

Guidance on **Mainstreaming Disaster Risk Reduction** in the Health Sector, Myanmar - Rural Settings



Ministry of Social Welfare, Relief and Resettlement
and
Ministry of Health

In partnership with
Association of South East Asian Nations (ASEAN)
United Nations (UN)
Asian Disaster Preparedness Center (ADPC)



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SECTION I

Introduction to this Guidance

1.1 Purpose of the Guidance

The 'Guidance on Mainstreaming Disaster Risk Reduction in the Health Sector, Myanmar - Rural Settings' aspires -

- To emphasize the 'need' to mainstream disaster risk reduction (DRR) in the health sector initiatives.
- To identify key approaches for mainstreaming DRR in the health sector in Myanmar, particularly in rural areas, based on the good practices, innovative approaches and lessons learned of Government, UN agencies, NGOs and others involved in the Cyclone Nargis recovery.
- Identify key 'vulnerabilities and opportunities' for creating a 'safer health system' in Myanmar.

1.2 Target Users of the Guidance

The primary target users of the 'Guidance on Mainstreaming DRR into Health Sector, Myanmar - Rural Settings' are government ministries and departments namely Ministry of Health, Ministry of Social Welfare, Relief and Resettlement which are engaged in mainstreaming disaster risk reduction (DRR) in the health sector.

It is also targeted at UN Agencies and NGOs (local as well as international) and others organizations focusing on improving the hazard resiliency of the health system in Myanmar. The Guidance will serve as a reference Guidance for government, UN Agencies and NGOs to mainstream DRR in the Health sector planning and programming.

In addition, the Guidance will act as a decision support tool, providing practical information to donors in terms of what the implementing agencies need to do and accordingly funding strategy can be prepared to effectively support the creation of safer health system.

1.3 Scope of the Guidance

The 'Guidance on Mainstreaming Disaster Risk Reduction in the Health Sector, Myanmar – Rural Settings' -

- Primarily focuses on Mainstreaming DRR in the health sector by looking into its structural, non-structural and functional aspects,
- Provides suggested approaches for mainstreaming DRR in the health sector based on the initiatives undertaken during Nargis recovery in Myanmar as well as the regional experiences,
- Concentrates on building safer health systems in rural and sub-rural areas: from Township to villages,
- DOES NOT provide instructions on how to build safer hospitals but provide key points of considerations in planning and implementing hospital construction programs.

1.4 Disaster Risk Reduction Terminology¹

- **Disaster:** A disaster is a "serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources".
- **Risk:** Risk is the product of hazards over which we have no control and vulnerabilities and capacities over which we can exercise very good control.

¹ The Prevention website: <http://www.preventionweb.net/english/professional/terminology/>

- **Disaster Risk:** The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.
- **Vulnerability:** Vulnerability is the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. A school is said to be 'at-risk' or 'vulnerable', when it is exposed to known hazards and is likely to be adversely affected by the impact of those hazards if and when they occur.
- **Preparedness:** Preparedness is the knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.
- **Mitigation:** Mitigation refers to the process of the lessening or limiting of the adverse impacts of hazards and related disasters.
- **Response:** Response is the provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.
- **Recovery:** Recovery is the restoration and improvement, where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.
- **Disaster Risk Reduction:** Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.
- **Retrofitting:** Retrofitting is the reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards.
- **Mainstreaming:** Mainstreaming in the context of disaster risk reduction is a strategy that refers to the practice of integrating risk reduction concepts and understandings in various subject matters ranging from development to education to agriculture with the hope of instilling a culture of safety in the society. Mainstreaming involves ensuring that disaster risk reduction perspectives are central to all activities - policy development, research, advocacy, legislation, resource allocation and planning, implementation and monitoring of programmes and projects.

SECTION II

Rationale for Mainstreaming Disaster Risk Reduction in the Health Sector

2.1 Impacts of Disasters on Health Sector

Disasters are defined as 'serious disruptions of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources'. All disasters lead to health concerns regardless of whether they have direct

bearings on the destruction of health facilities or cause dangers to its employees. Nutrition concerns for the affected communities is high as the local food production gets disrupted and transportation might be difficult since the roads might be strewn with debris to deliver food aid to remote areas. So too the access to clean water and adoption of sanitation practices (are highly prioritized) **become high priority** health matters because they could pose serious threats of the outbreak of diseases that could set off serious secondary disasters. Without a proper healthcare provision in the immediate relief and response phase, the recovery process (can be delayed) **cannot be successful**.

At the same time, any damage suffered by hospital building present great risks to all the patients staying there and the staffs working there. It further disables the ability of the local health authority to provide emergency services to the injured. Thus, without a doubt, making hospital safer from future disasters and enhancing the disaster risk reduction investment of health sector in the context of public safety would strengthen the overall health systems and help speed up the entire recovery process from any disaster.

(Furthermore, the death and injuries the disasters brought about to health personnel would have major impact on the service delivery in times of crisis.) **Further the death and injuries could impact the service deliver considerably**. The effect would be felt more prominently in rural areas of developing and under-developed countries where only a handful of healthcare professionals are in charge of a large number of populations. Replacing the loss of skilled human resources takes time and a considerable amount of financial investments are needed to build up the workforce again. Therefore, hand in hand with building safer health facilities, capacity building and awareness raising of health personnel is equally instrumental in imbuing a sense of preparedness and alertness and could save precious lives.

2.1.1 Natural Hazards in Myanmar

Myanmar is prone to a range of natural hazards including earthquake, tsunami, cyclone, storm surge, floods, fire, landslides, forest fire and drought. Its coastal regions are exposed to cyclones, storm surges and tsunamis while major parts of the country are at risk from earthquakes and fires. The rainfall-induced flooding is a recurring phenomenon across the country while hilly region of the country is exposed to landslide and central region is susceptible to drought.

2.1.2 Cyclone Nargis and its Impact

The category 3 Cyclone Nargis struck Myanmar on 2 and 3 May 2008, making landfall in the Ayeyarwady Division, approximately 250 km southwest of Yangon. With wind speeds of up to 200 km/h accompanied by heavy rain, the damage was most severe in the Delta region, where the effects of the extreme winds were compounded by a 12 foot (3.6 meter) storm surge. It led to loss of 84,537 human lives, 53,836 persons missing and damage to property to the tune of approximately 4.1 billion USD. Approximately 2.4 million people were severely affected, out of an estimated 7.35 million people living in the affected townships. Thirty-seven townships were significantly affected in Ayeyarwady and Yangon Divisions.

2.1.3 Damage and loss to Health Sector caused by Cyclone Nargis

The health sector was badly impacted by Cyclone Nargis mostly in Ayeyarwaddy Delta. There were 1,217 medical facilities in the pre-cyclone period which included 100-bed, 50-bed

and 16-bed hospitals, regional/ sub-regional health centers and medical training schools². According to the Post Nargis Joint Assessment (PONJA) report, approximately 75 percent of health facilities in the affected townships were damaged and most of the damages occurred in the lower Delta. Almost all the destroyed facilities were primary health facilities, including station hospitals, rural health centers and sub-centers. Though in monetary terms the value of the damage to these facilities may not be as high as if same amount of destruction is to be occurred to bigger city level hospitals, it has a major impact on the access of the rural population to health services.

The total damage and loss to the health sector has been estimated at about Kyat 19 billion and approximately two-thirds of damages and losses are incurred by the public sector and one-third by the private sector. It led to considerable decline in health service provision, in particular for immunization and communicable diseases, health care services for birth delivery and access to medicines.

PONJA also reported that more than 65 percent of households surveyed reported health problems among household members during early June 2008. The most commonly reported diseases were cold, fever and diarrhoea with 39, 37 and 34 percent, respectively. 23 percent of the surveyed households reported mental problems among household members due to the cyclone, with a large variation across townships from 6 to 51 percent.

The danger of a rise in gastro-intestinal diseases was envisaged as the proportion of households using pit latrines decreased from 77 to 60 percent as many sanitation facilities were destroyed together with the family dwellings, whereas unsanitary defecation practices such as open defecation, floating latrines and trenches doubled from 23 to 40 percent. The increase in floating latrines from 3 to 7 percent in combination with the common use of river water as a source of drinking water as well as the low usage of soaps was raised as a particular health concern beyond June 2008. As per the Periodic Review-I survey conducted in October/ November 2008, prevalence of diarrhoea among children was found in some townships and showed significant spatial variation. The cases of fever were clustered within the high prevalence areas. However, the outbreak of epidemic or water borne diseases in Nargis affected areas were successfully prevented by the rapid and persistence actions taken by all concerned agencies under the leadership of the Ministry of Health.

Overall, the damage and loss estimates in the Health Sector in Yangon and Ayeyarwady Divisions are given in Table 1.1 below.

Table 1.1 Damage and Losses Estimates of Health Sector in Yangon and Ayeyarwady Divisions

	Public (Kyats million)	Private (Kyats million)	Total (Kyats million)
Damage	11,545	1,236	12,781
Loss	1,141	4,971	6,113
Damage and Loss	12,686	6,208	18,894

Source: PONJA

2.2 Typical Vulnerabilities in Health Sector

The damage and loss to the health sector can be not limited but attributed mostly to a number of factors and key factors as follows:

- *Prior site assessment before the construction of health facilities*

² Myanmar Live After Nargis (2009) Chachavalpongpun and Thuzar .

In general, there is limited site assessment before construction of the health facilities in Myanmar, thus the environmental and hazard risks at the site is not much accounted in the planning. The reasons cited are the limited budget as well as inadequate understanding of environmental and DRR issues and their benefits. The consequence is the lack of knowledge of possible hazards in the vicinity and the opportunity to include hazard resistant features in the health facility design. In rural areas, it is highly important to consider the environmental impacts when a new construction project is to be implemented. Unlike in crowded urban areas, rural areas can offer greater choice in land with vast amount of open spaces. However, care needs to be taken not to disturb the delicate balance between the environment and hazards by building in protected forest areas or on a site which is historically vulnerable but without proper records of any past hazards. Thus, proper site assessments should be made the essential features of building health facilities to provide safer care services to the rural population.

- Application of hazard resilient building designs

The structural soundness of the health facilities get compromised when proper multi-hazard resilient building standards are not applied in the first place, making the structure vulnerable to the forces of nature. Sometimes the misconception is that these features would raise the cost significantly but in actual fact, such precaution coupled with regular maintenance can help save considerably higher costs of repair and reconstruction post-disasters. Moreover, the usage of local materials of high quality, such as local timber, bricks or sand and pebbles for cement making as well as local laborers can save significant costs on transportation and further drive down the overall rates. Therefore, the economic benefits of such designs need to be promoted to seek support from the decision makers for enforcement of disaster resilient design application in health facility construction.

- Disaster preparedness plans for hospitals

Except for major hospitals like Yangon General Hospital, disaster preparedness planning and practice is not prevalent in rural health facilities. It does not really matter how small the facility is, a preparedness plan can reduce the chaos and restore some order even in the most hectic time following a disaster, plus it also ensures the minimum disruption to the healthcare service provision in time of need.

- Awareness on DRR issues

Even though the Ministry of Health in Myanmar, in partnership with the Ministry of Social Welfare, Relief and Resettlement, is offering disaster risk reduction trainings to its staffs, most of the beneficiaries of such schemes are the national level staffs. The sub-national level health offices have limited familiarity with the subject and as a result DRR mainstreaming in their routine works is not taking place and the relation between safer health facilities and ability to offer greater healthcare services are overlooked. In times of disasters, local health officers are the ones who have to interact first with the affected communities. Hence, raising the understanding of the township medical officers on DRR offers invaluable benefits to the communities.

Box – 1

Typical Vulnerability of Health Facilities to Potential Hazards

1. **Buildings.** The location and building specifications, particularly regarding design, the resiliency of the

materials, and physical vulnerability, determine the ability of hospitals to withstand adverse natural events. The slightest structural or architectural element that collapses or fails entails both financial and human costs;

2. **Patients.** It is customary for health facilities to work 24 hours a day at about 50% of their service capacity. Any disaster will inevitably increase the number of potential patients and amplify their level of risk. Waiting lists get longer, since it becomes impossible to meet both routine demand and that generated by the emergency. Patients also suffer from the decline in the provision of services as a result of damaged, partially evacuated or non-operational facilities.
3. **Hospital beds.** In the aftermath of a disaster, the availability of hospital beds frequently decreases even as demand goes up for emergency case of the injured.
4. **Medical and support staff.** It is hardly necessary to describe the significant disruption to the care of injured caused by the loss of medical or support personnel. In order not to suffer a concomitant loss in response capacity, outside personnel must be hired temporarily, adding to the overall economic burden. Sometimes, the death of a specialist can entail major technical costs for the country affected by the disaster.
5. **Equipment and facilities.** Damage to non-structural elements (such as equipment, furniture, architectural features and medical supplies) can sometimes be so severe as to surpass the cost of the structural elements themselves. Even when the damage is less costly, it can still be critical enough to force the hospital to stop operating.
6. **Basic lifeline and services.** The ability of hospitals to function relies on lifelines and other basic services such as electrical power, water and sanitation, communications, and waste management and disposal. It is not a given that self-contained backup emergency services are available at all health facilities. When a natural disaster affects some of the services, the performance of the entire hospital is affected.

Source: Protecting New Health Facilities from Natural Disasters: Guidelines for the Promotion of Disaster Mitigation (2003) Pan-American Health Organization (PAHO).

2.3 Rationale for Rebuilding Safer Health System

Health facilities are considered as critical structures in the community that can provide both health services and restore resilience. Thus, it is imperative to mainstream disaster risk reduction in the health sector -

- For long-term risk reduction in health sector.
- *To optimize the inputs* as safer construction techniques may increase the construction cost of health facilities but it is cost effective in long-run. WHO study found that the mitigation investment that increases the structural integrity of a hospital will increase total construction costs by no more than 1–2%.³
- *To not-add risk* as unplanned development that can unintentionally increase vulnerability and thus add risk, in other words to avoid recreation of risks.
- *To reduce impact on public finances* as most of the health facilities in Myanmar are run by the Government and impact to health facilities will not only impact the human productive capacity but also erode the public finances due to cost of restoration.
- *To consider infrequent hazards* in DRR planning and programming.
- *To be better prepared* for future hydro-meteorological hazards that might become more severe in consideration to climate change.
- *To ensure the hospitals maintain their functionality* during emergency situations.

³Disaster Risk Reduction and Preparedness for Health Facilities, World Health Organisation, Japan.

2.4 Opportunities in Creating Safer Health Systems in Rural Areas

• Momentum for DRR

Fresh from the Cyclone Nargis and recovery works, the high awareness and commitment of all stakeholders should be harnessed and the opportunities should be availed to take strong policy and strategic measures in mainstreaming DRR into health sector. The long-standing support from the Ministry of Health (MoH) is evident in the fact that it has been working closely with both international and local NGOs over the years, prior to the Cyclone Nargis recovery. By advocating for support of such bodies as NDPCC in the mainstreaming efforts, an assurance of financial and political good will can be achieved in improving the healthcare system in the country.

• Enhanced coordination

The pre-Nargis affiliations between the MOH and its counterparts non-government agencies has already built the trusts between the organizations and makes it possible for the Cyclone Nargis recovery health interventions to work effectively and accountably. The Early Warning and Response System (EWARS) developed and introduced during the Cyclone Nargis recovery became the single source of data and information with all NGOs committing to share data. Furthermore, the participation of MoH at the Health Cluster meetings facilitated the field-level coordination mechanism through official endorsement of the Cluster activities. Building on the greater coordination accomplished during Cyclone Nargis recovery, more collaborative activities can be implemented in the health sector with the involvement of DRR and development professionals.

• Access to additional resources

One major benefit of increased international support following the Cyclone Nargis was that some of the Donor's policy stipulated earmarking percentage of relief and response fund for DRR. This funding can be availed for DRR into Health preparedness and mitigation. Additionally, the technical resources available in the country, for instance the presence of international experts in public health emergency, disaster risk reduction, etc., can help further the safer hospital concepts.

2.5 Challenges in Mainstreaming Disaster Risk Reduction into Health Sector

• Improvement of understandings in both DRR and basic health functions

A dual challenge that needs to be addressed urgently is to improve the understanding and benefits of mainstreaming DRR by health personnel; at the same time improving the understanding of basic health function needs by DRR and development practitioners. In construction sector, equal emphasis should be given to both functional and structural soundness of health care facilities so as not to impede the emergency operations. It is, therefore, crucial that construction planners and DRR experts are made aware of the fundamental requirements of a health facility even before they formulate any DRR mainstreaming activities to ensure inclusion of such issues in the designing stage of a health structure.

• High cost of health facilities

Health facilities are usually expensive to build if they are to meet the international standards. In Myanmar, the limited budget will be stretched. There is high probability of going for a large number of low cost structures than a small number of expensive ones as the quantity take precedence than quality in many cases. However, with careful inclusion of DRR resilient features and usage of local materials and laborers, the costs of building strong health facilities can be reduced and at the same time boost the local economy.

- Consideration of other health related sectors

In promoting the mainstreaming of DRR in the health sector, the focus has always been on making the health facilities (buildings) stronger to withstand the future hazards or assisting the health personnel in preparing for emergency situations. At times, the linkages to other health related sectors such as nutrition, water and sanitation get limited attention. In a disaster situation, these are the sectors that could trigger secondary health hazards if not tackled on time or if overlooked. Thus, every DRR mainstreaming program should also look into making these sectors safer and disaster proof in relation to health.

SECTION III

How to Mainstream Disaster Risk Reduction in the Health Sector



3.1 Mainstreaming of Disaster Risk Reduction in the Health Facility Construction

Quality healthcare is very important and without a durable structural that house essential medicinal facilities and skilled human resources, provision of quality healthcare come into question. Hence, it is important that the DRR elements need to be incorporated in the health facilities construction.

3.1.1 Location/site assessment

In the construction of health facilities in rural areas, it is important to identify specific hazard risks and vulnerabilities at the proposed location before a final decision is made through a combination of desk research and field survey to get the maximum results. Some of the key considerations for site selection are as follows:

- In flood prone area, it should consider the Highest Flood Level [HFL] and select an area higher than HFL or to elevate the level of the plinth above it.
- The geotechnical properties of soil should be considered, specifically the type of soil, moisture content, etc.
- In earthquake prone areas, locating health facilities above or near the fault line should be avoided.
- The slope stability should be considered to avoid slope failure/landslide hazards if the facility is to be built in hilly terrains.
- The highest tsunami tide and storm surge levels of past events should be considered in coastal areas.
- The topography and forest coverage of the surrounding should be taken into account. Heavy surrounding forestation acts as wind breaker and gently slope valley acts as a funnel and could accelerate its speed.
- Possibility of technological hazards in the neighborhood such as chemical, inflammable or hazardous materials storage should be looked into. The proximity to power plant, industrial zone can be one crucial factor under this consideration as the hospital should not be exposed to additional unnecessary risks.

Overall, the site selection for the new health facility should be based on the best mix of safety vis-à-vis prevailing hazards and levels of risk and accessibility, in terms of the supply and demand of health care services and the cost-effectiveness.

3.1.2 Incorporation of disaster resilient features

PAHO/WHO has recommended that '*essential areas and components of hospitals be built to retain the third and most demanding performance objective (i.e., functional protection) and that new health facilities be built entirely so as to meet, at least, the first level of protection, namely life safety*'⁴. The design must incorporate structural detailing that can resist the identified level of risk. It is highly recommended that

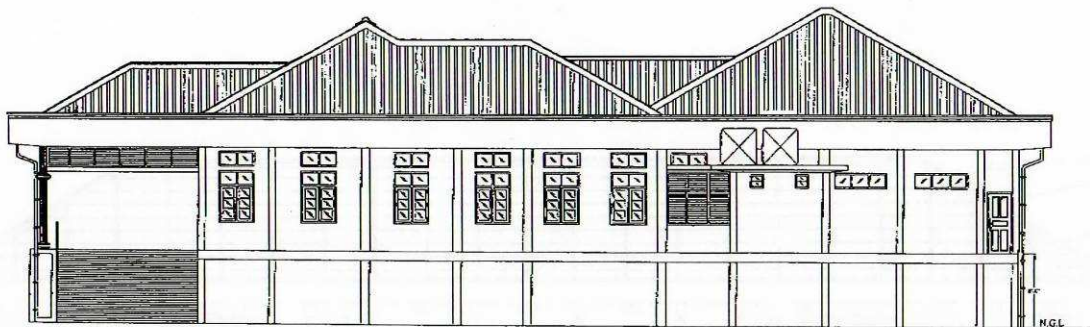
- Multi-hazard features are applied to structure rather than confine the design to one or two specific hazards. Basic traits are strong walls and columns with lateral bracings; strengthened roofs with reinforced trusses; extra reinforcement around openings such as windows and doors; durable foundations (depending on the type of soil and the load it needs to carry, the depth of foundation will have to be determined);

⁴ Guidelines for vulnerability reduction in the design of new health facilities (2004) World Health Organization (WHO), Pan-American Health Organization (PAHO) and Prevention Consortium, the World Bank Group.

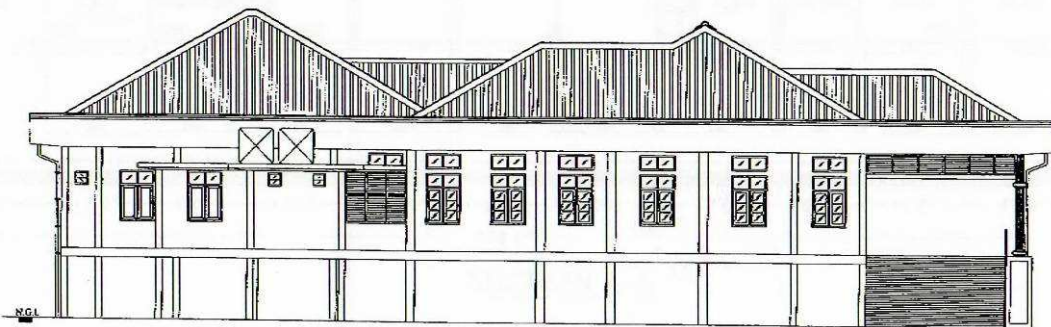
reinforced columns and beams; and sturdy joints (particularly where the beams and columns meet).

- Hazard resistant designs to be applied to water and sanitation facilities as an integral part of the overall building design.
- Climate change adaptation considerations to be employed such as installation of rain water harvesting facilities, alternative energy (solar and wind) sources and other eco-friendly features such as good ventilation designs.
- Usage of local construction materials and local talents that can also help revitalize the local economy. Nevertheless, the resources used need to undergo vigorous quality check to prevent from re-creating needless risks and precautions must be taken not to overexploit the local resources.

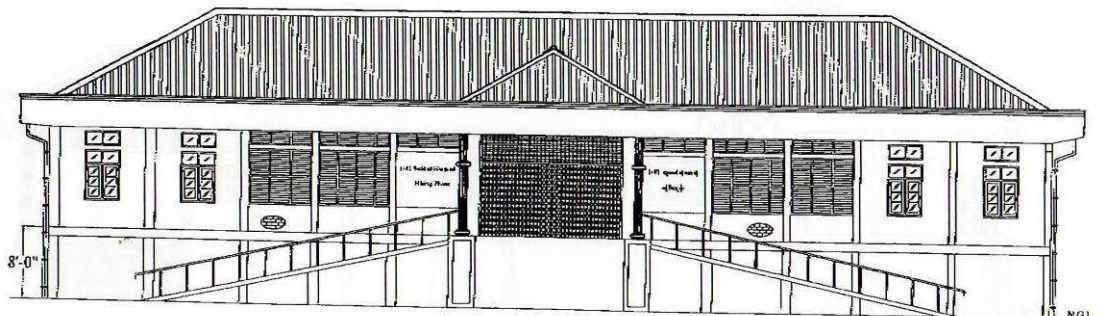
The Ministry of Health (MoH) of the Government of Myanmar has its own standard specifications and designs for hospital, health center, rural health center and sub-rural health center, as shown in the following diagrams.



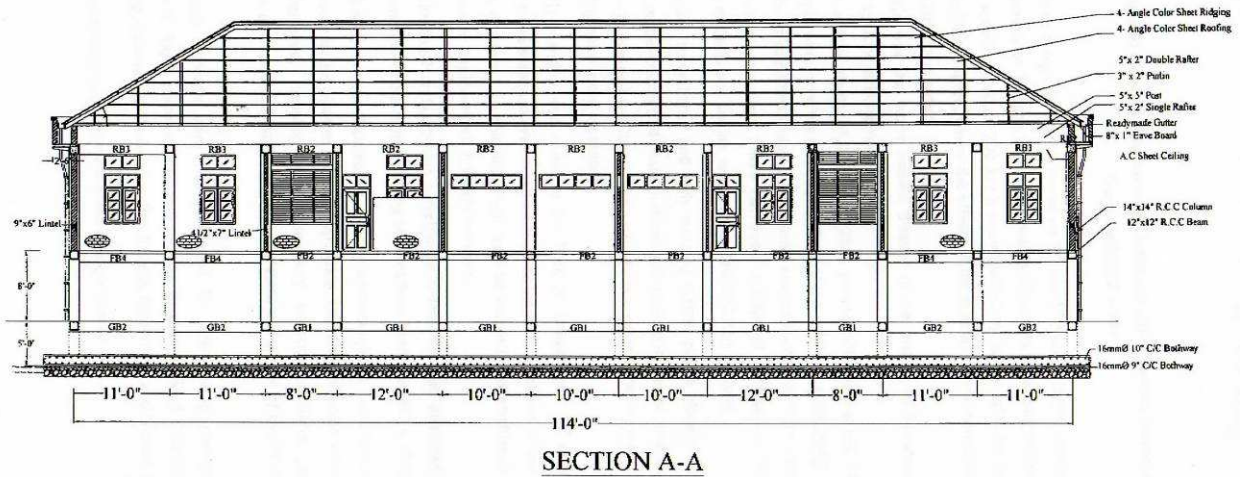
RIGHT SIDE ELEVATION



LEFT SIDE ELEVATION



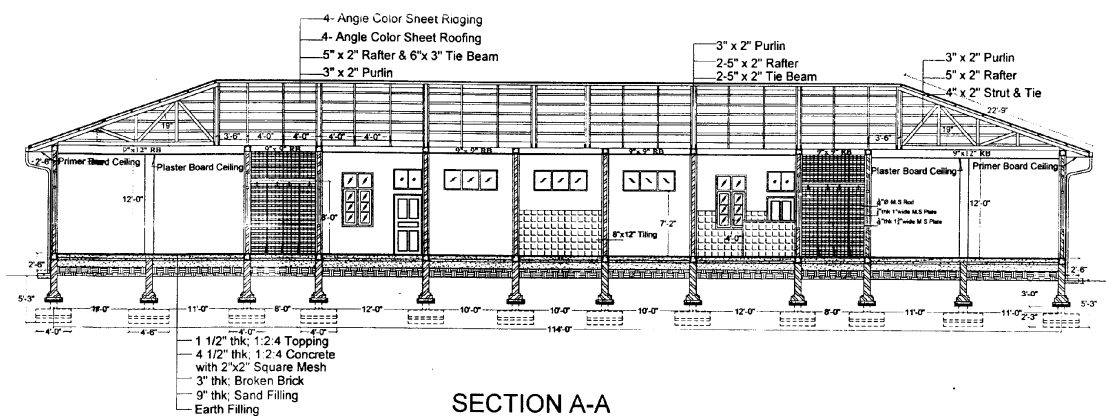
FRONT ELEVATION



Box – 3

Multi-hazard Hospital Design by MERCY Malaysia

In collaboration with Ministry of Health, MERCY Malaysia has designed a Sub Rural Health Center, in the cyclone affected areas of Ayeyarwady Division, that included earthquake, cyclone and flood risks reduction elements. The key features of the structure include 16 mm reinforce steel bar for cyclone and earthquake resistance, stir-up at different angle to increased resistant, semi-slab roof around the building which allow people to escape during flash flood and rain water collection.



Source: Contract Guidance for Reconstruction of 16-bed Hospital in Kyone Da Village, Dadeye, Ayeyarwaddy (2009) MERCY Malaysia.

Equal attention must also be paid to the safety of the operational components: such as architectural elements (non-load-bearing walls, floor coverings, ceilings, and other coverings

or finishes); equipment and contents (electromechanical systems, medical and laboratory equipment, furnishings), and services or lifelines. In the case of hospitals, nearly 80 percent of the total cost of the facility is due to operational components. The impact of damage to the facility's operational components may vary. For instance, damage to medical equipment can actually cause loss of the functional capacity of the facility and provision of critical care in time of needs. Secondary effects of the damage to operational components are also important, for instance the fall of debris in hallways or escape routes, fires or explosions, or the rupture of water or sewerage pipes. Even relatively minor damage can compromise aseptic conditions in the affected areas, putting critical patients at risk.

The key considerations, thus, to be taken in terms of operational elements, particularly in terms of rural health facilities, are:

- Inclusion of features that would permit expansion of services instantly as and when an emergency situation arrives. An example is the construction of covered corridors and walkways that could be converted rapidly into crisis management or mass casualty management zone.
- Different perspectives of facility design in rural and urban settings. For instance, in rural areas, the outpatient units might need to design with the contemplation that people have to come from afar and might need to stay overnight just to consult the doctors for a few hours whereas in urban areas, these are mainly just walk-in and walk-out services. Similar deliberations need to be taken into account in designing rural health facility with the operational aspect in mind.
- Accommodation of physical (having ramps for physically challenged patients), social (spacious waiting rooms) and gender needs.
- Provision of anchorage to equipment and furniture to prevent them from being thrown around and create secondary hazards.
- Additional storage space for drugs and equipment as well as for extra power generating apparatus like generators need to be considered. This would prevent congesting the hallway and corridor unnecessarily and at the same time reduce the risks of exposure to elements that might get exploded and cause further harms. Besides, in remote rural areas, where replenishment of supplies could take days, stockpiling of extra basic medicines and other equipment could maintain the service running during emergencies until replacement can arrive.
- The rural facilities especially need to be equipped with emergency communication systems (mobile phones or satellite phones that does not rely on conventional telephone lines) for immediate mobilization of resources from other areas if it gets hit by any natural disasters.

One important factor in health facility construction to ensure DRR considerations are well incorporated is to conduct regular monitoring visits. Learning from Cyclone Nargis recovery, it is mainly the individual agency that oversees the construction from beginning until its completion with approval from the Ministry of Health. MERCY Malaysia, under its hospital construction project in the Cyclone Nargis recovery, had involved the township authorities to be part of the monitoring team, ensuring the quality control and the buy-in from the community.

Box – 4

What is a 'hospital safe from disasters'?

The term "hospital" encompasses all health facilities - large or small, urban or rural, complex or primary

care centers. A hospital safe from disasters:

- will remain intact and not collapse in disasters, killing or injuring patients and staff;
- will continue to function, providing critical services when they are most needed;
- has contingency plans and a well-trained health workforce that is ready and able to deal with the health consequences of emergencies.

10 Steps that can Make a Difference

1. Recognize that disasters are health issues and that health services must remain operational.
2. Plan for disaster-resilient hospitals from the beginning—at the planning and design stage.
3. Draft, legislate and enforce safe building codes and standards.
4. Make existing health services less vulnerable by identifying underlying risks.
5. Raise awareness among national decision-makers.
6. Prepare hospital emergency and contingency plans.
7. Train the health workforce to deal with emergency health needs.
8. Protect the entire health services network: blood banks, laboratories, supply warehouses, communication infrastructure and more.
9. Educate yourself about what can be done to protect critical health facilities.
10. Involve communities as agents of disaster risk reduction.

Source: Hospitals Safe from Disasters: Reduce Risk, Protect Health Facilities, Save Lives. World Health Organization, Regional Office for South-East Asia (WHO-SEARO),

3.2 Mainstreaming Disaster Risk Reduction in Retrofitting of Health Facilities

In Myanmar, most of existing health facilities have been built with limited consideration to hazard safety standards. Therefore, to safeguard both the structural and functional aspects of health facilities, it is vital to retrofit the existing rural structures to minimize the future hazard risks. The first step is to perform a thorough assessment to identify the level of risks. The assessment should be conducted by a team of competent health facility design experts, engineers, architects and builders and health emergency personnel. It should concentrate on identifying not just the structural deficiencies but also non-structural and functional defects. The final results should highlight areas that need to be addressed.

Once the needs and risks are identified, detailed repair and retrofitting plans with anticipated budget could be drawn up and elements discussed under section 3.1.2 can be applied. If the assessment demonstrates that the danger of total collapse is imminent, salvaging the structure would create more risks and would require greater financial investments. Under the circumstances, absolute reconstruction of facility is recommended.

The cost of retrofitting such as installing extra bracing or reinforcement to the walls, roofs and joints or any other engineering interventions could diverge depending on the situation. Nevertheless, it may prove to be a necessary investment in the safety of the health facility and the security of the health care systems in emergencies⁵. It might not be possible to retrofit all rural health facilities throughout the countries given the available financial resources. Under the circumstances, priorities should be given to the most critical areas such as emergency operating rooms of selected facilities in most hazard prone regions.

⁵ How to safeguard health facilities, WHO.

3.3 Capacity Building for Safer Health System

In striving towards building more disaster resilient health system, three key capacity building initiatives can be planned and delivered.

3.3.1 Capacity building of workers, professionals and planners in construction sector

Capacity building of personnel in construction sector should look into:

1. *Raising the awareness of the engineers and architects on operational/ functional aspects of the hospitals;* particularly on the coordination of various departments and services. This would help the professionals in designing health facilities that facilitate functionality.
2. *Educating engineers and architects on inclusion of multi-hazard resilient features in hospital designs* while keeping in mind the operational side of the facilities. This would also cover educating the future *town and development planners* in selecting more suitable and safer sites for hospitals.
3. *Training of, especially local, builders such as carpenters and artisans* through a combination of practical coaching on site and theoretical learning on the importance of safer construction methods.

Capacity building of health workers

By enhancing the knowledge of the health workers on disaster risk reduction issues, a more prepared work force is being supported that understand and have the ability and willingness to take forward the disaster risk reduction aspects as an integral part of the 'safer hospital' concept. Enhancing the capacity on how to prepare and response to disasters and emergencies should cover the entire healthcare workforce from doctors, nurses, midwives, public health practitioners and volunteers. The capacity building programs need to encompass a mix of technical skills and filed know-how. In rural areas, nurses and midwives constitute the largest portion of healthcare workers and are therefore placed in the frontline to private a wide range of health services. Suggested topics of trainings for the healthcare workers are:

- Public safety and risk management in general;
- Emergency preparedness, including the planning process, handling logistics, DRR standard operating procedures, working with limited or damaged resources, management of evacuations and dispatching of casualties, principles of effective leadership in emergencies, and the functioning of DRR and health related support platforms (roles and responsibilities of different stakeholders, etc.);
- Maintenance of health care facilities;
- Rapid assessment of health needs, identification of health risks and safety issues such as monitoring and detecting potential communicable disease outbreak and application of suitable control measures;
- Access to early warning information and how to react to it;
- Principles of recording, reporting and Guidanceation during emergencies;
- Psychosocial reactions and therapeutic support including counseling;
- Environmental health including water and sanitation;
- Hospital preparedness;
- Nutritional programmes;
- Management of the dead and the missing;
- Access to resources; and
- SPHERE Standards.

A noteworthy capacity building practice being undertaken by the Ministry of Health, since before Cyclone Nargis, is the provision of basic DRR trainings for its personnel, with technical assistance from the Ministry of Social Welfare, Relief and Resettlement. However, the trainings are demand-based mainly due to the limited budget and a more permanent program should be pursued with support from international partners such as MERCY Malaysia, Cesvi, World Health Organization (WHO), Merlin, Care, Malteser, Amara, etc. The strengthened bonds between the Ministry of Health and its partners in Nargis recovery could provide greater access to international technical know-how can benefit the in-country health workers.

On the issue of psycho-social support, Myanmar Red Cross Society (MRCS) has been the lead player in providing in-house training for its staffs and red cross volunteers on psycho-social care. Further, UNDP, in partnership with Action Aid, is also tackling the issue by training monks, nuns, teachers and other leading community figures and representatives in addressing the issues of trauma. Under the UNDP's *'Early Recovery Program of Cyclone Nargis'*, 60 youths from five townships have been identified and trained in using theatre techniques for psycho-social support. 156 villages in 5 townships have profited from that activity and additionally, in 30 villages, information hubs that provide psycho-social support information were piloted⁶.

Capacity building of the public through awareness raising activities

Strengthening the ability of the local communities on DRR and health issues in emergencies should not just focus on helping them cope with immediate issues but also need to have a long term vision towards the community development as well. Besides, the community itself possess knowledge about its own needs and capabilities. Through carefully designed public awareness programs, where a focus on specific message is to be conveyed to the intended target audiences, following objectives should be aimed for.

- Conscious and informed community plays the part of quality controller for health services rendered;
- Change of attitude towards adoption of more hygienic life style.

Particularly in rural settings, public should be made aware of:

- Healthy eating and drinking practices;
- Basic hygiene practices;
- Basic information on communicable diseases and how to avoid them in time of crisis;
- Basic knowledge with regards to handling of dead bodies (to handle and dispose of dead bodies before any big response and relief programs could be launched).

A significant number of information, education and communication (IEC) materials have been developed and widely distributed in the Nargis response and recovery phases with subjects ranging from information on communicable diseases, healthy water drinking and sanitation practices and basic safety information with regards to various disasters. Existing initiatives can be expanded to other regions in the country: to selected hazard prone areas as pilot activities first. But, it has to be noted that the present IEC materials might need to be revised depending on the local needs and nature of hazards. Therefore, an initial study is to be conducted to determine the local requirements and existing knowledge base of the new pilot area. The Ministry of Health and its partner NGOs already have considerable experiences in public awareness raising activities and with national press, radio and television

⁶ Community Driven Recovery: Cyclone Nargis One Year On (2009) United Nations Development Programme.

media at its disposal, joint programs between MoH and its partners could effectively reach the populace.

3.4 Development of Disaster Preparedness and Response Plan for Rural Health Center

In order to ensure the smooth functioning of the rural health centers in the aftermath of a disaster, a multi-hazard disaster preparedness and response plan is a first step. A plan assist in prompt and effective emergency medical care to all who need it and the minimization of morbidity and mortality resulting from any disaster.

Especially in rural context, it is imperative that the preparedness plan of a health facility is coordinated or linked to community disaster preparedness plans. Giving the limited human resources available in rural health centers, it is not just the public who are relying on the health center and its services for their well being, the health personnel also depend on the public to keep the centre safe and running in time of crisis and to provide assistance for such functions as repair of health center in the aftermath of disasters. Thus, the mutual dependency has to be taken into account in developing the preparedness plan of the health center.

Suggested steps to be followed for such a task are discussed in detail below.

3.4.1 Formation of Plan Development Committee/ Team/ Task Force

Before the Disaster Preparedness and Response Plan is drawn, a committee/ team/ task force needs to be formed. The chief of the health center and other key responsible personnel, matron and key physicians/ specialists would be invited to be in the committee/ team/ task force. The representatives of the community too should be part of the committee/ team/ task force; in particular those responsible for local DRR or related functions. The main responsibility of the committee/ team/ task force is to draft the plan based on the description provided in section 3.5.2.

Box – 5 The key guiding principles for the development of a Hospital Disaster Preparedness and Response Plan

- *Predictable: The hospital disaster plan should have a predictable chain of management.*
- *Simple and Concise: The plan should be simple and operationally functional.*
- *Flexible: The plan should be executable for various forms and dimensions of different disasters.*
- *Anticipatory: All hospital plans should be made considering the worst case scenarios.*
- *Part of a Regional Health Plan in Disasters: A hospital cannot be a lone entity making its plans in isolation. The hospital plans have to be integrated with the regional Division/state/district/ township) plan for proper implementation.*

3.4.2 Preparing the Disaster Preparedness and Response Plan⁷

⁷ Hospital Disaster Plan, Wisconsin Department of Health Services.

The essential components of a Disaster Preparedness and Response Plan are described briefly below:

- Purpose of the plan
 - To identify Standard Operating Procedures (SOPs) for emergency activities and responses to both internal and external disaster situations that may affect staff, patients, visitors and the community;
 - To clearly define the responsibilities of individuals and units in the event of a disaster situation;
- Situations and assumptions contains information on various scenarios of emergency situations such as major disasters with mass casualties, major disasters with minimum casualties and also possible internal disasters such as fire at the health center. A short portrayal of Information on possible hazards in the vicinity of the hospital can be included here as well.
- Lines of authority identify the persons in charge at different levels. It can best be portrayed in a table format.
- Standard Operating Guidelines comprise of standard operating procedures categorized under:
 - Preparation of the facility to handle emergency situation: Various activities under each unit will be spelled out clearly – what needs to be done and who needs to do it. It will also include communication mechanism to be employed to ensure smooth flow of information. Main points of consideration are: internal communication that is the communication among different units (a person(s) can be assigned solely to relay the information from one unit to another) and external communication (to answer enquiries from outside. A qualified member of the community could help out in this position if all staffs are occupied). This section will also address modes of coordination between the health facilities and civil/government response agencies.
 - Provision of emergency operations and services: detailed tasks each individual; specifically the head of the health center, and each unit should focus on during emergency such as handling of seriously injured patients in the intensive care unit (registration, who to be given priority, how to get access to their previous medical record, keeping new records, etc.), handling of dead bodies (registration, identifying the body, etc.). Moreover, the section will also include means of resource mobilization both internally and externally. External resource mobilization should focus more on getting in touch with the office of the nearest health authorities and seeking help.
 - Evacuation plan: how to systematically proceed with the evacuation of patients, staffs, medical records and equipment, etc., to a safer location if the building is in jeopardy.
 - Provision of psychosocial care to the patients and their families as well as the employees of the health center.
- Plan development and maintenance provides detailed information on who is responsible for the development (in this case the Plan Development Committee/ Team/ Task Force), its time line and its maintenance, that is its periodic revision (Plan Development Committee/ Team/ Task Force can become the Plan Maintenance Committee/ Team/ Task Force).

As annexes, the Plan can include the community DRR plan if one exists, the architectural plan of the building, map of the surrounding area indicating designated safe areas and how to get to them, list of telephone numbers for emergency contacts such as nearest fire brigade. One additional issue to include in the Plan is the fire protection measures within the premise since fire is one of the most common disasters many communities faced in Myanmar. It can simply be installation of local fire-fighting equipment such as gunny bags, sand buckets, axe, hooks and flats, fire beater (fire swatter), buckets etc., and this can be part of the preparatory standard operating procedures.

• **Disposal of dead bodies in emergencies**

The disposal of dead bodies in emergency situations is very important as there can be many fatalities and the collection and disposal of bodies becomes an urgent need. Though it require a detailed planning however, key principles are as follows:

- Give priority to the living over the dead.
- Dispel fears about health risks posed by corpses.
- Identify and tag corpses.
- Provide appropriate mortuary services.
- Reject unceremonious and mass disposal of unidentified corpses.
- Respond to the wishes of the family.
- Respect cultural and religious observances.
- Proper use of protective equipment in handling dead bodies
- Educate the public with proper sanitation and provide basic public health services to prevent outbreak of communicable diseases

3.5 Mainstreaming Disaster Risk Reduction in other Health Related Sectors

3.5.1 WASH (Water Supply, Sanitation and Hygiene)

The rural population in Myanmar relies on water sources close to their living quarters such as village ponds or streams and rivers. In the rural villages, many people, significantly women and girls, spend considerable amount of time collecting and carrying water for the family from a far away sources. Due to various reasons, one of them being unsafe sanitary practices such as discharge of wastes directly into running water bodies, these water bodies could easily get contaminated. The danger is far greater in a disaster situation as the interruption of water and sanitation services, due to damages to the systems, can compromise the health and social well beings of the affected population. In temporary shelters and camps where over-crowding is a frequent problem, the risks of epidemic could easily be triggered by unfavorable or inadequate water and sanitation facilities, making already vulnerable conditions more life threatening.

Application of risk reduction strategies to reduce vulnerability in water and sanitation sector, therefore, is a must to protect the health of the communities under all circumstances and also to protect the investment made in installing the infrastructure however basic it may be. The objective of DRR in this case should be to ensure provision of minimum level of service in disaster situations. In any community, the sustainability of the water and sanitation services have to be viewed as public health interventions, fundamental to their future development.

Box - 6 Highlighting the Importance of water and sanitation Services in Emergency

During the emergency water and sanitation services are especially important for the following activities:

- **Medical attention for victims.** In hospitals and health centers, the continuity of a safe water supply is essential to providing medical care to the victims of a disaster. Even when a health facility has taken protective measures for the impact of a disaster, the quality of care it can provide will be limited if the public services of water and sewerage are interrupted.
- **Search and rescue activities.** The search and rescue teams need water not only for their own consumption, but sufficient quantities for the consumption and hygiene of the people they rescue.
- **Human consumption (drink and hygiene).** The services must ensure that there is safe and sufficient water for human consumption and personal hygiene, particularly for persons directly affected by the disaster.
- **Attention to populations in shelters.** Especially for victims who have lost their homes and are in overcrowded shelters, the provision of enough safe water for consumption and adequate sanitation facilities are fundamental for safeguarding their health.
- **Fire fighting during earthquakes.** Fires that occur after earthquakes cannot be extinguished without a reliable water source.
- **Cleaning.** Essential facilities such as hospitals and schools need to be cleaned before routine activities can resume, for which water is essential. Water is needed to clean houses and public spaces in general if they are to be fit for use.
- **Well-being.** The interruption of services has adverse effects on well-being, quality of life, and development of affected populations as well as those who are not directly affected. As mentioned earlier, lack of accessible water forces the population (especially women and children) to carry water. Many industries require continuous supplies of water to operate and produce goods and services.

Source: The Challenge in Disaster Reduction for the Water and Sanitation Sector: Improving Quality of Life

By Reducing Vulnerabilities (2006) PAHO, UNISDR, UNICEF and IFRC.

Key points of consideration in ensuring access to safe and adequate drinking water and sanitation facilities at all times are:

- In constructing water and sanitation facilities for rural health centers, to add hazard resistant features to water storage structure or sanitation facilities. For example, raising the elevations of latrines in flood prone region to prevent damage as well as possible contamination, building stronger walls, etc.
- Application of precautionary measures such as building water storage facilities at a safe distance from waste disposal systems, conducting thorough assessment of water quality in the area before declaring the water safe for consumption, promoting awareness of the community in building covered latrines, installation of durable and environmentally friendly water collection (rain water harvesting), distribution and waste disposal systems (using bamboo instead of plastic pipes for water distribution within the village), etc. Once the facilities are built, certain protective means as putting covers on water storage facilities and educating the public to drink only boiling water, etc, could be promoted. Regular assessments and monitoring of risks to the existing water and sanitation systems in place including periodic testing of drinking water sources for contamination. This could be carried out by the community in collaboration with local government authorities, NGOs and health institutions. The assessment should also include identifying structural weaknesses of the infrastructure and operational capacity of the local workforce to deliver the systems and services. If

any improvements are required, remedies should be quickly formulated and implemented not to let any disruption to the services.

- In emergency situations, whenever external assistance is required to resume the water and sanitation services within the community, minimum standards for water and sanitation aids established in SPHERE handbooks need to be strictly followed by the temporary service providers (mainly NGOs or UN agencies)
- Promoting habitual maintenance of built facilities through public awareness raising campaigns and education programs in the community.
- In planning and actual implementation of WASH projects, to encourage the active involvement of local community.

With the right combination of good surveillance system and timely actions, Health Sector Recovery of Nargis was able to prevent any major disease outbreak after the disaster. Jointly led by the Ministry of Health and World Health Organization (WHO), the Health Recovery Working Group introduced the Early Warning and Response System (EWARS) that successfully prevented outbreaks of any water-borne diseases in the affected areas. More information on EWARS is given in Annex 1.

Box – 7

Basic Indicators for Water during Emergencies and Disasters

Access to water and available amounts

- Average amount of water for drinking, cooking, and personal and domestic hygiene: 15 liters per person daily.
- Supply of water in health centers: 40-60 liters per patient per day.
- Maximum allowable distance between houses and water collection point: 500 meters.
- Water collection points should be maintained so that adequate amounts of water are consistently available.

Water quality

- New sources of water that must be used because of an emergency situation should contain no more than 10 fecal coli forms per 100 ml.
- Concentrations of residual chloride in piped water should be 0.2-0.4 milligrams per liter, and turbidity should be less than 5 NTU.
- Total solids dissolved in water should not exceed 1,000 milligrams per liter.

Source: The Sphere Humanitarian Charter and Minimum Standards in Disaster Response. Standard 1 on water supply: access to water and available quantities.

3.5.2 Food Security and Nutrition

As stated in SPHERE Handbook, “access to food and the maintenance of adequate nutritional status are critical determinants of people's survival in a disaster.” In rural areas, where food production of a nation usually takes place, the impacts of the disaster could cripple the manufacturing capacities greatly and the affect could have wide-spread repercussions. Nevertheless, it is crucial to recognize that food insecurity issues are usually the compound result of many factors: lack to access to or unavailability of a variety of food items, lack of income and lack of practice of healthy eating and wider macro-economic and socio-political factors influencing people's access to nutritionally adequate food⁸.

⁸ SPHERE Handbook 2004 Edition.

In post disaster times, malnutrition is one of the biggest concerns as the affected communities are struggling to regain their livelihoods and normalcy and at times end up not being able to get access to or afford to eat nourishing food. In Myanmar, PONJA identified food insecurity as one of the potential health hazards during the first few weeks of the Nargis disaster. The immediate response from response and relief agencies was the delivery of food items such as high energy biscuits in the most affected townships.

Disaster risk reduction in this sense is to reduce the health risks by means of monitoring the food insecurity information in affected areas and to raise the awareness of the community to increase the intakes of nutritious foods even with the limited budget. The first step is to carry out a rapid assessment of the general situation on the ground; directly talking to general population at risks or affected population after a disaster. Based on such factors as estimated population size, possible increases in illness and death, and information about water, sanitation, and food crops, the nutritional situation can be observed and projections made for implementation of preventive actions to protect against any future crisis.

Another area to look into is in the distribution of food aids to disaster affected communities. The most vulnerable groups of the population: namely infants, new born, elderly, pregnant women, physically and mentally challenged persons, should be identified as priority for food aid targeting. Cultural acceptability of the food ration also needs to be considered in determining the type of food aid.

Relating to food security problems in rural areas is the child mortality where food shortage in combination with other factors like poor WASH facilities and scarce health services could augment the risks of diseases. Poor nutritional status leads to lowered immunity and thus to increased morbidity from infectious diseases such as measles⁹. In addition to MoH and WHO, other child focused agencies like Save the Children and UNICEF also run child immunization programs in Myanmar but more vigorous awareness raising of parents are required in rural areas: considering the facts that rural areas do not have full access to electricity, messages disseminated through radio and TV media might not reach the rural population as quickly as it should. More innovative means of risk communication campaigns are called for such as community theatre and the distribution of leaflets and posters on the subject.

It is highly important that any nutritional interventions be designed and delivered in such a way as to avoid the community becoming dependent on the outside help. It should support local food production activities to resume as early as possible. Collaboration, in this case, between various sectors such as agriculture, planning, health, environment and DRR is vital to come up with sustainable food production methods. Longer term objectives such as boosting the local economy so as to improve the community's purchasing power of nutritious food and educating the community on the intake of nutrient balanced diets also are to be promoted simultaneously.

One way to effectively monitor the food security and nutrition issues over a specific vulnerable region is the implementation of early warning systems that necessitate close cooperation between health officials, local authorities and communities (in many cases also the NGOs) to observe and regularly report the situations on the ground. This requires training

⁹ Nutrition and Disaster Preparedness: Focusing on Vulnerability, Building Capacities (2006) Marion E Wright and Maija Vesala-Husemann

local health workers to carry out data collection periodically and experts on nutrition at the higher level to analyze and interpret the findings. The critical information has be timely and actionable: for health sector to take any necessary interventions and warnings disseminated to the community to get prepared and take actions. As mentioned before, the Early Warning and Reponse System (EWARS) of MoH-WHO in the Nargis relief and recovery phases proved that a system is already and further use could be built upon this.

SECTION IV

Creating an Enabling Environment for Safer Health Sector



Learning from and drawing on experiences from major crises in recent years in the region as well as in the country, investing in major efforts to integrate risk reduction into the health sector and to build capacity of all stakeholders to respond to health-related crises is important and Myanmar has to strive for. In creating a safer health sector in the country, due attention must be given to public health in all development and DRR plans, in order to mitigate the damage and loss (disruption of health services, damage to infrastructure, etc.) due to hazards. This chapter identifies the major aspects of creating such an environment to improve the safety of health sector in Myanmar, to enhance the effectiveness of responses to crises and to contribute to the rapid recovery of health systems.

4.1 Mainstreaming Disaster Risk Reduction in the Health Sector Development Plan

There is already precedence in Myanmar of DRR mainstreaming initiatives, many of them triggered by the Cyclone Nargis recovery. The Ministry of Health (MoH) has been working hand in hand with international and local NGOs in training its human resources on DRR and in the recovery phase of Cyclone Nargis, a lot of agencies opted for "build back better" approach for reconstruction and repairs of the health facilities in disaster affected areas and integrated hazard resilience features in the construction process. As these activities are coming to an end, it is important to Guidance it and replicate in future health facility construction with contextualization.

It is important to ensure mainstreaming of DRR in a comprehensive manner at national level Health Sector Development Plan. The inclusion of DRR in the National Health Sector Development Plan help in allocation of essential resources to employ safety features in health facilities. The proactive DRR initiatives affords the health sector to be saving as many lives as possible with limited or no interruption and the 'fully functioning health system positively impacts on the ability of a country to protect itself, and recover from disasters'¹⁰.

4.2 Development of National Guideline on Building Safer Health Facility

It is of utmost importance that the health facilities to should remain fully operational during and after a disaster so as to continue to provide healthcare services to the affected community. The structural viability of the building, in that case, plays a vital role. Cyclone Nargis recovery has already elicited a number of guidelines for safer health facility construction in the country by Ministry of Health, MERCY Malaysia, UN Agencies and other NGOs. Expanding this effort to national level is the logical next step, to promote adoption of safer construction practices all over the country. But in the development of the guidelines, equal emphasis should also be given to the functionality of the health facilities. Different perspectives of rural and urban health structures also should be highlighted and different design options have to be developed based on the geographical, cultural and social needs of specific regions. Under the leadership of the MoH, a Guideline development committee or task force can be constituted, comprising of experienced healthcare workers, planners, engineers, DRR and development practitioners from national and local NGOs.

4.3 Advocacy for Integrating Disaster Risk Reduction in Health Sector

In order for the DRR to be mainstreamed successfully at the national level plans and enforce the wide spread usage of safer health facility construction guidelines as discussed above, the commitment and support from the decision-makers at the higher level is important. A

¹⁰ Health and Disaster Risk Reduction: Policy Paper (2009) Merlin.

multi-disciplinary network of actors from health, public works and utilities, land planning and management, disaster risk reduction, development and finance should be constituted.

In order to achieve this goal, it is important to sensitize the policy makers and organizing high level meetings and conferences with well known key speakers from both international and national arena; who are familiar with and have extensive experiences in DRR mainstreaming into health sector will be helpful. Demonstrating the possibility of mainstreaming by showing examples of achievements in other countries of similar economic and social settings will be effective. As pointed out in WHO paper on "Disaster Risk Reduction and Preparedness of Health Facilities", the social benefits of a hospital that remains operational in the wake of a disaster is a far more powerful argument. Equally notable is the claim on economic perspective that investing a little extra in preventive measures can save a lot in the recovery and reconstruction phases. Once it is realized that disaster mitigation measures are both possible and affordable, the objective of "safe and resilient" hospitals, as an integral part of emergency preparedness, response, and recovery will be achieved.

4.4 Involving the Community

The mutual dependence of health sector and the community within which it exists are apparent. In the resource poor rural environment, the involvement of the community in DRR planning of health sector is more than necessary for several reasons: they hold the knowledge about their own environment and information on hazards; they are the first responders in any disaster situations and building their capacities in rapid response could save uncountable lives; they are the ones to help maintain any health facility within their community; they are the ones in control of their daily hygiene and other health related practices.

Thus, in promoting healthier eating and sanitation practices, in carrying out protection and maintenance works of physical health facilities and in responding to any threats to the community (particularly health related threats), there has to be strong and robust interaction between the community and the health sector. It is not just the health sector offering services to the community, the community's support, understanding and buy-in are just as imperative to create an enabling environment for safer health sector.

4.5 Facilitating the Professional Development of Basic Health Staff in Rural Area

One consistent problem the health sector faces is the problem of retaining basic health staff, particularly in remote rural areas. The conditions they have to function in rural health facilities are quite different from their counterparts in urban hospitals. The basic health staff in rural area have to carry out the clinical assessment and management without sophisticated tools and equipment, and at all times, they have to be constantly in touch with the communities and be understanding of their local needs. In these challenging circumstances, providing opportunities for continuous professional development of basic health staff in rural area is one way to attract and retain them.

There are strategic factors that have to be taken into account in designing long-term education and professional development programmes for the basic health staff in rural area.

- The programs need to be made accessible directly from rural areas.
- They need to include sufficient exposure to relevant specialist knowledge to help them gain access to wider scope of practices.

- They need to be linked to career incentives like job promotion based on merits and experiences in rural context.
- They need to consider development of professional networks of rural health workers throughout the country and include means of fostering professional networks/ interaction between rural and urban health workers.

Such programs commands cross-government coordination and commitment between various ministries which in undertaking activities such as health, social welfare, DRR, development, finance, etc., to ensure synergies and resource allocation. At a more formal level, the rural health workers could be encouraged and supported to continue pursuing their correspondent higher education degree (master, post graduate studies), particularly in conducting academic research that would draw attention to nuances of rural health issues.

4.6 Advancing the Application of Early Warning and Response Systems

To ensure an effective response to any health threats: disease outbreak, it has to be detected at the earliest possible moment. The use of Early Warning and Response Systems (EWARS) in Myanmar, although still in its early stage, has been successfully demonstrated by MoH and WHO during the Nargis relief and recovery operations. It makes use of the information fed directly from official sources at the ground level. Tested and proven, application of EWARS could also be expanded to other areas in the country such as the drought vulnerable areas where food security is a major concern for all humanitarian actors. The success of such extension entails mobilizing and harnessing necessary resources: financial resources to install essential monitoring tools (communication equipment for reporting), travelling and data collection and human resources who can perform the tasks of gathering and analyzing the data through professional trainings of existing health workers.

4.7 Building and Strengthening Inter-disciplinary Network

Building safer health system to reduce public health impacts of emergencies requires multi-sectoral outlook. The provision of quality and sustainable healthcare service is ultimately linked to the preparedness of other sectors like transport, land planning, public works, social welfare, fire services, law and order and infrastructure. Even in the case of purely health related crisis such as major epidemics and chemical spills, without the collective efforts of the above mentioned sectors, the required interventions would not be able to delivered to the affected population on time. Hence, strengthening the network across multi-sectoral stakeholders, at both national and local levels, would be instrumental in advocating for safer healthcare system in Myanmar. The networks could build upon the existing partnerships established under the Cyclone Nargis recovery programs¹¹. It could serve as the central information sharing platform for all its members, covering both government and non-government players, and could help identify and develop common services and approaches to DRR, leading to the implementation of joint initiatives to reduce exposure to future risks.

¹¹ Coordination structures exist at both national and local levels.

References

Post-Nargis Joint Assessment (2008) Tripartite Core Group (TCG).

<http://www.asean.org/21765.pdf>

Post Nargis Recovery and Preparedness Plan (PONREPP) (2008) Tripartite Core Group (TCG).

www.aseansec.org/CN-PONREPP.pdf

TCG Report. Post-Nargis Periodic Review I (2008) Tripartite Core Group (TCG).

<http://www.asean.org/22119.pdf>

TCG Report. Post-Nargis Periodic Review II (2009) Tripartite Core Group (TCG).
<http://www.asean.org/CN-TCG2.pdf>

Disaster Risk Reduction and Emergency Response for WASH: Reference Note (2009) Water Supply and Sanitation Collaborative Council (WSSCC). www.wsscc.org

Health and Disaster Risk Reduction: Policy Paper (2009) Merlin.

Safe Hospitals Checklist (2009) Pan-American Health Organization (PAHO).

Hospital Disaster Plan, Wisconsin Department of Health Services.
http://www.dhs.wisconsin.gov/rl_dsl/hospital/hospitaldisastrplng.htm

Community Driven Recovery: Cyclone Nargis One Year On (2009) United Nations Development Programme.
[http://www.reliefweb.int/rw/RWFiles2009.nsf/FilesByRWDocUnidFilename/VVOS-7VAK63-full_report.pdf/\\$File/full_report.pdf](http://www.reliefweb.int/rw/RWFiles2009.nsf/FilesByRWDocUnidFilename/VVOS-7VAK63-full_report.pdf/$File/full_report.pdf)

Hospitals Safe from Disasters: Reduce Risk, Protect Health Facilities, Save Lives. World Health Organization, Regional Office for South-East Asia (WHO-SEARO),
http://www.searo.who.int/LinkFiles/Hospitals_Safe_from_Disasters_SEARO_Safe_Hospitals_Brochure.pdf

Guidelines for vulnerability reduction in the design of new health facilities (2004) World Health Organization (WHO), Pan-American Health Organization (PAHO) and Prevention Consortium, the World Bank Group.

Disaster Risk Reduction and Preparedness for Health Facilities, World Health Organisation, Japan.

Protecting New Health Facilities from Natural Disasters: Guidelines for the Promotion of Disaster Mitigation (2003) Pan-American Health Organization (PAHO).
http://www.preventionweb.net/files/629_10343.pdf

Myanmar Live After Nargis (2009) Chachavalpongpun and Thuzar .
<http://www.preventionweb.net/english/professional/terminology/>

Institutional Arrangements for Disaster Management in Myanmar (2009), Asian Disaster Preparedness Center (ADPC).
<http://www.adpc.net/v2007/IKM/ONLINE%20GUIDANCES/downloads/2009/Institutional%20Arrangements%20for%20DM%20in%20Myanmar.pdf>

Increasing Access to Health Workers in Remote and Rural Areas through Improved Retention: Global Policy Recommendations (2010) World Health Organization
http://whqlibdoc.who.int/publications/2010/9789241564014_eng.pdf

Nutrition and Disaster Preparedness: Focusing on Vulnerability, Building Capacities (2006) Marion E Wright and Maija Vesala-Husemann
http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Volume112006/No3Sept06/tpc31_516086.aspx

Annex 1

Brief Summary of Cyclone Nargis Response and Recovery

The Cyclone Nargis caused widespread destruction to homes and critical infrastructure, including roads, jetties, water and sanitation systems, fuel supplies and electricity. The health sector was badly impacted. A large number of water supplies were contaminated and food stocks damaged or destroyed. The winds tore down trees and power lines, while the accompanying storm surge submerged countless villages. It led to near-total destruction of fields and shelter in areas that were directly hit by the cyclone, in addition to downed power and communication lines and other loss of infrastructure affecting a much bigger area.

Cyclone Nargis Response

The Government of Myanmar, Myanmar-based civil society organizations, private enterprises and individuals responded swiftly. The Natural Disaster Preparedness Central Committee (NDPCC) chaired by the Prime Minister led the response efforts by forming 10 Emergency Disaster Response Sub-committees. For close and effective supervision in undertaking relief and rehabilitation tasks in the townships within the storm-hit region, 12 ministers were assigned to the 12 most affected townships.

The emergency response by the United Nations and international NGOs was organized in terms of 12 clusters covering critical needs including health, nutrition, shelter, water, sanitation and hygiene, agriculture and logistics. ASEAN's regional response was in line with the spirit and purposes of the ASEAN Agreement on Disaster Management and Emergency Response. The Foreign Ministers of ASEAN countries set up the ASEAN Humanitarian Task Force for the victims of the Cyclone Nargis (AHTF), headed by ASEAN Secretary-General. Also, the Tripartite Core Group comprising the Government of Myanmar, ASEAN and the United Nations was constituted to coordinate the relief efforts. The people of Myanmar throughout the country gave generously to their less fortunate storm affected compatriots in cash and in kind. As per Post-Nargis Joint Assessment (PONJA) Report, the recorded contributions in cash and kind from Myanmar nationals reached a total of about USD11.86 million by 24 June 2008 and substantial contribution was also made anonymously and without registration anywhere.

The Post-Nargis Recovery Processes

National Reconstruction Plan: The Natural Disaster Preparedness Central Committee (NDPCC) issued '*Programme for Reconstruction of Cyclone Nargis Affected Areas and Implementation Plans for Preparedness and Protection from Future Natural Disasters*' on 15 August 2008. As per the plan though the Cyclone Nargis affected 47 townships (7 in the Ayeyarwady Division, and 40 in Yangon Division) but the damage was most severe in 10 townships, of which 7 are in Ayeyarwady Division, and 3 are in the Yangon Division. It spells out the Government's plans for recovery in three phases:

- The completion of emergency relief measures;
- Recovery, reconstruction and development measures and
- Measures for long-term preparedness and protection from natural disasters.

It explicitly references the aims of '*building back better*' to create more resilient and better conditions of life and livelihoods, with reliance placed on domestic resources and capacities while at the same time welcoming well coordinated external assistance in the form of finance, goods and services, technical know-how and expertise. The rehabilitation and

reconstruction tasks under the plan consist of three broad areas, namely the rebuilding of damaged or destroyed towns and villages, the rehabilitation and development of economic activities, and preparedness and protection from future natural disasters.

Post-Nargis Recovery and Preparedness Plan (PONREPP): The Tripartite Core Group (TCG) prepared the Post-Nargis Recovery and Preparedness Plan in December 2008 which outlines three-year strategy from 2009 through 2011 for consolidating progress and promoting durable recovery in the affected areas. It is a complimentary effort to the Government's reconstruction plan. The plan addresses operational programs across eight sectors namely Livelihoods, Shelter, Education, Health, Water/Sanitation, Disaster risk reduction, Environment and Protection under three chapters with a people centric vision: *Productive lives, Healthy lives* and *Protected lives*. The plan estimates need of 800 million USD for medium term needs in the light of likely abortive capacity limitation within three years.

Health Sector Recovery Initiatives

The above mentioned National Reconstruction Plan and PONREPP both provide strategic guidance for inclusion of DRR elements in health sector recovery program and lay the foundation for its integration into operational issues.

The Ministry of Health was the lead organization in health sector recovery and worked closely with the international organizations namely WHO, UNICEF, UNDP, UNFPA, JICA, OXFAM, Merlin, Marie Stope International and other health focused agencies, the partnership of which predated Nargis. The recovery objective of Health Technical Working Group was to improve the access to health care services amongst hard-to-reach populations in areas most affected by Cyclone Nargis with the expected outcomes of enhancing provision of, and access to quality basic maternal and child health care services (including nutrition and immunization) and psychosocial support to affected populations.

At the third Recovery Forum meeting held on 18 June 2010, following achievements were reported in health and WASH sectors under PONREPP:

- Over 930,000 patient consultations occurred and 27,800 children received treatment for or preventative care for malnutrition. 843 health facilities regularly supplied with drugs.
- A disease surveillance and early warning system was operational
- A large scale nutritional outreach, vaccination and public health response
- Early recovery and build back better planning for clinic reconstruction in line with MoH standards
- Reconstruction of Large numbers of RHCs and sub-RHCs with dual features enabling them to be used as Cyclone shelters
- Implementation of Health Sector Recovery plan agreed amongst all partners, endorsed by MoH, and being now implemented by agencies in coordination with MoH through a Pooled Fund.
- At least 106,000 households facing water shortages during two consecutive dry seasons were assisted with at least 3 litres of drinking water per day (agencies met the minimum standard of water distribution)
- Over 3,850 village ponds were repaired or newly constructed,
- Over 72,000 household school and rural health centre latrines constructed
- 1,500 new cement water storage tanks constructed

- Over 100,000 ceramic water filters were provided to household, schools and rural health centers for water treatment at point of consumption
- Over 600,000 water storage items (ceramic jars and plastic buckets) distributed to households
- Water purification items distributed benefiting at least 600,000 people

The recovery initiatives undertaken so far are summarized below.

- Construction of new health centers and reconstruction or retrofitting of damaged structures.
- Provision of technical services and advisories such as family planning, mobile clinic, mother group support on child nutrition, psychosocial support¹², counseling, support to women's health club discussion, etc.
- Distribution of IEC materials on diseases like malaria, HIV/AIDS, dengue, etc.
- Immunization service and Vaccine campaign.
- Organizing trainings to health workers and other emergency response/ rehabilitation coordinators and practitioners on communicable diseases, reproductive health, basic first aid refresher and multiplier courses¹³, psychosocial support, mental health care, voluntary health trainings and basic health education.
- Construction of piped water systems in Township urban areas and large communities.
- Construction and rehabilitation of ponds, wells and construction of large size tanks.
- Strengthening household water collection, storage and treatment.
- Distribution of aid materials such as safe delivery kite, hygiene kit, water purification tablets, mosquito net, new born kit, recreation kit, vitamins and other essential medicines.
- Distribution of food items to communities that are still facing food shortage problems.

Under the Government's Reconstruction Plan, it was identified 17 rural health centers and 119 sub rural health centres for reconstruction together with the need for upgrading and expansion of hospitals and clinics in Cyclone Nargis affected areas.

¹² The Ministry of Health in collaboration with WHO and other partner NGOs have been conducting trainings on psychosocial support for its health officers even before the Nargis incident, but the cyclone has placed the psychosocial concerns to the forefront. IOM, Action Aid, OXFAM, CARE and Myanmar Red Cross Society (MRCS) are particularly active in extending psychosocial programmes to the affected communities to help them cope with the loss and the associated trauma.

¹³ Mainly by Myanmar Red Cross Society together with French Red Cross

Annex 2

Background Information on the Ministry of Health, Government of Myanmar

The Ministry of Health is the nodal Ministry for Health facilities in Myanmar. It comprises (7) departments including Department of Health and Department of Medical Sciences, which are headed by the Director Generals like other departments. The Department of Health is responsible of providing health services and it has (11) Divisions namely Public Health, Planning, Administration, Medical Care, Food and Drug Administration, National Health Laboratory, Disease Control, Epidemiology, Occupational Health, Finance, Central Medical Store and Nursing. The Department of Medical Sciences is responsible for human resource development of health personnel.

Emergency Management Action Plan, Yangon General Hospital

The Yangon General Hospital has a 7-member Hospital Management Committee chaired by the Hospital Superintendent and other members including Medicine Professor, Surgery Professor, Professor of Clinical Supporting department (Radiology and Pathology), Deputy Medical Superintendent (Secretary), Administration Officer and Nursing Superintendent.

The Emergency Management Action Plan of Yangon General Hospital is in existence over 15 years and regularly updated. It is considered as the Model Plan by other hospitals of the country. The plan describes Emergency situation as a situation when more than 10 persons have been seriously injured and for 200-bed hospital the emergency can be declared when more than 3 are seriously injured. A 15-member Emergency Period Supervisory Committee has been constituted and composition is shown in Table below.

Table: Composition of Emergency Period Supervisory Committee

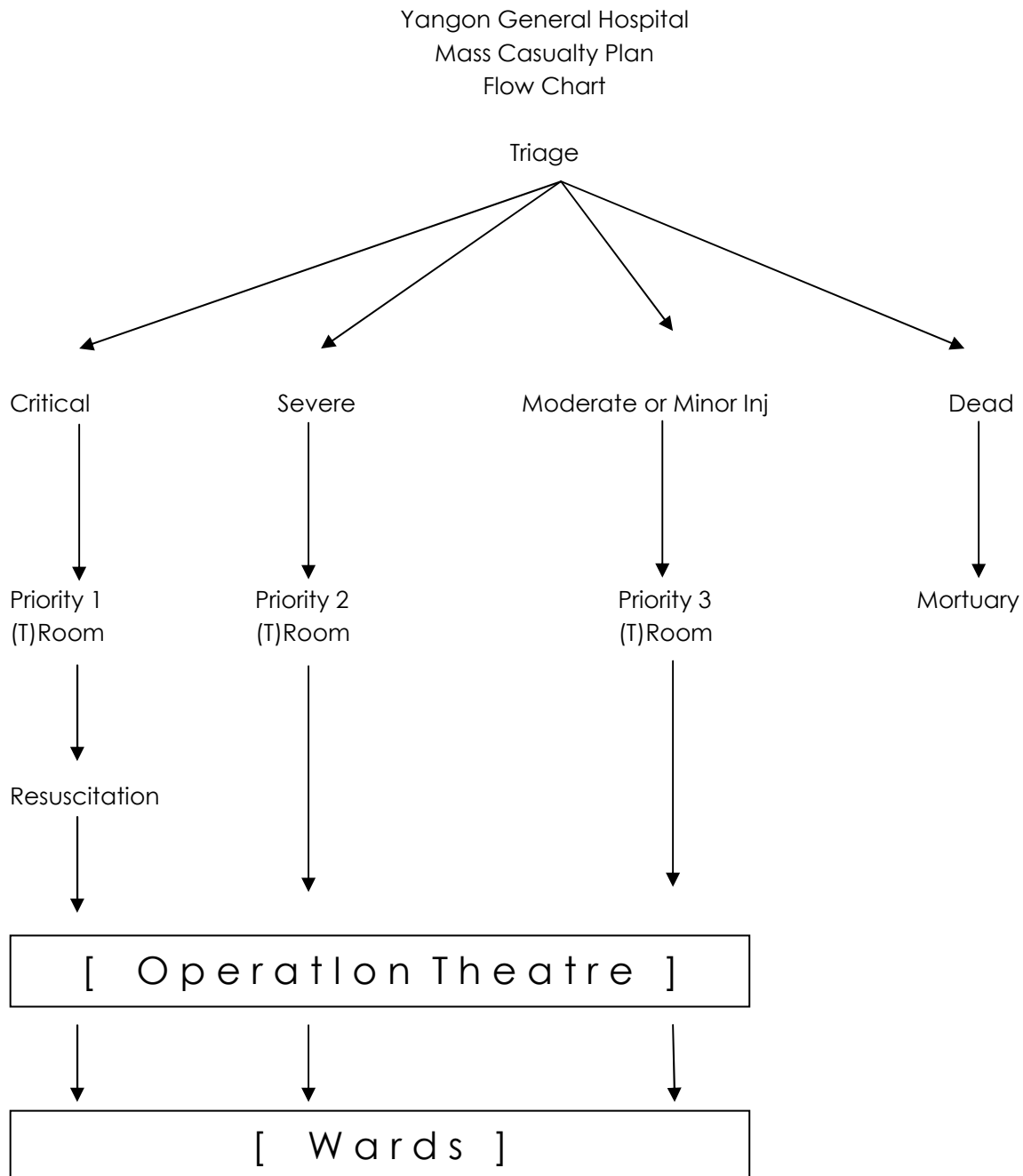
Sr. No.	Members
1.	Medical Superintendent (Command Control)
2.	Professor and Head of Orthopedic Department
3.	Professor and Head of Neurology Department
4.	Professor and Head of Surgery Department
5.	Professor and Head of Orthopedic Department
6.	Professor and Head of Medical Department
7.	Professor and Head of Anesthesia Department
8.	Professor and Head of Plastic Surgery and Maxillo Facial Department
9.	Professor and Head of Radiology Department
10.	Professor and Head of Pathology Department
11.	Professor and Head of Forensic Medical Department
12.	Deputy Medical Superintendent
13.	Assistant Medical Superintendent I
14.	Nursing Superintendent
15.	Assistant Director (Administration)

The roles and responsibilities of the committee are as follows:

- To prepare Mass Casualty Plan for response in emergency
- To share Mass Casualty Plan with other staffs (to make sure that the all concerned staff know their roles and responsibility and that the new staff should know the Plan)
- To maintain the human resources as well as medicine stock as per the Plan
- To review and update the Plan.

The Yangon General Hospital is part of the 'Network Hospitals' so that in case of mass casualty some patients can be shifted to other Network Hospitals. The New Yangon General Hospital and Institute of Medicine acts as back-up for the Yangon General Hospital under 'Network Hospitals'.

The hospital has constituted two mobile teams and each team comprises General Surgeon, Orthopedic Surgeon, Physician, Trained Nurse and Menial. The plan includes 'Triage' and the flowchart is mentioned below. The ward-wise mock drills have also been conducted to check preparedness and identify areas of improvement.



Annex 3

Safe Hospital Checklist

The following summarized checklist, adapted from the 'Safe Hospitals Checklist' of PAHO, can be utilized to analyze the safety standards of hospitals structurally and non-structurally.

Hospital Location

Location of the Hospital	Safety Level			
	No	Yes		
		Low	Average	High
1. Geological Phenomena				
Earthquake (historical events, proximity to fault lines, soil type)				
Volcanic eruption (proximity to volcano or volcanic activity)				
Landslide (proximity to hills and mountains, stability of slopes)				
Tsunami (historical events, proximity to sea)				
2. Hydro-meteorological Phenomena				
Hurricane/ Cyclone (historical events)				
Flooding (historical events, proximity to water bodies)				
Storm surge (historical events)				
Others (historical events)				
3. Environmental Sanitation Phenomena (at the hospital and its immediate surrounding area)				
Epidemics (historical events, capacity of hospital to handle such events)				
Contamination (historical events, capacity of hospital to handle such events)				
Infestation (historical events, capacity of hospital to handle such events)				
Others (historical events of any other kind, capacity of hospital to handle such events)				
4. Chemical and/or Technological Phenomana				
Explosion (existence of any potential explosive sources in and around hospital)				
Fire (historical events in and around hospital, any				

preparedness measures)				
Leak of hazardous materials (historical events in and around hospital, any preparedness measures)				
Others (historical events in and around hospital, any preparedness measures)				

Structural Safety of the Building

Structural Soundness of the Hospital Building	Safety Level		
	Low	Average	High
1. History of Facility Safety			
There has been prior structural damage to the hospital as a result of natural phenomena. <i>Low = Major damage; Average = Average/moderate damage; High = Minor damage.</i>			
Has the hospital been repaired or built using current safety standards? <i>Low = Standards not applied; Average = Standards partially applied; High = Standards fully applied</i>			
Has the hospital been remodelled or modified? <i>Low = Major remodelling or modifications have been carried out; Average = Average/moderate modifications; High = Minor changes</i>			
2. Safety of the Structural System and Type of Materials Used in the Building			
Construction quality <i>Low = Deterioration caused by weathering; cracks on the first floor; Average = Deterioration caused only by weathering; High = Good; no deterioration or cracks observed.</i>			
Condition of building materials <i>Low = Rust with flaking; cracks larger than 3mm; Average = Cracks between 1 and 3 mm; rust powder present; High = Cracks less than 1 mm; no rust.</i>			
Interaction of nonstructural elements with the structure <i>Low = Separation is less than 0.5% of the height of the shorter building; Average = Separation is 0.5%–1.5% of the height of the shorter building. High = Separation is more than 1.5% of the height of the shorter building.</i>			
Proximity of buildings (hazards of pounding, wind tunnel effects, fires, etc.) <i>Low = Separation is less than 0.5% of the height of the shorter of two adjacent buildings; Average = Separation is between 0.5% and 1.5% of the height of the shorter of two adjacent buildings; High = Separation is more than 1.5% of the height of the shorter of two adjacent buildings.</i>			
Structural redundancy <i>Low = Less than three lines of resistance in each direction; Average = Three lines of resistance in each direction or lines without orthogonal orientation; High = More than three lines of resistance in</i>			

each orthogonal direction of the building.			
Structural detailing including connections <i>Low = Built before the 1970s; Average = Built in the 1970s or 1980s; High = Built in the 1990s or later</i>			
Safety of foundations <i>Low = Information is lacking; foundation depth is less than 1.5 m; Average = Plans and soil analysis are lacking; foundation depth is more than 1.5 m; High = Plans, soil studies are available; foundation depth is more than 1.5 m.</i>			
Irregularities in the plan (rigidity, mass, and resistance) <i>Low = Shapes are irregular and structure is not uniform; Average = Shapes are irregular but structure is uniform; High = Shapes are regular and structure has uniform plan.</i>			
Irregularities in elevation (rigidity, mass, and resistance) <i>Low = Stories with different heights, discontinuous, irregular elements; Average = Stories with similar heights (they do not differ by more than 20%); there are no discontinuous or irregular elements. High = Stories of similar height (they do not differ by more than 20%); there are no discontinuous or irregular elements.</i>			
Structural adaptation to various phenomena (meteorological, geological, among others)			

Elements Related to Non-structural Safety

Non-structural Safety	Safety Level		
	Low	Average	High
1. Critical Systems			
1.1 Electrical System			
Generator has capacity to meet 100% of demand. <i>Low = 0–30%; Average = 31–70%; High = 71–100%</i>			
Generator protected from damage due to natural phenomena <i>Low = No; Average = Partially; High = Yes.</i>			
Safety of electrical cables <i>Low = No; Average = Partially; High = Yes.</i>			
Lighting system for critical areas of the hospital <i>Low = No; Average = Partially; High = Yes</i>			
1.2 Telecommunication System			
Technical condition of antennas and antenna bracing <i>Low = Poor; Average = Satisfactory; High = Good.</i>			
Technical condition of anchors and braces for equipment and cables <i>Low = Poor; Average = Satisfactory; High = Good.</i>			
Site has adequate conditions for telecommunications systems. <i>Low = Poor; Average = Satisfactory; High = Good</i>			
1.3 Water Supply System			

<p>Water tank has sufficient reserve to provide at least 300 litres daily per bed for 72 hours</p> <p><i>Low = Sufficient for 24 hours or less; Average = Sufficient for more than 24 hours but less than 72 hours; High = Guaranteed to cover at least 72 hours.</i></p>			
<p>Water storage tanks are in protected site</p> <p><i>Low = The site is susceptible to structural or nonstructural failure; Average = Failure would not cause collapse of structure; High = Low possibility of functional failure.</i></p>			
<p>Safety of water distribution system (valves, pipes, connections)</p> <p><i>Low = Less than 60% are in good operational condition; Average = between 60% and 80% are in good condition; High = Above 80% are in good condition.</i></p>			
<p>Supplementary pumping system</p> <p><i>Low = There is no back-up pump and operational capacity does not meet daily demand; Average = All pumps are in satisfactory condition; High = All pumps and back-up systems are operational.</i></p>			
1.4 Fuel Storage (gas, diesel)			
<p>Fuel tanks have at least 5-day capacity</p> <p><i>Low = Less than 3-day capacity; Average = 3- to 5-day capacity; High = Capacity for 5 or more days.</i></p>			
<p>Fuel storage is accessible and in secure location</p> <p><i>Low = There is a risk of failure or tanks are not accessible; Average = One of the two conditions have been met; High = The fuel storage tanks are accessible and they are located in a secure site.</i></p>			
<p>Safety of the fuel distribution system (valves, pipes, and connections)</p> <p><i>Low = Less than 60% of system is in good operational condition; Average = between 60% and 80% of system is in good operational condition; High = More than 80% of system is in good operational condition.</i></p>			
1.2 Medical Gases (oxygen, nitrogen, etc.)			
<p>Anchors for tanks, cylinders, and related equipment</p> <p><i>Low = Anchors are lacking; Average = Quality of anchors is inadequate; High = Anchors are of good quality.</i></p>			
<p>Protection of medical gas tanks and/or cylinders and related equipment</p> <p><i>Low = No areas used exclusively for this equipment AND no qualified personnel to operate it; Average = Areas exclusively for this equipment OR it is operated by qualified personnel; High = There are areas used exclusively for this equipment AND it is operated by qualified personnel.</i></p>			
<p>Adequate storage areas</p> <p><i>Low = There are no areas reserved for storage of medical gases; Average = Areas reserved for storage but in hazardous location; High = Sites are accessible and do not present hazards</i></p>			
2. Heating, Ventilation and Air-conditioning System in Critical Areas			
<p>Adequate bracing for ducts and review of flexibility of the</p>			

ducts and piping that cross expansion joints <i>Low = Poor; Average = Satisfactory; High = Good.</i>			
Operational condition of equipment (boiler, air-conditioning systems, exhaust, etc.) <i>Low = Poor; Average = Satisfactory; High = Good.</i>			
3. Office and Storeroom Furnishings and Equipment			
Anchors for shelving and shelf contents secured <i>Low = Poor; Average = Satisfactory; High = Good.</i>			
Safety of computers and printers <i>Low = Poor; Average = Satisfactory; High = Good.</i>			
Condition of office furnishings and other equipment <i>Low = Poor; Average = Satisfactory; High = Good.</i>			
4. Medical and Laboratory Equipment and Supplies used for Safety Level Diagnosis and Treatment			
Fixed (secured and locked) medical equipment in surgery theatres and recovery rooms <i>Low = The equipment is in poor condition or it is not secured; Average = The equipment is in fair condition or not properly secured; High = Equipment is in good condition and is secured.</i>			
Condition and safety of laboratory equipment <i>Low = The equipment is in poor condition or it is not secured; Average = The equipment is in fair condition or not properly secured; High = Equipment is in good condition and is secured.</i>			
Condition and safety of medical equipment in emergency room <i>Low = The equipment is in poor condition or it is not secured; Average = The equipment is in fair condition or not properly secured; High = Equipment is in good condition and is secured.</i>			
Condition and safety of medical equipment in intensive care unit <i>Low = The equipment is in poor condition or it is not secured; Average = The equipment is in fair condition or not properly secured; High = Equipment is in good condition and is secured.</i>			
Condition and safety of medical equipment in the pharmacy <i>Low = The equipment is in poor condition or it is not secured; Average = The equipment is in fair condition or not properly secured; High = Equipment is in good condition and is secured.</i>			
Condition and safety of medical equipment in other services <i>Low = More than 20% of the essential equipment for a system's operation is at risk of material or functional failure and/or if nonessential equipment puts the entire service's operation at direct or indirect risk; Average = Neither "Low" nor "High"; High = 100% of the essential equipment and at least 80% of the nonessential equipment is secured.</i>			
5. Architectural Elements			
Condition and safety of doors and entrances			

<p>Low = Damage to doors and/or entrances will impede their performance and that of other components, systems, or operations; Average = Damage to doors and/or entrances will not impede the performance of other components, systems, or operations; High = Doors and/or entrances will suffer no or slight damage, and this damage will not impede their performance or that of other components, systems, or operations.</p>			
<p>Condition and safety of windows and shutters Low = Damage to windows will impede the performance of other components, systems, or operations; Average = Damage to windows will not impede their performance; High = Slight damage to windows will not impede their performance or that of other components, systems, or operations.</p>			
<p>Condition and safety of other elements of the building envelope Low = Damage to element will impede the performance of other components, systems, or operations; Average = Damage to element will not impede its performance; High = No or slight damage to element will not impede its performance or that of other components, systems, or operations.</p>			
<p>Condition and safety of roofing Low = Damage to roofing will impede the performance of other components, systems, or operations; Average = Damage to roofing will not impede its performance; High = No or slight damage will not impede its performance or that of other components, systems, or operations.</p>			
<p>Condition and safety of railings/parapets Low = Damage to railings will impede the performance of other components, systems, or operations; Average = Damage to railings will not impede its performance; High = No or slight damage to railing will not impede its performance or that of other components, systems, or operations.</p>			
<p>Condition and safety of perimeter walls Low = Damage to walls will impede the performance of other components, systems, or operations; Average = Damage to walls will not impede their performance; High = No or slight damage to walls will not impede their performance or that of other components, systems, or operations.</p>			
<p>Condition and safety of other outside elements (cornices, ornaments, etc.) Low = Damage to element will impede the performance of other components, systems, or operations; Average = Damage to element will not impede its performance; High = When element suffers no or slight damage it will not impede its performance or that of other components, systems, or operations.</p>			
<p>Safe conditions for movement of patients, personnel, and others, and hospital vehicles outside of building Low = Damages to structure or road and walkways will impede access to buildings or endanger pedestrians; Average = Damages to structure or road and walkways will not impede pedestrian and hospital vehicle traffic; High = No</p>			

or slight damage to structure or road and walkways; this will not impede pedestrian or hospital vehicle access.			
Safe conditions for movement of patients, personnel, and others inside the building (corridors, stairs, elevators, etc.) Low = Damage to element will impede the performance of other components, systems, or operations; Average = Damage to element will not impede its performance; High = When element suffers no or slight damage, and it will not impede its performance or that of other components, systems, or operations.			
Condition and safety of internal walls and partitions Low = Damage to elements will impede the performance of other components, systems, or operations; Average = Damage to elements will not impede their performance; High = No or slight damage to elements will not impede their performance or that of other components, systems, or operations.			
Condition and safety of lighting system Low = Damage to element will impede the performance of other components, systems, or operations; Average = Damage to element will not impede its performance; High = No or slight damage will not impede its performance or that of other components, systems, or operations.			
Condition and safety of elevator system Low = Damage to element will impede the performance of other components, systems, or operations; Average = Damage to element will not impede its performance; High = No or slight damage will not impede its performance or that of other components, systems, or operations.			
Condition and safety of stairways Low = Damage to element will impede the performance of other components, systems, or operations; Average = Damage to element will not impede their performance; High = No or slight damage will not impede its performance or that of other components, systems, or operations.			
Condition and safety of floor coverings Low = Damage to element will impede the performance of other components, systems, or operations; Average = Damage to element will not impede its performance; High = No or slight damage will not impede its performance performance or that of other components, systems, or operations.			
Hospital access Low = Damage to element will impede the performance of other components, systems, or operations; Average = Damage to element will not impede its performance; High = No or slight damage will not impede its performance or that of other components, systems, or operations.			

Security aspects of a hospital's functional capacity

1. Organization of the Hospital Disaster Committee and the Level of Organization Emergency Operations Center	Level of organization		
	Low	Average	High
Committee has been formally established to respond to			

major emergencies or disasters <i>Low = Non-existent; Average = Exists; High = Exists and is functioning.</i>			
The Committee's membership is multi-disciplinary <i>Low = 0–3 disciplines represented; Average = 4–5 disciplines represented; High = 6 or more disciplines represented (e.g., hospital director, nursing director, maintenance engineer, chief of emergency unit, chief of medicine, chief of surgery, chief of laboratory and support services, among others).</i>			
Each member has specific responsibilities <i>Low = Responsibilities not assigned; Average = Responsibilities have been officially assigned; High = All members know their responsibilities.</i>			
The hospital has an Emergency Operations Centre (EOC) <i>Low = Nonexistent; Average = Room has been officially assigned; High = EOC exists and is operational.</i>			
The EOC is in a protected and safe location <i>Low = The room is not in a safe location; Average = The location is safe and protected; High =The EOC is safe, protected and easily accessible.</i>			
The EOC has a computer system and computers <i>Low = No; Average =Partially; High = The EOC has all computer system requirements.</i>			
Both internal and external communication systems in the EOC operate correctly. <i>Low = Does not function/ nonexistent; Average = Partially operational; High = Complete and functional.</i>			
The EOC has adequate equipment and furnishings <i>Low = Absent; Average = To some extent; High = Present.</i>			
An up-to-date telephone directory is available in the EOC <i>Low = No; Average = Directory exists but is not up-to-date; High = Available and current.</i>			
2. Operational plan for internal or external disasters	Level of completion		
	Low	Average	High
The plan specifies actions to be taken before, during, and after a disaster in hospital's essential services (emergency room, intensive care unit, disinfection and sterilization unit, surgery, among others). <i>Low = Plan does not exist or exists only as a Guidance; Average = Plan existsand personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i>			
There are procedures for how, when, and by whom the plan is activated/deactivated. <i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i>			
Plan includes procedures for contracting personnel and for			

<p>procurements in case of disaster.</p> <p><i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained in procedures; High = Plan exists, personnel have been trained, and resources are in place to carry out the procedures.</i></p>			
<p>Hospital has a specific budget for use in disaster situations.</p> <p><i>Low = Not budgeted; Average = Covers less than 72 hours; High = Guaranteed for 72 hours or more.</i></p>			
<p>Plan include and specify the physical space that can be equipped to treat mass casualties.</p> <p><i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out expansion of space.</i></p>			
<p>The plan specify the places and personnel responsible for carrying out triage.</p> <p><i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out triage.</i></p>			
<p>The plan include the approach to and actions needed to expand hospital services.</p> <p><i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>Regular safety inspections are conducted by the appropriate authority</p> <p><i>Low = Inspections do not occur; Average = Partial or outdated inspection; High = Inspections are complete and up-to-date.</i></p>			
<p>Hospital's Epidemiologic Surveillance Committee has specific procedures for disaster incidents or treatment of mass casualties.</p> <p><i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>Procedures for preparing sites for temporary placement of dead bodies and for forensic medicine</p> <p><i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>Procedures for triage, resuscitation, stabilization, and treatment</p> <p><i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan</i></p>			
<p>The plan provides for ambulances and official vehicles for</p>			

<p>the hospital. <i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>Food rations for hospital staff during the emergency <i>Low = Nonexistent; Average = Covers less than 72 hours; High = Guaranteed for at least 72 hours.</i></p>			
<p>The plan specifies the duties for personnel called up during an emergency <i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>There are written arrangements regarding cooperation between the hospital and community authorities. <i>Low = No arrangements exist; Average = Cooperative arrangements exist but are not operational; High = cooperative arrangements exist and are operational.</i></p>			
<p>The plan has specific forms that facilitate the listing of patients during emergencies. <i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>Procedures for communicating with the public and media <i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>Procedures for response during evening, weekend, and holiday shifts <i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>Simulation exercises and drills <i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>3. Contingency plans for medical treatment during different types of disasters</p>	<p>Level of implementation</p>		
	<p>Low</p>	<p>Average</p>	<p>High</p>
<p>Tsunamis, volcanoes and landslides <i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>Floods and hurricanes <i>Low = Plan does not exist or exists only as a Guidance; Average =</i></p>			

Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.			
Fires and explosions Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.			
Chemical accidents Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.			
Pathogens with epidemic potential Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.			
Psycho-social treatment for patients, families, and health workers Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.			
Control of infections acquired during hospitalization Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.			
4. Plans for the operation, preventive maintenance and restoration of critical services	Level of availability		
	Low	Average	High
Operation manuals for electric power supply and back-up generators Low = Guidance and plans do not exist; Average = Guidance and plan exist and personnel have been trained; High = Guidance and plan exist, personnel have been trained, and resources are in place to restore electric power.			
Operation manual for drinking water supply Low = Guidance and plans do not exist; Average = Guidance and plan exist and personnel have been trained; High = Guidance and plan exist, personnel have been trained, and resources are in place to restore water supply.			
Operation manual for fuel reserves Low = Guidance and plans do not exist; Average = Guidance and plan exist and personnel have been trained; High = Guidance and plan exist, personnel have been trained, and resources are in place to restore fuel supplies.			
Operation manual for supply of medical gases Low = Guidance and plans do not exist; Average = Guidance and plan exist and personnel have been trained; High = Guidance and plan exist, personnel have been trained, and resources are in place to restore medical gas systems.			

<p>Operation manual for standard and back-up communications systems</p> <p><i>Low = Guidance and plans do not exist; Average = Guidance and plan exist and personnel have been trained; High = Guidance and plan exist, personnel have been trained, and resources are in place to restore communications system.</i></p>			
<p>Maintenance of Wastewater systems</p> <p><i>Low = Plan does not exist or exists only as a Guidance; Average = Plan exists and personnel have been trained; High = Plan exists, personnel have been trained, and resources are in place to carry out the plan.</i></p>			
<p>Maintenance manual for solid waste management</p> <p><i>Low = Guidance and plans do not exist; Average = Guidance and plan exist and personnel have been trained; High = Guidance and plan exist, personnel have been trained, and resources are in place to restore solid waste management.</i></p>			
<p>Maintenance of the fire suppression system</p> <p><i>Low = Guidance and plans do not exist; Average = Guidance and plan exist and personnel have been trained; High = Guidance and plan exist, personnel have been trained, and resources are in place to restore the fire suppression system.</i></p>			
<p>5. Available of medicines, supplies, instruments and other equipment for use in emergency</p>	<p>Level of Availability</p>		
	<p>Low</p>	<p>Average</p>	<p>High</p>
<p>Medicines</p> <p><i>Low = Nonexistent; Average = Availability covers less than 72 hours; High = Availability guaranteed for at least 72 hours.</i></p>			
<p>Items for treatment and other supplies (sterilized materials for use in an emergency)</p> <p><i>Low = Nonexistent; Average = Supply covers less than 72 hours; High = Supply guaranteed for at least 72 hours.</i></p>			
<p>Instruments</p> <p><i>Low = Nonexistent; Average = Supply covers less than 72 hours; High = Supply guaranteed for at least 72 hours.</i></p>			
<p>Medical gases</p> <p><i>Low = Nonexistent; Average = Supply covers less than 72 hours; High = Supply guaranteed for at least 72 hours.</i></p>			
<p>Electro-medical equipment</p> <p><i>Low = Nonexistent; Average = Supply covers less than 72 hours; High = Supply guaranteed for at least 72 hours.</i></p>			
<p>Life-support equipment</p> <p><i>Low = Nonexistent; Average = Supply covers less than 72 hours; High = Supply guaranteed for at least 72 hours.</i></p>			
<p>Triage tags and other equipment for managing mass casualties</p> <p><i>Low = Nonexistent; Average = Supply covers less than 72 hours; High = Supply guaranteed for at least 72 hours.</i></p>			

Personal protection equipment for epidemics (disposable) for hospital staff <i>Low = Nonexistent; Average = Supply covers less than 72 hours; High = Supply guaranteed for at least 72 hours.</i>			
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Annex 4

Stakeholders and their Role in Safe Hospital Advocacy

Stakeholders	Roles
Governments	<ul style="list-style-type: none"> • Take a leadership position — make this a national priority • Create a framework in which all sectors and government levels can help make hospitals and health facilities resistant to natural hazards • Draft, pass and enforce legislation in particular building codes that protect hospitals
UN, international and regional agencies and NGOs	<ul style="list-style-type: none"> • Build on existing inter-agency mechanisms and strategic partnerships • Highlight this cross-cutting issue on the agenda of agency or regional meetings • Collect, share and disseminate good practices
Health institutions and the health workforce	<ul style="list-style-type: none"> • Participate in National Platforms for Disaster Risk Reduction • Become agents of disaster risk reduction • Seek opportunities to update skills and knowledge • Conduct media events in and outside of hospitals and health facilities
The donor community	<ul style="list-style-type: none"> • Consider how donor-funded development projects can contribute to achieving the goal of hospitals safe from disasters • Look for ways to mainstream health sector risk reduction into project design • Make “hospitals safe from disasters” a component of the larger disaster and development portfolio
Financial institution	<ul style="list-style-type: none"> • Propose that all health construction projects have incorporated risk reduction measures • Promote research and studies from an economic point of view • Solicit government enforcement of existing legislation on building codes
Universities, schools and professional associations	<ul style="list-style-type: none"> • Develop modules or courses that contribute to hospital safety into university and professional curricula • Review and make changes to existing school and university • Act as repositories of specialized expertise • Encourage innovations and cutting-edge designs • Publish articles for scientific and technical publications and Journals • Contribute to the development and periodic review of national building standards

Source: 2008-2009 World Disaster Reduction Campaign, Hospital Safe from Disasters. WHO.

Annex 5

Hospital Evacuation Plans and Guidelines According to International Best Practices

I. Purpose:

Evacuation - the removal of patients, staff and/or visitors in response to a situation which renders any medical facility unsafe for occupancy or prevents the delivery of necessary patient care.

II. Policy Statement:

- Partial Evacuation - patients are transferred within the hospital. There are two levels of a partial response:
 1. Horizontal - first response; patient movement occurs horizontally to one side of a set of fire barrier doors.
 2. Vertical - movement of patients to a safe area on another floor or outside the building.

This type of evacuation is more difficult due to stairways which will require carrying of non-ambulatory patients; elevators cannot be used.

- Full Evacuation - patients are transferred from Hospital to an outside area, other hospitals, or other alternatives areas
 1. Paramedic escorted patients will be diverted from the Emergency Department due to internal disruption.
 2. The building should be evacuated from the top down as evacuation at lower levels can be easily accelerated if the danger increases rapidly.

III. Responsibility:

- Authorization for Evacuation -
 - a) Evacuation of the facility or portion thereof can only be authorized by:
 - Public Safety Officer (Fire or Police)
 - Chief Executive Officer or Administrator on call
 - Nursing Supervisor
 - b) The decision to evacuate from unsafe or damaged areas shall be based on the following information:
 - The Engineering Department's evaluation of the utilities and/or structure of the department.
 - The medical staff and/or Nursing Department's determination whether adequate patient care can continue.
 - Evacuation should only be attempted when you are certain the area chosen for the evacuees is safer than the area you are leaving.
- Communication of Evacuation –
 - a. This evacuation plan is based on the premise that an event has occurred, causing the Hospital to be in an internal disaster mode

IV. Procedure:

- a. General Instructions-
 1. Evacuate most hazardous areas first (those closest to danger or farthest from exit).
 2. Use nearest or safest appropriate exit. Sequence of evacuation should be:

- a. Patients in immediate danger
 - b. Ambulatory patients
 - c. Semi-ambulatory patients
 - d. Non-ambulatory patients
3. Close all doors. If time permits, shut off oxygen, water, light and gas, if able.
 4. Elevators may be used, except during a fire or after an earth quake

b Hospital Emergency Incident Command Structure: -

1. Emergency Incident Command (in the Command Center/EOC)

- All available information shall be evaluated and evacuation schedule established in coordination with the Section Chiefs. This information shall include:
 - i. Structural, non-structural, and utility evaluation from Engineering/Damage Assessment & Control Officer.
 - ii. Patient status reports from Planning Section Chief.
 - iii. Evaluate manpower levels and authorize activation of staff call-in plans, as needed.
- Disaster evacuation schedule to:
 - i. Planning Section Chief
 - ii. Liaison Officer
 - iii. Safety and Security Officer
 - iv. Logistics Chief
 - v. Operations Chief

2. Liaison Officer

- Maintain contact with Public Safety Officials, Health Dept. and Ambulance Agency.
- Complete "Hospital Evacuation Worksheet"

3. Logistics Chief

- Assign Transportation Officer to assemble evacuation teams from Labor Pool.
- Notify Planning Section Chief of plans.

4. Transportation Officer

- Assemble evacuation teams from Labor Pool.
- Ensure coordination of off-campus patient transportation
- Confirm implementation of Transportation Action Plan.
- If able, assign six people to each floor for evacuation manpower.
- Brief team members on evacuation techniques, (attached)
- Arrange transportation devices (wheelchairs, gurneys, etc. to be delivered to assist in evacuation).
- Report to floor being evacuated and supervise evacuation.
- Report to Nurse Manager/Charge Nurse for order of patients being evacuated and method of evacuation.

5. Nursing Service Officer

- Designate holding areas for critical, semi-critical, and ambulatory evacuated patients.
- Organize efforts to meet medical care needs and physicians staffing of Evacuation Holding areas.
- Distribute evacuation schedule to Nurse Managers.

- Verify Nurse Managers/Charge Nurses have initiated evacuation procedure.
- Request Medical Staff Officer to notify physicians of need for transfer orders.
- Assign Holding Area Coordinators, and adequate number of nurses to holding areas.
- Contact pre-established lists of hospitals, extended care facilities, school, etc. to determine places to relocate patients. Forward responses to Planning Section Chief.

6. Medical Staff Officer

- Notify physicians of need for patient transfer orders.
- Assist Nursing Service Officer as needed.

7. Nurse Managers or Charge Nurses

- Determine patient status. Patients will be evacuated according to status.
- Communicate status with large sticker on patient's chart according to the following criteria:
 - i) non-critical/Ambulatory
 - ii) non-critical/Non-ambulatory
 - iii) critical/requires ventilation or special equipment
- c. Report patient status to Nursing Service Officer.
- d. Assign specific nurses to maintain patient care.
- e. Assign two nurses to prepare patients for evacuation.
 - Place personal belongings in a bag labeled "BELONGINGS" with name Patient No. with medications, prosthetics, and special Patient need items the inside bag.
 - Place KARDEX and addressograph in Patient's chart secured with tape, which is to remain with the patient.
- f. Designate a safe exit after determining location of patients to be evacuated.
- g. Assign a person to record Evacuation Activity, including:
 - Time of evacuation
 - Method of evacuation
 - Name of patient
 - Evacuation status A B C
 - Evacuated from Rm. to (area)
- h. Forward documentation of evacuation and patient disposition to Patient Tracking Coordinator or Patient Info Manager.

8. Patient Information Manager

- Compile patient info on Inquiry Sheets.

9. Cardiopulmonary Services Manager

- Assign staff members to perform ventilation on required patients.
- Assess number of positive pressure breathing devices/bag-valve-masks available

10. Safety and Security Officer

- If able, assign a security person to each area being evacuated for traffic control/safety.
- Turn off oxygen, lights, etc. as situation demands.
- Check the complete evacuation has taken place and that no patients/staff remain.
- Place "Evacuated at " (date/time) sign up at main area exit/entrance of evacuated area after evacuation is complete.

11. Facilities Operation Officer

- Obtain equipment/supplies needed for structural safety during evacuation.
- Obtain portable toilets and privacy screens for use in areas where evacuated patients

are relocated, if necessary.

12. Labor Pool Officer

- All available Engineering, Housekeeping, Security staff, etc. not previously assigned to incident will assist in the movement of patients.

(Source: Guideline for Hospital Emergency Preparedness Planning, UNDP, India)

Guidance on
Mainstreaming Disaster Risk Reduction
in the Health Sector, Myanmar - Rural Settings



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