measured on the Boso peninsula. A tsunami was generated in Sagami Bay with wave heights as high as 12 metre (39 feet) on Oshima.</p>
5 Oct. 1948	Ashgabat (Askhabad), Turkmenistan (then Turkmen Soviet Socialist Republic)	110000	7.3	<p>In Ashgabat (Askhabad) and nearby villages, almost all brick buildings collapsed, concrete structures were heavily damaged and freight trains derailed. Damage and casualties also occurred in the Darreh Gaz area, Iran. Surface rupture was observed both northwest and southeast of Ashgabat. Many sources listed the total at 10 000, but a news release on 9 December 1988 advised that the correct death toll was 110 000.</p>



12 May 2008	Eastern Sichuan, China	87 587	7.9	<p>At least 69 195 people killed, 374 177 injured and 18 392 were missing and presumed dead in the Chengdu-Lixian-Guangyuan area alone. More than 45.5 million people in 10 provinces and regions were affected. An estimated 5.36 million buildings collapsed in Sichuan and in parts of Chongqing, Gansu, Hubei, Shaanxi and Yunnan. The total economic loss was estimated at US\$ 86 billion.</p> <p>At least 700 people were buried by a landslide at Qingchuan, and a train was buried near Longnan, Gansu. Landslides also dammed several rivers, creating 34 barrier lakes which threatened about 700 000 people downstream.</p> <p>More than 53 000 km of roads and 48 000 km of water pipelines were damaged. About 1.5 km of surface faulting was observed near Qingchuan. The earthquake was felt in much of central, eastern and southern China, including Beijing, Guangzhou, Hefei, Nanjing, Shanghai, Tianjin, Wuhan and Hong Kong. It was also felt in parts of Bangladesh, Taiwan, Thailand and Viet Nam.</p>
8 Oct. 2005	Pakistan and India	86 000	7.6	<p>At least 86 000 people were killed, more than 69 000 injured and extensive damage occurred in northern Pakistan and at least 1350 people killed and 6266 injured in Jammu &amp; Kashmir, India. An estimated four million people in the area were left homeless. Entire villages were destroyed in the Muzaffarabad area of northern Kashmir and 80% of the town of Uri, Jammu &amp; Kashmir, was destroyed. At least 32 335 buildings collapsed in Anantnag, Baramulla, Jammu and Srinagar cities of Jammu &amp; Kashmir, India. Landslides destroyed several mountain roads and highways cutting off access to the region for several days. Liquefaction and sandblows occurred in the western part of the Kashmir Valley and near Jammu. Landslides and rockfalls also occurred in parts of Himachal Pradesh, India.</p>



28 Dec. 1908	Messina, Italy	72 000	7.2	Over 40% of the population of Messina and more than 25% of Reggio di Calabria were killed by the earthquake and tsunami as well as by fires in some parts of Messina. The casualty toll is based on the census data of 1901-1911. Severe damage occurred in large parts of Calabria and Sicily. The earthquake was felt throughout Sicily and in the north upto Naples and Campobasso. Tsunami heights of 6-12 metres (20-39 feet) were observed on the coast of Sicily south of Messina and heights of 6-10 metres (20-33 feet) observed along the coast of Calabria.
31 May 1970	Chimbote, Peru	70 000	7.9	About 50 000 people were killed, 20 000 missing and presumed dead and 150000 injured in Ancash and La Libertad from the earthquake. A catastrophic debris avalanche of rock, ice and mud buried the town of Yungay, which had a population of 20 000.
1 Nov. 1755	Lisbon, Portugal	70 000	8.7	This earthquake occurred on All Saint's Day while many of the 250 000 inhabitants of Lisbon were in Church. Stone buildings swayed violently and then collapsed. Many who sought safety on the river front were drowned by a large tsunami. Fire ravaged the city. One quarter of Lisbon's population perished. This earthquake had a profound effect on the intellectual outlook of Europe.
20 June 1990	Western Iran	40 000 to 50 000	7.4	An estimated 40 000 to 50 000 people were killed, more than 60 000 injured, and 400 000 made homeless by this earthquake. There was extensive damage and landslides in the Rasht-Qazvin-Zanjan area, Iran. Nearly all buildings were destroyed in the Rudbar-Manjil area. This earthquake was felt in most of northwestern Iran.

**Source:** United States Geological Survey (USGS)  
[http://earthquake.usgs.gov/earthquakes/world/most\\_destructive.php](http://earthquake.usgs.gov/earthquakes/world/most_destructive.php)



# NOTES FROM THE FIELD:

## The first days after the Padang Earthquake

By Mr Gde Yulian Yogadhita,  
Emergency and Humanitarian Action, WHO Indonesia

**O**n 30 September 2009 I was conducting a training session on rapid health assessments at the University of Indonesia when rumours of an earthquake in North Sumatra reached us, but nothing was confirmed. It was only that evening at a farewell party for the outgoing WHO Representative to Indonesia that we learnt from our Information Officer as well as from the Ministry of Health that there has indeed been a large earthquake there. I was asked to join the Ministry of Health medical team leaving early the next morning, at 4 a.m., for Padang. We were a little delayed as the C-130 aircraft earmarked for us could not carry all the medical equipment we needed.

On reaching Padang we went directly to the hospital, which had been badly damaged. There was no water,

no electricity. We tried to help clean the place, and set up a tent for an operating theatre for orthopaedic surgery so that the injured could be treated.

We then went to the Provincial Health Office control room. Since WHO has the experience in setting up information centres, that was what I was asked to do. So I went about setting up the information and command post. On the first day it was chaotic as there were few staff. Many staff had their houses destroyed or damaged by the earthquake and so they had to guard their belongings and find shelter for their families. At the command centre we had to put up all information



such as baseline population data as well as data on all the puskesmas (health centres). In that situation, however, finding baseline data was slightly difficult.

Fortunately, the West Sumatra Health Office has a communication system that was working even after the earthquake, so we could collect information. First, we tried to find out whether the puskesmas was functioning or not. If it was not, we checked the population under its jurisdiction so that arrangements could be made to ensure health services for these people. If the puskesmas was functional, we checked how many people or resources they had, and what their medical needs were. Based on the information, we made maps showing the areas with the highest density of population and those which need medical help. We kept updating the information through radio communications. Some of the health centres were not reachable by radio; so we sent couriers on motorcycles to find out about their situation.

The first three days after the earthquake we worked round-the-clock, often 20 hours a day, snatching only a few hours of sleep. On the first day we had set up camp

next to the mortuary and found ourselves sleeping next to dead bodies! Eventually space was made available in a training centre for our lodging.

During the first 48 hours many medical teams, both national and international, from outside the affected region began pouring in. We ensured that all such teams were registered so that we could keep track of who was working where. Then we did capacity mapping, and advised which team where to go depending on the needs of the affected areas and the expertise of the team. We the WHO staff also served as “intermediaries” as there were more than 20 international providers leading to some language barriers.

Every evening we had an evaluation meeting, after which we sent the information on needs and supplies to the central level. Accordingly, skilled medical people were sent, be it specialized nurses or more orthopaedic surgeons. The Central Government also sent medicines and equipment as per the need.

I was in Padang for two weeks. I feel satisfied with the thought that we could do our bit to help the people using our skills and expertise at that time of need.



# Preparing for Disasters in Bangladesh

Dr KAH Akram,  
Emergency and Humanitarian Action, WHO Bangladesh

**A**lthough Bangladesh has not had an earthquake for almost 100 years, the country is at high risk since it is close to the borders of the Indian and Eurasian tectonic plates. Bangladesh also endures many natural disasters, such as floods and cyclones, regularly. We keep getting tremors, and we have to be prepared. That is why at the Emergency and Humanitarian Action (EHA) Unit of the WHO Country Office in Bangladesh we have focused on preparedness for earthquakes and other disasters.

Earthquakes are likely to cause large casualties, and training has been conducted in hospitals across the country for mass casualty management. Training on triage has also been conducted so that when there is a rush of people needing attention at the hospital after a disaster, the staff will know how to prioritize.

We have produced training videos with messages explaining what to do following a disaster such as an earthquake when inside the house, or in the office or on the street. This video has been distributed to more than 10 000 people for dissemination. We have also distributed videos on what to do following snake-bites, how to perform CPR, and how to save a drowning person.

The WHO Country Office for Bangladesh has to work closely with the government to achieve its goals. We already have an established focal point in the government, the Director of Disease Control, with whom we liaise closely. We meet every week and work with his support. We also keep in regular touch with the meteorological department. We check for cyclone warnings. In the rainy season we regularly check the flood situation.

We are closely linked in our work on disaster preparedness: we have established control rooms at the *upazila* (sub-district) level. They send signals to us in case of any emergency and also inform us when everything is normal.

We have also trained volunteers at the community level, and equipped them with searchlights, megaphones, raincoats, etc. If there is any warning or alert sounded, they go out with their megaphones and ask people to move to shelters. As a result, there have been fewer casualties during recent cyclones and floods.

We've established a core group of such volunteers for the EHA at the community level, and equipped them with a kind of emergency health kit comprising a small waterproof bag that contains dressing material, antibiotic lotion and other basic first-aid products. More than 20 000 such kits have been distributed to volunteers already.

We work closely not only with the government but also with other UN organizations and specialized agencies. The UN Disaster Management Group is responsible for emergencies and has six clusters. WHO heads the health cluster. There is a constant need to ensure a good level of coordination and understanding with partners!

I have been in this job for eight years, and prior to that had worked with disasters for 20 years. In these 28 years, I have seen considerable and tangible development in Bangladesh in terms of both preparedness and response to disasters. For example, when Cyclone Sidr struck in 2007 we isolated typhoid and shigella. In the past, organisms such as these would have spread rapidly, and case-fatality rates would have been over 50%. But this time, the case-fatality rate was less than 1%. There were many cases but few deaths. That is because of the work and effort that has been put in the field of disaster preparedness and response.

Of course, in a developing country like Bangladesh the situation continues to be challenging. But I am happy to be part of the domain of emergency preparedness and response, and happy to have contributed in helping people in need in emergencies.



# Evolution of Disaster Risk Reduction Programme for the Health sector in Indonesia

By Dr Vijay Nath Kyaw Win

**T**he Regional Training on the use of the United Nations' Central Emergency Response Fund (CERF), facilitated by the CERF Secretariat and OCHA Regional Office, Bangkok, was held on June 15-16 2010. This training provided an opportunity to highlight the lessons learnt from the Padang earthquake which struck Indonesia on 30 September 2009. This was also seen as an opportunity to share the operational mechanisms of the Crisis Centre of the Indonesian Ministry of Health and WHO. The participants were eager to know how the Crisis Centre of the Ministry of Health, Indonesia, has become one of the most powerful institutions of its kind in the world, having dealt with so many emergencies and disasters all over the country in the recent past.

It was a long and arduous process for the Ministry of Health to develop such a strong and sustainable programme against the complex range of emergencies and disasters in Indonesia. Located on the boundaries of four moving tectonic plates and "Pacific Ring of Fire", as well as having 126 active volcanoes, Indonesia is highly vulnerable to various natural disasters. On an average, Indonesia has five earthquakes measuring above 5 on the Richter Scale every day! Thus, speaking specifically about earthquakes, according to the emergency health information record & database, the following are the major earthquakes that have occurred within the boundaries of Indonesia over the last five years:

The earthquake and tsunami in Aceh on 26 December 2004—one of the worst natural disasters in the world

### LIST OF MAJOR EARTHQUAKES IN INDONESIA (2004–2009)

No	Date	Magnitude (RS)	Location	Dead	Injured
1	6 Feb. 2004	6.9	Nabire, Papua	34	600
2	12 Nov. 2004	6.0	Alor	27	118
3	26 Nov. 2004	6.4	Nabire, Papua	30	163
4	26 Dec. 2004	9.0	Aceh, Medan	131 029	155
5	28 Mar. 2005	8.7	Nias and Simeulue	900	177
6	27 May 2006	6.2	Yogyakarta	5 414	36 978
7	17 July 2006	7.7	Pangandaran, Java	668	9 299
8	21 Jan. 2007	7.3	Sulawesi	4	4
9	6 March 2007	6.3	Sumatra	52	250
10	12 Sept. 2007	8.4	Padang, West Sumatra	25	50
11	13 Sept. 2007	7.8	Sumatra	25	100
12	2 Sept. 2009	7.3	Tasikmalaya, West Java	46	100
13	30 Sept. 2009	7.6	Padang, West Sumatra	1 117	3 515
<b>Total</b>				<b>139 371</b>	<b>51 509</b>

recorded by man—became a turning point for the Ministry of Health to really focus on well-coordinated preparedness activities. In 2004, the Emergency Preparedness & Response (EPR) programme for the health sector was developed by the MoH with WHO support.

Based on experiences and observations from the field when responding to emergencies, the EPR programme was then modified and upgraded into the Disaster Risk Reduction Programme for the Health Sector (DRRPHS) in 2008, and is based on the concept of risk management. Broadly, the programme addresses three major components: reducing hazards, reducing vulnerability

to hazards and increasing the capacity to respond to disasters, in line with the Hyogo Framework for Action (HFA), the National Disaster Management Bill, and the Millennium Development Goals.

The next question is how we are going to implement these three components? First, to reduce hazards, all health facilities in provinces and districts had conducted hazard mappings where health facilities with their available resources are identified. Hazard identification in 33 provinces, 560 districts and municipalities, and 6093 sub-districts and down to the village level would ensure local authorities and communities are better prepared and the risk of a disaster is reduced.



Since Indonesia is the largest archipelago in the world, reduce vulnerability of a population of 230 million spread over 17 000 islands is not an easy task. To reduce vulnerability, nine Regional Crisis Centres (RCC) and two additional Sub-Regional Crisis Centres were established in the country in 2006. Each Regional Crisis Centre is formed by three basic structural components of the health system, such as hospitals, public health facilities and universities. Their role is to facilitate provinces to manage risk, strengthen preparedness, response and recovery, and to develop programme activities. Each RCC has an Emergency Communication and Operation Unit, a supply depot, shelter, and training facilities which are linked with all provinces and district crisis centres as well as with other sectors, and are coordinated from the MoH Central Emergency Operation Unit which is linked to different directorates in the MoH.



To increase the capacity in managing risk, the “Technical Guidelines”, also known as standard operating procedures for the health sector, launched by the Minister of Health in 2007, and guidelines for specific areas of works were developed and are being utilized. Training courses were organized systematically and institutionalized using the universities network in nine regions. In addition, in order to learn, share experiences, update knowledge, skills and practices according to international standards, the International Training Consortium on Disaster Risk Reduction (ITC-DRR) was established in 2007.

So far, the ITC-DRR had conducted four international training sessions on emergency and disaster management and one study tour in which mid-level managers and professionals from around the world had participated. The trainings were on Developing Contingency Planning, Pandemic Control, Psychosocial & Mental Health Support, and BioChemical & Nuclear Radiation Risk Management. This year’s training will be focus on Earthquake & Tsunami Risk Management, planned to be conducted sometime during November 2010.

ITC-DRR in collaboration with the Ministry of Education and Husanudin University had also initiated Masters Degree and PhD Programmes on Emergency and Disaster Management in January 2010. To further strengthen the disaster risk reduction programme globally, the MoH Indonesia is now in the process of establishing a Management Excellence Centre on Disaster Risk Reduction, which will have an operations room, and network with universities and organizations to monitor and support capacity-building activities nationally and internationally.

MoH and WHO Indonesia warmly welcome all professionals around the world to share and learn from each other, transforming lessons into tangible action to support disaster risk reduction programme activities in an endeavour to make the world safer for future generations.

# Making health facilities in the Region safe from disasters

By Dr UB Das

## Introduction

**G**rowing urbanization has increased the demand and need for health care in urban areas. In the years to come it will be practically impossible for governments to provide optimum health services to the ever increasing population. The growing importance of health-care providers in the private sector, thus, cannot be ignored. Both the governments and private health facilities in Member States of the WHO South-East Asia Region are overwhelmed by the burgeoning outpatient and inpatient load. The fact that denying health services to people seeking them in public and private health facilities is neither possible nor ethical only compounds the problem. Thus the strain on health-care facilities leads to a scenario where increased importance is given to the day-to-day functioning of the

facility and less to the safety of that place. It has been the experience in many cases of hospital accidents that routine safety checks were not done in many health facilities as there were no procedures for the same, and in many the procedures for safety inspection did not exist as this aspect was never given importance.

The safety of a hospital or health-care facility involves three categories:

1. **Structural:** This refers to the strength of the building frame and its capacity to withstand any damage due to earthquakes, flooding, fire or other kinds of accidents.



2. **Non-structural:** This involves electrical wiring, plumbing and other fittings, the safe placement of medical equipment, drugs (especially those containing chemicals that can cause burn injuries and explosions), storage devices for medical gases, radioactive materials and machines that can emit radioactivity.
3. **Functional:** This is about maintaining the operational continuity of the health facility in the event of any accident or disaster within the health facility or in its catchment area.

Emergencies in health facilities can be of internal nature or external depending upon the cause.

**Internal emergency:** This can be due to any acute disruption of the functioning of the health facility due to incidents such as a fire or spillage of liquid chemicals/ drugs causing reactions and burn injuries. Fires are commonly caused due to electrical short circuit, leakage of medical gases from storage facilities, and malfunction of medical equipment mostly due to human error during handling or poor maintenance. Internal emergencies can also be due to poor crowd management during the

rush hours such as outpatient consultation time, and handling of family members of any deceased patient in the indoor/ICU sections of the health facility.

**External emergency:** Such emergencies occur when the normal functioning of the health facility is overwhelmed by events that occur outside the facility but have a direct impact on it. Mass casualty events in recent times have illustrated this in a big way. The attack on the twin towers of the World Trade Centre in New York on 11 September 2001, the Madrid train bombings in 2004, and the serial bombing in market places in New Delhi in 2005 and 2008 are some examples of events that occur in urban settings and impact the functioning of health facilities tangibly. Other natural events like seasonal floods, cyclones and earthquakes that have been experienced in many Member States of the Region also damage health facilities in the affected areas and render them incapable of providing any kind of medical relief services during the time when they are needed the most.

## Case Study 1

A multi-bed multispeciality hospital in city of Ahmedabad in the state of Gujarat, India, had an outbreak of fire in



the catheterization laboratory ('cath lab') due to a short circuit in April 2010. The smoke from the fire spread through the ducts and engulfed the operation theatre below. The doctors in the operation theatre had already administered anaesthesia to woman for breast surgery and another for removal of gall bladder. But with the sudden spread of smoke and ensuing darkness, everyone panicked and fled leaving the two patients on the operating table. Luckily the two patients survived. The corridor of the hospital was filled with patients and their attendants when a cloud of smoke descended and darkness engulfed the place triggering chaos and even a stampede. One patient in Coronary Care Unit was on ventilator and died of asphyxiation and shock. Eighteen other patients in the ICU and three patients admitted in different wards had a providential escape even as the fire worsened. Some patients and their attendants had to escape by jumping out of windows.

The Medical Superintendent of the hospital when asked later why the hospital had not adhered to fire safety norms said it was the responsibility of other government departments and not the hospital management to look into the fire safety of the building.

## Case Study 2

In September 2009 a powerful earthquake measuring 7.9 on the Richter scale struck Padang in Indonesia. The largest public hospital remained functional after the earthquake but two medium-sized private hospitals collapsed during the earthquake making them completely unusable for the next three months. The same was the case with smaller health facilities and primary health-care centres in Sumatra. This aggravated post-quake mortality and morbidity levels. The vital "golden hour", i.e. the first one or two hours after an earthquake during which many lives can be saved by simple first-aid measures, were lost. The number of those disabled and the total disability and morbidity were compounded due to the health facilities having collapsed and been rendered non-functional after the quake.

These individual examples highlight the vulnerability of health facilities in all Member States of the SEA Region. A disaster can strike wantonly at any time across many

health facilities across the Member countries of the Region.

All these real incidents, rather accidents, highlight one major issue: **the safety and preparedness of health facilities and of the personnel working there are of utmost importance at all times.**

Structural and non-structural safety along with a well-tested emergency/contingency plan is of vital importance to all health facilities, especially in the context of the SEA Region. Generally this is one aspect of health care which is overlooked/neglected by policy-makers, execution experts and health professionals themselves. The importance of hospital/health facility safety comes to the fore only in the event of an accident or disaster as mentioned above.

The key problem is not lack of funds alone; lack of sensitivity on this subject among policy-makers and planners is the main issue. The decision-makers have to be made aware and made to realize the importance of this subject, which will then be reflected in the policies and guidelines stipulated for the health sector and health facilities. This will address the problem of failure to incorporate relevant planning stipulations during construction and operationalization of health facilities to a great extent.

## Conclusions

In the above real-life events it is quite clear that there was no standard protocol to deal with any kind of emergency or event that demanded urgent remedial action in an organized manner.

**Accreditation of all health facilities in all Member countries (both in the public and private sector) is the need of the hour.**

This will make the health facilities adhere to certain safety norms to ensure the safety and security of patients attending these health facilities in the event of any emergency as well the safety of the personnel working in them. The norms of accreditation can be agreed upon and developed as a safety tool/guideline, drawing from similar tools from countries/regions which already have such norms in place.

The health staff deployed and working in the health facilities mentioned above or all health facilities in general are not aware of or trained to deal with contingencies if such as event strikes their own health facilities. It is presumed by even senior-level health administrators, planners and policy-makers that safety of the health facility is the responsibility of other government departments such as those for fire, buildings, electricity and others.

Due to inadequate training and lack of awareness health staff are incapable of responding to any such emergency in their health facilities. This not only endangers the lives

of thousands of people who are admitted into these or who attend them for consultations but also their own lives, and this has a compounding effect on the well-being of society in general.

Our efforts at all levels (WHO, UN, non-UN, government and NGO) should be directed at spreading awareness and undertaking advocacy measures to train health staff to be prepared and equipped to deal with any such emergency/disaster in order to ensure that all health facilities remain functional even after the worst kind of disaster has struck and are able to provide services to the affected population. This will considerably minimize loss of life and disability and bolster the preventive and public health initiatives in the affected areas during the ensuing days.

**Steps That Can Be Taken To Prevent Such Disasters**

- Developing a uniform hospital safety code (similar to the building codes) in all Member countries.
- Ensuring the readiness of fire safety and electrical equipment used in health facilities.
- Developing a good and workable emergency/contingency plan for the health facility; and train all staff on their individual roles in the event of an emergency. Conduct regular mock drills to reinforce the plan and fill up the gaps.
- Providing induction training of all health staff at all the health centres at the time of joining service.
- Regular checks of electrical and other equipment used in health facilities.
- Having clearly demarcated exit passages at strategic locations in all health facilities.
- Keeping a copy of updated inventory at all items (drug and non-drug) outside the health facility (preferably at the residence of a senior management official).
- Plan for easy evacuation of all patients and staff in the event of any disaster.
- Using a checklist/accreditation guideline developed by local authorities or international agencies (such as WHO) to conduct independent safety evaluation





of the health facility. This will help improve the quality of health care delivered by the facility.

- Contingency plan should ensure that vital functions of the health facility can continue/remain unaffected even after a major disaster.
- Conducting regular simulation exercises and incorporating lessons learnt into the hospital contingency plan on a regular basis.
- Awareness and advocacy among the general population.

In addition to these preventive steps that can be taken to make health facilities disaster-proof, the challenge will always be to maintain operational continuity of the health facility. As stated already, ensuring personal safety of the health staff working there and the safety of patients admitted/visiting the facility are equally important.

A contingency plan to meet day-to-day emergencies in the health facilities (e.g. gas leakage, electrical short circuit, overcrowding and stampede in waiting areas, spillage of medical waste, contamination of equipment, etc) should be formulated on a priority basis. These smaller contingency measures should then be incorporated into the broader disaster planning scheme of the health facility and the sub-national plan for health facilities. Training of both health-care and

non-health-care staff to ensure safety of equipment, drugs and chemicals used in the hospital will prevent many of the routine accidents that occur.

To enhance the structural safety of the health facility, an assessment of the architectural safety should be conducted by hiring experts on the subject who are available both in the government and private sector. Retrofitting of the health facility to make it resistant to earthquakes, flooding, cyclones, bomb blasts and other natural elements should be conducted.

The cost of making health facilities safer is considerably lower if safety codes are implemented while building the health facility than any retrofitting activity carried out later.

Redesigning, if possible, some parts of the health facility (waiting area, entry and exit passages, connecting corridors, etc) is very helpful and serve their purpose well during panic situations when there is the likelihood of unprecedented crowd movement in the facility.

Latest developments worldwide can provide new insights on safety and these can be incorporated as “best practices” into the contingency plan of the health sector to strengthen health facilities as per the vulnerability and hazard profile of the respective region, district and locality in which they are situated.

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# Primary health care in emergencies

By Dr Vijay Kumar

Countries in the WHO South-East Asia (SEA) Region have experienced humanitarian crises in the form of natural emergencies and complex emergencies including conflicts. For each humanitarian crisis there are dozens of smaller events that strike the local communities. The maximum impact of emergencies is seen among the poor on account of out-of-pocket expenses. Emergencies adversely affect development and the health of the people, thereby stalling or reversing the gains. The devastating Asian Tsunami (2004) that hit six countries of the SEA Region contributed to an estimated 230 000 people missing or dead. In 2008, cyclone Nargis hit Myanmar and left 133 665 dead or missing. The World Disaster Report 2006 indicated that during the last 10 years about 58% of the total number of people killed in disasters and emergencies were from the SEA Region countries. During this period the maximum number of natural disasters (1273 events) and technological disasters (1387 reported events) occurred in Asia, representing 44% of all the reported events worldwide.

The concept of primary health care, first officially acknowledged in the Alma Ata Declaration in 1978, places health equity at the heart, and into the international agenda. The ultimate goal of primary health care is better health for all. WHO has identified five key elements to achieving that goal:

- Reducing exclusion and social disparities in health (universal coverage reforms);
- Organizing health services around people's needs and expectations (service delivery reforms);
- Integrating health into all sectors (public policy reforms);
- Pursuing collaborative models of policy dialogue (leadership reforms); and
- Increasing stakeholder participation.

The challenges in the application of a PHC approach in emergencies in countries of the SEA Region comprise: (a) lack of healthy public policy and poor application of the national policy at the community level; (b) unequal presence of community-based health workers and volunteers with inadequate capacity to respond to emergencies; (c) inadequacies in the information



system, including early warning systems and surveillance; (d) inherent vulnerability of the communities; and (e) problems in coordination among key sectors. These are some of the reasons why the damage to life and property in an emergency is greater in countries of SE Asia Region than in many countries in the other regions of WHO.

While on the one hand humanitarian crises may severely disrupt the development and process of revitalization of PHC, on the other hand they represent a unique opportunity to strengthen health systems and PHC. The maximum effect of the acute emergency occurs during the first few days and weeks after its occurrence. At this time, help from outside is not available or does not take full effect. The challenges posed by complex emergencies are different though the total loss of life and property and adverse impact are sometimes even greater than that in natural emergencies.

The frequent occurrence of disasters with a high impact in developing countries (especially on the poor and vulnerable population) and the recognition of the role of better preparedness in the community make a strong case for focusing on adoption of PHC approach in emergencies.

Tangible progress has been made in the countries of SEA Region. Consultations have been held to revitalize PHC, the social determinants of health, and self care. Following the Asia Tsunami, benchmarks have been developed, the tools refined and community preliminary benchmarking undertaken in four Member States. An emergency fund – The South-East Asia Regional Health Emergency Fund (SEARHEF) -- was established through multicountry cooperation and used in many emergencies following their occurrence. Assistance from this fund is provided to Member States within 48 hours of request. At the Twenty-seventh Meeting of the Ministers of Health in Kathmandu in 2009, a resolution was passed to make hospitals safe from disasters.

Efforts are needed during the pre-emergency phase for mitigation of the effects of emergencies. These comprise: (a) community benchmarking for emergency preparedness; (b) community-based disaster management planning; and (c) strengthening health

system-based PHC. Response to emergencies include: (1) risk management (2) use of resources and coping mechanisms; and (4) promotion of and support to self care. The focus on the PHC approach during the post-disaster recovery phase should merge into the pre-emergency phase.

Revitalization of PHC and adoption of the PHC approach in emergencies should include: (1) implementing a people-centred approach, making optimum use of coping mechanisms and self care; (2) developing the capacity of the community-based health workforce; (3) strengthening of health systems and the health-care delivery system; (4) generating and using information for action; (5) developing and implementing surveillance and early warning systems; (6) promoting intersectoral collaboration; (7) undertaking health actions for equity and universal coverage; (8) adoption of healthy public policy; and (9) implementing a rights-based approach.

An intercountry meeting is proposed to be organized in Dhaka, Bangladesh, from 28-30 September 2010 to update Member States on concepts of PHC and its complementarity with emergency and humanitarian action; share experiences in community preparedness and response before, during and after the emergency; describe the capacities and needs on community preparedness and response for emergency and humanitarian action; and prepare a roadmap for implementation to enhance community capacities using the PHC approach in emergency and humanitarian action.

In this meeting, it is proposed to review the best practices, prepare plans for community benchmarking for quality assessment and improvement, review and adapt guidelines for developing the capacity of community-based health-care workers, volunteers and staff in the first level health facilities with emphasis on specific areas that have been relatively neglected. These include reproductive and child health, mental and psychosocial health, and chronic and noncommunicable diseases. The roadmap would focus on strengthening coping mechanisms, self care and intersectoral collaboration with an emphasis on the poor and vulnerable populations.

# Q&A Surviving Earthquakes

## Can you predict earthquakes?

A: No. No scientist has ever predicted a major earthquake. However, based on scientific data, probabilities can be calculated for potential future earthquakes.

## How can I plan ahead for an earthquake?

1. Ensure your house and your local health facilities are earthquake-resilient. If necessary, they should be retrofitted.
2. Make sure each member of your family knows what to do no matter where they are when an earthquake occurs. Establish a meeting place where you can all reunite afterward.
3. Keep some emergency supplies—food, liquids, and comfortable shoes, for example.
4. Know where your gas, electric and water main shutoffs are and how to turn them off if there is a leak or electrical short.
5. Locate your nearest emergency medical facility.
6. Take a First Aid and CPR training course.

## What should I do during an earthquake?

1. If you are indoors—STAY THERE! Get under a desk or table, or move into a hallway or get against an inside wall. Stay clear of windows, fireplaces, and heavy furniture or appliances. Get out of the kitchen, which is a dangerous place (things can fall on you). Don't run downstairs or rush outside while the building is shaking.
2. If you are outside—get into the open, away from buildings, power lines, chimneys, and anything else that might fall on you.
3. If you are driving—stop, but carefully. Do NOT stop on or under a bridge or overpass, or under trees, light posts, power lines, or signs. Stay inside your car until the shaking stops.
4. If you are in a mountainous area—watch out for falling rocks, landslides, trees, and other debris that could be loosened by quakes.

## What should I avoid doing during an earthquake?

1. Do not use matches, lighters, camp stoves or barbecues, electrical equipment or appliances until you are sure there are no gas leaks. A spark that could ignite leaking gas and cause an explosion and fire.
2. Do not use your telephone, except for a medical or fire emergency.

## What do I do after an earthquake?

1. Wear sturdy shoes to avoid injury from broken glass and debris. Expect aftershocks.
2. Check for injuries. If a person is bleeding, put direct pressure on the wound, use clean gauze or cloth if available. If a person is not breathing administer CPR; DO NOT attempt to move seriously injured persons unless they are in danger of further injury; cover injured persons with blankets to keep warm; seek medical help for serious injuries.
3. Check for hazards such as fire, gas leak, damaged electrical wiring, downed or damaged utility lines, spills and fallen items.

(Source: <http://earthquake.usgs.gov/learn/faq/>)

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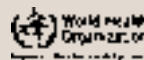
##### Thailand

Dr Arun Mallik

##### Timor-Leste

Mr Tito De Aquino

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