

The untold stories of the Sichuan earthquake

Emily YY Chan took part in the relief effort after the Sichuan earthquake in May. She reports on the short-term needs of those affected and the medical and public-health challenges that will be faced by the Chinese population as rehabilitation and reconstruction continues.

On May 12, 2008, an earthquake that measured 8.0 on the Richter scale, hit the Chinese province of Sichuan. Tremors were felt as far away as Beijing and even Hong Kong. Soon the media were reporting hundreds and thousands of lives lost. Particularly dreadful was the loss of life of the pupils attending afternoon lessons in the 7000 schools which collapsed. As of the end of June, 2008, the official mortality figures had reached 70 000, but millions of others have been and continue to be affected both indirectly and directly by the earthquake's impact.

The main difference between the response to the Sichuan earthquake and the 1976 Tangshan earthquake—the quake with the highest mortality in the 20th century¹—has been in China's progressive openness² towards information and media access. Recent economic development has also enhanced the country's capacity to respond effectively to major natural disasters.

Within hours of the earthquake, local Communicable Disease Centres (CDCs) had become involved in disaster relief, and the national network, built up as a response to SARS, was used to bring in public-health help from other regions. In an email sent to the director at Chinese University of Hong Kong a few days after the disaster, the director of the CDC in Chongqing wrote, "I was sent to the epicenter in Yingxiu Town, Wenchuan County as an expert to direct activities of epidemics prevention after earthquake. The epidemics prevention group from our center is the first one to arrive in the epicenter zone. We conduct water surveillance, medical aid and environmental protection (eg, sprinkling disinfectant) activities in the earthquake areas...many groups

are organised from CDCs across the nation to battle in the front line against epidemic outbreaks."

As someone involved in disaster relief in Asia for the past decade, I was asked to join the Médecins Sans Frontières team that was offering assistance. The experience provided an opportunity to assess not only the short-term needs of those affected, but also the medical and public-health challenges that will face the Chinese population in the post-earthquake rehabilitation and reconstruction effort.

The first days

We arrived at Chengdu by nightfall on day 3 after the disaster carrying drugs donated by colleagues and plastic bags overflowing with donated snacks and water bottles from flightcrew and passengers. Chengdu, the provincial capital of Sichuan and a few hours drive away from the earthquake epicentre of Wenchuan, was where most of the 45 000 medical relief volunteers from outside the province first assembled to obtain access to the affected sites.^{3,4} Although high-rise buildings in the city did not seem to be damaged, an

unspoken emptiness was in the air since most citizens had temporarily moved to rural areas to avoid any potential collapse of the massive urban structures within the city.

Although the Chinese Government was generally receptive to offers of outside support and help, in practice, it was cautious about civilian-based relief efforts from outside mainland borders because of concerns about the overall efficiency of operations. Even within the country, dozens of relief teams from other provinces were not given official facilitation to reach the relief sites. No civilian airtravel was granted into the disaster area. Meanwhile, although roads were monitored by the People's Liberation Army, this did not stop many people trying to rush to the destruction zone to offer their help. The British consul in Chongqing later told me he found himself doing most of his search for wounded British citizens in a series of hitch-hiked lifts. However, the government granted our civilian medical team, largely composed of Chinese nationals from Hong Kong who had relevant earthquake-relief experience, immed-



A collapsed section of the elevated expressway near Yingxiu Town, Wenchuan County

iate facilitation with travel permits, endorsement letters for participation in relief efforts, and the flexibility to choose the site where we might best support the medical-relief effort. We travelled from Chengdu by road and, in contrast to other Asian relief settings, highway travel was well managed by troops, with no traffic or security problems. En route, huge road-side propaganda billboards and banners were prominently displayed as encouragement to victims and relief teams alike.

During our first day in the disaster zone (day 4 after the earthquake), we visited several relief medical facilities, and our rapid assessment of health and medical needs revealed no apparent lack of medical supplies. However, the effectiveness of the medical response seemed to be impaired by suboptimum organisation of the medical facilities, mismatch of clinical specialties, and a general lack of skill mix in the field-relief teams. In some sites, although the patient to doctor ratio was 1:3, 80% were orthopaedic surgeons and too few anaesthesiologists were available to assist operations or manage pain control. Many sites had no generalist physicians to manage underlying common chronic medical conditions⁵ and no mental-health specialists to deal with post-disaster psychological needs during the first week. The lack of multidisciplinary teams or a more holistic approach meant that some survivors who had

no immediate surgical needs but who had potentially life-threatening medical conditions (eg, unstable arrhythmias or hypertension) did not always receive best management despite the availability of drugs and resources. As a consequence, a patient entering trauma surgery might have no pre-operative assessment and poor management of underlying unstable chronic medical conditions.

Treating elderly patients

That evening, we arrived at Guanghan San Shiu Triage Referral Hospital—one of the six airlift triage sites that had been receiving patients evacuated by helicopter from the areas which experienced the greatest devastation: Wehchuan, Ching Ping, Mengzhu, Beichuan, and ShiFang. The site was originally a modern maternal and child health centre and had been turned into a triage site 2 days after the earthquake. Its workforce consisted of both local and out-of-province volunteer doctors, none with previous experience in disaster response or preparedness training. Overwhelmed and working with limited resources, the existing team quickly incorporated us into the medical-relief operations. We soon found ourselves at the front line of care, receiving patients and assessing their injuries and general medical conditions.

Providing adequate medical treatment for our patients was challenging since many were seriously injured, having been trapped in the rubble for at least 48 h, anxious about their families, and in mental shock. Unlike affected populations in other large-scale disasters in Asia such as the 2004 Indian Ocean tsunami and 2005 Pakistan earthquake, many patients were older, reflecting the socioeconomic environment in rural China, where many people of working age have migrated to urban settings for better job opportunities, leaving behind a population in which older people, women, and children are over-represented. Although the

official total mortality had not yet been released, the media had tended to focus their reports on mortality among young people in the collapsed schools. However, the greatest morbidity will probably be among those over 60 years who lived in low-density houses which collapsed. Despite military triage before patients were airlifted, which gave priority to those with the highest chance of survival, the median age of our patients was 79 years. Similar age patterns were observed in other government and civilian relief sites, with 40% of patients older than 60 years.⁵ Although no major outbreak of tetanus has been reported in Sichuan, this is inevitably a risk, and our survey⁶ found that 78% of the population older than 60 years were not vaccinated.

Elderly people in rural Sichuan will be heavily dependent on the post-disaster reconstruction programme, which will have major implications for their future. In addition to the challenge of rebuilding their socioeconomic support systems, they face not only the typical needs after an earthquake related to orthopedic trauma, but also the continuing needs for clinical management of complex chronic conditions. However, past experience in Japan, the Pakistan earthquake, and Hurricane Katrina⁷⁻⁹ suggests that chronic medical needs post disaster are often inadequately managed and can result in increased rates of complications and indirect morbidity after a disaster. The issues about payment for such conditions within a health system recently reorganised to provide some, but not all, medical health-care costs can potentially increase the stress and anxiety of survivors as they struggle to rebuild their lives. Additional medical costs will pose a substantial financial burden for people caring for their families, if not for themselves.

Mental-health needs

Not only will chronic diseases pose a burden, but the mental-health needs of patients, which were apparent in



Many earthquake survivors were elderly people

Getty Images

the immediate aftermath of the quake, will also need long-term treatment and support.

Typically, patients first arrived with an excessive eagerness to tell us how they survived through the ordeal but as they settled after a few hours, their emotional state was obvious, ranging from abnormal positivity towards their rehabilitation after the earthquake to uncontrollable crying, and even attempted suicide. The lack of experience and training in mental-health needs perhaps limited patient care and sensitivity in this phase of the emergency response. The imbalance of the doctor:patient relationship in rural China, where doctors are credited with powerful professional status, perhaps contributed to a lack of sensitivity to patients' psychological needs, but the health-care staff themselves also had their own needs. Chronically fatigued and emotionally disturbed by the traumas they had witnessed, our role as more experienced disaster-relief workers included providing support to members of our local medical team.

Although the mandate at the triage site was to stabilise patients after their aeromedical transfer and to quickly redirect them out to other hospitals at the city or provincial level, by May 17, the third day of the triage centre's operation, the hospital was overflowing with patients. Transfer to the well equipped secondary hospitals designated for major operations was just not possible since these tended to be multistorey buildings, and their use was prohibited because of fear of structural instability. Our work was also further complicated by the frequency and magnitude of aftershocks. We could only work on the ground floor of our three-storey building after an aftershock measuring 6.3 on the Richter scale occurred. Indeed, at midnight on day 5, the government, worried about further aftershocks, issued an evacuation order to move all patients outside the building onto the street. Within 2 h we had transferred 100 seriously injured

patients to hastily erected hospital field tents, each one with different manufacturers' instructions.

Such experiences highlight the mental and physical stress that health relief personnel were under. In addition to their heavy clinical duties under suboptimum conditions and resources, teams had no preparedness training, little rest, and were working under ad-hoc arrangements. Dis-agreements about protocols for clinical management, quality of care, and level of expertise inevitably emerged, adding to the pressures. However, the team shared a common goal: helping survivors. And everyone held great respect for our site coordinators, who tried their best to support our work in difficult circumstances. The team spirit helped alleviate the discomforts of our shared makeshift home, where regardless of rank or gender, we slept in the open air on the streets, next to the tents where our patients were crammed together. When it rained we created makeshift shelters using thin plastic sheets, which kept us partially dry but offered little protection from the cold when the ambient temperature fell to below 10°C. The sound of falling cement, the movements of aftershocks, and patients moaning made an unlikely lullaby.

Our work at the triage site came to an end on day 14 after the disaster as the government decided to close down all triage sites and send all patients either to tertiary hospitals in Chengdu or Chongqing or out of the province for severe cases.

Post-emergency medical issues

Reflecting on the experience several lessons emerge. The rapid and effective response by the government should be commended, but the region's preparedness was insignificant, even though Sichuan is known to be at risk of earthquakes and had a major quake with human mortality in 1981.¹⁰ The patterns of morbidity revealed a large burden on older people, whose chronic long-term conditions required



Patients are transferred out of the Sichuan Province by simple trucks

additional care over and above the disaster response. Their rehabilitation will pose particular challenges—not least how their care will be paid for.

Survivors expressed their concerns about medical costs and the associated treatments. To quote a 49-year-old man with multiple rib and hip fractures who was sent to Guangzhou to receive surgical intervention: "I don't know how we will get back to Sichuan. Things were so expensive in Guangzhou and we have nothing left. Everything is buried under the rubble. We have no resources to survive in the city and to pay for the treatment." Almost 10% of the most severely injured patients were sent out of province for treatment and it was not clear how they might pay for their daily living maintenance, rehabilitation after surgery, or return expenses to Sichuan after a potentially long stay for treatment despite the ongoing generosity and public support from richer parts of China.

Migrant workers among these internal displaced people could also face lack of entitlement to free medical services after the disaster. In the immediate aftermath, the government provided free access to services, irrespective of place of origin or status. Yet migrant workers, who make up 15% of the population in the affected area, tend to be from the lowest socioeconomic strata¹¹ and could face uncertainty about entitlement to



Survivors evacuate through the rubble of Yingxiu on their way out of the epicentre

health services once the immediate emergency relief is over.

In addition to physical needs, mental health after the disaster will need to support not only survivors but also those involved in the relief process, including health-care workers themselves. And, as the acute phase of disaster relief comes to an end, the challenge of long-term policy and planning for rehabilitation services for populations with long-term disabilities becomes an additional need. Earthquakes are known to cause comparatively high mortality but low morbidity.¹² Injury patterns reported¹³ in Sichuan seem to be similar to other earthquakes and survivors who are left with permanent disabilities might face challenges in physical recovery as well as having psychological needs. A month after the earthquake Chok Wan Chan, the president of the International Pediatric Association visited specific medical facilities for child survivors in the affected area. On his return he commented: "Children are housed in temporary tents where daytime temperatures can reach up to 40°C. Although their health conditions are stable, most of them are very frightened and many [are] left with disabilities. In addition to their mental health, the wellbeing, rehabilitation and protection of these orphaned children needs to be highlighted." Indeed, the media reports a police crack down on infant traffickers who

prey upon lost children and orphans in hospitals. Concerns for "orphaned" older people should run in parallel. Social service and primary health-care facilities with an understanding of geriatric services will be needed to bridge the service gaps and prevent complications which could arise from a lack of medical treatment and care for their often multiple chronic diseases.

Conclusion

Most media and the international community have witnessed and commented positively on how China has responded to the Sichuan earthquake, the most severe natural disaster of the 21st century to date. The long-term health issues that China will need to address include sensitivity to the demographic profile and its implications for affordable treatment, rehabilitation, and long-term care at both ends of the age spectrum including concerns about mental health.

The successful avoidance of epidemics of infectious disease and provision of basics for public health such as clean water and food were commendable, and the efforts of volunteers and local organisations heroic. However, while the immediate rescue and response was managed in a swift and effective manner, the lack of emergency preparedness and training for medical staff to face the challenges of a natural disaster in a high-risk geographic area should signal an important lesson for future policy development.

Finally, as in other major disasters and human-security crises, the traumatic events will inevitably fade into the background and be forgotten by the media as other world events unfold.¹⁴ The most difficult challenge in 2008 will be for the public to celebrate the Beijing Olympics while remembering the plight of those survivors who face long-term consequences and must rebuild their lives and communities.

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Emily YY Chan
emily.chan@cuhk.edu.hk

Assistant Professor, School of Public Health, Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, NT, Hong Kong, SAR, China.

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