MASS CASUALTY MANAGEMENT SYSTEMS

**Strategies and guidelines
for building health sector capacity**

World Health Organization

Health Action in Crises

Injury and Violence Prevention

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2007

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FOREWORD

Major emergencies, crises and disasters have become more frequent during recent decades, especially in middle and low income countries. They affect more and more people, disrupting health sector programmes and essential services, and slowing the process of sustainable human development.

Many lives could be saved if the affected communities were better prepared, with an organized scalable response system already in place. In addition, survivors of mass casualty incidents often suffer disabilities or health impairment – physical or psychological. These can severely strain the health sector and draw scarce resources away from other essential programmes. Again, much of this is avoidable.

Experience shows that the community is the first to provide emergency assistance in such incidents. For this reason, preparedness planning increasingly emphasizes building capacity (human, organizational and infrastructural) at the community level. Empowering communities to develop emergency management plans for mass casualty incidents requires strong involvement by health authorities at all levels, especially the national level, as well as support from other sectors.

The common gaps in health system preparedness around the world are generally well understood, but they are often not addressed in a comprehensive and systematic way. In particular, many countries have not yet developed Mass Casualty Management Plans, and communities are too often left alone to develop preparedness and response plans without guidance from higher levels.

In September 2006, a Global Consultation on Mass Casualty Management was held in Geneva at WHO headquarters. The Guidelines set out in this document are the direct result of the consultation. They are designed to help policy makers, decision makers and emergency managers at all levels, especially at community level, to overcome the gaps in health system preparedness for managing mass casualty incidents.

ABBREVIATIONS AND ACRONYMS

CCC	Command, control, and coordination
CDC	Centers for Disease Control
CERT	Community Emergency Response Team (Australia)
CRED	Centre for Research on the Epidemiology of Disasters
CWTC	Citizens Welfare Training Course (Philippines)
ED	Emergency Department
EMS	Emergency Medical System
HAC	Health Action in Crises
Hazmat	Hazardous Material
HCF	Health Care Facility
GIS	Geographical Information System
MCM	Mass casualty management
MOU	Memorandum of Understanding
NGO	Non-Governmental Organization
RAV	Rural Ambulance Victoria (Australia)
ROTC	Reserved Officers Training Course
SAR	Search and Rescue
SOPs	Standard Operating Procedures
SERPs	Supplemental Emergency Response Plans
TCS	Trauma Care Systems
WHA	World Health Assembly
WHO	World Health Organization

A NOTE TO READERS

While this document contains a Glossary of Definitions, three key terms must be understood from the outset.

First, "*Ministry of Health*", much of information in these Guidelines deals with the role of a country's supreme health authority – usually the Ministry of Health – in mass casualty management. However, in many countries, much or all of the responsibility for organizing the response to emergencies is in the hands of organizations other than the Ministry of Health. For example, some countries have separate ministries for emergency situations, while in others the Ministry of Interior or specially mandated agencies may have this role. These Guidelines, should therefore be interpreted and adapted according to the official structures and organizational realities in each country.

Second, we have used the phrase "*provincial or state"* to denote levels of government organization between the national and the local levels. (We have reserved the term *regional* to apply to international regions according to WHO designations: Africa, the Americas, Eastern Mediterranean, Europe, South East Asia, and Western Pacific.)

Finally, "*community"* is used in its broad sense of a geographically discrete area and population. It is defined as a division of a country small enough to permit effective participation and large enough to have the necessary resources to implement planned activities (WHO 2006a). A community will normally correspond to a unit of local government (municipality, district, commune, or township), with four major organizational features relevant to emergency management: (1) its own common assets for responding to an emergency (police, fire, hospital etc); (2) authority for decision making delegated by a higher authority; (3) responsibility for its own financial and human resources; (4) accountability for its actions (WHO 1999). However, reality is rarely this neat, and readers will have to apply this definition in ways which make most sense to local conditions.

PREAMBLE:
MASS CASUALTY MANAGEMENT PLANNING CONCEPT WITHIN THE WIDER HEALTH SECTOR EMERGENCY MANAGEMENT

The following is adapted from WHO's *Community Emergency Preparedness: A Manual for Managers and Policy Makers* (WHO 1999).

An emergency plan is a set of arrangements for responding to, and recovering from emergencies, and it is about protecting life, property and the environment. The development of an emergency plan should take into account existing plans at other administrative levels, plans that operate at the same level, as well as any plans developed for specific hazards.

The prerequisites for planning are: a recognition that risks and vulnerability exist, and that emergencies can occur; an awareness by the community, government, and decision-makers of the need to plan and of the benefits of planning; implementation of the plan is guaranteed by appropriate legislation; and, designation of an organization responsible for coordinating both planning and emergency response and recovery in the event of an emergency.

The planning process (Figure 1) can be applied to any community, organization or activity. It includes:

- **Project definition**: determines the aim, objectives and scope of an emergency plan, and decides the tasks and the resources required for performing these tasks.

- Formation of a representative **planning group**: to gather the required information and to gain the commitment of key people and organizations, both of which will contribute to the successful implementation of the plan.

- **Potential problem analysis**: through breaking the problem into its components to examine risks, their causes, possible preventive strategies, response and recovery strategies, and trigger events for these strategies.

- **Resource analysis**: to identify the required resources for the response and recovery strategies, resources available, discrepancy between requirement and availability, and responsibility.

- Designation of **roles and responsibilities** to individuals and organizations.

- **Management structure** concerning the command of individual organizations and control across organizations.

- Developing **strategies and systems** for specific response and recovery.

- **Documentation**: The written emergency plan will consist of the outputs of each step of the process.

Figure 1: Emergency planning process

DEFINE PROJECT ↓ REVIEW PLANNING GROUP ↓ ANALYSE POTENTIAL PROBLEMS ↓ ANALYSE RESOURCES ↓ DESCRIBE ROLE & RESPONSIBLITIES ↓ DESCRIBE MANAGEMENT STRUCTURE ↓ DEVELOP STRATEGIES	For the health sector plan, the process will:

For the health sector plan, the process will:

• Consider the general country profile with available basic indicators relevant to the social, cultural, economic, demographic situation and expected emergencies.

• Consider the existence of a clear health policy on emergency preparedness with the necessary legal provisions.

The health sector should have the necessary technical and administrative organization for the emergency preparedness and response planning and implementation at the various levels (national, provincial and health facility). This includes:

• Coordination mechanisms.

• Capabilities for technical planning, programme implementation, training, research and logistical support.

• The necessary resource (human and financial) should also be made available and allocated.

• Eight technical areas are of priority for public health during emergencies: Mass Casualty Management; Communicable Diseases; Nutrition; Maternal, Newborn and Child Health; Water, Sanitation and Hygiene; Non-Communicable Diseases including Mental Health; Pharmaceuticals and Biologicals; and Health Care Delivery Services.

INTRODUCTION

These Guidelines address *management and policy issues* that relate to the mass casualty management systems and how they fit within the broader topic of emergency preparedness.
These management and policy issues are divided into chapters as follows:

- National emergency systems
- Mass casualty management at the national level
- Provincial or state level
- Community and local government level
- Health care facility level

It should be noted that many of these issues overlap the various levels, and that they should be contextualized according to the local conditions within the country. Therefore, it is hoped that readers will be able to apply the Guidelines to their own circumstances. WHO is coordinating further work to address technical issues and will publish further documents on these issues in the near future.

Scope and purpose of these Guidelines

For the purposes of these guidelines, a mass casualty incident is defined as *an event which generates more patients at one time than locally available resources can manage using routine procedures. It requires exceptional emergency arrangements and additional or extraordinary assistance.*

It can also be defined as *any event resulting in a number of victims large enough to disrupt the normal course of emergency and health care services* (PAHO/WHO 2001).

Most such incidents are marked by a relatively sudden and dramatic event that causes a surge in numbers of patients. This definition covers a wide range of incidents of varying degrees of severity. A bus crash in a small rural community with tens of injured survivors would fulfil this definition, as would a major natural disaster such as a severe earthquake affecting a heavily populated area. Responding to the two poses very different challenges as the latter will almost certainly be accompanied by substantial destruction of provincial, state or national infrastructure. Other incidents such as those of terrorist or biological origin will require similar responses.

Objective
The objective of these guidelines is to assist in developing mass casualty management systems in countries where these are currently lacking or need significant improvement. They are designed to help create systems which will be comprehensive and evidence-based. While planning should focus on the types of hazards most likely to give rise to mass casualty incidents in a particular setting, these systems will be capable of responding to all types of incidents at different scales, from the purely local to the national or international.

Target audience
Effective management of mass casualty incidents requires coordinated efforts across a wide variety of sectors, some of which may have little experience of working with the health sector. Accordingly, while the primary target audience for these guidelines is those responsible for developing health emergency management plans and policies, as well as those managing health system responses to mass casualty incidents, they are also designed to be useful to a wide range of individuals and organizations with responsibilities for emergency management.

Why preparedness is a growing priority

All governments have a responsibility to protect public safety and provide emergency relief in a crisis. This alone is sufficient justification for investing in preparedness for mass casualty incidents. However, there is also an important public health issue at stake. This becomes clear when emergency preparedness is considered against a rising body of evidence about mass casualty incidents.

A wide range of incidents, both natural and man-made – Mass casualty incidents can take a variety of forms. Transportation systems (road traffic, aircraft, shipping, railroads) account for many such incidents, as does industry (chemical spills, factory fires), buildings collapse or burn. Poisonings can result from sources such as restaurants or water supplies. Outbreaks of disease can quickly outstrip the ability of local health care facilities to contain and treat them.

Most vivid in the public imagination are natural disasters – events of a scale that they endanger both populations and environments - such as floods, windstorms, and earthquakes. According to historical data, the number of recorded natural disasters since 1900 have increased, as have the number of people affected. At the same time, man-made events are growing in frequency and impact (Box 1). In the 1970s, man-made events accounted for 16.5% of disasters and 4.3% of related deaths; in the 1990s, they had risen to 42% and 9.5% respectively (these figures do not include "complex emergencies" involving armed conflict and a total breakdown of authority).

In fact, the mass casualty incidents that most countries experience on a regular basis are major accidents – road traffic, industrial, as well as other incidents – with tens of victims, rather than larger numbers. For instance, about 1.2 million fatalities occur each year in traffic crashes, dwarfing the numbers killed in officially-designated disasters (WHO 2004). A significant proportion of traffic crashes involve mass casualties, particularly in developing countries. Moreover, research suggests that for each disaster listed in official disaster databases, about 20 other smaller emergencies with destructive impact on local communities are unacknowledged (Maskrey, cited in WHO 1999).

WHO policy on emergency preparedness

In 1981, the World Health Assembly passed a resolution which stated that "despite the undoubted importance of relief in emergencies, preventive measures and preparedness are of fundamental importance."

During the International Decade on Natural Disaster Reduction (1990-1999), further resolutions endorsed the importance of preparedness in the health sector. In 1995, recognizing that "disaster reduction is an integral part of sustainable development and each country bears the primary responsibility for strengthening its capacity," the Assembly clearly differentiated the WHO's role in "emergency preparedness and disaster reduction" from its responsibilities in "emergency response and humanitarian action".[1]

The importance of preparedness was reiterated in 2005, as well as the need to "strengthen the ingenuity and resilience of communities, the capacities of local authorities, and the preparedness of health systems." Member states were further urged:

> To engage actively in the collective measures to establish global and regional preparedness plans that integrate risk reduction into the health sector and build-up capacity to respond to health-related crises…

and:

> To formulate …national emergency-preparedness plans that give due attention to public health, including health infrastructure…

(Footnotes)
[1] See World Health Assembly resolutions WHA34.26 (1981), WHA42.16 (1989), WHA46.6 (1993), and WHA48.2 (2005).

In May 2007 the 60th World Health Assembly adopted a resolution on emergency-care systems. The resolution calls, among other things, for WHO to provide guidance for the creation and strengthening of mass-casualty management systems.

A four-pillar strategy

The WHO's Health Action in Crises (HAC) has recently elaborated a five-year strategy to build the capacity of the health sector and communities in emergency preparedness and risk reduction. This Strategy consists of four pillars:

- assessing and monitoring baseline information on the status of health emergency prepared-ness and risk reduction at regional and country levels
- institutionalizing emergency preparedness and risk reduction in ministries of health and establishing an effective all-hazard/whole-health programme for this purpose
- encouraging and supporting community-based emergency preparedness and risk reduction
- improving knowledge and skills in health emergency preparedness and response, and risk reduction.

This strategy aims to substantially increase the preparedness of the communities and the health sector to manage health consequences of mass casualty incidents and other emergencies and crises, and provides the conceptual underpinning to these Guidelines.

Box 1: Disasters and their impacts

The following is adapted from the article "Was 2005 the year of natural disasters?" in the January 2006 Bulletin of the World Health Organization.

From January to October 2005, an estimated 97 490 people were killed in disasters globally – 88 117 of them in natural disasters – according to the Centre for Research on the Epidemiology of Disasters (CRED). The annual number of natural disasters recorded since 1900 have increased and the number of people affected by such disasters has also increased since 1975, when about 75 disasters were reported globally. In 2000 the figure peaked at 525 and dropped to just under 400 in 2004. By far the highest number of fatalities – about 450 000 – occurred in 1984. In 2004 nearly 300 000 died in disasters, but the number of people affected has soared since 1975 with about 600 million people affected by disasters of all kinds in 2002.

Today's disasters stem from a complex mix of factors, including climate change, global warming influenced by human behaviour, socio-economic factors causing poorer people to live in risky areas, and inadequate disaster preparedness and education on the part of governments as well as the general population.

Some disasters experts reject the term "natural disasters, arguing that there is almost always a man-made element. So complex and intertwined are the factors behind these disasters that some experts believe the most practical approach to preparedness may be to focus on reducing the risks rather than factors behind the risks (Braine 2006).

Guiding principles

A number of guiding principles should be observed within all plans, protocols and operational procedures. These principles are designed to assist planners, policymakers, and implementing agencies as they develop plans for their own specific situations.

Clear lines of responsibility

Plans must clearly define the roles, responsibilities and expected activities of all those dealing with the incident. They must allow response to be scaled up from local, to provincial/state and to national levels in a seamless manner, with no confusion as to who is in charge at each phase of the response.

Scalability

Preparedness must address different scales of incident and surge in demand for health care. While some activities (triage, transportation, treatment) are common to managing all mass casualty incidents, additional measures such as evacuation of large populations may be necessary. For example, the scale of the 2004 Asian tsunami was beyond the thinking of planners. Plans must allow for "scale-up" in such events.

Whole-of-health

In addition to death and injury, other health considerations must be planned for. Planning strategies must also take into account the basics of environmental health (i.e. water, sanitation, housing); non-communicable diseases (including mental health); maternal, newborn and child health; communicable diseases; nutrition; and health care delivery services (including health infrastructure).

Knowledge-based

Almost every imaginable form of mass casualty incident has already occurred before, and planners therefore have access to a great – and growing – body of knowledge. Useful sources of information may include: official reports from other countries (particularly those with similar conditions); scientific and epidemiological data; and documentation from WHO and other organizations (See: Sources of Information).

Multisectoral

The success or failure of responses to mass casualty incidents depends on the cooperation of many sectors – communications, transportation, law and order, security, water and sanitation, social services, and other non-health sectors – that may not coordinate their "normal" daily activities. Coordination should be institutionalised not only at the level of national ministries, but – ultimately most important – at the local level of communities.

Box 2: Ethical guidelines

Experience teaches that mass casualty incidents frequently raise serious ethical dilemmas (Sztajnkrycer, Madsen et al. 2006). Some are perennial medical questions, such as what criteria will be used for triage decisions; others emerge from specific experience, such as tensions between local burial traditions and the need to manage fatalities efficiently. Since these dilemmas are largely predictable, the ethical principles underlying plans and protocols should be clearly defined so that they do not have to be debated while the emergency response is in progress. Plans and responses based on clear ethical guidelines are far more likely to be accepted before, during and after an event by individuals, the local community and the international community (including the media).

While different countries and cultures may define and prioritize ethical principles in different ways, they will generally include:

- Valuing human life
- Preserving the basic human dignity of every individual
- Doing the best for the most people
- Respecting local community standards and values.

The Universal Declaration of Human Rights and other human rights instruments, as well as more specific guidelines such as the Sphere Project's Humanitarian Charter and Minimum Standards in Disaster Response, provide useful reference points for the framing of ethically based plans (Sphere Project and McConnan M 2004).

National policies which enable local solutions

The fundamental concerns of a mass casualty management system are public safety and the building of safer communities ("building" in this case means not only physical construction but strengthening all of the elements – human, organizational and infrastructural – that make up a community). While plans must be in place to mobilize provincial/state and national resources if required, the national policy and strategy emphasis must be clearly directed at enabling local authorities to prepare for, respond to and recover from a mass casualty incident.

MASS CASUALTY MANAGEMENT: A KEY COMPONENT OF NATIONAL EMERGENCY SYSTEMS

The national government is the ultimate authority in emergency management as part of its overall responsibilities for the safety and security. Depending on the size and seriousness of the incident the government is responsible for implementing national coordination structures, approving extraordinary resources, calling up the military, assuming extraordinary powers, and for activating international systems of cooperation and aid.

A complex partnership

A variety of Ministries, agencies and other organizations have roles to play in emergencies, with the Ministry of Health taking on a major one. Although the names and responsibilities vary from country to country, these will likely include: the Ministries/Offices of the Interior, Security, Communications, and Environment; the various branches of the military; Civil Defense agencies; Red Cross/Red Crescent, the private sector, and so on. Given the mix of roles and responsibilities, some form of a coordinating structure (or structures) should be in place. These may have names like: Emergency Management Council or Cabinet Emergency Committee (comprising the head of state and key ministers); National Interdepartmental Emergency Committee (top-level civil servants); and National Disaster Recovery Committee (a wider grouping which may include non-governmental as well as government figures).

These structures should have formal roles laid out in National Emergency Management plans and policies. Many countries also have a permanently staffed national Emergency Management Agency (or similarly named system) which assumes command, control and coordination responsibilities when large-scale disasters or emergencies occur.

No matter what forms that government and public administration take, national emergency management systems should include:

- Identification of lines of authority, from the national to the local level
- Financial arrangements for funding emergency work
- Arrangements to ensure that government and community activities are maintained (for example, creation of parallel or "hardened" communications systems to take over if normal voice or data transfer systems are affected)
- National stockpiling of appropriate resources (including provincial or state and local pre-positioning of stockpiles)
- Database of national experts for advice on specific problems
- Protocols and formal arrangements for coordinated efforts with other countries, or between provincial/state governments within the country.

Increasingly, governments are adopting decentralized models of emergency management, devolving operational authority to the lowest possible level of government, recognizing that even though many emergencies can be handled effectively at local level, national political interest may require national involvement. However, some response capabilities may be maintained under national control. These may include Search and Rescue (SAR) teams and specialized functions such as Hazardous Material ("Hazmat") units needed to deal with events such as chemical incidents or terrorist attacks. Figure 2 provides a generic outline of how national systems of emergency management are structured, showing lines of authority and a range of participating services or agencies.

Figure 2: National Emergency Operational and Preparedness Structure
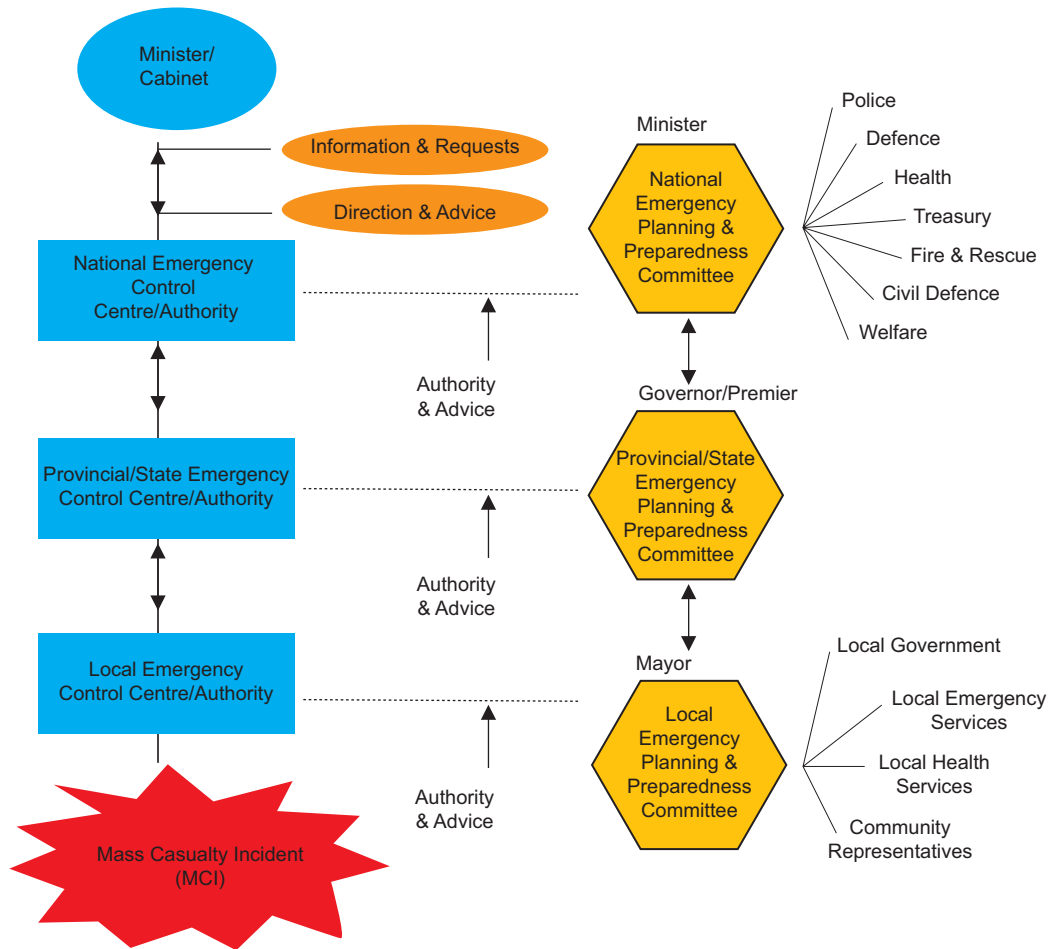
The Ministry of Health: a leading partner

Whatever the formal institutional arrangements, the Ministry of Health must be heavily involved in all national emergency management potentially dealing with mass casualties, because of both its expertise and its normative role in the setting of health-related standards and rules and procedures. For instance even if the Ministry of Health does not operate ambulances – in some countries this may be the task of the Red Cross/Red Crescent, Civil Defense authorities, or even the private sector – the Ministry of Health is nevertheless likely to set the standards regarding how ambulances are to be equipped, the training of crews and the numbers of ambulances per thousand population.

Because of its expertise, the Ministry of Health is usually well placed to help health care facilities and main health disciplines to develop their emergency plans, create training programmes, prepare drills and exercises, and so on. Finally, the Ministry is usually responsible for promoting standards and overseeing accreditation, for example in validating the plans developed by health care facilities and their local partners.

A dedicated unit within the Ministry of Health

In order for the Ministry of Health to meet its potential as a partner, it must organize itself in a way which maximizes its comparative advantages and brings together the people best suited to the task at hand. A necessary first step will be to form permanent structures with institutional responsibility for all Ministry of Health activities related to planning for mass casualty events. A recommended configuration is a dedicated emergency committee of senior staff, chaired by the Minister of Health, and a dedicated emergency preparedness and response unit whose head serves as secretary of the Committee. The

Committee and the Unit should adopt a multidisciplinary, all-hazard, whole-of-health approach, and therefore will consist of experts in all relevant fields.

Formal and informal relationships with other partners

In most countries, when a mass casualty incident occurs that requires a national response, some form of national emergency plan exists which is invoked according to established procedures. Within such arrangements, the immediate role of the Ministry of Health will be to act as a focal point for liaison, coordination and communication between the various health system components (e.g. public, private, military, and NGOs) as well as with other ministries, the office of the head of state and, when necessary, international agencies. This should be done based on a health sector plan (see following chapter) that takes into consideration the need for interdisciplinary coordination with health partners. Because of the potential for confusion arising over issues such as legal authority, jurisdiction, customs' importation procedures, and so on, the Ministry should sign Memoranda of Understanding (or equivalent agreements) with other partners to formalize the necessary arrangements. These agreements should be written with relevant national legislations in mind (see: A solid legislative basis, below).

Equally important, Ministry of Health staff should establish working relationships with staff in other organizations so that, during a crisis, the "players" (key individuals) are known to each other. This can be most effectively done by joint planning and exercises at all levels (discussed below), as well as regular meetings and periodic evaluations or reviews.

International cooperation

Although another part of government such as the Ministry of Foreign Affairs may have formal responsibility for requesting or accepting assistance from outside the country, the Ministry of Health will have an essential role of facilitating, and coordinating international health assistance if it is required. This applies when assistance is offered or received, and will normally be coordinated with other ministries, the national Emergency Management Agency, and the office of the head of state.

Once again, Memoranda of Understanding or other agreements for mutual aid, support and cooperation should be signed, particularly with neighboring countries, international agencies (including WHO) and international NGOs. It cannot be over-emphasized how important it is for these arrangements to have been prepared at a detailed level, in order for responses to work efficiently.

A solid legislative basis

The Ministry of Health should ensure (in concert with other ministries) that legislations exist which provides adequate authority for mass casualty management within the overall emergency preparedness and response plan. This goes well beyond providing special emergency powers when circumstances require, although that is of course an essential component. Responses from all levels of government (local, provincial/state, and national) must be defined and enabled in the appropriate laws, which will typically have titles like Emergency Management Act, Health Act, Community Services Act, and Quarantine Act.

At a minimum, legislations should define the roles of Ministers and other senior officials (e.g. Chief Health Officer, Health/Medical Emergency Coordinator) and provide legal authority for national emergency councils, committees and advisory groups. It must enable the essential Command, Control and Coordination models which form the basis for all emergency management systems.

If existing legislations or legislative gaps (i.e. lack of legally defined authority) act as barriers to effective mass casualty management, the Ministry of Health should help to draft the necessary amendments, according to the established law-making arrangements in the country.

PLANNING FOR MASS CASUALTY MANAGEMENT AT NATIONAL LEVEL

All countries – whatever their level of wealth and stage of development – have existing health sector systems, with significant human and material resources. These systems, with their existing arrangements and infrastructure for casualty management are the essential foundation for mass casualty management in times of emergency (WHO 1998). The Ministry of Health, and in particular the emergency preparedness and response unit described above, should therefore take responsibility for building on all existing health care resources that can help in responding to mass casualty incidents.

A generic framework for emergency planning is provided in the preamble, with particular reference to the health sector.

Establishing a baseline

Improving existing systems first requires establishing a "baseline" – an assessment of current system's capacity, against which planned changes can eventually be measured. To do so, the Ministry of Health should perform a comprehensive analysis of relevant health care resources available in the country, or direct lower levels of government, such as provinces/states, if that is where operational responsibility for health is located. This analysis may entail a comprehensive review of the health care system, or a more tightly focused look at those components that will be particularly called on in the event of a mass casualty incident. Whatever the focus, the baseline analysis should assess and map both the quantity and quality of available health care facilities, personnel and equipment.

Based on this analysis, a detailed risk assessment (see below), and consultation about the standards that must be met in emergency responses, a "gap analysis" can be carried out to (a) decide how to improve these resources to the required standards and (b) calculate the additional resources required to respond to a mass casualty incident should one occur. It will provide the Ministry of Health with the information it needs to set priorities and coordinate the redistribution of resources for optimum preparedness.

A variety of tools are available to assist with this process, and for assessing specific areas of health care. For example, an analysis of the gap between existing trauma care resources and the desired standard can be performed using the WHO *Guidelines for Essential Trauma Care and Pre-hospital Trauma Care Systems* (see: Sources of Information). These publications set affordable minimum standards for trauma care capabilities, including human resources, physical resources and administrative mechanisms.

Hazard analysis and risk assessment

A second key initiative should be taken to provide a detailed understanding of the hazards and risks specific to the country. The WHO's Community emergency preparedness: a manual for managers and policy-makers provides a detailed discussion of this process (WHO 1999). While it may be carried out or directed by the Ministry of Health at national level, hazard analysis and risk assessment should also be carried out on a provincial/state basis, particularly if health expertise and resources are concentrated at those levels. Emphasis should be placed on gathering retrospective data on previous incidents. This should not be limited to large-scale disasters but to those of smaller scale such as major traffic or industrial accidents, mudslides or floods that do not require national intervention, fires and building collapses, and so on. It should also include a forward-looking component assessing risk in the future from elements such as unsafe urban development, or changes in weather patterns.

Coupled with the baseline assessment, the information provided by this hazard analysis and risk assessment will provide a solid basis for the subsequent process of planning, and for the allocation of resources.

Having in hand the information collected in the baseline analysis, and in the hazard analysis and risk assessment, the Ministry of Health will be ready to help improve national preparedness for mass casualty incidents by implementing or sponsoring (i.e. helping other partners to implement) a number of initiatives. Some of these will be internal to the Ministry, while others will be carried out in cooperation with partner Ministries or agencies.

Developing a national mass casualty management plan

Ultimately, and working in consultation with other emergency management stakeholders, the Ministry of Health should produce or sponsor the production of a National Mass Casualty Management Plan: the highest level of a tiered array of plans from the national level through various sub-national levels of government (provincial/state levels) down to the local level.
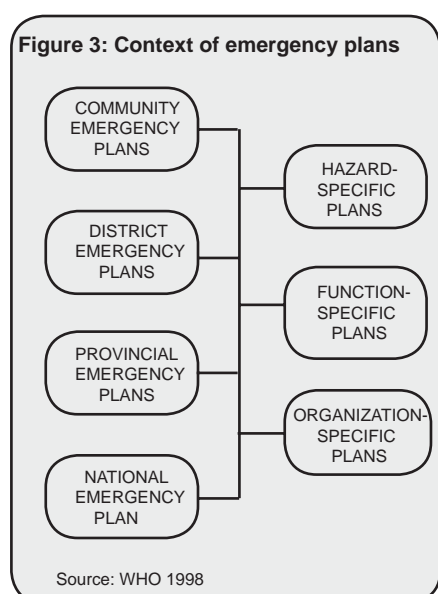
The national plan must be compatible with plans at provincial/state and local levels, although it will not necessarily be the model for them. For example, the plan produced for a mountainous province will focus on different hazards and different responses from that of a desert or coastal province. However, provincial plans should refer to the national plan and to the part they play in the national mass casualty management system. At the local level, all health care facilities must have plans compatible with the national plan.

Because the National Mass Casualty Management Plan should be consistent with the emergency management plans at national, provincial/state and local levels, it should be developed in consultation with other ministries and agencies responsible for emergency management and disaster planning.

The Plan must be reviewed regularly to take into account such issues as new or evolving hazards, improvements in capacity and resources, innovation in mass casualty incident procedures and technologies, and lessons learned from drills and training exercises.

A tiered approach

The National Mass Casualty Management Plan should be based on a "tiered approach" to dealing with mass casualty incidents, in line with the guiding principles of scalability and enabling local responses (see above). This approach recognizes that although a national approach to policy and management of mass casualty incidents is essential, the preparedness of local health services will be the crucial element in the success or failure of the national plan.

Figure 3: Context of emergency plans

COMMUNITY EMERGENCY PLANS

DISTRICT EMERGENCY PLANS

PROVINCIAL EMERGENCY PLANS

NATIONAL EMERGENCY PLAN

HAZARD-SPECIFIC PLANS

FUNCTION-SPECIFIC PLANS

ORGANIZATION-SPECIFIC PLANS

Source: WHO 1998

As seen in Figure 3, the tiered approach locates first responses at local level, as health care facilities and emergency system authorities first become aware of the incident and begin to deal with the surge in the number of casualties needing care. When it becomes obvious that the incident is of such a scale or nature that a higher level of response is required, a provincial/state plan – the next "tier" – must be in place to identify how resources and management structures at the higher level can coordinate the response.

Similarly, for an incident requiring national intervention, arrangements must be in place well in advance to identify what must be done, by whom, and with what authority.

The National Mass Casualty Management Plan must therefore provide clear criteria regarding the "triggers" (e.g. type or scale of incident) for these escalations. The triggers should be agreed by all stakeholders, and tested in training drills and simulation exercises.

Training guidelines and standards

Along with planning, well-designed and consistently updated training is an essential component of successful emergency responses. The Ministry of Health must therefore set the training and education standards required for health sector staff involved in mass casualty management. Again, a great deal of information already exists to guide the setting of such standards and the design of training programmes, including a number of professional organizations, national agencies, and WHO (see Sources of Information). The overall objective will be to provide all health staff with the training necessary to carry out the roles assigned to them within the National Plan.

The baseline analysis described above should provide information about the current availability and quality of training in the country, and current capacities. However, this may be supplemented by additional assessments on specific training needs if important gaps are identified.

For the most part, the Ministry of Health at national level will concern itself with standard-setting, planning, and monitoring activities. These will include ensuring that:

- overall standards of training are identified and disseminated to all parts of the health care system
- training takes into account the guiding principles described earlier, such as multisectorality, scalability, and whole-of-health
- training is kept up to date through accreditation of courses and certification of trainees
- a significant amount of training is delivered through realistic exercises and drills, including those done in cooperation with other sectors
- adequate material and financial resources allocated for training to be widely available and of sufficient quality (training facilities, learning materials, equipment, and teaching staff).

The Ministry of Health may also take the lead in promoting and setting standards for first aid training. Such training should be aimed at community members (see the discussion of a "culture of preparedness" below) as well as emergency response staff in sectors other than health. The majority of training will take place at local and provincial level (discussed below), although in smaller highly centralized countries it may be most practical or cost-effective to do national trainings.

It may be advisable for the Ministry of Health to establish a national training centre (or nominate an existing agency or institution) that will be the country's main source of expertise on training for mass casualty incident management. As well as "training of trainers" and setting standards, the centre may also carry out other functions such as operations research or public education on emergency management. Training courses for various categories of health workers on tasks related to MCIs should be conducted at the provincial and local levels, but in compliance with the national standards.

> **Box 3: Promoting preparedness among university students: Philippines**
>
> After World War II, colleges and universities in the Philippines implemented a programme of citizens' military training called Reserved Officers Training Course (ROTC). Recently, the programme was renamed and re-oriented from military preparedness to preparing for mass casualty incidents and other emergencies. This takes into account conditions facing the country, which suffers from relatively frequent natural hazards such as earthquakes, volcanic eruptions and storms, as well as increasing numbers of technological and man-made disasters.
>
> The re-named Citizens Welfare Training Course (CWTC) teaches a variety of skills relevant to mass casualty management such as first aid, emergency preparedness and response. Acceptance of the change was high, since students found these activities more meaningful than marching around in a field like soldiers. The course also teaches how the government responds to emergencies, and how students can become involved in the country's mass casualty management system.

Monitoring, surveillance and early warning

Ongoing collection and analysis of information is a vital part of preparedness. At the planning stage, the Ministry of Health should assess what types of information will be needed to support the smooth functioning of the National Mass Casualty Management Plan. Particular attention should be paid to the functions of monitoring, surveillance and early warning.

Monitoring system capacity

Unless some other part of government already has this responsibility, a unit within the Ministry (likely the one which carried out the baseline analysis) should be designated with responsibility to gather and maintain such information on an ongoing basis. This must include the most recent data on system capacity and resources, as well as documentation of lessons observed from previous incidents. As well as collecting such information, the unit should take responsibility for processing and disseminating such information in ways that are useful to policy makers and decision makers – both as part of preparation and in the event of a mass casualty incident.

The unit should make efforts to use information technology to best advantage. For example, Geospatial Information Systems (GIS) are increasingly affordable, and can be flexible and cost-effective means of both collecting and providing data vital to tasks such as establishment of temporary camps, quantifying deaths, and managing logistics. Similarly, web-based solutions (i.e. use of the internet) may be useful for involving and keeping stakeholders informed through dedicated websites, online courses and electronic discussion groups.

Surveillance, epidemiology and data collection

As noted earlier, mass casualty incident management does not solely involve trauma cases, although injuries do constitute an important part of the caseload in many incidents. With the increasing risk of pandemics and biological and chemical incidents, the Ministry of Health should ensure that a surveillance system is in place, which will undertake tasks such as pattern recognition in order to identify risks early and initiate protective measures as needed.

However, it is important that surveillance systems routinely collect data on injuries since, as mentioned previously, most morbidity and mortality in mass casualty incidents may in fact come from the cumulative effects of smaller-scale events.

The operational requirements for the surveillance system should be informed by the hazard analysis and risk assessment exercise carried out earlier, which will have studied the epidemiology of the most prevalent types of incidents in the country. The Ministry of Health should continuously update this system to take into account new and emerging threats.

As well as supporting preparedness, such a system will assist the efficient allocation and application of resources as an incident develops.

Early warning systems

As should be specified within the National Mass Casualty Management Plan (in coordination with national emergency management systems), that the surveillance function should include the provision of early warnings when potential incidents – including natural events such as floods and volcanic eruption – or other worrying trends are identified. This will require the creation of protocols for triggering warnings and the chain of command that needs to be informed.

National early warning systems should have agreements and working arrangements with their counterparts in neighbouring countries, with regional structures (i.e. those grouping countries in cooperative arrangements), and with international organizations like WHO. This will permit efficient cooperation between countries should the scale or location of a given mass casualty incident warrant it. As much as possible, this cooperation should have a practical orientation, with an emphasis on activities such as joint drills and exercises, regional training and technical networks. WHO Regional offices can facilitate such activities, offer training in relevant subjects, and obtain examples of plans or protocols being used in the region or internationally.

Financial and material resources

As well as creating a National Mass Casualty Management Plan, the Ministry of Health must ensure that it has done a detailed costing of the Plan, as well as estimating costs of responding to the most probable mass casualty incidents. This will include the resources used at local and provincial/state levels, as well as those for which the national level retains operational responsibility.

If the Ministry's current budget does not cover the necessary costs needed to conduct and support the activities specified in the Plan, the Ministry should consider making a request for a special budgetary allocation from the national government. The baseline analysis will be a source of solid evidence which can be used to justify the request. Other sources such as international donors should also be considered.

Stockpiling

Depending on the size and topography of the country, the Ministry of Health should consider pre-positioning resources (facilities, staff, supplies and equipment) close to risk areas. This will speed up the delivery of tiered assistance, and avoid over-reliance upon a few centralized facilities and on transportation infrastructure that may themselves be damaged in the event of a natural or man-made major emergency.

The mobilization, transport and deployment of these stockpiled resources must be carefully planned. Protection of the resources against natural and man-made hazards must be carefully considered in such plans, as well as the safety and security of staff and facilities.

Continuous monitoring of expiration of supplies and equipment is important in order to maintain quality, and to permit updating and planning for future replenishment of these vital resources.

PROVINCIAL/STATE (INTERMEDIATE) LEVEL

In many countries, responsibility for most operations of the health system (and other components of government) is vested in intermediate levels of government such as provinces or states. The National Mass Casualty Management Plan should reflect this, ensuring that the roles and responsibilities of the provincial or state health authorities are seamlessly integrated into the national arrangements, including the national Emergency Management System.

At a minimum, provincial/state authorities must:

- plan and coordinate operational management of resources required within their defined boundaries
- identify provincial/state lines of authority and roles and responsibilities of provincial/ state emergency and health officials
- provide for a multisectoral response by creating and maintaining links between health and other agencies
- Undertake regular assessments and evaluations of the preparedness at the level of individual communities.

In many cases, provincial/state Mass Casualty Management Plans will provide a greater degree of operational detail than the national Plan, which will concentrate more on policy, lines of authority, standards, and management of international assistance.

Some operational functions may be most efficiently prepared and delivered at province/state level, rather than nationally or locally. These may include the following:

- *Internally displaced persons:* disasters frequently result in large numbers of people being forced to leave their homes and fleeing to other communities. The health and other needs

of these people must be seen to, and may pose significant coordination, security and resource challenges to emergency and health systems in the host areas.

- *Plans for mass gatherings:* major sports tournaments, religious gatherings, festivals, or concerts concentrate large numbers of people in one place. A serious incident in such a place is therefore highly likely to overwhelm local health care facilities, and require the assistance of facilities some distance away.

- *Training centres*: as noted earlier, provincial or state-based centres, particularly in large countries with decentralized systems, may be cost-effective ways to deliver the standard of training specified in the National Mass Casualty Management Plan.

- *Stockpiling*: pre-positioning of certain key resources can be planned and maintained by provincial/state authorities.

- *Management of specific risks*: radiological or chemical accidents of a limited scale (i.e. which do not trigger the involvement of national authorities).

COMMUNITY AND LOCAL GOVERNMENT LEVEL

It is at the community level that the full effects of mass casualty incidents are experienced, and it is also at this level that the greatest gains in emergency preparedness can be made.

Experience teaches that on average, it takes between 48 and 72 hours (but sometimes considerably more) for assistance from other countries to be mobilized and set up operations at a mass casualty scene. During that time, the community and local government are "on their own". What is done during this critical period is vital in determining the outcome of the incident in terms of mortality, morbidity and control of disabilities.

Planning and organization

At local level – which may include district, municipal, commune or other units of government – the Mass Casualty Management Plan will usually be a "sub-plan" of a more general emergency management plan. This emergency management plan will be under the authority of the local government leader such as a mayor, or the local representative of the Emergency Management Agency or Civil Defence authority. The plan will aim to ensure that major agencies with emergency responsibilities – e.g. police, search and rescue, fire-fighting, social services, utilities (telephone, electricity, etc.), military, Red Cross/ Red Crescent, NGOs, Emergency Management System, Civil Defence – and the health sector work as a team to organize the delivery of emergency services for victims in a mass casualty incident. (The role of individual health care facilities such as hospitals is examined in more detail in the chapter on the health care facility level).

The creation of a local Mass Casualty Management Plan should reflect a process compatible with that at national level, including baseline assessment, hazard analysis and risk assessment, and a detailed costing process. Informed by the guiding principles listed earlier in this document, the plan should take a long-term view going beyond enabling local authorities to *prepare* for and *respond* to a mass casualty incident: it must also aim to help the community *recover* once the acute phase of the incident is over.

It is important to find ways to involve the greater community in the planning process, recognizing that, as in all planning, the process is at least as important as the outcome. This will contribute to inculcating a "culture of preparedness" in the community (see: A culture of community preparedness, below). It will

also permit decision-makers and planners to access the community's "collective wisdom" about local events and conditions, and incorporate it in planned responses.

Lines of authority

In operational terms, the health sector's local planning for mass casualty management must fit within the arrangements set up by nationally standardized Emergency Management System, in order to ensure that there is no overlap or conflict with the activities of the different agencies. Command, control, and coordination (CCC) responsibilities must be clearly identified at local level, including the establishment of the main CCC structures: the emergency operation centre (a centralized location from which emergency operations can be directed or coordinated) and the site command post (i.e. directing activities at the site of the incident). However, the health sector should be proactive when it sees that improvements can be made to current arrangements (see box for an example from Morocco of successful efforts to improve coordination).

All health sector workers involved in emergency responses should understand where they fit within the overall emergency response, and the need to cooperate with its other components.

Partnerships with NGOs and the private sector

The management of mass casualties will test the surge capacity of a local community, stretching the existing health services. In order to supplement the government health sector, private health services and non-government organizations (including ambulance services, private hospitals and health professionals) should be included as part of the surge capacity for the community. An inventory of the available services and resources of the private sector and NGOs should be made available to local emergency management authorities. Private sector and NGO agencies should participate in the planning, training and exercising at local level for mass casualty incidents (FEMA, American Red Cross et al. 1993). In some places, businesses may have significant capability to contribute to planning and responses.

Box 4: Multisectoral coordination: Morocco's ambulances

Morocco provides a good example of a country which has successfully adopted a multisectoral approach to mass casualty incident management. Until recently, several sectors ran their own ambulance services, including the police, military, Civil Protection, and the public hospitals run by the Ministry of Health. Differing geographic jurisdictions and procedures meant that even in mass casualty situations, injured patients might be brought to hospitals ill-equipped to receive them. For instance, in a large road traffic crash, Civil Protection ambulances might take patients to a small hospital with no surge capacity (but within the correct administrative boundary serviced by a given Civil Protection unit) rather than to a major hospital nearer the scene of the crash. Other arrangements would then have to be made for the receiving hospital to transfer the patients to the major hospital.

After the earthquake of Al Hoceima in 2004, the Ministry of Health (with the support of WHO) convoked a national inter-sectoral meeting to discuss training in mass casualty management. The participants, including the police, army, Civil Protection, and Red Crescent, agreed to fund and send staff to a training workshop organized by the health sector. After a few workshops, the partners realized that improving coordination and inter-sectoral cooperation was of equal importance.

As a result, the ambulances of the Civil Protection (which transport the greatest number of accident victims) are now allowed to transfer patients to the best adapted hospital, even if the hospital is outside their jurisdictional area, and coordinate this with the hospitals so that emergency departments can activate their surge plans for dealing with mass casualty patients. As the Civil Protection recruits more and more medical officers for staffing their ambulances, the Ministry of Health has agreed to train these professionals and provide refresher training on a regular basis in public hospitals.

A "culture" of community preparedness

Whatever the scale of a mass casualty incident, the first response will be carried out by members of the local community – not just health care staff and designated emergency workers, but also many ordinary citizens.

In order for citizens to play an optimum role in responding to a mass casualty event, it is important to develop a "culture of preparedness". Spreading basic knowledge such as who to inform when an incident occurs can speed up responses and result in lives being saved. Similarly, increasing basic search and rescue and first aid skills can avoid the onset of complications for those injured in a mass casualty incident. In addition to knowledge, attitudes need to be changed. The passive expectation that responding to emergencies is someone else's responsibility (typically someone in authority) can be changed to an active willingness to get involved in the activities necessary to a planned response.

While efforts to inculcate such a culture can be sponsored (i.e. funded and conceived) at national level, programming is likely to be most effective if delivered by local government authorities and based in a planning process. Such activities may include:

- preparedness training to teach communities how to survive without outside help for a given period (48 or 72 hours)
- Basic search and rescue and first aid training for community members and for emergency services staff (publications such as *Capacity Building for Search & Rescue in Local Communities (Jeannet 1999)* and *International harmonization of First Aid: First recommendations on life-saving techniques* (IFRC 2004) provide useful advice on this)
- presentations at public gatherings such as clubs, religious centres (e.g. those connected with churches, mosques and temples), and community service organizations
- Advertising or public information through the press and electronic media, or using posters, leaflets and public displays in markets and shopping areas.

The education system has an important role to play in preparedness. Schools can incorporate some elements of the community's emergency preparedness plans in curricula for children and teen-agers, in order to increase the awareness of what to do during a mass casualty incident.

First aid training

First-aid training for the general public is a key component of community preparedness for mass casualty incidents, and is especially important if the community has no professional Emergency Management System. Training curricula should be based on national and international first-aid guidelines, and will generally include life saving skills like control of external bleeding; securing airways; splinting of fractures; and proper handling of the injured. Training can be carried out in a variety of settings, including workplaces (coordination with occupational health and safety training may be possible) and in schools.

It is also highly recommended that all emergency personnel (security, police, fire and rescue, and other "first responders") be highly skilled in first aid. This is not only important to operational effectiveness but to increasing the culture of preparedness in the general community, since it increases the potential number of qualified instructors for these skills.

Community-based training and education plans

Training and education should not be conceived as a "one-off" efforts, provided only once in the expectation that people will learn and remember what they need to know. Rather, training and education should be planned and budgeted as a continuous and scaled process, and scheduled to reinforce and update skills on a regular basis. In particular, local knowledge should be periodically tested through exercises including "tabletop" exercises (involving writing and discussion rather than physical action), sectoral drills, and even comprehensive Emergency Management System field exercises involving all sectors. Plans should also include a monitoring and evaluation process to ensure that training and education is effective.

Since no mass casualty management training is equally suited to all communities, national and international standards should be adapted to specific local needs and conditions.

Managing mass fatalities

Following a large-scale incident such as a natural disaster, there are likely to be a number of fatalities which will exceed the ability of the local authorities to manage mortuary operations at normal standards (Morgan, Sribanditmongkol et al. 2006). This must be prepared for, in cooperation with other sectors, including religious authorities as well as those with formal emergency response roles. For example, communities that have lost many loved ones will be much better able to cope with and recover from a major emergency if they are confident that the authorities will assist in returning remains to families for the proper observance of cultural and religious rites. Among other issues, policies and procedures must be in place to minimize the exposure of corpses, respect religious or cultural traditions, and prepare support for their relatives. A good source of information is the 2006 publication *Management of Dead Bodies After Disasters: A Field Manual for First Responders* (PAHO/WHO 2006).

Communications planning

The most commonly cited problem in disaster management is invariably communications breakdown, with emergency activities and decision-making being seriously affected by vital information being lost or delayed. To help overcome this problem, comprehensive communication plans between and among health and emergency management agencies must be established. The aim of such planning is to implement standardized, interoperable, trouble-free equipment, systems and procedures, which have been well practiced and are fully understood by all who will use them.

Communications can be a confusing term in the context of mass casualty incidents because it covers several dimensions:

- between individual responders (e.g. members of search and rescue teams) on the scene, and between them and staff at the emergency operation centres
- between agencies (e.g. Emergency Management System officials, police, ambulance services) and health care networks
- between tiers: local, provincial or state, national and international
- with the community
- with the media.

Each of these dimensions must be planned for in detail, with rigorous attention to the creation of protocols, use of efficient, robust and affordable technology, and realistic costing. Planning should also include provision for documentation and record keeping (e.g. communications logs). These will be important for post-incident investigations and enquiries, and for improving services through lessons learned.

Once the plans are developed along the planning process (see above) and validated, they should be widely disseminated to all concerned and tested through table-top drills and field simulation exercises. They must form the basis for all emergency related trainings of relevant entities within the community.

> **Box 5: First-aid in rural and isolated communities**
>
> In the Australian state of Victoria, ambulances may take a relatively long time to attend to emergencies in many smaller and remote communities. In response, the agency Rural Ambulance Victoria (RAV) has created a Community Emergency Response Team (CERT) initiative as part of the state's emergency medical services system. CERT is a flexible service delivery model delivered as a collaborative partnership between RAV and the whole community. The CERT team does not transport but instead provides basic life support and first aid care to sick and injured casualties in the local community until the ambulance arrives.
>
> The programme is structured around the 'chain of survival' concept and is designed to ensure a quick response to life threatening emergencies such as heart attack, where professional emergency medical services are not able to respond quickly enough to save lives. In rural communities this program utilizes established volunteer resources and focuses on the entire community and not on any one interest group or agency.

Communication with the community

Plans at community, provincial/state and national levels should include provisions for communication with the community in general and with individuals affected by the incident, including victims' families. Individuals from each service should be trained to carry out this function.

In preparing for a mass casualty incident, attention must be paid to the public's expectations of who to call, where to go for help and what to expect during and after a mass casualty incident. To achieve this level of preparedness, local authorities and community leaders should be included in the early stages of planning so that such concepts as reduced standards of care and allocation of scarce resources are agreed upon or at least understood.

Plans should be prepared to enable the consistent and timely provision of information to the public throughout an event. Individual members of the public should be informed about how to access the health care system, both if they are victims and if they have "routine" conditions. They should also have access to information about how to apply self-care. Ideally, 24-hour telephone information lines and hotlines staffed by health care professionals should be planned for.

Again, the principle of scalability and tiered response is important. For example, well-known authorities at local, provincial or state and national levels whom the community will recognize and trust must be identified and prepared for the communications role they may be called upon to undertake.

Procedures for informing particularly vulnerable groups within the community (including cultural and linguistic minorities, as well as the poorest and most isolated members of society) must also be prepared.

Communication through and with the mass media

Arrangements should be put in place ahead of time for all branches of the media to deliver official information. Alternative channels (the internet, public meetings) should also be used to achieve 'blanket' coverage.

At the same time, in many places the mass media are not simply conduits for official information but exercise an active and independent role. In this case, emergency authorities need to have a strategy and procedures aimed at maintaining good relations with the media (including foreign media should they become involved) and enabling a flow of clear, accurate information as the situation develops. As some of this will necessarily focus on health care facilities, hospital officials should be intimately involved with community-level communications planning.

HEALTH CARE FACILITY LEVEL

Well-prepared, resilient local health care facilities (e.g. hospitals and clinics) with staff who have received training and had plenty of practice through drills and exercises, are the cornerstone of effective mass casualty management.

Mass casualty incidents present health care facilities (and, potentially, entire health care systems) with the challenge of "surge", as people suddenly arrive in need of medical attention, in numbers beyond usual system capacity. Surge can be defined as a demand for health services in a mass casualty incident where additional *capacities* (in terms of the amount of personnel, equipment or supplies) and/or *capabilities* (in terms of specialized expertise) are required (CNA Corporation 2004).

Planning

Each facility requires plans which document how it will manage mass casualty incidents. The plans, which should be compatible with national standards, should include all elements covering planning, response and recovery and should allocate roles and responsibilities to all sections of the health care facility in a whole-of-health approach.

Given that large-scale incidents or disasters may severely affect the hospital's basic infrastructure (e.g. electricity, telephones, water supply), it is increasingly recognized that "continuation of operations" is an important issue to be covered in planning, and that this requires coordination with services and authorities external to the health care facility itself. Another emerging issue is the need to create a *network* of local health care facilities that can cooperate using pre-planned and tested arrangements as surge occurs.

Each health care facility will necessarily create its own unique plan responding to its particular conditions and that of the community it serves, with particular reference to the local Mass Casualty Management Plan (see above). A number of publications may help in creating such plans, such as WHO's recent *A Practical Tool for the Preparation of a Hospital Crisis Preparedness Plan With Special Focus on Pandemic Influenza* (WHO 2006b) and PAHO/WHO's *Establishing a mass casualty management system* (PAHO/WHO 2001).

A list of elements which should be covered in a facility-level Mass Casualty Management Plan is shown in the checklist at the end of this chapter.

Roles and responsibilities

Each health care facility must have a Hospital Emergency Incident Command System (directed by an Emergency Management Group or similarly named "command" group) which should be compatible with the national Emergency Management System and its local structure. Depending on the size of the incident, the designated command staff for each health care facility should have a complete set of protocols for reporting to and communicating with a provincial or state coordinating centre.

As well as triggers for scaling up the response, such protocols should cover when the surge plan can be de-activated and the health care facility can resume normal operations. With some scenarios such as a damaged health care infrastructure or pandemic, normal operations may not return for some time.

A tiered approach to surge planning: working from the bottom-up

Approaches to surge depend on the size of the event. As the size of the event grows beyond the surge capacity of an individual health care facility, the involvement of higher tiers of the health care system should be triggered, up to the national or international level.

Arrangements to deal with surge at the level of individual health care facilities may include the following procedures:

- discharge of less acutely ill persons
- cancelling elective procedures
- adding additional beds to wards and rooms
- setting up cots in open spaces
- pre-established procedures to call back staff for extra shifts
- maintaining or increasing stocks of equipment, supplies, pharmaceuticals.

Greater levels of surge will require cooperation by a network of local health care facilities (including clinics and other types of facilities such as labs and blood banks). Planned arrangements should typically include:

- agreements on how the various health care facilities will share staff and equipment based on formal Memoranda of Understanding
- medical regulation and dispatching of patients (i.e. flow to and from health care facilities
- procedures to call up volunteers who have been identified as willing and able to provide assistance (e.g. retired health care providers.)
- logistical systems to coordinate receipt and distribution of equipment, supplies, and pharmaceuticals.

For mass casualty events requiring provincial/state, national, or international assistance, the health care facility's planning should provide for:

- alternate care facilities using existing buildings (e.g. schools or local government building) or temporary facilities such as mobile hospital units and field hospitals
- an emergency medical call centre incorporating the dispatch function
- transportation plans for moving equipment, supplies, and personnel to the area of need to support the health care facilities already involved in the response
- systems for transportation of casualties to other health care facilities or alternative care sites
- systems to track all patients, including those who are transported
- infrastructure to receive and re-distribute donations of goods and services.

Emergency and trauma care systems

Effective emergency and trauma care systems – from on-the-spot first aid to operating theatre trauma surgery – are key factors to health care facilities' success in preventing avoidable mortality and morbidity during mass casualty incidents. Building up both their everyday capacity and their ability to cope with surge must therefore be a priority. At the same time, thought should be given to the standards of care appropriate to mass casualty events. The need to provide rapid care to large numbers of patients may require measures such as relaxed documentation requirements, reduced testing procedures, and larger staff-patient ratios (Health Systems Research Inc. 2005).

Again, a considerable amount of guidance and information exists. For example, hospital officials and public health care decision-makers should make use of publications from WHO and other sources on low-cost, rational planning and investment that can maximize the potential of trauma care systems in low and middle resource settings (American College of Surgeons 1990; American College of Surgeons 1993).

Training and exercises

Each health care facility must plan to build its own capacity to deal with mass casualty incidents, based on a detailed plan of training and continuing education for all staff. This plan must be based on an initial analysis of existing capacity, and adequately funded to ensure its sustainability over time.

While identified gaps in knowledge may need to be filled with help from outside trainers, where possible the facility should aim to use local and especially internal personnel to carry out these activities. This should also help ensure that the training will correspond to the needs and condition in the facility. Although existing training materials (manuals and audio-visual materials) can be purchased or borrowed, and should be consulted in the planning process, whenever possible training materials specific to the facility should be developed, preferably with the participation of key staff.

In addition to enhancing skills in clinical management, training should aim to maintain the integrity of the organizational structure against the panic that may ensue when an incident first arises. As with preparedness at other levels, drills and exercises are the most effective means of capacity building, and should be built into the plan. Finally, training should be evaluated at regular intervals, both to ensure its quality and to adjust the curriculum as necessary.

Communications

Each health care facility should have its own communications plan (including the designation of a well trained spokesperson) to deal with the community at large and with the media. This should be compatible with local or community communications planning.

The plan should include training, not just for designated spokespersons but for all staff who may need to communicate with media, relatives, and patients.

Checklist: Elements to be considered by a health care facility in developing a mass casualty management plan

Situation analysis	1.	The role and place of the health care facility in the community
	2.	The hazards and risk that can be reasonably expected
Roles and responsibilities	3.	The overall command structure: functions, roles, responsibilities, composition, place
	4.	Standard Operating Procedures (SOPs) and Supplemental Emergency Response Plans (SERPS – i.e. developed by the various units or departments of the hospital for organizing their own activities)
	5.	Job descriptions for key personnel (also known as Job Action Sheets)
Triggering the plan	6.	The alarm and its processing
	7.	The activation of the plan and its tiers
	8.	Mobilizing personnel (e.g. "call back" procedures for staff who are not at work when the incident occurs)
Operational areas	9.	Receiving area for disaster patients
	10.	The Emergency Department
	11.	The main treatment areas
	12.	Family and media centres
	13.	Management of fatalities
Support for operational areas	14.	Security
	15.	Essential supplies (including pharmacy and blood bank)
	16.	Maintenance of critical equipment
	17.	Ancillary services
	18.	Continuity of operations (including evacuation and relocation)
	19.	Psychosocial support (for patients, families, staff)
Coordinating with other health facilities	20.	Coordination mechanisms with other health care facilities (Memoranda of Understanding; Standard Operating Procedures)
	21.	Medical chart and special forms used in emergency situations when the plan is activated; this includes patient tracking
	22.	Communication systems and sharing of information procedures
Community relations Preparedness	23.	Relationship with the community (including the key services such as fire)
	24.	Training of staff
	25.	Exercises
	26.	Validation of the plan
	27.	Revision and updating of the plan
	28.	Special sub plans for fire, terrorist attack, chemical, and epidemic incidents.

GLOSSARY OF TERMS

Capacity building	Efforts aimed to develop human skills or societal infrastructures within a community or organization needed to reduce the level of risk. In extended understanding, capacity building also includes development of institutional, financial, political and other resources, such as technology at different levels and sectors of the society.
Casualty	Any human accessing health or medical services, including mental health services and medical forensics/mortuary care (for fatalities), as a result of a hazard impact.
Community	A group of people with a commonality of association and generally defined by location, shared experience, or function. A community (with its five elements: people, property, services, livelihoods, and environment) has four major features. They: own common assets for responding to an emergency (police, fire, hospital, etc.); have authority for decision making delegated by a higher authority; have responsibility for their own financial and human resources; are accountable for their actions.
Disaster	A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources.
Emergency	An event, actual or imminent, which endangers or threatens to endanger life, property or the environment, and which requires a significant and coordinated response.
Emergency management	The organization and management of resources and responsibilities for dealing with all aspects of emergencies, in particularly preparedness, response and rehabilitation. Emergency management involves plans, structures and arrangements established to engage the normal endeavours of government, voluntary and private agencies in a comprehensive and coordinated way to respond to the whole spectrum of emergency needs. This is also known as disaster management.
Geographic information systems (GIS)	Computer programmes for capturing, storing, checking, integrating, analysing and displaying data about the earth that is spatially referenced. Geographical information systems are increasingly being utilized for hazard and vulnerability mapping and analysis, as well as for the application of disaster risk management measures.
Hazard	A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydro-meteorological and biological) or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity, frequency and probability
Health Care Facility	This term encompasses hospitals of all sizes and types; specialized medical services; primary health care clinics; general practitioner's surgery, etc.
Mass Casualty Incident	An incident which generates more patients at one time than locally available resources can manage using routine procedures. It requires exceptional emergency arrangements and additional or extraordinary assistance.

Mass Casualty Management System	A coherent and interrelated set of established procedures, policies, and plans that contribute to the shared objectives of optimizing the baseline capacity to deal with patient populations expected in a mass casualty incident, and efficiently increasing this capacity during the response to a mass casualty incident.
Mitigation	Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.
Preparedness	Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.
Recovery	Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk.
Relief	The provision of assistance during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration.
Risk analysis	Systematic use of available information to determine how often specified events may occur and the magnitude of their likely consequences.
Stakeholders	Those who may, be affected by or perceive themselves to be affected by the emergency risk management process.
Standard Operating Procedures	A set of instructions covering those features of operations which lend themselves to a definite or standardized procedure without loss of effectiveness.
Surge	Sudden demand for health services in a mass casualty incident where additional capacities (in terms of the amount of personnel, equipment or supplies) and/or capabilities (in terms of specialized expertise) are required.
Vulnerability	The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards.

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April 2007