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Guidance Note on Recovery

HEALTH

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IRP was conceived at the World Conference on Disaster Reduction (WCDR) in Kobe, Hyogo, Japan in January 2005. As a thematic platform of the International Strategy for Disaster Reduction (ISDR) system, IRP is a key pillar for the implementation of the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters, a global plan for disaster risk reduction for the decade adopted by 168 governments at the WCDR. The key role of IRP is to identify gaps and constraints experienced in post disaster recovery and to serve as a catalyst for the development of tools, resources, and capacity for resilient recovery. IRP aims to be an international source of knowledge on good recovery practice. IRP promotes "Build Back Better" approaches that not only restore what existed previously but also set communities on a better and safer development path and support development of enhanced recovery capacity at regional, national, and sub-national levels with particular focus on high-risk low-capacity countries.

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Chapter 1

Introduction to Health Recovery

Purpose

There is currently an abundance of documents, plans and policies that address common issues faced in the mitigation, preparedness and relief phases of natural disaster management. Yet for disaster recovery planners and policy makers, there is no cohesive documented body of knowledge. It is conceded that preventive measures are vital to reducing the more costly efforts of responding to disasters. Nevertheless, in the post disaster situation, the availability of knowledge products reflecting past practices and lessons learned is critical for effective and sustainable recovery. Unquestionably, a wealth of experience and expertise exists within governments and organizations; however the majority of this knowledge is never documented, compiled, nor shared. Filling this knowledge gap is a key objective of the International Recovery Platform and The Guidance Note on Recovery: Health, along with its companion booklets, is an initial step in documenting, collecting and sharing disaster recovery experiences and lessons. IRP hopes that this collection of the successes and failures of past experiences in disaster recovery will serve to inform the planning and implementation of future recovery initiatives. The aim is not to recommend actions, but to place before the reader a menu of options.

Audience

The Guidance Note on Recovery: Health is primarily intended for use by policymakers, planners, and implementers of local, regional and national government bodies interested or engaged in facilitating a more responsive, sustainable, and risk-reducing recovery process. Yet, IRP recognizes that governments are not the sole actors in disaster recovery and believes that the experiences collected in this document can benefit the many other partners working together to build back better.

Content

The Guidance Note on Recovery: Health draws from documented experiences of past and present recovery efforts, collected through a desk review and consultations with relevant experts. These experiences and lessons learned are classified into four major issues:

- Impacts of Disasters on the Health Sector
- Humanitarian Assistance: Relief and Transition
- Recovery Phase
- Pre-Disaster Health Sector Recovery Preparedness

The materials are presented in the form of cases. The document provides analysis of many of the cases, highlighting key lessons and noting points of caution and clarification. The case study format has been chosen in order to provide a richer description of recovery approaches, thus permitting the reader to draw other lessons or conclusions relative to a particular context.

It is recognized that, while certain activities or projects presented in this Guidance Note have met with success in a given context, there is no guarantee that the same activity will generate similar results across all contexts. Cultural norms, socioeconomic contexts, gender relations and myriad other factors will influence the process and outcome of any planned activity. Therefore, the following case studies are not intended as prescriptive solutions to be applied, but rather as experiences to inspire, to generate contextually relevant ideas, and where appropriate, to adapt and apply.

The purpose of this Guidance Note is to provide emergency planners and other officials in the health sector with guidance as to how the health sector in a country devastated by a disaster can be reconstructed and rehabilitated.

The International Recovery Platform (IRP) has developed the following definition for the Recovery phase, "The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors. The recovery task of rehabilitation and reconstruction begins soon after the emergency phase has ended, and should be based on pre-existing strategies and policies that facilitate clear institutional responsibilities for recovery action and enable public participation. Recovery programmes, coupled with the heightened public awareness and engagement after a disaster, afford a valuable opportunity to develop and implement disaster risk reduction measures and to apply the "build back better" principle."

The focus of this Guidance Note is on the long term "Recovery" phase and the majority of the case studies included in this document are focused on recovery, reconstruction and rehabilitation projects and issues.

However, this document does include a chapter that provides information and case studies concerning the humanitarian relief and transition phases in order to clearly differentiate the activities involved in these two phases from the recovery phase that is the primary focus of this Guidance Note.

A chapter on the impacts of disasters on health and well being of individuals and communities and the various components of the health sector in a community, region or nation is included.

A final chapter is included in this document that provides examples of pre-disaster preparedness and hazard mitigation actions and measures that can be taken to reduce the impacts of future disasters on the health sector and better health workers to deal with future disasters.

A set of 9 Annexes are included at the end of this Guidance Note that provides more detailed information concerning the health sector in disasters.

This document is comprised primarily of Case Studies taken from experiences in disasters from across the globe. These Cases provide real world examples of the impacts of disasters on the health sector, examples of actions taken in the immediate response/relief and transition phases after a disaster and a full range of examples of actions and activities that have taken place in the recovery phase. For each case Study included in this Guidance Note, lessons have been identified and presented as part of the presentation.

Chapter 2

Impacts of Disasters on the Health Sector

Disasters have widespread impacts that effect not only individuals' health and well being but also the health sector that is designed to serve them. Health workers, facilities and systems are all exposed to disaster risk that could result in death and injury to the health workers, damage or destruction of health facilities such as hospitals and community clinics and disruption or elimination of health and medicine delivery systems. Understanding the impacts a disaster can have on individuals and the health sector provides a basis for: determining material, human and resource needs relevant to the health sector post-disaster and identifying opportunities in the recovery phase to enhance and upgrade health sector capacities and capabilities; and building back better in order to reduce the impacts of future disasters.

This section presents a series of case studies that detail the human suffering that disasters cause and that the health sector will be called on to address as well as the impacts disasters have on the various components of the health sector including health workers and facilities.

Sub Issue 1: Human Impacts

All humans are vulnerable to the impacts of a disaster. Dealing with death and injuries caused by a disaster event is the first task of humanitarian assistance and organizations such as the World health Organization (WHO) have developed guides and manuals designed to help drive humanitarian response and relief efforts in the first days and weeks after a disaster has struck. Examples of these guides are provided in Chapter 3 of this document.

There are groups of individuals in every society whose unique needs and circumstances make them more vulnerable to the impacts of a disaster than others. This group of so-called "special needs "populations include children, single women, individuals with disabilities, pregnant and/or nursing mothers, and the elderly to name a few.

Researchers in the United States have identified five functional areas where these populations have additional needs in disasters: maintaining independence, communication, transportation, supervision and medical care (Kailes, J and Enders, A, 2007).

The following case studies provide examples of the impacts disasters can have on "special needs" populations and identify the types of issues that health sector planners will need to deal with in the recovery phase of a disaster. These issues have a direct bearing on the options for recovery.

Women and Children

Case 1: Impact of Tsunami on Women and Children, Indian Ocean Tsunami, 2004

According to the current study, the tsunami-affected population reporting a permanent disability leading to an inability to work was approximately 2.3%. The fact that this group represents such a small proportion of the population suggests that government re-training programs and/or pensions schemes may be feasible options. The high concentration of mortality amongst women of child-bearing age implies an increase of motherless children in tsunami-affected regions. As previous studies have shown, children who have lost their mothers are a highly vulnerable group, exhibiting higher mortality rates than their peers.

Source: Guha-Sapir D., Parry LV., Degomme O., Joshi PC., Saulina Arnold JP., 2006, "Risk factors for Mortality and Injury: Post-Tsunami Epidemiological Findings from Tamil Nadu", Centre for Research on the Epidemiology of Disasters (CRED).

Supporting Documents

Gracey M, 2004, " Orphaned and vulnerable to infection, undernutrition and early death: increasing threats to infants and children", Acta Paediatr, 92 (1): 8-9.

Masmas TN., Jensen H, da Silva D, Hoj L, Sandstorm A, Aaby P., 2004, "Survival among motherless children in rural and urban areas in Guinea-Bissau", Acta Paediatrica, 83 (1): 99-105.

Lessons:

- High mortality among women in the population may lead to more orphans
- Past studies have shown that orphans are highly vulnerable and exhibit higher mortality rates than their peers

Box 1: Children, women and elderly more vulnerable in disasters

Mortality risk associated with age is a U-shaped curve; with higher mortality amongst the young (under 15 years old) and senior (above 50 years old) cohorts. It was particularly notable that the high death rate amongst children was accompanied by very few injury cases, suggesting that amongst youngsters, evacuation or shelter to avoid exposure to disaster conditions is particularly critical. In addition, this study corresponds with what has been reported in other tsunami-affected regions-that the death toll for women was significantly higher than that for men.

However, the current results reveal that the importance of gender as a risk factor

varies significantly depending on age and ability to swim. For example, the results suggest that in fact it was only women between ages of 15 to 50 years that had a heightened mortality risk: for children under 15 and for seniors over 50 years of age, the difference between the genders disappears.

This heightened risk for women has been attributed to a combination of factors including biological, physical, and cultural differences. For example, women in this age bracket are of child bearing age and many may have had dependent children in their care. In an emergency situation such as the tsunami, this may have hindered their ability to escape. However, the current results suggest that a major confounding factor for the increased death rate amongst women was their inability to swim. Contrary to the suggestion by Jonkman and Kelman, swimming ability (even in turbulent conditions) did reduce the overall mortality rate by more than 60%.

Source: Guha-Sapir D., Parry LV., Degomme O., Joshi PC., Saulina Arnold JP., 2006, "Risk factors for Mortality and Injury: Post-Tsunami Epidemiological Findings from Tamil Nadu", Centre for Research on the Epidemiology of Disasters (CRED).

(Supported documents)

Jonkman SN, Kelman I., "An analysis of the causes and circumstances of flood disaster deaths. Disasters 2005; 29 (1): 75-97.Disaster Deaths http://www.ilankelman.org/disasterdeaths.html#floods

Lessons:

- High mortality rates among children under 15 years old and individuals over 50 years old
- Women ages 15-50 years old are more vulnerable than men
- Swimming ability reduces the mortality rate by 60% in flooding disasters

Case 2: The distribution of deaths related to the 2004 Indian Ocean tsunami

The higher mortality rates here for girls and women have been related to the fact that they are more often responsible for small children, a fact which may limit their mobility. The loss of these primary caregivers can leave surviving children and families still more vulnerable.

Water and sanitation-related illnesses: Children under five are the main victims (80 per cent globally) of sanitation-related illnesses (diarrhea disease primarily) because of their less developed immunity and because their play behavior can bring them into contact with pathogens. This also results in higher levels of malnutrition and increased vulnerability to other illnesses, with effects on overall development. During heavy or prolonged rains, blocked drains and flooded latrines can make contamination difficult to avoid, increasing the incidence of diarrhea illness in children.

Source: United Nations Children's Fund (2007) The State of the World's Children, UNICEF: New York.

Sheridan n Bartlett, 2002, 'The problem of children's injuries in low-income countries: a review', "Health Policy and Loanning; 17 (1): 1-13", Children's Environments Research Group, City University, New York, USA. Oxford University Press, p.2.

Lessons:

- Women and girls responsible for young children have higher mortality rates because of limited mobility
- Children under 5 years old are the main victims of sanitation-related illnesses because of less developed immunity and greater exposure to pathogens

Nutrition

Box 2 : Nutrition in Emergencies: Factors that impact nutrition in disasters and steps to reduce these impacts

Dr R P Sinha in Nutrition in Emergencies, noted emergencies adversely affect care factors directly linked to nutrition that may be disrupted. These include: infant feeding practices (i.e. breastfeeding practices, the use of breast milk substitutes); complementary feeding practices; feeding practices during illness, food hygiene, etc. Equally important are factors less directly linked to nutrition, like: the degree to which a child is protected from trauma and abuse, and the affection and physical stimulation received by the child.

This calls for:

- Integrated planning annually at district and sub district levels with active community participation
- Mapping of areas with threat potential of drought, floods, earthquakes, cyclones, etc.
- Assessment of immediate and long term needs

  Decentralized provisioning via depots for the immediate resource needs identified and provisioned before the risk periods
- Development of Contingency Plans and administrative arrangements at decentralized levels

Source: Dr R P Sinha, "Nutrition in Emergencies"

Lessons:

- Nutrition for infants can be negatively impacted by interruptions in breastfeeding as well as exposure to abuse and trauma and degree of

affection and physical stimulation received by the infant

- Integrated planning, assessments, decentralized provisioning, empowering communities and monitoring can mitigate negative impacts
- Additional steps in recovery include mapping threat areas, assessment of needs and development of contingency plans

Case 3: Risks of Artificial Feeding in Emergencies, Botswana 2005

Key Issue: Flooding disasters can trigger outbreak of communicable diseases

The risks of artificial feeding were exposed in Botswana in 2005/06 where replacement feeding with infant formula was offered to all HIV-infected mothers as part of a national programme to prevent transmission of HIV from mother to child (PMTCT). Flooding led to contaminated water supplies, a huge rise in diarrhea and malnutrition in young children. National under five mortality increased by at least 18% over 1 year. Non-breastfed infants were 50 times more likely to need hospital treatment than breastfed infants, and much more likely to die. Use of infant formula 'spilled over' to 15% of HIV-uninfected women, exposing their infants to unnecessary risk.

Source: Dadhich J P, 2009, "Need for Supporting Breastfeeding during Emergencies and Risks of Artificial Feeding", MCH Community E-Newsletter, Breastfeeding Day Special. http://www.solutionexchange-un.net.in/health/comm_update/res-35-310709-12.pdf

Lesson:

- Non-breastfed infants are more likely to need hospital treatment and more likely to die from infectious disease post-flooding

Case 4: Single parent households, women and men: Difficulties single parent households incur after a disaster

A common phenomenon in the aftermath of a disaster is the large number of both women and men who are left as single parents with responsibility for caring for their children and extended families alone. Single parents may need special support, guidance and assistance in coping with their responsibilities of caring for children and elderly or other dependent family members alongside the grief associated with loss. Men and women may face different difficulties in adjusting to their new roles as family providers and caregivers. Women may be more likely to face considerable bureaucratic and legal obstacles in gaining access to the financial and material assistance, documentation, land title, property and compensation to which they are entitled following the death of their husbands. They may also face obstacles gaining access to employment. Single women heads of household also frequently face threats to their physical security and well-being, including rape, sexual abuse and exploitation. Women who have not previously been primary caregiver may face

practical, social and psychological difficulties in adapting to their new role.

Men who have not previously been primary caregivers may also face practical, social and psychological difficulties in adapting to their new role. Men may also need support in finding alternative employment, or re-training opportunities, in order to accommodate their family responsibilities. A common problem in the aftermath of a disaster is substance abuse, especially among heads of household who are trying to cope on their own and are struggling with the loss of family members and the disintegration of their family and community support structures. Not only can valuable family income and benefits be wasted on the purchase of intoxicating substances; their abuse can also lead to an increase in domestic and sexual violence within the home and community. It is advisable to give particular support to single parent households or to people with new childcare responsibilities. Monitoring their progress in the aftermath of a disaster will help to ensure that they are coping with and adjusting to their new roles and responsibilities.

Source: "Human Rights and Natural Disasters" Operational Guidelines and Field Manual on Human Rights Protection in Situation of Natural Disaster", 2008, Bruking-Bern Project on Internal Displacement.p.75.

Lessons:

- Single women parents face a number of physical and psychological threats in the post-disaster environment
- Men's roles change post disaster and this can give rise to substance abuse and domestic and sexual violence
- Supporting and monitoring single parent households is recommended to ensure that proper adjustments are being made to new roles and responsibilities

Case 5: Access to communications technologies by disabled persons in disasters

After Hurricane Katrina, most people were found to have lost cell phone usage in the area for between several days and up to many weeks because cell towers and their back up on-site generators were destroyed.

Early warning systems could also rely on SMS messages, as they are the fastest way of communicating with many people. To help the blind, the only communication available is by using a cell phone running the Symbian operation system, which is expensive, or secondly purchasing a special piece of software that you must run on the cell phone and requires outside funding.

HAM radios are very useful as are satellite phones during disasters. Toll-free numbers can also be used by communities before and during the emergency. HAM radios still require mass and are financially out of reach of the average person in a developing country but can be purchased through external funding sources for communities. It is important that this equipment be maintained properly and if the disabled are

involved at this stage they can become part of local disaster plans. Without electricity, computers and TVs also are useless.

The most important issue highlighted from discussions and our own earlier experiences during disasters was that while technology is essential in emergencies, it is not accessible to the disabled, many of whom cannot use technology as they may not know how to.

Source: Ashok Hans and Reena Mohanty, 2008, 'Disasters, Disability and Technology', "Conference on Disability and Disasters 28th-29th January 2008", Bhubaneswar India, p.51.

Lessons:

- Technologies used by disabled individuals become inaccessible in a disaster when the electric power is interrupted
- Wireless, SMS and HAM radios provide some assistance but each technology excludes some segment of the disabled population
- Assisting the disabled should be part of any disaster preparedness, mitigation and recovery plan.

Case 6: Impact of disaster on the health of a child, Bangladesh

Haseena Begum, 13-year-old daughter of a daily labourer, lived in Doi Khaoa village of Hatibandha Upazilla of Lalmonirhat District in Bangladesh. When she was aged two, there was a flood and their home was washed away. Her father did not have enough food to feed her even once a day. Haseena suffered from serious diarrhea and dehydration. Though she drank saline water it was not enough. Then she began to get pain in her eyes and soon found it difficult to see. Her father could not take her to hospital and instead took her to a quack. She was not provided Vitamin A supplement and her condition deteriorated and she became blind.

Source: Munim Hossain Khandker, 2008

Lesson:

- Lack of medical care can aggravate and even become the cause of disability.

Case 7 : Privacy and Security of Women with Disabilities: Protecting women with disabilities after a disaster

Privacy and security are a high priority for many people when using the toilet or bathing, especially for women. Lack of security can lead to anxiety about latrine use. This may lead to urine retention, and subsequently to medical problems." This problem becomes more difficult for women with disabilities as they may be using a wheel chair or not able to see. The issue affects not only health but women may be targets of sexual violence while fetching water or using a toilet facility (Hazel Jones

and Bob Reed, 2005).

Source: Jena, P.K., IAS, "UNDP Mainstreaming Disability in Disaster Management – A Toolkit", UNDP. http://data.undp.org.in/dmweb/pub/DisabilityToolkit.pdf

Lesson:

- Women, especially disabled ones, have increased vulnerability in evacuation centers and camps

Elderly populations

Elderly individuals are especially susceptible to death and injury in disasters because of a number of factors including physical and cognitive disabilities, reliance on caregiver support to function, transportation needs and increased susceptibility to diseases and infection.

Case 8: Elderly in disasters: Impacts of disasters on the elderly and the role the elderly can play in recovery

The lack of accurate data disaggregated by age is one of the greatest impediments to assessing the needs of older people and ensuring their inclusion in camp management, distributions and daily camp life. The lack of precise analysis of their responsibilities is also an impediment and all too often their social support system is not properly mapped or poorly examined to see if it still functions. This means that specific targeting and inclusion of older people in aid delivery has been very difficult. Although they are accepted as being a vulnerable group, very little is done to meet their specific needs, or to recognize their unique capacities and contributions. Aid delivery must mainstream older people to ensure their specific needs are addressed in the same way as for women and children. This should be both in the provision of basic services as well as for other camp activities. Efforts must be made to include elderly people in camp management or other activities such as literacy projects, life skills, agriculture, etc.

Separation during displacement leaves older people further disadvantaged. They are often unable to displace themselves over large distances or to move as easily from area to area. This often leads to a double burden on older people. They may lose the normal support structures provided by their own children while, at the same time, given the additional burden of caring for grandchildren when the middle generation moves to other areas to pursue income-generating opportunities. This not only leaves the older people potentially vulnerable but may also have an impact on the development of the children for whom they are caring. In the case of displacement, all concerned are affected psychologically.

Older people specifically have reported how large-scale population movements and "camp life" have eroded their positions of respect and authority. The destruction of communities and loss of assets can leave older people feeling that they are no longer

able to make a contribution to their families and communities both economically and culturally. Older people are vulnerable, but also have a crucial role to play in aid delivery and camp life. To be able to fulfill this role, however, intervening agencies need to have the knowledge and capacity to locate and target older people. This can be achieved effectively through awareness rising of the basic needs and rights of older people, ensuring representation of older people on all camp committees, and promoting the establishment of committees of older persons.

Source: "Human Rights and Natural Disasters" Operational Guidelines and Field Manual on Human Rights Protection in Situation of Natural Disaster", 2008, Bruking-Bern Project on Internal Displacement.p.70.

Lessons:

- The lack of accurate data disaggregated by age is one of the greatest impediments to assessing the needs of older people
- The needs of elderly individuals are often considered but not sufficiently addressed in the aftermath of a disaster
- Elderly individuals must be included in decisions and governing councils established in evacuation centers and camps to ensure their needs are considered

Communicable Diseases

Exposure to communicable diseases can be high during the immediate aftermath of a disaster and lead to increased morbidity and mortality rates among individuals impacted by the disaster especially those who reside in evacuation centers for a length of time.

Case 9: Impact of communicable diseases post-disaster

According to the World Health Organization (WHO) document, "Communicable Diseases Following Natural Disasters - Risk Assessment and Priority Interventions," The risk of diarrheal disease outbreaks following natural disasters is higher in developing than in developed countries. In Aceh Province, Indonesia, a rapid health assessment performed in the town of Calang two weeks after the December 2004 tsunami found that 100% of the survivors drank from unprotected wells, and that 85% of residents reported diarrhea in the previous two weeks. In Muzaffarabad, Pakistan, following the 2005 earthquake, an outbreak of acute watery diarrhea occurred in an unplanned, poorly-equipped camp of 1800 persons. The outbreak involved over 750 cases, mostly adults, and was controlled following the provision of adequate water and sanitation facilities (10). In the United States, diarrheal illness was noted following hurricanes Allison (11) and Katrina (12-14), and norovirus, Salmonella, and toxigenic and nontoxigenic V. cholerae were confirmed among Katrina evacuees.

Diseases associated with crowding - Measles and the risk of transmission in the disaster-affected population is dependent on the baseline vaccination coverage rates among the affected population, and in particular among children aged <15 years. Crowded living conditions, as is common among people displaced by natural disasters, facilitate transmission and necessitate even higher immunization coverage levels to prevent outbreaks.

A measles outbreak in the Philippines in 1991 among people displaced by the eruption of Mt. Pinatubo involved more than 18 000 cases. In Aceh following the tsunami, a cluster of measles involving 35 cases occurred in Aceh Utara district, and continuing sporadic cases were common despite mass vaccination campaigns. Sporadic cases and clusters of measles (>400 clinical cases in the six months following the earthquake) also occurred in Pakistan following the 2005 South Asia earthquake.

Natural disasters, particularly meteorological events such as cyclones, hurricanes and flooding, can affect vector breeding sites and vector-borne disease transmission. While initial flooding may wash away existing mosquito breeding sites, standing water caused by heavy rainfall or overflow of rivers can create new breeding sites. This can result (with typically some weeks delay) in an increase of the vector population and potential for disease transmission, depending on the local mosquito vector species and its preferred habitat. The crowding of infected and susceptible hosts, a weakened public health infrastructure and interruptions of ongoing control programmes are all risk factors for vector-borne disease transmission.

An earthquake in Costa Rica's Atlantic Region in 1991 was associated with changes in habitat that were beneficial for breeding and preceded an extreme rise in malaria cases. Additionally, periodic flooding linked to El Nino-Southern Oscillation has been associated with malaria epidemics in the dry coastal region of northern Peru.

The risk of vector-borne disease outbreaks can be influenced by other complicating factors, such as changes in human behaviour (increased exposure to mosquitoes while sleeping outside, movement from non-endemic to endemic areas, a pause in disease control activities, overcrowding), or changes in the habitat which promote mosquito breeding (landslide deforestation, river damming and re-routing).

Source: John Watson, 2006, "Communicable Diseases Following Natural Disasters - Risk Assessment and Priority Interventions", WHO

Lessons:

- Increased epidemiological surveillance is a must after disasters
- Evacuation centers and "tents cities" could be hazardous to the health of its occupants
- Drinking from unprotected wells and unclean water can increase chances of diarrheal illness

- Displacement of population can increase exposure to communicable diseases. Crowding of infected and susceptible hosts, a weakened public health infrastructure and interruptions of ongoing vector control programmes are all risk factors for vector-borne disease transmission

Case 10: Causes of death from Hurricane Mitch

The year 1998 was marked by one of the most devastating and deadly hurricanes in history. Hurricane Mitch devastated Central America. Flooding and landslides resulted in an estimated 10,000 deaths between 26 October and November 1998. The flooding of roads and destruction of health centers hindered emergency relief efforts. The immediate causes of morbidity and mortality were the landslides and floods. The emergency teams treated a great number of the injured immediately after the storm. A study of infectious diseases before and after Hurricane Mitch in the Nicaraguan community of Villanueva showed that the incidence of acute diarrheal illness and acute respiratory infection increased significantly. This study found that the incidence of acute diarrheal disease rose from 2,849 to 6,798 per 100,000 ($p < 0.01$) after the hurricane. Specifically, they found that the incidence of acute respiratory infection increased from 295 to 1,205 per 100,000 ($p < 0.01$). The evidence suggested that the increased incidence of these illnesses was attributable to flooding, poor sanitation measures, overcrowding, and damage to basic infrastructure.

It should be noted that this study was unique in that it was carried out at the same time as relief operations. In fact, the study was used to assist the relief teams in prioritizing their activities. Thanks to the investigations, emergency personnel were able to prepare for an increase in patients with acute respiratory and diarrheal illnesses. Evidence was never presented to link the presence of dead bodies to these increased rates of infection. On the contrary, the lack of drinking water, poor hygiene, and overcrowding were indicated as the causal factors in the increase in these illnesses.

Source: http://www.paho.org/english/DD/PED/DeadBodiesBook.pdf

Lessons:

- Immediate causes of morbidity and mortality following cyclones were the landslides and floods, not the wind.
- Reported incidence of acute diarrheal illness and acute respiratory infection increased significantly post event
- Increased incidence of these illnesses was attributable to flooding, poor sanitation measures, lack of drinking water, overcrowding, and damage to the basic infrastructure.

The following two tables, developed by PAHO for a report entitled, Health Laboratory Facilities in Emergencies and Disaster Situations, provide information on:

- Disease and medical conditions encountered in disaster situations;
- Modes of transmission of diseases encountered in disasters

Box 3 Diseases and medical conditions encountered in disaster situations

Disease/medical condition	Population displacement	Epidemic	Earthquake/volcanic eruption	Flood/tidal wave	Drought	War	Environmental pollution
Aids/HIV	1	0	0	0	0	1	0
Anaemia	2	0	0	0	1	0	1
Anthrax	1	1	0	1	0	0	1
Cholera	2	2	0	2	1	1	1
Dehydration	1	0	1	0	1	1	0
Dengue*	1	1	0	1	0	0	0
Diphtheria	1	1	0	0	0	0	0
Dysentery/ gastroenteritis	2	2	0	2	1	1	1
Enteric fevers	2	2	0	1	1	1	1
Haemorrhagic fever*	1	1	0	1	0	1	0
Hepatitis A	1	1	2	2	1	1	1*
Intoxication	0	1	0	0	0	0	2
Leptospirosis	1	1	0	1	0	1	2
Leishmaniasis	1	1	0	0	1		
Malaria	2	2	0	1	1	1	0
Malnutrition	2	0	0	0	1	1	0
Measles	2	1	1	1	2	1	0
Meningitis	1	2	0	0	0	1	0
Plague*	2	1	0	0	0	1	0
Poliomyelitis	1	1	0	1	0	0	1
Protozoan dysentery	1	1	0	1	1	1	1
Relapsing fever*	2	2	0	0	0	1	0
Streptococcal disease	0	1	2	0	0	0	0
Tetanus	1	0	2	1	0	2	0
Trauma	1	0	2	2	0	2	0
Tuberculosis	1	1	0	0	0	0	0
Typhus*	1	1	0	0	1	1	0
Viral encephalitis	1	0	0	1	0	0	0
Whooping cough	1	0					

0 = Rare problem

1 = Potential problem (depends on area)

2 = Likely problem (depends on area)

* Particularly in endemic areas

Box 4 Modes of transmission of diseases encountered in disasters

Disease	MODE OF TRANSMISSION						
	Food contamination	Water/ sanitation	Aerosol droplet	Vector	Sexual contact	Blood/ needles	Trauma/ burns
AIDS/HIV					X	X	
Anthrax	X	X	X				
Bacterial dysentery/ gastroenteritis	X	X					
Cholera	X	X					
Dengue				X			
Diphtheria			X				
Enteric fevers	X	X					
Hepatitis A	X	X					
Intestinal helminths and protozoa	X	X					
Leishmaniasis				X			
Leptospirosis	X	X					
Malaria				X			
Measles			X				
Meningitis			X				
Plague			X	X			
Pneumonia			X				
Poliomyelitis		X					
Protozoan dysentery		X					
Relapsing fever				X			
Streptococcal disease			X				X
Tetanus							X
Trench fever				X			
Tuberculosis			X				
Typhus				X			
Viral encephalitis				X			
Haemorrhagic fever	X	X	X	X		X	X
Whooping cough			X				

Source: "Health Laboratory Facilities in Emergencies and Disaster Situations", 1994, WHO, WHO/EMRO. http://www.helid.desastres.net/?e=d-0who--00-1-0--010---4----0--0-10l--1en-5000---50-about-0---01131-0011Mc%60SYQWM42f9417b000000004b771e81-0utfZz-8-0-0&a=d&c=who&cl=CL1.2&d=Jh0193e

Livelihoods and health impact

Case 11: Loss of livestock, Somalia

Pastoralists make up 60 percent of the population of the Gedo region of Somalia. In 2002 they experienced a culmination of the following shocks:

- Three years of successive poor rains leading to drought conditions;

- Local insecurity caused by internal political rivalries and power struggles;
- Fragmentation of local administration, and breakdown of social services;
- Restrictions on market exchanges because of insecurity related to clan rivalries;
- Reduction in market opportunities resulting from the ban on livestock exports of the Gulf States because of fears of Rift Valley fever.

The impact of these shocks led to:

- Poor livestock condition and inability to move animals because of weakness and clan boundaries;
- Increased conflict over natural resources such as water and pasture, leading to overutilization of surrounding pasture resources;
- Ineffective animal disease control measures;
- Reduced availability of milk;
- Increased prevalence of acute malnutrition;
- Increased incidence of communicable diseases such as measles, diarrhea and upper respiratory tract infections.

Source: Adapted from FSAU Somalia, February, 2002."Protecting and promoting good nutrition in crisis and recovery: Resource guide, Food and Agriculture Organization of the United Nations", Rome, 2005.

Lesson:

- Impact of disaster on individuals' livelihoods can have negative health impacts

Sub Issue 2: Impacts on Health Professionals

Health professionals (i.e. doctors, nurses, clinicians, technicians, hospital workers, etc.) are vulnerable to death, injury and dislocation from a disaster. Many communities are underserved by experienced medical professionals in non-disaster periods. Any losses among health care professionals caused by a disaster can have a significant impact on the health and well-being of community members.

Sub Issue 3: Impacts on Medical Facilities

Medical facilities in many countries are few and far between. When a disaster destroys or damages a medical facility (i.e. hospital, clinic), the impact on the health and well-being of the communities and individuals that these facilities serve can be

significantly compromised. This is especially true during disaster such as floods that frequently increase the incidents of water borne and sanitation-related diseases.

Case 12: Impact on Medical Facilities

Hospital care post-disaster, Turkey earthquake 1999

The 1999 earthquake in Turkey left more than 44,000 people injured. Most were either medically evacuated to faraway health facilities because of damage to nearby hospitals or were treated outdoors on the grounds of the closest hospital or clinic, because it was either destroyed or perceived to be unsafe.

Earthquake in El Savador 2001

The 2001 earthquakes in El Salvador left 1,159 dead and 8,122 injured. Nineteen hospitals (63%) were damaged and six were completely evacuated. Three years after the earthquake, patients at the hospital San Rafael in the capital were still being admitted in temporary facilities (tents or containers).

Wind and Water Wreak Havoc on Hospitals , Hurricane Ivan 2004

Hurricane Ivan struck the small Caribbean nation of Grenada in the West Indies in September 2004. It was the strongest hurricane on record occurring this close to the equator. The second most important hospital in Grenada (the country has only two), the Princess Alice Hospital, lost most of its roof. Barely 10 days later, Tropical Storm Jeanne unleashed its fury on Haiti, the poorest country in the Western Hemisphere. The La Providence Hospital, which lies below sea level, is a 60-year-old facility and the only public hospital available to serve more than 250,000 people in the province of Artibonite. Jeanne's torrential rains left the hospital under two meters of water and mud, killing some patients. No patient could be admitted or receive any surgical care until a 100- bed Red Cross field hospital was airlifted from Norway.

Source: PAHO and WHO, "SAFE HOSPITALS: A Collective Responsibility, A Global Measure of Disaster Reduction", p.8-10, 17-18.

Lessons:

- Failure of hospitals denies medical care when most needed and l raises also social and economic concerns
- Hospitals are at great risk of closing due to impact of a disaster

Case 13: Role and Impacts on health services from disasters

Hospitals and health facilities need to remain functional during disasters. The human cost of hospital failure is made very clear in the aftermath of disasters, as the immediate focus is on fatalities, search and rescue, and the need to tend to the injured. When hospitals are unable to fulfill their emergency function at the time when most needed, critical care is compromised and lives are lost needlessly.

However, health services are not only critical emergency centers; they play a vital role in recovery, social cohesion and economic development. The long-term impact of the loss of public health services on the Millennium Development Goals exceeds the impact of delayed treatment of trauma injuries. Hospitals, primary health centres, and other health facilities are central to sustainable recovery from disaster, and to health-driven development goals, taking key roles in: ongoing health surveillance to prevent outbreaks; public health and sanitation campaigns; particularly preventive medicine attracting health research and hosting reference laboratories; driving innovation and acting as focal points for community organization. Disasters can wipe out huge swathes of the health systems in developing countries or vulnerable regions.

After the 2003 Algerian earthquake, 50% of the health facilities in the affected region were no longer functional due to damage. In the region of Pakistan worst affected by the 2005 South Asia Earthquake, 49% of health facilities, from sophisticated hospitals to rural primary care clinics and drug dispensaries, were completely destroyed.

Algeria: Earthquake, Emergency Appeal 14/03, IFRC, June 27 2003 -The social implications of hospital failure carry immense risks. Hospitals, health facilities and health services have a unique symbolic value as touchstones of public faith in government and society. They are sanctuaries for the community's most vulnerable people, meaning that there is a moral imperative to provide hospitals and health facilities with adequate protection. Deaths of the sick, elderly and children in hospitals during disasters, and the failure of emergency services when they are most needed, can have a crippling effect on public morale and can ignite political dissatisfaction.

Public confidence in all levels of the United States government dropped after perceived inadequacies of the emergency response to Hurricane Katrina in New Orleans, during which the country witnessed the recovery of 44 dead bodies from an abandoned and damaged hospital. At least 140 elderly patients of hospitals and nursing homes died in the wake of the hurricane, and health and aged care facilities were later accused of euthanizing or abandoning their elderly charges.

Source: '45 bodies found in a New Orleans hospital', *New York Times*, September 13 2005, 'Nursing home owners charged in Katrina deaths', Associated Press, September 13 2005.

Earthquake in Peru: Situation Report No. 6, Office of the Resident Coordinator, UN Country Team in Peru, 21 Aug 2007.

Hospitals Safe from Disasters 2008-2009 World Disaster Reduction Campaign, www.unisdr.org/wdrc-2008-2009. www.who.int/hac/techguidance/safehospitals

Lessons:

- Disaster can severely impact health services and significantly reduce the ability to provide medical services in the post disaster phase

- Hospitals and other medical facilities play critical roles in the recovery phase
- Public confidence in government recovery efforts can falter if the health infrastructure fails and/or is not rebuilt properly

Case 14: Importance of Area-Wide Disaster Relief Systems and Medical Systems, Great Hanshin-Awaji Earthquake

The Great Hanshin-Awaji Earthquake caused extensive damage to many medical facilities, rendering it impossible to provide adequate medical services within the disaster area. It therefore became necessary to evacuate critically wounded and hospitalized patients to medical facilities located outside of the region. However, difficulties were encountered even in trying to procure ambulances, and helicopters were underutilized as a means of area-wide transport. It is important that area-wide, disaster relief medical systems are implemented, including readying helicopters and heliports, to allow medical personnel to save the life of each and every victim who can be saved.

Source: The Great Hanshin-Awaji Earthquake Memorial, Disaster Reduction and Human Renovation Institution "Lessons from the Great Hanshin-Awaji Earthquake", 2005, World Conference on Disaster Reduction, p.12.

Lessons:

- Destruction of medical facilities increases the need for ambulances and helicopters to evacuate injured and sick individuals. A good example of successful evacuation of medical facilities is from Bam earthquake response
- Developing area-widesystems before a disaster strikes will result in lives saved

Sub Issue 4: Impacts on Clean Drinking Water

Access to clean drinking water is often a daily issue in many communities around the globe. In the aftermath of a disaster, especially a flood disaster, access to clean drinking water becomes even more limited because of pollution from flood waters and water main breaks. This often results in increased incidence of waterborne infectious diseases that pose a significant risk to adults and children alike.

Case 15: Flood and Clean Drinking Water, Mexico, Ghana and Mozambique, 2000

Mexico

In June 2000, heavy rains ruptured the wall of an open sewer in Mexico. This forced 6,000 people out of their homes in the low-income areas of Chalco valley. Although emergency shelters were available, many residents camped on their roofs to protect their homes from looting. Residents blamed the spill on the local authorities for

failing to install piped sewerage.

Ghana

In northern Ghana, clean drinking water became scarce three months after a severe floods. Water sources had been polluted by tons of untreated human and industrial waste. More than 200 dams, wells and boreholes in the upper West Region were reported to be polluted with sewage and used engine oil. In addition, the floodwater had submerged refuse dumps due to rising river levels. The costs of the flooding rose dramatically due to the need to resettle people in other areas and to rehabilitate the polluted dams in the three northern regions.

Mozambique

The widespread floods in Mozambique in February 2000 made international headlines. Coupled with the lack of access to adequate sanitation and drinking water, nearly 800,000 people were put at an increased risk of infectious diseases. The dam management was criticized, for example with claims that water had not been released in time, but it is possible that, with such overwhelming floods, better dam management would have had only slight effects. The key issues were to strengthen existing monitoring and early warning systems, to control settlement of flood plains and promote activities to limit human and economic casualties and a new flood is threatening in 2001

Source:
http://www.who.int/water_sanitation_health/hygiene/emergencies/floodrought/en/index2.html

Lessons:

- Inadequate access to clean drinking water and inadequate sanitation put people at increased risk of infectious disease
- Disaster costs rise when individuals and communities must be relocated after a disaster outside of a flood areas
- Wells can be polluted by flood waters and the materials such as used engine oil that are carried in the flood waters

Sub Issue 5: Impacts on Creating New Health Risks

Disaster can often expose individuals to new and potentially dangerous health risk

Case 16: Asbestos in Sichuan Earthquake , China, 2008

The May 12, 2008 earthquake in Sichuan, China, destroyed many buildings including hospitals, schools, government offices and private homes. The external walls, roofs, window awnings and bathrooms in many of these buildings had been made using asbestos cement sheets – commonly known as “fibro” or “fibro cement”. The earthquake broke the fibro into many small pieces, releasing fine fibers of asbestos at

the broken edges. During clean up operations, there is the risk of liberating substantial quantities of asbestos fibers, particularly if heavy plant and equipment are used to demolish damaged structures and load rubble into vehicles. These asbestos fibers are a significant risk to public health.

During the cleanup of damaged and destroyed buildings after the earthquake, it is likely that there will be a need to handle, break up and dispose of asbestos-containing building and insulation materials. Much of this work may be undertaken by temporary labourers, volunteers and local residents who are unaware of the hazards of asbestos and who may be unable to identify asbestos-containing material. Further, it is unlikely that the workers will, in the first instance, be provided with appropriate personal protective equipment (PPE), thus increasing their risk of long term health problems.

As a result of the cleanup operations there may be an accumulation of asbestos containing waste that will present a hazard to people in the local environment and those living in close proximity to the site of final disposal.

Source: "Asbestos: hazards and safe practices for cleaning up after the earthquake", Technical information note by the country offices of WHO and UNEP in Beijing http://www.wpro.who.int/NR/rdonlyres/55CD7A37-D566-462E-B109-653B63E0ADDC/0/Asbestos_clear_up_CHNearthquake.pdf

Lessons:

- Earthquake can cause destruction that exposes populations to additional health risks such as asbestos release from damaged and destroyed buildings
- Clean-up workers are especially vulnerable to exposure to asbestos and other hazardous building materials because of a lack of protective gear

Summary

Possible impacts of a disaster on the health and well-being of the populations and the health sector include:

- Increased morbidity and mortality among "special needs" populations including women, children and the disabled
- Crowding, inadequate water and sanitation, and poor access to health services, often characteristic of sudden population displacement following disasters, increase the risk of communicable disease transmission. Although the overall risk of communicable disease outbreaks is lower than often perceived, the risk of transmission of certain endemic and epidemic-prone diseases can increase following natural disasters.

- Medical facilities are at great risk for damage and destruction in a disaster and their loss of functionality can negatively impact response and recovery efforts
- Access to clean drinking water is critical in the immediate response and the recovery phases
- Disaster can create new and additional health risks for all populations

Chapter 3

Humanitarian Assistance: Relief and Transition

In the immediate aftermath of a disaster, health workers and facilities play critical roles in dealing with the wide variety of injuries suffered by the population and the disposition of dead bodies. As noted previously, The World Health Organization provides the following definitions for these two phases:

- **Humanitarian** relief primarily aims to 'save lives, alleviate suffering and maintain human dignity during and in the aftermath of man-made crises and natural disasters.
- **Transition** can be defined as the period between the immediate aftermath of crisis (relief) and the restoration of pre-crisis conditions or their improvement to a satisfactory level (development) (WHO, 2008)

This phase of humanitarian assistance is well developed and involves national, provisional and local government organizations, international aid organizations and non-governmental organizations (NGOs).

Much of the work conducted in the immediate response phase involving damage and needs assessments will serve as the basis for planning for the recovery phase. In addition, there is a transitional phase between the immediate response and recovery phases.

Box 5: Immediate response actions: WHO role for humanitarian assistance/relief phase

The WHO has identified the following as critical actions the WHO engages in during the humanitarian assistance/relief phase in the immediate response to a disaster impacting the health sector:

- **Assessment of health risks:** WHO works to improve analysis of health information, health risks and needs that are essential for effective planning of the public health interventions needed to prevent or alleviate the impact of emergencies on physical and mental health.
- **Health co-ordination:** WHO works to co-ordinate the health activities of governments, UN agencies and non-governmental organizations to ensure they are in line with international standards and local priorities and do not

compromise or damage longer term health development.

- **Epidemic and nutritional surveillance**: WHO works to strengthen national health surveillance systems and integrate information from external partners so that the earliest possible action can be taken against communicable diseases, common childhood illnesses, malnutrition, conditions related to childbirth and damage to mental health.
- **Control of preventable** causes of illness and death: WHO offers the services of specialists and internationally tested standards and guidelines to help all health actors in an emergency to identify and address health priorities. Areas of support include prevention and response to infectious diseases from HIV/AIDS and tuberculosis to measles and other childhood diseases, mental health, environmental health, water, food, shelter, sanitation and the violence and injury prevention as well as all aspects of health care delivery. WHO also carries out evaluations of the effectiveness of health programmes in the field.
- **Access to basic preventative and curative care**: Together with other health partners, WHO works to ensure basic preventative and curative care is available, including access to good quality essential drugs and vaccines, surgical supplies and health information, to all affected and particularly to the especially vulnerable such as the very young, elderly, pregnant women, the disabled and the chronically ill.
- **Prevention of malnutrition**: WHO seeks to ensure actions taken by all partners to support nutrition during an emergency are technically sound, guided by international standards and well evaluated.
- **Management of health risks in the environment**: WHO analyses environmental health risks in emergencies, and supports activities which deal with threats ranging from water and sanitation to the effects of pollutants and munitions.
- **Protection of health workers, services and structures**: WHO acts as an advocate for national and international health workers in situations of crisis, and is a key partner in negotiating secure humanitarian access and protecting the neutrality of health workers, services and structures.
- **Human rights to health**: Where basic human rights such as access to health, food, nutrition or education are unfulfilled, people are more vulnerable to the negative health impact of natural or man-made disasters. WHO works to ensure that humanitarian health activities combine the best public health practice with adherence to human rights principles regardless of adverse political or natural environments.
- **Reducing the impact of future crises**: Beyond the acute crisis, WHO works to help health authorities in disaster-prone and vulnerable countries prepare

for and prevent the worst health outcomes of disasters whether manmade or natural. This includes developing strategies for rapid response, building up an experienced cadre of national staff resilient to emergencies, and crucially taking action to reduce the impact of disaster before it strikes. In humanitarian crises, what often makes the difference is thinking ahead and having people on the ground who know what to do at the local level. Sadly, the countries most likely to need these skills are also those where capacity is weakest. WHO works to evaluate the 'lessons learned' from acute crises and disseminate best practice and information to all involved whether local partners, governments, health and civil institutions, or international agencies.

Source: Emergency and humanitarian action, WHO, http://www.who.int/mediacentre/factsheets/fs090/en/

Lessons:

- Immediate actions in disaster response phase include assessments, coordination, surveillance and protection of health care workers
- Humanitarian assistance/relief seeks to detect/control disease outbreaks, access basic preventative care and prevent malnutrition
- Guiding principles as part of humanitarian assistance/ relief should include respecting the rights of the individuals needing treatment and their access to immediate care and to reduce the impact of future crises

Box 6: Guidance on storage and disposal of dead bodies

A manual developed by the PAHO, WHO, ICRC and IFRC entitled, "Management of Dead Bodies after Disasters: A Field Manual for First Responders" provides the following guidance for dealing with dead bodies after a disaster event.

Long-Term Storage and Disposal of Dead Bodies

- Overview
  - All identified dead bodies should be released to relatives or their communities for disposal according to local custom and practice.
  - Long-term storage will be required for remaining unidentified bodies.
- Method of disposal/Long-term storage
  - Burial is the most practical method as it preserves evidence for future forensic investigation, if required.
  - Cremation of unidentified bodies should be avoided for several

reasons:

- Cremation will destroy evidence for any future identification.
- Large amounts of fuel are needed (usually wood).
- Achieving complete incineration is difficult, often resulting in partially incinerated remains that have to be buried.
- It is logistically difficult to arrange for the cremation of a large number of dead bodies.

Communications and the Media

- Overview
  - Good public communication contributes to a successful victim recovery and identification process.
  - Accurate, clear, timely, and up-dated information can reduce the stress experienced by affected communities, defuse rumors, and clarify incorrect information
  - The news media (TV and radio, newspapers and the Internet) are vital channels of communication with the public during mass disasters. Journalists, both local and international, often arrive soon after the disaster.

Source: Oliver Morgan, Morris Tidball-Binz, and Dana van Alphen, 2009, "Management of Dead Bodies after Disasters: A Field Manual for First Responders", PAHO, WHO, ICRC, IFRC. http://www.paho.org/English/DD/PED/DeadBodiesFieldManual.pdf

Lessons:

- Release dead bodies to relatives and store remains that are unclaimed
- Adopt various means for properly disposing of dead bodies including burial
- Communicate with the public through the news media concerning the policy for disposing of dead bodies

Summary

In summary, the immediate needs of the populations impacted by a disaster are the focus of humanitarian assistance/relief programs sponsored by government and non-governmental organizations involved in the health sector.

- Activities in this phase include damage and needs assessments, surveillance, coordination and ensuring access to adequate health care to all populations.

- Consideration is also given to reducing future impacts and for enhancing the capacities and capabilities of the existing health sector.
- This consideration is given closer examination in that transition phase that exists between the humanitarian assistance/relief and phase and the recovery phase

Chapter 4

Recovery Phase

As noted previously, the World Health Organization (WHO) provides following definition for the recovery phase:

"Recovery is the process of 'restoration of the capacity of the government and communities to rebuild and recover from crisis and prevention of relapses. In so doing, recovery seeks not only to catalyze sustainable development activities but also to build upon earlier humanitarian programmes to ensure that their inputs become assets for development.' There will be parallel needs to assure the humanitarian imperative, that is, to plan and carry out activities aimed at protecting lives and reducing disease, malnutrition and disabilities among the vulnerable populations in the affected areas, and to set the foundations for the developmental imperative. The latter should strengthen the institutional capacity to pursue longer term health development goals, to discharge the essential public health functions and development of the health care delivery system within an environment of good governance, to assure human security and extend social protection in health."

Source: World Health Organization. November 2008. "Health Cluster Guidance Note on Health Recovery." Prepared by the Department of Recovery and Transition Programmes. Health Action in Crisis.

The recovery phase offers the best opportunities for enhancing and improving health sector capacities and capabilities. In order to take full advantage of these opportunities, health officials and their planning units should consider the guidance provided by the World Health Organization (WHO), the World Bank and others in the following case studies

Box 7: The Six Core Health System Building Blocks – Key Considerations During Recovery

Topic: Rebuild the health sector recovery with an eye on opportunities for enhancement and improvement

The following are the core building blocks defined in *Strengthening Health Systems to Improve Health Outcomes: WHO's Framework for Action*, WHO 2007. All need to be considered during recovery without losing the essential focus on health outcomes:

1. Leadership and governance

Leadership and governance are key to set overall health policy and translate this into health strategies and annual plans that can be resourced and implemented, but are often seriously affected during a prolonged crisis/conflict. The following are some elements to consider:

- Capacity building to enable a MoH to assure the necessary leadership (may need technical assistance in the short term, and capacity building activities for the longer term).
- Formulating policies and strategies to give a sense of direction and provide a common framework for action (negotiation and sharing being as important as the final product)
- Developing coordination platforms involving all critical stakeholders.
- Supporting decentralization by strengthening planning and managerial capacity at provincial and district levels. Responsibilities and procedures must be clear, adequate resources (human and financial) distributed, and management support provided.
- Encourage health sector partners (including donors) to engage in strengthening health management capacity (at whatever level) as a standard part of any recovery plan/project proposal.

2. Human resources

To assure a competent, functioning, affordable health workforce it is necessary to:

- ensure the early establishment of a human resources database and information system for both short- and long-term HR planning;
- examine salary issues and recent trends in training and in- and outmigration, and potential recruitment and training of lay personnel for specific tasks; and
- plan early for appropriate human resources and their development based on sound reflection and analysis.
- Avoid an undue expansion of the health network (without the human resources to manage it adequately or the funds to meet future recurrent expenditures) and ensure appropriate training and retraining activities. But avoid a host of inadequate *ad hoc* training activities. (Training of lower-level health workers may be justified in the short term but long-term planning for pre-service training is essential.)
- The *contracting out* of services is sometimes proposed to scale up coverage of essential health services in an insecure environment and poorly resourced health sector (e.g. Afghanistan in 2008). It may indeed be useful when the State is virtually absent but contracting should be used with caution so as not

to jeopardize the long term development of the State itself.

3. Financing

Realistic estimates are required for both the costs of recovery activities and the levels of funding likely to be available from the government budget, continuing (but diminishing) humanitarian funding, new development schemes, bilateral funding, various global funds, and loans from international financial institutions. Elaborating strategies and formulating plans without linking them to the resources realistically going to be available, is a futile exercise. The issue of user fees – whether they should be introduced, maintained or abolished – is likely to be contentious.

4. Medicines and technology

In case of a prolonged crisis, supply arrangements for drugs and other medical material will usually have changed considerably and become fragmented. The (re)establishment of a central pharmaceutical store or similar mechanism must be carefully planned based on detailed analysis of the factors impeding the supply of essential drugs and supplies to the public health facilities. Promote essential drug concept s and standardized treatment protocols.

5. Information

A first priority during recovery is to (re)establish an appropriate Health Management Information System (HMIS) that collects relevant, reliable sex- and age- disaggregated data and provides a sound information basis for both short- and longer-term planning. Thorough health facility assessments will be needed to establish a baseline using existing data and through surveys. Factors impeding the recording and transfer of information from central to sub-regional and local authorities, and the transfer of reports from local to sub-regional and central authorities, must be identified. Epidemiologic surveillance and early warning systems must be mainstreamed into regular provincial and district operations.

6. Service delivery

During recovery it will be crucial to strengthen primary health care services. This includes planning the restoration of service delivery, including expansion to underserved areas (difficult balance between politics, equity and efficiency) as well as introducing new service delivery models, where needed. Combine lessons from other countries with an understanding of local context. Specific areas such as blood safety, sterilization in health facilities, disposal of injections and sharp medical supplies, and medical waste disposal, will need to be addressed.

Source: World Health Organization. "Health Cluster Guide: A Practical Guide for Country-Level Implementation of the Health Cluster." Provisional Version, June 2009. http://www.who.int/hac/global_health_cluster/guide/en/index.html

Lessons:

- Recovery from a disaster is an excellent opportunity to enhance and improve existing health sector capacities and capabilities
- Coordination and leadership are critical for gaining support and acceptance for making positive changes to the health sector during recovery
- Realistic approaches to rebuilding and enhancing the health sector workforce, financing of health's sector projects and systems and distribution of new medicines and technologies are needed to experience a full recovery
- Policy issues should be resolved by the health authorities not by uncoordinated initiatives of individual humanitarian organizations, as in Haiti where some NGOs conflicted with MoH by offering long term medical care without the legally required user fee.
- Information and communications and service delivery are also key factors

The World Bank provides additional information concerning the transitional and recovery phases and the opportunities each present to health officials.

Box 8: Principles and opportunities in the transitional and recovery phases

According to World Bank Good Practices Notes on Health, "Recovery and reconstruction should be divided into two phases, with different priorities for each: (a) transitional, and (b) recovery and reconstruction. The duration of each phase will differ from country to country and depends on a number of factors including commitment and political will of the government, and the financial and technical capacity of the country. The transitional phase usually takes 3 to 12 months and the recovery and reconstruction takes 1 to 3 years or even longer.

The strategy should design the future vision for the sector. The key principles for recovery and reconstruction of the health sector should include:

- **Equity:** Expansion of service provision to underserved areas, the poor and vulnerable population sub-groups populations;
- **Effectiveness:** Increasing the access to and quality of key services such as surgical basic care, laboratory and other diagnostic services and in-patient care;
- **Appropriateness:** Adoption of new service delivery models to respond to new health needs if the previous system was outdated; and
- **Efficiency:** Greater overall efficiency with savings used to finance some of these measures.

Transitional Phase. The most urgent need is to ensure access to an essential health care package and public health programs (services and activities) that reduces

vulnerabilities and saves lives. Primary Health Care (PHC) services should be easily accessible at the temporary resettlement sites where people live while secondary care services can be provided at appropriate sites. Early warning alert and response systems for epidemics or any other public health emergency prevention should be revitalized and strengthened. It is imperative to make sure that (a) poor and vulnerable groups have access to free health care; (b) emerging mental health problems are addressed properly; (c) a package of health services for disabled people is provided.

In the Chinese context it may be appropriate to maintain health services free of charge and phase these out over time. An exit strategy based upon DNA and careful cost modeling and per capita payments can be developed. While the essential package of public health services and activities should be fully financed by the government, funding essential clinical services could combine payment by health insurance schemes, government subsidies and out-of-pocket payments, aimed at less than 20% of out-of pocket expenses for the general population. However, for the poor and vulnerable populations, free health care services are highly recommended.

Medium and Long Term Recovery and Reconstruction. Broader health system issues such as utilization and quality of health services should be addressed in this phase. Disasters like earthquakes provide an opportunity for the health sector to re-organize and reform. Establishment of new hospitals, health centers and public health institutions should be rationalized to reduce unnecessary redundancy and unhealthy competition.

The concept of the "Safe Hospitals Initiative" of the WHO should be embraced to build health facilities back better. This initiative has been implemented in California, U.S.A, Mexico and other Latin America countries. Independent reviewers should be hired to review the quality of the design of all healthcare facilities to ensure an increased preparedness for the next disaster. Special requirements for hospitals and other health facilities should be met because these (especially secondary and tertiary facilities) must remain functional immediately after earthquakes. In addition, essential supporting infrastructure, such as water supply, access to transportation systems, telecommunications, and electricity should function after earthquakes.

The current public health emergency protocols and relevant plans at all levels should be revised based upon the lessons learnt from the Wenchuan Earthquake, and embrace the concept of all-hazards preparedness. It is generally agreed that there are four elements for effective disaster prevention and preparedness: (a) an accurate analysis of hazards and vulnerable populations; (b) formulation of disaster preparedness and response plans; and (c) communicating prevention and preparedness to the public as well as key decision-makers and (d) regular drills and exercises to test and improve the plans.

Discontinued health care services in the affected areas should be gradually revitalized in this phase. Special attention should be given to mental health, prevention and

control of non communicable diseases, and services for the vulnerable groups and the disabled. Financing mechanisms need to be designed and implemented to protect people against the catastrophic costs of health care in a post-crisis era.

New services should be launched to address emerging health needs. For instance, post-traumatic stress syndrome and depressive disorder are the two mental health problems that may affect a large number of survivors. These conditions often manifest only one to three months following the event. They are more likely to be concentrated among women and children, disabled and other vulnerable populations. The magnitude of this vulnerability can be quite sizeable. For the countries hit by the 2004 Tsunami, WHO estimates that 20-40% of the affected population suffered mild psychological distress, 30-50% exhibited moderate or severe distress and 10-15% had mental disorders. International experience suggests that mental health and psychosocial support services are typically delivered through four levels of care: (a) self and family care; (b) community mental health services; (c) care and support outside the formal health sector; and (d) mental health care through primary health care.

Because of the changed profiles of disease and health issues, loss of health workers and the innovations to be piloted, the current health system management needs to be reviewed and strengthened. A human resource development plan and proper institutional arrangements should be designed and implemented.

Source: World Bank Good Practice Notes. *Health*. July 2008.

Lessons:

- Activities during the transitional phase should ensure that the poor and vulnerable groups have access to free health care emerging mental health problems are addressed properly and a package of health services for disabled people is provided
- Disaster offers an opportunity to reorganize and reform the health sector but care must be taken to reduce unnecessary redundancy and unhealthy competition
- When rebuilding facilities and systems, rebuild safer in order to reduce the impacts of future disasters
- Because of changes brought on by the disaster and its impacts on the population, health officials must consider new human resources plans and deployments

Case 17: Health sector reconstruction, Pakistan

Key Issue: Post-disaster is an opportunity to revitalize and enhance the health sector

In Pakistan, based on the Damage and Needs Assessment (DNA), a health sector reconstruction strategy was designed with two overlapping phases, building upon the ongoing work and learning lessons from the relief effort. The overall theme was Build Back Better, however, in health the strategy envisaged a revitalized system that would ensure provision of an integrated essential package of services:

Short term (3-12 months) The short term strategy focused on ensuring revitalization and availability of the basic health services and core public health programs and functions, with attention given to:

- Provision of services for people living in the relief camps;
- provision of essential services using mobile services; use of alternate structures including prefab units; and use of community based workers for outreach services;
- provision of secondary care services at appropriate levels;
- provision of a special package of health services for disabled people; and
- making functional epidemic prevention programs, and strengthening/rebuilding the surveillance systems and field epidemiology capacity.

Medium to long term strategy (12 months to 36 months) included the reconstruction of seismically safe facilities and also outlined options for addressing key issues faced by the sector including low utilization and inadequate quality of care, including:

- rationalized reconstruction of seismically safe facilities with integration of smaller units into larger facilities, facilities closed or relocated, and upgrading of some facilities based on population size;
- an essential package of services defined and delivered using an integrated approach;
- emphasis on needs of the vulnerable population sub-groups including undertaking vulnerability assessment;
- strengthening of the management and organizational system including effective coordinated response involving multiple partners;
- community based rehabilitation of the disabled working with nongovernmental organizations; and
- an institutional mechanism for operationalizing rapid emergency and

disaster response.

Source: World Bank Good Practice Notes. *"Health"*. July 2008

Lessons:

- Short-term relief activities must focus on revitalizing essential health services, helping special needs populations and preventing disease outbreaks
- Long-term recovery involves building back safer and efficiently in order to maximize health sector capacities and capabilities

The World Bank has identified key lessons learned from past disasters that health officials should consider in planning and implementing projects in the recovery phase.

Box 9: World Bank principles for recovery: Recommendations for rebuilding the health sector safer and better

World Bank Good Practices Notes on Health provides the following recommendations concerning health sector recovery and reconstruction:

The key recommendations based upon the lessons learnt and best practices around world for the health sector recovery and reconstruction include:

- **Build Back Better**: The objective for recovery and reconstruction should be building the health sector back better. This means the system will have safer infrastructure ("seismically-safe hospitals"), be prepared for key public health hazards and emergency, and provide equitable and affordable services to vulnerable groups;
- **Communication and Coordination**: Reconstruction should be led and coordinated by a strong national or local authority. Clear roles and responsibilities should be developed and assigned to different sectors and the Government at various levels. Affected populations and communities needs to be consulted during planning and implementation of the recovery and reconstruction strategy;
- **Two Phase Approach**: A transitional strategy to bridge between the emergency phase and the reconstruction phase is needed. Transitional phase should ensure access to an essential health care package and public health programs (services and activities) that reduces vulnerabilities and saves lives. The reconstruction phase needs to restore and further develop service packages and build the health system back better;
- **Health Sector Damage and Needs Assessment (DNA)**: A standardized methodology for all sectors will allow integrated assessments. The health sector DNA should be comprehensive, balance timeliness and quality, and balance the current loss and future needs. Cost estimates of damages and

needs should be made;

- **Rapid Assessment of Vulnerable Groups**: Particular attention needs to be given to map the existing and newly emerged vulnerable populations in both the transitional and reconstruction strategies. Service provision and benefits should be expanded to underserved areas, the poor and newly-vulnerable population sub-groups. The expanded package should be costed and financed; an exit strategy for financing free services to the normal population should be developed in parallel;
- **Every step measured**: The Monitoring and Evaluation (M&E) plan should focus on a few critical indicators, have clearly defined frequency and timeline, and preferably be implemented by a multi-sectoral team comprising surveyors and evaluators. A budget, usually 5 to 10% of the recovery and reconstruction budget, should be set aside for this purpose;
- **Reasonable Expectations**: The post-disaster "window of opportunity" to introduce institutional and regulatory reforms needs to be balanced with what can be practically achieved in the context of an emergency recovery project.

Source: World Bank Good Practice Notes. *Health*. July 2008

Lessons:

- Build back a safer and more secure health infrastructure
- Coordinate and communicate with all potential partners
- Use a standard methodology for assessing damage and needs and assess vulnerable populations
- Take advantage of the "window of opportunity" to enhance and improve the health infrastructure

Case 18: World Bank recommendations for a recovery Monitoring and Evaluation Program

According to World Bank Good Practices Notes on Health, "The Monitoring and Evaluation (M&E) plan for health reconstruction should focus only on a limited number of critical indicators (e.g., Pakistan had 3-5), have clearly defined frequency and timeline, and preferably be implemented by a multi-sectoral team comprising surveyors and evaluators. A budget, usually 5 to 10% of the recovery and reconstruction budget, should be set aside for the monitoring and evaluation. The findings of the M&E exercises can be used to assess results, then to periodically revise plans, budgets, and allocations.

Source: World Bank Good Practice Notes. *Health*. July 2008.

Lessons:

- Establish credible Monitoring and Evaluation program for your recovery program
- Identify a limited number of indicators and establish a multi-sector team to implement the M&E program
- Set aside between 5-10% of the recovery costs for the M&E program

Damage and needs assessments are identified as critical elements in developing both transitional and long-term recovery plans. Often these assessments build on the initial damage and needs assessments conducted in the immediate aftermath of a disaster but are designed to identify long-term projects and activities

Case 19: World Bank experience in assessments; Planning for a better health system for the next 5 to 10 years

According to the World Bank Good Practices Notes on Health, "International experience shows that in the aftermath of a natural disaster, a transitional strategy for restoring and maintaining health services should be developed while planning for a better health system for the next 5 to 10 years. A rapid assessment should be done for a changed population profile, epidemiology and burden of diseases. The health needs of the people in the affected areas should be assessed periodically, and particular attention needs to be given to the existing and newly emerged vulnerable populations in both transitional and reconstruction strategies. The transitional phase should prioritize rapid restoration and assurance of undisrupted supply of essential health services.

Reconstruction planning begins during the damage and needs assessment phase.

International experience suggests that a Damage and Needs Assessment (DNA) is a process, rather than a one time event, and often goes hand in hand with reconstruction efforts. It is critical to standardize the methodology for DNAs across sectors to allow integrated assessments and reconstruction planning for all sectors. Timeliness and precision needs to be balanced when DNA is undertaken.

Damage and Needs Assessment (DNA) in the health sectors should cover the following key areas:

- **Damage Overview and Recovery Needs**: Impacts of earthquake on health systems as well as human health should be assessed and rough costs of damage and for reconstruction estimated.
- **Reconstruction and Recovery Strategy**: The DNA should help in (a) designing an overall approach and key principles for reconstruction strategy; (b) understanding access to primary and secondary health care services by different groups; (c) targeting populations with special needs; (d) designing detailed needs assessment and mapping of vulnerable populations; (e)

understanding the current coordination within the health sector and between different sectors; (f) understanding the capacity of the health sector and healthcare workforce; (g) assessing health promotion and disease prevention efforts; and (h) examining and designing seismically-safe health care facilities.

- **Reconstruction within the Framework of Health Reforms**: The DNA should explore how to rationalize primary and secondary health care facilities as part of reconstruction efforts and opportunities for consideration of alternate management arrangements for primary healthcare services.
- **Cost Estimates**: Estimation should include costs for (a) facility clean up, (b) health infrastructure and related equipment, (c) public health campaigns and trauma mitigation efforts, (d) human capital needs, (e) medical waste management, and (f) increases in the costs of health treatment.

Source: World Bank Good Practice Notes. *Health*. July 2008.

Lessons:

- Assessments in the transitional phase should focus on health needs in the affected area with emphasis on the needs of vulnerable groups and should prioritize rapid restoration and assurance of undisrupted supply of essential health services
- Assessment is a process that needs to be standardize across all sectors
- Assessments identify recovery needs, are used in developing recovery strategies and programs, assist in developing reforms of the exiting health systems and serve as the basis for cost estimates for recovery actions
- Costs estimates must account for facility, human, materials and health treatment costs

The remaining case studies presented in this section have been aligned into 6 sub-sections that reflect "The Six Core Health System Building Blocks – Key Considerations During Recovery," developed by the World Health Organization (WHO) and noted earlier in this section. These building blocks include

- Leadership and governance
- Human resources
- Financing
- Medicines and technology
- Information
- Service Delivery

Sub Issue 1: Leadership and Governance

According to the WHO guide, "Leadership and governance are key to set overall health policy and translate this into health strategies and annual plans that can be resourced and implemented, but are often seriously affected during a prolonged crisis/conflict. The following are some elements to consider:

- Capacity building to enable a Ministry of Health (MoH) to assure the necessary leadership (may need technical assistance in the short term, and capacity building activities for the longer term).
- Formulating policies and strategies to give a sense of direction and provide a common framework for action (negotiation and sharing being as important as final product)
- Developing coordination platforms involving all critical stakeholders.
- Supporting decentralization by strengthening planning and managerial capacity at provincial and district levels. Responsibilities and procedures must be clear, adequate resources (human and financial) distributed, and management support provided.
- Encourage health sector partners (including donors) to engage in strengthening health management capacity (at whatever level) as a standard part of any recovery plan/project proposal.

Source: World Health Organization. "Health Cluster Guide: A practical guide for country-level implementation of the Health Cluster." Provisional version – June 2009. http://www.who.int/hac/global_health_cluster/guide/en/index.html

The following case studies provide examples of "Leadership and Governance" in past disasters in the following areas:

- Coordination among recovery partners
- Safer Facilities in the Future
- Patient treatment
- Policy Initiatives

Coordination among recovery partners

Case 20: Leading role of the Ministry of Health, Gujarat Earthquake, 2001

A massive earthquake shook India's Gujarat state in January 2001. It affected not only the population but also the health facilities. The district hospitals, community health centres, primary health centres, sub-centres and thousands of Anganwadi centres in the affected districts were either entirely destroyed or damaged and rendered nonfunctional. Health professionals in the worst-affected districts were

themselves suffering from trauma and injuries.

In the aftermath, the Government of India took the lead, and NGOs and international agencies lent a hand in the response. An evaluation was conducted, and a number of successful features of the response and recovery phases were identified:

- Successful health sector coordination allowed for timely execution of response, with no overlapping of activities and resource allocation
- Effective partnership between the government, private sector, NGOs and UN agencies
- Joint planning for resource needs, including medical supplies, and
- Integration of vertical health programmes.

Source: WHO Regional Office for South-East Asia, 2009, "Case Studies on Safe Hospitals in the South-East Asia Region." p.5-7. http://www.searo.who.int/worldhealthday2009/linkfiles/WHD-Kit/RHS/case_studies.pdf

Lessons:

- Ministry of Health leadership should be supported by NGOs and international agencies
- Coordination, partnership, joint planning and integration of programs key to success

Case 21: Government, United Nations, NGOs, World Bank and private sector working together, Tsunami, 2004

Governments of tsunami affected countries are working with the UN, NGOs the World Bank and the private sector on a detailed, district-by-district assessment of progress in different communities. This will help them coordinate overall reconstruction efforts. It will also help them identify needs and gaps and indicate what more needs to be done to help speed recovery so that more people are able to rebuild their livelihoods and maintain good health. The UN's Special Envoy for Tsunami Recovery has been given the responsibility of improving the coordination of support to countries during the recovery process. The office of the Special Envoy places a strong emphasis on health, arguing that good health is the sign of successful recovery and that joint action for health is a sure sign that we are coordinating our collective efforts.

Concerted action is needed to ensure that the recovery effort is managed effectively. This calls for (a) effective coordination between different actors; (b) joint action in affected areas; (c) regular assessments of the overall impact of the recovery effort through regular information on the health status and well-being of tsunami-affected populations; and (d) rigorous tracking of the extent to which funds provided for recovery programmes reach those in need, especially in the health and education

sectors.

We are now at a critical stage in our tsunami relief efforts. Communities that suffer from major disasters usually depend on external assistance for at least six months, as authorities undertake the lengthy process of planning major reconstruction. If this dependence goes beyond six months, however, affected communities are liable to experience deep and lasting despair. This compounds their psychological trauma and can result in extremes of alienation and anger. The next three months are critical: the recovery must gain momentum in a way that reflects the extensive involvement of communities and attention to the needs of all, while, at the same time, maintaining relief efforts. We must do all we can to ensure that the planning and implementation of recovery programmes continue with as few impediments as possible.

Source: WHO, "Sustaining recovery six months on: the role of health professionals" http://www.who.int/hac/crises/international/asia_tsunami/6months/6months/en/index.html

Lessons:

- UN Conducted detailed, district-by-district assessment of progress in different communities provides mechanisms for reconstruction coordination and helps identify needs and gaps in recovery efforts
- Critical elements in recovery effort include coordination among all groups, joint action, regular assessments of impacts and rigorous tracking of funds
- An unsuccessful transition for relief to recovery can have negative psychological impacts of affected communities

Safer Facilities in the Future

The recovery phase offers the opportunity to build back safer and stronger in order to reduce the impacts of future disasters. This takes foresight, planning, leadership and coordination. To build back better is perhaps the best result that can be had in a recovery process.

Case 22: Rebuilding safer health facilities, Gujarat Earthquake

According to the WHO report entitled, *Case Studies on Safe Hospitals in the South-East Asia Region,* "During the rehabilitation and reconstruction phase, several measures were taken to ensure that hospitals are safer in emergencies in the future. Among them are:

- Systematic survey of health facilities
- Vulnerability and impact analysis of health facilities
- Rehabilitation of health facilities, including repair, strengthening, new construction as per new revised norms of earthquake safety, and retrofitting

- Guidelines developed for buildings according to earthquake seismic zones
- Seismic zoning of the state of Gujarat
- Linkages established with the departments for creating awareness and training about safe building practices and mitigation measures
- Launching of joint community-level awareness programmes
- School training and mock drills

The Gujarat example shows that health safety initiatives should not only involve bricks and mortar but also ways to make health centres integral to the future health and medical needs of the vulnerable population.

Lessons learned: Rebuilding after a disaster will always be a learning experience. The Gujarat earthquake of 2001 had its own lessons, especially in the rebuilding of its health facilities.

Hospital location

After the earthquake, all new locations were chosen nearest to the community and work to ensure practical involvement of the community and provide knowledge about the facilities which were designed and built with seismic-resistant design inputs.

Hospital design

More space was provided in the designs for seismic movements. Soil testing for building and the uniform application of building codes were ensured.

Structural safety

Care was taken at the foundation and plinth stage to safeguard against possible hazards. Easy access routes were introduced and the quality of material used checked intensively.

Nonstructural concerns

Separate electrical circuits were installed with higher capacity to meet the demand of the new health facilities. Proper lighting was provided in critical areas. Lightning conductors, proper telecommunication cabling connections, and sufficient water storage capacity for at least 15 days, were kept in mind during reconstruction.

Health services

All the health centres now have an operations plan for hazards, including provision for essential medicines; emergency procedures were also put in place. Pre-hospital emergency medical care has been introduced to handle all health emergencies.

Health sector and health facility preparedness

A Health Action Plan for preparedness was initiated for the state by the Department

of Health. Simulation exercises have been conducted for each health centre. Also completed: contingency plan, identification of all agencies for contact and communication, and a plan of action for procuring medicine and sourcing suppliers and equipment in an emergency.

Linking with other sectors

Soon after the earthquake, the Gujarat state Disaster Management Act, 2003 was promulgated. It created an authority that devolves power and responsibility to functionaries at district headquarters, state and local authorities, police and the community and the private sector to act in the event of a disaster.

Engaging the community

Advocacy materials have been widely disseminated on (a) emergency preparedness; (b) epidemiology; (c) disaster warning; and (d) safety measures. Information was published and distributed with the help of NGOs, WHO, the state government of Gujarat, the United Nations Development Programme (UNDP), and community volunteers following the earthquake on various issues including response, recovery and rehabilitation.

Appropriate training involving community members with provisions for clear roles, cooperation and accountability have now been established and rehearsals have also been conducted.

Source: WHO Regional Office for South-East Asia, 2009, "Case Studies on Safe Hospitals in the South-East Asia Region." p.5-7. http://www.searo.who.int/worldhealthday2009/linkfiles/WHD-Kit/RHS/case_studies.pdf

Lessons:

- When rebuilding and rehabilitating medical facilities in the recovery phase it is important to incorporate disaster resilient measures into the siting, construction and repair of these facilities so that they can survive the next disaster
- Officials in charge of recovery projects should consider location, design, structural safety, and nonstructural concerns in the design, repair and reconstruction of damaged health facilities
- Preparedness measures should be included in the recovery and reconstruction activities including conducting preparedness exercises in health facilities, linking with other sectors and engaging the community

Patient treatment

Case 23: Treating individuals with chronic diseases, Great Hanshin-Awaji Earthquake, 1995

Assistance for those suffering from intractable diseases who are highly reliant on

medical care:

- The regional disaster emergency medicine manual has been created, and the production of a manual of health care guidance for patients with intractable diseases has also helped in the preparation of lists of patients requiring priority assistance during emergencies by the prefectural health and welfare office. The launch of the Medical Network Assistance Project for Patients with Intractable Psychiatric Illness is also contributing to progress in the development of a system for confirming the safety of these patients and ensuring their appropriate medical care.

Support for self care by patients with chronic illnesses:

- The amendment of the Medical Care Law and revisions to the medical treatment payment system have meant that patients are now offered full information concerning their treatment and medication, paving the way for them to carry out their own self care.

Source: Hyogo Prefectural Government, Japan, "The Great Hanshin-Awaji Earthquake: The Report of the 10-Year Reconstruction Overall Verification and Recommendations", 2005, The Office of the 10th Year Restoration Committee, p.132-133. (Aiko Yamamoto, "Initiation in Nursing Care and Welfare to Protect the Lives and Health of Those in greatest Need of Assistances")

Lessons

- Provisions should be made in advance of a disaster to care for patients with chronic diseases
- These provisions include the development of a treatment manual, a network of health professionals focused on patients with chronic diseases and amending existing laws to assist patients in carrying out their own care

Box 10: Emergency health planning for individuals with disabilities

People with disabilities are often less able to flee for safety in the event of a disaster. They are therefore likely to be disproportionately represented among the casualties of disasters. Since disasters can result in numerous physical threats to the health of people still occupying a region when they occur, the number of people living with disabilities may rise as a result of the disaster itself. The WHO estimates that following a disaster, five to seven per cent of people in camps or temporary shelters have a disability. As a result of the December 2004 tsunami, for example, the World Bank estimated a 20 per cent increase in the number of people with disabilities. In addition, one third to half of all people affected by disasters suffer from mental distress. Evidence from emergencies shows that people with disabilities suffer particularly high rates of mortality. These can be due to several factors, including that: people with physical and mental disabilities are often not included in emergency registration systems and therefore fail to receive their basic entitlements

to food, water, shelter and clothing; their specific needs are not met; people with physical and mental disabilities are often excluded from the disaster response because of lack of access due to loss of family and community support, and of mobility and supportive aids. Efforts should be made to integrate the needs, views and perspectives of people with these disabilities into each stage of the emergency relief, recovery and reconstruction phases of the disaster response. Efforts should also be made to protect these people against discrimination and physical and emotional abuse. The identification and location of people with physical and mental disabilities is part of the emergency registration activity; it also helps verify that these people receive their basic entitlements. It is important to ensure that disability considerations are included in post-disaster reconstruction and rehabilitation and that housing, public buildings and community facilities are accessible to persons with disabilities. In order to ensure that the concerns of persons with disabilities are fully integrated into the disaster response, it is important to educate and raise awareness among local government and law enforcement officials and humanitarian workers regarding the rights and needs of people with disabilities."

Source: "Human Rights and Natural Disasters" Operational Guidelines and Field Manual on Human Rights Protection in Situation of Natural Disaster", 2008, Bruking-Bern Project on Internal Displacement.p.72.

Lessons

- Individuals with disabilities are especially vulnerable in disasters and experience particularly high rates of mortality
- Efforts should be made to integrate the specific needs of the disabled in planning for all phases of a disaster including the recovery phase
- Disability considerations must be included in all reconstruction projects to ensure that housing, public buildings and community facilities are accessible to individuals with disabilities
- It is important to educate and raise awareness among local government and law enforcement officials and humanitarian workers regarding the rights and needs of people with disabilities

Case 24: Support for communication with the hearing impaired and others, Great Hanshin-Awaji Earthquake, 1995

To ensure the availability of and dispatch of sign-language interpreters, the Hyogo Sign-Language Interpretation Center was established as a means of developing a support system for communication with people who are hearing impaired. It also trains emergency disaster-relief specialist volunteers (sign-language interpreters). In April 2005, and Information Center for the Hearing Impaired was opened to assume the function of a base for relief activities during disasters.

Source: Hyogo Prefectural Government, Japan, "The Great Hanshin-Awaji Earthquake: The Report of the

10-Year Reconstruction Overall Verification and Recommendations", 2005, The Office of the 10th Year Restoration Committee, p.132-133. (Aiko Yamamoto, "Initiation in Nursing Care and Welfare to Protect the Lives and Health of Those in greatest Need of Assistances")

Lessons:

- Establish disability support institutions and capabilities pre-disaster
- Interpreters are critical to recovery for the hearing impaired, as for the blind and those with other communication disabilities, including those who do not understand the local language

Case 25: Public health considerations, Indian Ocean Tsunami, Tamil Nadu, 2004

While disease and other public health considerations were not the focus of the current study, the survey did reveal that 25.9% of the populations were injured on the day of the tsunami. Of those were injured, the vast majority received some form of medical treatment. While many injuries were treated in government hospitals, the largest proportion (60.2%) received medical attention from private (that is, private for profit and private for non-profit) institutions such as private hospitals and NGOs. This suggests that there was a heavy reliance on the non-public health sector following the tsunami in Tamil Nadu. Such patterns of post-disaster health care emphasize the importance of including private health providers in emergency response planning and disaster training. Further research is required to determine to what extent this pattern of health care is reflected following other acute disasters in other regions.

Source: Guha-Sapir D., Parry LV., Degomme O., Joshi PC., Saulina Arnold JP., 2006, "Risk factors for Mortality and Injury: Post-Tsunami Epidemiological Findings from Tamil Nadu", Centre for Research on the Epidemiology of Disasters (CRED).

Lessons:

- Many persons injured in disaster are treated in private and NGO hospitals
- It is important to include private health providers in emergency response planning and disaster training

Policy Initiatives

Policy initiatives designed to enhance existing health services and capabilities should be considered during the recovery phase and put forth by the leadership in coordination with all partners and with the full participation of the public.

Case 26: Control of dengue fever is a challenge but doable, Indonesia, February 2005

Dengue fever (DF) with its severe manifestations such as Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) is currently of major public health

concern in the South East Asia region. Global estimates indicate that at least 100 countries are endemic for DHF and about 40% of the world population (2.5 billion people) are at risk in the tropics and sub-tropics. Over 50 million infections are reported annually. About 400,000 of the cases reported are of DHF, which causes high childhood mortality in several Asian countries. All countries affected by the Tsunami are endemic to dengue.

Though ecological and climatic factors influence the seasonal prevalence of the dengue mosquito vectors, factors related to human ecology in internally displaced persons camps determine the extent and intensity of vector breeding. In temporary shelters where drinking water comes from outside sources or from rainwater harvesting, there is an increased tendency to store drinking water in containers that may become breeding places of Ae. aegypti (and to a lesser extent of Ae. albopictus). Accumulation of rainwater in containers and other items of debris rapidly become Aedes breeding sites. Interruption of vector control activities in the area following the tsunami emergency has increased the risk of the disease.

Health centers are essential as an alert network and for early diagnosis and treatment of suspected cases. Through reporting by health care agencies into WHO/MOH Indonesia disease surveillance system established in Aceh two cases and one death have been documented. A case of dengue fever (IgM positive, DEN-4) is presently admitted to German Offshore Hospital with hemorrhagic symptoms from Aceh Utara district (6 hours driving distance east of Banda Aceh).

The control of dengue represents a major challenge to those providing health care services in the tsunami affected areas. While the focus remains on acute relief efforts in Aceh province, rehabilitation and reconstruction are gaining momentum in other tsunami affected areas of Indonesia. WHO is working with local and international health partners to facilitate the implementation of recommended vector control measures, promote public health education, strengthen the clinical care systems for dengue case management, improve hospital preparedness, initiate training of health care personnel for clinical case management and provide guidance in dengue fever management in patients.

Source: Aceh Epidemic Alert and Response team. Indonesia situation report update, 1 February 2005. http://www.who.int/diseasecontrol_emergencies/guidelines/Dengue_ind_risk%20assess.pdf

Lessons:

- The recovery phase is an opportunity to work with partners to introduce new health measures that will mitigate future disaster impacts
- Areas to be considered for improvement in the recovery phase include implementing vector control measures, promoting public health education, strengthen the clinical care system, training for health care workers and guidance on treating infectious diseases likely to be encountered in the

aftermath of a disaster

Case 27: Policy initiative to change how to deal safely with healthcare waste, Hurricane Ike, Turks and Caicos Islands (TCI), 2008

On 8 December it was officially stated that the recovery operation following Tropical Storm Hannah and Hurricane Ike had been completed on South Caicos and Salt Cay islands. Independent of the disasters, there is still some work to do at the dump sites. The government intends to replace the dump sites on the two islands with transfer stations for regular waste in order to send the disaster waste to the sanitary landfill in Providenciales. This would be an important action to improve environmental protection.

It is recommended that the old dump sites not currently being utilized at South Caicos and Salt Cay are maintained as a preparedness measure in case of future unexpected rapid increase of waste. In the event of a new disaster, the lack of such a precautionary measure would prove a formidable logistical challenge when all the waste has to be shipped to Providenciales. With this situation in mind, the follow-up mission, as thus the following part of this report, focused on the situation at Grand Turk.

Disaster Waste Collection

As a part of its contingency work, the Environmental Health Department of Grand Turk mobilizes a contractor every time there is a risk for a hurricane hitting the island. The contractor then relocates appropriate equipment to a site where it is more readily accessible for clean up. These measures were also taken before Tropical Storm Hanna and Hurricane Ike impacted TCI.

The first clean-up phase after the storms was completed fairly quickly. However, during the September/October mission there were still piles of debris and other waste material to be found in the streets. By mid-December, the waste on the island had been cleaned up, with a few exceptions. People continued to dispose of secondary disaster waste in the streets, although this was far less common compared to the situation in October. Nevertheless, there is a need of a grappler in order to reach waste behind walls and in small lanes. As it is now, the front loader is frequently manually loaded because the machine cannot grip the waste.

The debris that spread into the salinas (salt lakes) has been cleaned up, with a few exceptions such as the pond to the west on the nether side of the new hospital.

At the hospital, proper waste disposal of common waste as well as infectious waste is reestablished, with a functioning incinerator and proper storage facility. The temporary wooden construction for the oil tank has been replaced with a steel construction.

The power company, Turks and Caicos Utilities, announced in October their need of support regarding the collection of downed poles and in particular downed

transformers. There was no international aid available for this task, but most of the electricity poles have been removed from the streets. However, many are remaining in yards and on other private property. Most poles were recovered by people informally after an announcement from the authorities. The Environmental Health Department arranged the collection of the transformers, and most of them have been secured now. In October it was estimated that 160 transformers had collapsed. In December the number of uncollected transformers was estimated to be around 15-20 (excluding empty transformer buckets left in different places).

Most of the uncollected transformers were found on private property. A few are still left in the streets. The South Base, where suspect roofing material was found in October, has been cleared of debris. Two damaged buildings remain, and at a private workshop in the northern part of the base, debris and equipment from the downed grid can still be seen. The wires from the grid are slowly being coiled up on most places on the island. The wires are recovered and stored awaiting recycling. Cables used for telecom, internet and TV are still remaining in the streets, albeit often moved to the side. Cables are coiled up and collected only in some districts. A number of job opportunities could be provided in order to take care of the collection of wires and cables.

Source: Joint UNEP/OCHA Environment Unit mission, supported by the Swedish Rescue Services Agency, 2008, "Addressing Disaster Waste Management Issues II: Follow up Mission Report", Turks and Caicos Islands, 6-14 December 2008. http://www.unep.org/greenstar//publications/Report%20TCI%20-%20Addressing%20Disaster%20Waste%20Management%20Issues,%20Nov%202008%5B1%5D.pdf

Lessons:

- Disposal of health related waste was identified as an environmental problem and policy initiative put forth to fix the problem
- Old dump sites should be maintained as a preparedness measure in case of future unexpected rapid increase of waste
- Old construction and storage measures should be replaced by new technologies and construction methods and materials

Sub Issue 2: Human Resources

The WHO guide entitled, "The Six Core Health System Building Blocks – Key Considerations During Recovery," identifies Human Resources as the second building block for recovery and defines this block as follows:

To assure a competent, functioning, affordable health workforce it is necessary to:

- "Ensure the early establishment of a human resources database and information system for both short- and long-term HR planning;
- "Examine salary issues and recent trends in training and in- and

outmigration, and potential recruitment and training of lay personnel for specific tasks; and

- "Plan early for appropriate human resources and their development based on sound reflection and analysis.
- "Avoid an undue expansion of the health network (without the human resources to manage it adequately or the funds to meet future recurrent expenditures) and ensure appropriate training and retraining activities. But avoid a host of inadequate ad hoc training activities. (Training of lower-level health workers may be justified in the short term but long-term planning for pre-service training is essential.)
- "The contracting out of services is sometimes proposed to scale up coverage of essential health services in an insecure environment and poorly resourced health sector (e.g. Afghanistan in 2008). It may indeed be useful when the State is virtually absent but contracting should be used with caution so as not to jeopardize the long term development of the State itself."

Source: World Health Organization. "Health Cluster Guide: A practical guide for country-level implementation of the Health Cluster." Provisional version – June 2009. http://www.who.int/hac/global_health_cluster/guide/en/index.html

Case 28: Building capacity in health workforce, Aceh Tsunami 2004

The loss of experienced administrative and health staff has added further capacity-building needs at all levels of the health system.

These problems were exacerbated by decades of conflict, which added to disrepair and discouraged staff from working in certain areas. As attention turns to rebuilding the health system, the challenge is to provide sustainable improved quality health services to the population, while at the same time being careful not to overbuild and create a further burden on the government in terms of maintenance and staffing. Reconstruction needs to consider the assistance required by the private sector; more than one fifth of curative services in urban areas and one tenth in rural areas were privately provided before the tsunami.

The re establishment of the health workforce, building its capacity in both management and improved quality service delivery, and development of an effective plan for transition of services from NGOs to local institutions are all persistent concerns. Community based health services and hospital services should be more closely coordinated at the provincial level and some of the more difficult structural issues need to be addressed-job descriptions, career paths, and use of contacts for particular services. While sort term gains have been achieved through special campaigns including increases in immunization coverage, there is a need to ensure that routine services are strengthened. This will require support from the provincial administration.

Source: "Aceh and Nias one year after the tsunami: The recovery effort and way forward", A joint report of the Badan Rehebilitasi dan rekonstruksi (BRR) and International Partners, December 2005. p.77, 81-82

Lessons:

- In building human resource capacities the challenge is to provide sustainable improved quality health services to the population, while at the same time being careful not to overbuild and create a further burden on the government in terms of maintenance and staffing
- Consider the assistance required by the private sector
- Coordinate local and community-based health services providers at the provincial level

Sub Issue 3: Financing

The WHO guide entitled, "The Six Core Health System Building Blocks – Key Considerations During Recovery," identifies Financing as the third building block for recovery and defines this block as follows, "Realistic estimates are required for both the costs of recovery activities and the levels of funding likely to be available from the government budget, continuing (but diminishing) humanitarian funding, new development schemes, bilateral funding, various global funds, and loans from international financial institutions. Elaborating strategies and formulating plans without linking them to the resources realistically going to be available, is a futile exercise. The issue of user fees – whether they should be introduced, maintained or abolished – is likely to be contentious.

Source: World Health Organization. "Health Cluster Guide: A practical guide for country-level implementation of the Health Cluster." Provisional version – June 2009. http://www.who.int/hac/global_health_cluster/guide/en/index.html

Case 29: Assessment of health sector damages and financing of needs, Earthquake in El Salvador

On January 14, the day after the earthquake, PAHO/WHO issued an appeal for US $770,000, based on a very preliminary assessment of health sector damages and needs, conducted just hours after the earthquake.

Four days later, a more accurate picture is emerging in the health sector. Most notably are the importance of maintaining and strengthening immunization and the restoration of the cold chain, and an assessment of necessary emergency rehabilitation measures in health facilities.

The following consolidated and revised appeal reflects these emergency needs for PAHO technical support now estimated at US$1,750,000. Additional needs, such as for the rehabilitation of health facilities, will be the object of specific projects as they

are identified.

Source: http://www.paho.org/English/PED/ElSalvador-appeal.htm

Lesson:

- Financing of health systems recovery projects should be based on a complete assessment of damages and needs. The financial requirements will vary with the phase of recovery – early, long term, etc.

Case 30: Medical Fee Exemption System for Earthquake-Affected People, Great Hanshin Awaji Earthquake, 1995

A system to exempt earthquake-affected people from payment of medical fees was set up. Under this system, 1) those whose home collapsed, even partially or 2) chief earner of the household was killed, seriously injured, or ill, were given exemption from medical expenses while in the hospital. In the case of those covered by national insurance, those whose business was lost or who had lost their job and had no income, were added to the target group.

The exemption system was discontinued after four months. The victims had just moved into temporary housing without much hope for the recovery of their lives, the number of disaster-related deaths were increasing and people's health conditions were deteriorated. Many of the disaster-hit people with health problems were forced to stop receiving medical treatment due to the termination of the system.

Source: Takayama, 'Support for medical patients and public and for private medical facilities', "Lessons from the Great Hanshin Earthquake", (Hyogo Research Center for Quake Restoration, 2005, p.50-53.

Lessons:

- Providing financial support (waiver of medical care fees) to people impacted by disasters helps them to recover
- Discontinuing the financial support (waiver) can result in stopping medical assistance for some people

Sub Issue 4: Medicines and technology

The WHO guide entitled, "The Six Core Health System Building Blocks – Key Considerations During Recovery," identifies Medicines and Technology as the fourth building block for recovery and defines this block as follows, "In case of a prolonged crisis, supply arrangements for drugs and other medical material will usually have changed considerably and become fragmented. The (re-)establishment of a central pharmaceutical store or similar mechanism must be carefully planned based on detailed analysis of the factors impeding the supply of essential drugs and supplies to the public health facilities. Promote the essential drug concept and standardized

treatment protocols.

Source: World Health Organization. "Health Cluster Guide: A practical guide for country-level implementation of the Health Cluster." Provisional version – June 2009. http://www.who.int/hac/global_health_cluster/guide/en/index.html

Case 31: Short- and Long-term policy strategies for getting medicines for HIV/AIDS-affected populations in the aftermath of Wenchuan Earthquake, China 2008

Short-term policy response (end 2008)

1. A supply chain management assessment (procurement, delivery, storage, distribution and monitoring) should be done in conjunction with any health systems assessment.
2. Provincial centers for disease control and health bureaus must determine where service delivery breaks have occurred and ensure access to antiretrovirals for all people living with HIV/AIDS.
3. The rights of people living with HIV/AIDS must be respected in accordance with the 1 March Regulation on HIV/AIDS Discrimination. People living with HIV/AIDS should not be sent to central hospitals and detained. Alternatives should be promoted, such as allowing for simplified migration to areas with HIV/AIDS services, including areas where relatives or supportive community members welcome them. Policies for this are in place in Sichuan, but they must be implemented.

Long-term policy response (2009-2010)

1. A re-evaluation of the supply chain systems should be completed, and priority should be given to ensuring timely procurement and delivery to people with AIDS.
2. Financing for the establishment of a supply chain system to rural areas should be done. The delivery of any medical drug can benefit from improved supply chain management systems.
3. Development of an "Emergency Preparedness Drug Supply Chain Systems Strategy".

Source: "Reconstructing Wellbeing: Bringing Public Services to Those Who Need Them Most After the Wenchuan Earthquake", UNICEF, p.20. http://www.unicef.org/china/publications_9362.html

Lessons:

- Short-term strategies can meet the immediate medicine needs of patients
- Long-term strategies are designed to improve and enhance procurement and delivery of medicines and financing of the supply chain based on an evaluation of the existing practices

Sub Issue 5: Information

The WHO guide entitled, "The Six Core Health System Building Blocks – Key Considerations During Recovery," identifies Information as the fifth building block for recovery and defines this block as follows, "A first priority during recovery is to (re-)establish an appropriate Health Management Information System (HMIS) that collects relevant, reliable sex- and age- disaggregated data and provides a sound information basis for both short- and longer-term planning. Thorough health facility assessments will be needed to establish a baseline using existing data and through surveys. Factors impeding the recording and transfer of information from central to sub-regional and local authorities, and the transfer of reports from local to sub-regional and central authorities, must be identified. Epidemiologic surveillance and early warning systems must be mainstreamed into regular provincial and district operations.

Source: World Health Organization. "Health Cluster Guide: A practical guide for country-level implementation of the Health Cluster." Provisional version – June 2009. http://www.who.int/hac/global_health_cluster/guide/en/index.html

Presented in the following sub-sections are examples concerning information systems and communications in disasters and how they impact recovery:

- Monitoring & Evaluation (M&E)
- Information systems
- Using the media to communicate
- Community outreach communications efforts
- Poor communications practices

Monitoring & Evaluation (M&E)

Case 32: The Tsunami Recovery Impact Assessment and Monitoring System (TRIAMS): Measuring progress in the recovery from the Asian Tsunami

The Tsunami Recovery Impact Assessment and Monitoring System (TRIAMS) is a sub-regional initiative that defined, promoted and supported a common system to monitor recovery activities and assess their overall impact in the four countries most affected by the 2004 Indian Ocean earthquake and tsunami – Indonesia, the Maldives, Sri Lanka and Thailand. The purpose of the TRIAMS initiative is to assist governments, aid agencies and affected populations in assessing and monitoring the rate and direction of tsunami recovery in the countries covered over a period of five years.

Source: WHO website. 2010.
http://www.who.int/hac/crises/international/asia_tsunami/triams/en/index.html

The response to the 2004 Indian Ocean tsunami paired multi-country devastation with multi-country funding on an unprecedented scale. The availability of emergency aid and the attendant pressure to spend it undermined the role of recovery planning. At the same time, the multitude of development actors rendered normal coordination mechanisms unworkable. Many feared that in the chaos, funding would be misused and needs would go unmet.

The Tsunami Recovery Impact Assessment and Monitoring System (TRIAMS) initiative was designed to sidestep obstacles to planning and coordination by instead improving government monitoring of the overall recovery through focus on some key agreed recovery outcomes and outputs. Since 2006, Indonesia, Sri Lanka, Maldives and Thailand have been employing the TRIAMS approach to help manage the completion of recovery interventions and to assess results, while highlighting remaining gaps. They have been assisted by TRIAMS partners IFRC, WHO and UNDP, with additional support from UNICEF, who are each interested in learning from the TRIAMS experience to help build suitable recovery management tools that could be available for use in future emergencies.

In 2009, 50 stakeholders representing governments and agency partners met in a third regional TRIAMS workshop in order to identify and share lessons with one another and examine how the use of data has improved the quality of decision-making. This report explores the themes and specific lessons that have emerged during this initiative with implications for further application of TRIAMS in the affected countries and as an approach that could be used globally.

The TRIAMS approach is meant to improve ongoing management and planning of recovery efforts, improve feedback to beneficiaries, partners and the public on the utilization of resources and the results and in the process test systems for future disaster recovery efforts. TRIAMS can be defined in terms of 5 attributes:

- A multi-sectoral conceptual framework including vital needs, basic social services, infrastructure and livelihoods
- Focus on a limited number of common, priority indicators to provide an evidence base for an overview of the overall recovery effort
- Orientation toward results for beneficiaries
- Attention to equity in the recovery effort through use of more disaggregated (sub-district level) data
- Country ownership and leadership

The methodologies promoted in TRIAMS include:

- Collection and compilation of indicator data, metadata and analysis in a database
- Use of thematic mapping to show geographic distribution and equity

dimension of recovery assistance

- Use of existing routine and survey sources of quantitative data
- Use of beneficiary perspectives to triangulate and better understand how affected people view the quality and relevance of the recovery assistance
- Incorporation of disaster risk reduction elements into the indicators

The process of establishing evidenced-based recovery monitoring systems can be simplified to 5 steps:

- Agree on Indicators/framework
- Collect and compile the data for the selected indicators
- Analyze the data
- Utilize the analysis
- Institutionalize/mainstream into sustainable systems

Source: "Lessons learned in post-crisis recovery monitoring: Including 3rd Regional Tsunami Recovery Impact Assessment and Monitoring System (TRIAMS) Workshop," Bangkok, Thailand, 25-27 February 2009. http://www.who.int/hac/crises/international/asia_tsunami/triams/triams_report_3.pdf

Aceh, after suffering 30 years of conflict, was struck by earthquakes and a tsunami in December 2004. Subsequently, a major earthquake hit Nias in March 2005. The National and international efforts at reconstruction, the progress they have made, and the tasks that remain, are detailed in this report. Overall progress has been substantial – exceeding many expectations - however there is still a lot more to be done, particularly in the inland areas of Aceh and the island of Nias. The Tsunami Recovery Indicators Package (TRIP) is part of a larger data collection and analysis initiative known as the Tsunami Recovery Impact Assessment and Monitoring System (TRIAMS). It is principally an information resource and aid to ongoing analysis, planning and assessment by local and national government and the broader recovery and development stakeholders in Aceh and Nias. It is based on collections from government (mainly BRR, BPS and Provincial Government Offices of health, education, marine and fishery, agriculture, etc.) bilateral and multilateral organisations (such as the WB and UN agencies), local and international NGOs.

Source: "Tsunami Recovery Indicator Package (TRIP): The Third Report for Aech and Nias. January 2009. http://www.who.int/hac/crises/international/asia_tsunami/triams/trip_v3.pdf

Data was collected and analyzed that measured progress in several health sector recovery areas including access to safe water, access to improved sanitation, health of children under 5 years old, health facilities and human resources, and progress on several Millennium Development Goals for Aceh and Nias including improvements in reducing child mortality, improved maternal health, and ensuring environmental sustainability that measures improvement in access to clean water and improved

sanitation.

Source: "Tsunami Recovery Indicator Package (TRIP): The Third Report for Aech and Nias. January 2009. http://www.who.int/hac/crises/international/asia_tsunami/triams/trip_v3.pdf

Lessons:

- Measuring progress towards recovery goals is a critical element in measuring the success or failure of recovery programs and projects in meeting the needs of the people impacted by a disaster
- A monitoring and evaluation programs like TRIAMS can only be developed and implemented with the full cooperation and collaboration of all government and agency partners involved in recovery efforts
- All partners in the process have roles in the collection, analysis and dissemination of the results
- Five steps for designing and implementing such a M&E program are:
  - Agree on Indicators/framework
  - Collect and compile the data for the selected indicators
  - Analyze the data
  - Utilize the analysis, and
  - Institutionalize/mainstream into sustainable systems

Information Systems

Case 33: Using a web-based program to disseminate information, Great Hanshin Awaji Earthquake, 1995

Just after the Hanshin Earthquake, Nishinomiya city staff developed the disaster work assistance system which was greatly effective in assisting the victims and recovery work. Part of the system is still working. This system which used lessons from the affected area was renewed as a permanent web system for use all over Japan. On January 17th, 2009, the Ministry of Internal Affairs and Communications supplied this system ver.2.00 CD-ROM to all local governments in Japan and opened the "Support Center for all Japan" in the Nishinomiya City information center. After that, it has improved and now ver.3. is on the website which copes with a new assistance system.

Source: Nishinomiya City Information Center,
http://www.nishi.or.jp/homepage/nicc/hss/hss05_izoku.html

Lesson:

- Web-based systems based on past disaster experience can provide a

platform for the dissemination of recovery information to the public, including availability of critical services

Case 34: Worldwide Web technology used to disseminate disaster information, the Hyogo Emergency Net (E-Net)

The Hyogo E-Net is a system designed to utilize current trends in mobile and wireless information technology in order to supplement conventional systems for disaster management, such as radio and loudspeaker vans, which directly supplies local citizens with emergency information (on earthquakes, tsunamis, weather warnings), evacuation information and other vital information via e-mail on mobile phones and websites.

Each municipality in Hyogo Prefecture will have its own website. In the event of emergencies and disasters, this system will expedite the transmission of vital information to local citizens in the most immediate manner possible. "Please register yourself at the website of your municipality. You will then receive messages containing information regarding emergencies, earthquakes, tsunamis, and weather warnings from Hyogo Prefecture and your municipality." The Hyogo E-Net was designed based on the lessons learned through the experiences of the Great Hanshin-Awaji Earthquake.

Source: Hyogo Emergency Net (E-Net). http://bosai.net/index.do (http://bosai.net/e/en/index.do)

Lessons:

- Technology can be used to collect and disseminate disaster information to users with connections to those technologies
- Users signed up for information on potential disaster events and recovery efforts post-disaster

Using the media to communicate

Case 35: Radio use in disasters: Radio helps disabled person to access treatment

A lot of information which the victims wanted came from "Radio Kansai". For example, one victim wanted information on where to go for artificial dialysis as he could not get this service as the hospital was destroyed. Such kind of persons with chronic diseases needed information on alternate health facilities, which the radio was providing.

Source: Mieda, 2008, "Disaster report-Lessons from the Great Hanshin-Awaji earthquake"

Lesson:

- Radio can be very effective in getting health messages and information to

individual disaster victims

Case 36: Asbestos release from damaged building, Great Hanshin-Awaji earthquake 1995

After the Great Hanshin-Awaji earthquake, reconstruction was started. However, there were problems because asbestos dust emerged from rubble.

A volunteer team in Nagata ward started the "Mask Project". The first aim was to raise awareness of the use of masks. They distributed masks and leaflets about the harmful affects of asbestos in schools and camps. Second aim was to provide information about asbestos pollution sites. They used local free papers and put on the map sites which had high concentration of asbestos dust. They also indicated on the maps places where masks were available. In this way health protection information was disseminated to the public.

Source: Okamoto Yasuyoshi, 1995, ASNET, vol.31, 1995/5/22. from "Symposium on thinking about disaster and Asbestos", 2010, Thinking about disaster and Asbestos committee, 2010/1/16.

Lesson:

- Use local free papers to get health protection information to public

Community-based outreach

Case 37: Community-based health and first aid (CBHFA), Cyclone Nargis, Myanmar, 2009

Following the exit of many international aid agencies in the delta beginning in March, the past few months have seen 10 organizations continuing with operations. Of these organizations, the MRCS provides the largest outreach across the 13 townships targeted under the Nargis Appeal, through an expansive network of volunteers. Community-based health and first aid (CBHFA) activities have progressed well despite the heavy rains and difficulties in accessing communities in remote areas.

Community activities and beneficiaries reached

During the May to August 2009 period, approximately 56,573 beneficiaries were reached through community-oriented and community initiated activities such as hygiene promotions in schools and among communities in general, as well as health education for communities. Hygiene promotions have included hand-washing exercises and clean-up campaigns, while health education has covered health talks or discussions on disease awareness and prevention, immunizations and malaria-prevention activities.

Approximately 6,300 community members, including midwives, community health workers, community volunteers, and local authority representatives, have taken a lead in these activities.

The household monitoring format has been finalized and tested in the field. Test results indicate good levels of impact of activities on communities in terms of health

indicators, hygiene practices, immunization coverage for under five-year-olds and the distribution of supplies such as mosquito nets, latrine pans and pipes. During this reporting period, community activities were conducted in 82 village tracts across all 13 targeted townships. They were carried out by 240 CBHFA-trained Red Cross volunteers and 2,730 CBHFA-trained community volunteers.

Of the total number of beneficiaries reached, up to 19,939 were comprised of school children who attended hygiene promotion activities conducted in 131 schools across all townships. The activities included the distribution of various types of information, education and communication materials to targeted communities. These materials comprised pamphlets on tuberculosis (TB), malaria and dengue prevention; posters and pamphlets on HIV awareness and prevention; hygiene promotion pocket charts and posters; and PHAST14 tool kits. Significant community participation has been seen because communities have been given a substantial amount of ownership in the planning and implementation of activities, especially disease prevention and epidemic preparedness planning at village level. The selection of these activities and their successful implementation is the result of 82 community action plans drawn up by trained community volunteers and 5,761 other community members between May and August. The plans were drafted under the supervision of hub health officers and trained Red Cross volunteers. The first community action plans were drawn up towards the end of 2008. There are currently a total of 110 operational community action plans for 82 village tracts across nine townships.

Community mobilization by CBHFA-trained volunteers

Between May to August 2009, a total of 210 Red Cross volunteers across 13 townships attended CBHFA training workshops in the field on community mobilization and household monitoring activities. The workshops were conducted by MRCS/International Federation CBHFA master trainers. A total of 60 Red Cross volunteers also attended a training of trainers' (TOT) training during this period. The total number of Red Cross volunteers who have received training in CBHFA today stands at 517, including TOT-trained volunteers. In addition, 1,701 community volunteers across the 13 townships were trained in CBHFA during multiplier workshops conducted by hub health officers, trained Red Cross volunteers and previously trained community volunteers. The total number of community volunteers who have received CBHFA training from the start of the early recovery period until the present time is 2,730.

A further 300 community volunteers across the 13 townships are targeted to be trained in CBHFA over the next four months. These new recruits will help existing Red Cross and community volunteers to reach out to an additional 60,000 direct beneficiaries by December, through continued community activities.

Collaboration with the water, sanitation and hygiene promotion programme

The CBHFA programme has collaborated with the water, sanitation and hygiene promotion programme, in hygiene promotion activities during latrine constructions.

In this regard, CBHFA-trained Red Cross volunteers and community volunteers have conducted hygiene promotion activities for communities participating in latrine construction projects implemented by water and sanitation teams. This collaboration took place in 57 village tracts across 12 townships during the May to August reporting period. To date, collaborative CBHFA-water, sanitation and hygiene promotion activities have taken place on 130 occasions. These joint activities have mobilized 9,824 community members from 57 village tracts, across 12 townships.

Source: IFRC, "Operations update" 9th October, 2009, 'Myanmar: Cyclone Nargis', Emergency appeal., p.11-14.

Lessons:

- Community-based health and first aid (CBHFA) programs are an effective method for reaching targeted populations in the recovery phase
- Programs promote good health activities and disease prevention
- Trained volunteers are critical to reaching all targeted populations

Case 38: Reporting on diseases; Role of medical workers in working with radio to get disaster information to the public

Reports of disease in the media originate at local, regional, or national levels. It is common in this age of satellite communications for a television or newspaper item to have directly reached the international services from the area affected by the disaster, thus bypassing authorities in the capital. Although estimates of death and disease are not usually reported in the media, so that sensationalism is minimized and panic and anxiety are prevented, breakdowns of respect of such a policy do occur. Reporters often assume that information provided by a doctor or nurse on the scene is more accurate and reliable than that in releases from official, central sources. Inexperienced and tired health personnel have on occasion locally released information, subsequently shown to be mistaken or exaggerated, to members of the media. The likelihood of such an occurrence will be reduced if seasoned health workers lead relief teams, there are briefings about the policy of dealing with the media, and an open relationship is developed between the media and the relief coordinator.

Source: "Epidemiologic Surveillance after Natural Disaster", 1982, PAHO.
http://www.helid.desastres.net/?e=d-0who--000--1-0--010---4-----0--0-10l--11fr-5000---50-about-0---01131-001-4kq6ajV%2e7122217a000000004b78a617-0-0-0&a=d&c=who&cl=CL1.1&d=Jph09ee.1

Lessons:

- Training health workers to work with radio can minimize inaccurate reporting on health conditions in recovery
- Inexperienced and tired health personnel should not talk to the media

without training

- An open and transparent relationship with the media is important to getting accurate and timely information to the public

Poor communications practices

Case 39: Poor communications practices, Mozambique

The lack of transparency and sharing of information created a culture of passive acceptance and a climate of misinformation. During the 2000 floods this did not result in major conflicts, but it could become an explosive situation in the future. Agencies involved in post-emergency interventions should explicitly recognize the need for improved communication with beneficiaries and take measure to promote a culture of openness.

Source: Peter Wiles, Kerry Selvester, and Loudes Fidalgo, 2005, "Learning Lessons from Disaster Recovery: The Case of Mozambique", Working Paper Series No.12, World Bank., 25.

Lesson:

- If you are not open and transparent in your communications post-disaster the people you are trying to serve may become receptive to rumors and misinformation

Sub Issue 6: Service Delivery

The WHO guide entitled, "The Six Core Health System Building Blocks – Key Considerations During Recovery," identifies Service Delivery as the sixth building block for recovery and defines this block as follows, "During recovery it will be crucial to strengthen primary health care services. This includes planning the restoration of service delivery, including expansion to underserved areas (difficult balance between politics, equity and efficiency) as well as introducing new service delivery models, where needed. Combine lessons from other countries with an understanding of local context. Specific areas such as blood safety, sterilization in health facilities, disposal of injections and sharp medical supplies, and medical waste disposal, will need to be addressed.

Source: World Health Organization. "Health Cluster Guide: A practical guide for country-level implementation of the Health Cluster." Provisional version – June 2009. http://www.who.int/hac/global_health_cluster/guide/en/index.html

Presented in the following sub-sections are examples of service delivery efforts in the following areas:

- Capacity building

- Supporting private health care facilities
- Decentralizing service delivery
- Addressing infrastructure issues
- Providing long-term rehabilitation services

Capacity Building

Case 40: Recovery process focuses on long-term health capacity development, Tsunami 2004

The tsunami of 26 December 2004 was one of the worst natural disasters in recent memory. Six months after the tragedy, the rebuilding and recovery process has provided an opportunity for the health sectors in the affected countries, assisted by the World Health Organization (WHO), to strengthen their health systems in a long-term, sustainable manner. Local health capacity and infrastructure are being fortified and local people have been trained in skills that will serve their communities better.

According to Dr Samlee Plianbangchang, Regional Director, WHO South-East Asia Region, "The aftermath of the tsunami presented a great public health challenge to the WHO. However, every disaster presents opportunities to both countries and international agencies to strengthen their capabilities and capacity."

Health systems in many affected countries had been devastated by the tsunami. For example, in Aceh, Indonesia, 53 of the 244 health facilities were destroyed or severely incapacitated. 57 of the 497 provincial health office staff died, while 59 were reported missing. WHO assisted the health sectors of the affected countries, at their request, in strengthening their resources and in setting up systems where they had been destroyed. In meeting the needs of the affected areas, WHO also provided technical guidelines and medical supplies. Resources were mobilized in partnership with the government health authorities.

Damaged hospitals and clinics were also upgraded and equipped with relevant instruments and resources. In Aceh, for example, the Meulaboh District Laboratory as well as the Provincial Food and Drug laboratory have been equipped by WHO. In the Maldives, the Public Health Laboratory has been provided with laboratory equipment such as a water purification system and accessories to assist in surveillance and monitoring of chemical and microbiological contaminants in food.

As part of the United Nations country team, WHO is working closely with the government in the Maldives in the 'Recovery Plus" process. Here, the challenges of the tsunami disaster are being transformed into opportunities to accelerate sustainable long-term development. Three thousand drums have been procured for collecting hazardous waste from tsunami-affected islands, and 13 health professionals have undergone training to develop and implement a national strategy for management of healthcare waste. With a view to long-term, sustainable use of water resources, 'template' water safety plans are being developed, and the needs for water quality surveillance assessed. Draft guidelines for food safety have been

developed and 25 food inspectors trained.

In India, through local efforts, WHO has initiated rigorous water quality monitoring and social mobilization for environmental sanitation and hygiene in the relief shelters in the worst affected district in Tamil Nadu. In addition, a long term project to monitor the changes in ground water quality following the disaster has been initiated in all the coastal districts of Tamil Nadu.

All tsunami-affected areas are currently focusing on capacity building.

This is also the first time that modern technology for forensic identification of bodies has been used on such a large scale following a natural disaster. In Thailand, the Ministry of Public Health is being assisted by WHO in over 30 projects, including forensic science, the architectural engineering aspects of building hospitals and other public health infrastructure in disaster-prone areas, mental health (particularly in the long term psychological effects of disasters on children), and capacity building in disease surveillance as well as development of mobile emergency response units.

Mental health of the affected populations has been a key concern. In every affected country, WHO, along with the concerned governments, has provided training for psychosocial support, with help from the communities. This emphasis on mental health in the tsunami-affected countries has set in motion some far-reaching changes. The Sri Lankan government plans to review its national mental health act and mental health policies. In Indonesia, Aceh will become the first province to have community mental health services. In India too, a framework for providing psychosocial support, including a referral care system has been initiated in the affected districts of Tamil Nadu, Kerala and Andhra Pradesh. More than 3000 "Community Level Workers" have been trained and are actively providing support to the affected communities.

Source: http://www.who.int/mediacentre/news/releases/2005/pr30_searo/en/index.html

Lessons:

- Disasters offer an opportunity to strengthen health systems in a long-term sustainable manner
- The recovery phase is an opportunity to not only rebuild hospitals and other medical facilities but also to upgrade and better equip these facilities
- There is an opportunity to revise existing programs and promote new programs that increase the capacity of the health systems

Case 41: Pre-Tsunami medical system could not meet the public needs, Tsunami 2004

Reconstruction cannot simply aim to replace what existed. Low levels of public investment, poor maintenance and inefficient use of resources meant that pre-tsunami health services did not fully meet the needs of the population and the

quality of such services was generally poor. The coverage of key public health programs such as child immunization was low. Rural populations had inferior access to maternal health services.

Islamic Relief has developed satellite clinics and several NGOs also provide mobile clinics to IDP locations.

Source: "Aceh and Nias one year after the tsunami: The recovery effort and way forward", A joint report of the Rehabilitation and Reconstruction Body (BRR) and International Partners, December 2005. p.77-78.

Lesson:

- There is an opportunity in the recovery phase to improve and strengthen health systems to meet both disaster and non-disaster needs

Case 42: Building a safer hospital, Hurricane Georges, St. Kitts and Nevis, Caribbean, 1998

Citizens of the small Caribbean nation of St. Kitts and Nevis in the Eastern Caribbean had a sense of déjà vu as they awoke on 21 September 1998 to survey damage caused overnight by Hurricane Georges. Roofs were lost and other buildings seriously affected at Joseph N. France Hospital. The laboratory roof was gone and support services such as storage facilities, laundry and the central sterile supplies department all had sustained damage. An estimated 90 per cent of the hospital could not function. With its 174 beds, Joseph N. France Hospital is the only referral hospital on the island, serving a population of 33,000 people on St. Kitts and 9,000 on Nevis. Three years earlier, almost to the day, Hurricane Luis had ripped through the island, damaging the same hospital severely. In fact, JN France Hospital has suffered moderate to severe damage from hurricanes on no less than 10 separate occasions since it opened in 1966.

Source: "Hospitals Safe from Disasters: Reduce Risk, Protect Health Facilities", Save Lives: 2008-2009 World Disaster Reduction Campaign, ISDR, WHO, WB, UN.

Lessons :

- The redevelopment of Joseph N. France Hospital was already underway and an overall master development plan for the site had been prepared when Hurricane Georges struck St. Kitts and Nevis in 1998. The subsequent decision to rebuild the pediatric ward, and the speed at which it was developed and implemented, illustrated the importance of having such a master plan in place to coordinate multiple projects and funding sources.
- The main project partners, national and international, were based in different countries. A Project Steering Committee representing all interested parties met regularly and this was important to monitor timelines and facilitate communication and decision making.
- The use of an independent check consultant engineer to review the designs

and audit the construction with regard to natural hazard mitigation ensured, to the extent possible, the construction of a health facility safe from natural hazards. This approach continues to be promoted in the Caribbean with governments and funding agencies. Fortunately, the measures incorporated into the construction of the pediatrics unit—primarily to reduce the risk and impacts of hurricanes and earthquakes—have not yet been tested in an actual disaster situation.

Supporting private health care facilities

Case 43: Support for medical patients and public and private medical facilities, Great Hanshin Awaji Earthquake, 1995

In the areas impacted by the Great Hanshin Earthquake, private medical facilities were also severely affected. Doctors, dentists, their families, staff, hospitalized patients, and their homes suffered great damage by the earthquake and fires.

Finding out how serious the damage wrought by the earthquake was, the national government decided to assist the reconstruction of private medical facilities.

However, the aid was only for the restoration of "emergency sections" of the facility. The direct public aid helped the reconstruction of damaged hospitals and clinics a great deal.

Source: Takayama, 'Support for medical patients and public and for private medical facilities' , "Lessons from the Great Hanshin Earthquake", Hyogo Research Center for Quake Restoration, 2005, p.50-53

Lessons:

- Government funding may be needed to rehabilitate private sector medical facilities during disaster recovery
- Opportunity for the government to demand that private sector medical facilities incorporate mitigation measures in their rebuilds in order to build safer facilities

Decentralizing service delivery

Disasters sometimes serve to identify geographic areas and populations that are underserved by the health sector. The recovery phase is an opportunity to rectify inequities in the delivery of health care services and to build health systems and facilities that serve all populations.

Case 44: Decentralizing delivery of health services to elderly individuals, Great Hanshin-Awaji Earthquake, Japan, 1995

Help for those most vulnerable to disaster was the focus both in terms of conveying information to people with hearing or visual impairments and those with language

difficulties, and of sustaining medical services such as the regular dialysis needed by patients with chronic kidney failure. The lessons learned during this early phase have led to progress with practical initiatives during the following ten years, including the designation of case hospitals for disaster medicine, the designation of disaster medicine coordinators, and the training of disaster medical staff. In order to help those most vulnerable to disaster who are in need of daily medical care, it will be necessary to create systems whereby their neighbors already watch out for them under normal circumstances and which enable medical patients themselves to obtain a full understanding of their own condition. This will require the collaboration of medical and other institutions set up for emergency situations.

Twelve hospitals in the prefecture were designated as base hospitals for disaster medicine in 1996. The Hyogo Emergency Medical Center opened in 2003, and will play a central role as the prefectural base hospital for essential disaster medicine.

Since 2001 the prefectural Medical Association has established a Clinician's Forensic Training Association, and has been holding training seminars twice a year for the purpose of improving the post-mortem examination skills of clinicians.

The utility of home visits by nurses in very elderly communities such as temporary emergency housing and disaster reconstruction housing was investigated by nursing universities in the prefecture. This led to the establishment of the Health Advisor Project, which contributed greatly to both the health care and mental health care/emotional support of victims.

Lessons and proposals:

Enhancement to disaster emergency medicine - The role and scope of authority of disaster medicine coordinators must be clarified to enable them to fulfill their functions with speed and accuracy when disaster strikes. It will also be necessary to plan better training for disaster medical staff by means of realistic training exercise, and to enhance the disaster emergency medicine system even further.

Assistance to and engagement with people vulnerable to lack of communication - It will be necessary to set up a system for obtaining the cooperation of sign-language volunteers during disasters, and to facilitate a system for the placement or dispatch of sign-language interpreters to public institutions.

Assistance to and engagement with persons receiving nursing care at home and patients with chronic diseases who are highly reliant on medical care - It will be necessary to set up a system for continuous medical assistance to enable persons with specified intractable diseases to receive the medical care they require from medical institution inside and outside the prefecture.

Promotion of community creation - It will be necessary to work toward creating communities in which local people can watch out for each other and support each other, through such means as the prefectural government promoting regular activities to raise people's awareness of patients who require assistance such as

people receiving nursing care at home, reinforcing the activities of local organizations to encourage people to talk to each other and interact socially, and the continued participation of disabled people in society

Enhancements to mental health care/emotional support - Under normal circumstances, mental health care/emotional support should be incorporated into regular emergency medicine and local healthcare and welfare policies, and medical, healthcare, and welfare staff other than psychiatric practitioners should be offered information and training on mental health care/emotional support.

Investigation of a new system for nursing care provided mainly by Hyogo Nursing Association - In order to promote health and positive living in a highly aged society, and to prevent people from becoming shut in promote health care, accessible "Mobile Health Care Rooms" are needed where people can freely come for advice. Medical workers with an understanding of physical conditions and detailed knowledge of medical information will be needed in a collaborative relationship with LSAs, to provide a link with medical treatment.

Collaboration between volunteers and prefectural government institutions - In light of the future highly aging society, to enable the functioning of Mobile Health Care Rooms in line with local circumstances, bases to promote these should be established at a level of one per Junior High School district, and coordinators assigned.

Source: Hyogo Prefectural Government, Japan, "The Great Hanshin-Awaji Earthquake: The Report of the 10-Year Reconstruction Overall Verification and Recommendations", 2005, The Office of the 10th Year Restoration Committee, p.116-118.

Lessons:

- Earthquake offered opportunity to identify better mechanisms for delivering health services to elderly individuals after a disaster
- Outreach to individuals with special needs prior to a disaster helps to plan service delivery post disaster
- Opportunity to create a new health delivery service and to recruit and train nurses to deliver the service

Case 45: Delivering new medical services based on residents' survey, the Great Hanshin-Awaji Earthquake, Japan, 1995

Hyogo prefectural government carried out a four-year health survey of earthquake victims living in emergency temporary housing, general housing and reconstruction public housing projects from 1995 through 1998, linking this with the development of health promotion measures in disaster-stricken areas. One issue for the future is the need for a system for keeping track of people's destinations when they move from temporary housing to permanent housing, in order to maintain continuity of contact.

The government has encouraged participation in society through projects to support positive living such as the Life Classes, and encouraged elderly people to undertake activities of their own accord, particularly as volunteers. Future efforts to create friendships and living spaces will be necessary in addition to dealing with each elderly person on an individual basis.

Nursing volunteers launched "Mobile Health Care Rooms" as a space where elderly people can talk at length about their worries concerning moving to a new place as a result of the earthquake, or health concerns arising from their solitary lifestyles, and feel free to come and ask advice. There will be a need in future for healthy community creation and collaboration with neighborhood association activities. (Keiko Chikata, "Promotion of health and Positive Living for the Elderly")

Source: Hyogo Prefectural Government, Japan, "The Great Hanshin-Awaji Earthquake: The Report of the 10-Year Reconstruction Overall Verification and Recommendations", 2005, The Office of the 10th Year Restoration Committee, p.40.

Lessons:

- Bring health services to individuals wherever they reside
- Track individuals movements from temporary to permanent housing in order to maintain effective delivery of health services

Addressing infrastructure issues

Case 46: Actions taken to restore clean water, Puerto Limón, Costa Rica

In 1991, an earthquake affected the Atlantic coast and hinterland of Costa Rica. Water mains were broken in the coastal town of Puerto Limón, and landslides increased the sediment and turbidity of the Banano river which supplied water to the town's water-treatment plant. Within 18 hours of the earthquake, the first planeload of bottled water arrived, and the local plant requested additional plastic bottles from Miami. In all, some 130, 000 liters were provided during the first three days.

Within 60 days, additional water was added from wells drilled along the course of the main pipe from the treatment plant to the town and fed directly into the system; 120 breaks in the main pipelines had been repaired; and service was available for 6 hours a day. Within 90 days, another 200 breaks in the distribution network had been repaired, and deeper wells had been dug to supplement supplies from the new diversion works on the Banano River.

Source: http://www.who.int/water_sanitation_health/hygiene/emergencies/em2002chap7.pdf

Lessons:

- Immediate clean water need can be met with shipments of bottled water

from outside the disaster area

- Long-term recovery of clean drinking water requires repairing water main breaks and drilling new wells
- Health services must coordinate with infrastructure departments

Case 47: Management of healthcare waste in Port-au-Prince, Haiti Earthquake, 2010

Given the scale of the human tragedy caused by the earthquake, an unprecedented number of patients with varying traumas were taken to medical facilities and to temporary hospitals. Among the concerns for environmental experts was the lack of adequate facilities for the management of healthcare waste in Haiti.

This matter was discussed between UNEP, the World Health Organization (WHO), and the Haitian Government, and it was agreed that a temporary facility to dispose of medical wastes would be created within the municipal landfill in Titanye. A design for the same was provided and the facility was promptly constructed. Additional steps to train staff, equip them with the required personal protective equipment (PPE), and to provide suitable containers for the collection of healthcare waste were also agreed.

Concurrent efforts were also initiated by NGOs to fabricate temporary incinerators in the Dominican Republic, with a view to bringing them to Haiti. Ideas to construct such facilities in Haiti were also discussed.

However, within the first week it was obvious that s major leakage of healthcare waste was occurring from the system, including bloodied bandages and severed limbs, which were conspicuous in their absence. Although provisions had been made to procure a truck to collect healthcare waste from the seventeen hospitals in the city, only half-loads of waste were arriving on site after three days. Moreover, the material that arrived was constituted mainly of empty cartons from hospitals, and not the truly bio-hazardous medical waste for which the disposal site had been intended.

In early February, Dr Per Berg of Sweden–recruited by MSB (the Swedish Civil Contingencies Agency) and seconded to UNEP–arrived in Port-au-Prince as a technical expert to assist the Government in the management of bio hazardous waste. As part of this mission, he established a work plan to identify the shortcomings in the system, track its implementation and provide training support to the team.

The mystery of the missing healthcare waste was partly solved when investigations were initiated to ascertain where the hospitals were disposing of their medical wastes. It came as a great relief when it was established that a number of these hospitals had incinerators which had remained functional throughout.

It also became clear during this investigation that the system by which hospitals had arranged the collection of bio hazardous wastes with the dedicated driver was not working well. To resolve this, the Government, supported by an expert from the US Army, developed a new routing plan covering the facilities which did not have

resident captive incinerators.

In mid-February, a team from the Service Métropolitain de Collecte de Résidus Solides (SMCRS) (the municipal solid waste management authority) was provided with personal protective equipment and trained by the UNEP/MSB expert in the proper handling of bio hazardous wastes. Unfortunately, despite measures to ensure that the cells containing medical wastes were built away from the scavengers (and the presence of eight trained staff who were instructed to guard them), they were set on fire for unknown reasons. Dr Berg also visited hospitals in the interior of the country, including some in Petit Guave and Jacmel, which were mostly found to have their own functioning incinerators. These are all very basic and were therefore spared from the breakdown that affected more sophisticated electrical systems. The main shortcoming of these incinerators is that they do not function effectively without fuel.

In early March, containers for the segregated collection of bio-hazardous wastes arrived in Port-au-Prince after a long delay at the port in Santo Domingo. This was a major request from hospitals across the city to facilitate the collection of bio hazardous materials on site. The containers were handed over to the SMCRS and distributed to various hospitals in Port-au-Prince and cities in the interior. In addition, a training session was conducted for hospital staff.

All the required elements for a functioning bio hazardous waste management system are now in place, though confidence in the fact that the system is working may still be lacking.

Source: UNEP, 2010, "Haiti Mission Report 20 January - 19 March 2010 "Muralee Thummarukudy Programme Officer, Post Conflict and Disaster Management Branch United Nations Environment Programme.
http://oneresponse.info/Disasters/Haiti/Environment/publicdocuments/Key%20Environmental%20Issues%20-%20Full%20Text.pdf

Lessons:

- Collection and disposal of medical waste is an often overlooked but critical function in providing immediate and long-term medical care after a disaster
- Multiple partners may be needed to design and implement an efficient and effective medical waste disposal capability
- Major elements of a medical waste disposal operation include assessment, equipment and training

Providing long-term rehabilitation services

Case 48: Providing long term rehabilitation services to disaster victims, Tsunami in South Asia, 2001

It was realized that SMRC need to provide long term intervention in terms of fitting of assistive devices, artificial limbs, psychological reinforcement, counseling,

vocational orientation, vocational training and rehabilitation. They were also required to provide follow up services to all the persons who have been provided artificial limbs and other assistive devices by other organizations as well.

Generally earthquake-affected people needed support, services and intervention in the following areas:

Fitting of prosthetic devices and rehabilitation aids: All the amputees in the area need to be fitted with artificial limbs and then given training in the use of these artificial limbs. Similarly persons who had been given braces and other supports for spinal injuries and persons who were recovering from multiple fractures would require intensive physiotherapy to enable them to recover the full use of their limbs.

Physiotherapy Services: They started physiotherapy Centers at appropriate locations with the involvement and participation of local NGOs. It is advisable to start such center as a part of relief hospitals set us in the affected area.

Psychotherapy and Counseling Unit: The killer earthquake or any disaster shatters peoples' confidence in nature and themselves. People find it difficult to come to grips with the situation and have symptoms of fear, psychosis, vertigo, reduction of efficiency in work, insomnia, giddiness and fear or the unknown. It is essential to set up a Unit for counseling people, providing counseling and intensive reinforcement sessions to cope with this fear and rebuild their lives in the proposed Center.

Vocational Training and Rehabilitation Unit: People who had been injured or had become disabled due to earthquake or other disasters would need to get on with their lives and earn a living. They provided facilities of assessment of the residual abilities of the person, making of individual plan, vocational training in choosing trade and placement in self-employment and employment with the help of corporations and funding agencies.

Center for Persons with Spinal Injuries

The persons who sustained spinal injuries during the earthquake or other disaster required long-term intervention for their health management and rehabilitation. Many of them required short-term hospitalization and medical advice for their condition. Similarly some of them required braces and other rehabilitation devices on a regular basis. It was desirable to establish a 10 bed spinal injury hospital for this purpose. This hospital provides the required health, medical and rehabilitative intervention to such persons on an indoor day care basis.

Micro Credit

The project with the support of the National Handicapped Finance and Development Corporation, Faridabad, a venture of the Ministry of Social Justice and Empowerment provided micro credit to earthquake-affected persons with disabilities. This scheme enabled the target group to avail micro credit at reasonable and affordable rate of interest.

Community Based Rehabilitation

It was essential to launch a project for promoting community-based rehabilitation for all categories of disabilities in the disaster-affected area. Services of rehabilitation were provided in the homes of the target group members with the involvement of the community.

Outcome

After BPA/SPANDAN started working the area, it was realized that the target group would require most of these services on a continuing basis for a very long time. For example, any person who has been provided artificial limbs would require consistent follow-up services and repair and maintenance of these devices. Similarly any person with spinal injury may require long term care treatment and support services including short-term hospitalization. Thus to begin with, the top priority of the project was to provide appropriate assistive devices, physiotherapy and counseling services. To begin with, the priority of the project was to provide health intervention to people with spinal injuries and repair and replacement of artificial limbs.

The outcome of their efforts of providing support to earthquake affected people has resulted into emergence of a permanent center know as "Kutch Comprehensive Center for the Rehabilitation of Persons with Disabilities." The highlights of this center are:

- The State Government provided the land measuring one acre completely free of cost.
- Handicap International provided technical support for 3 years and all of the recurring expenses for 2 years.
- Die Johanniter provided complete funding for the construction the center at the cost of Rs.1.5 crores.
- The Give India raised Rs.45,00,000 for the center.
- The European Commission provided an endowment of Rs. 1 crore for the meeting recurring expenses of the center on permanent basis.
- Corporate and individual donors provided support for meeting all initial expenses.
- The Chief Minister of Gujarat, Narendra Modi laid the Foundation Stone.
- The then Deputy Prime Minister of India, LK Advani inaugurated the "Disaster Management Centre."
- The Scientific Advisor, Dr.Abdul Kalam inaugurated the makeshift limb-fitting center.

Now, this center is capable of providing relief and support to persons with injuries, persons acquiring disabilities and those needing psychological counseling and

psychiatric intervention in the Western part of India.

Source: Busan Punani: "Natural Disasters-Role of Disability Development Organizations."(From "International Conference on Disasters & Disability 28th & 29th January 2008", Shanta Memorial Rehabilitation Centre, Bhubaneswar, Orissa. p.62-64.

Lessons:

- Post-disaster there will be a need for long-term rehabilitation for those individuals suffering crippling injuries
- Often short-term medical services outstrip immediate health needs but long-term medical needs often outstrip available medical services
- Coordination, joint funding and leadership are key to establishing programs to deliver needed medical services to individuals with long-term medical needs

Summary

In summary, the most important lesson is that the recovery phase offers extraordinary opportunities to enhance and improve health sector capacities and capabilities. A number of factors influence just how effectively and efficiently health officials can make such changes including:

- Leadership and governance are at the core of the health sectors ability to make positive change in existing health programs and systems – this involves active leadership form the Ministry of Health and close coordination with the various governmental and non-governmental organizations involved in the recovery of the health sector
- Take advantage of the recovery to develop new plans for training and deployment of medical workers that better meet the needs of the population
- Identify financing opportunities to fund the types of changes to be made to the programs and systems
- Restock and resupply medicines and technology based on identified needs
- Collect and disseminate information on medical needs and create a baseline for from which you can build back better and safer
- Explore new service delivery methods and mechanisms
- Conduct ongoing assessments and Monitoring and Evaluation (M&E) programs through the recovery to identify needs, allocate resources and ensure progress

Chapter 5

Pre-Disaster Health Sector Recovery Preparedness

Conducting long-term recovery efforts inevitably leads officials to identifying what measures can be taken to reduce the impacts of the next disaster. These officials can also identify those preparedness activities they can undertake to be better prepared for the next disaster. This is true across all sectors including the health sector.

The case studies presented in this section provide examples of mitigation and preparedness actions that have been taken to reduce the impacts of future disasters and better prepare health officials and systems for the next disaster.

Sub Issue 1: Mitigation actions

Box 11: Vulnerability reduction in the design of new health facilities; Building safer health facilities

According to the World Bank Good Practices Notes on Health, "The earthquake provides an opportunity for health sector reform. First, it is better that the reconstruction addresses key issues currently faced by the health sector such as health financing to reduce out-of-pocket expenditure by the earthquake-affected population and provide better health service insurance coverage, benefits, and accessibility to the poor and other vulnerable population sub-groups. Second, the future health system should be designed to be prepared for and responsive to all major hazards in the future. As mentioned in sector notes, the building standards and codes for earthquake prone zones are critical. Hospitals need to be constructed to higher standards to ensure their integrity and functionality when another earthquake hits. Risk based and all-hazard approach for emergency preparedness and response should be practiced. Third, the existing health system in the affected areas may need to be rationalized and streamlined to meet the changed needs because of different population profiles and epidemiology. Duplications in the public health system can be reduced.

Source: World Bank Good Practice Notes. *Health*. July 2008.

Lessons:

- Medical facilities should be constructed to standards that exceed the existing

building codes so that they will remain functional after a disaster strikes

- Risk based and all-hazard approach for emergency preparedness and response should be practiced
- Duplications in the health system because of post-disaster shifts in populations should be identified and reduced

Case 49: Vulnerability reduction; Guidance for safe building construction

According to a WHO/PAHO report, Knowledge does exist in the area of vulnerability reduction in the design of new health facilities but how much of this knowledge is being applied in actual situations is not yet clear. Stated in a different way, how much of the "Guidelines for vulnerability reduction in the design of new health facilities" are known and being adopted at global, regional, national and local levels to ensure that new health facilities cover three levels of protection from adverse events, namely life safety, investment protection and functional protection is a valid question to ponder on.

Source: "Disaster Risk Reduction and Preparedness of Health Facilities: A literature review prepared by the WHO Kobe centre, Japan", 2007, WHO Kobe Centre.
http://www.who.or.jp/2007/@FINAL_Dis_&_prep_facilities_LitReview_24AUG07.pdf
Supporting documents
Guidelines for vulnerability reduction in the design of new health facilities. WHO, Pan-American Health Organization, the World Bank Group, ProVention. April 2004.
Pan American Health Organization (PAHO/WHO), Protecting New Health Facilities from Disasters: Guidelines for the Promotion of Disaster Mitigation, Washington D.C., 2003.

Lessons:

- Standards exist for building hospitals that will remain functional after a disaster and other medical facilities that meet life safety standards
- Building to higher standards protects the investment made in building hospitals and ensures that these facilities will be open to serve the populations after a disaster

Case 50: e-Atlas maps hazard risks, WHO e-Atlas

The World Health Organization Regional Office for the Eastern Mediterranean presents the *WHO E-Atlas of Disaster Risk for the Eastern Mediterranean Region, Volume 1: Exposure to Natural Hazards*. The e-Atlas uses geographic information systems and various disaster models to assist disaster management decision-makers, particularly those in the Member States of this Region regularly experiencing disasters, to reduce health risks to vulnerable populations due to emergencies and health crises. This tool can be used to help predict the magnitude of a disaster on a specific population, to assess where damage might be the greatest and to forecast specific resources which may be required.

Volume 1 of the e-Atlas contains a set of maps and supporting documents explaining methodology and providing metadata that illustrate the distribution of natural hazards (earthquakes, floods, heat, wind, and landslides) occurring in WHO 痴 Eastern Mediterranean Region, as well as estimates of the sizes of populations exposed to such hazards.

This and subsequent volumes, still under development, can be used to improve disaster preparedness in the health sector; aid emergency response measures through improved baseline information; assist in identifying, planning and prioritizing areas for mitigation activities to minimize the effects of natural hazards; and provide a base for transitional and early recovery activities following an emergency.

It is envisioned that this e-Atlas will ultimately contribute to building national and local capacities in the health sector for disaster risk reduction, a key priority of the Hyogo Framework for Action 2005‑015: Building the resilience of nations and communities to disasters.

Source: The WHO e-atlas, http://www.emro.who.int/eha/e-atlas.htm

Lesson:

- Risk mapping can help officials identify hazard risk and measures to mitigate those risks

Case 51: Hospital retrofits in Costa Rica, 1990 and El Salvador, 2001

Hospital retrofit helps keep hospital open and functioning post-disaster, Costa Rica, 1990.

An ambitious program to retrofit five major hospitals was underway in Costa Rica when a 6.8 magnitude earthquake struck in 1990. The partial retrofitting of one hospital is credited with saving the facility and its occupants. In other hospitals, those parts of the facility that had already been retrofitted came through the quake in excellent condition, while other parts which had not yet been reinforced showed evidence of structural failure, even though allegedly they had been designed to withstand an even stronger seism. Non-structural damage was concentrated in the buildings or departments that had not yet been retrofitted. The savings far exceeded the cost of retrofitting.

Hospital retrofit works to keep hospital open and functioning after a disaster, El Salvador, 2001

The 286-bed Benjamin Bloom Children's Hospital in El Salvador's capital, San Salvador, was seriously damaged in a 1986 earthquake and was repaired adhering to anti-seismic norms. Fifteen years later when major quakes once again struck in 2001, this hospital suffered mostly cosmetic damage.

Source: PAHO and WHO, Safe Hospitals: A Collective Responsibility, A Global Measure of Disaster

Reduction", p.8-10, 17-18.

Lessons:

- You can retrofit a facility to reduce the impacts of a disaster
- Retrofits can save money and lives by ensuring the hospital will remain functioning after a disaster

Sub Issue 2: Preparedness actions

Case 52: Education lowers disaster risk for children, Indian Ocean tsunami in 2004

Funding should therefore be directed at programs aimed at supporting such children by ensuring their continued access to basic needs and education, while at the same time rebuilding the livelihoods of their communities. The current data suggests that people who had received at least one year of education were at lower risk of both death and injury due to the tsunami than those with no history of education. Even after controlling for potentially confounding variables, this significant difference remained. Some formal education may therefore equip people with certain skills or knowledge with can have protective benefits during acute disasters and should be a consideration for long-term development policies.

Source: Guha-Sapir D., Parry LV., Degomme O., Joshi PC., Saulina Arnold JP., 2006, "Risk factors for Mortality and Injury: Post-Tsunami Epidemiological Findings from Tamil Nadu", Centre for Research on the Epidemiology of Disasters (CRED)

Lessons:

- Education levels are good indicators of how well prepared people may be to deal with a disaster
- The more education a child has the better able he or she is to cope with the impacts of a disaster

Case 53: Program to reduce impact of future events on medical infrastructure, Nepal

Recognizing the gap between current hospital capacity and predicted medical needs in a post earthquake scenario, a seismic assessment of 14 hospitals was conducted in 2001 in Kathmandu Valley, including Patan Hospital. Subsequently, Patan was one of four priority hospitals to undergo a more rigorous study. Unlike most other hospitals in Nepal, Patan Hospital's earthquake resilience was considered relatively good. Nonetheless, it was almost a foregone conclusion that a major earthquake would leave the hospital unable to function due to structural and non-structural damage. Therefore, the study recommended a detailed structural analysis to assess how the hospital would fare during high-intensity earthquakes. It also called for backup generators with an adequate fuel supply to provide an uninterrupted supply of

electricity if external power is interrupted, response scenarios that simulate handling at least 200 casualties (the potential consequences of mid-scale earthquakes) and plans and procedures that contemplate a hospital that has been out of service.

The event that prompted action Nepal is highly prone to disasters, particularly to earthquakes, which claimed more than 11,000 lives in the 20th century alone. Data suggest that earthquakes of the magnitude of the Great Bihar Earthquake in 1934 occur approximately every 75 years and although this is only a statistical estimate, a devastating earthquake is inevitable in the long run and likely in the near future. This is particularly troublesome because the Kathmandu Valley Earthquake Risk Management Action Plan suggests that as many as 60 per cent of buildings in the area are likely to be heavily damaged if the ground motion of the 1934 earthquake is repeated today. How would Nepal's health services cope with such an event?

To find out, an earthquake mass casualty scenario was used for Kathmandu Valley to estimate the number of people that would require hospital services, based on: (1) expected damage to buildings; (2) a one-to-five ratio of deaths to injuries; and (3) the Kathmandu Valley's population of 1.5 million (in 2002).). The estimates ranged as high as 22,500 dead (up to 1.5 per cent of the population), with up to 112,500 injured. Even the best of health systems would be hard pressed to deal with this scale of injury. And in the most severe intensity earthquakes, chances are that even the combined capacity of all emergency departments in Kathmandu Valley would only be able to serve a fraction of those requiring care. The limited number of patient beds and the fact that hospitals would be damaged, unable to function or even collapsed are aggravating factors that would put thousands of patients and health workers at risk.

Source: "Hospitals Safe from Disasters: Reduce Risk, Protect Health Facilities, Save Lives", 2008-2009 World Disaster Reduction Campaign, UNISDR, WHO, WB.
http://www.unisdr.org/eng/public_aware/world_camp/2008-2009/pdf/wdrc-2008-2009-information-kit.pdf

Lesson:

- Understanding the hazard risk to a hospital can help you plan for whether that hospital will survive a disaster and identify those preparedness measures that you must put in place to deal with the damage to the hospital and retain some functionality post-disaster

Case 54: Preparedness training for hospital workers, Tsunami, Sri Lanka, 2004

The earthquake and tsunami of 26 December 2004 killed 12 500 people in Sri Lanka's Ampara district. Ampara General Hospital was the tertiary care institution in Sri Lanka that managed the highest number of tsunami victims. Fortunately, training in disaster preparedness and response had just been completed.

Preparedness

For over five years now, the annual "Public Health and Emergency Management in Asia and Pacific" (PHEMAP) course has been introducing participants to the concepts of health action in times of disaster. This course is conducted jointly by WHO-SEARO (through its Emergency and Humanitarian Action Programme) together with the WHO Regional Office for the Western Pacific (WPRO) and the Asian Disaster Preparedness Centre in Bangkok, Thailand.

As a result of the preparedness measures, when the tsunami on 26 December. 2004, the Ampara General Hospital staff were well aware of what their duties were. A total of 1015 patients were admitted the hospital immediately after the tsunami. More than 4000 patients received treatment from the outpatient department. Pf these, only 17 died in the aftermath of the tsunami.

Source: WHO Regional Office for South-East Asia, 2009, "Case Studies on Safe Hospitals in the South-East Asia Region". p.17, 19. http://www.searo.who.int/worldhealthday2009/linkfiles/WHD-Kit/RHS/case_studies.pdf

Lesson:

- Trained hospital workers are better prepared to treat victims of a disaster

Case 55: Capacity building pre-disaster: Training for health workers and first responders, Nepal

Since 2002, in order to strengthen response capacities in any emergency, the Ministry of Health with assistance from the WHO Nepal country office and WHO-SEARO organized several rounds of Mass Casualty Management (MCM) training programmes and simulation exercises for health workers and first responders in Kathmandu, Pokhara, Bharatpur and other districts. These training programmes included full-scale mock drills simulating major disaster scenarios (e.g. earthquake, road traffic accidents, air crash etc). These activities have been organized systematically and conducted regularly.

Main objectives of the MCM training and mock drills are to:

1. Enhance the health system's pre-hospital emergency response capability by focusing on inter-sectoral collaboration, victim stabilization, triage and disaster logistics.
2. Enhance hospital emergency preparedness to deal with mass casualties following the MCM principles.
3. Strengthen communication, coordination and collaboration among the key stakeholders to respond to mass casualties.

Specific objectives:

1. Expose participants to a simulated health emergency and to the principles of mass casualty management such as disaster logistics, triage and medical evacuation.

2. Support institutionalization of the mass casualty management system in the hospitals and health institutions and promote mock drills.

Skills Acquired:

1. Learn how to set up pre-hospital facilities to prioritize and stabilize victims.
2. Define the roles of key actors and institutions in health sector emergency response.
3. Clarify the lines of command and establish clear lines of communication.
4. Test the functionality of the triage system.
5. Practice the principles of medical evacuation.
6. Examine the strengths and weaknesses of the existing disaster response system.

Source: WHO Regional Office for South-East Asia, 2009, "Case Studies on Safe Hospitals in the South-East Asia Region". p.15. http://www.searo.who.int/worldhealthday2009/linkfiles/WHD-Kit/RHS/case_studies.pdf

Lessons:

- Preparedness training for health workers and first responders enhances capacity health sector in disasters
- Pre-disaster drills introduce health workers and first responders to mass casualty management system
- Mass casualty management training and drills strengthen communication, coordination and collaboration among key stakeholders
- Training and drills help health workers and first responders to acquire the skill set needed to deal with a mass casualty disaster

Summary

There are measures that can be taken by officials to reduce the impacts of future disasters on the health sector and to better prepare the population and health workers to deal with future disasters including:

- Rebuilding old facilities and future facilities to higher standards that ensure that the facilities will remain functional after a disaster
- Retrofitting old facilities to life safety and higher standards
- Providing training to medical workers on disaster procedures and medical practices

- Raising the level of education among children and adults resulting in a population better able to deal with a disaster and its aftermath

ANNEXES

Annex 1: Hospital Safety Index

More than half of the 16,000 hospitals in Latin America and the Caribbean are in areas at high risk for disasters. The Hospital Safety Index helps health facilities assess their safety and avoid becoming a casualty of disasters.

The Hospital Safety Index provides a snapshot of the probability that a hospital or health facility will continue to function in emergency situations, based on structural, nonstructural and functional factors, including the environment and the health services network to which it belongs. By determining a hospital's Safety Index or score, countries and decision makers will have an overall idea of its ability to respond to major emergencies and disasters. The Hospital Safety Index does not replace costly and detailed vulnerability studies. However, because it is relatively inexpensive and easy to apply, it is an important first step toward prioritizing a country's investments in hospital safety.

Determining the Hospital Safety Index is a new way of managing risk in the health sector. It allows a health facility's level of safety to be monitored over time. Safety no longer has to be a 'yes-or-no' or an 'all-or-nothing situation, but can instead be improved gradually.

The Hospital Safety Index was developed through a lengthy process of dialogue, testing and revision, over a period of two years, initially by the Pan American Health Organization's Disaster Mitigation Advisory Group (DiMAG) and later with input from other specialists in Latin America and the Caribbean.

Calculating the Hospital Safety Index

There are a number of steps to calculating a health facility's Safety Index. First, an Evaluation Team uses the standardized Safe Hospitals Checklist to assess the level of safety in 145 areas of the hospital. Once the Checklist has been completed, the Evaluation Team collectively validates the scores and enters them into a scoring calculator, which weights each variable according to its relative importance to a hospital's ability to withstand a disaster and continue functioning. The safety score is calculated automatically.

The final Safety Index score places a health facility into one of three categories of safety, helping authorities determine which facilities most urgently need interventions:

- **Category A** is for facilities deemed able to protect the life of their occupants and likely to continue functioning in disaster situations.

- **Category B** is assigned to facilities that can resist a disaster but in which equipment and critical services are at risk.
- **Category C** designates a health facility where the lives and safety of occupants are deemed at risk during disasters.

Calculating the safety score allows health facilities to establish maintenance and monitoring routines and look at actions to improve safety in the medium term. This quick overview will give countries and decision makers a starting point for establishing priorities and reducing risk and vulnerability in healthcare facilities.

Components of the Hospital Safety Index

Form 1: General information about the health facility.

Form 2: Safe Hospitals Checklist.

Guide for Evaluators:

The Guide for Evaluators is the principal training tool. It provides guidance and standardized criteria for evaluating the components of a health facility individually and as part of the health services network.

Safety Index Calculator:

The scores or values obtained for each component on the Checklist are recorded onto an Excel spreadsheet that uses formulas to automatically calculate a numerical score for each of the 145 assessed components.

Source: Hospitals Safe from Disasters: World Disaster Reduction Campaign 2008-2009, PAHO. http://www.paho.org/english/DD/PED/SafeHospitalsChecklist.htm

Hospital Safety Index Guide for Evaluators

- Equipment and materials
- The following equipment and materials will be needed during the evaluation:
- Guide for Evaluators of Safe Hospitals (this document)
- Map of the area surrounding the health facility
- Natural hazard map(s)
- Plan of the health facility
- Forms (Form 1: General information; Form 2: Safe Hospitals Checklist)
- Notebooks, pencils, pens
- Two-way radio or cell phone
- Directory of key personnel involved in the evaluation
- Flashlights with charged batteries

- Still camera, video camera, tape recorder (optional)
- Light tools (measuring tapes, chisels, etc.) (optional)
- Calculator (optional)
- Other tools considered necessary for technical assessment

Evaluation team members should carry with them:

- Personal identification
- Evaluation team accreditation
- Comfortable and appropriate work clothing
- Necessary protective items (helmet, protective glasses, etc.)
- Role of the Hospital Disaster Committee in the evaluation

The members of the Hospital Disaster Committee should be present throughout the evaluation process, as well as hospital authorities and personnel who are involved in decision-making or who have vital information about the elements being evaluated. In terms of the evaluation, the main responsibilities of the Hospital Disaster Committee are: to provide all documentation needed to carry out the evaluation; to cooperate in the inspection of the structure by demonstrating or explaining the actual situation and facilitate an accurate diagnosis; to support the diagnosis process with comments and evidence; and to facilitate participation of key hospital personnel through interviews and or meetings about the evaluation. Everyone should keep in mind that the objectives of the evaluation process are to take the necessary steps to reduce risk, mitigate damage from disasters, and create social awareness about disaster prevention.

The Hospital Disaster Committee (also known as, for example, the "Emergency and Disaster Committee" or "Risk Management Committee") is the hospital entity responsible for articulating, directing, assessing, and coordinating hospital activities for the periods before, during, and after a disaster, ensuring the participation of all hospital workers. The structure of this committee should reflect that of the particular facility, but in general should have the following membership:

- Hospital director
- Director of administration
- Chief of emergency unit (coordinator)
- Chief of nursing
- Medical director
- Chief of maintenance and transportation
- Chief of security

- Labor union representative
- Community representative
- Other hospital personnel as deemed necessary.

This committee's main task is to guide the development and execution of a plan that integrates management of risk and of disaster and emergency response. Among other responsibilities, the committee determines the hospital's internal disaster response standards and functions, oversees permanent training and education for staff, and promotes cooperation and integration with the community it serves.

The by-laws of the Hospital Disaster Committee should be formalized before the evaluation process begins.

1.1 Hazards Refer to hazard maps. Request the Hospital Disaster Committee to provide the map(s) showing safety hazards at the site of the building.	Hazard Level				OBSERVATIONS
	No hazard	Hazard level			
		LOW	AVERAGE	HIGH	
1.1.1 Geological phenomena					
Earthquakes Rate the hazard level of the hospital in terms of geotechnical soil analyses.	☐	☐	☐	☐	
Volcanic eruptions Refer to hazard maps of the region to rate the hospital's exposure to hazard in terms of its proximity to volcanoes, volcanic activity, routes of lava flow, pyroclastic flow, and ash fall.	☐	☐	☐	☐	
Landslides Refer to hazard maps to rate the level of hazard for the hospital in terms of landslides caused by unstable soils (among other causes).	☐	☐	☐	☐	
Tsunamis Refer to hazard maps to rate the level of hazard for the hospital in terms of previous tsunami events caused by submarine seismic or volcanic activity.	☐	☐	☐	☐	
Others (specify) ..... Refer to hazard maps to identify other geological phenomena not listed above. Specify the hazard and rate the corresponding hazard level for the hospital.	☐	☐	☐	☐	
1.1.2 Hydro-meteorological phenomena					
Hurricanes Refer to hazard maps to rate the hazard level of the hospital in terms of hurricanes. It is helpful to take into account the history of such events when rating the hazard level of the facility.	☐	☐	☐	☐	
Torrential rains Rate the hazard level for the hospital in relation to flooding due to intensive rainfall, based on the history of such events.	☐	☐	☐	☐	
Storm surge or river flooding Rate the hospital's level of exposure to storm surge or river flooding hazards based on previous events that did or did not cause flooding in or around the hospital.	☐	☐	☐	☐	
Landslides Refer to geological maps to rate the hospital's level of exposure to landslide hazards caused by saturated soil.	☐	☐	☐	☐	
Others (specify) ..... Refer to hazard maps to identify other hydro-meteorological hazards not listed above. Specify the hazard and rate the corresponding hazard level for the hospital.	☐	☐	☐	☐	
1.1.3 Social phenomena					
Population gatherings Rate the hospital's exposure to hazard in relation to the type of population it serves, its proximity to population gatherings and prior events that have affected the hospital.	☐	☐	☐	☐	
Displaced populations Rate the hospital's exposure to hazard in terms of people who have been displaced as a result of war, socio-political circumstances, or due to immigration and emigration.	☐	☐	☐	☐	
Others (specify) ..... If other social phenomena affect the safety of the hospital, specify them and rate the level of hazard for the hospital accordingly.	☐	☐	☐	☐	

1.1.4 Environmental phenomena					
Epidemics With reference to any past incidents at the hospital and specific pathogens, rate the hospital's exposure to hazards related to epidemics.	☐	☐	☐	☐	
Contamination (systems) With reference to any past incidents involving contamination, rate the hospital's exposure to hazards from contamination of its systems.	☐	☐	☐	☐	
Infestations With reference to the location and past incidents at the hospital, rate the hospital's exposure to hazards from infestations (flies, fleas, rodents, etc.).	☐	☐	☐	☐	
Others (specify) ..... With reference to any past incidents at the hospital, specify any other environmental phenomena not included above that might compromise the level of safety of the hospital.	☐	☐	☐	☐	
1.1.5 Chemical and/or technological phenomena					
Explosions With reference to the hospital's surroundings, rate the hospital's exposure to explosion hazards.	☐	☐	☐	☐	
Fires With reference to the exterior of the hospital building, rate the hospital's exposure to external fires.	☐	☐	☐	☐	
Hazardous material spills With reference to the hospital's surroundings, rate the hospital's exposure to hazardous material spills.	☐	☐	☐	☐	
Others (specify) ..... Specify and rate other chemical or technological hazards in the area where the hospital is located.	☐	☐	☐	☐	
1.2 Geotechnical properties of soils					
Liquefaction With reference to the geotechnical soil analysis at the hospital site, rate the level of the facility's exposure to hazards from saturated and loose subsoil.	☐	☐	☐	☐	
Clay soils With reference to soil maps, rate the hospital's exposure to hazards from clay soil.	☐	☐	☐	☐	
Unstable slopes Refer to geological maps and specify the hospital's exposure to hazards from the presence of slopes.	☐	☐	☐	☐	

Comments on the results of Form 2, Module 1. The evaluator should use the space below to comment on the results of this module (1), and provide his/her name and signature. .....

.....

.....

.....

.....

Name/signature of evaluator .....

*this check list continues fromp.90-107.

Notice: This form should be distributed to all members of the evaluating team. For this purpose, do not use the version included in this document, which only serves as a reference or consultation tool; the form included in the folder should be photocopied (see "Evaluation Forms for Safe Hospitals") or, if you prefer, print directly from CD-ROM included.

Source: Hospital Safety Index Guide for Evaluators", 2008, PAHO, WHO, p.19-20, 90-107.
http://www.paho.org/english/DD/PED/SafeHosEvaluatorGuideEng.pdf

Annex 2: Tool for Analyzing Disrupted Health Sectors: A Modular Manual

To complete sound recovery plans, a timeframe of 1–2 years can be anticipated, depending on the general environment, the baseline situation and the complexity of the health sector. The initial round of exploration into the available information and its consolidation may take some months, during which informants and stakeholders are contacted and involved. The second round, consisting of studies considered as essential to put the policy discussion on firm grounds, may demand a longer period, and say 6–12 months. In the third round, new inputs are consolidated in a set of alternative projections, to be submitted to decision-makers.

Scenarios can be built by following a-

a. Top-down approach

By starting with a consideration of the global financing envelope and deducing from it what services will be affordable. This approach better suits severely disrupted contexts, where health care is fragmented, health authorities are absent or incipient, and most information is not available. In these conditions, approaching the analysis in aggregated terms may represent the only realistic option. Also, a topdown approach may be indicated in situations of urgency, when additional data cannot be collected. Examples of situations better studied through a top-down approach: Afghanistan in 2002 and Southern Sudan in 2003. Alternatively, the analysis may start the other way round, following a-

b. Bottom-up approach

Considering the facility unit recurrent cost and progressing to compute the total expenditure of running the whole health sector. This more information-intensive approach looks appropriate to distressed (but not collapsed) and fairly stable health sectors. The existing information base, although deficient, may provide a starting point for the analysis. In some cases, a stalled peace process may offer the opportunity to collect the missing data, in this way enhancing the results of the exercise. Example: Mozambique in 1990 –1992

Indicator	Dimension to be Monitored/Usefulness	Sources/Ways of collecting the Indicator(s)	Remarks
Total inputs (expressed in financial terms, by region, level of care, source, ownership, rural/urban and adjusted per head)	***Inputs***. Provides indications related to the system's costs, its geographical equity and global and relative efficiency (when related to outputs)	Data provided by the government, (MoF, MoH etc.), non-state groups (rebels etc.), UN agencies, donors, NGOs etc. need to be aggregated in monetary terms. Investment figures should be computed apart.	Tend to underestimate important contributions, such as patient payments or external resources (particularly from NGOs). May require the use of extrapolated data, when comprehensive ones are not available, which may be difficult and generate unreliable results. If certain inputs are computed at subsidized prices (such as drugs in many cases), it may be incorrect to aggregate their value with others provided at market price. The judicious use of shadow prices may address this difficulty. Because of the depopulation of rural areas and the concentration of IDPs in urban and peri-urban areas, studying the rural/ urban split may lead to flawed conclusions. When migratory movements (internal and abroad) involve a large proportion of the population, all indicators adjusted "per head" are grossly misleading and should be avoided.
Investment, by region, level of care, ownership, rural/urban and adjusted per head	***Inputs***. Crucial to anticipate the sector future patterns and demands, in terms of costs, service mix, efficiency, equity, ownership etc.	Due to the fragmentation that prevails in most situations, obtaining reliable information is labour-intensive. Consider building a national investment permanent database.	Should be analysed jointly with information related to the present conditions of the health care network. The patterns of the ongoing investment help in assessing the enforcement of stated policies. Whereas the investment decisions of single autonomous actors may be in line with declared policies, the aggregate patterns may look strikingly at odds with the same policies. The *Investment/Development* Budget of government, donors and NGOs often includes recurrent expenditure, which needs to be identified and removed to avoid gross overestimates.
The Investment/ Development Budget of government, donors and NGOs often includes recurrent expenditure, which needs to be identified and removed to avoid gross overestimates.	***Outputs***. Provides direct estimates of service volumes, their geographical distribution, ownership and contributions by level of care	The Health Management Information System (HMIS, but it can be called differently) is the main source. Due to their weaknesses, source data may need substantive manipulation to become useful. Specific info sources, such as NGOs, can be used to complement and validate HMIS data. In situations of rampant informal privatization of healthcare provision, a large proportion of service outputs may go unreported	As different services require different inputs and imply different costs, their outputs cannot be directly aggregated, but need adjustment by a weighting system, which attributes a higher value to the more resource-intensive class of services. Criteria for weighting different services and adjusting source data have to be developed, tested and agreed upon by experts. The weights can be based on total service unit costs. For specific sub-sectors, a different set of weights may be required. For staffing, basing the weights on average attendance times would be preferable, whereas for drug distribution, average treatment costs per broad categories of care may be a more reliable guide. The aggregate output distribution may influence resource allocation decisions, particularly at macro-level (narrowing the level of analysis makes these estimates progressively less useful). The original data set used to compute aggregate outputs may be used to study broad patterns of service mix. If a global aggregate indicator is found unreliable, sub-global aggregates, such as in-patient and out-patient volumes, may be used instead. This (more conventional) alternative implies more detailed work when it comes to using outputs to compute several important ratios, such as workloads, and multiply the number of indicators needed to characterize any production unit (region, district, facility etc.).

Indicator	Dimension to be Monitored/Usefulness	Sources/Ways of collecting the Indicator(s)	Remarks
Ratio of global inputs to global outputs and its evolution over time	***Efficiency***. Crucial indicator, whose computation is unfortunately fraught with difficulties	Its computation depends on the format eventually chosen for *Inputs* and *Outputs*	When the technical content of the provided care differs dramatically across areas, levels of care or over time, to draw conclusions about efficiency from the *inputs/outputs ratio* is incorrect. If aggregated estimates of *inputs* and *outputs* are not available or are considered unreliable, a global efficiency index is impossible to compute. Instead of computing an actual ratio, which would suggest a technical precision unsupported by the available information, the presentation of the relationship between inputs and outputs may remain deliberately impressionistic. A time series of aggregate inputs and outputs may convey how these two variables evolve in relation to each other, providing a precious "feeling" of the situation.
Staff workloads	***Efficiency***. Useful in redeployment of staff and to project the future workforce	HMIS or facility-based surveys (often carried out by NGOs)	The selection of a sub-set of facilities providing reliable and complete data is recommended. It should be presented as global and then disaggregated by region, class of facility, level of training, level of care, ownership. It is easier to compute if an aggregated measure of output is introduced. Given the frequent counting of ghost workers among active staff, any administrative estimate of workloads should be checked in the field before being retained as valid.
Bed Occupancy Rate	***Efficiency***.	HMIS	Same as above. It may show dramatic oscillations, depending on epidemics, population movements, availability of skilled staff, drugs or food etc.
Financial Implementation Rate, by source	***Efficiency***. Essential criterion for the allocation of non-wage funding	In most cases, routine data need to be complemented by reports and studies	Needs to be linked to planned and real outputs. Aggregated by cost centre, region, level of care (when possible). Special attention to be paid to absorption of external funds (given its frequently low levels). Misleading in high-wastage situations, quite common during protracted crises.
TB Treatment Success Rate	***Effectiveness and Efficiency***	TB-control programme, where this is in place	When the TB control programme is vertical, this indicator says little about the systemic performance of the health sector. The same holds for other vertical programmes. It can be taken also as an indicator or effectiveness.
Ratio of the average service consumption per head of a privileged group to a destitute one	***Equity***. Condense imbalances in a single index and, if followed over time, shows whether they are being redressed	Data source is the HMIS (already aggregated as *Outputs*, see corresponding entry), or specific studies	Useful only in situations where population figures are available and large migrations are not under way. It may be particularly interesting when comparing refugees, IDPs and residents of areas not directly affected by the crisis. It may require substantial adjustment of incomplete data sets to become reliable. Should be considered every time major investments are discussed. It may lead to major redistributive decisions within the health sector.
Ratios of health facilities to served populations, by geographical area, rural/ urban etc.	***Equity***	Available inventories of health facilities and mapping	To be meaningful, these figures need to assume fairly homogeneously distributed populations within the studied areas, which is usually not the case, particularly in war-torn contexts with major population movements. Ideally, these indicators should be refined, looking at the percentage of people having access to critical services, such as surgical theatres, maternity wards, labs, EPI delivery points etc. A more instructive indicator would be the *Proportion of population within 5 or 10 kms of a designed health unit*, which is usually not computable because of the limitations of census data.
Ratios of health facilities to served populations, by geographical area, rural/ urban etc.	***Equity***	Available inventories of health facilities and mapping	To be meaningful, these figures need to assume fairly homogeneously distributed populations within the studied areas, which is usually not the case, particularly in war-torn contexts with major population movements. Ideally, these indicators should be refined, looking at the percentage of people having access to critical services, such as surgical theatres, maternity wards, labs, EPI delivery points etc. A more instructive indicator would be the Proportion of population within 5 or 10 kms of a designed health unit, which is usually not computable because of the limitations of census data

Indicator	Dimension to be Monitored/Usefulness	Sources/Ways of collecting the Indicator(s)	Remarks
Inpatient Case-Fatality Rate for selected conditions	***Effectiveness***	Facility-based surveys	Consider computing this rate for a basket of major communicable diseases; these should be chosen considering the effectiveness of available standard treatment for a given level of care. For instance, a basket of inpatient cases of malaria, diarrhoea, acute respiratory infections, sepsis and meningitis would provide an informative, if rough, estimate of the existing capacity to tackle effectively serious common conditions at PHC level. To study higher-level care, other common conditions deserving surgical treatment could be added or considered apart (obstructed labour, acute abdomen, major traumas).
Proportion of post-operative infections after elective surgery	***Effectiveness***	Facility-based surveys	Simple, straightforward indicator, which should be computable even in troubled contexts.
Proportion of rational prescriptions within a sample	***Effectiveness and Efficiency***	Facility-based surveys	The well-known International Network for Rational Use of Drugs (INRUD) methodology is simple, reliable and informative. It should be used extensively, as a strategy to improve quality of care and to counteract waste, particularly in situations where drugs are scarce.
Patient compliance	***Effectiveness***	Surveys	Exit interviews may be misleading. Home visits provide more accurate information.
User satisfaction	***Effectiveness***	Surveys	Difficult to study and standardize. Interview results may be very misleading. Before adopting this concept, a robust and sensitive methodology must be developed. Results should always be considered together with an expert assessment of the quality of care provided.
Infant Mortality Rate	***Outcomes***	High-quality surveys with large samples	Often estimated using indirect *retrospective* methods, such as the sisterhood one (WHO and UNICEF, 1997) , that measure past rather than present mortality. Thus, these values should not be used to draw conclusions, such as the impact of ongoing interventions, about present patterns, particularly in a fast-moving context.
Maternal Mortality Ratio	***Outcomes***	High-quality surveys with even larger samples	
Workforce structure (new enrolments, attrition, skills, age, gender, employer) and deployment	***Human Resources***	HMIS, dedicated inventories	To obtain reliable figures in very fragmented situations is difficult. Deployment needs to be disaggregated by main categories: level of training, gender, region, urban/rural, facility ownership, level of care. In countries with a very high HIV prevalence, the workforce structure may change quickly. Be wary of "ghost workers", very common in troubled situations.
Average teams per class of facility	***Human Resources***	Routine data need to be validated by facility-based surveys	Given personnel movements, actual over- and under-staffing patterns in relation to routine reports are common. Possibly aggregated by training level (i.e., university-, mid-, basic-), skilled vs. unskilled. Sub-samples of facilities reporting complete data may be compiled as representative proxies. Combining these data with workloads, the *average service volume per class of facility* (very useful to study the network in view of restoring, expanding or rationalizing it) may be computed. In disrupted situations, to find overstaffing associated to reduced service outputs is common.

Indicator	Dimension to be Monitored/Usefulness	Sources/Ways of collecting the Indicator(s)	Remarks
Inputs and outputs of the pre-service training system	***Human Resources***	A specific study is usually needed	It could be computed as cost per trainee or per year of training, by level of training and by training facility.
Inputs and outputs of the in-service training system	***Human Resources***	A specific study is usually needed	It could be computed as cost per participant per day of in-service training. Due to the dispersion of in-service training activities, collecting these data is labour-intensive. Average figures should be taken with caution, because exposure to in-service training varies dramatically within the workforce (with over-trained workers against neglected ones). Given the over-reliance on in-service training, typical of protracted crises, studying this area is particularly relevant.
Drug total imports, by source of funding and adjusted per head	***Drugs***	MoH data need to be complemented with reports prepared by donors, NGOs and private importers.	Unavailable in most cases, or grossly underestimated. To collect reliable figures is very difficult and labour-intensive, particularly for the private sector and for donations. Caution is needed in aggregating widely different prices of the same drug. Comparing drug prices purchased through different channels provides precious indications of the sort of measures needed to improve drug availability.
Drug distribution by region, rural/ urban, ownership and level of care	***Drugs. Equity***	Where centralized, shared mechanisms are in place, the use of routine information is usually possible. In other cases, specific studies are needed.	It is an essential component of *Total Inputs*, discussed above. Beyond financial figures, the appropriateness of the drugs available at each level of care should be studied (the supplying of drugs inappropriate for a given level of care is a very common finding).
Waste and pilferage along the supply line and at facility level	***Drugs. Efficiency***	A tracer study is usually needed to throw light on this issue.	Usually overlooked during a protracted crisis, this information may provide crucial contributions to the policy discussion and to the conception of a recovery strategy.
Drug availability at facility level	***Drugs***	Facility-based surveys	A number (5–10) of vital drugs should be selected as markers. The indicator could be expressed as proportion of selected drugs available over the studied period.
Absolute level of financing, disaggregated by source and management responsibilities	***Financing***	Consider the implanting of permanent capacity, to carry out this review at regular intervals.	To be followed over time. Estimates of patient contributions need specific studies and are difficult to obtain. The external share of total financing helps to gauge the degree of discretion to be enjoyed by future governments. Trends are as important as absolute figures.
Expenditure structure, by cost centre, region, urban/ rural, level of care, ownership	***Financing***	A specific study with a substantial field component is usually needed.	Crucial to address existing imbalances, spot gaps and devise measures aimed at rationalizing health care provision. To consolidate contributions may be extremely complex. Should be complemented and validated by costing studies at facility level.

Source: “Analysing Disrupted Health Sectors: A Modular Manual”, 2009, World Health Organization, p.58-60, 370-374. WHO/HAC/MAN/2008.8.rev.1.

※This is a draft version of the manual and it is printed for the use of the Analysing Disrupted Health Systems in Countries in Crises” course only.

Annex 3: Tool for Understanding Children in the Evacuation Site

It is essential to find out in what kind of situation the children are in the shelter and/or evacuation site. Sometime it is difficult to know where the children are. It is advisable to make special maps which indicate which children are in the shelter and/or evacuation site and which are elsewhere in a community, taking into consideration the time when another health worker will take over

1) What kind of children are they?

Age Distribution: According to children's developmental stages, necessary treatments and things may be different.

Permanent address of children: The establishment of a new relationship among children at the shelter and/or evacuation site may sometimes depend on whether or not they have known one another before a disaster.

Existence of high-risk Children: It is essential to make sure whether each children receives the necessary care. It is possible to think that high-risk children are susceptible to the influence of those around them and that vice versa.

2) Who are the children with?

Adults are usually away from an evacuate site during the day to clean up their houses or to work. It is necessary to make sure who takes care of children during the day and at night, or whether they have a dialog with their parent(s). To best discover what kind of help each child needs, put yourself in their place and make sure they are being heard and understood.

3) How are the children behaving?

The way children behave reflects the conditions of their minds and bodies.

It is very important to perceive how each of them behaves and spends everyday at the shelter and/or evacuate site after a disaster. The information from adults around them may be very helpful. However, nothing is more helpful than to closely watch each of them.

List 1: Children who require special care

Children in a high-risk situation	check	Explanations
Children with chronic physical problems	☐	For the children who require special medical treatments or equipments such as an oxygen or suction machine, they need to continue their life sustaining treatments and medicine; they may need to

		contact hospitals.
Children with mental or emotional problems	☐	When those children are in a place, such as a shelter, where they have to live among strangers, they sometimes show excessive reactions to stimuli around them. Their reactions (hyperactivity or screams and cries) might be considered strange behaviors, and considered as strange and disturbing others.
Children who rely on others for their daily lives	☐	These children require continual assistance for transportation or for everyday activities (meals, discharges, sleep, changing clothes and so on)
Children who have gone through a special experience when a disaster strikes	☐	The experiences such as deaths or injuries of any of their family members, confinement in their houses or somewhere else, injuries of their own, the destruction of their houses or towns, and such may have caused or may cause psychological trauma, and therefore proper measures should be taken for each situation.
Children with psychological problems before a disaster	☐	Children with maladjustment to an ordinary situation such as refusing to attend school, or having problems with a home environment and such may tend to be more susceptible to being hurt.

List 2: How children's behavior may change after a disaster

Children's behaviors and reactions that should be paid attention to	Explanations
Infants * Cry at night * sleep problems * increased sensitivity to even faint sounds * loss of facial expression * (fever, diarrhea, poor appetites, loss of appetite for milk.	Change of living environment and/or parent(s) reactions may cause children to show any of these reactions in their daily life. It is important for adults to talk or to have physical contact with them in a relaxed atmosphere.

Small children - school-aged children (in the lower grades) * Behaviors younger than their age. (Regressive behaviors such as thumb-sucking, bedwetting, pants-wetting, insist to be held, excessive clinging to parent, and so on.) * Loss of appetites, restlessness, apathy, emotional numbing, loss of facial expression, decreased concentration and attention span * Nail-biting, tic, frequent urination, bedwetting, self-harming * The children exhibit different behaviors from their usual styles; i.e., easy to cry and/or to anger, increased irritability and/or impatience, and outburst of violent behaviors * make-believe earthquake, destroying of piled blocks, plays with violent actions. * Panic behaviors such as flashbacks	Parent(s) and a family member may be confused at the children's behaviors after a disaster in a strange environment such as shelter and/or evacuation site where things are totally different from usual. However, it is quite normal for children to show those reactions under such circumstances. As long as no serious problems arise, leave children as they are for the time being to see if they likely to return to previous functioning. Explain the implication of children's reactions to their parent(s) or any of their family members and give them instructions to use a supportive and compassionate verbal or non-verbal exchange with the children to reassure them. For example playing with them or giving them a hug with compassionate words of reassurance. As unnecessary separations from their parent(s) and their family members give both children and their parent(s) and/or family members anxiety and fear, extremely careful consideration is required. If any of these reactions on this list are repeated or prolonged, the intervention of medical professionals might be required. Therefore careful observation of children is important, and if necessary, make arrangements for the professional.
School aged children in the upper grades * Poor appetites, restlessness, apathy, emotional numbing, loss of facial expression, decreased concentration and attention span	Children may feel helpless, isolated, or restless when they see adults busy rebuilding their lives and the lives of their families. Create work activities which children can join in to let them find their role as a member of their family or of their shelter and/or evacuate site. It is necessary to find work that is safe and achievable tasks. It is important to explain to children how things are

* Nail-biting, tic, frequent urination, bedwetting, bowel incontinence * Sleep disorders, fatigue * The children exhibit different behaviors from their usual styles; i.e., easy to cry and/or to anger, increased irritability and/or impatience, and outburst of violent behaviors * Behaviors younger than their age. (Regressive behaviors such as thumb-sucking, and so on.. * Fighting, breaking things * Panic behaviors such as flashbacks * An asthma attack, skin rash, alopecia, stuttering, symptoms of transient autonomic imbalance * Excessively well-behaved children, excessively exertive / persevere children, quiet children	going and what adults are doing for reconstruction of living. Avoid attitudes that imply that children do not have to know what is going on. Children who understand what is going on around them may show excessive responses, trying to be unnecessarily patient or to avoid annoying others. If any of these reactions on this list are repeated or prolonged, the intervention of medical professionals might be required. Thereof, careful observation of children is important, and if necessary, make arrangements for the consultation with professionals.

Infants

Name

Children's behaviors and reactions that should be paid attention to	check	notes
Cry at night	☐	
sleep problems	☐	
increased sensitivity to even faint sounds	☐	
loss of facial expression	☐	
fever	☐	
diarrhea	☐	
poor appetites	☐	
loss of appetite for milk	☐	

Back to "understanding children in the shelter and/or evacuation site."
Back to "List2: How children's behavior may change after a disaster"

Small children - school-aged children (in the lower grades)

Name

Children's behaviors and reactions that should be paid attention to	check	notes
behaviors younger than their age. (Regressive behaviors such as thumb-sucking, bedwetting, pants-wetting, insist to be held, excessive clinging to parent, and so on.)	☐	
loss of appetites	☐	
restlessness	☐	

apathy, emotional numbing, loss of facial expression	☐	
decreased concentration and attention span	☐	
nail-biting, tic	☐	
frequent urination, bedwetting	☐	
self-harming	☐	
the children exhibit different behaviors from their ua syes; i.e., easy to cry and/or to anger, increased irritability ad/or imptience, and outburst of violent behaviors	☐	
make-believe earthquake, destroying of piled blocks, plays with violent acions.	☐	
panicky baviors such as flashbcks	☐	

School aged children in the upper grades

Name

Children's behaviors and reactions that should be paid attention to	check	Notes
poor appetites	☐	
restlessness	☐	
apathy, emotional numbing, loss of facial expression, decreased concentration and attention span	☐	
nail-biting, tic、	☐	
frequent urination, bedwetting	☐	
bowel incontinence	☐	
sleep disorders, fatigue	☐	

The children exhibit different behaviors from their usual styles; i.e., easy to cry and/or to anger, increased irritability and/or impatience, and outburst of violent behaviors	☐	
behaviors younger than their age. (Regressive behaviors such as thumb-sucking, and so on.)	☐	
fighting, breaking things	☐	
panic behaviors such as flashbacks	☐	
an asthma attack	☐	
skin rash	☐	
alopecia	☐	
stuttering	☐	
symptoms of transient autonomic imbalance	☐	
excessively well-behaved children, excessively exertive	☐	
persevere children	☐	
quiet children	☐	

Source: http://www.coe-cnas.jp/english/index.html

Annex 4: Check List for Health Care of Elderly

1) Food

Meals distributed in shelters are sometimes inappropriate for the elderly who may have lost their dentures and have difficulty chewing. Therefore, the elderly are at risk of developing malnutrition or gastrointestinal symptoms such as diarrhea. Support is necessary to ensure suitable meals are provided for the elderly.

2) Sanitary problems

When services providing a lifeline are cut by disasters, it becomes difficult to supply water for toilets and baths, which causes unsanitary conditions. In particular, elderly evacuees with disabilities may be unable to take a bath for long periods of time making it difficult to maintain personal hygiene. To prevent infection in shelters, it is important that elderly evacuees, in particular those with disabilities, are provided the support they require to maintain personal hygiene.

3) Risk of food poisoning

In shelters, where disaster victims sleep and eat in the same place, where uneaten food and waste cannot be adequately disposed of and where victims cannot wash their hands properly due to restriction on the use of water, the elderly face potential hygiene problem. The elderly are particularly vulnerable because of their depressed digestive systems and compromised immune systems. There are concerns that, once an elderly evacuee gets food poisoning, diarrhea, vomiting and other symptoms, his/her fluid and electrolyte balance is easily disturbed, which can have serious consequences.

Therefore, prevention of food poisoning is essential.

4) Decreased mobility

Elderly living in shelters suffer a decrease in activity caused by various mental and physical factors. The shelter environment often causes problems for the elderly who may have difficulties transferring the activities of their daily lives to a new setting. In addition, since there may be a delay in evacuation following disaster, the elderly may end up living in poor conditions such as in the aisles or doorways of shelters, further restricting activity.

After disasters, more elderly people complain about pain in their back or knees, however they are often unable to receive medical treatment or rehabilitative therapy. These factors decrease their ability to remain active and as a result, there is an increased risk of their becoming bedridden. To support the elderly, it is important to maintain their ADL/IADL and prevent them becoming bedridden which will affect their subsequent quality of life.

5) Deterioration of health Condition

The elderly often suffer from deterioration in their overall health due to an insufficient intake of nutrition and water, mental and physical fatigue caused by the disaster, and

the poor living environment of the shelter. Because of interruptions in use of medication and failure to receive medical treatment by primary or appropriate specialists, chronic diseases suffered before the disaster often get worse.

It is necessary to evaluate the health of the elderly and provide support to prevent the aggravation of chronic conditions.

6) Development of respiratory infections

Because of communal living and inadequate ventilation in shelters, respiratory infections tend to spread. Elderly with decreases in resistance and reserve force to infection are easily infected by cold and influenza viruses, and readily develop shelter pneumonia, which may become serious. It is, therefore, necessary to take preventive measures against respiratory infection, and to find and treat borderline pneumonia.

7) Risk of developing delirium

In addition to mental and physical fatigue, an acute change in the living environment within the shelter may cause a transient brain dysfunction (such as mental agitation, unclear speech, sleep disorder and forgetfulness), the symptoms of which can be mistaken for dementia. In elderly in the shelter, delirium can be differentiated from dementia using the following checklist. An accurate coping strategy is necessary.

8) Exacerbation of dementia symptoms

Mental and physical fatigue, changes in the physical condition caused by the disasters and acute changes in the living environment can exacerbate symptoms of dementia and development of dementia in the elderly. Therefore, the elderly in a shelter should be carefully monitored.

9) Isolation in terms of information

In addition to age-related hearing loss and decreased ability to communicate with other people caused by physical and mental fatigue or shock following the disaster, the elderly are often unable to obtain sufficient information.

Information aimed at assisting disaster victims in restoring their lives is sent to shelters from the government and other organizations. However, the elderly, particularly those living alone, often fail to receive such information, and, even if they do receive it, may not fully understand the contents. Therefore, elderly tend to be isolated in terms of information and procedures regarding restoration.

10) Problems surrounding transfer from the shelter

When the disaster scale is large and restoration is prolonged, it is difficult for the elderly to return to their former residence, necessitating the transfer to temporary housing. In the elderly who have difficulty in adapting to environmental changes, repeated changes in the place of living not only affects their physical and mental health but also disturbs any connections they have made with others. As a result, the elderly feel lonely and isolated.

In temporary housing

1) "House Bound" and "Solitary death"

Elderly victims of disaster who have lost their homes, family/relatives and friends are often given priority for transfer to temporary housing because of health management issues. However, elderly evacuees often have problems adapting to new housing environments, which may bear little resemblance to their former homes and which may be far away from relatives, and there are risks of a suicide or solitary death. Elderly residents who are housebound, going out only to go shopping or visit hospitals etc, and who are reluctant to communicate with others, are most at risk.

To determine the risks, it is important to evaluate the living conditions of elderly residents, including participation in community activities, and determine whether there is sufficient social support.

2) Problems around living in temporary housing

In temporary housing life, physical function and activity tend to decrease. Because there may be many extremely elderly residents, day-to-day support may be necessary.

3) Problems associated with health management

Prolonged life in temporary housing causes many health problems including worsening of chronic diseases and development of new diseases. Self-management of health can cause problems in the elderly who may: demonstrate a lack of concern about their own health; fail to get medical check-ups for a long period of time after the disaster; and fail to administer medication correctly. Therefore the health of each elderly resident should be regularly evaluated, and support for the prevention of aggravation of conditions should be provided for both elderly residents with health problems and those without apparent health concerns.

4) Increase of elderly persons with dementia

Physical and mental fatigue and changes in physical condition following disaster and prolonged evacuation are associated with an increase in the number of elderly people with dementia and aggravation of its symptoms. Therefore, it is important to monitor the following:

5) Anxiety about life in the future due to the disaster

For elderly people who have retired and live on a pension, the loss of homes and properties through disaster may cause marked anxiety about future life. Many of them feel reluctant to move out of the temporary housing and there is a tendency for them to be left behind. While these are not health care issues, it is important to provide psychosocial care based on the economical situation.

Source: http://www.coe-cnas.jp/english/group_senior/manual/manual02/08.htm

Annex 5: Check List for Pregnant and Nursing Mothers

1) Confirm the safety of people and their environment

Listed below are points to check when confirming safety of people and their environment. Use this list as a reference to create a checklist that suits the characteristics of your facility, and keep it in a visible place.

2) Provide a sense of security

Immediately after a disaster strikes, it is said that people come to their senses when someone rushes to their aid or by hearing other peoples voices. In one reported case, a mother felt relieved by hearing the words your baby is OK from someone checking the safety of the mothers and babies. The safety of their baby is the primary concern of postpartum mothers. When checking the safety of patients, use your voice to call out to them, and try to confirm the safety of the baby as soon as possible so you can relieve the mother's worry. And, if possible, try to allow the mother and baby to be together.

When there are seriously ill patients at the hospital or sick people at evacuation shelters, caring for healthy pregnant women and postpartum mothers becomes low priority. However, even though they are physically healthy, do not forget that their minds and bodies received a great shock from the disaster. Try to show that you care about them through your actions and words.

3) Evacuation methods for mother and child

- Postpartum mothers

  Have the mother carry the baby. Evacuation will be safer if the baby is firmly fixed to the mother's body with baby carriers and scarvers so that both of the mother's hands are free.

- When walking on her own is impossible due to just undergoing surgery or other reasons

  Use stretchers (sheets) and wheelchairs.

  Several people may be required to carry the mother, so handle the situation by asking those who are in relatively good condition to help.

4) Gather and disseminate information

5) Adjust hospitalization periods according to the patients' needs

6) Convey information regarding resources available in the region

At homes and other facilities, the items below can also be used:

Something to absorb blood and amniotic fluid	* Newspaper (to spread under towels), towels
Something to keep warm	* Holding the baby * linens such as towels, plastic wraps, aluminum foil
Something to tie the umbilical cord with	* String or other items that can be used to tie the cord tightly
Something to disinfect items with	* Fire from lighters, etc. (pass metal objects over a flame before using them.

Adjusting your cognition and supporting day-to-day life and health

It is necessary to adjust your cognition and realize that this is an emergency situation where normal procedures are not possible. Handle things by setting an order of priority suitable under the circumstances.

- Nutrition and water
- Preparing formula
- Sleep and rest
- Sanitation
- Environment: Hot/cold temperature, Smell
- Activities

Source: "Human Rights and Natural Disasters* operational Guidelines and field manual on human rights protection in situation of natural disaster", 2008, Bruking-Bern Project on Internal Displacement.p.65.

Annex 6: Check List for Nutrition

Food and diseases

1) Preventive food safety measures in the aftermath of natural disasters

During and following natural disasters, particularly floods and tsunamis, food may become contaminated by surface water that has itself been contaminated by pathogenic bacteria from sewage and wastewaters from sewer systems, septic tanks, and latrines as well as from farms and farm animal. The following issues should be investigated:

- The protection of food requires attention along the food-chain, including the primary production sectors.
- While much of the normal agricultural production may be adversely affected by flooding associated with a tsunami, there may be areas where food can still be harvested or where food has been stored safely post harvesting.
- If agricultural produce is harvested from an area affected with flooding it may be contaminated with microorganisms (from raw sewage or decaying organisms) and chemicals in the flood waters. While it is possible to reduce the potential hazard associated microorganisms by thoroughly cooking the produce, such actions may not remove chemical hazards. Therefore only harvest food from affected areas where it is necessary and where you can be confident that chemical contamination has not occurred. Also ensure the product is properly identified as being harvested from an affected area.
- Similarly agricultural produce that was stored in the affected areas at the time of the disaster may also be affected by the flood waters. Such food should be treated as with food harvested from affected areas.
- If crop fields have been contaminated by human excreta, following floods or damage to sewerage systems, an assessment should be carried out rapidly to assess the contamination of crops and to establish measures, such as delayed harvesting and thorough washing and cooking, to reduce the risk of transmitting faecal pathogens.
- Foods that have not been affected should be protected against exposure to other sources of contamination and not kept under conditions in which bacterial growth may occur.

Safe and hygienic warehouse management must be observed:

- Storage structures should have good roofs and ventilation. Products should be kept at away from walls and off the floor. Pallets, boards, heavy branches, bricks, or plastic bags or sheets should be placed underneath them. Bags should be piled two-by-two cross-wise to permit ventilation.

- Spilled food should be swept up and disposed of promptly to discourage rats.
- Fuel, pesticides, bleach and other chemical stocks should never be stored together with food.
- If spray operations for pest control are needed, they should be carried out by qualified technical staff, under the close supervision of the national authority (Ministry of Health / Ministry of Agriculture). Wearing of protective gear to reduce exposure of the operators to toxic chemicals is essential.
- Safe food handling during food distribution and preparation must be assured
- During emergency response operations, large-scale distribution of imported or locally-purchased food items as well as mass preparation of cooked food frequently occur. In this context special attention must be brought to the following:
- All foods used in food distribution and mass feeding programmes must be fit for human consumption (as well as being nutritionally and culturally appropriate) The quality and safety of all items should be controlled before importation or local purchase and any unfit items be rejected.
- Stocks should be regularly inspected and any suspect stocks should be separated from other stocks and samples be sent to a suitable laboratory for analysis; in the meantime they should not be used.
- Kitchen supervisors, cooks and ancillary personnel should be trained in personal hygiene and the principles of safe food preparation (See Annex).
- Kitchen supervisors should be trained to be able to recognize potential hazards and apply appropriate food safety measures; the personal hygiene of personnel involved in food preparation should be monitored.
- Employees and volunteers preparing food should not be suffering from an illness with any of the following symptoms: jaundice, diarrhea, vomiting, fever, sore throat (with fever), visibly infected skin lesions (boils, cuts, etc.), or discharge from the ears, eyes or nose.
- Cleaners should be employed to keep the kitchen and surrounding areas clean; they should be properly trained and their work supervised and there must be adequate facilities for waste disposal.
- Water and soap must be provided for personal cleanliness, and detergent for cleaning utensils and surfaces which should also be sanitized with boiling water or a sanitizing agent, e.g. bleach solution.
- Foods should be stored in containers that will prevent contamination by rodents, insects, or other animals
- Hot and/or cold holding of food may have to be improvised.

2) Consumer education and information

In many cases, consumers will be preparing food under conditions that are more primitive than normal, due to lack of water supply and electricity. This is especially the case for homeless people who have no facilities or equipment for food preparation. In all cases however, consumers should be warned to take special care regarding food safety from the procurement of raw materials and water, through handling and preparation to final consumption.

3) Provision of food after a natural disaster

- After a natural disaster, as soon as families have reestablished their capacity to cook, any food they may be given is usually distributed in dry form for them to prepare and consume in their homes or temporary shelters. People may not always be familiar with all kinds of dry foods. When given, they should be shown how to prepare dry foods.
- In addition to safe water for food preparation, a means of washing hands and utensils will be needed.
- A shortage of fuel for cooking may also be a major constraint, and this may need to be supplied to ensure adequate cooking and reheating of cooked food.
- In some cases, as an alternative to mass feeding, it may be possible to help households by providing shelf-stable rations that do not need cooking or by setting up temporary shared neighborhood kitchens where people can prepare food for their own families or in groups.

4) Response to an outbreak of foodborne disease

Investigation of and response to a suspected food safety emergency involves:

- timely treatment of exposed people
- removal (recall) of the contaminated food from circulation. This should be coordinated by the national food safety agency in collaboration with the food industry and other food providers.
- rapid identification of the causative agent and the suspected foods by patient interviews and by appropriate diagnostic laboratory testing
- epidemiological investigation to identify the causative agent, the responsible food and the manner of contamination including: collection, transport and processing of samples; collation of information about sources of contamination and coordination with law enforcement, food safety regulatory authorities, industry, emergency medical response agencies, and (when imported food may be involved) quarantine and customs agencies (swift communication among all these entities is essential)
- timely provision of information to the public on food-related risks and the actions they should take to minimize those risks; the information must be

conveyed in a manner that is culturally appropriate and does not cause unnecessary anxiety

Food safety is essential for disease prevention

In the aftermath of natural disasters

- KEY 1: KEEP CLEAN - (prevent the growth and spread of dangerous microorganisms)
- KEY 2: SEPARATE RAW AND COOKED FOOD (prevent the transfer of microorganisms)
- KEY 3: COOK THOROUGHLY (kill dangerous microorganisms)
- KEY 4: KEEP FOOD AT SAFE TEMPERATURES (prevent growth of microorganisms)
- KEY 5: USE SAFE WATER AND RAW MATERIALS (prevent contamination)

http://www.who.int/foodsafety/foodborne_disease/emergency/en/

Following natural disasters, such as the recent earthquake and tsunami in South East Asia, food in affected areas may become contaminated and consequently be at risk for outbreaks of foodborne disease, including diarrhoea, dysentery, cholera, hepatitis A, and typhoid fever. Poor sanitation, including lack of safe water and toilet facilities and lack of suitable conditions to prepare food have led to mass outbreaks of foodborne disease. As persons suffering from the direct effects the disaster may already be at risk through malnutrition, exposure, shock and other traumas, it becomes essential that the food they consume is safe. This is particularly important for foods for infants, pregnant women and the elderly who are most susceptible to foodborne disease. Under most conditions, the threats posed by contaminated water and food are interrelated and cannot be separated. Therefore, water should be treated as a contaminated food and should be boiled or otherwise made safe before it is consumed or used as an ingredient in food. WHO has prepared guidance for public health and other authorities on the key the food safety issues to be considered in disaster situations. This includes a reminder that authorities must maintain existing support for food safety and heighten their vigilance against new foodborne risks introduced by the disaster. Basic messages, such as those contained in the WHO Five Keys for Safer Food, should be reinforced to all food handlers, especially those involved in mass catering.

Source: http://www.who.int/foodsafety/foodborne_disease/emergency/en/

Annex 7: The Safe Drinking Water Response to the Indian Ocean Tsunami

After three months, most new initiatives focused on the resettlement of the affected populations. In some instances, survivors were relocating in new settlements, either because of fear of another tsunami or because of government mandates designed to reduce vulnerability. In such cases, water is supplied centrally, usually via municipal treatment and distribution systems, or settlers rely on household or communal groundwater or surface sources. In most instances, however, displaced populations are returning and rebuilding on their previous home sites. Both scenarios present certain implications:

- Government-drafted recovery plans contemplate the expenditure of significant amounts of tsunami aid to upgrading water and sanitation facilities, particularly in the most populous areas. The unprecedented amount of money raised and committed creates an opportunity to implement suitable, appropriate and sustainable solutions that reflect best practices based on experience in environmental engineering and public health. It also creates the risk that funds will be allocated based on political, commercial and other priorities.
- Restoring wells has presented a particular challenge. While this normally consists of removing silt and debris and chlorinating the well to deal with microbiological contamination, saline water intrusion has rendered many, perhaps even most, wells unusable even after several months. Pumping the wells to encourage freshwater recharge has proved ineffective in many cases. While many of those interviewed expressed optimism that groundwater sources would recharge with freshwater after the commencement of the monsoon, hydrologists have explained that many of the groundwater aquifers servicing such wells have themselves become contaminated, thus raising questions about the near-term restoration of the wells and the futility of digging wells or drilling boreholes that tap the same aquifer.
- In addition to assisting with redevelopment and restoration, relief organizations are involved with other initiatives relating to drinking water. As described below, household-based water treatment, and water handling and management practices generally, are being introduced as part of integrated water-sanitation-hygiene programs. Water quality testing and surveillance can also be implemented on a more systematic basis.

Household Water Treatment

While efforts must continue to expand access to safe piped water supplies, treating water at the household level is increasingly recognized as an effective and cost-effective intervention against waterborne disease. In development settings among low-income populations, NGOs have implemented household-based approaches to water

treatment, including boiling and pasteurization, chemical disinfection (e.g. the Safe Water System-SWS), solar disinfection (e.g. Sodis), filtration (e.g. ceramic candle filters, biosand filters), combined flocculation/disinfection (e.g. PUR and Watermaker) and improved household water storage vessels. Some of these approaches have also been shown to be effective in preventing waterborne disease in emergencies, including floods and other natural disasters and political conflicts (Roberts, 2001; Doocy, 2005).

In the Indian Ocean tsunami response, boiling was the most common approach to treating water at the household level. This was particularly true in Aceh where UNICEF and the Ministry of Health have promoted boiling for years. Issues arose concerning the introduction of chlorination as an alternative to boiling, particularly when investigators for NGOs found evidence of unsafe water at the household level. In one study, 47.5% of water sampled from 400 households (78% of which reported boiling, the others not treating their water at all) were positive for E. coli, and a significant majority found it often (25.7%) or sometimes (42.6%) difficult to practice boiling, mainly due to the unavailability (65.5%) or cost (62.8%) of fuel or lack of a stove (20.8%) (Handzel, 2005). Nevertheless, due to the scale of demand on those involved in the emergency response, most NGOs promoted boiling as the only practical means of treating water at the household level during the initial phases of the emergency. They observed that because boiling was well-known and widely accepted, it did not require programmatic support for its promotion, thus allowing them to focus on providing basic water and sanitation needs. They also reported that they believed boiling was the obvious alternative for those householders who were consuming water from unsafe wells or surface sources because they did not like the taste of chlorinated water being delivered to the camps.

Some relief organizations promoted chlorinating water at the household level, but only to a limited extent. They noted that householders showed greater willingness to chlorinate their water during the initial phases of the disaster, mainly using liquid bleach (sodium hypochlorite), bleaching powder (calcium hypochlorite) or a variety of chlorine tablets that were widely distributed during the first two weeks of the response. Health officials explained that when faced early on with dead bodies and other obvious sources of perceived contagion, survivors seemed more willing to treat their water and accept the uncustomary taste of chlorine. As the recovery effort continued, however, many discontinued this practice, perhaps because their assessment of vulnerability declined, but also because other bulk supplies of water were more readily available. How extensive or important such household chlorination actually was is difficult to assess. What is clear, however, is that in the absence of programmatic support, chlorination in the home was not generally accepted, particularly when the risk of waterborne disease was not readily apparent and alternatives became available.

The limited role of household water treatment was not a result of unavailability of the technology. In fact, the quantity of products sent to the region for the purpose of treating water was remarkable, particularly in view of the quantities that can be shown to have actually been used by the affected population.

- Chlorine and the Safe Water System (SWS). Common sources of chlorine from liquid bleach, bleaching powder, household disinfectants were widely available in most areas, but this was used mainly for cleaning and disinfecting rather than for treating water. An estimated 140,000 bottles of sodium hypochlorite specifically designed for water treatment were shipped to Aceh province from an already established SWS programme in Jakarta for use by an NGO experienced in promoting the SWS. (The SWS combines disinfection with locally produced sodium hypochlorite, safe storage, and community education.) 70,000 bottles were actually reported to have been distributed to affected communities by the end of March. Bottles were initially left with camp coordinators for distribution; however it was soon found that this was not resulting in proper use and distribution was suspended until training could also be provided. A training session of 30-60 minutes significantly increased uptake and the portion of households with sufficient residual chlorine levels.

- Chlorine Tablets. It is believed that millions of locally-produced chlorine tablets (mainly chloramine/hydroclonazone, halazone and calcium hypochlorite/HTS) were shipped to affected areas. While these were widely available in the early phases of the emergency, we found few of these tablets in the camps after several months, and it was difficult to find shops that stocked them or knew that they could be used for treating water. One foreign manufacture reported shipping a total of 30 million dichloroisocyanurate (NaDCC) tablets to the region in a succession of orders, mainly from NGOs and UN agencies. While chlorine tablets were used to treat water in bulk and in certain settings immediately following the tsunami, only limited use of these tablets at the household level could be confirmed.

- Combined Flocculation/Disinfection. Sachets containing a combination of a flocculant plus a time-released disinfectant have been shown effective in preventing diarrhoea in refugee camps and other emergencies (Doocy, 2004). Within two weeks of the disaster, over 15 million sachets of combined flocculant/disinfectant were shipped to Sri Lanka and Indonesia; a month later, another 1 million sachets went to the Maldives. After four months, however, much of the product had not yet been used. In Aceh, two NGOs suspended distribution after giving out roughly 1.6 million sachets due to questions about its suitability and acceptability, as well as lack of human resources to provide necessary programmatic support. Certain NGOs expressed enthusiasm for the product, noting its potential, especially when turbid surface water (e.g. from the river) is the only available option. In the majority of locations around Aceh, however, water was largely sourced from wells or tanker supplies and was of acceptable clarity. In such cases, recipients reported that the treatment process was too complex and the resultant taste was unpleasant. In Sri Lanka, except for some initial use in limited numbers, NGOs were waiting to use the product at later stages, especially after monsoons commence, when the risk of

contaminated (and turbid) water would be greater and the product could be deployed with necessary training and follow-up.

- Ceramic Filters: India and other countries throughout south Asia are among the largest producers and users of ceramic drip water filters. Several brands could be purchased in shops near the areas affected by the tsunami at prices from Rs700-1100 (US$16-25), and local WHO officials reported that some householders were purchasing and using them. Nevertheless, the evidence suggests that filters were used only sporadically in the four months following the disaster. In one camp in Tamil Nadu, RedR India reported that 40% of the population had been given such filters and that the positive results should lead to wider use in villages and urban camps. UNICEF distributed 550 donated filters to families in five locations in Aceh, and though follow-up confirmed the filters were well received and in use, they had no plans to expand the program preferring instead to focus on hygiene messages and promotion of boiling. Oxfam, which has previously used the filters in post-flooding responses and other settings, procured 20,000 filters within two weeks of the tsunami, but decided to deploy them only in the resettlement phase when people began to re-establish their households more permanently.

- Solar Disinfection. Local NGOs (Helvatas and LEAD) introduced the Sodis solar disinfection program in 5 camps in Sri Lanka and 22 villages in Tamil Nadu, India. While local partners are also implementing the Sodis program in other parts of Indonesia, NGOs elected not to implement the intervention in the tsunami-affected areas there due to the availability of treated water under camp- or community-wide systems.

- Biosand Filters. Two NGOs (Dhan Foundation and Samaritan's Purse) with experience in biosand filter programs reported plans to introduce the filters during the resettlement phase of the emergency response. In the earlier phases of the emergency, however, biosand filters did not play a major role.

- Improved Storage. A few NGOs imported and distributed improved water storage devices (with small necks to prevent introduction of hands and taps for safely accessing water). In general, however, householders used locally-produced open-mouth vessels, buckets, pots and tubs to collect and store water and use it in their tents, shelters or homes. Local inhabitants who were not directly affected by the disaster often procured and provided such vessels to survivors, together with food and other utensils. While improved storage vessels may have been readily embraced by the affected population, they simply were not available in large numbers in the immediate aftermath of the disaster, and once conventional water containers were provided, relief organizations did not regard them as a priority.

The main reasons for not using household water treatment fall into five main categories:

- Emphasis on Water Quantity over Quality. As recommended by Sphere and other guidelines, the initial emphasis in the drinking water response was on quantity rather than quality. Physiological needs (hydration) are the first priority, and outweigh microbiological concerns. As discussed more fully below, this will have important implications in the priority attached to household water treatment.

- Unnecessary Given Bulk Supply of Water. Because the population affected by the tsunami was either displaced or had otherwise lost access to their customary sources of fresh water, they were dependent on water supplied in bulk. In fact, it is possible that the saline water intrusion that rendered so many surface and shallow groundwater sources unusable actually helped minimize waterborne disease since affected populations were not even tempted to consume water from such sources that were also likely to be contaminated by microbial pathogens.

- Need for Programmatic Support. All of the common means for treating water and maintaining its microbiological quality at the household level require some level of programmatic support. While some approaches, such as certain gravity filters that are easy to use and make noticeable improvements in water aesthetics, may require less of a behaviour change campaign than chlorination or solar disinfection, all household-based approaches require a commitment of both human and financial resources for their introduction that may be impractical in the early phases of a disaster. Moreover, while emergencies are often viewed as an opportunity to expose and introduce an affected population to new health and other initiatives, this in not typically true until the situation has become stabilized and recovery begins. As noted above with respect to parts of Aceh, the introduction of chlorination as an alternative to boiling was resisted. Among other things, this was due to its awareness, given its own long-standing campaign to promote boiling, of the significant effort required to obtain high levels of adoption of such interventions even without having to deal with a massive disaster.

- Concern about Mixed Messages. In Aceh where the practice of boiling drinking water is widely reported and genuinely appears to be a well-established behaviour, there was concern (particularly from the Ministry of Health and UNICEF) that new messages about alternative water treatment methods may confuse matters and result in a decrease in normal practice, thus leaving individuals exposed to increased risk of waterborne diseases. With so many agencies working on water, sanitation and hygiene promotion issues, the early stand made by UNICEF and the Government of Indonesia on the water boiling issue was an attempt to avoid proliferation of conflicting messages being given to the affected populations which only serves to dilute their effectiveness.

- Concerns about Sustainability. In addition to the previously discussed preference for existing practice, concerns about the sustainability of new

household-based water treatment methods also led to resistance to their introduction. For example, the Indonesian Government made it clear that they would not commit to the chlorination of all public water supplies once the relief agencies left and so it was important to maintain the high pre-tsunami levels of boiling. Although the circumstances and raised risk perceptions which result from a natural disaster may be sufficient to trigger initial or short-term behaviour change, as has been discussed, these do not seem to be sustained and people may no longer feel the need to treat their water if there aren't any visual or sensory cues to suggest that it is unsafe or unpalatable. Such short-term behaviour change without sustained promotion could be detrimental to health if it means the abandonment of previous safe drinking water practices. It will also be essential to maintain a supply of the hardware (e.g. sodium hypochlorite or flocculent/disinfectant sachets) which may become difficult in the unstable regions of Sri Lanka and Aceh.

Except for the concerns about sustainability, these reasons mainly argue against the premature introduction of household water treatment, rather than against its use altogether. In fact, many of the relief organizations who had procured products with a view toward introducing household water treatment reported that they still planned to do so but were waiting for more appropriate circumstances. Some organizations expressed the view that point-of-use water treatment at the household level was an ideal solution for certain members of the affected populations once they began to return to their home sites and no longer had access to bulk supplies of treated water. Others also reported that they planned to take advantage of the presence of large numbers of people in the camps and temporary settlements to introduce household water treatment as part of an overall water/sanitation/hygiene program and ensure its proper use before people vacated these settings.

For these reasons, conclusions about the role that household-based water treatment and safe storage in the tsunami response may be premature. Such interventions have demonstrated their effectiveness in development settings, and it is possible that they will be an important part of the overall drinking water response in the medium- and long-term. We have therefore recommended that this specific issue be revisited 12 to 18 months following the tsunami to better assess the role of household-based water treatment.

Medical wastes in emergencies

Special care must be taken with refuse from a field hospital or health centre. The main categories of waste of concern are: infectious waste; pathological waste; sharps; pharmaceutical waste; genotoxic waste; chemical waste; waste with high heavy metal content; pressurized containers; and radioactive waste. Each type of waste requires specific measures for handling, storage, collection, treatment and final disposal and destruction. In the case of simple health centres, particularly in rural areas, well-managed on-site burial may be appropriate. In larger centres producing a significant quantity of sharps and infected waste, high level technology may be required. When

health facilities operate diagnostic laboratory services, radiological diagnosis and treatment facilities, pharmacies, etc., waste management is a specialized activity requiring trained and well-equipped staff.

Waste management during triage and classification of victims

Triage and classification of victims generate potentially infectious waste. Since this is a rapid response activity, it is highly recommended that all wastes generated during this stage, without exception, are stored in containers, preferably in red bags, that are properly labelled as "bio-contaminated waste". Direct contact with such wastes must be avoided.

Waste management during routine medical activities

Management will be similar for permanent (existing hospitals and health centres) and provisional (field hospitals) health facilities.

Wastes should be segregated at the point of generation according to their type:

- Infectious, bio-contaminated wastes (including sharp materials);
- chemical wastes (drugs, chemical solutions, etc.);
- non infectious, common wastes (paper, cardboard, glass, or the like; empty chemical product containers should be treated as chemical wastes).

Only puncture proof, hermetic plastic containers of 2–5 litre capacity or opaque glass bottles should be used to store sharp objects

For each hospital room, washable and easily disinfected PVC containers with a capacity of 40–50 litres should be used. Waste should be disposed of in coloured bags according to national codification. Usually they are:

- red bags for bio-contaminated wastes;
- yellow bags for chemical wastes;
- black bags for common wastes.

These wastes should then be collected separately at latest 12–24 hours. Small carts, preferably with lids, should be adapted to this end. The personnel assigned to handle medical waste should be properly trained and should wear protective gear such as with aprons, masks, boots and gloves.

Treatment should be done according to the type of waste. Sharp materials disposed in puncture proof containers should then buried in a protected sharp pit. Existing functioning nearby waste treatment facilities should be used but only if safe means of transport can be ensured.

Burial area should be isolated and protected to avoid illegal recycling. However, this may not be possible in permanent health facilities, due to lack of space. In such cases, protected areas should be used at landfill sites to receive treated wastes. Common

wastes may be managed by the municipal waste-collection service, as long as they are not mixed and do not contain hazardous materials.

In the acute emergency phase, if no better options exist to treat infectious waste, a basic temporary incinerator for medical waste can be used. However, it is of outmost importance to be aware of the fact that though it may help reduce the volume of waste to be buried, it will produce toxic smoke, only partially reducing the health risks posed by the waste. The use of incinerators, as opposed to direct burial, besides exposing the operators to highly hazardous fumes, also creates an additional step in the disposal process, increasing the chances of waste escaping into the environment.

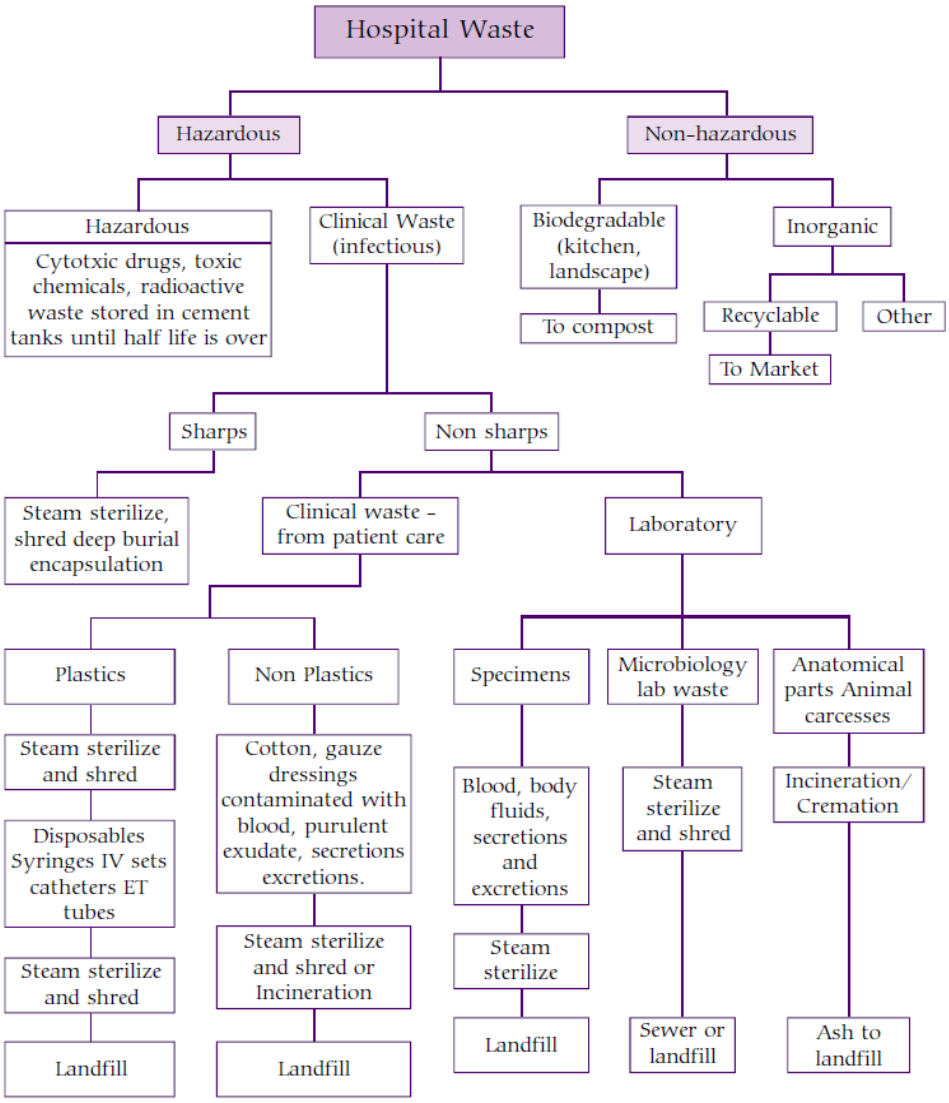
For the rehabilitation and reconstruction phases after the emergency, only long term environmentally friendly options should be selected. Non burn technologies such as autoclaving should always be preferred to incineration techniques

Source: WHO, 2005, "The Drinking Water Response to the Indian Ocean Tsunami Including the Role of Household Water Treatment". http://helid.desastres.net/en/d/Js8018e/1.html

Annex 8: Sanitation and Waste Disposal in Hospitals

Disinfectants	Recommended use	Precautions
Sodium hypochlorite 1% in-use dilution, 5% solution to be diluted 1:5 in clean water	Disinfection of material contaminated with blood and body fluids	• Should be used in well-ventilated areas • Protective clothing required while handling and using undiluted • Do not mix with strong acids to avoid release of chlorine gas • Corrosive to metals
Bleaching powder 7g/litre with 70% available chlorine Table 6 shows dilutions for bleach	Toilets / bathrooms - may be used in place of liquid bleach if this is unavailable	Same as above
Alcohol (70%) Isopropyl, ethyl alcohol, methylated spirit.	Smooth metal surfaces, tabletops and other surfaces on which bleach cannot be used.	• Flammable, toxic, to be used in well- ventilated area, avoid inhalation. • Kept away from heat source, electrical equipment, flames, hot surfaces. • Allow it to dry completely, particularly when using diathermy as it can cause diathermy burns.
Detergent with enzyme	Cleaning endoscopes, surgical instruments before disinfection is essential	Manual cleaning is an essential part of the cleaning process.

Note: A neutral detergent and warm water solution should be used for all routine and general cleaning. When a disinfectant is required for surface cleaning, e.g. after spillage or contamination with blood or body fluids, the manufacturer's recommendations for use and occupational health and safety instructions should be followed.



Source: Prüss A, Giroult E and Rushbrook P, eds. *Safe Management of Wastes from Health-care Activities*. Geneva, World Health Organization, 1999, page 168. Electronic access: http://whqlibdoc.who.int/publiations/9241545259.pdf

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Annex 9: Intervention of Primary and Secondary Prevention, Psychological First-Aid, Family and Community Support, and Community Support Functioning

Public Health Measures	Individual/Group Measures
Principle: Safety	
• As much as possible, bring people to a safe place and make it clear that it is safe • Provide an accurate, organized voice to help circumscribe threat and thereby increase the perception of safety where there is no serious extant threat • Inform the media that enhancing safety perceptions in a community can be achieved by media coverage that strategically conveys safety and resilience rather than imminent threat • Encourage individuals to limit exposure to news media overall, and to avoid media that contain graphic film or photos if they are experiencing increased distress following viewing • Recommend limiting the amount of talking about the trauma if doing so makes one more anxious or depressed • Teach people how to discriminate between political propaganda and more realistic information regarding threat in the context of war and terrorism. • Educate parents regarding limiting and monitoring news exposure for children	• Engage in imaginal exposure and real-world, in-vivo exposure which: ➢ Interrupt the post-traumatic stimulus generalization that links harmless images, people, and things to dangerous simuli associated with the original traumatic threat ➢ Re-link those images, people, and events with safety (The Bridge that collapsed was threatening, but all bridges are not." "That night was unsafe, but all nights are not unsafe.") • Utilize "grounding techniques," such as reality reminders, to bring individuals to the relative safety of the present time • Teach contextual discrimination in the face of trauma and loss triggers • Assist in developing more adaptive cognitions and coping skills • With children, include methods that aid in the reversal of regression in the ability to discriminate among indications of danger
Principle: Calming	
• First and foremost, engage in actions that help people directly solve concerns. (e.g., bolstering initial resources and preventing resource loss) • Give information on whether family and friends are safe, and if further danger is impending • Provide large-scale community outreach and psycho education via media presentation, interactive websites and computer programs about the following topics: ➢ Post-disaster reactions to help individuals see their reactions as understandable	• Offer direct approaches in anxiety management to help those with severe agitation, "racing" emotions, or extreme numbing reactions attain a state of mastery or calming, such as: ➢ Therapeutic grounding (For those with re-experiencing symptoms) ➢ Breathing retraining ➢ Deep muscle relaxation ➢ Stress inoculation training, including: ▪ coping skills

Public Health Measures	Individual/Group Measures
and expectable ➢ Anxiety management techniques for common post-trauma problems (e.g., sleep problems, reactivity to reminders, startle reactions, incident-specific new fears) ➢ Signs of more severe dysfunction, so that people also do not underpathologize their symptoms and know where to turn for professional assessment and treatment ➢ Limiting media exposure for those with minor to mid-level problems of anxiety ➢ Receiving news reports from a friend or family member that give the facts without the images and hyperbole, for those with more severe emotionality • **Not Recommended:** ➢ The use of lies, or "spinning" information, in order to calm a population or a group of rescued individuals, which ultimately undermines credibility and is counter-productive	▪ deep muscle relaxation ▪ breathing control ▪ assertiveness ▪ role playing ▪ covert modeling ▪ thought stopping, positive thinking and self-talk ➢ Yoga ➢ Mindfulness treatments ➢ Imagery and music paired with relaxed states ➢ Medications such as anti-adrenergic agents, antidepressants, and conventional anxiolytics ➢ Interventions with a combination of anxiety management skills, cognitive restructuring, and exposure ➢ Training in problem-focused coping, which assists individuals in breaking down the problem into small, manageable units. This will: ▪ increase sense of control ▪ provide opportunities for small wins ▪ decrease the real problems people are facing ➢ "Normalization" of stress reactions to reduce anxiety associated with reactions (e.g., "I'm going crazy," "There's something wrong with me," "I must be weak.") • Involvement with uplifting activities not associated with the trauma ➢ Purpose: ▪ To distract from distressing preoccupation with the trauma and its aftermath, (for individuals who are not in extreme distress) ▪ To promote a sense of predictability, normalcy, and control (in both the outer world and inner world of cognition and emotions) ▪ To foster positive emotions that include joy, humor, interest, contentment, and love and have a functional capacity to broaden a "thought-action" repertoire that leads to effective coping • Examples: ➢ Being with friends ➢ Listening to calming music ➢ Going to a movie

Public Health Measures	Individual/Group Measures
	➢ Watching a situation comedy ➢ Exercise (also has a depression-reducing and an anxiety-reducing effect) • **Not Recommended:** ➢ Benzodiazapene tranquilizers, which have been shown to increase the likelihood of PTSD among symptomatic trauma survivors, despite an immediate calming effect ➢ Psychological debriefing, which may enhance arousal in the immediate aftermath of trauma exposure ➢ Alcohol, which can lead to potential misuse and other alcohol-related behaviours
Principle: Self- and Collective Efficacy	
• Provide people with outside resources that can be used to help reverse the loss cycle, which leads to empowerment and restored dignity among citizens • Create a way to manage and orchestrate people's personal and environmental resources • As much as possible, involve victims in decision-making policy and efforts (e.g., targeting of need), to rebuild self- and collective efficacy. • Promote activities that are conceptualized and implemented by the community, such as: ➢ religious activities ➢ meetings ➢ rallies ➢ collaboration with local healers ➢ collective healing and mourning rituals • Foster "competent communities" that: ➢ encourage the well-being of their citizens ➢ provide safety ➢ make material resources available for rebuilding and restoring order ➢ share hope for the future ➢ support families, who are often the main provider of mental health care after disasters ➢ foster the perception that others are available to provide support, which:	• Individual and group-administered cognitive behavioral therapy (CBT) should: ➢ Remind individuals of their efficacy ➢ Encourage active coping and good judgment about when and how to cope ➢ Enhance sense of control over traumatic stressors ➢ Help to "recalibrate" expectations and goals that were formed under "normal" circumstances ➢ Translate intervention within the socio-cultural ecologies of the target countries • Foster behavioral repertoires and skills that are the basis of the efficacy beliefs, with practice involving increasingly difficult situations • Teach individuals to set achievable goals, so they may: ➢ reverse the downward spiral toward feelings of failure and inability to cope ➢ have repeated success experiences ➢ reestablish a sense of environmental control necessary for successful disaster recovery • With children and adolescents: ➢ Address developmental interruptions ➢ Promote normal and adaptive developmental progression ➢ Teach emotional regulation skills when faced by trauma reminders ➢ Enhance problem-solving skills in regard to post-disaster adversities

Public Health Measures	Individual/Group Measures
▪ mitigates the perception of vulnerability ▪ emboldens individuals to engage in adaptive activities they might otherwise see as risky • Collaborate with rural development and vocational skills training initiatives to: ➢ help local populations to enhance their survival capacities ➢ increase resilience and quality of life ➢ prevent exacerbation of psychological disturbances by instilling hope and helping survivors to acquire a sense of control and mastery • For children and adolescents: ➢ Be cognizant of the dangers of over-protectiveness ➢ Include them in community recovery ➢ Facilitate restoration of the school community, which fosters: ▪ renewed learning opportunities ▪ engagement in age-appropriate, adult-guided memorial rituals ▪ school-initiated pro-social activity (learned helplessness into learned helpfulness)	
Principle: Connectedness	
• Help individuals to identify and link with loved ones • Facilitate reconnection of children with parents and parental figures • Increase the quantity, quality, and frequency of supportive transactions between trauma survivors and their social supporters • Treat temporary housing and assistance sites as villages, whichhave: ➢ village councils ➢ welcoming committees ➢ churches ➢ places to go for services ➢ meeting places ➢ entertainment ➢ sports fields ➢ recreational activities ➢ places for teens to congregate under supervision ➢ religion-school-community partnership networks ➢ mentoring services	• Identify and assist those who lack strong support, who are likely to be more socially isolated, or whose support system might provide undermining messages (e.g., blaming, minimalization). • In cases of evacuation and destruction of homes and neighborhoods, or where informal social support fails, make it a priority to: ➢ keep individuals connected ➢ train people how to access support ➢ provide formalized support • Target social support via psychoeducation and skills-building, including: ➢ Enhancing knowledge of specific types of social support, such as: ▪ emotional closeness ▪ social connections ▪ feeling needed ▪ reassurance of self-worth ▪ reliable alliance ▪ advice

Public Health Measures	Individual/Group Measures
➢ community solidarity activities ➢ citizens who fill social roles within their natural cultural traditions and practices • As much as possible, address potential negative social influences (e.g., mistrust, in-group/out-group dynamics, impatience with recovery, exhaustion, etc.) when designing interventions	▪ physical assistance ▪ material support ➢ Identifying potential sources of such support ➢ Learning how to appropriately recruit support • Teach individuals to ignore attachment bonds in evacuation procedures • With families, include specific strategies to address discordance amongfamily members that may stem from: ➢ differences in the type and magnitude of exposure to trauma, loss, and subsequent adversities ➢ differences between family members' personal reactions to trauma and loss reminders
Principle: Hope	
• Provide services to individuals that help them get their lives back in place, such as: ➢ housing ➢ employment ➢ relocation ➢ replacement of household goods ➢ clean-up and rebuilding ➢ payment of insurance reimbursements • Develop advocacy programs to help victims work through red tape and the complex processes involved in the tasks that emerge following mass disaster. • Support rebuilding of local economies that allow individuals to resume their daily vocational activity, to prevent ongoing resource loss cycles • The media, schools and universities, and natural community leaders (e.g., churches, community centers) should help people with: ➢ Linking with resources ➢ Establishing systems that enable those in recovery from similar traumas to share their experience and hope with those struggling with recovery ➢ Memorializing and making meaning ➢ Accepting that their lives and their environment may have changed ➢ Making more accurate risk assessment ➢ Reducing self-blame ➢ Problem-solving	• Cognitive behavioral therapy (CBT) that: ➢ Reduces exaggeration of personal responsibility and counteracts cognitive schemas, such as catastrophizing and the belief that problems are due to an internal, stable trait ➢ Identifies, amplifies, and concentrates on building strengths ➢ Normalizes responses ➢ Indicates that most people recover spontaneously ➢ Highlights already exhibited strengths and benefit-finding, rather than promoting benefit-finding prior to an individual's readiness. ➢ Includes guided self-dialogue to: ▪ envision a realistic, yet challenging, even difficult outcome (e.g., accepting that one's home will take months to rebuild vs. the assertion that "I will never have a home again") ▪ underscore and restructure irrational fears ▪ manage extreme avoidance behavior ▪ control self-defeating self statements ▪ encourage positive coping behaviors • With children and adolescents, CBT that: ➢ Addresses ongoing trauma-generated expectations, beyond symptom response ➢ Includes forward-looking exercises that promote developmental progression to instill hope and renewed motivation for learning and future planning

Public Health Measures	Individual/Group Measures
➢ Setting positive goals • Building strengths that they have as individuals and communities	

Source: Five Essential Elements of Immediate and Mid-Term Mass Trauma Intervention: Empirical Evidence, the Journal of Lifelong in Psychiatry, Vol VII, No. 2, Spring 2009, p.235-237

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