World Health Organization

A Mass Casualty Management Trainer's Manual

Kathmandu, Nepal
January 2006

His Majesty's Government Nepal
Ministry of Health and Population
Department of Health Services
Epidemiology and Disease Control Division

Photographs by:
Mr. Erik Kjaergaard WHO / EDCD &
Ms. Trine Ladegaard WHO / EDCD

Preface

Foreword

Contents

1. Introduction

The Ministry of Health and Population (MOHP) in collaboration with the World Health Organisation (WHO) has given priority to an emergency preparedness and disaster response programme within the health sector in Nepal. The programme is coordinated through the Disaster Health Working Group and implemented in collaboration with the Epidemiology & Disease Control Division (EDCD) of the Department of Health Services.

One of the priority areas for EDCD and WHO is to improve the health sector's capacity to respond to mass casualty incidents. This is not only an area of concern in a worst-case scenario such as a major earthquake, but also in everyday emergencies like road traffic accidents and other recurring incidents. Until now, mass casualty management has been done on an ad-hoc basis. Even though major hospitals are used to dealing with accidents on a daily basis, little systematic training has been implemented.

In order to counteract this situation, MOHP and EDCD, in collaboration with WHO, National Society for Earthquake Technology (NSET) and Nepal Red Cross Society (NRCS), decided to implement Mass Casualty Management Training Programmes and Simulation Exercises for Health Personnel and first responder institutions in Kathmandu and other urban areas of Nepal. These mass casualty management training programmes include a full-scale mock drill simulating a major earthquake or large road traffic accident to improve the capacity of hospitals for emergency preparedness and disaster response. The mock drills are carried out in collaboration with a range of institutions that all have a major role to play in terms of disaster response.

The mass casualty management programme has been on-going for four years and substantial experience has been gained in appropriate training methodologies. The planning of a large mock drill to test the practical application of the mass casualty management theory is both time consuming and logistically challenging, but live mock drills remain the best way to put theory into action and to test hospital emergency preparedness. The experience gained in this regard in Nepal could be utilised by a number of other national and international partners. A training of trainers would be the next and natural step in the process to institutionalise the capacity to organise and carry out mass casualty management trainings and in order to ensure the sustainability of the programme. This trainer's manual not only uses and records the existing experiences but also facilitates future TOT and ensures sustainable knowledge transfer.

2. A Trainer's Manual

2.1 Background

It is often said that Nepal is an extremely disaster-prone country. The statement is supported by the fact that annually recurring hazards such as floods, landslides, fires and epidemics claim a substantial number of lives every year and seriously affects the property, livelihoods and health of thousands of families. To add to the picture, history demonstrates the high risk faced by Nepal when it comes to earthquakes. In the past, moderate and large earthquakes have knocked over buildings, obstructed roads, killed and injured people and left the knowledge that this is likely to happen again. Despite this knowledge, the country remains extremely vulnerable as buildings are not seismically safe, and capacity across sectors is insufficient to cope with a large-scale emergency.

In any mass casualty incident, an essential part of disaster response will have to be provided by the existing health facilities. All hospitals will be expected to play a major part when responding to disasters that involve a large number of injured people. In order to do so most efficiently it is imperative that each hospital has its own emergency plan that sets up at system for disaster response. One important aspect of optimising scarce hospital and health sector resources is the mass casualty management system that includes pre-established procedures for resource mobilisation, field management and hospital reception.

The best test of hospital emergency plans and mass casualty management capacity is a real life mass casualty incident. However, it is not advisable to wait for real casualties in order to train the MCM system. The theory can be taught in a class room setting but in order to really test and train the theory in praxis, simulations are indispensable ways to give health sector responders a taste of the real thing. Different types of simulations can be used ranging from desk top simulations to computer-based ones and to live mock drills. The latter is the focus of this manual as it is the most difficult to organise but also the most rewarding type of simulation.

Desk Top Simulation, Kathmandu 2001

Computer-based simulation, Dharan 2004

Mass Casualty Management trainings and mock drills can be used in two ways: 1) to test, revise and upgrade already existing skills and plans, or 2) to introduce the MCM system to hospital staff and first responders and to initiate hospital emergency planning where little or no institutional capacity exists. This manual focuses on the latter, but methodologies can easily be adapted to suit the first scenario.

After the outline of the background and the contents of the publication in the first and second chapter, the third chapter focuses on the mass casualty system whereas chapter four will deal with other aspects of hospital emergency planning and response. Chapter five explains in detail how to organise training programmes and how to conduct a mock drill. Finally, a number of annexes give examples of programmes and presentations as well as checklists and suggested evaluation formats. When organising trainings, these can be used a starting point and adapted to suit the hazard, the country situation and the participants of the given training.

2.1.1 Objectives of MCM training Programmes

The overall objectives are to:

- Expose participants to a simulated health emergency and specifically to the principles of mass casualty management such as disaster logistics, triage and medical evacuation.
- To initiate or improve hospital emergency preparedness while institutionalising the mass casualty management system in the hospitals and health institutions.

The specific objectives are to:

- Introduce the principles of mass casualty management.
- Train health sector emergency response through simulation exercises.
- Contextualise MCM principles and procedures.
- Encourage development of specific emergency procedures.

During the simulation exercises participants are expected to:

- Learn how to set up pre-hospital facilities to prioritise and stabilise victims.
- Define the roles of key actors and institutions in health sector emergency response.
- Clarify the lines of command and establish clear lines of communications.
- Test the functionality of the triage system.
- Practice the principles of medical evacuation.
- Understand the strengths and weaknesses of the existing disaster response system.

3. The Mass Casualty Management System

3.1 Basic Principles

Mass Casualty Management is essential in the aftermath of disasters with a major inflow of victims in order to rapidly classify the injured on the basis of the severity of their injuries and the likelihood of their survival with prompt medical intervention.

The Mass Casualty Management system is based on:

- ✓ Pre-established procedures, to be used in daily emergency activities and to be adapted to meet demands of a major incident.
- ✓ Maximisation of the use of existing resources.
- ✓ Multi-sectoral preparation and response.
- ✓ Strong pre-planned and tested coordination.

3.1.1 Advanced Medical Post

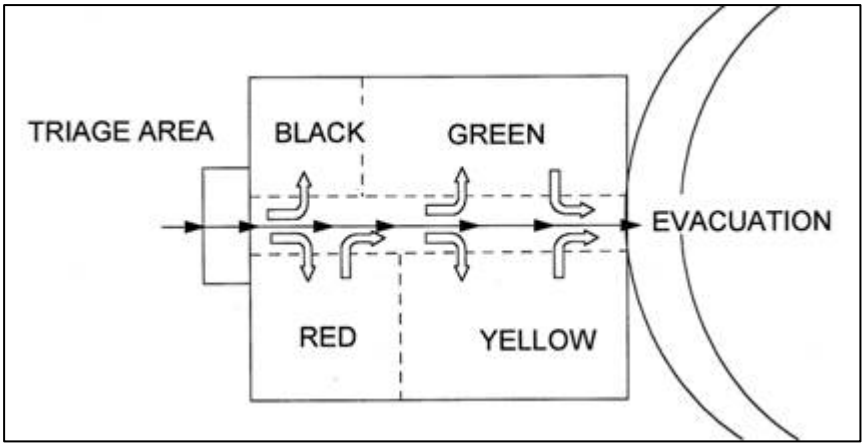
In most mass casualty incidents, the majority of search & rescue is normally carried out by people from the local communities and they may have limited or no first aid skills. Moreover, transportation takes place in a haphazard-manner using all means at hand, with no forewarning to the receiving health facility and with no medical attention before and during the transport. Experience suggests that many disaster victims could have been saved had there been effective first aid facilities available at the emergency location. At the same time, a large inflow of people with minor or non-life threatening injuries normally floods nearby medical facilities where resources are overwhelmed as a result.

Therefore, one of the guiding principles of the MCM system is that health personnel should go to the location of the incident and start the treatment of victims there. If possible, it greatly facilitates the field based treatment to set up an advanced medical post (AMP) close to the disaster cite. By establishing an advanced medical post (AMP) at scene, several important objectives are achieved. Not only are more lives saved and the level of severe disability reduced. The number of people with minor injuries having to be cared for at health facilities is also significantly reduced.

Ideally, the AMP should have:

- A good location in a safe area, with direct access to the evacuation road, at a short distance from the Command Post and in a clear communication zone.
- Good triage capacity.
- Specifically trained medical teams.
- Good radio-communications between the field and the hospital.
- Good coordination of all involved sectors.

Figure 1: Design of a basic AMP[1]:



3.1.2 Triage

Another central principle of the MCM system is the concept of triage. Triage derives from the French verb, "trier" and means "to sort". Triage is a process of assigning priorities for transport/evacuation or medical care in situations involving multiple or mass casualties. The objective of "classical" field triage is to identify victims needing immediate transport to health care facilities and those who can be delayed. Triage in the Mass Casualty Management system is essentially based on urgency (the victim's status), and, secondly, on likelihood of survival.

National template of Triage Tags

Field triage can be conducted by first responders who have had training in triage techniques such as Red Cross personnel, police or fire service personnel. The triage must be repeated upon arrival to hospital and this should be done by a medical doctor or a nurse trained in the techniques of triage. For medical triage in the AMP and in the hospital, all four colour codes are used as outlined below. In the field, it is only necessary to prioritize between acute and non-acute cases. Ideally the medical triage should be repeated upon evacuation to determine any change in the victims' status.

[1] The figure is reproduced from the publication, Establishing a Mass Casualty Management System, Pan American Health Organization

Triage is carried out using the internationally accepted colour code system:

- **Green**: Victims whose injuries are so minor that they can be managed by self-help or volunteer assistance.
- **Yellow**: Victims whose injuries require medical care but can be somewhat delayed.
- **Red**: Victims whose injuries demand urgent medical attention, after resuscitation, or, as soon as practicable.
- **Black**: Victims dead.

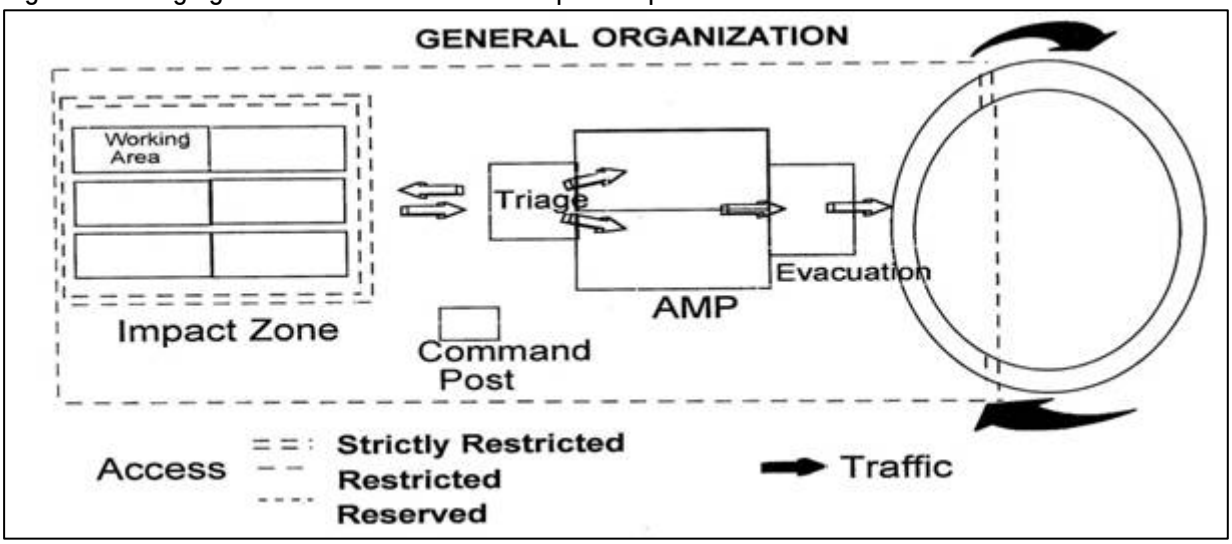
This approach emphasizes the need for rapid stabilization and appropriate dispatch of the victim according to the type of injury. It is easy to remember to the system as the three Ts: Tag, treat and transfer. The transfer of victims should ideally take place in a manner that ensures a safe, quick, and efficient evacuation by appropriate vehicles to an appropriate and prepared health care facility. Efficient evacuation procedures such as a one-way transport system between the different levels of the field response and the referral health facility facilitates a smoother and quicker evacuation. Refer to figure 2 below for an outline of the general organization of the response operation.

TAG
↓
TREAT
↓
TRANSFER

3.1.3 Command and Control

An organized system establishing the lines of authority and decision responsibility in a clear chain of command is vital to the efficiency of the disaster response. To ensure this it is important that a movable command centre is established that coordinates the efforts of different sectors as well as the over-all health sector response. The incident commander should be the senior most medical person available.

Figure 2: Managing the incident location and response operation[2]



[2] The figure is reproduced from the publication, *Establishing a Mass Casualty Management System*, Pan American Health Organization

4. Hospital emergency planning

Disaster cupboard in a
Zonal Hospital

Most hospitals have some form of plan to deal with a mass casualty inflow of victims but only few have documented their plan in detail. As a consequence of the lack of written emergency plans, many staff members are not aware of their responsibilities and roles during disasters and confusion is bound to arise. A Hospital Preparedness Plan should be a part of every hospitals fundamental operational plan as it can prepare the hospital for small and large scale accidents and humanitarian disasters. A Hospital Preparedness Plan can also improve the efficiency of the day to day routines of a hospital and ensure that scarce resources are used optimally.

How?

- A Hospital Preparedness Plan should be prepared as a joint collaboration by an inter-sectorial team of hospital staff with an equal gender balance represented in the team. An inter-sectoral team ensures the awareness of and speedy response by every staff member during small and large scale disasters.

When?

- A Hospital Preparedness Plan should be developed as soon as possible and implemented soon hereafter. The Hospital Preparedness Plan should not be done haphazardly but should be developed in an orderly and timely responsible manner, and most importantly, before any emergency occurs.

4.1 Summary of hospital preparedness activities

The purpose of a hospital emergency plan is to:

- Identify and assess potential risk scenarios;
- Outline the policy for effective response to both internal and external disaster situations that may have an impact on the operation of the hospital and may affect hospital staff, patients, visitors and the community;
- Identify hospital capability to handle mass casualties;
- Identify responsibilities of individuals and departments in the event of a disaster situation;
- Identify Standard Operating procedures for emergency activities and responses; and
- Identify and spell out the linkages with and role of external actors.

Each hospital should form its own Disaster committee. As a guiding principle the committee should consist of the following people:

- Director / Chief of Hospital
- Chief of Emergency Service (ER)
- Chief of Surgery
- Chief of Anaesthesia
- Chief of Medicine
- Chief of Orthopaedics
- Chief of Nursing Services
- Administrative Officer

The hospital disaster committee's responsibilities are:

- To formulate its own emergency preparedness and disaster response plans. If the hospitals have no existing plan, it can be based on the template provided in this publication. If a plan exists, it is the disaster committee's responsibility to review, evaluate and up-date the plan continuously and test it regularly, e.g. annually;
- To organise and train disaster response teams.

In times of disasters, a disaster committee can also help ease the transition from ordinary practice to mass casualty management, which is not easy to achieve but is essential in order to save lives.

5. Organising training programmes

The organisation of any training programme requires careful planning in advance to get the desired outcome. This is even more so the case when a mock drill involving multiple actors is included. Logistics, equipment, timing of events and facilitation of the participants' role play all need to be considered and managed simultaneously. This chapter outlines a number of practical considerations that, if followed, should make the life of the organiser a little easier.

Incident Location in Kathmandu during Live Mock Drill

5.1 Pre-visit

Visiting the location in advance of the actual training makes it easier to find a suitable venue for the theoretical part of the training and an incident location for the mock-drill. It also serves to establish a good collaboration with all key stakeholders for emergency response in the given community, thus ensuring their support to the mock drill. The pre-visit should ideally take place two-three weeks before the training is scheduled. This allows sufficient time for participants, resource persons and volunteers to dedicate their time but not enough time to forget the purpose of the training. During the pre-visit, meetings should be made with:

- Referral and participating hospitals
- Local Red Cross Chapters
- Local Administration (e.g. CDO)
- Training venue (e.g. Hotel meeting hall)
- MCM venue (e.g. School)
- Other stakeholders (e.g. police, Royal Nepal Army and Scouts)

5.2 Participants

Keeping in mind the typical setting of an emergency response, it is important to maintain a multi-sectoral approach to MCM trainings. Although the majority of participants should come from medical facilities, adequate seats should be given to representative from I/NGOs and/or CBOs and from other line ministries or the local administration. The participants could consist of hospital based staff such as doctors, nurses, paramedics as well as non-medical staff such as Red Cross volunteers, army and police and other relevant sectors. In order to create a productive and stimulating environment and to keep the mock-drill manageable, it is best to limit the number of participants to around 30 core people. Additional observers and volunteers can be included in the mock-drill as necessary (see below in the section on mock-drills).

5.3 Class room sessions

The number and specific content of presentations and class-room sessions is flexible and should be adjusted depending on the type of participants as well as the mass casualty management scenarios envisaged. However, some key presentation as are a must to include as they aim to impart all the basic knowledge needed by the participants to fulfil their role in the mock-drill. And subsequently, this knowledge should inform changes in practices at the individual health facilities.

It is recommended to include one or two more broad and general presentations on *emergency preparedness and response*, preferably focussing on the health sector. (See annexes for sample presentations about Health Sector Emergency Planning and Hospital Emergency Planning)

The presentation on the *theory behind the MCM system* is important and should be given adequate time for both presentation and discussion. The theoretical knowledge could be re-enforced through training videos if available, through indoor simulations or through group discussions and exercises such as the SMART triage. (See annex ?? for more details)

Finally, *group discussions* aimed at evaluating and revising existing emergency plans or at initiating emergency planning is a useful way of making sure that participant apply the new approach in their everyday work. The ideal outcome of such group discussions is a commitment from all participants that they will continue with the process in their respective institutions.

Indoor simulation in Bharatpur, 2003

5.4 Mock drills

Simulation exercises of any type require careful planning and none more so than a live mock drill. The size of a mock drill can be varied according to the simulated scenario, the needs and the available resources. It is important that the number of casualties is sufficient to involve all the participants in the response and to give them a sense of being somewhat overwhelmed. If it is too easy to manage, it is not necessary to fully apply the MCM system, and an important chance is lost. On the other hand, if the number of casualties is too high and the scene very unmanageable the mock drill becomes very long and exhausting and both participants and volunteers may loose interest before the end of the simulation.

5.4.1 Location(s)

Different locations can be used as the incident location for the mock drill. The choice of an appropriate incident location ultimately depends on the simulated scenario and on what is realistically available.

As some victims can be expected to have to remain in place playing the role as victims and injured for a substantial period of time, it is also important to consider the conditions in terms of security and comfort such a hot and cold weather.

Hazard simulated	Incident location	Comments
Road traffic accident	An open ground close to a road or busy inter-section	Location should be safe enough to allow the simulation to take place without risk to the participants and victims.
Earthquake	Any building with an adjoining open ground can be used. Schools are often convenient to use as different class rooms, corridors and staircases can be used to hide victims, and the schoolyard provides space for the AMP. Other alternatives are local communities, community centres and local businesses.	At the same time, students from the school can be used a volunteers for the victims, and the mock drill can also be used as an opportunity to raise the awareness of natural hazards and emergency preparedness.
Bomb-blast or explosions	Any building with an adjoining open ground can be used (same as above).	For security reasons, the location should be acceptable to local law enforcement agencies.
Chemical accident	An open ground close to a road, train station or in a local business or industry.	For security reasons, the location should be acceptable to local law enforcement agencies.

5.4.2 Equipment

A mock drill can be made in a very basic manner with practically no equipment or more advanced depending on the resource available. However, a few things are important to ensure that the mock drill seems real and that operations can be managed.

Not a lot of medical equipment is necessary. Some can be purchased such as bandages and sticks for splints. Other things can be borrowed from local NGOs and hospitals such as stretchers, tents for the AMP and blankets. Other possible, but not essential, items such as IVD drips and ambu bags can also be borrowed from participating institutions.

As one of the key features of the mock drill is the organisation of evacuation to the referral hospital, means for transportation of victims is essential. One or two ambulances can normally be borrowed from participating institutions like Red Cross. However, as in real life, there may not be sufficient ambulances to be had, and provisions can be made to use other vehicles.

5.4.3 Logistics and communication

For the mock drill, logistic requirements are higher than during the rest of the training programme. For the participants, transportation has to be arranged from the training venue to the incident location. The easiest is to hire a bus that can accommodate all participants but an alternative option is individual arrangements in organisational vehicles.

At the incident location, it is important to ensure that all volunteers and resource persons have adequate water and food as most of them will be in the field the entire day. The volunteers can also participate in the snack break with the participants at the end of the day.

Communication between facilitators and resource persons as well as between the participants during the mock drill presents another challenge. For the organisation of the drill, the facilitators and resource people will be in several locations at the same time, and it is imperative that they can communicate easily to facilitate the smooth running of the drill. If all have mobile phones this is an easy way to ensure that messages can be given.

Two-way radios are another way to ensure communication. These can be rented, but are typically quite expensive. The facilitators and resource persons can communicate on one channel which is not used by the participants. The participants do not need to a have a radio each, but each team or function should have a radio. In total, 10-12 radios should be sufficient to serve the communication needs of both facilitators and participants.

5.4.4 Volunteers

Volunteers can fulfil several important functions. The most essential function is that of victims. As this role involves a lot of acting, children and young people are generally less self-conscious than adults and thus easier to work with. If entire school classes are used, it also provides the teacher with a good opportunity to discuss emergency preparedness and awareness with the class afterwards. Nursing and medical students also make good victims, and their participation as volunteers can help raise the knowledge of the respective college or campus.

Volunteers for victims can also come from local communities involved in the mock drill. If a community disaster management committee exists, there may already be very high awareness and interest and the mock drill can help generate even more. It may also be an opportunity for the community to test search and rescue, first aid and organisational skills. Furthermore, it can be an important step to improve the linkages between community level disaster management programmes and the local health facilities.

The number of victims needed depends on the number and level of participants. If the participants are very experienced, the number of victims should be higher. For 30 participants of mixed previous experience, no more than 100 victims are advisable as it will take too long to prepare and manage all the victims.

Although many volunteers are happy to play to victims without any payment, it is good to give them a token payment as thank you for the effort and it shows appreciation on behalf of the organisers. The incentive should be sufficient to cover any expenses for transportation etc.

Additional volunteers can be organised as observers, crowd control (see below) and to assist the participants with search and rescue and evacuation. These can come from the local community and from District and local Red Cross chapters or they can be scouts, fire fighters and students.

5.4.5 Preparing the Victims

The victims are the most important aspect of a mock drill. The simulated scenario only seems real when the victims are convincing in their makeup and acting.

Victims should be prepared by experienced external resource persons from e.g. Red Cross as this is a time consuming activity. There are different ways of preparing victims. The easiest and least time consuming is to use a moulage kit with prepared masks for fractures, abdominal wounds, shock faces and burns. Fake blood can be attached to the wounds that the victims will start once the simulation starts. This gives a very real feeling, but victims must be instructed to wear old clothes as the blood is very messy and may stain the clothing.

Preparing an abdominal wound

Burn masks

Modelling an arm wound

Getting a victim ready

Another way of preparing injuries is to use skin coloured modelling putty and theatre paints to make wounds and colour in burns. Pieces of broken glass or metal can be attached to the wounds. Animal intestines can be attached to a piece of plastic that can be tied around the victims waste to simulate an abdominal wound. With a pillow, a women can appear to be pregnant and with complications.

All victims should have an individual profile. As they are only acting, medical personal cannot actually check their vital signs, so profiles should be made in advance that indicate the severity of the condition. There are different ways of making such profiles. 1) The pulse and blood pressure can be written on a piece of paper and attached to the clothes of the victims. 2) It can be written on the wrist of the victim, or 3) the victim can be instructed to tell the responder what his or her signs are.

After the end of the simulation, all equipment and moulage kit parts should be retrieved from the volunteers. One way to make sure that everything is retrieved is to link it with the payment of incentive to the volunteers.

A teenage girl is lying on the ground with no visible injury apart from a burned hand. She is moaning and complaining of pain. The first doctor to attend her is concerned about her vital signs but as she is conscious tags her as yellow. After half an hour, the girl is still waiting in the AMP and she now starts moaning higher and higher. Suddenly she stops. It seems she has lost conscience. Another doctor examines her and tries to wake her up but fails. The girl is re-tagged as red and immediately transferred to the hospital. In the hospital, the girl is sent to the operation theatre and an IVP drip is prepared and almost administered. At this point in time, one of the facilitators interrupts the procedure to explain that the girl is only acting.

5.4.6 Observers

In order for as many people to benefit from the mock drill as possible, it is a good idea to invite some additional observers. Observers can come from the local administration, from other hospitals and medical facilities, or from local communities. Apart from learning from their observations, observers can also assist the evaluation of the mock drill. As it is difficult for the organisers to observe everything that goes on in several different locations at the same time, the presence of observers in crucial positions can give useful information on the events of the drill. For instance, if medical observers from other facilities observe the handling of the victims in the referral hospital, they can comment on the adequacy of triage facilities, area allocations, medical management and overall system for response.

5.4.7 AMP

Each incident location should have at least one AMP. If there is only one incident location it is good to have two AMPs to make sure that all medical participants will be actively involved. It will also require better organisational skills of the participants to manage and coordinate the treatment and evacuation from two field facilities.

The participants themselves should be told to establish the AMP upon arrival to the scene. Tents can be provided, or if not available, tarpaulins and blankets to facilitate this. The participants must be encouraged to establish the AMP according to the MCM system.

Each AMP should be provided with the basic equipment needed to complete the simulation. It is a good idea to provide flags or pieces of cloth in the triage colours for the different sections of the AMP.

Each AMP should be allocated teams of search and rescue team and the participants also need to provide human resources and organise a system for evacuation from the AMP to the black holding area or temporary morgue and to the referral hospital.

5.4.8 Crowd control

As in real emergencies, a large crowd of spectators is bound to appear within the first minutes of the simulation. While it is a good experience for the spectators and a useful tool to improve awareness in the wider community, it is important to establish some sort of crowd control. If not, it may become impossible for the participants to do their "work". This task can successfully be given to the participants themselves. The participants from the police and army, if any, can often bring additional volunteers and it is a good exercise for them to set up a perimeter and prevent the spectators from flooding the scene.

Keeping the crowds from overflowing the AMP, Kathmandu 2004

5.4.9 Role play

Role playing is an important aspect of a successful mock drill. As mentioned earlier, the role play of the victims is an essential factor to make the scenario believable and realistic. A number of other roles can add to the overall feel of the scenario as well as highlight certain aspects that the participants might not think of otherwise. Journalists can be invited to participate or alternatively, one of the facilitators can play this role. In real emergencies, the media is a factor to be remembered, and the inclusion of the journalist reminds the participants of the importance. Role play is also a useful tool for the de-briefing session and will be discussed below.

5.4.10 De-briefing and evaluation

Once the mock drill is over, it is important to continue the momentum and carry out a proper de-briefing of all the events of the mock drill. This can take the shape of a role play, where participants are invited to debrief the hospital director or the Minister as well as representatives of the press. The facilitators can play the different roles or invite others to do so.

First of all, the incident commander should be asked to give a complete report of the response. This report should cover the total number of victims at the incident location, the total number of victims evacuated to hospital, the number red, yellow, green and black tagged victims, and the success rate of the triage system.

Depending on the time, the triage officer of the AMPS and the evacuation officer can also make reports, as it is a good opportunity for them to talk about their experiences and to compare perceptions of magnitude and performance.

Finally, the hospital emergency manager should report on the hospital emergency response system. This could include information on triage, on the appropriateness of area allocation and resources, on the status of the victims when the reached the hospital and on the overall capacity of the hospital to manage the inflow of victims. This should ultimately lead to a discussion of the appropriateness of the existing hospital emergency plan and to ideas of how to improve or initiate planning in the future. If the training is a three day programme with a mock drill on day two, this discussion can be continued and carried forward in the next day's group discussions.

Debriefing in Bharatpur, 2003

5.5 Evaluation

In order to continuously improve the training modalities, it is important to allow space for the participants to comment on the content and the methodology. Throughout the training, either at the end of the day or in the beginning of the next day, participants should be asked to comment on the day's programme. This can be done verbally during plenum sessions or participants can be given coloured cards to write on. Comments given in writing during the day can then be summarized by the facilitators the following day.

At the end of the last day, it is important to carry out an overall evaluation of the complete programme. An example of an evaluation format can be found in annex XX. It is good to supplement the written evaluation with a discussion of what worked, what did not, what could be done differently and what the participants feel they take away with them.

5.6 Follow-up

The referral hospital is expected to prepare a hospital emergency plan, or if a plan existed beforehand, to update and revise it according to the lessons learned during the mock drill. The central responsible health authorities and the hospital management should make sure that necessary follow-up takes place and that progress is made by the hospital. Once the plan is prepared, a system institutionalising mock drills to test it on at least an annual basis should be established.

Abbreviations

AMP	Advanced Medical Post
CBO	Community Based Organisations
CDO	Chief District Officer
DHS	Department of Health Services
EDCD	Epidemiology and Disease Control Division
EHA	Emergency and Humanitarian Action
INGO	International Non Governmental Organisation
MCM	Mass Casualty Management
MOHP	Ministry of Health and Population
NGO	Non Governmental Organisation
NRCS	Nepal Red Cross Society
NSET	National Society for Earthquake Technology
PAHO	Pan American Health Organization
WHO	World Health Organization

Mock Drill in Kathmandu, 2004

References

- *Establishing a Mass Casualty Management System*, Pan American Health Organization, Washington 1995
- *Guidelines on Hospital Preparedness and Response Planning*, Philippines 2000
- *Manual 2: Disaster Medicine*, AEM, Australia, 1999

Annex 1: Sample Programme (three days)

Day I: Mass Casualty Management

09:00-10:00	Welcome and Introduction - Participants Registration and Administrative Issues - Welcome Remarks - Participants Introduction - Objectives of the Training Programme - Schedule of the Training Programme	Guest of Honour (if present) Main facilitator Admin Assistant
10:00-10:45	Basic Concepts in Emergency Preparedness and Response	Facilitator / resource person
10:45-11:15	***Tea Break***	-
11:15-11:45	Emergency Preparedness and Disaster Management in the Health Sector WHO	Facilitator / resource person
11:45-12:45	Principles of Mass Casualty Management	Facilitator
13:00-14:00	***Lunch***	-
14:00-16:00	Indoor Simulation Exercise	Main Facilitator Mock Drill
16:00-16:30	***Tea Break***	-
16:30-17:00	*START Triage*	Facilitator / resource person

Day II: Mock Drill

09:30–10:00	Review of Day 1	Main Facilitator
10:00-10:30	Video on Mass Casualty Management	Facilitator / resource person
10:30-10:45	**Tea Break**	-
10:45-12:45	Briefing on the Mock Drill - Alerting Process and Multi-sectoral Collaboration - Communication Skills (Use of VHF Radios) - Transport Management - Coordination Between Field & Hospitals	Main Facilitator Mock Drill
12:45-13:45	***Lunch***	-
10:00-14:30	Field Preparation for Action	Main Facilitator Mock Drill
14:15-14:45	Departure to the Field	
14:00-16:00	Mock Drill	All facilitators
16:00-16:30	***Tea Break***	-
16:30-17:00	Debriefing and Discussion	All Facilitators

District Emergency Planning

09:00-09:30	Review of Day 2	Main Facilitator
09:30-10:30	Review of Mock Drill	Main Facilitator Mock Drill
10:30-10:45	***Tea Break***	-
10:45-11:15	Participants' Presentations	
11:15-11:30	Introduction to Hospital Emergency Preparedness Guidelines, Triage Tags and Health Sector Emergency Procedures	Facilitator / resource person
11:30-12:00	Presentation on Hospital Emergency Planning	Facilitator / resource person
12:00-13:00	Group Discussions on District Emergency Planning	All facilitators
13:00-14:00	***Lunch***	-
14:00-16:00	Group work cont. and presentations of group work & Follow-up in the Future	All facilitators
16:00-16:30	WHO Video on Myths & Realities of Disasters	Facilitator
16:30-16:45	Evaluation of the Programme	Facilitator
16:45-17:00	Certificate Award and Conclusion of the Training	Main facilitator

Annex 2: Sample Programme (two days)

Day I: Mass Casualty Management and Emergency Planning

Time Frame	Topics / Contents	Resource Person
09:00 -9:30	Registration	
09:30 -10:00	Welcome Remarks Participants Introduction Objectives and schedule	Main Facilitator Guest of honour (if present)
10:00 -10:30	Emergency Preparedness and Disaster Management in the Health Sector – an overview	Facilitator / resource person
10:30-11:00	**Tea / Coffee**	
11:00 -11:45	Principles of Mass Casualty Management	Facilitator / resource person
11:45 -12:15	Introduction to Hospital Emergency Preparedness Guidelines, Triage Tags, Health Sector Plan and other publications, MUSTER	Facilitator / resource person
12:15 -12:45	Hospital Emergency Planning for Disaster Response	Facilitator / resource person
12:45-14:00	**Lunch**	
14:00 - 16:00	Briefing on the Mock Drill - Alerting Process and Multi-Sectoral Collaboration - Transport Management - Communication and Coordination Between Field & Hospital - Plan for 13th Jan. (venue, assembling, preparation, mock drill)	Main Facilitator Mock Drill
16:00- 16:15	**Tea / Coffee**	
16:15 -16:45	Video on Mass Casualty Management	Facilitator
16:45 -17:00	Evaluation and conclusion of MCM training programme day 1	Main facilitator

Day II: Mock Drill

Time frame	Topics / Contents	Resource Persons
10:00-13:30	Preparation of incident locations, dressing up casualties	Resource persons
11:00-11:45	Discussion of facilitators and resource persons	All facilitators
11:45-12:30	Field Preparation for Action (with participants)	All Facilitators
12:30-13:00	**Tea / Snacks**	
13:00-13:30	Departure to the Field	All participants
13:30-14:30	Mock Drill	All participants
14:30-16:00	Debriefing and Evaluation of Mock Drill	All participants, observers, facilitators and resource persons
16:00-16:30	**Refreshment**	**All**

Annex 3: Checklist

	Item	Status
Training	Stationary for all participants	
	Newsprint	
	Markers	
	Overhead transparencies	
	Photocopy paper	
	Evaluation formats	
	Certificate	
	Banner	
	Hand-outs of all presentations	
	Reference materials (e.g. MCM manual)	
	Videos: MCM + Myths and Realities	
	Multi-media projector	
	Overhead projector	
	Screen	
Simulation	Moulage kits including additional needs for making victims such as glass pieces and metal sticks	
	Triage Cards	
	Ribbons (green and red for non-medical field triage)	
	Red, Yellow, Green and Black cloth pieces / flags for the AMPs	
	Bandages / first aid equipment / ampu bag / IV drips	
	Sticks for splints	
	Stretchers	
	Blankets	
	Tents for AMP	
	Walkie talkies	

Annex 4: Presentation on MCM System

Theory of Mass Casualty Management

Based on
Establishing a Mass Casualty Management System
(PAHO, Washington, 1995) and
Manual 2: Disaster Medicine
(AEM, Australia, 1995-1999)

1

Definitions

Mass Casualty Incident

Any event resulting in a number of victims large enough to disrupt the normal course of emergency and health care services.

Mass Casualty Management

Management of victims of a mass casualty event, aimed at minimizing loss of life and disabilities.

Mass casualty is a relative term depending on the capacity of the health system.

2

Challenge and Objective

Challenge

The scarcer the resources, the more efficient the organization must be.

Learning objective

To accustom participants with establishing a MCM system designed to maximize the use of existing resources by coordinated multi-sectoral preparation and response mechanism.

1

Inappropriate Approaches

Scoop and Run Approach

Competition and no coordination.

Classical Care Approach

Basic triage and field care before evacuation but no coordination between the field organization and the receiving health care organization.

4

Appropriate Approach

Mass Casualty Management Approach

- Pre-established procedures for resource mobilization, field management and hospital reception.
- This theoretical approach must be adapted to specific situational problems in terms of topography, infrastructure, communication and scarce health facilities.

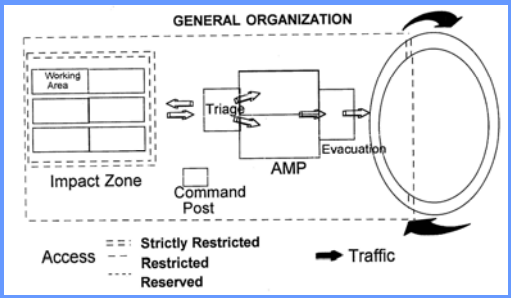
5

Purpose of Mass Casualty Management Systems

- Accelerate and amplify daily procedures to maximize the use of existing resources.
- Establish a coordinated multi-sectoral rescue chain.
- Bring disrupted emergency and health care services back to routine operation promptly and efficiently.

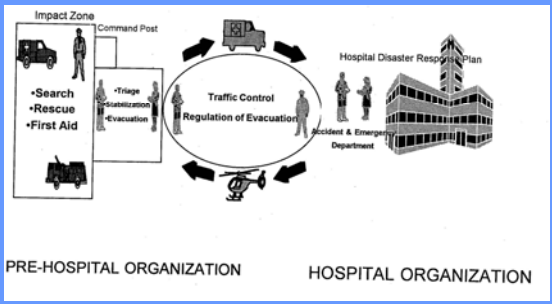
6

General Principles of Field Mass Casualty Management



7

A Multi-sectoral Rescue Chain



8

Alerting Process

Objectives:

- To confirm the initial warning.
- To evaluate the extent of the problem.
- To ensure that appropriate resources are informed and mobilized.

The core of the alerting process is the dispatch (communications) center that must have the capacity to mobilize a small assessment team (flying team).

9

Field Area Identification

The second role of the initial assessment team is to identify the field areas to be established. These will include:

- Impact zone,
- Command Post Area,
- Advance Medical Post Area,
- Evacuation Area,
- VIP and Press Area, and
- Access Roads.

10

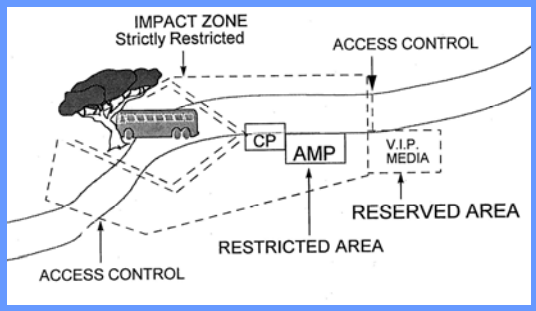
Safety Measures

Preventive actions include establishment of the following restricted areas:

- The impact zone - Strictly restricted to professional rescuers.
- The secondary area - Restricted to authorized staff involved in the rescue operation.
- The tertiary area - Restricted to press officials and a buffer zone for onlookers.

11

Restricted Areas RTA



12

The Command Post

Objectives

- Coordinate the various sectors involved in the field management.
- Link with back-up systems to provide information and mobilize resources.
- Supervise victim management.

The command post must be set up at the very beginning of a rescue operation.

13

3 T Principle

TAG

TREAT

TRANSFER

16

Preconditions for an Efficient AMP

- Located in a safe area, with direct access to the evacuation road, at a short distance from the Command Post and in a clear communication zone.
- Good triage capacity.
- Specifically trained medical teams.
- Good radio-communications between the field and the hospital.
- Good coordination of all involved sectors.

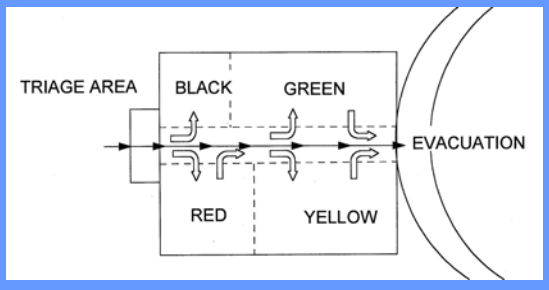
14

Triage

- Triage is the process by which victims are sorted, prioritized, and distributed according to their need for first aid, resuscitation, stabilization, evacuation, and hospital care.
- Triage is a continuing process which begins in the field and continues into the hospitals.

17

Design of a Basic AMP



15

Principles Behind Triage

- Based on urgency (victim status), likelihood of survival, and care resources available.
- Operational objectives:

  1) Quick identification of victims needing immediate stabilization (field medical care).

  2) Quick identification of victims who could be saved only by life-saving surgery.

Only a small number of victims need immediate treatment in a hospital.

18

Triage Color Codes

- **Red**: Requires immediate stabilization care.
- **Yellow**: Requires close monitoring; care can be somewhat delayed.
- **Green**: Requires delayed or no treatment.
- **Black**: Dead.

If the AMP is successful, the number of red victims should decrease, and reclassification will be necessary before evacuation.

19

Levels of Triage

0) Field Triage (non-medical!)	Green & Red **Ribbons**
1) Medical Triage	Green, Yellow, Red & Black Triage **Tags**
2) Evacuation Triage	Green, Yellow, Red & Black Triage **Tags**
3) Hospital Triage	Green, Yellow, Red & Black Triage **Tags**

22

Requirements for Triage

- Triage, by implication, necessitates accurate medical judgment. It should always be carried out by the most clinically skilled and experienced doctor.
- Triage has to be undertaken in isolation; it CANNOT be combined with resuscitation and victim stabilization.

The most skilled and experienced doctor should NOT be involved in individual case management.

20

Evacuation Color Codes

- **Red:** Victims to be transferred immediately or as soon as possible to hospital, by equipped ambulance, with medical escort.
- **Yellow:** Victims to be transferred, after evacuation of all red victims, to hospital, by ambulance, with first aide escort.
- **Green:** Victims to be transferred, at the end of the field operations, to appropriate health care facilities by available vehicles, without escort.
- **Black:** Victims to be transferred to morgue.

23

Optimizing Triage

- When color code triage is utilized, the percentage of incorrect classification decreases in accordance to experience.
- If red and yellow victims are categorized in an ”acute victim” category and green and black in a ”non-acute victim” category, the percentage of incorrect classification is significantly lower.
- Tagging should be combined with spatial relocation of victims.

21

Transport Organization

Objective:

- To ensure that victims will be safely, quickly, and efficiently transferred by appropriate vehicles to appropriate and prepared health facilities.
- Initial task: Stop spontaneous evacuation in unsafe, uncontrolled conditions to any unprepared health care facility.
- In limited resource conditions, transport of victims should be staggered.

24

Rules of Evacuation

No victim may be removed from the AMP to the hospital before:

- The victim is in the most stable possible condition.
- The victim is adequately equipped for the transfer.
- The receiving hospital is correctly informed and ready to receive the victim.
- The best possible vehicle and escort are available.

25

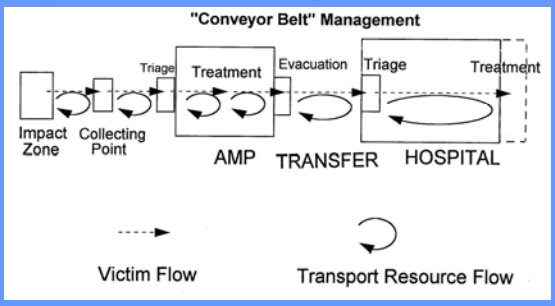
The "Noria" Principle

- Victim movement must be in a *"one way" direction and without any crossings.*
- Victim movement will be organized as a kind of *one-way "conveyor belt",* taking them from a basic first aid care level to sophisticated levels.
- Each transport level will have to use its own limited resources in a rotating system.

Decrease the number of times a red victim is handled between field and hospital.

26

Victims Flow



27

Field Organization Checklist

- Situation Assessment.
- Report to Central Level.
- Working Areas Pre-Identification.
- Safety Measures.
- Command Post.
- Radio Communications.
- Search and Rescue.
- Triage and Stabilization.
- Controlled Evacuations.

28

Annex 5: Presentation on Health Sector Emergency Preparedness

- Large numbers of people face very high risk of severe illness and death, because
  - Local and/or national systems that ought to sustain livelihood security are stressed oftentimes overwhelmed to respond and provide urgent action.
  - As a result, some sections of society are vulnerable, and livelihoods are put at risk

This Presentation

- 1. Why Emergency Preparedness
- 2. Situation in Nepal
- 3. Emergency Preparedness in Nepal
- 4. Current Issues and Recommendations for Hospitals

- The people affected are more likely to die due to ill-health than starvation, bombs, or other threats
- …. and, vulnerability can be triggered by illness and health system failure – eg HIV, Malaria, and communicable diseases.

- At least two billion people in more than 50 countries face avoidable threats to health because they are exposed to disasters.
- The increased health threats results in high rates of suffering and death: the principal causes of death are common illnesses that are made more dangerous by crisis conditions.

Health Effects of Different Types of Disasters

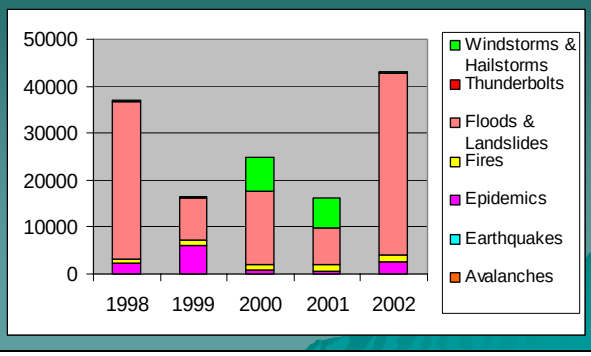
HEALTH EFFECTS	EARTH-QUAKES	FLOODS	LAND-SLIDES	EPIDEMICS	FIRES	CONFLICT SITUATION
Deaths	Many	Few	Many	Many	Few	Many
Severe injuries requiring extensive treatment	Many	Few	Few	-	Many	Many
Increased risk of epidemics	Yes	Yes	Yes	-	-	Yes
Damage to water systems	Severe	Light	Severe (but localised)	None	None	Limited (Depends on the factions fighting
Damage to health facilities	Severe (structural and equipment)	Severe (equipment only)	Severe (but localised)	None	Depends on location	Limited (Depends on the factions fighting)
Demand of health services	High	High	Low	Moderate	Moderate	High
Food shortage	Possible (due to distribution problems)	Common	Common (but localised)	None	Possible (if crops destroyed)	Common (in prolonged conflicts)
Major population movements	Common (generally limited)	Common	Common (generally limited)	Rare	Unlikely	Common (generally limited)

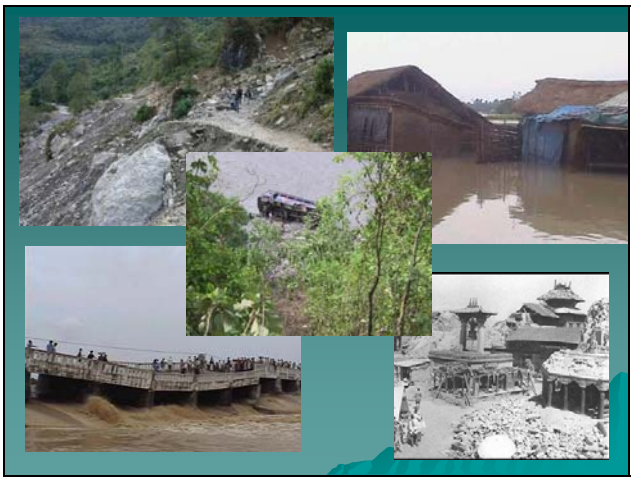
(Source: Adapted from PAHO, 1999, 16-17).

Prevalent Hazards in Nepal

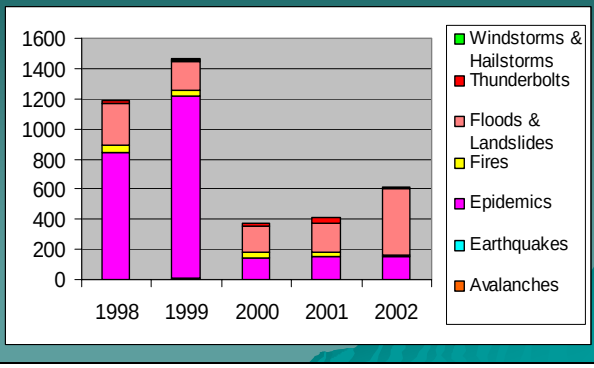
- Nepal is prone to various types of natural hazards; most prominent earthquakes, floods, landslides, fires and frequent epidemics.
- A major earthquake of the 1934-magnitude affecting urban areas is widely accepted as the worst-case scenario.
- Road traffic accidents are a major concern for emergency wards throughout the country.
- Victims of political violence have been a recent phenomena relevant in some parts of the country.

Affected Families due to Natural Hazards 1998-2002





Deaths due to Natural Hazards 1998-2002



- In a period of 33 years (1971-2003), the total losses from various disasters are:
  - about 25,000 deaths
  - about 200,000 buildings destroyed,
  - about 500 km. road damaged
  - about 150,000 livestock killed.
- In monetary terms, the total loss is calculated to be more than NRs. 746,000 million.

National Disaster Management Initiatives

- 1982: The Ministry of Home Affairs adopts the Natural Calamity (Relief) Act, which defines the national disaster management system with relief committees at the national and district level.
- 1993: The Government, United Nations, donors and NGOs form three sectoral working groups in order to strengthen co-ordination during the catastrophic floods.
- 1996: The Ministry of Home Affairs develops an ambitious National Action Plan.

Health Sector Emergency Planning

- At the end of 2000, WHO and EDCD decided to revitalise the Disaster Health Working Group (DHWG).
- DHWG Secretariat with members from the Ministry of Home Affairs, Ministry of Health, Ministry of Local Development, DHS, EDCD, GTZ, OFDA / USAID, NRCS, NSET-Nepal, WHO and other institutions.
- The DHWG Secretariat has played a key role in designing and implementing the emergency planning process.
- Publication of a national Health Sector Emergency Preparedness and Response Plan in September 2003.
- In October 2003, the DHWG and its Secretariat was institutionalised as a legal body for disaster preparedness and response within MOH (with the Minister level decision).

- Triage tags (colour coding red / yellow / green / black) have been printed and are in the process of being distributed to health facilities.
- Hospital Emergency Planning is a part of all trainings
  - Guidelines for Hospital Emergency Planning in English and Nepali

Seismic Vulnerability Assessment of Selected Hospitals in Nepal

- Structural
- Non-Structural
- Guidelines for Assessment
- Guidelines for Mitigation of Non-structural vulnerability

Public Health in Emergencies

- Format to supplement the existing disease surveillance system in providing information on Disasters
- Guidelines on Public Health in Emergencies for District Health Workers in English and Nepali following SPHERE standards
- Training to district level Rapid Response Teams focussing on Public Health in Emergencies

Mass Casualty Management Training

Current Issues 1:2

- Ensure all hospitals have emergency response plans and procedures (including triage tags) in place.
- Strengthen field based / pre-hospital mass casualty management in collaboration with hospitals, NRCS, RNA and Nepal Police among others.
- Identify priority health facilities and institutionalize a coordinated mass casualty management system at the national level.
- Enhanced focus on remote areas and field level training to reach the most vulnerable victims.

Current Issues 2:2

- Inclusion of emergency preparedness and disaster risk management in Health Sector policy and planning.
- Strengthen building codes and building practices for critical facilities such as hospitals.
- Include and / or strengthen the area of Emergency Preparedness and emergency medicine in the Curriculum of all medical teaching institutes.

Recommendations for Health Facilities / Hospitals

- Appoint a focal point for emergency preparedness in each health facility.
- Assess vulnerabilities and capacities in each health facility and plan accordingly.
- Develop and regularly update an emergency response plan targeting prevalent hazards.
- Operationalise the emergency plan.
- Initiate multi-sectoral collaboration with partner organisations.
- Test emergency response procedures.

Annex 6: Presentation on Hospital Emergency Planning

An Introduction to Hospital Emergency Planning

Emergency & Humanitarian Action / World Health Organization Nepal
&
Epidemiology and Disease Control Division / Department of Health Services/ Ministry of Health and Population

Why Hospital Emergency Plans

- An essential part of any medical disaster response will have to be played by the existing health facilities.
- Especially in disasters that involve a large number of injured people, all hospitals will be expected to play a major part in the response.
- With no- or insufficient emergency plans, the hospital resources may be overwhelmed.
- It is, therefore, imperative that each hospital has its own emergency plan that sets up at system for disaster response.

2

Hospital Planning Needs 1:2

- An INTERNAL Emergency Affecting the Hospital Staff and Patients

  E.g. fire, earthquake, bomb-threats

- An EXTERNAL Disaster Resulting in Casualties Coming for Treatment at the Hospital

  E.g. Road Traffic Accidents, floods, political violence

3

Hospital Planning Needs 2:2

- Internal Emergency Plan:
  - ✓ Evacuation of the staff
  - ✓ Evacuation of the patients
  - ✓ Arrangements for care of critical patients elsewhere
- External Emergency Plan:
  - ✓ Mass casualty management system
  - ✓ Standard operating procedures for all staffs and departments
  - ✓ Emergency supplies
  - ✓ Referral agreements and hospital networking
  - ✓ Training of staff

Note: Both types of plans must be tested and updated regularly.

4

The External Emergency Plan 1:2

Most hospitals have some form of plan to deal with a mass casualty inflow of victims but only few have documented their plan in detail.

As a consequence of the lack of written emergency plans, many staff members are not aware of their responsibilities and roles during disasters and confusion is bound to arise.

A Hospital Preparedness Plan should be a part of every hospitals fundamental operational plan as it can prepare the hospital for small and large scale accidents and humanitarian disasters.

5

The External Emergency Plan 2:2

The disaster plan must be made in accordance with the hospital's level of

- ✓ complexity
- ✓ capacity

and bear in mind the demand that may be generated as a result of an emergency.

It should take into consideration all aspects that are crucial to an efficient disaster response.

6

Disaster Committee 1:2

All hospitals should form a disaster committee. As a guiding principle the committee should consist of the following people:

- Director / Chief of Hospital
- Chief of Emergency Service (ER)
- Chief of Surgery
- Chief of Anaesthesia
- Chief of Medicine
- Chief of Orthopaedics
- Chief of Nursing Service
- Hospital Administrator / Manager

7

Disaster Committee 2:2

The disaster committee's responsibilities are:

- To formulate the respective hospital's emergency preparedness and disaster response plan.
- To review, evaluate and up-date the plan continuously and test it regularly.
- To organise and train disaster response teams.

8

The Mass Casualty Management System 1:2

When activated, a good disaster plan enables the hospital to control the inflow of victims in a way that makes sure that only seriously injured victims in urgent need of hospitalisation are admitted to the hospital.

It is extremely important that the hospital's capacity is not overwhelmed by an inflow of not seriously injured victims and chaos that makes it impossible to attend to the people most in need.

That is why it is necessary to introduce a system of mass casualty management system in hospitals.

9

The Mass Casualty Management System 2:2

The MCM system is based on:

- Pre-established procedures, to be used in daily emergency activities and to be adapted to meet demands of a major incident.
- Maximisation of the use of existing resources.
- Strict prioritisation of casualties in terms of urgency of condition and required treatment.
- Multi-sectoral preparation and response.
- Strong pre-planned and tested coordination.

Note:
Until normal hospital routines can be resumed and the situation is normalised, it is often necessary to limit services to basic patient care rather than the standard normal care.

10

Standard Operating Procedures for Staff and Departments

Roles and responsibilities of all staff members as well as departments must be decided upon and clearly spelled out in the emergency plan.

- The personnel could be divided into different disaster response teams that are all familiar with their collective and individual roles and responsibilities. Every team must assign a leader whose duty is to ensure that all the tasks on the team's checklist are done.
- For specific functions, the emergency plan should contain checklists of the responsibilities of the respective staff member during an emergency.

11

Emergency Supplies and Equipment

- The hospital should be prepared to receive a large inflow of victims at any one time, and must therefore stock emergency medicine in a special disaster store. Re-stocking from external sources may be necessary, and these sources should be located in advance.
- Provisions for adequate safe water supplies should be arranged in case the hospital's own water supply is interrupted.
- Emergency supplies of fuel, gas and oxygen must be stored in a safe place, preferably outside the hospital buildings. The hospital's emergency generators must be maintained at all times to secure electricity for vital life support systems.

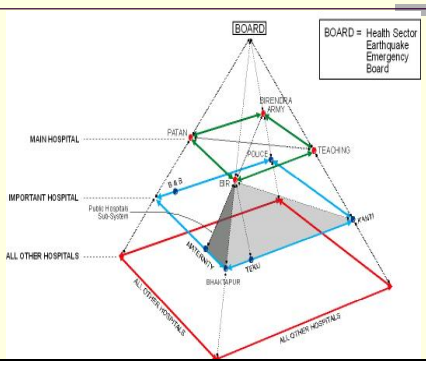
12

Referral Agreements & Networking 1:2

- Every hospital should integrate its own disaster plan with those of community disaster management agencies. Strong relationships with community agencies (e.g. fire department, army, local emergency management, local NGOs, other national agencies) are important to ensure a coordinated disaster response.
- One part of hospital emergency preparedness is to make arrangements with other hospitals for patient referral.
- The pyramid depicted in the next slide illustrates an example of how the hospitals of Kathmandu Valley could coordinate their emergency plans with each other and create a manageable system of communication and coordination of patient referral in times of disaster.

13

Referral Agreements & Networking 2:2



Source: Structural assessment of hospitals in Kathmandu Valley, 2001-2002

14

Other Aspects to Consider when Planning 1:2

- Activation: Who has the authority to activate the plan and when.
- Communication: Updated lists with staff telephone no; provision of alternative means of communication in case telephones do not work (e.g. radios, messengers)
- Treatment areas: Assignment of areas dedicated to reception, triage, walking wounded, treatment of red & yellow casualties, morgue, information centre
- Documentation: registration of all admissions (name, age, sex, address, time of admission, injury and treatment given)

16

Other Aspects to Consider when Planning 2:2

- Inpatients: Routine operations should be rescheduled, out-patient services re-arranged, ward patients may be transferred or temporarily discharged.
- Information: Who will be in charge of collecting information and liasing with the press and other interested parties.
- Crowd control: Security must be maintained, e.g with the help of police and volunteers, to make sure the hospital is not over-run. All visitors should be made to leave.

17

Staff Training

Even the best plan can fail if simulations are not carried out to test the plan and the staff knowledge:

- ✓ Carry out activities in the hospital to test whether the institution is ready to receive any number of causalities and treat them according to priority.
- ✓ Train emergency procedures and mass casualty management principles.
- ✓ Practise emergency case management and triage techniques as well as the established line of command
- ✓ Make sure all staff members are familiar with his / her individual responsibilities.

15

In Conclusion

- Hospitals need to plan for both internal and external emergencies.
- Plans are never finalised; they must be continously updated, rehearsed, and they must be integrated with community emergency plans.
- Training should focus on familiarising staff with the plan and their role in an emergency as well as test the functionality and approprieteness of the plan itself.

18

Annex 7: Presentation on Basic Disaster Management Concepts

Emergency

- A **STATE** demanding immediate and **extraordinary** action that may be due to epidemics, to natural or technological catastrophes, to civil strife or other man-made causes

4

Defining Terminology

- Hazard
- Disaster
- Emergency
- Capacity
- Vulnerability
- Preparedness
- Response
- Mitigation
- Rehabilitation
- Reconstruction

2

HAZARD

-A trigger PHENOMENON

It is a rare or extreme natural or man made event that threatens to adversely affect human life, property or activity to the extent of causing disaster.

5

DISASTER

- An EVENT that causes serious disruption of the functioning of a society: widespread human, material, or environmental losses, including loss of lives and deterioration of health and health services.
- This disruption is: on a scale sufficient to warrant an extra ordinary response from out side the affected community or area.

3

6

These may be

- **Sudden Catastrophic Events**
  - -like earthquakes and hurricanes
- **Slow-onset processes**
  - -such as droughts, economic crises, environmental degradation (such as arsenic poisoning in the Ganges delta), or the increasing prevalence of fatal HIV infection.
- **Complex and Continuing Emergencies**
  - -Including the over 100 violent conflicts now underway in the world, and associated displacement of affected people.

7

A disaster occurs when hazards and vulnerability meet

VULNERABILITY → DISASTER ← HAZARD

Underlying causes
Poverty
Limited access to
-Power structures
-Resources
Ideologies
Economic systems
Age Sex
Illness and disabilities

Unsafe conditions
physical environment
-dangerous locations
-dangerous buildings, etc
Fragile local economy
-low levels of income
-livelihoods at risk
Public actions

Dynamic pressures
Lack of:
-local institutions
-education
-training
-appropriate skills
-local investments
-local markets
-services
-press freedom
Macro-forces
-population expansion
-urbanisation
-environment degradation

Vulnerability + Hazard = DISASTER

Trigger event
Earthquake
High winds, storm
Floods
Landslide
Volcanic eruption
Drought
War, civil strife
Economic crisis
Technological accident

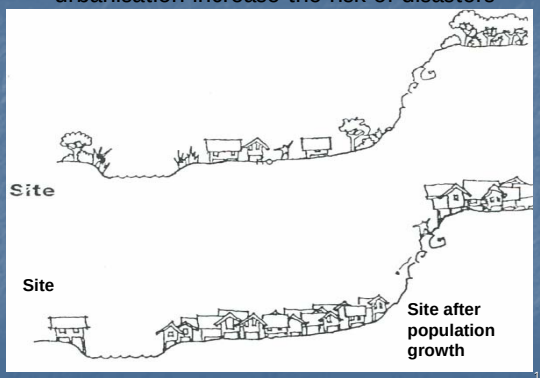
11

- VULNERABILITY: Reflects the level of disruption and loss a hazard can potentially cause in a community / society.
- CAPACITY: The ability of human beings to mitigate or cope with the combined effect of hazard and vulnerability.

Capacity and Vulnerability are opposite sides of the same coin. The more capacity one has, the less vulnerable one is, and vice versa.

8

Poverty, demographic growth and fast urbanisation increase the risk of disasters



12

- **Disaster = $\frac{\text{Hazard x Vulnerability}}{\text{Capacity}}$**

Human factors are at play in determining vulnerability and capacity and thus the magnitude of a disaster ("Earthquakes do not kill people but buildings do").

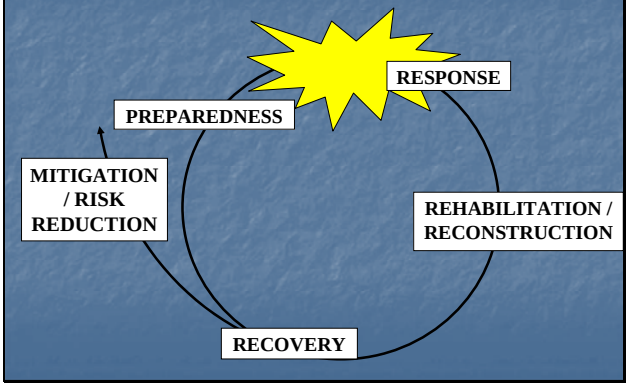
10

Exercise: Hazards and Vulnerability in Nepal

Name a hazard and describe how vulnerable your area is to that hazard

13

The Disaster Cycle – disaster reduction



Risk reduction

- First step is to assess the risk:
  - determine what part of the risk can or cannot be reduced, i.e. the hazard itself (example: flood barriers to divert and contain rivers).
- Make a strategy for reducing the threat of the hazard (typically inter-sectoral, as part of development programmes or community based disaster risk management);
- Asses the vulnerability of the community or institution;
- Prevent, Mitigate and Reduce the physical vulnerability of essential infrastructure to unavoidable hazards (e.g. making hospital buildings safer for earthquakes).

Note: Focuses on reducing **vulnerability!**

18

Emergency Preparedness

- **Goal:** To reduce suffering, immediate and long-term avoidable mortality, morbidity and disability in any type of emergency and to build a bridge to development.
- Emergency preparedness consists of planning, capacity building AND of risk mitigation and reduction

15

Rehabilitation

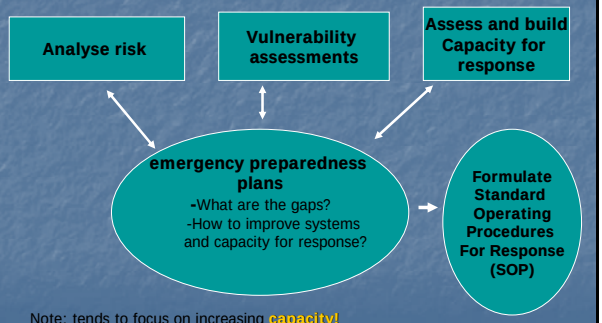
"To rehabilitate a building or an area means to improve its condition so that it can be used again"

- Physical infrastructure (buildings, lifelines, bridges and roads etc.)
- Systems (supply, surveillance etc.)
- Services (e.g. primary health care)

Note: in the inter-mediate phase of emergency response

19

Emergency preparedness consists of:



Note: tends to focus on increasing **capacity!**

17

Reconstruction

- "The reconstruction of a building, structure, or road is the activity of building it again, because it has been damaged".
- Requires strategic planning – reconstruction of health institutions should be integrated in over-all plans for reconstruction of the affected community;
- Window of opportunity – safer location, building practices, sustainability;

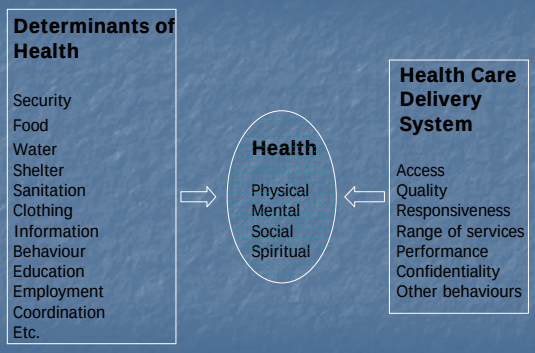
Note: Long-term undertaking which requires a lot of money and sustained commitment.

20

Disasters and the Health Sector

21

How to define health?



24

disasters and daily emergencies....

- Disaster management is a specialised aspect of the routine emergency management capability of the health sector;
- Major problems : resources and organisation;
- Role of the health sector :
  - Active contribution to the wider community emergency management process;
  - Important partner (e.g. in Disaster Relief Committee);
  - Not restricted to treating injuries but active role in ensuring public health;
  - Contribute to elaboration of policy and best practices (Intra and inter-sectoral)

22

Some Essential Elements for Effective Disaster Response

- Updated and tested emergency plans;
- Capacity of first responders;
- Vulnerability of lifeline systems;
- Adequate and appropriate information/ information management.

25

The health sector and emergency response....

- Take into account the public health consequences of hazards:
  - Increased # deaths, injuries;
  - Population displacements;
  - Psychosocial;
  - Food shortage, water, sanitation;
  - Disruption of health infrastructure, routine health services, disease surveillance...
- Sustainability through :
  - Local level empowered, training, resources;
  - REQUIREMENT : policy, plans, arrangements.

23

Essential Elements: Lifelines

- Systems or networks that provide for the circulation of people, goods, services and information
- They are vital for the health, safety, and economic activity of the community.
- Lifelines are needed for:
  - the health of the population
  - the delivery of health care

26

Physical Lifelines

- Water supply
- Electricity generation and supply networks
- Sewerage
- Telecommunication networks
- Transport
- Fuel pipeline / networks

27

Key Facilities & Structures

- hospital
- Health posts
- ambulances
- police / army
- fire brigade

- general medical care
- food distribution networks
- schools
- emergency shelters

28

Lifelines
are vulnerable
to natural hazards

Lifelines
are vulnerable
to man-made hazards

29

Essential Elements: Health " Intelligence" ?

Disasters kill, but *nobody dies "of a disaster*".

- No matter how complex and confused the disaster, people die of precise and recognisable causes: of drowning, of measles, of starvation, of obstructed labour, of a bullet wound.
- Epidemiology - that is proceeding upstream from the actual causes of death – helps us to understand what are the priorities and find solutions for mitigation and response.

30

The **UNEXPECTED** cannot be a priority.....

but emergencies will always occur,
and when they occur
they become priorities

31

Annex 8: Presentation to start the mock drill

Mass Casualty Management
Simulation Exercise

Emergency Response

- *People trapped in the rubble will die if they are not rescued and given medical treatment at the earliest possible time (72 hours)*
- *To maximize trapped victims chances of survival, it should be given top response priority and Search And-Rescue teams most respond rapidly after a structure collapses.*

Emergency Response

"Response measures are those which are taken immediately prior to and following disaster."

Such measures are directed towards:

- **saving life**
- **protecting property**
- **dealing with the immediate damage caused by the disaster**

SEARCH AND RESCUE

Relation between SAR and mortality:

Research on earthquake mortality has shown that entrapment in collapsed buildings and length of time before rescue are significantly related to mortality.

So how quick SAR operation were performed is directly related to the mortality rate.

Emergency Response

- *Response always starts from Search and rescue (SAR).*
- *Search And Rescue (SAR) is the process of locating and recovering disaster victims that may be trapped or isolated and bringing them to safety and provide basic medical attention as required.*
- *Search And Rescue (SAR) is the most significant response problem generated after the big disasters e.g. earthquakes.*

SEARCH AND RESCUE

Experience learned

- *The probability of survival is greatly increased if victim in a collapsed building rescued within 24 HOUR which we called "GOLDEN 24 HOURS".*
- *Studies suggest that most people, who are successfully rescued are excavated by local survivors immediately after the quake occurs.*

SEARCH AND RESCUE

Experience learned

- *The probability of survival is greatly increased if injured can be transported to definite care within ONE HOUR of injury, which we called "GOLDEN HOUR".*

SEARCH AND RESCUE IN REAL !!!

❑ **Time ?**

How soon such heavy equipment could be deployed ?

Not soon or May be not possible at all !!!

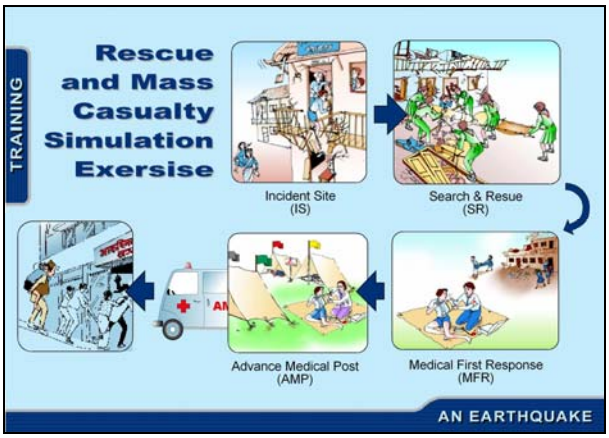
SEARCH AND RESCUE

Survival rates vs. Rescue time

Tangshang Earthquake, 1976

Time of Extraction	Number of Victims	Percentage of Victims	Number of Surviving	Percentage of Surviving
1/2 Hour	2277	21.30	2261	99.3
1 Day	5572	52.10	4513	81.0
2 Days	1638	15.30	552	33.7
3 Days	348	3.30	128	36.7
4 Days	395	3.70	75	19.0
5 Days	459	4.30	34	7.4
0-5 Days	*10689*	*100,00*	*7653*	*70.8*

Source: Sheng ZY, 1987



SEARCH AND RESCUE IN REAL !!!

❑ **Shortage?** ***Are rescue equipment available and sufficient?***

Crane, buldozer etc.

Mass Casualty Management Team 1

Comand Post (Charlie Papa 1)

Search and Rescue (Sierra Romeo 1)

Advance Medical Post (Alfa Mike 1)

Transport Officer (Tango 1)

Mass Casualty Management Team 2

Comand Post 2 (Charlie Papa 2)

Search and Rescue (Sierra Romeo 2)

Advance Medical Post (Alfa Mike 2)

Transport Officer (Sierra Romeo 2)

Action

- As per initial report
  - Several parts inside the Core area are damaged e.g. Chokache Galli, Kilagal, Thahity etc.
  - Several Institutions are damaged e.g. Gorkhapatra Sansthan, Trichandra Campus etc.
- Government has decided to dispatch following Teams to following location immediately

Team	Location
– Team 1	Ward No 17, Kwabahal, Thahity
– Team 2	Gorkhapatra Sansthan

Disaster Scenario: Earthquake

Event: Earthquake 7.2 Scale of Richter

Location: Kathmandu Valley
27.42.4 North, 85.18.4 East

Depth: 33 km

Time: 12.55 local time

Total Population: 1.500.000

Casualty: 200 confirmed dead (First Report)
(First Report) 1000 Injured
2000 missing

Local Situation

Kwabahal, Thahity, Ward No 17:

This place is located on the way from Thamel to Thahity, inside the Core Area. Thamel is most prominent Tourist Area. There are many Tourist shops and and lots of tourists used to walk through this street. The area is full of narrow streets and low rise buildings. As just received first initial report, a lot of casualties were lying in different streets, gullies, courtyards, collapsed houses etc.

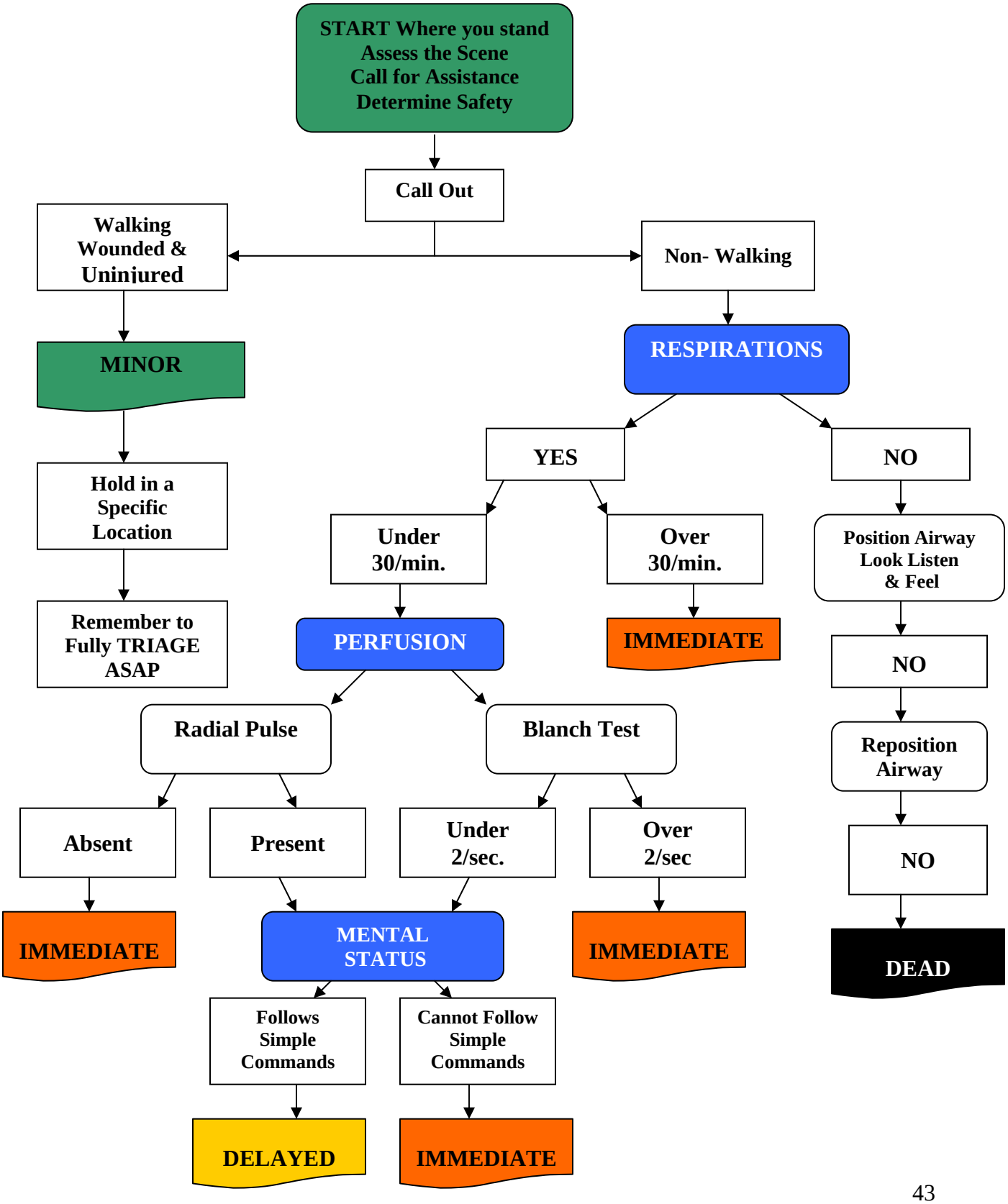
Gorkhapatra SansthanWard No 25:

This is the first News Media Institution of Nepal. Gorkhapatra and The Rising Nepal were the news papers published from this Institution. As the newspapers are the oldest, the buildings are also very old and not maintained properly. Every day 600-700 staffs used to work at day time. The building is highly vulnerable and access to the building is highly difficult. It is learnt from the message just received, many staffs were injured and some of them already passed away.

Overall Situation

- **30 % of buildings are destroyed.**
- **40% of buildings are not safe.**
- **Several houses on fire with risk of spreading.**
- **30% reduction of pumping capacity due to failure of the power supply**
- **Some parts of the city without water due to broken water pipes.**
- **Lower lying areas are contaminated due to failing sewage system**
- **Several hospitals are partly damaged**
  - **2 General Hospitals (Birendra Army and Birendra Police) are completely destroyed**
  - **Bir Hospital is O.K**
  - **Teaching Hospital is inaccessible due to road blockage**

Annex 9: SMART - Simple Triage And Rapid Treatment



Student handouts - Triage Assessment Exercise I

Directions: you respond to a vehicle collision on the Prithvi Highway near Mugling. You arrive on scene and see victims trapped inside a minibus that collided into the side of a truck. A smaller car with moderate damage is stalled to the side of the intersection. Your Commanding Officer asks you to begin triage. You see 2 injured victims standing in the side of the road near the small car, 2 adults inside the truck and 2 adults, a child and an infant inside the minivan.

1. What is your On Scene Report? (Hint: What do you have? What are you doing? What do you need?

2. Triage the eight patients below using START:

Victim	Type of Injury	Pertinent Info.	Triage Category	Reason
1	**Truck Driver -- c/o** Neck & shoulder pain, elderly, history of cardiac illness	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	
2	**Truck Passenger --** Upset but no apparent complaints, elderly man	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	
3	**Minibus Driver --** Blood from ears, facial fracture, skull laceration, unconscious	**R**espirations: Under 30 **P**ulse (radial): None **M**ental Status: Unconscious	o Immediate o Delayed o Minor o Dead/ Dying	
4	**Minibus Passenger --** Major skull fracture with eye socket hanging out	**R**esp: None after head tilt **P**ulse (radial): None **M**ental Status: Unconscious	o Immediate o Delayed o Minor o Dead/ Dying	
5	**Minibus Passenger --** Child in back seat with seat belt on, answers questions but whimpers	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	
6	**Minibus Passenger --** Infant properly restrained in car seat, crying & whimpering	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	
7	**Adult Male # 1 --** Curbside, shook up, grabbing neck	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	
8	**Adult Female # 2 --** Curbside. No apparent complaints	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	

3. What is your Triage Report?

Triage Assessment Exercise I - Answer Sheet

1. **On Scene Report:** Responding vehicle is on scene of a three- vehicle collision with several victims down, some are trapped. Responding vehicle is assuming command, initiating triage and informing appropriate authorities. Give me the balance of a First Alarm Medical.

2. **Triage Results Using START:**

Victim	Triage Category	Reason for Selected Category
# 1	Delayed	No abnormalities according to criteria.
# 2	Delayed	No abnormalities according to criteria.
# 3	Immediate	No radial pulse.
# 4	Dead/ Dying	No respiration after head tilt.
# 5	Delayed	No abnormalities according to criteria.
# 5	Delayed	No abnormalities according to criteria.
# 7	Delayed	No abnormalities according to criteria.
# 8	Minor	Self- extricated. No complaints.

3. **Triage Report:** Triage to Command. Triage is complete. We have a total of 8 patients, 1 Immediate, 5 Delayed, 1 Minor and 1 901 –H.

4. **Patients Upgraded Due to Mechanism:** Patient 5 and 6 are likely to be upgraded later in the incident since they were inside the same vehicle as the Dead/Dying victim and Immediate patients. Patient # 1 may need to be upgraded, depending on condition, especially because of age and medical history.

Student handouts - Triage Assessment Exercise II

Directions: You are working on an ambulance and are dispatched as a second due unit to a reported bombing of a Government office. As you arrive on scene, you hear shouts and screams and see several victims lying about. You report the incident as you arrive. Command directs you to perform triage and to follow- up with a Triage Report.

You survey the scene and direct all those who can walk to get up and walk 200' down the street to a collection area. You advise the walking wounded that a paramedic will be there to assist them in about 10 – 15 minutes. You and your partner begin triage. You find the nineteen patients below. What is their Triage Category? What is the reason for your decision?

Victim	Type of Injury	Pertinent Information	Triage Category	Reason for Selected Category
# 1	Compound fracture of the left femur	**R**espirations: Under 30 **P**ulse (radial): Absent **M**ental Status: A O X 4	o Immediate o Delayed o Minor o Dead/ Dying	
# 2	Sudden onset of chest pain, no shortness of breath	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: A O X 4	o Immediate o Delayed o Minor o Dead/ Dying	
# 3	90% second degree burns over body	**R**espirations: None **P**ulse (radial): Present **M**ental Status: Unconscious	o Immediate o Delayed o Minor o Dead/ Dying	
# 4	Patient states she is a diabetic. Skin is moist and clammy	**R**espirations: Under 30 **P**ulse (radial): Absent **M**ental Status: A O X 4	o Immediate o Delayed o Minor o Dead/ Dying	
# 5	Unable to move legs	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Confused	o Immediate o Delayed o Minor o Dead/ Dying	
6	No apparent injuries	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: A O X 4	o Immediate o Delayed o Minor o Dead/ Dying	
# 7	Sucking chest wound	**R**espirations: Over 30 **P**ulse (radial): Present **M**ental Status: Unconscious	o Immediate o Delayed o Minor o Dead/ Dying	
# 8	Dislocated right shoulder	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: A O X 4	o Immediate o Delayed o Minor o Dead/ Dying	
Victim	**Type of Injury**	**Pertinent Information**	**Triage Category**	**Reason for Selected Category**

# 9	No visible wounds	**R**espirations: None **P**ulse (radial): Absent **M**ental Status: Unconscious	o Immediate o Delayed o Minor o Dead/ Dying	
# 10	Scalp wound with an estimated blood loss of 500 cc	**R**espirations: Over 30 **P**ulse (radial): Present **M**ental Status: Confused	o Immediate o Delayed o Minor o Dead/ Dying	
# 11	Significant head injury	**R**espirations: Under 30 **P**ulse (radial): Absent **M**ental Status: Unconscious	o Immediate o Delayed o Minor o Dead/ Dying	
# 12	Three month old Infant	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Unconscious	o Immediate o Delayed o Minor o Dead/ Dying	
# 13	Impaled, 1 foot piece of shrapnel in right eye	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	
# 14	Female 6 months pregnant, broken left lower leg	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	
# 15	Severe difficulty breathing, chest sinks in on inspiration	**R**espirations: Over 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	
# 16	Unable to move, no verbal response	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake but stares into space	o Immediate o Delayed o Minor o Dead/ Dying	
# 17	Amputated left arm, bleeding controlled	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	
# 18	Large head wound, brain matter showing	**R**espirations: None **P**ulse (radial): Absent **M**ental Status: Unconscious	o Immediate o Delayed o Minor o Dead/ Dying	
# 19	Minor abrasions	**R**espirations: Under 30 **P**ulse (radial): Present **M**ental Status: Awake & Oriented	o Immediate o Delayed o Minor o Dead/ Dying	

Triage Assessment Exercise II - Answer Sheet

Victim	Triage Category	Reason for Selected Category
# 1	Immediate	No radial pulse.
# 2	Delayed	No abnormalities according to criteria.
# 3	Immediate Dead/ Dying	If respiration begins after airway established. If no respiration after airway established.
# 4	Immediate	No radial pulse.
# 5	Immediate	Impaired mental status.
# 6	Delayed	No abnormalities according to criteria.
# 7	Immediate	Respiration over 30/ minute.
# 8	Delayed	No abnormalities according to criteria.
# 9	Immediate Dead/ Dying	If respiration begins after airway established. If no respiration after airway established.
# 10	Immediate	Respiration over 30/ minute.
# 11	Immediate	Radial pulse absent.
# 12	Immediate	Impaired mental status.
# 13	Delayed	No abnormalities according to criteria.
# 14	Delayed	No. abnormalities according to criteria.
# 15	Immediate	Respirations over 30/ minute.
# 16	Immediate	Impaired mental status.
# 17	Delayed	No abnormalities according to criteria.
# 18	Dead/ Dying	No respirations. Obvious mortal injury.
# 19	Delayed	No abnormalities according to criteria.

Annex 10: Sample Evaluation Format

I. INFORMATION ABOUT PARTICIPANTS

1. In which institution do you work?

Hospital / Health Institution	☐
Army	☐
Police	☐
NGO	☐
Others	_____

2. What profession do you have? (One tick mark only)

Medical Doctor	☐
Nurse	☐
Paramedic	☐
Army	☐
Police	☐
Volunteer	☐
Others (please specify)	_____

3. Experience in Mass Casualty Management?

A lot (years)	☐
Some (months / weeks)	☐
None	☐

II. ASSESSMENT OF THE TRAINING

	Yes	No
4. Did you learn anything new?	☐	☐
5. Would you like to see the training programme repeated?	☐	☐

6. What do you think about?

	Excellent	Good	OK	Bad
The Theory Classes (Presentations)	☐	☐	☐	☐
The Mock-Drill	☐	☐	☐	☐
The Video	☐	☐	☐	☐

7. What was the best item in the programme? –And why?

8. How can we improve the training programme?

9. Any suggestions for the follow-up in future?

III. ADMINISTRATIVE MATTERS

10. What do you think about the training facilities?

11. What do you think about the facilitators of the training programme?

12. Any other comments / suggestions?

Annex 11: Sample Certificate

Mass Casualty Management
Training Programme and Simulation Exercise

This is to certify that Dr./ Mr./ Ms..... attended the "Mass Casualty Management (MCM) Training Programme and Simulation Exercise" held on the 09th and 13th January 2004 in Kathmandu, Nepal. The Programme was jointly organised by HMG / N, MoH, DHS, Epidemiology & Disease Control Division, the World Health Organisation and NSET – Nepal.

Dr. Kan Tun Representative to Nepal World Health Organisation	Dr. M. B. Bista Director Epidemiology & Disease Control Division	Mr. S. B. Pradhanang President National Society for Earthquake Technology