ten years after the tsunami of 2004
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IMPACT
ACTION
CHANGE
FUTURE
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Why another book on the tsunami? This question came up repeatedly during the planning of this book. There were several important reasons:

- The tenth anniversary of the tsunami is a good time to look back at lessons learnt and acted upon, both of which need to be documented.
- It is a stock-taking exercise of current capacities so that work on further improving the present status can be better planned.
- This book also aims to provide a strategic map for the future to scale up capacities in emergency risk management for health in countries of the South-East Asia Region.

The day of 26 December 2004 will be forever etched in history and people’s minds, especially of relatives and friends of the 227,000 who perished, the large majority of whom were from the five most affected countries in this Region – Indonesia, India, Maldives, Sri Lanka and Thailand. From a public health perspective, the tsunami of 2004 was a reminder that health is a critical component of any action towards prevention, preparedness, response or recovery from any emergency – the importance of this could not to be ignored or forgotten.

The 2004 tsunami is an example of an event that helped to turn adversity into advantage; from a terrible disaster to a journey towards better development, especially in disaster management. Apart from recounting the event, and the response of thousands of humanitarian and public health professionals, the book
summarizes and analyses the impact of the tsunami and the change it generated at the international, regional, national and even community levels. It led to reform in many global emergency mechanisms; the cluster approach, emergency funding through the United Nations Central Emergency Response Fund (CERF) and the South-East Asia Regional Health Emergency Fund (SEARHEF) of the WHO Regional Office; standards for preparedness (South-East Asia Region Benchmarks for emergency preparedness and response) were all sparked by the tsunami of 2004. Two events proved that these changes and investments were working – the potential tsunami from an 8.9 magnitude earthquake in the Banda Sea on 11 April 2012—where we saw that all systems had been put in place, from early warning, evacuation to safer ground and return. The second event was the Nepal earthquake, where investments in safer health facilities through assessments, structural and non-structural retrofitting, and functional preparedness paid off on 25 April 2015. The heightened awareness demonstrated by these events can be traced back to that day of tragedy – 26 December 2004.

Although systems did improve, there is much more to be done, especially in risk reduction. Thinking about prevention and putting this into practice needs to move further, especially in health. The Hyogo Framework of Action, 2005–2015 was replaced by the Sendai Framework of Action in 2015, which is the global framework that has been signed by Member States. The emphasis is on investments for disaster prevention, especially in the health sector, and covers other events such as pandemics.
As this public health function of managing health needs before, during and after an emergency is key to this Region, the South-East Asia Region has included this as one of the flagship areas for the coming five years. It aims to scale up what was built after the tsunami and further expand this capacity at various levels in Member States.

The key points of this publication are summarized below:

• It *recounts* the impact of natural disasters (or any emergency) on the health services and health of a population.
• It *reminds* us of the importance of prompt and appropriate action.
• It *reinforces* the fact that a disaster is also an opportunity to change and improve upon the existing system – be it an earthquake-proof health clinic, or training more community health workers in first aid.
• It *reiterates* that in the future, there is more to be done.

The lessons taught by the tsunami were far reaching. They have been learnt well, and have been built into health systems in many countries of the South-East Asia Region.

Dr Poonam Khetrapal Singh  
*Regional Director, WHO South-East Asia Region*
26 DECEMBER 2004 started off as an ordinary day. But it was not. It was, in fact, one of the most extraordinary days the South-East Asia Region had ever witnessed, or indeed, the world. It was a day when the largest earthquake in the world for over 40 years occurred (measuring 9.1–9.3 on the Richter scale), followed almost immediately by a powerful tsunami that wrecked the coastal areas of India, Indonesia, Maldives, Myanmar, Sri Lanka and Thailand. It uprooted trees and houses, washed away huge numbers of people, and left devastation in its wake. Nothing would ever be the same in the Region.

The tsunami affected each of the countries differently. In India, the Andaman and Nicobar Islands, and the states of Tamil Nadu, Andhra Pradesh, Kerala and the Union Territory of Puducherry were affected, resulting in 18 045 deaths and 730 000 displaced.

In Indonesia, the provinces of Nanggroe Aceh Darussalam and North Sumatra bore the brunt. About 50% of the residents in Aceh lost their lives. More than 167 700 residents succumbed to the forces exerted by the events. Indonesia accounted for 74.5% of the total deaths.

In the Maldives, the tsunami inundated many of the islands. All the 200 inhabited islands were affected; some were destroyed forever.

Myanmar was less affected than the other countries, with 61 fatalities and 43 injured.

In Sri Lanka, the tsunami decimated 14 of the 28 districts in the country and displaced 516 000 people. The death toll was 35 322.

In Thailand, the country’s tourist areas of Phuket, Phang Nga, Krabi accounted for 97% of all deaths, of which a substantial number were foreign tourists from 37 countries. About 8212 people lost their lives, of whom 2448 were from other countries.
IMPACT: WHAT IT MEANT

The initial relief responses were provided by the local population, and security personnel such as the Armed Forces, fire and police personnel in each of the countries. In many areas, communications, roads, transportation and logistics had broken down completely. WHO went into action and began its relief operations by assessing the impact of the disaster—measuring ill health and assessing health needs, identifying priority requirements, and the causes of ill health and death.

Around 800 primary and secondary health facilities had been destroyed in the disaster. There was damage to the infrastructure—buildings, records, laboratory equipment and supplies. In the Maldives, at least 1800 pregnant women across 200 islands were impacted.

Most of the injured were in need of urgent medical attention, but due to the deaths of health-care personnel, it was difficult to provide adequate relief. Indonesia lost 208 health-care personnel. Thailand lost one physician and one nurse. In Sri Lanka, 35 health-care personnel were injured but survived.

 Destruction and contamination of wells and aquifers with salinated water, debris and bacteria led to a paucity of drinking water. Water storage tanks were also washed away. In the Maldives, boats and other means of transportation used for transporting water between islands were damaged. Debris clogged the drains in Colombo and parts of the Maldives.

The destruction of 600 000 homes left many people bereft of shelter, and into camps for internally displaced persons (IDPs). Aceh province and the Andaman and Nicobar Islands sustained the greatest damage to shelters.

Damage to the electrical infrastructure was minimal, except in Aceh province, which also lost several roads and bridges. In the Maldives, jetties, sea walls, quays, and in the Andaman and Nicobar Islands, docks, were badly damaged. Communication systems in Aceh province, the Maldives and Sri Lanka were affected. In Banda Aceh, 90% of the government district was destroyed and 40% of the staff of the provincial government was killed.
Executive summary
ACTION: PICKING UP THE PIECES

Relief and recovery responses

In the first few days, WHO aimed to provide life-saving and life-preserving measures to countries. The Regional Office set up field offices, provided logistic support, and deployed over 160 people from all over the world for a period of three months to meet the initial health needs of the affected population. A 100-day strategy was adopted. WHO focused its operational activities in Indonesia, Sri Lanka and the Maldives, as India and Thailand did not request for help. The WHO Regional Office and country offices supported the international efforts.

Public health functions such as surveillance, maternal and child health services, immunization, psychosocial support and management of dead bodies were conducted on a massive scale. Other preventive measures included the provision of mosquito netting and insecticide-impregnated plastic sheeting to decrease the risks of developing malaria and dengue. Fogging with insecticides was also initiated in the coastal areas of India, Indonesia and Sri Lanka.

Laboratory facilities were strengthened or established, and measures taken to rebuild damaged medical facilities in Aceh and Sri Lanka, with nongovernmental organizations (NGOs) taking the lead. Humanitarian and UN agencies helped in the efforts. Despite the lack of a comprehensive public health infrastructure prior to the tsunami, there were no major disease outbreaks in any of the countries.

Countries in which health facilities had been damaged set up alternative care sites. Functional capabilities and capacities of the medical care system were normalized by recruiting additional help.

After the initial week, Indonesia, the Maldives and Sri Lanka were inundated with responders, supplies and equipment. None of these countries had national bodies to coordinate and control the influx of humanitarian teams. There was much duplication of efforts and gaps in other areas. Indonesia requested WHO to coordinate activities. The Maldives issued a statement in January 2005 that unrequested drugs were no longer welcome. Later, countries strengthened coordination and control systems by putting policies and structures in place.
Executive summary
Countries helped themselves as best as they could to fill gaps in essential requirements. One of these was the lack of drinking water. Maldives used coconut water, the Nicobar Islands transported water from unaffected wells and the mainland countries imported water from neighbouring areas. Singapore, India and the United States, and humanitarian organizations supplied packaged water to the affected countries.

In the IDP camps, improvised sanitation systems were installed, helped by UN agencies and NGOs. Progress in improving sanitation was slow, as new sewage pipes had to be laid. Temporary shelter was provided by intergovernmental organizations, NGOs and often the military, but building permanent housing was a slow process.

WHO, Japan and IFRC donated generators to the Maldives as relief measures for loss of electricity supply systems. Members of the Indian Navy repaired the generating equipment in the Andaman and Nicobar islands.

Each of the countries was faced with the disposal of huge amounts of waste on a daily basis. In Indonesia, the government hired private contractors to remove and dispose of the debris. WHO and other UN agencies helped in the cleaning up. NGOs helped with the identification and burial of corpses.

Communication systems were restored to the affected areas fairly soon. The newspaper in Banda Aceh began to print again within five days. The United Nations Educational, Scientific and Cultural Organization (UNESCO) issued a flash appeal for US$ 600 000 to restore the radio networks in Aceh province.

Several governments offered compensation packages to restore the economy and livelihoods. The United Nations Development Programme (UNDP) assisted many of the countries with developing and implementing strategies to restore their respective economies.

Although schools were damaged in many of the countries and many teachers lost their lives, schools reopened in 2–3 weeks in India, and after a month in the Maldives. UNICEF played an important role in assisting with recovery of the educational system.
CHANGE: REBUILDING FOR THE BETTER

What changed in WHO

Much has been done in the past decade to ensure comprehensive preparedness and response by Member countries through the efforts of the Emergency and Humanitarian Action unit (EHA) of WHO. The achievements have been in grouped into four broad areas.

In order to provide information for action, WHO worked with Member countries to formulate 12 benchmarks for emergency preparedness and response. The aim was for countries to measure their preparedness, identify gaps and take action accordingly. Each of these benchmarks has standards, and each standard has indicators. A checklist guides analysis of the existing situation, while a simple scoring system provides a numerical value. To date, ten countries have used the benchmarks for assessment.

In November 2009, the South-East Asia Disaster Health Information Network (SEADHIN) was created as a repository of information on the tsunami. It is currently being updated. In addition, the Regional Office has documented information on the tsunami through various publications, including a comprehensive, two-volume book.

In order to develop and strengthen surge capacity, the South-East Asia Regional Health Emergency Fund (SEARHEF) was formally established in 2007. The speed with which the funds are released helps to fill in critical gaps and reduce further morbidity and mortality. SEARHEF has been used in many disasters in the Region.

WHO country offices in the Region set up their own operations rooms with technical support and assistance from the Regional Office. Technical, administrative and planning staff from the country offices have been trained through country office readiness workshops in launching response operations in the event of an emergency.

The Regional Office manages a stockpile of emergency medicines and supplies in warehouses in Delhi and Bangkok. These have been used in several emergencies.
In 2005, the United Nations Humanitarian Reform defined WHO as the global health cluster lead with responsibility for ensuring that health needs are addressed in any emergency. Since then, the cluster approach has been used in many emergencies. A training programme for health cluster coordinators is ongoing since 2005.

Many countries have conducted structural and non-structural assessments of their health facilities in order to make health facilities safer with help from WHO.

In order to build the capacity of personnel who take the lead in disasters, WHO and the Asian Disaster Preparedness Center in Thailand organized a training programme called Public Health and Emergency Management in Asia and the Pacific (PHEMAP) for the WHO South-East Asia and Western Pacific Regions. So far, 122 graduates from various Member countries have been trained. Bhutan and Sri Lanka are developing national PHEMAP courses, and India plans to adapt it.

What changed in countries

Countries worked to put in place legislation and policies to support planning for disaster management; build stronger and more resilient health systems; reduce the vulnerability of communities through education, training and preparedness; ensure the safety of health facilities; develop standard operating procedures (SOPs) to be followed during an emergency; and enhance absorbing, buffering and response capacities to disasters.

Countries are in various stages of establishing a legislative framework for disaster management. All countries have constituted multisectoral disaster management committees and appointed national focal points for disaster management.
All countries have developed disaster management plans and policies, as well as health sector preparedness plans, but these need to be more comprehensive. Health sector contingency plans are not in place in all countries.

Adequate funding for disaster preparedness and response has not been allocated in most countries, although assessments of funding needs have been done by most.

Most countries have conducted assessments of the disaster resilience of health facilities. Smaller health centres are in the process of assessment.

Most countries have surveillance systems in place for communicable diseases, and some also for noncommunicable diseases. However, surveillance systems need to be integrated with emergency preparedness and response (EPR). Most countries have constituted rapid response teams at both the national and subnational levels. Communication systems with the community have also been established or strengthened in many countries.

Most countries have conducted assessments of community risks and vulnerabilities, and many have community-level action plans. Many countries hold mock drills and simulation exercises, but these are often not regular.

**Changes in international frameworks**

International frameworks include the *Hyogo Framework for Action 2005–2015: building the resilience of nations and communities to disasters*, which has been an important instrument for raising public and institutional awareness, generating political commitment, and focusing and catalysing actions by a wide range of stakeholders at all levels.

The *Sendai Framework for Disaster Risk Reduction 2015–2030* aims to guide the multihazard management of disaster risk in development at all levels, as well as within and across all sectors. Greater investment has been focused on health, and several targets and indicators pertain to health.
FUTURE: AND MILES TO GO ...

On 25 April 2015, an earthquake measuring 7.6 on the Richter scale hit Nepal, severely affecting 14 districts. It was an earthquake that people knew would happen, an event they had been preparing for. Six hospitals in Kathmandu Valley were all intact and functioning. Hospital staff implemented their contingency plans and were able to treat patients. Nepal has taken steps to protect and prepare itself for any eventuality.

The WHO Regional Office for South-East Asia has identified “Strengthening capacities in emergency risk management in countries of the South-East Asia Region” as a flagship area. This flagship area has five key objectives: advocate, manage, support, respond, engage. The flagship programme of the Region is aligned with the principles of the Sendai Framework for Disaster Risk Reduction 2015–2030.

Most of the activities initiated over the past decade need further intensification. There is also a need to scale up capacity in countries to cover all types of emergencies – whether they are disease outbreaks, natural disasters or caused by any other hazard.

The decade after the tsunami has shown us how to achieve these ambitious targets. We need to invest actively in pre-emergencies, as these will have invaluable dividends for a safer and healthier future.

Member States of the WHO South-East Asia Region: Bangladesh, Bhutan, Democratic People’s Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, Timor-Leste
On 26 December 2004, the South-East Asia Region experienced a disaster of unprecedented magnitude. Two extremely rare and different events originated under and in the Indian Ocean, in close proximity to the southwestern shores of northern Indonesia. These events were an earthquake and a tsunami, related to the rupture of the Sumatra–Andaman fault, which extended for almost 1800 km. At 7.58 a.m., it generated the largest earthquake in the world for over 40 years. Its magnitude was unbelievable; it measured 9.1 to 9.3 on the Richter scale. The epicentre was 30 km under the seabed, and 250 km south-southwest of Banda Aceh in Indonesia and Sumatra Island. This massive earthquake was followed by several aftershocks ranging from 6.0 to 7.3 on the Richter scale; these were in themselves large and powerful enough to destroy thousands of lives.

This primary event elevated the floor of the Indian Ocean by at least three meters, which led to the second event – the most destructive
tsunami recorded in modern history. Powerful, enormous walls of water 10–30 meters in height moved through the Indian Ocean at astounding speeds of over 500 km an hour, and wrecked the coastal areas of India, Indonesia, Maldives, Myanmar, Sri Lanka and Thailand. The tsunami reached as far as the Seychelles, Malaysia, Tanzania, Kenya and Somalia, though it had lost much of its power by then. Indonesia, the country closest to the epicentre, was the worst affected. The disaster affected the lives of every single family in the areas of Aceh and North Sumatra.

The extent and enormity of the disaster was beyond human capacity to imagine. The tsunami went on a nine-hour rampage and killed people living more than 6000 km from where it began. It left more than 227 000 people dead and displaced more than 1.7 million from their homes. It also destroyed huge areas of the natural environment, and turned back the development clock by decades. Coastal areas in the affected countries were flooded, and homes and buildings, roads and bridges, water and electricity supplies, crops, fishery infrastructure, telecommunication networks were wiped away as though they had never existed. The disaster affected every aspect of life and livelihood. The estimated economic loss due to this natural hazard was the highest ever recorded. It also led to the most generous outpouring of human and monetary assistance ever.

Asia, particularly South-East Asia, is the world’s most densely populated area. Apart from the high overall population density, in coastal areas, this is disproportionately higher. The most densely populated (among the areas in Sumatra island) is Banda Aceh, at 2916 persons/sq.km (the average density in other parts of the world is 175 persons/sq.km). The South-East Asia Region is also home to largely low- and middle-income countries, for
whom rebuilding the economy after such devastation could take several decades. Fishing is the commonest occupation in the coastal areas and, for many, their livelihoods were totally destroyed. Ongoing civil strife in some of the countries was an added burden. Thus, in each of the countries, the impact of the tsunami differed by the geography of the land and ocean, population densities, culture and livelihood of the people, types and locations of the built environment, presence of civil strife, and the level of preparedness and available resources.

In India, the events of the day wreaked havoc on the Andaman and Nicobar Islands. It is unlikely that the population could have been moved out of harm’s way before the arrival of the tsunami, as these islands were close to the epicentre of the earthquake and origin of the tsunami. These islands were among the few areas that felt the earthquake; they were subjected to more than 215 aftershocks. The islands suffered severe structural damage first from the earthquake and then from the massive tsunami waves.

On the mainland, the earthquake was not a major factor and was not felt. However, the tsunami affected the south-eastern states of Tamil Nadu, Andhra Pradesh, Kerala and the Union Territory of Puducherry. About 1089 villages were affected in these areas, with 18 045 deaths and 730 000 displaced.

Both the earthquake and the tsunami impacted the Sumatra island of Indonesia, with a minimal interval between them. The water pushed its way 12–14 km inland, carrying with it everything in its path. Indonesians were caught unawares and had little chance of survival, as wave after wave picked them up and battered them relentlessly. More than 167 700 residents succumbed to the forces exerted by the events and many lost all family members and all of their worldly belongings. Two provinces were primarily affected – Nangroe Aceh Darussalam
The tsunami on 26 December 2004 devastated Banda Aceh and the west coast of Sumatra. With tens of thousands left homeless and living in makeshift shelters, and tens of thousands of corpses as Aceh headed into the rainy season, the fear of disease was acute. Downtown Banda Aceh is destroyed while a mosque is left standing.
This pleasant, post-Christmas Sunday started normally. In Tranquebar village of Nagapattinam district in Tamil Nadu, India, disaster management expert Samuel Manuel was in church listening to a sermon when two boys rushed into the church, panic-sticken and said “the sea was coming”. The church was far inland from the sea, so Samuel got on to his motorcycle and went to investigate. When he finally reached the shore at about 10 am, he found himself surrounded by dark water, debris, dead bodies and cries for help from the survivors. Most were either young or very old, and many were women. He rushed to get help. Before the day’s end, many coastal communities along mainland India in the states of Tamil Nadu, Andhra Pradesh, Puducherry and Kerala, and the Andaman and Nicobar Islands had been devastated.

On the Indonesian island of Simeulue, nearly 100 years ago in 1907, about 70% of the population had lost their lives in an earthquake followed by a tsunami. Termed “smong” (meaning ocean coming onto land) in the local language, this story of the smong was passed on verbally from generation to generation. On 26 December 2004, the people saw the enormous waves charging towards them, recalled the story of the smong and fled the coast. Only 44 of a population of 78,389 died. However, Indonesians on the other islands did not anticipate the waves. Hopefully, Indonesians who survived will remember the lessons learnt from the tsunami and pass on the knowledge to future generations so that they are better prepared in case of such an event.

The Maldives, 2400 km from the epicentre of the earthquake, first alerted the World Health Organization Regional Office for South-East Asia to the unfolding tragedy. A panic-sticken voice called the Regional Office to say, “We’re being flooded! Male is flooded,” before the line crackled and fell silent. Though the death toll was small compared to the other countries, the unique geographical features of this island nation caused the largest disaster the country had ever seen. It was the only country to be affected in its entirety. As the average elevation of the land is 1.5 meters, waves 3-4 meters in height washed over and destroyed many islands completely and forever. The waves washed away 108 persons and displaced 29,000.

On the Indonesian island of Simeulue, nearly 100 years ago in 1907, about 70% of the population had lost their lives in an earthquake followed by a tsunami. Termed “smong” (meaning ocean coming onto land) in the local language, this story of the smong was passed on verbally from generation to generation. On 26 December 2004, the people saw the enormous waves charging towards them, recalled the story of the smong and fled the coast. Only 44 of a population of 78,389 died. However, Indonesians on the other islands did not anticipate the waves. Hopefully, Indonesians who survived will remember the lessons learnt from the tsunami and pass on the knowledge to future generations so that they are better prepared in case of such an event.

26 December 2004 was a day of worship in Sri Lanka. That Sunday morning, Christians had gathered for mass, while Buddhists gathered at temples for Unduwap Poya Day, a special day when the people set aside worldly pursuits. There was little evidence that the day would be any different from the usual. Sri Lankans were mystified by the strange behaviour of the sea. After a first, modestly high wave, the sea receded far away from the beaches. Many tourists and locals went to explore further, and were helpless when the sea returned with full fury. The tsunami took more than 35,000 lives, more than in any other country except Indonesia.
and North Sumatra. About 50% of residents in Aceh lost their lives, and about 500,000 were displaced.

In the Maldives, the tsunami was of a very different character from that in the other countries. The water came in like a sudden rise in the tide, and many islands were completely washed over. Although the waves were only about 3–4 meters in height, many islands in this archipelago of nearly 2000 islands have a height of just 1.5 meters above sea level. All the 200 inhabited islands were affected; some were destroyed forever. Though the death toll of 82 was low compared to that of other countries, the number of persons injured and killed was huge relative to the comparatively small population of the country. Over 29,000 were left homeless, of whom nearly 5000 had to be evacuated to other islands. Beaches and harbours were eroded, jetties and quays destroyed, and coastlines altered. Coral reefs and beds were damaged, and trees and mangroves uprooted. The soil and groundwater were inundated with seawater.

Myanmar was less affected than the other countries due to a number of factors. There is a high underwater mountain range underneath the Andaman and Nicobar Islands, which afforded some protection. Numerous offshore islands protect the south of the country. Customs and traditions also played a part; it was a full moon day, and most people do not venture out to sea during a full moon. It was also low tide when the tsunami hit Myanmar. In addition, the population density in the affected areas was low. As a result, there were only 61 fatalities, with 43 injured.

Although most of the people in the disaster-affected areas witnessed some sort of natural warning of the impending tsunami, such as the ground shaking, strange animal behaviour, unusual behaviour of the sea, few understood these signs and fled to safety. However, a group of indigenous people, the Mokens, living on one of Thailand’s Surin islands, understood the dangers of these warning signs and went to higher ground. On this island, Mokens had transmitted the story from one generation to another of a day when the sea reared back into a giant wave and crashed violently inland. They refer to the tsunami as the wave that “eats people”. On this island, the only casualty was a previously disabled man who failed to reach higher ground.
The tsunami reached Sri Lanka at around 09.00 a.m. Although hours had elapsed from the onset of the earthquake until the arrival of the first wave of the tsunami at its shores, Sri Lanka had no warning of the possibility that a tsunami would strike. No tsunami had been recorded in Sri Lanka for more than a century. It affected coastal areas in the north-east, east, south and south-west of the country, decimating 14 of the 28 districts in the country. Eight of these were in the conflict areas in the north, which, after two decades of strife, were bereft of resources to start with. The tsunami displaced 516,000 people immediately. The death toll was 35,322.

Six provinces in Thailand along the Andaman coastline suffered immense damage. The tsunami struck at the heart of the country’s tourist areas of Phuket, Phang Nga, Krabi, among others. These three districts accounted for 97% of all deaths, of which a substantial number were foreign tourists from 37 countries, which caused grave concern to their respective governments. A concerted effort was made to identify the victims. There was minimal damage to health and transport/logistics infrastructure, and the geographical extent of the damage was relatively limited. About 8,212 people lost their lives, of whom 2,448 were foreign nationals.

As Myanmar was minimally affected, the effects of the tsunami in India, Indonesia, Maldives, Thailand and Sri Lanka are described.
The impact of the disaster was indescribable. Such devastation had never happened before. Lives and livelihoods lay in ruins. The local people in all the affected countries put aside their grief and horror, rallied as best as they could and provided initial relief responses. In many areas, communications, roads, transportation and logistics had broken down completely, along with people’s spirits. This posed a huge challenge to the operational role of the World Health Organization (WHO) as a coordinating body for humanitarian action in the health sector.

The logical first step was to assess the impact of the disaster on all aspects in order to be able to provide emergency relief. WHO collaborated with ministries of health in the affected countries and international partners to help determine the damage, identify priority needs and assess capacities.
ASSESSING THE DAMAGE

A total of 422,750 persons were injured by the events of 26 December, of whom more than 227,000 persons lost their lives. About 99% of deaths occurred within three days of the events. Indonesia suffered the greatest loss, comprising 74.5% of the total deaths.

In the area of public health, around 800 primary and secondary health facilities were destroyed in the disaster. The damage to the infrastructure in the impacted areas was extensive, including that sustained by the health facilities, which comprised buildings, records, laboratory equipment and supplies. In Aceh, 592 health facilities were damaged and 30% of midwives were reported dead or missing. In Sri Lanka, about 100 health facilities were destroyed. The public health infrastructure in the Maldives was largely functional, although about 41 health facilities were damaged, and there was a massive loss of medical equipment, consumables and laboratory equipment.
In India, damage to the health infrastructure included 80 subcentres, 13 primary health centres and seven partially damaged district hospitals. Thailand suffered minimal loss of health infrastructure.

Most of the injured were in need of urgent medical attention. Many were homeless, and shelter needed to be provided to them on a priority basis. In the Maldives, at least 1800 pregnant women across 200 islands were impacted, and about 500 were left without access to any delivery facilities.

The loss to the medical care system was the greatest in Indonesia, where 208 health-care personnel had lost their lives, including 97 nurses/midwives and seven physicians. Thailand reported that one physician and one nurse were killed by the tsunami. In Sri Lanka, 35 health-care personnel were injured but survived.

Most of the damage to the water system was related to the destruction and/or contamination of the wells and aquifers.

“Now disasters have become a permanent challenge for people like us. We cannot think of a disaster as something that occurs to somebody else. It has become a part and parcel of our lives. We have to prepare ourselves better. People’s resilience and a community-based approach, which were followed here, will have long-term success in improving the public’s ability to face such disasters.”

Radha Krishnan

District Collector, Nagapattinam, Tamil Nadu, India

Voices from the field (multimedia product). WHO, 2005
with salinated water, debris and bacteria. Water storage tanks were also washed away. In areas where rainwater harvesting was an important source of water, the harvesting equipment was damaged, destroyed or swept away. Damage to the wells and distribution equipment was greatest along the shores. In addition, in the Maldives, boats and other means of transportation routinely used for transporting water from islands with water to those without were damaged or destroyed. The pumping system was damaged in Colombo and, where drainage systems were in place, many got clogged with debris. The Maldives faced a similar situation. In India, many of the toilets were damaged. In Thailand, the groundwater became infected with coliforms. Provision of adequate amounts of clean drinking water was thus an immediate necessity.

Destruction of homes left many people bereft of shelter. Almost 600,000 houses were damaged or destroyed. Aceh province and the Andaman and Nicobar Islands sustained the greatest damage to shelters. Sri Lanka lost 145,700 houses to the tsunami. Although some 150,000 houses were damaged in the parts of India impacted by the tsunami, the burden on the country was low. The damage to shelters in Thailand was the least among the five countries. Some 7200 houses were damaged in the Maldives, where construction consisted mostly of coral and limestone. The homeless were transported to camps for internally displaced persons (IDPs). The challenge was to prevent overcrowding in these camps, provide adequate clean water and sanitation, and prevent the outbreak of diseases.
In each of the countries, the sources of *electricity* were located far from the shore and thus were not directly impacted by the tsunami. However, the Maldives incurred substantial damage to the electrical infrastructure: 24 power-generating plants, 104 generators and 121 km of cables. Major local damage occurred in Aceh province, although the main transmission lines were intact. In the Andaman and Nicobar islands, fuel storage facilities were damaged or swept away, and their contents leaked into the environment.

The *transportation and logistics* along with the *public works and engineering sectors* accounted for between 60% and 70% of the total costs of damage to the infrastructure. In Aceh province, 10% of the roads were damaged or destroyed (29 800 km), as well as many bridges. In Tamil Nadu, India, 31% of the roadways were damaged. In Thailand, smaller roads built on sand roadbeds were severely damaged. In the Maldives, jetties, sea walls, quays, causeways, breakwaters, navigation markers and beacons were destroyed. In the Andaman and Nicobar Islands, severe damage occurred to the docks and some were under water due to the sinking caused by the earthquake. The damage to the transport infrastructure prevented some of the injured from being transported to functioning health facilities, or from help reaching them.

In each of the countries, coral reefs were damaged by the earthquake and tsunami, and by the debris that was dragged into the sea as the tsunami retreated. The presence of broken glass and metal with sharp edges presented another hazard that resulted in lacerations and puncture
Ten years after the tsunami of 2004

wounds. Some of the debris contained medical wastes and other hazardous materials that had not been adequately disposed of before the tsunami, and were washed away with the flooding of medical facilities and industrial sites. Many mangroves were uprooted as well, changing the geography of the coastlines. The damage to the environment was staggering.

The most apparent damage related to the social support systems in each of the countries was the sudden disruption of the social fabric. Many had to face the agonizing loss of and inability to rescue family members, and the terrifying experiences of watching those who drowned or were carried away by the violent sea. For many, the reactions to these experiences will persist throughout their lives. The emotional toll cannot be quantified.

Overall, security systems and infrastructure were not damaged significantly in any of the countries impacted. Exceptions included the death of some 2000 military personnel and dependents in Aceh province, and substantial damage to infrastructure and loss of military personnel in the Andaman and Nicobar islands (116 service personnel were killed in the damage to the Indian airbase on Car Nicobar Island). In most of the countries, security personnel such as the Armed Forces, fire and police personnel were among the initial responders.

Several countries faced a breakdown in communication systems. The telecommunications system in Aceh province lost 18 of its staff and the damages to its hardware were estimated at US$ 5.9 million; the privately owned television station lost 12 of its staff and studio, and
What it meant

IMPACT

the newspaper 54 of its staff of 200, plus its offices and printing and other equipment. In Thailand, landlines were impacted, but there was no serious damage to the hardware. Damages to the communications system in the Maldives were estimated at US$ 18.5 million. Sri Lanka lost 6.5% of its total landlines.

Damage to the economy in each of the countries was huge. The total economic loss to the infrastructure in the Maldives was equivalent to 62% of its gross national product (GNP). The estimated costs of the damage in India totalled US$ 15.71 million. The estimated cost of the damage to the health-care system in Thailand was US$ 3.8 million. The economic costs associated with the loss of life and livelihood cannot be estimated.

Several jobs were also lost due to the collapse of business entities, especially in Aceh and Sri Lanka. The tourism industry in the Maldives, Thailand, Sri Lanka and other countries also suffered huge setbacks.

In a disaster of this magnitude, good coordination and control systems are of vital importance. Other than in Banda Aceh, the seats of the governments were not directly damaged by the events. Most of the governmental infrastructure remained undamaged and the governments remained functional. However, in Banda Aceh, the capital of Aceh province, 90% of the government district was destroyed and 40% of the staff of the provincial government was killed.

The education sector was not spared. More than 30 schools in the Andaman and Nicobar Islands were flattened by the earthquake. Not only were physical structures affected in
each of the countries, but textbooks, library books, records, computers, and other equipment were also damaged or destroyed. All levels of schools were affected. The medical school in Banda Aceh remained structurally intact, but books, computers and teaching materials were damaged or destroyed. In Aceh and Nias, 2240 schools were destroyed and more than 2000 education staff were killed. Universities and schools in Sri Lanka were also damaged and 59 were totally destroyed.
99% of deaths within 3 days
74.5% of deaths in Indonesia

227,000 dead
422,750 injured

800 health facilities destroyed

800

Loss of buildings, records, consumables, laboratory equipment and supplies

Medical care

Indonesia 208 health-care personnel died
Thailand 1 physician, 1 nurse died
Sri Lanka 35 health-care personnel injured but survived

Public health

Water supply and sanitation

Boats for transporting water from islands with water damaged or destroyed in Maldives

Destruction/contamination of wells and aquifers with salinated water, debris and bacteria, storage tanks washed away

Pumping system damaged in Colombo, Maldives

Rainwater harvesting equipment damaged, destroyed

Groundwater contaminated

Toilets damaged in India
SHELTER
- 600,000 houses damaged
- Homeless transported to camps for internally displaced persons

ELECTRICITY
- In Maldives: substantial damage to electrical infrastructure
- Aceh: mainly local damage
- Andaman and Nicobar Islands: fuel storage facilities damaged

TRANSPORTATION AND PUBLIC WORKS
- Roads damaged in all affected countries
- As these were coastal areas, severe damage to jetties, docks, harbour facilities

COMMUNICATIONS
- Aceh: loss of staff and facilities of telecommunications centre, newspaper and TV station
- Sri Lanka: landlines impacted
- Maldives: heavy damage

SECURITY
- 2,000 military personnel and dependents died in Aceh
- 116 in Airforce Base in Andaman and Nicobar Islands

ECONOMY
- Huge losses in most countries

SOCIAL SUPPORT
- Sudden loss of social fabric

EDUCATION
- Major loss of schools, equipment and education staff in Aceh, Sri Lanka, Maldives

COORDINATION AND CONTROL
- In Bangsa Aceh: 90% of government district destroyed

Support sectors:
- Shelters
- Electricity
- Transportation and public works
- Communications
- Security
- Economy
- Social support
- Education
- Coordination and control

Damage
Relief responses

In the first few days, WHO aimed to maximize the life-saving and life-preserving efforts of all humanitarian action through support to countries. The challenge for WHO was to ensure timely assistance to the affected countries while maintaining standards, norms and procedures, and ensuring accountability. The Regional Office mounted a swift response and recovery operation by setting up field offices, providing logistic support, and deploying over 160 people from various WHO offices all over the world over a period of three months to meet the initial health needs of the affected population.

As a first response, a 100-day strategy was adopted. During this period, WHO focused its operational activities in Indonesia, Sri Lanka and Maldives. India and Thailand did not request for help. The Regional Office acted as the nodal point and, along with WHO country offices, supported the international response.
Objectives of the WHO 100-day strategy

- Monitoring public health to provide early warning of emerging health threats and enabling timely organization of necessary response;
- Replacing lost assets, infrastructure and supplies that were crucial to meeting additional health threats consequent to the disaster, as well as the reactivation of previously available health services;
- Providing technical expertise to health authorities to enable gap-filling;
- Establishing and sustaining effective regional, national and local health coordination to ensure efficient deployment of assistance;
- Ensuring up-to-date information on the health situation to local, national and international partners;
- Refining health needs assessment and facilitating early recovery and rehabilitation.

“To care and to make a difference, we put together a team of dedicated soldiers to man the Operations Room located in our Office in New Delhi from where the entire operation was managed... I can say, as leader of the Operations, that what my team carried out was not only unprecedented, but by far the biggest and most challenging mission that WHO in the Region has ever had to face. Among the crucial ingredients of the response were: health protection and disease prevention, health services, medical and logistics supply, resource mobilization and coordination among partners.”

Dr Poonam Khetrapal Singh
Overall Lead of the Operations for the WHO response to the tsunami of 2004 presently Regional Director, WHO South-East Asia Region

Extract from the foreword of From relief to recovery: the WHO tsunami operations. WHO South-East Asia Region, 2007.
Public health functions such as surveillance, maternal and child health services, immunization, psychosocial support and management of dead bodies were conducted on a massive scale. The diseases for which surveillance was conducted differed by country. There was the augmented potential for outbreaks of infectious diseases such as measles and other vaccine-preventable diseases, particularly in areas in which the respective pre-event immunization rates were low, as in India and Indonesia. India, Indonesia and Thailand implemented measles vaccination programmes. Sri Lanka did not, as it had conducted a measles immunization campaign a month earlier. Both Sri Lanka and the Maldives initiated a mumps vaccination programme following a limited outbreak. Indonesia had an unexpected outbreak of tetanus, probably due to incomplete pre-event immunization.

As diarrhoea was common in each of the countries, an increase in the incidence of diarrhoea was anticipated during the post-tsunami period among the large number
Ten years after the tsunami of 2004

of IDPs crowded into camps. Some of the other public health challenges included managing and making sense of a huge amount of information, and managing the mobilization and coordination of technical staff, supplies and equipment.

Other preventive public health measures included the provision of mosquito netting and insecticide-impregnated plastic sheeting to decrease the risks of developing malaria and dengue. Fogging with insecticides was also initiated in the coastal areas of India, Indonesia and Sri Lanka. Some chemical disinfectants and bleach were used by India and the Maldives to control possible infections arising from dead bodies and animal carcasses.

Prior to the tsunami, the Maldives had well developed public health and medical care systems. These continued to provide basic health-care services to most of the population, and were only transiently impacted. However, delivering relief and recovery responses was immensely challenging due to the logistics related to travel. Injured and ill victims often had to be transported by boat to locations where health services were available.

Sri Lanka had an ongoing civil conflict for 20 years preceding the events of 26 December. The country’s capacities were overwhelmed by the devastation caused by the tsunami waves, and it needed assistance from the international community and national partners to fill the gaps in medical care, public health and management of the displaced. Prior to the tsunami, Sri Lanka had a relatively robust public health system with outstanding immunization coverage and a functioning disease surveillance system that only required minimal support from the Regional/Country Office.
No outside assistance for medical care was available in any of the affected countries on the first day. In Indonesia, the system was completely overwhelmed by the number of injured and dead. Initial responses were provided by the Indonesian military, and later by the military of many other countries. Aceh province had been affected by conflict for 30 years before the events of 26 December 2004. The functioning medical care system did not have the absorbing and buffering capacities to meet the challenges and burdens of injuries and deaths. The medical care and public health systems were further compromised by the loss of essential staff, and inability of the injured to reach medical facilities, or for medical help to reach the injured due to breakdown of the transportation system.

In the Maldives, too, their National Security System came to their aid. Thailand responded in accordance with its National Disaster Mass-Casualty Plan, which had been practised within one month before the event, with trained professionals immediately reaching the areas affected. Countries set up alternative care sites, as assistance came in from neighbouring areas.

Initially, all the countries were short of supplies needed for the immediate care of the injured. The populations on the islands experienced the greatest problems due to logistical difficulties in providing assistance. However, after the initial week, the affected countries were inundated with responders, supplies and equipment, whereas the greatest need was for the provision of routine medical care. In Sri Lanka and Indonesia, initially no attempt was made to check the credentials of the arriving persons or organizations. In Sri Lanka, by 29 December, there were
Ten years after the tsunami of 2004, there were at least 6000 expatriates in 70 different teams. In Aceh, Indonesia, hundreds of nongovernmental organizations (NGOs) and humanitarian organizations came to help. In both Sri Lanka and Indonesia, there was no designated authority to take charge, and control and direct the work of these humanitarian teams. As a result, there was much duplication of efforts, and gaps in other areas.

The Aceh provincial government requested the WHO South-East Asia Regional Office to coordinate all the humanitarian health-related NGOs and their personnel, equipment and supplies. Indonesia received 400 tons of supplies that were provided by at least 140 different donors. Of the drugs received, the majority were not on the national needs list and three quarters of them were labelled in unfamiliar languages. In addition, one quarter of the donated medications had already expired before they arrived. The disposal of this material cost the Indonesian government at least US$ 3.2 million. In Aceh, the medical relief teams tended to station themselves in the more populated areas and little medical assistance reached the rural areas. Overall, the medical relief teams brought too many physicians and too few nurses. The Maldives was also inundated with unrequested medicines that remained at the airport due to lack of transportation facilities. In January 2005, a month after the catastrophe, it issued a statement that unrequested drugs would not be accepted.

The damage to water supply was dealt with in innovative ways by the affected countries. In the Maldives, coconut water was used as the alternative source of water, or the
population migrated to islands where water supplies were available, or water was transported between the islands using small boats. In some of the Nicobar Islands, water was transported from unaffected wells that were further inland. In the mainland countries, water was imported, usually using tanker trucks, from neighbouring areas not directly impacted by the events.

In some of the Andaman and Nicobar Islands, no assistance with water supply was immediately possible; it was delayed for several weeks, as it had to be transported over long distances, and the destruction of harbour facilities impeded the ability of ships to dock. Relief supplies provided by outside agencies, including national governments, began 24–48 hours after the earthquake and tsunami struck. In most of the areas not immediately accessible by ground transport, augmented water supplies were transported by air. Supplies of bottled and packaged water were imported to areas by ships from several countries, including Singapore, India and the United States. Supplies were often donated by humanitarian organizations, including United Nations (UN) agencies and many NGOs such as OXFAM and the International Federation of Red Cross and Red Crescent Societies (IFRC). Responsibility for the coordination of these activities was undertaken by the United Nations Children’s Fund (UNICEF).

In the IDP camps, improvised sanitation systems had to be installed. Often, the governments, UN agencies and NGOs assumed responsibility. A few outbreaks did occur, but were detected and prevented by the application of good public health measures.
For the homeless, *shelter* was provided by intergovernmental organizations (IGOs), NGOs and often the military. Emergency shelters were erected with tents, plastic sheeting and mosquito netting. This was followed by the construction of temporary housing.

To support the *electricity infrastructure* in the Maldives, which had sustained substantial damage, WHO, Japan and IFRC donated generators as relief measures. However, some of the generators could not be delivered because they were too large and heavy for the watercraft that could approach some of the islands. Members of the Indian Navy repaired the generating equipment in the Andaman and Nicobar islands. The lack of capacity of locals on how to operate and maintain the new equipment was a handicap.

The *public works and engineering sectors* in each of the countries was faced with the task of disposing of huge amounts of waste on a daily basis. The collection systems that did function dumped the waste onto any open space – along roads, in fields, and beaches as well as in dump sites. Relief activities consisted primarily of opening roads to transport people, supplies and equipment. In addition, airport buildings had to be repaired to allow storage of the massive amounts of imported relief goods. In the Maldives, Thailand and India, the governments ordered that no additional, unwanted supplies and personnel be allowed inside their respective borders. Clearing the remaining debris was a slow process.

*Social support systems* had been badly disrupted in the affected countries. In each country, the number of women killed exceeded that of the men. In addition, the elderly, those who were physically handicapped, the chronically
ill, and children were also among those killed, as they may not have had sufficient strength to survive the forces to which they were exposed. In Indonesia and the Maldives, the mortality rate of persons 65 years of age and older was disproportionately higher than for other adults.

Initially, people searched frantically for those who were lost or dead. Some were found – most were not. Inability to identify the dead posed problems that grew worse as time passed. Initially, attempts at identification were visual. The myth that dead bodies could spread disease was widely touted by the media. In many of the countries, religion and culture dictated that the dead must be buried within 24 hours of the time of death. These factors combined to result in the initiation of and continued mass burials of victims who had not been identified. Eventually, governments together with specialized NGOs, in particular the International and National Red Cross Societies, were involved with the recovery, burial and identification of corpses.

In Thailand, many of those killed or injured by the tsunami were tourists from other countries. A remarkable effort was launched to repatriate injured survivors from Thailand. Many of the Thais killed were from the poorer segments of the population and many were migrant workers. Ultimately, 76% of the corpses in Thailand were successfully identified. In the Maldives, many of the residents and tourists of the inhabited islands had to be evacuated to other islands that had not sustained total damage. This created tensions and sometimes conflict. Thailand had educated and trained many volunteers at the community level to assist those affected and to recognize
the presence of mental health problems. This was generally not the situation in the other four countries.

**Military and security personnel** played an important role in responding to the situation. In Aceh, before the event, civil strife had been ongoing for about three decades, and military presence was there. After the tsunami, the military provided immediate relief measures. They were later confronted with a huge influx of personnel associated with aid organizations, and the arrival of military personnel and equipment from the United States, Australia, India, the United Kingdom, Singapore, Japan, Germany, and others to help in relief efforts. After accepting help initially, foreign military personnel were asked to leave Aceh at the end of the response phase by March 2005.

In the Maldives, the National Security Service provided needed resources to the isolated islands. In the Andaman and Nicobar Islands too, initial responses were provided by local fire and police personnel, and locally stationed armed forces personnel. The Indian Government provided military resources for relief operations in Aceh, Sri Lanka and the Maldives. Cargo planes airlifted casualties to higher medical facilities, and air-dropped essential supplies to inaccessible areas. Naval ships brought food, water and other essentials to the Andaman and Nicobar Islands.

In Sri Lanka, civil unrest had been going on for about two decades before the tsunami. However, at this time of crisis, both sides put aside their differences and agreed to cooperate in relief and recovery efforts, and a post-tsunami management structure was mutually approved.
In Thailand too, initial relief efforts were provided by disaster relief teams of military personnel, police officers and marine rescue officers.

In response to the loss of *communication systems*, immediate buffering capacities were provided through the use of satellite phones and radios in Indonesia, where the responding military had access to satellite communications. Runners and couriers on motorcycles were also used. Communications across the Maldives were achieved using citizen band and/or very high frequency (VHF) radios aboard fishing and/or commercial boats, and were also provided by the Maldivian Coast Guard.

Communications within and between health facilities and field workers were bolstered by the provision by WHO of computer communications capabilities at the medical facilities, including hospitals and community health offices. The media provided the world with profound images of the catastrophe, and helped to raise unprecedented amounts of donations, in cash and in kind.

India and Thailand, with their large *economies*, did not request financial assistance from the international community to fund relief activities. Indonesia, Sri Lanka and the Maldives accepted assistance with the relief processes. The Maldives was faced with a very limited economy and small pressures could have resulted in collapse.

The Thai Government allocated US$ 1.7 billion (1.4%) of its total budget towards relief and recovery costs, excluding the huge amounts provided in-kind by the humanitarian
community, especially through UN agencies and NGOs. A total of US$ 13.69 billion in cash donations was pledged, which was the largest sum ever pledged.

Although the education sector was impacted adversely by the tsunami, in India, classes reopened after a 2–3-week break. In the Maldives, the start of the school year was delayed by one month, but 60% of the expatriate teachers failed to return to their posts. UNICEF played an important role in assisting with the recovery of the educational system.

The crucial need for having established coordination and control systems became obvious after the initial few days. Other than in India and Thailand, during the first days, weeks and months, there was a relentless intrusion of humanitarian medical relief teams that, apart from help, may have contributed to the duplication of services and the provision of goods that were not needed. This led to stress on the coordination and control mechanisms, and posed additional challenges to the management of relief efforts.

As India and Thailand did not request international assistance, they were able to avoid much of the chaos that was apparent in the other three countries. The Government of the Maldives quickly learnt to limit unneeded relief activities. With the assistance of multiple UN agencies, they were able to provide the necessary coordination and control of relief activities. The Maldives was able to control the receipt and discontinuation of aid also because of the logistical difficulty in transporting everything by boat, especially as harbours had been damaged.
Just the opposite happened in Indonesia, especially in Aceh province, and in Sri Lanka. The initial responses were unstructured and spontaneous. The relief efforts in Aceh province spiralled out of control, and there was difficulty in bringing some coordination between the various organizations. Similarly, Sri Lanka had no designated agency responsible for disaster response that had the mandate, resources and authority to coordinate and control the responses, and consequently, had no overall disaster response plan. It promptly established a National Disaster Management Centre that was charged with planning, especially in relation to restoring the lost infrastructure, coordinating the access and importation policies for the safe storage of donated goods, and for the recovery of damaged natural resources. Both of these countries are good examples of what can happen without a well-developed disaster response plan, and a coordination and control mechanism that has the mandate, resources and authority to regulate the responses.

UN agencies augmented coordination and communication capabilities. By mid-January in Indonesia, the Office for the Coordination of Humanitarian Affairs (OCHA) had initiated a website called the Humanitarian Information Centre (HIC) for reporting progress and the results of health response activities. In August 2005, 170 of the participating organizations were using the HIC for reporting process. The International Committee of the Red Cross (ICRC) initiated efforts to help victims find relatives and friends, and posted listings in local newspapers and public places.
Recovery responses

To manage the recovery process, *coordination and control systems* were strengthened in almost all the countries. Sri Lanka formed a National Disaster Management Centre in June 2005, which engaged in comprehensive planning activities. UNDP advised the Maldives and sent senior health workers to Singapore for training in disaster risk management. Indonesia established a new coordinating body, the Badan Rehabilitasi Dan Rekonstruksi (BRR). It formulated a new law in 2007, constituting a national disaster agency, and undertook several reform measures. The Maldives developed a National Policy on Disaster Management and initiated an information management system, as well as an early warning system. Sri Lanka realized the need to improve coordination capacity to respond to all disasters, and passed the National Disaster Management Act, 2005. Thailand also put together a subcommittee for the coordination of international assistance.

Urgent action had to be taken to address the critical *public health* needs of about 5 million people in the Region, including the large number of IDPs crowded into camps in Aceh and Sri Lanka. Apart from setting up and strengthening surveillance systems and conducting mass immunization campaigns, laboratory facilities were strengthened or established, and preventive measures continued for vector-borne diseases. Measures were taken to rebuild damaged medical facilities in Aceh and Sri Lanka, with governments taking the lead supported by various agencies and NGOs. There were problems with the cold chain in Aceh and the Maldives due to inundation with water and lack of electricity. The WHO Regional Office along with its country offices, UNICEF, and key implementing partners such as the Red Cross Societies provided supplies, equipment and personnel to assist the ministries of health of the affected countries with
restoration of the cold chain. There were no deaths due to starvation or severe malnutrition in any of the countries, indicating that food shortages had been well managed.

Despite the lack of a comprehensive public health infrastructure prior to the tsunami, there were no major disease outbreaks in any of the countries. The public health response left many countries in a better state after recovery than what they were before 26 December 2004, in line with the principle of “build back better”. Surveillance was strengthened in each of the countries, laboratory facilities improved, and personnel trained. The number of IDPs and IDP camps declined progressively.

Much of the recovery effort in the medical care system was provided by NGOs. Recovery consisted not only of restoring or replacing the physical structures, but also of restoring the functional capabilities and capacities of the medical care system. Such capacities included recruiting, educating and training medical care personnel to assume the roles of those killed or injured. The Maldives recruited 23 expatriate physicians during the relief period and encouraged them to remain for a period of at least one year; at least 15 of these physicians remained in the Maldives past the one-year period. In Indonesia and Sri Lanka, when the NGOs had departed, the levels of care that had been available during the relief phase needed to transition to regular, routine services as they were handed back to the government. This was relatively easier, as the demand for services decreased and emergency, life-saving care was no longer needed.

It cost US$ 12.2 million to restore the Maldives’ health-care system and a total of US$ 2.2 billion to recover. It cost Indonesia US$ 91.9 million to restore the health services (81% to repair medical facilities). Estimates to restore the health-care system in Sri Lanka were at least US$ 60 million.
In each of the countries, efforts to restore water supplies to their pre-event levels, and in some cases, even beyond, were begun simultaneously with the relief responses. Many of the resources were provided by outside agencies, such as UNICEF, WHO, IFRC and NGOs. In Indonesia, wells were cleaned and disinfected, Singapore provided a water purification plant, and the Regional Office helped to repair the water treatment plants in Aceh. More than 250 agencies participated in Indonesia in the water recovery processes (including efforts at restoring sanitation). India drilled new bore wells.

Containers to store and transport water were donated for use in Sri Lanka, the Maldives and the Andaman and Nicobar Islands. In the latter two areas, efforts were also directed at repairing and replacing the damaged water harvesting equipment. Desalination plants were set up in Sri Lanka and the Maldives. However, the fuel required to run these plants had to be imported, which raised the costs substantially. There were problems in maintenance and sustainability, which were solved in due course.

The sanitation in the affected countries was poor even before the event. Progress in improving sanitation was slow, as the affected populations moved to newer areas where fresh sewage and water systems had to be constructed and operationalized.

The recovery of shelter in the form of permanent housing for those who had lost their homes was a slow process in all the countries. The attempt was to move the IDPs from camps into temporary housing and eventually into permanent structures.

Recovery of public works and engineering systems understandably took a long time. Large amounts of debris had to be removed first. In Indonesia, the government hired private contractors to remove and dispose of the debris. WHO provided drums for storage of hazardous materials, and other UN agencies advised on the clean up. Several interventions have been directed at decreasing the creation of large amounts of debris in case of another catastrophe. These include the purchase of incinerators by Thailand, and provision of education and training on destruction of hazardous materials in the Maldives.

The processes involved in the recovery of social support systems varied among countries. Some attempted to remarry and re-establish families. Sri Lanka encouraged the families of orphaned children to care for them. Some tried to drown their sorrows; alcohol consumption increased. The psychosocial support provided by international responders was often transient. Recovery of those incapacitated by their reactions to the stresses to which they were exposed was slow, and many may never recover.

Early efforts at restoring the communications system in each of the countries were directed at restoring mobile phone services. Attention was then directed towards repairing damaged lines and network systems. Except in some islands in the Maldives and the Andaman and Nicobar Islands, telephone services were generally restored to the affected areas relatively quickly. The lone newspaper in Banda Aceh began to print again within five days. Simultaneously, the United Nations Educational, Scientific and Cultural Organization (UNESCO) issued a flash appeal for US$ 600 000 for restoration of the radio networks in Aceh province.
Several governments offered compensation packages to restore the economy and livelihoods. India provided compensation funds to survivors who had lost a relative, the injured, and to those who had lost their livelihoods. More than US$100 million was provided to fishermen to compensate for lost boats and equipment, and rebuild livelihoods. However, difficulties were encountered by some who deserved compensation, but were unable to produce a death certificate or a body. Thailand also provided compensation to fishermen who had lost their livelihoods due to destruction of their boats. The United Nations Development Programme (UNDP) assisted many of the countries with developing and implementing strategies to restore their respective economies. Following the initiation of relief efforts, India agreed to accept financial resources to assist with recovery.

By the end of 2006, most of the tourist trade in the affected countries had returned to pre-event levels. This component was an essential element in recovery of the economies of Thailand and the Maldives.

The tsunami left a trail of unanswered questions in its wake. Could countries have avoided the extensive devastation if they had been better prepared? While the need for being better prepared was felt strongly by all affected countries, how prepared was prepared? One of the major outcomes of the tsunami in answer to these questions was the development by consensus between WHO and Member countries of a set of 12 benchmarks for assessing emergency preparedness and response. These benchmarks set the framework for building capacity and are discussed in the next chapter.
SUPPORT SECTORS

SHELTER
- Provided by intergovernmental organizations, NGOs, and military

PUBLIC WORKS AND ENGINEERING
- Roads repaired
- Airport buildings clogged with huge amounts of relief materials
- Indonesia, Thailand stopped unwanted material from entering their countries

ELECTRICITY
- Generators donated in Maldives
- Indian Navy repaired equipment in Andaman and Nicobar Islands

SOCIAL SUPPORT
- Governments together with specialized NGOs (international and national Red Cross societies) involved with recovery, burial and identification of corpses; in Thailand, surviving tourists sent back to their countries; 76% of bodies identified (including tourists)

SECURITY
- Military personnel came from United States, Australia, India, the United Kingdom, Singapore, Japan, Germany to help relief efforts; airlifted casualties and air-dropped supplies

COMMUNICATIONS
- Satellite phones and radios used in Indonesia
- Very high frequency radios in Maldives
- WHO provided computer communication capabilities

COORDINATION AND CONTROL
- Relentless intrusion of humanitarian medical relief teams without any coordination in Indonesia, Maldives, Sri Lanka; UN agencies augmented coordination and communication capabilities

EDUCATION
- In India, classes begun after 2-3 week delay, one month delay in Maldives. But 60% of teachers failed to return
- UNICEF assisted with recovery

COORDINATION AND CONTROL
- Indonesia, Sri Lanka and the Maldives accepted assistance with relief processes
- Huge amounts provided in-kind by the humanitarian community, as well as cash donations

ECONOMY
- Indian Navy repaired equipment in Andaman and Nicobar Islands
- Generators donated in Maldives
- Indian Navy repaired equipment in Andaman and Nicobar Islands
- Electricity
- Social support faced with disposal of huge amounts of waste
- Roads repaired
- Government buildings clogged with huge amounts of relief materials
- Maldives, India, Thailand stopped unwanted material from entering their countries
- Military personnel came from United States, Australia, India, the United Kingdom, Singapore, Japan, Germany to help relief efforts; airlifted casualties and air-dropped supplies

RELIEF SUPPORT SECTORS

- Support provided by intergovernmental organizations, NGOs, and military
- Roads repaired
- Airport buildings clogged with huge amounts of relief materials
- Indonesia, Thailand stopped unwanted material from entering their countries
- Military personnel came from United States, Australia, India, the United Kingdom, Singapore, Japan, Germany to help relief efforts; airlifted casualties and air-dropped supplies
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- Support provided by intergovernmental organizations, NGOs, and military
- Roads repaired
- Airport buildings clogged with huge amounts of relief materials
- Indonesia, Thailand stopped unwanted material from entering their countries
- Military personnel came from United States, Australia, India, the United Kingdom, Singapore, Japan, Germany to help relief efforts; airlifted casualties and air-dropped supplies
No major outbreaks
5 million people to be cared for including large number of IDPs

**Medical Care**

- Care provided mostly by NGOs
- Capacity building done of medical personnel and facilities restored
- Cost of restoring health-care system
  - Indonesia: US$ 91.9 million
  - Maldives: US$ 12.2 million
  - Sri Lanka: US$ 60 million

**Public Health**

- Laboratory facilities strengthened/established
- Preventive measures continued for vector-borne diseases
- Cold chain repaired in Aceh, Maldives by WHO, UNICEF, Red Cross societies

**Water Supply and Sanitation**

- Restoration of water supply helped by UNICEF, WHO, IFRC and NGOs
- Maldives and Andaman and Nicobar Islands
- Rainwater harvesting equipment repaired/replaced
- Desalination plants set up in Maldives, Sri Lanka
- Slow progress in improving sanitation as new systems had to be laid

**Support Sectors**

- Shelters: provision of permanent housing slow in all countries
- Public works and engineering: removal of debris took long time and money; WHO and UN agencies helped; incinerators purchased by Thailand, and education and training on destruction of hazardous materials provided in the Maldives
- Social support: some remarried, homes found for orphans; alcohol consumption increased
- Communications: mobile services restored first followed by repairing damaged lines and network systems; UNESCO issued flash appeal for restoration of the radio networks in Aceh
- Economy: governments offered compensation packages to restore livelihoods and to families of dead; UNDP assisted in restoring economies
The tsunami made it clear that change was inevitable. The status quo could not continue. It jolted Member countries of the WHO South-East Asia Region into realizing the extensive threat that disasters can pose to development in general and public health in particular, and that they needed to be better prepared. For WHO, it provided a unique learning experience – the biggest challenge it had ever faced as well as the opportunity to make a difference and build back better. Globally, the event set in motion a series of humanitarian responses. In the Region, it highlighted the crucial issues of preparedness and risk mitigation.
WHAT CHANGED IN WHO

The process of translating the lessons learnt from the tsunami into action began shortly after the event, and is ongoing. Together with Member countries, the WHO Regional Office for South-East Asia through its Emergency and Humanitarian Action (EHA) programme, has since been working towards reducing the health consequences of disasters, emergencies, crises and conflicts, and minimizing their social and economic impacts. The many achievements of WHO in this area can be categorized in the following four broad groups: (i) providing information for action by measuring performance, setting priorities and addressing gaps; (ii) strengthening capacities of Member countries to prepare for and respond to sudden disasters; (iii) focusing on reducing risks and providing safer health facilities; and (iv) building the capacity of Member countries through a comprehensive, all-hazards approach.

INFORMATION FOR ACTION: MEASURING PERFORMANCE, SETTING PRIORITIES AND ADDRESSING GAPS

Benchmarks for emergency preparedness and response

From the countries’ responses to the tsunami, there appeared to be a strong correlation between the levels of preparedness and the efficacy of the country’s responses to the disaster. This raised a number of issues. What are the necessary elements for the health sector to prepare for an emergency? Is there a state when a country could be fully prepared for any eventuality? How prepared would that be? How could preparedness be measured?

In an effort to systematically address these issues, the process of setting benchmarks was thought of as a novel approach to measuring the state of preparedness in countries. In November 2005, twelve benchmarks on Emergency Preparedness and Response were formulated by all Member countries, with the involvement of several other sectors such as home
THE 12 BENCHMARKS

**POLICY AND LEGISLATION**
1. Legal framework and functioning coordination mechanisms and an organizational structure in place for health emergency preparedness and response at all levels involving all stakeholders
2. Regularly updated disaster preparedness and emergency management plan for health sector and standard operating procedures (SOPs) (emergency directory, national coordination focal point) in place
3. Emergency financial (including national budget), physical and regular human resource allocation and accountability procedures established
4. Rules of engagement (including conduct) for external humanitarian agencies based on needs established

**COMMUNITY PREPAREDNESS AND RESPONSE**
5. Community plan for mitigation, preparedness and response developed, based on risk identification and participatory vulnerability assessment, and backed by a higher level of capacity
6. Community-based response and preparedness capacity developed, and supported with training and regular simulation/mock drills
7. Local capacity for emergency provision of essential services and supplies (shelters, safe drinking water, food, communication) developed

**CAPACITY-BUILDING**
8. Advocacy and awareness developed through education, information management and communication, including media relations (pre-, during and post-event)
9. Capacity to identify risks and assess vulnerability at all levels established
10. Human resource capabilities continuously updated and maintained
11. Health facilities built/modified to withstand the forces of expected risks

**HEALTH SURVEILLANCE AND EARLY WARNING**
12. Early warning and surveillance systems for identifying health concerns established.
affairs, foreign affairs and education. These benchmarks also integrated multisectoral concerns at the community, subnational and national levels.

The framework provided by the benchmarks helps countries to assess where they are in the area of emergency preparedness, and is a strong tool for planning programmes and activities in the area. The 12 benchmarks are broad in nature as they reflect the consensus of all 11 countries on the desired performance required for improving emergency preparedness and response. They are grouped into four areas: (i) policy and legislation, (ii) community preparedness and response, (iii) capacity-building, and (iv) health surveillance and early warning. Each benchmark has a corresponding set of standards and indicators that further elaborate the best practices of the specific benchmark. A checklist is included to help guide analysis of the existing situation and establish a baseline, while a simple scoring system provides a numerical value. In the coming years, the gradual achievement of the benchmarks at various levels will serve to build capacity, secure intersectoral linkages, improve planning and legislation, and ultimately reduce the vulnerability to emergencies of communities and systems.

All these are packaged in a tool that has been applied in ten countries of the Region so far. In each country, the benchmarks are rated together by stakeholders from various sectors. This helps in establishing a consensus on the level of achievement, gaps and priorities against the benchmarks, and corresponding standards and indicators. In most countries, a university or academic institution is involved in the process.

Countries that have completed assessment have taken action based on the results. Bangladesh identified that one of its priorities is the development of a national comprehensive health sector emergency preparedness and response plan focusing on all hazards faced in the biennium.

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**SRI LANKA BENCHMARKS ASSESSMENT: SCORE**

<table>
<thead>
<tr>
<th>Benchmark group</th>
<th>No. of indicators</th>
<th>Cumulative grade of indicator measured</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal</td>
<td>36</td>
<td>45/72</td>
<td>62.50</td>
</tr>
<tr>
<td>Community</td>
<td>33</td>
<td>34/66</td>
<td>51.50</td>
</tr>
<tr>
<td>Capacity building</td>
<td>25</td>
<td>26/50</td>
<td>52.00</td>
</tr>
<tr>
<td>Early warning and response system</td>
<td>21</td>
<td>13/42</td>
<td>30.09</td>
</tr>
</tbody>
</table>

Publications by the Regional Office on the tsunami

This is a narrative and covers the work of the Regional Office and country offices towards relief, response and early recovery.

A SERIES OF THE WORK done in various technical and operational areas with regard to the tsunami

VOICES FROM THE FIELD (2005)
A multimedia presentation that puts together accounts from staff and partners in the field

FROM RELIEF TO RECOVERY: THE WHO TSUNAMI OPERATIONS (2007)
This documents the recovery efforts in the affected countries.

This is a two-volume book that follows a systematic framework to document various aspects of the tsunami.

Nepal endorsed building codes, conducted retrofitting activities and seismic assessments of several health facilities. In Indonesia, it contributed to strengthening the ongoing activities in the Disaster Risk Reduction programme of the MoH. The tool will be adapted to assess the nine regional and two subregional crisis centres in Indonesia. Operational research using the adapted tool is planned to be conducted at the subnational level.

Building a repository of information on emergencies

Information on disasters and emergencies needs to be organized and stored, so that it can be used as a learning tool. Such information also helps in preparing an evidence base, so that it can be used to review, adapt and revise guidelines; improve management and operations for future emergencies; and improve planning processes and interventions for recovery and rehabilitation. In November 2009, the South-East Asia Disaster Health Information Network (SEADHIN) was created as a repository of “good practices” in different countries. Information is shared between scientists, practitioners, technical institutions and end-users, such as NGOs, governments or any public health institution, through the existing medical and public health library networks. The SEADHIN website is currently being updated.

Documenting and analysing the tsunami of 2004

Every disaster should be documented, as each one has the potential for providing important lessons that one can learn from, and experiences that one can draw upon. This is possible only if the actions and their outcomes are recorded for posterity. The Regional Office began to realize the importance of documenting the action taken during the tsunami and good practices within six months of the earthquake and tsunami. A number of documents were published, each of which documented different aspects and different stages of the tsunami.
STRENGTHENING SURGE CAPACITY IN THE REGION

South-East Asia Regional Health Emergency Fund (SEARHEF)

One of the major lessons learnt following the 2004 tsunami was that in emergency situations, the time taken to mobilize financial resources is far too long to meet the immediate health needs of the affected population. A formal request to set up an emergency fund was made at the Twenty-fourth Meeting of Ministers of Health of countries of the South-East Asia Region in Dhaka, Bangladesh, in August 2006. Member countries recommended the creation of an emergency solidarity fund. The Regional Office, through the EHA unit, took several steps to estimate the main corpus of the fund vis-a-vis vulnerability of the Region, develop the business rules and guidelines of the fund, and convene meetings of representatives from Member countries in the process.

The South-East Asia Regional Health Emergency Fund (SEARHEF) was formally established at the Sixtieth Session of the WHO Regional Committee for South-East Asia, held in Thimphu, Bhutan, in 2007 through resolution SEA/RC60/R7. At its establishment, the Royal Government of Thailand donated US$ 100 000 towards the voluntary contribution component of the fund. In 2009, the Democratic Republic of Timor-Leste also made a donation of US$ 10 000. The Fund is designed to meet immediate financial needs after an emergency according to the rules governing the Fund.

Mobilization of resources from SEARHEF has proven that the speed with which funds are released supports surge capacity to fill in critical gaps that otherwise may have led to further morbidity and mortality.

CYCLONE NARGIS

May 2008, Myanmar

On 2–3 May 2008, Cyclone Nargis caused one of the worst natural disasters in the Region when it rampaged through 47 townships of the Ayeyarwady and Yangon divisions of Myanmar, with winds at 160 kmph and 15 hours of torrential rain. The cyclone left more than 130 000 dead or missing and 19 350 injured.

The cyclone blew away houses, tore down trees and ripped off roofs – including those of some health centres, rendering many non-functional just when their services were most needed. Vital lifelines for the community, such as village ponds, the main sources of fresh water, were contaminated by seawater that surged inland. Stagnant pools of water, ideal for breeding mosquitoes, added to the risk of malaria and dengue. The thousands rendered homeless had little protection.

A total of US$ 350 000 – the maximum allowed under SEARHEF regulations – was allocated. Of this amount, US$ 175 000 was released, as per policy, within 24 hours of an official request by the WHO Representative to Myanmar. This enabled the country to procure hundreds of tonnes of basic medicines and equipment to treat the sick and injured, including antibiotics, emergency medical kits, bandages and surgical equipment, as well as public health measures. These potentially saved thousands of lives. The Fund was also used to mobilize health workers from other parts of the country to serve health clinics in the affected areas.
TORRENTIAL RAINS
August 2011, The Democratic People’s Republic of Korea

North and South Hwanghae provinces of the Democratic People’s Republic of Korea experienced heavy rainfall and repeated storms during June–August 2011. Over 80 000 people were affected and 40 000 displaced. In addition, 10 600 houses were completely and 760 were partially damaged; 24 health facilities were submerged and partially damaged; 34 deaths and 887 injuries were also reported. Hygiene and sanitation facilities for the affected population were a major concern. Increased incidences of diarrhoea, acute malnutrition, respiratory infection and skin diseases were recorded. Water supply was extremely limited and, wherever available, the quality was compromised. Shortage of essential medicines and laboratory consumables in health facilities made management of cases very difficult.

The Government declared an emergency situation. An amount of US$ 310 000 from WHO SEARHEF was provided to the two most affected provinces – North and South Hwanghae. The Fund was used for purchasing emergency health kits for replenishment, distribution and stockpiling, as well as other basic essentials. Thirty bicycles were purchased for mobility of household doctors. Surveillance systems for identifying outbreaks were also strengthened. More than 800 doctors and nurses were mobilized for first aid, mitigation and public health measures, and 35 undamaged hospitals were made available to support the affected population.

WHO institutional readiness

After the tsunami of 2004, WHO country offices in the Region set up their own operations rooms with technical support and assistance from the Regional Office. Country office readiness workshops were also designed and conducted in country offices, and are ongoing. A roster of experts on disaster management in the Region is maintained and used for emergencies. If needed, global rosters are also used.

Global SOPs have been developed to address various needs in an emergency. These include procedures for emergency funds, delegation of authority, rapid recruitment and speedy procurement. These SOPs are being used for the emergencies that the WHO Regional Office and country offices have had to respond to in recent years. To acquaint countries with these, the Regional Office has held orientation workshops.

Technical, administrative and planning staff from the country offices have been trained in launching response operations in the event of an emergency in the countries of their duty station. The full methodology is now being put together in modules in order to conduct the workshops on a regular basis.

Stockpile of health emergency medicines and supplies

During emergencies, medicines are among the most urgently needed items. In order to make available life-saving medicines during disasters, the Regional Office manages a stockpile of emergency medicines and supplies in warehouses in Delhi and Bangkok. These are mobilized for response in emergencies. They have been used in several emergencies, such as Cyclone Giri in Myanmar, the cloudburst in Leh, India, earthquake in Myanmar, floods in various countries, and the earthquake in Nepal in April 2015. The stockpile contains items such as the interagency emergency health kits, surgical and trauma kits, as well as diarrhoeal disease kits.
REDUCING RISKS AND MAKING HEALTH FACILITIES SAFER

Health centres and staff are critical lifelines for people in times of disaster. The focus in the Region thereby shifted to making health facilities safer. This issue was taken up through a technical consultation in 2008, and followed up by high-level advocacy through the Kathmandu Declaration on Protecting Health Facilities from Disaster in 2009. These are the main tools used by Member countries for advocacy and interventions.

Advocacy

Besides the Kathmandu Declaration, a regional web-based/social media campaign is being carried out to spread the message to a wider audience regarding safer health facilities, in order to engage the public on the issue. It is linked to other global campaign efforts of the International Strategy for Disaster Risk Reduction.

Partnerships and multisectoral collaboration

In 2008, the United Nations International Strategy for Disaster Risk Reduction (UNISDR) for Asia and the Pacific together with WHO in the Western Pacific and South-East Asia Regions
THE EFFECT OF THE PHEMAP PROGRAMME

Ampara General Hospital in Sri Lanka is a tertiary-care institution that managed the largest number of tsunami victims. A total of 125 000 people were killed in the Ampara district.

A graduate of the PHEMAP course working in the hospital held three workshops in the hospital for medical consultants, medical officers, nurses, paramedics and other employees before the tsunami. These workshops increased the participants’ understanding of disasters, their management, community participation, triage, pre-hospital casualty management and accident/emergency care.

The course led to conducting external and internal triage for disaster management, opening of a disaster management command centre, and an accident and emergency treatment unit. In addition, the community was also trained to deal with disasters.

As a result of these preparedness measures, when the tsunami struck, the staff of the hospital were well aware of what their duties were. More than 4000 patients received outpatient treatment. Out of a total of 1015 patients who were admitted immediately after the tsunami, only 17 died.

 convened partners that would work together for safe hospitals. The group reconvened in 2009 to assess progress after the global campaign. This informal group communicates regularly and exchanges information.

Building capacity through a comprehensive approach

Personnel who take the lead in helping people during emergencies need to be trained and their skills enhanced. To this end, WHO approached the Asian Disaster Preparedness Center (ADPC) in Thailand in 2001 to organize a training programme called Public Health and Emergency Management in Asia and the Pacific (PHEMAP) for the WHO South-East Asia and Western Pacific Regions. WHO partners with academic and national institutes in countries to further adapt, develop and deliver the course. So far, 122 graduates from various Member countries have been trained. The curriculum and materials for the PHEMAP programme were updated in 2013.

In the South-East Asia Region, Bhutan and Sri Lanka have developed national PHEMAP courses. Sri Lanka has trained 125 graduates since the national course began in 2006. The graduates have found the course very useful in responding to post-conflict situations. Bhutan conducted the first course in November 2011 with 32 participants from various districts. These graduates are all involved in implementing contingency plans for the health sector. India is presently reviewing the course with a view to adapting and implementing it through identified institutes in the country. National PHEMAP brings skills to the subnational levels, which contribute in good measure to the resilience of communities.
WHAT CHANGED IN COUNTRIES

The focus in countries needed to shift to building capacity at the national and subnational levels to prepare for and respond to disasters; put in place legislation and policies to support planning for disaster management; build stronger and more resilient health systems; reduce the vulnerability of communities through education, training and preparedness; ensure the safety of health facilities; develop SOPs to be followed during an emergency; and enhance absorbing, buffering and response capacities to disasters.

LEGISLATION AND POLICY

Countries are in various stages of establishing a legislative framework for disaster management, and national disaster management plans. All countries have established National Disaster Management Programmes and constituted multisectoral disaster management committees. Ministries of health have also appointed national focal points for disaster management. However, subnational focal points have not been established in all countries. In many countries where there are no separate national disaster management plans, the national health policy includes a section on emergency preparedness and response (EPR). Learning from the tsunami, some countries have put in place a specific code of conduct for international humanitarian organizations, but many have still to do so. Most countries also have coordination committees for EPR at the central and subnational levels.

PLANS, SYSTEMS AND SOPs

Most of the countries have developed disaster management plans and policies, as well as health sector preparedness plans. However, these are not always comprehensive or updated regularly. Health sector contingency plans are also not in place in all countries. Many countries have SOPs for
disaster management, but these are not always available at the subnational levels. These SOPs need to be revised and updated regularly.

**EMERGENCY RESOURCES (FINANCIAL AND HUMAN)**

Adequate funding for disaster preparedness and response has not been allocated in most countries. Many countries have carried out assessments of funding needs to identify funding gaps. However, most have not managed to plug these gaps. Rapid mobilization of funds is also an issue, including those from development partners. Funds also need to be earmarked for the subnational levels.

In order to strengthen human resources, countries have conducted assessments of the training needs of health-care workers, and prepared training guidelines and modules. Training is not often conducted on a regular basis, and there is a lack of skilled trainers and equipment in some countries. Rapid turnover of staff and the need to train new staff that replace these is another issue in many countries. In addition, in most countries, institutional capacity for EPR needs to be enhanced.

**SAFER HEALTH FACILITIES/HOSPITALS**

The tsunami highlighted the importance of having hospitals that are structurally sound. Countries have conducted assessments of the disaster resilience of health facilities. Bangladesh conducted assessments in four selected hospitals and more detailed assessments and interventions are under way. In Bhutan, national preparedness and contingency planning with an all-hazards approach was completed in 2011, and a comprehensive safe hospitals programme is being conceptualized for implementation. In collaboration with Geohazards International, the country conducted a detailed assessment of the Jigme Dorji Wangchuk National Referral Hospital in Thimphu. Retrofitting activities revealed that the hospital is vulnerable to large earthquakes. Two additional district
hospitals will also conduct assessments, and training will be held for engineers. Smaller health centres are in the process of assessment.

In India, the MoH is conducting both structural and non-structural assessments of existing facilities. Indonesia is assessing health facilities in the areas affected by the 2009 earthquake in Sumatra. The Maldives has conducted a vulnerability assessment and more comprehensive assessments are planned. Nepal too is conducting assessments of existing health facilities, and implementing interventions based on the results.

In May 2009, the Government of Nepal launched the comprehensive Nepal Disaster Risk Reduction Consortium (NRRC), which is developing a long-term disaster risk reduction action plan building on the National Strategy for Disaster Risk Management (NSDRM). Of the five flagship areas in this Consortium, one focuses on safe schools and hospitals. WHO leads the subgroup for safe hospitals. The hospitals in Kathmandu were saved in the April 2015 earthquake because of the retrofitting done earlier.

In India and Indonesia, new policies and regulations are being put in place on the design and structure of health facilities according to the hazards in the areas where they are located. In Indonesia, complementary courses covering various aspects of keeping health facilities safe, such as advocacy, planning and assessments, are being conducted for policymakers, and hospital administrative and managerial staff of various sectors.

**SURVEILLANCE**

Most countries have constituted rapid response teams at both the national and subnational levels, and these are trained at regular intervals. Communication systems with the community have also been established in many countries. Training for health-care workers is required on risk communication at the subnational level.
COMMUNITY PREPAREDNESS IN THE REGION

On 11 April 2012, an earthquake of the magnitude of 8.7 on the Richter scale hit the coast of Aceh and rocked it for over 4 minutes. The tremors were felt in neighbouring countries. There was a sense of déjà vu – would this be a repeat of the tsunami of 2004? Thankfully, it was not.

The actions taken that day proved that the Region has learnt from its experiences and knows how to manage and respond to emergencies better. There was organized evacuation of people to higher ground by all coastal communities, not only in Indonesia but also in Sri Lanka, India (Chennai), the Maldives and parts of Thailand, which also felt the earthquake. This was due to community preparedness, education and training.

In Banda Aceh and Padang in Sumatra Island, communities have been trained and have identified escape routes in case of a tsunami. The hospitals in Banda Aceh evacuated their patients in an orderly fashion. In Sri Lanka, the tourism sector moved guests to higher ground in an organized manner. The clear link of communication between tsunami warning systems and the community was obvious in many coastal areas. There were only eight deaths and the injured were promptly treated.

Most countries have surveillance systems in place for communicable diseases, and some also for noncommunicable diseases. However, surveillance systems that are integrated with EPR need to be developed in most of the countries, and existing systems made more efficient.

Laboratory capacity and surveillance needs to be improved at the subnational level in most countries. Surveillance systems also need to be set up for water quality, food, sanitation and waste management.

COMMUNITIES

While countries have the overall responsibility for reducing disaster risk, it is a shared responsibility between governments and relevant stakeholders. Non-State stakeholders, such as civil society, volunteers, voluntary work organizations and community-based organizations, play an important role as enablers in providing support to countries, in accordance with national policies, laws and regulations.

Most countries have conducted assessments of community risks and vulnerabilities, and many have community-level action plans. However, not all people are aware of these. Training has been held in some countries to enhance the skills of community volunteers. Many countries hold mock drills and simulation exercises, but these are often not regular. Community health workers and volunteers have also been trained to provide first aid. Some countries have allocated a fund for community-level activities, and some have stocked emergency supplies in the community. In most countries, community awareness and preparedness are inadequate to meet the challenges in disaster situations.
CHANGES IN INTERNATIONAL FRAMEWORKS FOR DISASTER MANAGEMENT

International mechanisms for strategic advice, coordination and partnership development for disaster risk reduction, such as the Global Platform for Disaster Risk Reduction and the regional platforms for disaster risk reduction, as well as other relevant international and regional forums for cooperation, have been instrumental in the development of policies and strategies, and the advancement of knowledge and mutual learning.

THE CLUSTER APPROACH

The foundations of the current international humanitarian coordination system were laid by the UN General Assembly resolution 46/182 in December 1991. In mid-2005, a review of the humanitarian response system was undertaken to examine perceptions that humanitarian response does not always meet the basic requirements of affected populations in a timely fashion, and can vary considerably from crisis to crisis. Following this, in 2005, a major reform of humanitarian coordination, known as the Humanitarian Reform Agenda, introduced a number of new elements to enhance predictability, accountability and partnership. The “cluster approach” was one of these new elements.

Clusters are groups of humanitarian organizations, both UN and non-UN, in each of the main sectors of humanitarian action, e.g. water, health and logistics. They are designated by the Inter-Agency Standing Committee (IASC) and have clear responsibilities for coordination. The aim of the cluster approach is to strengthen systemwide preparedness and technical capacity to respond to humanitarian emergencies, and provide clear leadership and accountability in the main areas of humanitarian response.
WHO was defined as the global health cluster lead with responsibility for ensuring that health needs are addressed in any emergency.

Following the tsunami, there were around 250 NGOs working in health in Aceh, Indonesia, which led to a great deal of confusion, overlaps in some areas and gaps in others. Sri Lanka, too, faced a similar situation. Since then, the cluster approach has been used in many emergencies – Cyclone Sidr in Bangladesh (November 2007) and Cyclone Nargis in Myanmar (May 2008), the earthquake in Sumatra (September 2009), in Myanmar for the Rakhine conflict (2013) and, most recently, in the Nepal earthquake in April 2015. All had different levels of implementation and demands from WHO.

A training programme for health cluster coordinators in the Region was started in 2005 by WHO and again in 2010 so that all partners and key stakeholders are capable of managing health clusters in various contexts in the future. Thirteen participants from the Region attended. This training course will be an ongoing feature for building leadership capacity in the Region.

**HYOGO FRAMEWORK FOR ACTION 2005–2015**

The World Conference on Disaster Reduction held in January 2005 in Kobe, Hyogo, Japan, adopted the “Framework for Action 2005–2015: building the resilience of nations and communities to disasters”. The Hyogo Framework for Action has been an important instrument for raising public and institutional awareness, generating political commitment, and focusing and catalysing actions by a wide range of stakeholders at all levels. It has led to a decrease in mortality in the case of some hazards, and has confirmed that reducing disaster risk is a cost-effective investment in preventing future losses. It has helped countries to enhance their capacities in disaster risk management.
SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION 2015–2030

At the Third World Conference on Disaster Risk Reduction held in March 2015 in Sendai, Miyagi, Japan, States reiterated their commitment to disaster risk reduction. Building resilience to disasters was to be addressed with a renewed sense of urgency in the context of sustainable development and poverty eradication. They also agreed to integrate their commitment into policies, plans, programmes and budgets at all levels, and strengthen existing mechanisms for better implementation. The Sendai Framework aims to guide the multihazard management of disaster risk in development at all levels, as well as within and across all sectors. It will apply to the risk of all types of disasters – small- and large-scale, frequent and infrequent, sudden and slow-onset, caused by natural or human-induced hazards, as well as related environmental, technological and biological hazards and risks.

The Conference identified seven global targets and four priority areas. Many of these are related to health. Greater investment has been focused on health, and several targets and indicators pertain to health. The key points that relate to health are that health should be viewed as an explicit outcome of disaster risk reduction,
and not just saving lives. In addition, health and access to health services is regarded as a human right embodied in the principles. The Framework also adopted an all-hazards approach, including epidemics and pandemics. The Safe Hospitals initiative has been taken as a priority action. Critical infrastructure, including health facilities, is recognized as having a special role. One of the Framework’s seven targets is to reduce disaster damage to these facilities.

The role of rehabilitation is included as an important aspect of the post-disaster phase.

Protecting people and their health and livelihoods is seen as a core element for building resilience.

Since 2004, Member countries have come a long way. In order to protect hard-won development gains, Member countries, WHO and international bodies have instituted many changes. These are aimed at better preparedness before disasters, resilience during disasters and mitigation of the after-effects. Institutional and legal frameworks are now in place, systems and SOPs have been developed, health facilities are now safer and communities are better prepared. These efforts now need to be sustained and scaled up at all levels.
THE STORY OF NEPAL

25 April 2015 – an earthquake measuring 7.6 on the Richter scale hit Nepal, severely affecting 14 districts. It was an earthquake that people knew would happen, an event they were preparing for. And in many ways their preparedness worked. Six hospitals in Kathmandu Valley were all intact and functioning. Hospital staff implemented their contingency plans and were able to treat patients; whether they were the walking wounded or those brought to the capital Kathmandu for more complicated procedures. Two of the six hospitals had been retrofitted, and the other four had already been assessed and non-structural interventions made.
Over the past decade, throughout the health system in Nepal, an ongoing training in mass casualty management for triaging patients had served the population well. In the affected districts, in hospitals that were not damaged, there were tents outside for triaging patients. There was a systematic movement of patients, from tents to areas of the hospitals such as wards or operating theatres, wherever they needed to be treated. In areas where hospitals were damaged, hospital tents manned by foreign and national teams cleaned wounds, treated fractures, and stabilized complicated cases for referral.

Although the push for risk reduction through safer health facilities and preparedness came a little over a decade ago in Nepal, this intensified after the tsunami of 2004. Nepal was the first country in the WHO South-East Asia Region to carry out the benchmarks capacity assessment, and worked most actively towards safer health facilities within a national consortium for disaster risk reduction.

**TURNING POINT**

Indeed, the tsunami was the turning point not just for the affected countries but also for other countries in the Region that were prone to disasters. Every disaster acts as a reminder of the need for better risk reduction and preparedness; such events help to prove that the investments made prior to the emergency were justified. They also help the health sector to further intensify actions so that risks are managed better and populations are safer.

How can the gains in the areas of preparedness and risk reduction following the tsunami of 2004 be sustained? How can they be scaled up, as there is much room for improvement? What can be done to improve on the existing interventions?

Much has changed over the past decade. There are more initiatives across sectors, and many achievements within the health sector across countries. However, vulnerabilities have also increased – unplanned urbanization,
constant migration within and across countries, environmental
degradation, and extreme weather events due to climate change.
How can capacities be improved so that vulnerabilities are reduced?

**FLAGSHIP AREA**

Taking cognizance of this evolving context and public health need, the
WHO Regional Office for South-East Asia has identified this as a flagship
area: “**Strengthening capacities in emergency risk management in
countries of the South-East Asia Region**”. This is a multifaceted critical
capacity to secure gains in public health and protect the health of
populations in times of crises. This flagship area has five key objectives:

- **Advocate**: awareness of key partners on health issues in emergencies
  improved in the Region
- **Manage**: information and knowledge management for emergency risk
  management – health across all hazards improved
- **Support**: capacities of countries in emergency risk management in
  the health sector built to prevent, prepare, respond and recover from
  emergencies across all hazards
- **Respond**: WHO capacity for preparedness and response to public
  health emergencies in place
- **Engage**: competent partners across sectors engaged with all aspects
  of the work of emergency risk management in the WHO South-East
  Asia Region.

“The tsunami of December 2004 taught us several lessons. Member States were
instrumental in establishing the South-East Asia Regional Health Emergency
Fund in 2007, which has helped meet the immediate financial needs of our
countries for a quick response in emergencies. The 12 Benchmarks for
Emergency Preparedness and Response have received global recognition and
provide a framework for national capacity-building.

We need to take a holistic approach and integrate prevention, risk reduction,
preparedness, response and recovery. We must make disaster risk reduction
an integral part of national strategies and a sustainable development policy.”

*Strengthening emergency risk management for sustainable development is one of the four strategic areas identified by the Regional Director in her vision statement for a healthier South-East Asia.*
Although countries and the international community have been working to achieve these results since the tsunami, most of the activities that have been initiated over the past decade need further intensification. National technical capacity for disaster risk management in the health sector needs to be strengthened. To generate better evidence for action, procedures for collection, analysis and reporting of disaster risk management-related data need to be strengthened. This would help to improve national and regional databases and knowledge on the public health aspects of disaster risk management. However, it should be clarified that the fundamental principle of scaling up capacities in countries for emergency risk management is to cover all types of emergencies – whether they are outbreaks or natural disasters or caused by any other hazard.

For improving awareness, there are still sectors that are not fully conversant with the issue of health in emergencies. Partners in the finance and foreign ministries, intergovernmental bodies and the private sector are more engaged in responses and support related to infrastructure rather than basic social services such as health. As such, advocacy in these areas requires more work with other partners. The nuances of the health response also need to be conveyed well – before, during and after an emergency. In many emergencies, the unannounced arrival of foreign medical teams or of unrequested medicines and essential supplies continue to be commonplace. This can be addressed simply by coordination between the different ministries concerned, as seen in recent events. Investments in and budgets for recovery also favour more non-health infrastructure projects, which limit the opportunity for more risk reduction in the health sector – possibly translating into earthquake-proof health centres or district hospitals so that the health system can respond better during the next disaster. Improved awareness will pave the way for better practices so that the health agenda is a priority in countries before, during and after a disaster.
For **information management**, scaling up of the existing information repository in the South-East Asia Disaster Health Information Network (SEADHIN) is key. A public site to share information should be made available so that the community of practitioners, researchers, policy-makers and others can contribute further to a body of knowledge that can result in action.

Information on emergencies and health is scattered, and there is no consolidated information base or one that is linked to key sources. Information needs to be collected, collated and made available in one place for various purposes, such as research, or to guide action during the next emergency. This is not being done in a systematic way. The lack of good archiving practices results in poor documentation, leading eventually to poor research and evidence generation, and ultimately in lessons not learned for the next event. Breaking this self-perpetuating cycle is the aim of information management for health emergencies. In addition, much valuable information published in the local languages is lost, as peer-reviewed journals have a bias towards the English language. An area to be explored is the use of data from surveillance in order to detect and respond to outbreaks earlier.

In the area of **supporting capacity development**, a considerable amount of human, financial and technical assistance will be required for comprehensive emergency risk management. This covers developing capacities against the core competencies of the International Health Regulations (IHR) and the benchmarks for emergency preparedness and response. As all Member countries have national action plans towards achieving IHR core capacities, and 10 of the 11 Member countries in the Region have completed their capacity gap assessments using the benchmarks, a road map exists towards this goal. Clear priority gaps have been identified and plans made on how to address these; the challenge will be to address all of these in parallel, considering that the deadline for...
Ten years after the tsunami of 2004 compliance with the IHR is 2016. The critical perspective is to look at these capacities as a work in progress for maintenance, updating and improvement. The Regional Office should set up mechanisms for support, so that these capacities are always at the optimum level.

Capacities are judged at the time of an emergency; it becomes the moment to check whether preparedness initiatives worked or whether an entity can lead the response to the event. The flagship programme calls for improved capacities of all WHO offices to be able to deal with and respond to events in a timely and appropriate manner. The response needs to match the standards and requirements of the international community and the UN system, in which WHO leads the health cluster. Work in this area would mean improving the contingency plans, procedures and systems of the regional and country offices. This would make a difference at the time of emergencies.

This work requires engaging many partners with expertise in diverse areas – whether in emergency response, where standby agreements with other organizations are activated; during capacity development, where specialty training institutions can provide additional new knowledge and best practices to country public health staff; or through structural engineers working to ensure that health facilities are physically intact in any type of emergency.
Establishing formal partnerships and nurturing them will be important to take emergency risk management capacities to a different level.

International commitment is also in place for these flagship area goals to be achieved. The most important international initiative that supports this is the Sendai Framework for Disaster Risk Reduction 2015–2030, which has been signed by 187 Member countries. It crystallizes several shifts in the future thinking on disaster risk management. It is a shift from disaster loss to disaster risk, and from disaster management to disaster risk management.

The Sendai Framework stipulates that Member countries are in the lead and primarily responsible for disaster risk reduction work in countries. It describes a focus on people-centred approaches and convening other stakeholders for a shared responsibility for disaster risk reduction. The scope of the Sendai Framework is more comprehensive than earlier frameworks – it includes slow-onset and human-induced disasters, as well as biohazards (e.g. epidemics and pandemics).

Moreover, health is central to this framework. There are over 30 key references to health in this new international framework. The most important of these are, in summary, a call to
enhance cooperation between health authorities and stakeholders: (1) to strengthen country capacity for emergency/disaster risk management for health; and (2) to implement the IHR and build resilient health systems. It identifies specific inputs to these two overarching areas for health and comprehensive disaster risk reduction (DRR), such as:

- integrating disaster risk management into primary, secondary and tertiary health care;
- developing the capacity of health workers in understanding disaster risk, and applying and implementing DRR approaches in health work;
- supporting community health groups in DRR with other sectors;
- promoting the resilience of new and existing critical infrastructure, including hospitals and other health facilities, to ensure that they remain safe, effective and operational during and after disasters.

These principles set the stage for future work, both internationally and in the Region. The flagship programme of the Region on emergency risk management in the health sector is aligned with these.

Although ambitious, this can be done; the decade after the tsunami in the five most affected countries has shown us the way. It is important to strengthen these capacities at the subnational level as well, expand the work through joint collaboration with partners and build from what is currently in place. Today, we live in a world where there is always a possibility of danger. We need to invest actively in pre-emergencies. These investments will have invaluable dividends for a safer and healthier future.
WHAT CHANGED INTERNATIONALLY

**Humanitarian Reform**
- Cluster approach as one of its main pillars
  - Developed in 2005
  - WHO leads health cluster
  - Cluster approach used in many disasters, e.g., Cyclone Sidr in Bangladesh (November 2007) and Nepal earthquake (April 2015)

**Hyogo Framework for Action 2005–2015**
- Important instrument for raising public and institutional awareness, generating political commitment, and focusing and catalysing actions by a wide range of stakeholders at all levels
- Confirmed that reducing disaster risk is a cost-effective investment; helped countries to enhance their capacities in disaster risk management

**Sendai Framework for Disaster Risk Reduction 2015–2030**
- Developed at Third World Conference on Disaster Risk Reduction held in March 2015 in Sendai, Miyagi, Japan
- Applies to the risk of all types of disasters
- Has seven global targets and four priority areas, many related to health

WHAT CHANGED IN COUNTRIES

A. Legislation and Policy
B. Plans, Systems and SOPs
C. Emergency Resources (Financial and Human)
D. Safer Health Facilities/Hospitals
E. Surveillance
F. Communities

A. INFORMATION FOR ACTION: Measuring Performance, Setting Priorities and Addressing Gaps
- Benchmarks for emergency preparedness and response
- Building a repository of information on emergencies (SEADHIN)
- Documenting and analysing the tsunami of 2004

B. Strengthening Surge Capacity in the Region
- South-East Asia Regional Health Emergency Fund (SEARHEF)
- WHO institutional readiness improved with training and office readiness workshops
- Stockpile of health emergency medicines and supplies

C. Reducing Risks and Making Health Facilities Safer
- Advocacy
- Partnerships and multisectoral collaboration with collaborative demonstration projects
- Structural and non-structural assessments of health facilities

D. Building Capacity Through a Comprehensive Approach
- Public Health Emergency Management for Asia Pacific (PHEMAP)
THE TURNING POINT: TSUNAMI OF 2004
For all countries in the Region
Need to sustain gains in emergency preparedness and risk reduction
Response to Nepal earthquake of April 2015 showed that Member countries were much better prepared

CHANGING CONTEXTS OF EMERGENCIES
Unplanned urbanization
Migration
Environmental degradation
Extreme weather events due to climate change

FLAGSHIP AREA
Strengthening capacities in emergency risk management in countries of the South-East Asia Region
FIVE OBJECTIVES:
ADVOCATE, MANAGE, SUPPORT, RESPOND, ENGAGE
Aligned with principles of Sendai Framework for Disaster Risk Reduction 2015–2030

PATH OF SCALING UP
Strengthen national technical capacity for disaster risk management
Generate better evidence for action
Improve awareness
Scale up existing information repository (SEADHIN)
Support capacity development for comprehensive emergency risk management
Develop partnerships in diverse areas
International commitment
### Abbreviations

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<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ADPC</td>
<td>Asian Disaster Preparedness Center</td>
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<td>BRR</td>
<td>Badan Rehabilitasi Dan Rekonstruksi</td>
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<td>EHA</td>
<td>Emergency and Humanitarian Action</td>
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<td>EPR</td>
<td>emergency preparedness and response</td>
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<td>GNP</td>
<td>gross national product</td>
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<td>HIC</td>
<td>Humanitarian Information Centre</td>
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<td>IASC</td>
<td>Inter-Agency Standing Committee</td>
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<td>ICRC</td>
<td>International Committee of the Red Cross</td>
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<td>IDP</td>
<td>internally displaced person</td>
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<td>IFRC</td>
<td>International Federation of Red Cross and Red Crescent Societies</td>
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<td>IGO</td>
<td>intergovernmental organization</td>
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<td>NGO</td>
<td>nongovernmental organization</td>
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<td>NRRC</td>
<td>Nepal Disaster Risk Reduction Consortium</td>
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<td>NSDRM</td>
<td>National Strategy for Disaster Risk Management</td>
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<td>OCHA</td>
<td>Office for the Coordination of Humanitarian Affairs</td>
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<td>PHEMAP</td>
<td>Public Health and Emergency Management in Asia and the Pacific</td>
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<td>SEADHIN</td>
<td>South-East Asia Disaster Health Information Network</td>
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<td>SEARHEF</td>
<td>South-East Asia Regional Health Emergency Fund</td>
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<td>SOP</td>
<td>standard operating procedure</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<td>UNISDR</td>
<td>United Nations International Strategy for Disaster Risk Reduction</td>
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<tr>
<td>VHF</td>
<td>very high frequency</td>
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<td>WHO</td>
<td>World Health Organization</td>
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On 26 December 2004, two extremely rare events occurred close to the southwestern shores of northern Indonesia. The first was a massive earthquake measuring 9.1 to 9.3 on the Richter scale, and the second was the devastating tsunami it generated. Travelling at speeds of over 500 km an hour, the tsunami wrecked the coastal areas of six countries in the WHO South-East Asia Region – India, Indonesia, Maldives, Myanmar, Sri Lanka and Thailand, leaving more than 227,000 people dead and 1.7 million displaced. Countries were caught unawares, devastated, and were unprepared to cope with the effects of the disaster.

The event led to a chain of reform measures initiated by WHO, which are ongoing. These were aimed at building the capacity of countries to prevent, prepare for, and increase their resilience, absorbing and buffering capacities in the event of a disaster. Ten years later, the Nepal earthquake on 25 April 2015 proved that the Region has learnt its lessons well. Countries today are much better prepared.

Today, we live in a world where there is always a possibility of danger. Newer vulnerabilities, such as unplanned urbanization, migration and climate change threaten hard-won development gains. We need to invest actively in pre-emergencies. These investments will have invaluable dividends for a safer and healthier future.