

Safe in an emergency

Health systems and facilities built and organized to withstand emergencies and natural disasters is the theme of this year's World Health Day on 7 April. Dr Mohammed R Al Kashif, director of the Palestinian Ministry of Health's hospital services, describes how he and his colleagues coordinated hospitals and facilities across Gaza during the recent violence. Teddy Boen, from Indonesia, and Tony Gibbs, from Barbados and Grenada, talk about building health facilities to withstand tsunamis, earthquakes and other disasters.



WHO

Dr Mohammad R Al Kashif

Dr Mohammad R Al Kashif started his career in 1982 working as ophthalmologist with the Ministry of Health of Saudi Arabia. In 1996, he joined the Palestinian Ministry of Health ophthalmic hospital for two years before becoming consultant ophthalmic surgeon and later ophthalmic hospital director. He has also taught ophthalmology at the Faculty of Medicine at the Islamic University of Gaza, the Palestinian Ministry of Health's ophthalmic hospital and Al-Azhar University in Cairo, Egypt.

Q: How was Gaza prepared for the recent emergency?

A: When hostilities broke out on 27 December, we received more than 350 dead and injured. Our medical teams could not cope, so we activated our Ministry of Health emergency response plan. We called in additional staff and within two hours had more than 600 doctors, nurses, paramedics and operating-room technicians. We opened six operating rooms in Al-Shifa Hospital (main hospital in Gaza City) and added five others soon after. All 11 rooms were working 24 hours a day during the three-week conflict: each had two operating tables, but in some they operated on the floor. Despite that, many died waiting for surgery. Our philosophy was to make maximum use of resources. Our medical teams triaged cases. We kept the ones we could treat more easily or who couldn't be moved, while patients needing care for extended periods or types of surgery we could not provide were evacuated to other countries. Our medical teams divided into three shifts for the 24 hour-period: one on call, one sleeping and one working.

Q: What factors contributed to your success?

A: The dedication of the staff. They left their homes and families to work in

our hospitals. They refused to go home for more than 48 hours and displayed great courage and unity. Staff working for nongovernmental organizations (NGOs) and the private sector also made a good contribution. Retired doctors offered their services. Our teams were experienced as they had worked during the first and second *intifadas* (Palestinian uprisings). Our emergency plan was finalized a week before the violence started. Every member of staff had a schedule. Our health workers went out to fetch the injured and evacuate them. I am sorry that they were attacked. During the conflict, at least 16 medical personnel, including doctors, nurses and paramedics, were killed in the Gaza Strip. Another 24 were injured and 17 ambulances were damaged. About 20 international organizations supported the Ministry of Health response to the crisis, mainly the World Health Organization, the International Committee of the Red Cross, the United Nations Relief and Works Agency and the Arab Medical Union and Turkish Aid.

Q: What was your role during the emergency?

A: I led the management of the hospitals in the Gaza Strip from Al-Shifa Hospital for three weeks; I went home for 30 to 60 minutes most days. For

four days I couldn't go home because it was not safe. My flat was completely burned down. Many of our staff had similar experiences. One doctor's house was hit and two of his children were injured. He was working and could not go home, and saw his own children being brought in to the hospital. Many staff, whose relatives died during the conflict, could not even arrange their burials.

Q: What did you learn from the crisis?

A: We need to have more room in emergencies. The intensive care unit in Al-Shifa Hospital has 12 beds. We need to be able to increase that number to 50 in an emergency. We need one or two months' supply of drugs for operating rooms, more equipment for intensive care and surgery and more ambulances. Our health system was already badly affected by the 18-month blockade of Gaza. We were short of equipment, including laboratory materials and spare parts for X-ray machines. Electricity was cut for 12 days and we had to use generators without backups. Now we plan to get additional generators. Mobile telephone networks weren't working, but it helped having 300 wireless handsets.

Q: How would you advise other countries to maintain health care in a complex emergency?

A: The Ministry of Health should be the main health-service provider, and its staff should work with NGOs, community groups and private-sector providers as one team. Countries need well trained personnel, an independent communications system and an emergency response plan for which staff are trained. They need good intensive and ambulance care, good transportation, and staff specialized in treating orthopaedic and bone injuries. ■

Courtesy of Teddy Boen



Teddy Boen

Teddy Boen, a structural engineer from Indonesia, is a senior adviser for the World Seismic Safety Initiative and a former director of the International Association for Earthquake Engineering. He has worked as a consultant for The World Bank, the United Nations and NGOs involved in reconstructing Aceh and Java.

Q: What difficulties in building safe hospitals are specific to your region?

A: Engineers do not always know how earthquake prone the hospital site is and lack proper knowledge about earthquake-resistant design. On top of that, they rarely inspect the construction itself, leaving that to contractors and construction workers.

Q: What are the challenges of building hospitals to withstand tsunamis and earthquakes?

A: Tsunamis are usually caused by earthquakes, so we need to make hospitals resistant to earthquakes.

Q: What are your proudest achievements?

A: After the tsunami and earthquake in

December 2004, I checked the hospitals in Aceh to see which were structurally safe and could be reoccupied. After the earthquake in Yogyakarta in May 2006, I helped patients return to the wards. But, after attending a Hospital Preparedness for Emergencies and Disasters course, doctors realized that they don't always need to evacuate patients. [After that earthquake] we just had to patch up the cracks the following day.

Q: Is building earthquake-safe hospitals cost effective?

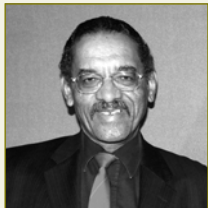
A: The structural cost of building a hospital is only approximately 20% of the total cost. The most expensive parts are the diagnostic equipment and

functional/operational components. If appropriately assessed, the cost of retrofitting – i.e. adding additional components to the existing structure – is minor compared to the total cost of the hospital. For newly built hospitals, important issues for building a seismic-resistant hospital are: preparing a proper, sound earthquake-resistant analysis and design both for the structural and non-structural components, followed by using good quality materials and good workmanship during the construction. The seismic design will not increase the cost for the structure significantly compared to the cost of the non-structural components and medical equipment.

Q: How can hospital safety standards be improved worldwide?

A: Assist developing countries in implementing a safe hospitals policy by funding the structural analysis (to identify the weak parts of the building) of several hospitals in each country, provide training to the local engineers and find the funds for retrofitting. ■

Courtesy of Tony Gibbs



Tony Gibbs

Tony Gibbs, a national of Barbados and Grenada, is the Secretary-General of the Council of Caribbean Engineering Organizations and a director and partner in an engineering firm through which he advises organizations and governments in the Caribbean and throughout the Americas on hazard-resistant hospitals.

Q: What are the major obstacles to building safe hospitals?

A: We know enough about technology to design and construct safe hospitals. The obstacles are insufficient determination to succeed and that people don't realize that safe hospitals can be built at a reasonable cost. The construction industry regards the effort needed to make hospitals safe as reducing competitiveness, rather than increasing value.

Q: Is there a major distinction between hurricane- and earthquake-resistant buildings?

A: The conventional approach to hurricane-resistance design is to prevent wind damage. A building might suffer damage by accidental impact from flying debris, but wind itself should not damage a well designed, constructed and maintained hospital. In the case of earthquakes, the conventional earthquake-resistant

design philosophy is to save lives, but not necessarily to protect the building. The result is often damage to and degradation of the facility's functional ability in severe earthquakes, which is not good enough! We need to adopt different processes at affordable costs to ensure a fully functional hospital after an earthquake.

Q: What would be your number-one recommendation for building a hospital in a hazard-prone region?

A: Independent review of the designs for all new facilities and quality assurance for their construction. These are important when you are designing for multiple hazards. We do not design separately for earthquakes and hurricanes – we always design for both. ■