

## Nepal earthquake exposes gaps in disaster preparedness

The April 25 earthquake in Nepal has caused mass devastation, killing and injuring thousands of people, and highlighting the country's vulnerability to disaster. Dinesh C Sharma reports.

Kathmandu, Nepal's picturesque capital located in the foothills of the Himalayas, is usually teeming with tourists and locals going about their daily lives. But, on April 25, it looked more like a war-ravaged city after a 7.8 magnitude earthquake struck causing widespread devastation.

The impact of the quake, which had its epicentre 77 km northwest of Kathmandu in the district of Lamjung, was felt across western and central Nepal and parts of north India (figure). The disaster, which also triggered an avalanche on Mount Everest, burying parts of the base camp, has left more than 7400 people dead and more than 14 000 injured, with most of the casualties reported from Kathmandu region, according to data released by Nepal's National Emergency Operations Center on May 4. The casualty figure is expected to rise as rescue teams clear debris in outlying areas, which can only be reached by foot because road and communication infrastructure is severely damaged. In the north Indian states of Uttar Pradesh and Bihar, about 80 people were killed.

The UN Resident Coordinator in Kathmandu estimates that 8 million people in 39 districts have been affected, 2 million of whom are in 11 severely affected districts. About 1.4 million people in these districts need immediate food assistance. The quake-hit regions include mountain and hilly areas, disperse rural populations, densely populated towns, and the country's two largest cities—Kathmandu and Pokhara. People living in poor quality and vulnerable homes with outer walls, roofs, and foundations made of mud and stone bore the brunt of the disaster. Essential services such as water and electricity supplies

remained disrupted in the capital for almost a week after the quake.

UNICEF's Thailand Representative, Bijaya Rajbhandari, who is Nepalese, was in Kathmandu with his family when the earthquake hit. "The quake caused extensive damage to buildings across the city and many people have spent the night outside in the cold because of ongoing shocks. These people are without basic facilities and the government hospitals are already overcrowded", he said on April 26. Subsequently, people have moved into tents in relief camps, which are providing shelter to about 75 000 people.

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Relief efforts mounted by national and international agencies have focused on providing food, water, shelter, and medical help to survivors. The rescue and relief operations were hampered due to rains and the inability of Kathmandu airport to handle additional traffic up to 3 days after the quake. India responded by airlifting military and civilian rescue teams, including personnel of the National Disaster Relief Force, field hospitals, and water purification equipment. Relief material was also rushed through by road from India to Nepal. Military field hospitals were set up in Lagankhel and Sinamangal by Indian armed forces, in addition to deploying smaller medical teams in rural areas. "Even after 4 days, rescue teams could not reach areas close to the national capital, like Sindhupalchowk, Banepa, Sankhu, and Rasuwa where casualty

figures could run into thousands", said Jagannath Lamichhane, coordinator of Kathmandu-based Movement for Global Mental Health. "In most of the affected villages, over 90% of homes have collapsed. They don't have young people who can volunteer as most of them have migrated to other countries for work."

### Response coordination

As rescue teams, relief material, and medical help pours in from different parts of the world, WHO is working with the Ministry of Health and Population to ensure that medical resources are distributed based on specific requirements of different regions. Ian Norton, a WHO official overseeing the effort, requested that all teams wanting to provide relief to register their intent so that they could be properly deployed. Medical teams that are self-sufficient requiring no external support are ideal for the situation. Norton cautioned that teams working outside the coordinated relief effort could become a burden on local authorities and diminish the effectiveness of health service delivery. "There are small teams that have been launched after

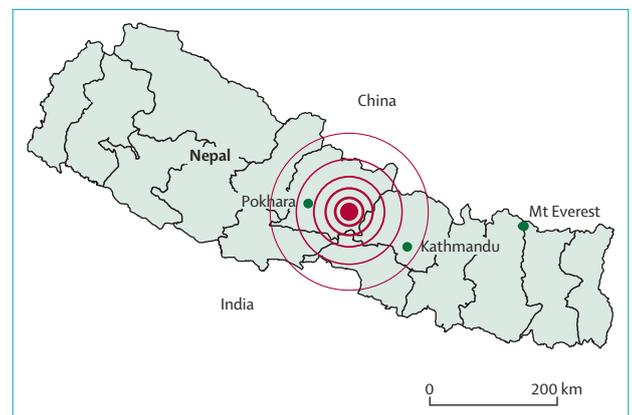


Figure: Map of Nepal showing the earthquake's epicentre



A member of a Chinese rescue team searches for survivors in Kathmandu

watching the news and that are trying to respond with the best of intentions, but unfortunately they do not have the sustainability to be able to deploy into remote areas where we need them the most", he said.

WHO has established a field office in the Gorkha district to coordinate national and international humanitarian aid. By May 2, more than 80 foreign medical teams had reached Nepal; 68 have been deployed to deliver health care in affected districts.

"All major tertiary care hospitals in Kathmandu are functional but they are overwhelmed", remarked Amit Gupta, a trauma care expert from the All India Institute of Medical Sciences who has been deputed by India's Ministry of Health to assess medical relief requirements. "Most medical relief is needed in far flung rural areas and districts where health facilities have been badly damaged and have become dysfunctional. This is the challenge for health authorities as they have depleted resources to handle the situation. Several foreign medical teams have arrived but they need to be deployed appropriately", Gupta added.

People in quake-hit districts, according to Gupta, are in urgent need of trauma care as they have suffered injuries from collapsing buildings. Survivors have injuries including broken bones, head trauma, and spinal injuries. All such persons need intensive and rapid medical treatment,

including surgery. Cases of crush syndrome—a condition characterised by shock and kidney failure after a crushing injury to skeletal muscle—are also being reported.

A team of doctors from Médecins Sans Frontières (MSF), which assessed the needs and capacity of four hospitals in Kathmandu, has found that health facilities are overstretched after dealing with an influx of wounded people, while also trying to continue to provide treatment to regular patients with chronic conditions. "The greatest need right now is space for our outpatient department and pharmacy, because they have been damaged and we cannot work there. The patients have to be shifted to tents where they can be safe", said Sudha Devkota, head of the Gorkha district hospital. "Health facilities are completely non-existent in rural areas post-quake. We have no other options than outsourcing public health needs for rural areas until basic health services are restored", noted Lamichhane.

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In addition to ensuring immediate medical relief for injured and displaced people, health authorities face the challenge of preventing outbreaks of communicable diseases that could occur as a result of overcrowding in relief camps, contaminated water supplies, and poor sanitation. Hyo-Jeong Kim, a WHO operations officer in Kathmandu, said "we are establishing an early warning response and alert system and strengthening the disease surveillance system in affected areas to identify any diseases that could spread through the population".

### Protecting health facilities

Based on the geological and seismic history of the region, scientists have been warning of a large earthquake

of the magnitude seen on April 25, for a long time. The earthquake risk for Nepal as a whole is high as it sits right on top of tectonic activity—ongoing subduction of the Indian plate underneath Tibet; several studies in recent years had forewarned large-scale devastation and loss of lives in the Kathmandu valley. Indeed, Nepal raised the issue of a major earthquake at last month's World Conference on Disaster Risk Reduction in Japan where countries adopted the Sendai Framework for Disaster Risk Reduction, which outlines the priorities for reducing disaster risk over the next 15 years.

Nepal has been working on securing front-line buildings such as hospitals in the event of a natural disaster. In 2009, a health ministers' conference adopted the Kathmandu Declaration on Protecting Health Facilities from Disasters. Projects to assess risks of hospitals were initiated, but progress has been slow because of political instability and inadequate institutional mechanisms for disaster risk reduction nationally.

"Building codes specific to hospitals and health facilities need to be developed and enforced. If medical equipment and essential supplies like water and electricity are damaged in hospitals, it can cripple medical services even if the building structure itself is sound", pointed out Hari Kumar, regional coordinator for south Asia, GeoHazards International, which has assessed seismic vulnerability of medical equipment and utilities at three large hospitals in Kathmandu as part of a WHO project. The assessment raised serious issues. For instance, the electrical power system of the National Academy of Medical Sciences—a tertiary referral and teaching hospital—was found to be ill equipped to keep life-saving and essential systems in the hospital functional after an earthquake. The April 25 disaster has put such predictions to the test.

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