

[Taiwan]

Lessons from Recent Disasters and the Development of Disaster Medical Assistance Teams in Taiwan

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Taiwan experienced a lot of disasters in recent several years, including a huge earthquake in 1999, air-crash in 1998 and 2001, and many typhoons and floods every year and SARS in 2003. These incidents created demands that challenged our medical infrastructures. The emergency medical preparedness programs evolved a lot in response to medical surge in these disasters.

In our system, several characteristics should be clarified in the beginning:

1. In our multiple casualty incident plans require to send hospital doctors to the incidents immediately to save lives, disregarding what they can do or if the scene is under control. The emergency medical services system of Taiwan was established in 1995, and the fire fighters were trained to be emergency medical technicians (EMT) to provide pre-hospital medical care, people still believe that physicians at the scene can provide better medical care than the fire fighters/EMT. An experienced physician at the rescue scene may do a better job in triage and arranging definite medical care site, but not every hospital physician has street sense and proficiency in trauma care skills. When the personnel in emergency room of a smaller hospital were deployed to the scene, it jeopardized the capacity of hospitals for receiving patients.
2. The plans tend to call back all the personnel immediately. The first step of a response plan of an organization is usually to call back all the off duty personnel by all means. This procedure is self-depicted because it guarantee there will be adequate human resources for the following several hours. It may sometimes prematurely deplete the resources, for example the manpower for the next shift if the emergency extends for a while. The time curve of casualty numbers found and treated in Chi-Chi earthquake in 1999 revealed the bottleneck of on-site medical care occurred around 24 hours after the earthquake rather than the first several hours.
3. The plans rely on a lot of volunteer workers responding to the surge demand. We believe that there will be a lot of volunteers during disasters, and it is socially inappropriate to refuse their participation. It is true for those disasters that are familiar to the civilian. In earthquakes, typhoons or traffic accidents, a simple call in public media can activate thousands of volunteers. The situation changes when the hazards are exotic and substantial risk existed for the responders.
4. The plans usually demand a designated hospital for a kind of special situation or emergency. It would be much more easily and cost efficient to provide equipment and personnel training to a limited number of hospitals, therefore we have designated hospitals for natural disasters, multiple casualty incidents, hazmat, radiation accidents and biohazard events in some cities. Only the designated hospitals have to sustain training and equipment maintenance.
5. The plans tend to overemphasize the importance of related clinical skills in dealing with the disasters, especially in CBRNE events that required specialized skills. Most of the command structures are staffed by experts from medical professionals, while the logistics, administration/finance, planning staffs are not activated.

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We should notice that some countermeasures may be not effective in multiple casualty incidents. There are some myths behind many response plans that we should take into account:

1. The myth of simple multiplication of individual care. Mathematically one times one thousand equal to one thousand times one, but individual care for one thousand times does not equal to population care for one thousand people for one time. We tend to manage multiple casualty incidents with the same model of a single trauma patient by have extraordinary number of responders. To summon as many responders as they can may be good in some limited scale events, but in more complicated situation the logistics for individual care escalated exponentially when casualty numbers increased, and crumpled the system.
2. The myth of multi-jurisdiction. In a cage, there are birds, rabbits and monsters. Totally there are 12 heads, 41 legs. Can we count the numbers of birds, rabbits and monsters? We can not find the answer because we do not know how many heads and legs one monster has. When a complex event occurs, multiple disciplines may be called into action. The “monsters,” which mean untrained, uncontrolled and unreliable responders, the system will become paralyzed. Another hazards are self-proclaimed experts and the omnipotent media, they could be more destructive than people who were simply ignorant.

Facing the potential challenges from disasters, some actions have been adopted based on the experience.

1. Disaster medical assistance teams, which were composed of medical operation unit (MOU) and medical support unit (MSU) were built in every regions in Taiwan. The MOU includes four doctors, eight nurses, and four ancillary medical personnel including EMT/paramedics. They should operate around the clock with 12 hours a shift. The MSU comprises other personnel from logistics, communication, information, engineering, and cook. For an event that the infrastructure and support of community is preserved, a MOU will be deployed, but in a huge disaster, three MOU with one MSU will be sent as a team. They should set up a field clinic and provide emergency medical care for several days. Some teams are special trained for hazmat, bio-threat, and radiation.
2. The pre-hospital emergency medical system and health facility medical system with other emergency response systems, including hazmat, nuclear accident and bio-terrorism medical care system are integrated into one system and Regional Emergency Operation Centers (REOC) are built by the DOH to coordinate the responders. The medical resources can be shared by different hospitals and well preserved for the patients sending to the hospitals by EMT after initial assessment and stabilization.
3. Hospital emergency incident command system that balances the command, operation and supporting side in emergencies is recommended to all the hospitals. No hospitals are immune to disasters, so basic medical preparedness for all hospitals is mandatory for new hospital accreditation criteria.

After these organization and teams being developed, special trainings are provided to guarantee that their capability in crisis:

 1. Disaster medical assistance team training. It is four days training composed of community emergency response training and basic medical skills. For facilitating the medical personnel to join the training, they are usually separated into basic and advanced courses. Nearly half of the courses are lectures, and the others are skill practice, tabletop exercise, and group discussion. The objective of training is not to convert them to experts, but competent responders and perform their jobs efficiently according to the plan. After the training courses, a two days field exercise will be conducted to have them work as a team rather an individual.
 2. Special response training. There are many training modules designed for the medical response teams in different situation. For example, hazmat, radiation accident, mortuary identification, psychiatry intervention and mental support. The duration is designed according to requirement. Team member may choice the modules according to their professions and the requirement for their roles in response team.

Several medical centers are chosen as base hospitals for the teams. Their responsibilities are providing training, equipment maintenance, and roster keeping. When a disaster strikes, the base hospitals should mobilize their members and equipments according to the guidance from the government. Through these efforts we hope to

build a robust and efficient framework for health authorities that maximize the ability to provide adequate medical evaluation and care for all kinds of mass casualty and complex incidents

that exceed the normal medical capacity and capability. That will be an indispensable part of the community safety network.