

HEALTH



PDNA GUIDELINES VOLUME B



# CONTENTS

■ ACRONYMS	1
■ INTRODUCTION	3
■ ESTABLISHING THE ASSESSMENT PROCESS	4
■ PRE-DISASTER BASELINE	12
■ ASSESSMENT OF THE DISASTER'S EFFECT ON THE HEALTH SECTOR	14
■ DAMAGE AND LOSS DUE TO THE DISASTER	16
■ ASSESSMENT OF DISASTER IMPACT	18
■ CROSS-SECTORAL LINKAGES, INCLUDING CROSSCUTTING ISSUES	20
■ THE HEALTH SECTOR RECOVERY STRATEGY	21
■ ANNEX 1: STEPS FOR THE PDNA PROCESS FOR THE HEALTH SECTOR	32
■ ANNEX 2: ANALYTICAL MATRIX BASED ON HEALTH SECTOR RESPONSE DOMAINS AND BUILDING BLOCKS	34
■ ANNEX 3: WORKSHEET ON BASELINE UNIT COSTS FOR INFRASTRUCTURE AND ASSETS TO ESTIMATE DAMAGES (EXAMPLE)	42
■ ANNEX 4: WORKSHEET ON BASELINE UNIT COSTS TO ESTIMATE LOSSES (EXAMPLE)	43
■ ANNEX 5: DISTRICT DATA COLLECTION FORM (EXAMPLE)	44
■ ANNEX 6: WORKSHEET TO ESTIMATE COSTS OF DAMAGES AND LOSSES (EXAMPLE)	45
■ ANNEX 7: FORM TO CALCULATE LOSS OVER TIME IN THE HEALTH SECTOR (EXAMPLE)	48
■ ANNEX 8: SAFE HOSPITAL INTERVENTIONS (EXAMPLES)	49
■ ANNEX 9: DISASTER RISK REDUCTION AND PREPAREDNESS INTERVENTIONS (EXAMPLES)	50
■ ANNEX 10: WORKSHEET FOR A RESULTS-BASED RECOVERY PLAN (EXAMPLE)	51
■ ANNEX 11: GLOSSARY	51
■ ANNEX 12: REFERENCES AND FURTHER READING	52



## ACRONYMS

<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>DRM</b>	Disaster Risk Management
<b>DRR</b>	Disaster Risk Reduction
<b>HIV</b>	Human Immunodeficiency Virus
<b>MDG</b>	Millennium Development Goals
<b>MOHS</b>	Ministry of Health
<b>PDNA</b>	Post Disaster Needs Assessment
<b>SGBV</b>	Sexual and gender-based violence



## INTRODUCTION

This document provides guidance to national and international stakeholders involved in the health sector during Post Disaster Needs Assessments (PDNA) processes and recovery planning. The guidance is based on applying an integrated approach when undertaking the PDNA process. An **integrated approach** involves taking the standard damage and loss assessment methodology and including a recovery strategy that puts special emphasis on the human condition.

Updates and additional tools for PDNAs and guidance for recovery planning in the health sector can be found on the websites of the following organisations:

- International Recovery Platform;
- Pan American Health Organisation (PAHO);
- United Nations Economic Commission for Latin America and the Caribbean (ECLAC);
- World Bank Global Facility for Disaster Reduction and Recovery (GFDRR); and
- World Health Organisation (WHO).

This guidance brings together the four components needed for a comprehensive PDNA analysis, which are:

1. health infrastructure and assets;
2. delivery of health services (including access to and changes in demand for services);
3. health governance processes; and
4. vulnerability and health risks of the affected population.

These elements will be used consistently when describing the pre-disaster baseline, the effects of the disaster, the estimation of the economic value of damage and loss, the disaster's impact on the economy and human development, and what is needed for a recovery and reconstruction strategy, including elements of building back better (referred to as BBB) and related costing.

Building back better refers to the concept that recovery and reconstruction should not only aim at restoring the health system to its pre-disaster condition, but also should address underlying vulnerabilities that may have contributed to the extent of the disaster's effects. Building back better aims to strengthen the resilience of the health system and communities so that they can better manage future disasters and their risks to the health sector.



## ESTABLISHING THE ASSESSMENT PROCESS

### A MULTISECTORAL PROCESS

When a country is affected by a disaster, the analysis of its effects and the formulation of the needs for recovery and reconstruction are done through a multisectoral process. This process helps to acknowledge the differences between sectors, but also their interdependency. Sectors and their accompanying sub-sectors are defined by the National Accounting Framework of a country. Broadly speaking, PDNAs often distinguish between three main groups of sectors: 1) productive, 2) social, and 3) infrastructure, and 4) cross-cutting. Health falls under the social sector, together with education, housing and culture. Nutrition is usually integrated under health.

### RECOVERY COORDINATION AND CONSULTATION

The health sector PDNA process is led by the Ministry of Health (MoH). The first step is for the Minister of Health to designate a focal point to manage the health part of the PDNA and recovery process. The MoH recovery focal point will work together with the other sectoral focal points appointed by the government, which allows synergies with other sectors relevant to health. Depending on the national context, the recovery process may fall under a National Disaster Management Authority. If the MoH has a focal point responsible for health disaster risk management functions connected to the National Disaster Management Authority, this person may also be appointed as the focal point for recovery.

The MoH recovery focal point will establish a health sector recovery coordination mechanism that allows mobilisation of technical resources from relevant departments in the MoH and consultation with subnational health authorities. When a government requests external support for a PDNA process, the MoH recovery focal point will be supported by recovery experts from WHO, the World Bank and the European Union. A small Steering Group can be established with clear roles and responsibilities assigned to the various stakeholders. For examples of practical steps to take in managing the PDNA process, including timelines, see **Annex 1**.

In addition to the United Nations, World Bank and European Union, it is important to involve all relevant health partners in the PDNA process, such as other United Nations agencies, development banks, donors, non-governmental organisations, faith and community based organisations, civil society, professional associations and the private sector.

## LINK TO HEALTH SECTOR DEVELOPMENT COORDINATION

If a national health sector development coordination mechanism exists - such as a sector-wide approach or an international health partnership - the recovery Focal Point should be connected to this group and the development partners need to be consulted to assist in the PDNA process. This ensures optimal harmonisation and alignment of the recovery strategy to national health policy and strategic planning. If such a sector-wide development coordination mechanism does not yet exist, the PDNA process can be used as an opportunity to initiate one.

## LINK TO HUMANITARIAN COORDINATION

The PDNA process needs to be linked to national and subnational coordination for humanitarian responses. Since the humanitarian reform of 2005, national emergency coordination mechanisms are supported through the Inter-Agency Standing Committee's Cluster Approach.

It is particularly important to ensure that the PDNA builds on humanitarian assessments, as much as possible. Information collected to inform humanitarian responses (for example, a Multisectoral Initial Rapid Assessment (MIRA) or a Health Resources Availability Mapping System (HeRAMS) is also essential to inform the PDNA and recovery strategy.

## THE ASSESSMENT FRAMEWORK

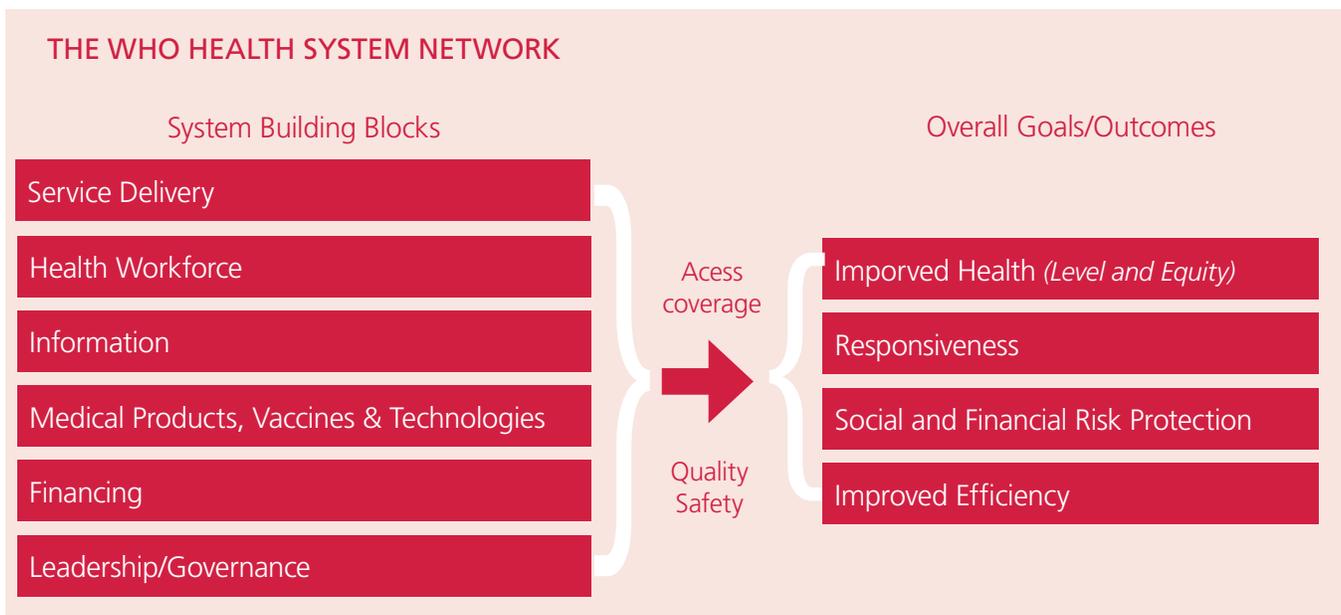
While the health sector part of the PDNA is harmonized with the other sectors, it makes use of existing, specific health system frameworks and assessment methods. This section describes how existing frameworks and methods can be used to identify relevant issues that need be assessed to inform the various elements of the PDNA.

## THE HEALTH SYSTEM FRAMEWORK

WHO, in the *World Health Report 2000* and their 2007 framework for action *Everybody's Business: Strengthening Health Systems to Improve Health Outcomes*, defines the health sector as a system which "consists of all organisations, people and actions whose primary intent is to promote, restore or maintain health." This includes efforts to influence determinants of health as well as more direct health-improving activities.

According to WHO, a health system framework is made up of six building blocks, with a strong interdependence between the building blocks. These are:

- **service delivery:** packages; delivery models; infrastructure; management; safety and quality; demand for care;
- **health workforce:** national workforce policies and investment plans; advocacy; norms, standards and data;
- **information:** facility and population based information and surveillance systems; global standards, tools;
- **medical products, vaccines and technologies:** norms, standards, policies; reliable procurement; equitable access; quality;
- **financing:** national health financing policies; tools and data on health expenditures; costing; and
- **leadership and governance:** health sector policies; harmonisation and alignment; oversight and regulation.



## HEALTH SECTOR ASSESSMENT AND ANALYSIS FRAMEWORK

Health sector analyses are based on the above health system framework. The health system framework is used in an assessment and analysis matrix that guides the health recovery team to establish:

1. a baseline; a systematic assessment of changes in the epidemiology of the burden of disease; the performance of the main health programmes; and
2. the six health system building blocks.

It takes into consideration the assets, stakeholders and processes that are typically included in the sector and how these may be affected by a disaster. This enables analysis of how pre-existing performance and constraints may affect the requirements needed to restore access to essential services, meet new health needs and identify priorities for Building Back Better. Using the existing health system framework as a starting point allows linking recovery planning with longer-term national health development plans.

## HEALTH SECTOR RESPONSE DOMAINS

Linked to service delivery, WHO lists a number of health sector response domains. These domains are:

1. general clinical services and essential trauma care;
2. child health (including treatment of malnutrition);
3. communicable diseases;
4. sexual and reproductive health (including STI and HIV/AIDS, maternal and newborn health and sexual violence); and
5. non-communicable diseases and mental health; and
6. environmental health.

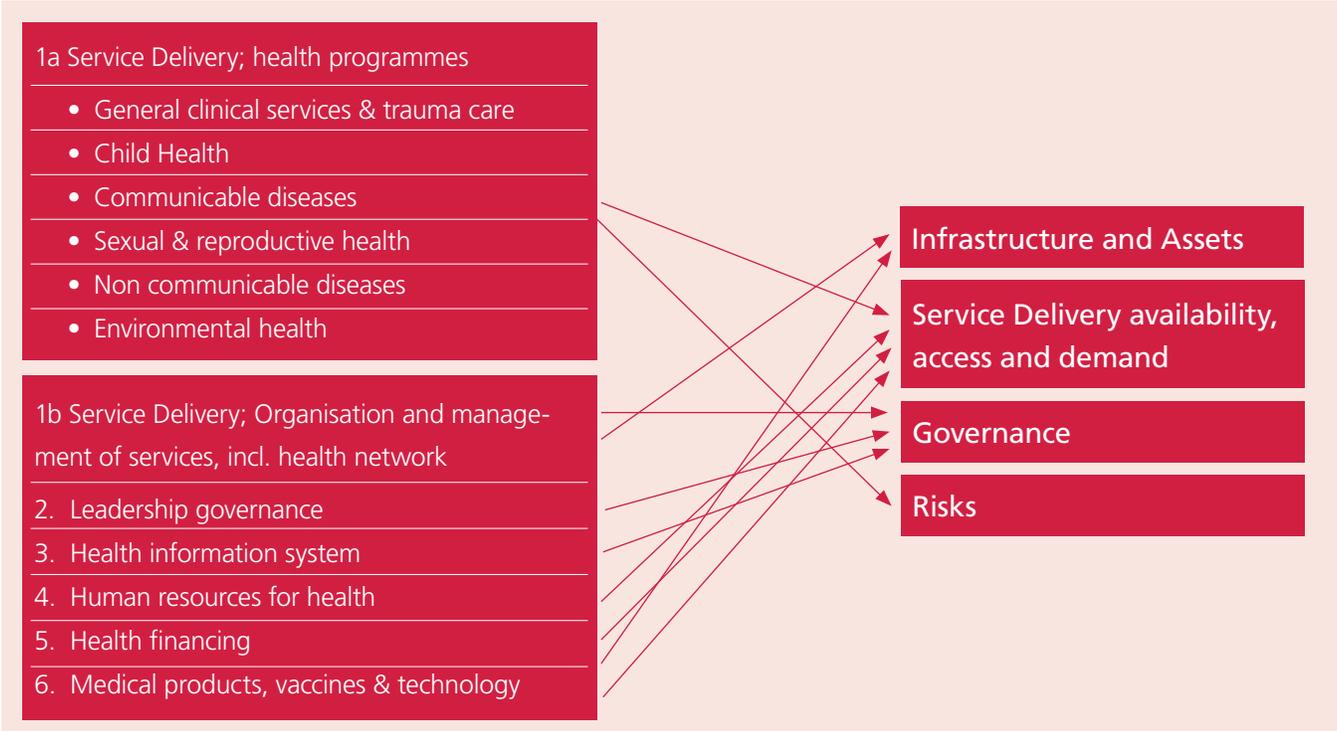
The domains represent the main health programmes that should be taken into account when undertaking a PDNA to determine the pre-existing burden of disease related to each domain and how the disaster affected this. Also required is an assessment of the performance of health programmes that had been addressing the morbidity and how this capacity has been affected by the disaster.

### RISKS TO HEALTH AND SOCIAL DETERMINANTS OF HEALTH

The health sector response domains can also be used to describe pre-existing risks that contribute to the related burden of disease. To determine the effect of the disaster on health risks, the analysis needs to include how these risks and determinants were affected by the disaster and if the disaster created new health risks.

### LINKING THE HEALTH SYSTEM FRAMEWORK WITH THE FOUR PDNA RECOVERY ELEMENTS

The diagram below demonstrates how the components of the health system framework and the health sector response domains are linked to the four dimensions of a PDNA: 1) infrastructure; 2) Service Delivery; 3) governance; and 4) risks.



## HEALTH SECTOR ASSESSMENT AND ANALYSIS MATRIX

The analytical matrix (see Table 1) provides a standardised and systematic protocol for collection and analysis of assessment data.

**Table 1:** Analytical matrix for the health sector contribution to the recovery strategy

Health programmes and health system functions	Baseline indicators, pre-crisis challenges	Effect of the disaster, key challenges for early recovery	Humanitarian response	Response for recovery, including building back better approaches, for the short, medium and long term	Key indicators for monitoring
1. (a) Service delivery - health programmes: <ul style="list-style-type: none"> <li>• general clinical services and trauma care</li> <li>• child Health</li> <li>• communicable diseases</li> <li>• sexual and reproductive health</li> <li>• noncommunicable diseases and mental health</li> <li>• environmental health</li> </ul>					
1. (b) Service delivery - organisation and management of services, including the health network					
2. Leadership and governance					
3. Health information system					
4. Human resources for health					
5. Health financing					
6. Medical products, vaccines and technology					

The matrix assists the assessment team to collect information that is aligned with key chapters of PDNA sectoral reports, such as the sector overview and baseline and disaster effect and recovery needs, including building back better approaches. The health sector team collects and provides information based on the best available data, evidence and/or professional judgements.

**Annex 2** provides examples of baseline data and indicators, common disaster effects, constraints and responses in relation to the immediate relief and early to medium recovery responses. WHO fact sheets on the health effects of hazards are also a good resource ([www.who.int/hac/techguidance/tools/WHO\\_strategy\\_hazards.pdf](http://www.who.int/hac/techguidance/tools/WHO_strategy_hazards.pdf)).

## ASSESSMENTS

### EXISTING DATA AND INFORMATION

A data collection strategy and gathering information for health sector recovery should be seen as a process and placed within a cycle of disaster management.

Assessments and information gathering required for recovery should build on data collected even before the disaster happened - data available from the normal health information management systems and other reports, such as disaster preparedness reports. This available data can be used as pre-disaster baselines and to inform rapid assessments in the early humanitarian phase. The data should then become part of a monitoring system of health system performance that can also measure the progress of the humanitarian response and recovery activities.

The scope and depth of the health sector assessment is constrained by the limited time in which it needs to be accomplished. Whenever possible evidence should be used; but it may also involve using the expert judgements of the team on the validity and accuracy of estimates. In particular for the estimates of costs, both for damage and loss, but also for the recovery plan, underlying assumptions and unit costs used in calculations need to be explained in a separate assumption sheet (**see Annexes 3 and 4**).

### SECONDARY AND PRIMARY DATA

The assessment teams should make use of existing secondary data whenever possible, such as data that has already been collected through humanitarian interventions, and decide which critical additional information needs to be collected specifically for the PDNA.

Primary data collection is usually limited to purposefully selected field visits, to verify assumptions based on the secondary data review and to seek the perspective of health authorities and communities in the affected areas.

### SOURCES FOR ASSESSMENTS

PDNAs are based on mixed assessment methods, as there is no single source or single method that can provide all the necessary information. The main sources for the PDNA are key informants, for example, from the MoH and development partners, focus group discussions with stakeholders and relevant experts, health facility-based information systems, observations, complemented by surveys of health facility performance and population-based surveys.

When surveys are appropriate, sampling will be purposive in the initial phases towards representative sampling in later phases (see: *Operational Guidance for Coordinated Assessments in Humanitarian Crises*. Inter-Agency Standing Committee, Needs Assessment Task Force, 2010). **Annex 5** provides an example of data to be collected from district health authorities on the effects of the disaster that is required to estimate damage and loss.

Care must be taken to ensure that both women and men from the affected community can participate in assessments. There needs to be a gender balance of the assessment team conducting the interviews, as well as of the informants and participants in focus group discussions. If appropriate, separate, private interviews can be held with men and women and attention should be paid to the time and venue of the assessment, etc., to ensure that both genders can participate equally. The needs, priorities and interests of women and men of all ages as

well as sub-groups of the population should be identified through a gender and age analysis based on the routine collection of qualitative sex and age disaggregated data and indicators, qualitative information sources and consultations and interviews with women and men in communities and among key stakeholders.

## RESOURCES AND DOCUMENTS TO CONSULT FOR ASSESSMENTS

Key resources and documents for the baseline, as well as identification of pre-existing constraints, and to guide recovery priorities include:

- the WHO statistics information system (see: [www.who.int/whosis/en/](http://www.who.int/whosis/en/));
- national statistics and health information management system reports (including morbidity rates of the common diseases in the country and in the affected area for the past five years);
- national health policy documents and annual health sector reviews;
- national disaster preparedness plans;
- available data from the MoH on location and capacity (such as numbers of beds, consultation rates, etc.) of both the public and private health infrastructure network, standards for health facilities, equipment and services, and their related unit costs;
- a description of the health management system, including its financing sources (whether free medical attention is given and paid for by the government or whether individuals must pay themselves and/or with the help of medical insurance schemes) and annual government budget appropriations; the unit cost of the services supplied (including differences in unit costs between the private and public sector), such as the cost of an outpatient consultation, daily hospital admission, etc.
- demographic health surveys and multi indicator cluster surveys;
- vulnerability and risk assessment and mapping;
- World Bank and UNDP Millennium Development Goal websites;
- humanitarian assessments and surveillance reports (MIRA, Public Health Risk Assessments, Disease Early Warning Systems);
- health strategies in the Inter-Agency Standing Committee Flash Appeal and/or the humanitarian strategic response plan; and
- humanitarian general and health sector situation reports (humanitarian dashboard).

For more on common indicators, see:

- [www.who.int/healthmetrics/tools/GFGuidanceOnRecommendedIndicators09.pdf](http://www.who.int/healthmetrics/tools/GFGuidanceOnRecommendedIndicators09.pdf)
- [www.who.int/hac/global\\_health\\_cluster/guide/tools/en/index.html](http://www.who.int/hac/global_health_cluster/guide/tools/en/index.html)
- [www.who.int/hac/techguidance/tools/disrupted\\_sectors/en/index.html](http://www.who.int/hac/techguidance/tools/disrupted_sectors/en/index.html)

For more on humanitarian assessment methods for the health sector, refer to the *WHO Health Cluster Guide*: [www.who.int/hac/network/global\\_health\\_cluster/guide/en/index.html](http://www.who.int/hac/network/global_health_cluster/guide/en/index.html).

## HEALTH SECTOR OUTPUTS FOR INCLUSION IN THE PDNA

The health sector assessment should have two outputs that are included in the larger PDNA document. The first is a summary of the health sector situation, requirements and proposed recovery strategy, which is usually no more than three to four pages. The second output is a 15-20 page more detailed report from the assessment and a more detailed strategy for recovery. These reports typically include a set of tables or annexes (see Annexes 6 and 7). The time horizon for the recovery strategy is determined by the government, but usually ranges from two to five years.

The more extensive health sector recovery strategy and plan can be used as a basis for reviewing and revising, as required, provincial and district health plans in the areas affected.

Examples of post-disaster health sector assessments and recovery plans can be found on the websites of the World Bank ([www.gfdr.org/node/118](http://www.gfdr.org/node/118)) and the International Recovery Platform ([www.recoveryplatform.org/resources/tools\\_and\\_guidelines](http://www.recoveryplatform.org/resources/tools_and_guidelines)).

## THE ASSESSMENT TEAM

The health sector assessment team normally is headed by a designated leader from the MoH, and includes experts from different professional disciplines as required for the assessment, and should be supported by experts from international organisations. In general, the team needs to have experts on public health and health systems, including medical doctors and epidemiologists, together with architects or civil engineers (that can estimate the value of damage to health infrastructure), and health economists that can estimate the value of production losses. Depending on the areas affected by the disaster, the subnational health authorities need to be involved in the assessment to ensure full access to information at all levels and to all locations in the affected areas, as well as to seek their views for the recovery strategy.

An adequate gender balance of the assessment team needs to be ensured. One team member should be appointed as the gender focal point and be responsible for coordinating findings with other teams and the gender advisor. This person should have prior experience with gender mainstreaming in the health sector. Health development partners will be offering assistance to support the health recovery assessment. A Steering Committee can be formed, inclusive of the most relevant stakeholders, to oversee the health recovery assessment process and ensure consultation with partners. Provisions for engagement with representatives of private health facilities should also be made, since in many countries the private sector share contributes significantly to the health infrastructure and subsequent service delivery capacity.

Transport for the assessment team is required to conduct site visits for direct observation and consultation with local health authorities and managers of affected health facilities. Transportation for the PDNA assessment should be supported by the development partners, so the national authorities can dedicate their transport capacity to the emergency response.

# PRE-DISASTER BASELINE

This section describes how to create a health sector overview and a pre-disaster baseline and which key issues should be addressed under the four PDNA components.

To estimate the effect of a disaster on the health sector, it is necessary to know what the health sector's characteristics were prior to the event. Average unit costs for the various components of the PDNA need to be established in the baselines. Most of this information should be available before the disaster happens and be part of the disaster risk management and preparedness process.

In this section the most important pre-disaster challenges and constraints for service delivery are highlighted. Further details can be found in **Annex 2**, under the column 'pre-disaster baseline and challenges'.

## CONTEXT

The baseline starts with a context analysis. This should include:

- a description of the development status of the country (for example, the country's ranking in the Human Development Index and health sections in Poverty Reduction Strategies);
- the country's progress in achieving health-related Millennium Development Goals; and the political context.

## INFRASTRUCTURE AND ASSETS

The baseline describes health system-related infrastructures and assets, as listed below. The baseline should include data for the public, private not-for-profit and private for-profit sectors.

- Description of the health network, including the locations and the levels of the health system (community, primary, secondary and tertiary levels) and referral mechanisms.
- Data on numbers of the various levels of the health infrastructure (for example, based on Service Availability and Readiness Assessments).
- Description of the physical infrastructures, including facilities for vertical health programmes, public health institutes, laboratories, pharmaceutical factories and warehouses.
- Logistics of the health system, such as transport of patients and pharmaceuticals.
- Administrative infrastructure for the health authorities.
- Infrastructure for schools and universities for training health workers is usually included under tertiary education under the education sector.

## SERVICE DELIVERY, AVAILABILITY, ACCESS AND CHANGES IN DEMAND

As part of the baseline, information related to service delivery should be described and can be broken down as follows:

- Key health status and coverage indicators linked to the health sector response domains.

- The socio-demographic situation and the status of the main epidemiological indicators, including the morbidity incidence of diseases that are relevant to the type of disaster in question.
- Availability and coverage of services can be described for the various health programmes and related to health status indicators, disaggregated by age and sex when relevant.
- Focus on top five mortality and morbidity patterns.
- Status and progress of health-related MDG indicators.
- Key indicators linked to human resources for health, health financing and medical products and technology. Describe main constraints when these factors affect coverage and access to services.
- Access, as defined by coverage and utilisation, as determined by affordability, financial and geographical barriers, cultural barriers and quality of care. (Utilisation can be described by average consultation rates.)
- Availability and coverage of essential packages of health services.

## GOVERNANCE

To describe how the health system is governed, the baseline should describe the items below.

- Organisation, management and regulatory functions of the health authorities for general service delivery.
- Funding sources and mechanisms for the health sector.
- Vision and mission statements from national health strategic plans and priorities for health sector reform.
- Participatory governance mechanisms for health service provision and processes at all levels (national to community level), including existence of complaint mechanisms for patients.
- (Disaster) Laws and regulations affecting the access of segments or sub-groups of the population to certain health services, e.g. reproductive health services.
- Coordination mechanisms for health development and humanitarian and disaster risk management.
- Health sector preparedness plans.
- Capacity to manage disaster response and recovery processes.
- Functionality of health information management and early warning systems.

## RISKS AND VULNERABILITIES

A pre-disaster baseline analyses the potential risks and vulnerabilities of the country's health system. These include:

- social determinants of health that could lead to increased marginalisation and discrimination in access to health services, including but not limited to poverty, ethnicity, religion and gender; pre-existing health risks, and types of disasters and presence of diseases with epidemic potential epidemics that have occurred in the country, including sexual- and gender-based violence (SGBV); and
- marginalised and/or disadvantaged sub-groups of the population with a special risk profile.

# ASSESSMENT OF THE DISASTER'S EFFECT ON THE HEALTH SECTOR

The section provides key considerations that will help analyse the effects on health and health sector performance linked to the four dimensions of PDNA, in both the public and private sectors, as well as the direct responses to mitigate these effects.

In **Annex 2**, the column on 'disaster effects' provides further examples of effects of disasters on the health system building blocks and the health sector response domains, followed by typical humanitarian responses.

## GENERAL DESCRIPTION OF THE DISASTER

The assessment begins with a general introduction describing the disaster, including the following information:

- geographical scope, population affected, number of people dead and injured, the evolution till date, etc.; and
- priorities for the immediate humanitarian response.

## EFFECTS ON INFRASTRUCTURE AND PHYSICAL ASSETS

The disaster's effects on the infrastructure and physical assets of the health system are then described, including:

- physical damage to health system infrastructure (both total numbers and percentage against baselines of the various levels of health facilities, whether partially or fully damaged, disaggregated by administrative units, and including private and public facilities); physical damage to furniture, equipment and medical supplies; and
- types and numbers of temporary health facilities established to replace damaged health facilities or in settlements of displaced populations.

## EFFECTS ON SERVICE DELIVERY, ACCESS AND DEMAND

Answering the questions below will help to assess the effects of the disaster on service delivery, access and demand.

- To what extent did the damage to infrastructure affect the functionality of the facilities and decrease availability of health service delivery?
- What is the effect of the disaster on morbidity patterns, in particular injuries, mental health ([www.who.int/mental\\_health/emergencies/en/](http://www.who.int/mental_health/emergencies/en/)) and incidences and nature of SGBV?
- How are health facilities in unaffected areas able to deal with trauma, SGBV and injuries, including capacity for transport and medical evacuations?
- How do population movements influence the caseload for health facilities in unaffected areas that host displaced populations?
- What are the direct effects on health workers (including displacement, deaths and disabilities) and indirect effects on the capacity to train health workers to address new and/or increased morbidity?

- What are the effects on the availability of pharmaceutical products?
- How does the disaster affect the access to health services of women and men of all ages and sub-groups of the affected population?
- How did the disaster affect the 'ability to pay' for access to health services for affected households and those that lost their livelihoods?
- Are there new geographic barriers to access functional health facilities?
- As a result of death, injury, displacement and migration caused by the disaster, household composition may change. As women and men may have different mobility and levels of access to and control over income, specific attention must be paid to access to services of households newly headed by women, older people or children.

## **EFFECTS ON GOVERNANCE AND SOCIAL PROCESSES**

Analyse how the disaster affected health sector governance and social processes by considering the questions below.

- How did the disaster affect the capacity of the health authorities to manage health services?
- How did the disaster affect the capacity of the health authorities to coordinate the humanitarian response and recovery process?
- What capacities are brought to the disaster response through international aid agencies and how can this capacity be used to support the recovery process?
- Are health information management systems affected by the disaster and are the health authorities able to establish early warning systems?

## **EFFECTS ON RISKS AND VULNERABILITIES**

- When examining the disaster's effects on health risks and vulnerabilities, be careful to consider the status of children, pregnant and lactating women, older persons, persons with disabilities and persons living with long-term or chronic illnesses.
- What was the impact of the disaster on the health of women and men of all ages and sub-groups of the affected population?
- Did the disaster affect the pre-existing health risks?
- What are the new disaster-induced health risks that women and men of all ages, households and communities may face?
- What are the increased risks for the transmission of communicable diseases (e.g., cholera, malaria, influenza, measles, TB), but also health risks due to the interruption of emergency and routine services, such as emergency obstetric care services and care for chronic and noncommunicable diseases (e.g., heart disease, diabetes, cancer, etc.).
- Has the disaster exposed populations to SGBV? (SGBV can increase after disasters and during crises).

# DAMAGE AND LOSS DUE TO THE DISASTER

This section gives guidance on how to estimate the value of damages and losses to the health sector due to the disaster. Damage and loss valuation extracts from the section on effects of the disaster as a starting point. Identify those elements that have financial implications, including damages to infrastructure and assets and losses due to changes in financial flows as linked to infrastructure, service delivery, governance and risks. Damage and loss should be disaggregated for public and private facilities.

## DAMAGE

The damage analysis looks at health infrastructure including hospitals, health centres and other health sector-related facilities, including health authority administration buildings, equipment and furniture and medical supplies. Damage is defined as the value of destroyed durable physical assets (buildings, equipment and machinery), replaced with the same characteristics and standards as prior to the disaster. In principle, assessment of infrastructure damage is done on a facility by facility basis, usually based on detailed estimates of numbers of square metres of the infrastructure damaged (disaggregated for roofing, floors, walls, etc.) with average unit costs per square meter for repair.

When large numbers of health facilities are damaged in the disaster-affected area and it is not feasible to assess all damaged facilities separately, estimates of the numbers of partially and fully damaged health facilities are made. The estimate is based, for example, on reports from subnational health authorities and initial humanitarian assessments. The estimation uses the average estimated value based on standards for each type of health infrastructure and average costs for repair and rehabilitation of partially damaged facilities by type. The same applies for the value of damaged equipment, furniture and medical supplies. In principle, this should be based on a detailed assessment for each health facility against pre-disaster inventories. But in case of large numbers of affected health facilities, average estimates need to be made, for example as a percentage of full replacement costs against national standards.

## LOSS

Loss refers to changes in the financial flows of the sector due to the temporary absence of infrastructure and assets and to increased or new demands for medical interventions for the affected population. Losses are measured as the change in operational costs for the provision of post-disaster medical care. Operational costs post disaster normally include higher expenditures over and above the normal budgetary appropriations for the health sector and lower revenues. Most interventions that involve increased expenditures are those that are managed as humanitarian response interventions to address the immediate consequences on health and health risks of the affected population.

It is important to determine the time needed for rehabilitation and reconstruction of health facilities, not only for planning the reconstruction, but also as losses occur until reconstruction has been completed, and/or prevention or control of epidemics have been accomplished and health risks are back to pre-disaster levels. **Annex 7** provides a table to plan recovery interventions over time.

As mentioned earlier, an assumption sheet must be produced, explaining how unit costs were estimated and what other assumptions were made to calculate damage and loss. More details on the method to calculate the costs of damage and loss can be found in *Damage, Loss and Needs Assessment: Guidance Notes, Volume 2*, The World Bank, Global Facility for Disaster Reduction and Recovery. 2010.

**EXAMPLES**

Typical examples for damage and loss are found in table 2 below. **Annexes 3 and 4** provide examples of tables for baseline unit costs and assumptions on damage and loss for the health sector as included in PDNA sector reports.

**Table 2:** Typical elements included in an assessment of damage and loss

Damage	Changes in flows
<p><b>Infrastructure and assets</b></p> <ul style="list-style-type: none"> <li>• Buildings disaggregated by community, tertiary, secondary and primary levels (hospitals, health centres, clinics, dispensaries, pharmacies, health posts, blood banks, laboratories, etc.)</li> <li>• Equipment and furniture</li> <li>• Medical supplies</li> <li>• Transport and logistics, ambulances, etc.</li> <li>• Infrastructure of the Ministry of Health at national and subnational levels</li> </ul> <p>Notes:</p> <p>Ambulances are included under the secondary and tertiary facilities.</p> <p>Pharmaceutical factories are included under the industry sector.</p> <p>Schools and universities for training health workers are usually included under tertiary education infrastructure in the education sector. The reduced ability to scale up health workers capacity may be a constraint to service delivery.</p>	<p><b>1. Increased expenditures for:</b></p> <p><b>infrastructure</b></p> <ul style="list-style-type: none"> <li>• remove debris, mud and other bio-hazardous materials from the destroyed or damaged facilities</li> <li>• establish temporary health facilities or mobile clinics for displacement settlements or in the vicinity of damaged facilities until facilities are reconstructed</li> </ul> <p><b>service delivery and access</b></p> <ul style="list-style-type: none"> <li>• treating increased number of patients due to new and/or increased health risks</li> <li>• additional cost per patient treated in alternative, temporary medical facilities</li> <li>• long term medical treatment for disabilities and psychological care of affected people</li> </ul> <p><b>governance</b></p> <ul style="list-style-type: none"> <li>• costs for increased coordination needs, support management capacity for service delivery</li> <li>• costs for establishing early warning systems</li> </ul> <p><b>risk reduction</b></p> <ul style="list-style-type: none"> <li>• additional expenditures for surveillance and control of possible epidemics</li> <li>• health prevention campaigns, vaccinations, vector control, etc.</li> <li>• health promotion campaigns</li> </ul> <p><b>2. Loss of revenue, due to:</b></p> <ul style="list-style-type: none"> <li>• interrupted service delivery in damaged facilities during the period of rehabilitation and/or reconstruction; and</li> <li>• temporary suspension of user fees for affected population.</li> </ul>

# ASSESSMENT OF DISASTER IMPACT

## MACRO-ECONOMIC IMPACT

The macro-economic impact analysis includes an estimation of the disaster likely effects on economic performance and the temporary macro-economic imbalances that may arise, as well as the temporary decline in employment, income and well-being of affected individuals and households. To measure the impact on macro-economic variables, analyses are usually made of the post disaster performance on gross domestic product, the balance of payments and the fiscal sector. For the health sector, an additional analysis can be done on the impact of the cost of damage and loss in relation to total health expenditures.

The health sector assessment team should deliver the following estimates of values to the PDNA team members handling the economic impact analysis:

- The higher number of medical attention provided to patients and the lower number of surgeries undertaken as a result of the disaster. This data will be used for the estimation of the disaster's impact on the value and growth of gross domestic product.
- The higher costs of monitoring morbidity rate increases and of preventive measures arising as a result of the disaster. This data will be used for the estimation of the disaster's impact on the value and growth of gross domestic product.
- The estimated recovery items (including items related to prevention and mitigation for the health sector) that must be imported from other countries in the absence of local production. This information will be used for the analysis on the balance of payments.
- The estimated portion of the health sector reconstruction costs that will have to be imported from abroad due to not being produced locally, expressed in a percentage of the total estimated reconstruction needs. This information will be used for the impact analysis on the balance of payments.
- The total value of higher government expenditures and lower revenues, over and above regular budget appropriations. This information will be used for the analysis of the fiscal sector impact.
- Estimates of the higher-than-normal costs of obtaining medical or health care. This will be used for the analysis of personal or household impacts.

## THE HUMAN DEVELOPMENT IMPACT

The human development impact is the difference between pre-disaster and post disaster levels of human development directly resulting from the disaster. The impact on human development is the disaster impact on the quality of human life in the medium and long term as measured through indexes, such as the Human Development Index, Gender Inequality Index, Multidimensional Poverty Index, the Millennium Development Goals and/or the new Sustainable Development Goals.

To estimate the human development impact of the disaster, it is useful to analyse:

- the performance on human development components before the disaster utilizing a pre-crisis baseline (pre-disaster human development trends, including key challenges, and the salient features of the policies implemented pre-crisis that influenced the condition of human development for affected populations); and

- the consequences of the disaster effects indicating short, medium and long term implications through business as usual scenarios, worse case scenarios and/or best case scenarios, based on past performance had the disaster not occurred, utilizing clearly stated assumptions.

When using the health-related MDGs, several indicators are difficult to measure over short periods of time, as the indicators were not designed as dynamic measures and are not sensitive to shocks, such as disasters. Health information systems may not provide required data at disaggregated level for the districts affected, such as maternal mortality ratios. However, data on other indicators, such as measles immunization coverage, antenatal care coverage, or HIV, TB and malaria patients with access to treatment, are part of a standard PDNA health assessment. Using this data to estimate impact on MDGs remains complicated. (Refer to Table 3 below).

Service availability and access to health programmes are often interrupted during and after disasters, but usually not for long. Services may be quickly restored by the health authorities. When collection of user fees is suspended for the affected population and when service delivery is supported by international aid agencies, access to services may actually be higher compared to pre-disaster levels.

**Table 3:** Health-related MDGs, targets and indicators

Goal 4: Reduce child mortality	
Target 4.A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate	4.1 Under-five mortality rate 4.2 Infant mortality rate 4.3 Proportion of one-year-old children immunized against measles
Goal 5: Improve maternal health	
Target 5.A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio	5.1 Maternal mortality ratio 5.2 Proportion of births attended by skilled health personnel
Target 5.B: Achieve, by 2015, universal access to reproductive health	5.3 Contraceptive prevalence rate 5.4 Adolescent birth rate 5.5 Antenatal care coverage (at least one visit and at least four visits) 5.6 Unmet need for family planning
Goal 6: Combat HIV/AIDS, malaria and other diseases	
Target 6.A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS	6.1 HIV prevalence among population aged 15-24 years 6.2 Condom use at last high-risk sex 6.3 Proportion of population aged 15-24 years with comprehensive correct knowledge of HIV/AIDS 6.4 Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14 years
Target 6.B: Achieve, by 2010, universal access to treatment for HIV/AIDS	6.5 Proportion of population with advanced HIV infection with access to antiretroviral drugs
Target 6.C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases	6.6 Incidence and death rates associated with malaria 6.7 Proportion of children under 5 sleeping under insecticide-treated bed nets 6.8 Proportion of children under 5 with fever who are treated with appropriate anti-malarial drugs 6.9 Incidence, prevalence and death rates associated with tuberculosis 6.10 Proportion of tuberculosis cases detected and cured under directly observed treatment short course

## CROSS-SECTORAL LINKAGES, INCLUDING CROSSCUTTING ISSUES

**Intersectoral** discussions should take place during all phases of the PDNA. Standards should be agreed upon, particularly on key dimensions such as administrative boundaries, place names and some of their key attributes such as demographics, which will provide a solid basis for data comparability and cross-sectoral analysis.

Health sector specialists need to work closely with environmental health (water and sanitation), nutrition and food security, housing and education, and age and gender specialists. These sectors are relevant to health; and conversely health considerations need to be integrated into these sectors. Furthermore, clarification of which sector aspects are addressed in other sectors helps to avoid double counting. For example, damage to health training facilities is usually included under the education sector.

**Crosscutting issues** relevant for health include the status of children, pregnant and lactating women, the elderly, persons with disabilities and persons living with long-term or chronic illnesses such as HIV/AIDS. In addition, there are also social determinants to be considered that could lead to increased vulnerability. These include the conditions in which people are born, grow, live, work and age. These usually include poverty, ethnicity and religion. Crosscutting issues and gender and age analysis are integrated as relevant in the four components under the pre-disaster baseline, disaster effects and recovery strategy.

In disaster situations, people are affected differently based on **gender and age**, and each category may have different resources available and different coping strategies. Available data suggests that there is a pattern of gender differentiation at all levels of the disaster process: exposure to risk, risk perception, preparedness, response, physical impact, psychological impact, recovery and reconstruction.

Women, older persons and children - particularly girls - may face increased risks to adverse health effects and violence due to their possible dependence on others, limited mobility, etc. They may be unable to access assistance safely and, therefore, often require different relief and recovery efforts and approaches. Additionally, females are often insufficiently included in community consultation and decision-making processes, resulting in their needs not being identified and met.

Different age groups will also be affected differently and will have varying needs. Older people can be particularly vulnerable. For example, of those who died in the wake of Hurricane Katrina in 2005, 71 percent were 60 years and older. Advanced age can result in decreases in mobility, sight, hearing and muscle strength, as well as greater vulnerability to heat and cold. Chronic diseases common to older age, such as coronary heart disease, hypertension, diabetes and respiratory disease, can worsen when treatment is interrupted.

# THE HEALTH SECTOR RECOVERY STRATEGY

This section provides guidance on how to develop and present the health sector recovery strategy. When possible, the health sector recovery strategy should be harmonized with the country's existing health sector development plan, while taking into account pre-disaster vulnerabilities, post disaster conditions and stakeholder consultations.

## SECTOR RECOVERY VISION AND GUIDING PRINCIPLES

The **recovery vision** is developed jointly during the consultative process, which ensures the support of key stakeholders for the recovery strategy. The recovery vision serves as a guide for the recovery process and provides the overall direction and 'end state' that the stakeholders desire to achieve.

The overall goal of health system recovery is to build the health system back and even make it better so as to contribute to a reduction in morbidity and mortality and improve the health status of the disaster-affected population. Health system recovery aims to strengthen and build upon humanitarian activities, while also correcting those aspects of the system that allowed for the negative impacts of the disaster on the health system in the first place. This means the system will have safer infrastructure, be better prepared for key public health hazards and future disasters and provide equitable and affordable services to all.

The key reference that should inform the recovery vision is the national health strategic plan. Significant pre-disaster constraints in the performance of the health system need to be taken into account, and planning for recovery should include further analysis to address these constraints. If there are ambitions for health sector reform formulated in the national health strategic plan, they need to be reflected in the recovery process.

At times, the recovery process is used to accelerate the introduction of health sector reforms. The enthusiasm for reconstruction may be high, the generosity of donors may be considerable and resistance to change reduced.

However, stakeholders involved in PDNAs should be cautious with using this 'window of opportunity' to introduce institutional and regulatory reforms or to aim for significant improvements in a short recovery period. Reform goals must be balanced with what can be practically achieved in the context of the disaster recovery period. While expectations may run high, there is limited evidence that major reforms in such contexts works. Furthermore, there are risks of being encouraged to introduce new policy approaches by international consultants or influential donors that may not be appropriate or realistic.

The below **guiding principles** apply to the recovery process in the health sector. Government commitment, leadership and ownership at all levels are critical for successful health system recovery.

- Governments can use the recovery process to strengthen their capacity.
- Planning health system recovery should start early, in parallel with the humanitarian response.
- Health system recovery plans should reflect the priorities and concerns of affected communities and focus on the most vulnerable and most affected.
- Adopt a health system approach using the six health system building blocks.

- Ensure that the recovery plans stay connected to development coordination processes and that the recovery plans take into account national strategies on health development and poverty reduction.
- Ensure continual coordination with other sectors.
- Throughout the process, maintain synergies with humanitarian actions.
- Work in partnership with civil society, donors, non-governmental organisations, the World Bank, other United Nations agencies and the private sector.
- Use the disaster as an opportunity to reinforce national capacities for disaster risk management and disaster risk reduction.

## **RECONSTRUCTION AND RECOVERY NEEDS, INCLUDING BUILDING BACK BETTER**

This section provides guidance on how to define needs for reconstruction and recovery. R During the PDNA, it is important to conduct inter-sectoral consultations to avoid double counting in the identification of recovery needs and costs (see the World Bank’s GFDRR *Damage, Loss and Needs Assessment Guidance Notes*, Volume 3).

The analysis of recovery and reconstruction needs aims at restoring the situation at least to pre-disaster levels, and also identifies needs and opportunities for building back better approaches. Building back better implies enhancing the health infrastructure’s resilience to disasters, improving access to services and goods, catalyzing the economy, supporting livelihoods, strengthening disaster risk management capacities of government and communities, and reducing risks and vulnerabilities to future disasters.

While the recovery plan should be harmonized with existing national health development plans and any proposed sector reform reflected in these, the recovery plan cannot aim to include measures that address the full development objectives.

Table 4 (below) summarizes the main effects of a disaster on the health system and recovery and reconstruction needs, including suggestions for ways to build back better.



**Table 4:** Disaster effects, recovery and reconstruction needs, including building back better

	Disaster effect	Health Recovery and reconstruction needs	
		Restore pre-disaster conditions	Building back better
<b>Infrastructure and assets</b>	Partial or full destruction of health infrastructure and assets.	Establish temporary health structures and possible mobile health units.  Reconstruct and repair destroyed and/or damaged health infrastructure, replace assets lost.	Ensure all infrastructures are hazard resilient.  Modernize and rationalize the health network.
<b>Service delivery, access and demand</b>	<ul style="list-style-type: none"> <li>• Reduced availability of health services and disrupted procurement of pharmaceuticals.</li> <li>• Reduced access to and possible increased demand for health services delivery.</li> </ul>	<ul style="list-style-type: none"> <li>• Restore capacity to deliver health services and procure pharmaceuticals.</li> <li>• Provide additional capacity in availability of services to meet increased and possible new demands for services.</li> <li>• Ensure equitable access to health service delivery and ensure utilisation of services, in particular for pre-existing and new vulnerable groups by reducing old and new barriers for access and utilisation.</li> </ul>	<ul style="list-style-type: none"> <li>• Address possible pre-existing constraints in capacity and performance of service delivery.</li> <li>• Adapt the health workforce and availability of pharmaceuticals</li> <li>• Reduce pre-existing and new inequities in access to health services. Improve utilisation and reduce barriers for access, taking into account reduced ability to pay.</li> </ul>
<b>Governance</b>	<ul style="list-style-type: none"> <li>• Effects on capacity of the health authorities to manage service delivery, including community participation, and capacity to manage the response and recovery process.</li> </ul>	<ul style="list-style-type: none"> <li>• Restore governance role for service delivery of health authorities at national and subnational level, including community participation.</li> <li>• Manage the response and recovery process and coordination mechanisms, within the health sector and between different sectors.</li> <li>• Support health information management and early warning systems</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthen governance role of national health authorities to better manage equitable service delivery and disaster risks, based on a disaster risk management capacity assessment, including health information management and early warning systems.</li> </ul>
<b>Risks</b>	<ul style="list-style-type: none"> <li>• Effects on pre-existing risks to health, new health risks caused by the disaster, and effect on the health status of the affected population.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct targeted health promotion and disease prevention interventions to control and mitigate impact of pre-existing and new risks to health, reduce excess/avoidable morbidity and mortality caused by the disaster.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce vulnerabilities and risks to health, and support community resilience.</li> <li>• Introduce longer term disaster risk reduction interventions, based on more detailed vulnerability and risk assessment and mapping.</li> </ul>

## RECONSTRUCTION NEEDS FOR INFRASTRUCTURE AND ASSETS

Infrastructure needs include the requirement to repair and/or reconstruct damaged infrastructure and repair or replace assets. Credit schemes can be considered for reconstruction and repair of private hospitals and other private health service-related facilities.

**For reconstruction needs related to building back better approaches,** several elements can be taken into consideration, as seen below.

- Ensure that buildings are able to withstand future hazards and remain functional if or when the next disaster happens. A first step is ensuring adherence to building codes and retrofitting. The safe hospital approach, for example, proposes making hospital infrastructure more resilient to common hazards and conducting training of health staff in managing disaster responses, including mass casualty management (for examples of the interventions used in safe hospital programmes, see **Annex 8**). A more detailed assessment of the safety of health infrastructure is often not feasible during the first three months after a disaster occurs, but such an assessment can be included in the recovery plan.
- When standards for health infrastructure have changed, the reconstruction can be used as an opportunity for the ‘modernization’ of the health facilities.
- The existing health network in the affected areas may need to be rationalized and streamlined to meet the changed needs because of population movements and changes in disease patterns.

## RECOVERY NEEDS FOR INFRASTRUCTURE, ASSETS AND SERVICES

### RESTORE TEMPORARY HEALTH INFRASTRUCTURE

While waiting for more permanent reconstruction of health infrastructures, which can take up to several years, it is necessary to establish temporary structures. This can be done, for instance, by renting a building and/or initiating mobile health units in the vicinity of damaged health facilities that are not functional and in displacement settlements or areas hosting large numbers of displaced persons where the capacity of the existing facilities is no longer sufficient.

### RESTORE SERVICE DELIVERY CAPACITY AND ENSURE ACCESS TO SERVICES

The immediate need in the affected areas is to restore the capacity to deliver health services at community, primary and secondary care levels, to ensure that health workers can resume their duties, and to procure pharmaceuticals. Additional capacity may be needed to meet increased and possible new demands for services based on changes in disease patterns, such as trauma and mental health. Ensure that appropriate triage and referral systems exist for emergency medical, surgical, trauma and obstetric care.

Primary health care services should be easily accessible to populations remaining in the affected areas and at temporary settlement sites, while secondary care services can be provided at appropriate sites. Health facilities in areas that receive significant numbers of internally displaced populations need to be strengthened to cope with the increased number of patients.

The availability of essential packages of health services needs to be reviewed, as well as how these packages may need to be adapted to changes in disease profiles and an increased burden of disease, as is often seen after disasters.

If infrastructure related to the production of pharmaceuticals has been destroyed, their production capacity will need to be restored as well as the functionality of the cold chain.

**For service delivery needs related to building back better approaches**, several elements can be taken into consideration, as seen below. The availability and performance of service delivery may need to be improved to address possible increases or changes in morbidity. If capacity was insufficient before the disaster, and access had been limited for vulnerable groups, these constraints need to be addressed.

- The health workforce capacity can be adapted to meet priority gaps and new health demands, and packages can be offered that encourage staff to return to or be (re)deployed to the affected areas.
- Efforts can be made not only to restore, but also to increase the national production capacity for pharmaceuticals. Also, regulations can be improved and better quality assurance mechanisms initiated.
- Address the pre-existing constraints related to performance of and access to health services.  
As examples:
  - reduce financial barriers to access services by, for example, suspending user fees for displaced persons and other populations that have reduced ability to pay for health services as many may have lost assets and livelihoods due to the disaster. Identify planned initiatives to reduce financial barriers, such as programmes for free Mother and Child Health services, that may already have been introduced as part of the health sector reforms;
  - reduce pre-existing and new inequities related to access by taking into account new and old differentiated vulnerabilities, needs and interests of women and men of all ages and sub-groups of the population, as well as findings from gender analyses; and
  - repair roads and bridges that can allow access to still functioning health facilities, as this may make it unnecessary to establish temporary facilities in affected areas.

#### **RESTORE AND STRENGTHENING GOVERNANCE CAPACITY, INCLUDING DISASTER RISK MANAGEMENT**

If it has been interrupted, the governance role for service delivery of the health authorities at national and sub-national level needs to be restored, including community participation as it existed prior to the disaster. This capacity is required to coordinate and manage the response and recovery processes. When large numbers of international health agencies enter the country to assist, these need to be registered nationally to ensure they meet national quality criteria. Furthermore, systems need to be put in place to ensure adequate and regular reporting by national and international partners, adapted to the emergency conditions (for example, more regular reporting, using simplified reporting formats). This includes the activation of early warning systems.

**For governance related building back better needs,** the recovery phase poses opportunities to strategy integrate or strengthen the existing national disaster risk management programme for the health sector, in coordination with the national disaster management authorities. The recovery phase can be used to scale-up existing health systems to manage emergencies and to protect and increase the resilience of the health systems and communities. While the PDNA itself cannot do an in-depth assessment of disaster preparedness capacity and plans for disaster risk reduction, the recovery can plan for such further analysis and include a budget to address obvious gaps.

Other building back better initiatives may include the following:

- Strengthen governance role of national health authorities to better manage equitable service delivery, including health information management and early warning systems.
- Strengthen the role of communities in the management and planning of health services and support to community resilience.
- Strengthen governance for disaster risk management, including updating of national disaster management laws. Depending on what is already known about the disaster risk management capacity of the MoH, a capacity assessment may need to be planned. This is often not feasible during the first three months after a disaster happened, but such an assessment can be included in the recovery plan.

- Revise and/or update preparedness plans and consolidate early warning systems.
- If not already specifically mentioned in the national health strategic plan, ensure that disaster risk capacity is included in the next Joint annual review and in the revision of the national health strategic plan.
- Promote participatory processes and systems inclusive of women, girls, boys and men with national stakeholders.

#### ADDRESSING HEALTH RISKS AND DISASTER RISK REDUCTION INTERVENTIONS FOR FUTURE RISKS

The immediate need following a disaster is to control and mitigate the effects of pre-existing and new risks to health and to support community resilience. Risks need to be broken down in prevention and disaster risk reduction programmes, into the following parts:

1. the probability of the risk occurring;
2. the severity of its consequences when it occurs; and
3. who is exposed to the risks and how.

The PDNA analysis should examine the root causes of disaster, including the vulnerability of assets, sectors and communities to the related hazards. This should be based on in-depth vulnerability and risk assessment and mapping, when such analysis is available.

To mitigate the most common risks, the below interventions should be undertaken:

- Prevent disease outbreaks and ensure capacity for early detection and rapid response to public health emergencies by strengthening early warning systems and ensuring outbreak preparedness and prepositioning of supplies;
- Resume vaccination services as soon as possible and consider mass vaccination in crowded settings, such as camps, or for other populations at increased risk;
- Conduct vector control exercises and implement preventive measures to reduce the risk of vector-borne diseases;
- Intensify community social mobilisation, including health risk communication, to promote safe water, sanitation and hygiene practices and key information messages. (For examples, see: [www.cdacnetwork.org/i/20140728102420-genh0](http://www.cdacnetwork.org/i/20140728102420-genh0)). Support adequate maternal and newborn health services, ensuring privacy and cultural sensitivity, with registration in camps, early detection of and referral for complications of pregnancy and childbirth, safe delivery and provision of relevant commodities;
- Support appropriate infant and young child feeding, supplementation for pregnant and lactating mothers and management of malnutrition, including building health worker capacity and supporting referral and hospital care for management of severe malnutrition in communities;
- Ensure continuity of treatment for chronic diseases (communicable and noncommunicable);
- Implement programmes that prevent and respond to sexual and gender-based violence.

For further examples of disaster risk reduction and preparedness interventions, see Annex 9.

## THE SECTOR RECOVERY PLAN

### PRIORITIZATION AND SEQUENCING OF RECOVERY NEEDS

Following the rationale of the recovery strategy, it is necessary to identify key outcomes, outputs and interventions based on the needs identified, then prioritise and sequence them over time (short, medium and long term) and distinguish those interventions that are related to restoring the situation as it was before the disaster from building back better interventions.

This prioritisation and sequencing exercise should be based on a consultative process and should include, and

The following considerations should be taken into account when conducting the prioritisation:

- Be informed by and aligned with the national health development objectives, as reflected in, for example, national health development policies, poverty reduction strategies, etc.
- Address and prioritise the key risks and vulnerabilities that contributed to the extent of disaster's impact on communities, systems and infrastructure. Note those that can be avoided (an obvious example is that damaged infrastructure that is rebuilt according to proper building codes and disaster retrofitting is more likely to ensure continued services and protect investments in infrastructure reconstruction during future hazards).
- When possible, building back better interventions should also have a positive contribution to the recovery from the current disaster.

Post disaster health recovery needs often outweigh available resources and cannot aim to take on the entire national health development agenda, hence the need to prioritise. The first group of priority interventions include those that will reconstruct damaged infrastructure, ensure access to services, restore governance and address health risks. Then priorities need to be established for interventions to building back better, as linked to these prior areas.

Mostly prioritisation is done based on expert opinion consensus, but should not be driven by international experts and development partners. Often in late stages of prioritisation, lobby groups or political interests may divert evidence-informed priorities. While discussions and arguments for prioritisation should be informed by available evidence, time usually does not allow in-depth ranking based on various methods of prioritisation, such as single criteria and multi-criteria decision analysis. The criteria for these prioritisation methods are listed below:

#### Single criteria analysis

1. Burden of disease analysis (e.g., top ten morbidity and mortality)
2. Cost-effectiveness analysis
3. Equity and gender analysis

#### Multi-criteria decision analysis (MCDA - ranking)

1. Population affected
2. Severity of the problem

3. Ease of implementation of required interventions
4. Emergency situation
5. Burden of disease
6. Population vulnerability
7. Cost effectiveness

With regards to sequencing, PDNAs usually have three timeframes: short, medium and long term. The short term or early recovery interventions overlap with the humanitarian response. For example, for the reconstruction of infrastructure, the period required for staged reconstruction of facilities and services needs to be estimated, taking into account existing construction sector capacity and replacement availability of specialised equipment.

The humanitarian and recovery phase should ensure access to an essential health care package and public health programmes that reduce vulnerabilities and save lives. The reconstruction phase needs to restore and further develop service packages, ensure that the medium- to longer-term health consequences of the disaster are addressed and build the health system back better.

## COSTING

This section explains the logic of how costs for reconstruction and recovery are calculated based on the projected needs and offers realistic approaches to estimating the costs for building back better.

All assumptions, possible formulas and references used for unit costs for each budget line item need to be made explicit, including for building back better, and attached as an annex to the sector chapter.

The following considerations should be taken into account for costing: The total required budget should be realistic and take into account the existing total health expenditures and absorption capacity of the health sector as to what is feasible to achieve over a period of three to five years.

- The costs for building back better should be proportionate to the costs of recovery and reconstruction needs, as well as the type of disaster (for instance, a slow onset drought may have very low reconstruction needs, but have high needs to invest in resilience and building back better).
- The costs for building back better should be realistic compared to the government's recovery budget and the financial envelope pledged by the government and international development partners. Building back better plans must take into account that a large percentage of the funds will be needed for physical reconstruction and compensation for losses, even though partially.
- The costs for building back better should also be realistic in terms of the absorption capacity of the country.

The difference between the cost of the proposed recovery and reconstruction needs and the value of the damage and loss should not become too large. (It is important to note that the value of recovery and reconstruction needs is not equal to the sum of damage and losses, it may be more or less.)

For post-disaster donor pledging conferences, the development partners are accustomed to looking at the size of the damage and loss and pledging accordingly. There is usually little funding remaining for investments in improved access, improvement of governance performance and risk reduction measures.

**Costing of infrastructure reconstruction** is guided by the estimated value of damage, augmented by additional costs involved in the introduction of quality improvements, technological innovations and risk reduction measures.

**Reconstruction needs = value of damage + cost of  
(quality improvement + technological modernization + relocation, when needed + disaster risk  
reduction features + multi-annual inflation)**

To plan for the incremental costs to make the health infrastructure ‘all hazard’ resilient depends on the original structural design criteria for the buildings and on the degree of improvement in construction standards and norms, as defined in the reconstruction strategy adopted after the disaster. The additional costs have been found to range from 10 to 35 percent of the replacement cost. Structural and civil engineers who are familiar with disaster-resilient construction standards would be able to define the percentages. When relocation of a hospital or clinic to a safer area is required to reduce disaster risk, the additional cost of land acquisition and provision of water, sanitation, electricity and other utilities need to be taken into account. Furthermore, the reconstruction strategy may include a rationalization of the health network, taking into account possible population movements and opportunities for increased efficiency. This may make the costs for reconstruction either higher or lower.

A scheme of structural retrofitting of hospitals and health facilities may also be required, to ensure that undamaged or lightly-damaged units are able to withstand the impact of future disasters and to continue functioning uninterruptedly. The financial needs are estimated by specialised structural or civil engineers after defining the standards for retrofitting and the degree of disaster resilience to be achieved, particularly in the case of earthquakes.

Health facility safety is not limited to disaster resilient buildings. Not only must the buildings remain standing after a disaster, but the facility must remain fully functional and even be able to cope with increased numbers of patients. A comprehensive recovery plan for the health facility will encompass not only disaster resilience of buildings, but also focus on emergency preparedness at the level of the health facility, including response planning and mobilisation of emergency medical response teams, training of health facility staff and conducting of simulation exercises. The action of individual hospitals should be integrated into a national programme to make hospitals safer and prepared for disasters.

An indicative range of the required budget for the development of a national programme on safe and prepared hospitals (not including implementation of extensive structural or non-structural measures) is as follows:

Risk assessment, including social economic assessment	\$50,000 - \$200,000
Rapid assessment of safety of health facilities	\$50,000 - \$200,000 per annum
Implementation of a national safe hospitals programme	\$100,000 - \$500,000 per annum
Training and capacity development	\$30,000 - \$100,000 per annum
<b>TOTAL</b>	<b>\$230,000 - \$1million</b>

**COSTING FOR HEALTH SECTOR RECOVERY**

The costs of providing health services under temporary conditions while damaged infrastructures are being repaired or rebuilt (in some cases taking several years) – whether it be the introduction of tent hospitals and clinics, rented premises or mobile services – must be carefully estimated. Additionally, funding is required for

re-establishing essential services, addressing crucial issues such as access and quality in the context of possibly increased morbidity and lower purchasing power, and support to governance and management capacity and to management of health risks.

The costs for the basic recovery needs are guided by the value of estimated changes in flows, which cannot be covered by the regular budget of the government without negatively impacting the sector's normal development activities.

**Recovery needs =  
estimated value of changes in flows over the total period until reconstruction is achieved -  
the amount of funds available in the government budget for this purpose**

The costing for investments related to building back better for the health system is more complicated and needs to take into account the building back better considerations mentioned earlier. For the purpose of the recovery plan, it is often not necessary or possible to do a detailed bottom up costing or to use formulas. Examples of recovery interventions and subsequent building back better approaches can be found in Table 4 and **Annex 2**. An assumption sheet is used to explain how cost estimates are made, including those for building back better (see **Annexes 3 and 4**).

## STRUCTURE OF THE RECOVERY PLAN

In line with the PDNA guidance on a recovery strategy (in Volume A), the sector recovery plan should be formulated following a results-based model, and therefore include: 1) priority needs; 2) interventions required; 3) expected outputs; 4) recovery costs; and 5) intended outcomes. See **Annex 10** for a table that may be used for a recovery plan.

There is no blueprint for recovery planning. The depth of response analysis will be limited, largely due to time constraints. The PDNA can identify issues that need to be assessed and analysed in further detail at a later stage, before making more explicit policy and planning choices for which implications cannot yet be overseen. This includes, for example, the rationalizing of the health network when there have been major population movements, policy issues as human resource production and distribution, or health financing to address reduced capacity to pay. Possible policy responses need to be based on an analysis of the main constraints in the health system (see: WHO's manual on *Analysing Disrupted Health Sectors*, Module 12: Formulating strategies for the recovery of a disrupted health sector and Annex 13, pages 382-385). Table 4 and **Annex 2** include examples of typical early to longer term responses, based on previous PDNAs.

The reconstruction and recovery plan for the health sector of the PDNA should follow the same main headings used to describe the effects of the disaster, and the interventions of the plan should be based on the priorities of the identified needs. Furthermore, expected outputs and outcome indicators need to be added.

## IMPLEMENTATION ARRANGEMENTS

### PARTNERSHIPS, COORDINATION AND MANAGEMENT

The mechanisms that need to be in place for implementation of a health recovery strategy follow the same principals as discussed in section 1.2. Management of the health recovery strategy should be led by the MoH and be part of the multisectoral implementation by the government entity that has that mandate.

Depending on funding mechanisms, additional management structures may need to be established, for example, when multi-partner recovery funds are created (as was the case after the earthquake in Haiti in 2010).

Implementation mechanisms should involve regional and district health authorities and ensure links with development partners, who can use the recovery strategy for updating and revising their national and subnational annual operational plans in areas significantly affected by the disaster. When revising district health plans, the recovery needs can be integrated to provide more detailed implementation plans that will link recovery to development, with bottom up budgets. During this process, it is realistic to expand consultations and involve subnational health authorities and communities.

Many humanitarian health organisations offer assistance to a country after a major disaster. In addition to supporting life saving interventions, some humanitarian agencies will also support early recovery approaches and/or support recovery programmes of the MoH. Humanitarian health partners need to be informed about the PDNA, which they can use as guidance to integrate early recovery approaches into their humanitarian programmes to support the recovery process.

## **MONITORING AND EVALUATION**

Establishing a monitoring system - if possible based on the existing health information management system - will allow assessing progress and effectiveness of the recovery interventions. The Monitoring and Evaluation (M&E) plan should:

- focus on a few critical indicators;
- have a clearly defined frequency and timeline; and
- preferably be implemented by a multisectoral team comprised of surveyors and evaluators.

For an example of such a monitoring system, see the Tsunami Recovery Impact Assessment and Monitoring System (<http://whqlibdoc.who.int/hq/2006/a91183.pdf>). A budget, usually 5-10 percent of the recovery and reconstruction budget, should be set aside for this purpose.

## **RESOURCE MOBILISATION AND FUNDING MECHANISMS**

Reaching consensus on funding mechanisms often poses a major challenge during the recovery phase. Deciding which funding mechanisms to use should be based on the local context and aim at achieving the greatest efficiency. Such decisions begin with dialogue between the national government and international partners and consider the pros and cons of each proposed arrangement to arrive at a mechanism that is agreeable to all parties. Financial modalities are often influenced by a Financial Management Assessment done by the World Bank and the funding preferences of specific donors. The result is often a mix of on and off budget funding mechanisms, and may include pooled funding arrangements, such as Multi-Partner Recovery Trust Funds. The modalities chosen should support the governance role of the MoH in financial management. Adequate financial tracking mechanisms for pledges, disbursements and actual expenditures need to be established.

## CHALLENGES TO SECTOR RECOVERY PLANNING AND IMPLEMENTATION

- Some challenges to be aware of when planning the recovery and its implementation are below.
- Focusing only on infrastructure and service delivery and neglecting the support components that enable access to services.
- Embarking on ambitious investment plans, without a comprehensive analysis of absorption capacity and available resources.
- Reproducing the same political and social systems that were at the root of the crisis, or not addressing the underlying vulnerabilities and inequalities that may have contributed to the impact of the disaster.
- Particularly when national policy making capacity is weak, international stakeholders pushing politically-oriented policy options or applying standard solutions that may have worked elsewhere but may not be appropriate for the country.
- Working within a limited and often unrealistic timeframe, which leads to inadequate consultation with all stakeholders.
- Unreliable and incomplete information is always a major challenge in countries in fragile situations.
- The risk that the assessments and recovery planning are done in isolation, not sufficiently embedded in either the humanitarian coordination or linked to longer term development cooperation mechanisms.

## ANNEX 1: STEPS FOR THE PDNA PROCESS FOR THE HEALTH SECTOR

### When a disaster occurs:

- Start collecting baseline information: this can be done in country, as well as remotely (off site); start filling in the analytical matrix with relevant information.
- Establish a database of pre-existing health facilities.
- Start collecting information on functionality/damage of health facilities.
- Start collecting information on disease trends, pre-existing and possible new risks to health, previous and new vulnerable groups, and response interventions done to mitigate health consequences of the disaster.
- Collect relevant reports that describe the health system and its pre-disaster performance.
- Prepare to send health recovery expert(s) to assist the country.

### When a PDNA is requested by government:

- Government to appoint focal points in the ministries whose sectors will be included in the PDNA, this should include a recovery focal point in the MoH.

- World Bank, European Union and World Health Organisation health experts liaise with the MoH focal point. Establish a Steering Committee to oversee the PDNA process and divide tasks.
- Prepare for training on the health component of the PDNA as part of the usual one-two day workshop that formally initiates the PDNA, and train relevant stakeholders.
- Call for a meeting with health development partners, identify key stakeholders that can assist in the assessment, and agree on how this group will be linked to recovery planning.
- Present the PDNA process and objectives to the humanitarian health coordination body, identify humanitarian partners, including donors, with an interest and capacity to support the (early) recovery process.
- Develop a time schedule, according to the overall deadlines of the PDNA, including:
  - site visits to verify reports of damages;
  - national and subnational workshops or focus group discussions with health authorities to discuss needs and constraints in health system functions and recovery needs and priorities;
  - regular meetings of the Steering Committee;
  - periodical engagement with other relevant sectors and crosscutting topics;
  - periodical meetings with the humanitarian coordination mechanism;
  - periodical reporting to the national health sector development coordination body; and
  - validation workshop of first draft.
- Assist the MoH to prepare for the donor conference, when this is organised.
- Hold meetings with donors and government to advocate for the importance of health in the recovery strategy.
- Include the MoH in the governing structures to manage the allocation of funds to and/or within the health sector.
- Agree on financing and implementation modalities and establish an M&E system for health system recovery based on the recovery strategy.

## ANNEX 2: ANALYTICAL MATRIX BASED ON HEALTH SECTOR RESPONSE DOMAINS AND BUILDING BLOCKS

	Pre-disaster baselines and challenges - key indicators	Disaster impact - key issues	Possible humanitarian responses	Possible (early) recovery response
Health outcomes	<p>Crude mortality rate; Under 5 mortality rate; disability</p> <p>Proportional mortality</p> <p>Life expectancy (by sex)</p> <p>Morbidity patterns</p>	<p>Increased number of deaths due to the immediate impact of the disaster</p> <p>New health risks (e.g., potential outbreaks or interruption of services for chronic diseases)</p> <p>Effects on the health related MDGs</p>	<p>Top five causes of mortality and morbidity to prioritise the health interventions and adjust these as morbidity patterns evolve over time</p> <p>Appropriate management of dead bodies (See Management of dead bodies after disasters. PAHO, WHO, ICRC and IFRC. 2006)</p>	<p>Rehabilitation of disabled persons</p>
Service delivery 1: Organisation and management (including infrastructure, equipment and transport)	<p>Database of health facilities (e.g., SARA)</p> <p>Availability of functioning 24/7 referral system between levels of care</p> <p>Average population covered by functioning health facility by type of health facility and by administrative unit</p> <p># of hospital beds per 10,000 population by admin unit</p> <p># of outpatient consultations per person per year by admin unit</p> <p># of consultations per clinician per day by admin unit</p> <p>Cost per case (treatment, transportation, etc.)</p> <p>Costs for campaigns</p> <p>Average revenue per patient</p> <p>Proportional mortality</p> <p># and % of health facilities that meet basic service capacity standards</p>	<p>Availability of health resources and services:</p> <p>Health facilities damaged/ destroyed, including equipment and furniture and records</p> <p>Assess damage and loss</p> <p>Estimate reconstruction costs by type and extend of destruction (\$)</p> <p>Effect on transport, logistics for supplies and referral between levels of care, including communication network, accessibility by roads that may be blocked, etc.</p> <p>Blood banks destroyed</p> <p>Staff killed, injured or displaced</p> <p>Increased demand for health services in unaffected areas due to population movements</p>	<p>(Re) establish provision of essential service package services: cost per case/per capita per year</p> <p>When necessary set up temporary health facilities, and deploy medical brigades, supported by international assistance</p> <p>Support health facilities in areas that received high numbers of IDPs</p> <p>Temporary pre-hospital units to treat injuries, and/or medical evacuation</p> <p>(Temporary) Increase outreach services</p> <p>Make buffer emergency medical supplies and emergency medical teams available; establishment of semi-permanent structures, mobile health units</p>	<p>Support to the decentralisation process when this is part of the national health policy</p> <p>Support to management of health facilities</p> <p>Repair of health facilities</p> <p>Replacement of damaged health and medical equipment (based on the safe hospital concept)</p> <p>Replacement of furniture</p> <p>Relocation of facilities</p> <p>Re-establish blood banks</p> <p>Review health network and rationalize numbers, types and distribution of health facilities, when appropriate</p>

Pre-disaster baselines and challenges - key indicators	Disaster impact - key issues	Possible humanitarian responses	Possible (early) recovery response
<p>Service delivery 1:            Organisation and management (including infrastructure, equipment and transport) (cont)</p> <p># health facilities with Basic Emergency Obstetric Care (EmOC)/            500,000 population by administrative unit            # health facilities with Comprehensive EmOC/500,000 population by administrative unit            % of health facilities with availability of clinical management of rape survivors +EC +PEP            % of births assisted by skilled attendant</p>			

Pre-disaster baselines and challenges - key indicators	Disaster impact - key issues	Possible humanitarian responses	Possible (early) recovery response
<b>Service delivery 2: Health sector response domains</b>			
<p>Child health</p> <p>Under-five mortality rate            Infant mortality rate            Proportion of 1 year-old children immunized against measles (and estimate of coverage 6 months - 15 years)            Coverage of DPT3 in under 1 year by admin unit</p>	<p>Increased child mortality/ Under 5 mortality rate/ neonatal mortality            Disruption of routine vaccination services            Increase in malnutrition/disease interactions among vulnerable children</p>	<p>Total cases of respiratory tract infection + cost per case            Total cases of Under 5 diarrhoea + cost per case            Mass measles vaccination campaigns (combined with vitamin A and bed nets, de-worming, etc.)            Basic neonatal care for newborns linked to deliveries in health facilities - see Minimum Initial Service Package (MISP) for EmOC</p>	<p>Re-establish routine vaccination            2x/year de-worming campaigns in schools            Scale up Integrated Management of Childhood Illnesses as part of an essential package of health services, including a strengthened community component</p>

	Pre-disaster baselines and challenges - key indicators	Disaster impact - key issues	Possible humanitarian responses	Possible (early) recovery response
<b>Service delivery 2: Health sector response domains</b>				
<b>Nutrition</b>	<p># of admissions to SFT and TFC (age/sex)</p> <p>Proportion/number of U5 with global acute malnutrition and severe acute malnutrition cases detected at the outpatient department/inpatient department</p> <p>Prevalence of underweight children under-five years</p> <p>Proportion of population below minimum level of dietary energy consumption</p> <p>Prevalence of global acute malnutrition + severe acute malnutrition.</p> <p>Level of food security based on IPC</p>	<p>Food shortage, lack of access to food by vulnerable populations, reduced diversity in diets</p> <p>Changes in breastfeeding practices as a result of the disaster</p> <p>Treatment of malnutrition disrupted by disaster</p> <p>Increased risk of malnutrition (women, children and older persons)</p>	<p>Incorporate vitamin A, zinc, and iron foliate in ongoing immunization campaigns</p> <p>Screening for malnutrition in health facilities and population</p> <p>Supplementary and therapeutic feeding programmes</p> <p>Treatment of medical complications of malnourished children</p>	<p>Growth monitoring</p> <p>Nutrition programmes within Integrated Management of Childhood Illnesses</p>
<b>Communicable Diseases</b>	<p># or incidence rates for selected diseases relevant to the local context by age/sex. (Cholera, measles, acute meningitis, hemorrhagic fever, zoonotic diseases, others)</p> <p>Case Fatality Rate for most common diseases</p> <p>Incidence, prevalence and death rates or Case Fatality Rates associated with tuberculosis</p> <p># and proportion of tuberculosis cases detected and cured under directly observed treatment short course</p> <p>Incidence and Case Fatality Rates associated with malaria</p> <p>Proportion of children under 5 sleeping under insecticide-treated bed nets</p> <p>Proportion of children under 5 with fever who are treated with appropriate anti-malarial drugs</p>	<p>Increased incidence and Case Fatality Rate, possible outbreaks</p> <p>Treatment disruption for patients on ARV (including for PMTCT) and TB/DOTS</p> <p>Increased risk of HIV transmission</p> <p>increased risk of malaria</p> <p>(increased exposure due to loss of homes, bed nets, etc. )</p> <p>Total cases of typhoid/ fever + cost per case</p> <p>Total cases of diarrhoea + cost per case</p> <p>Total cases of malaria/ dengue + cost per case prevention and control of disease outbreaks</p>	<p>Treatment of increased morbidity</p> <p>Reactive mass vaccination in epidemic settings (yellow fever epidemic, meningitis epidemic, measles)</p> <p>Disease control surveillance</p> <p>Tracing and treatment of known TB patients</p> <p>Ensure appropriate HIV prevention measures</p> <p>Tracing and provision of ART for people previously on treatment, including PMTCT</p> <p>Mass distribution of bed nets</p> <p>Environmental vector control (in crowded places)</p> <p>Establish standard precautions (distribution of hygiene kits, Provision of disinfectants; and safety boxes)</p>	<p>Community health education/promotion</p> <p>Restore or establish a comprehensive TB, malaria and HIV control programme</p> <p>Preventive vaccination campaigns in risk areas (yellow fever, meningitis)</p> <p>Further integration of vertical programming with other services</p>

Pre-disaster baselines and challenges - key indicators	Disaster impact - key issues	Possible humanitarian responses	Possible (early) recovery response
<b>Service delivery 2: Health sector response domains</b>			
<p><b>Communicable Diseases (cont)</b></p> <p>HIV prevalence among population aged 15-24 years  # of patients on ART  Condom use at last high-risk sex  Proportion of population aged 15-24 years with comprehensive correct knowledge of HIV/AIDS  Ratio of school attendance of orphans to school attendance of non orphans aged 10-14 years  Proportion of population with advanced HIV infection with access to antiretroviral drugs</p>			
<p><b>Sexual and reproductive health</b></p> <p>% of births assisted by a skilled attendant  % expected deliveries by CS by admin unit  # of cases or incidence of sexual violence (by sex and age)  Maternal mortality ratio; fertility rate  Contraceptive prevalence rate  Adolescent birth rate  Antenatal care coverage (at least one visit and at least four visits)  Unmet need for family planning</p>	<p>Increased risk of maternal and infant mortality and mortality  Increased risk of sexual and other forms of gender-based violence  Disruption in access to family planning  Disruption of PMTCT regimens for HIV+ pregnant women</p>	<p>Ensure provision of reproductive health services guaranteeing availability of MISP and expanding as possible  Clinical management of rape services and EmOC (basic and comprehensive)  Financial protection maternity services: free access to deliveries, EmOC, and follow up post-partum</p>	<p>Ensure sustainable provision of MISP and beyond  establish minimal availability for MISP, including EmOC  Integration of interventions, including antenatal care , PMTCT, nutrition and immunization  Strengthening of national family planning programme</p>
<p><b>Non-communicable diseases</b></p> <p>Prevalence of hypertension and diabetes, mental health, renal dialysis</p>	<p>Interruption of treatment  Patients lost for treatment of hypertension and diabetes, renal dialysis  Worsening of diabetes and hypertension status after disaster due to changes in diet and stress</p>	<p>Ensure continuity of treatment for chronic diseases  Tracing of patients cases on hypertension, diabetes and/or mental health treatment, renal dialysis</p>	<p>Re-establish data system for patients on treatment  Strengthen home care for patients with chronic diseases (communicable and noncommunicable)</p>

Pre-disaster baselines and challenges - key indicators	Disaster impact - key issues	Possible humanitarian responses	Possible (early) recovery response
<b>Service delivery 2: Health sector response domains</b>			
Injuries	<p>Potentially high number of injuries</p> <p>Increased # of people with disabilities</p> <p>Untreated wounds and infections of wounds are major public health problem, risks for tetanus</p>	<p>Treatment of injuries - prevention of long-term disability</p> <p># of total cases of injuries and cost per case</p> <p>Field hospitals, surgery and basic EmOC</p> <p>Set up referral mechanism, including international evacuation of patients</p> <p>Vaccination campaigns to include tetanus</p> <p>Amputations follow up care to be done at primary care level</p>	<p>Rehabilitation of persons with disability</p> <p>Strengthen capacity for prostheses and rehabilitation</p> <p>Disability care to be taken into consideration in new health system</p>
Mental health and psychosocial support	<p>Interruption of treatment of mental health diseases</p> <p>Decrease in functioning</p> <p>On average prevalence of severe mental disorder increases 1%</p> <p>On average rates of mild or moderate mental disorder increases 5-10%</p> <p>Mild or moderate: 15-20%</p>	<p>Strengthen community self-help and social support</p> <p>Ensure access to psychological first aid to people in acute distress</p> <p>Ensure continuity of treatment, managing new and pre-existing severe mental disorders in general health care</p> <p>Address the safety, basic needs and rights of people in mental hospitals + cost per case</p>	<p>Initiate development of sustainable community mental health system :</p> <p>build long-term, basic, sustainable community mental health services in areas affected by emergencies</p> <p>In districts without psychiatric inpatient care, plans for new general hospitals as part of health recovery investment should include considering planning for a staffed acute psychiatric care inpatient unit</p> <p>Include mental health in curriculum and of Primary Health Care staff</p>

Pre-disaster baselines and challenges - key indicators	Disaster impact - key issues	Possible humanitarian responses	Possible (early) recovery response
<b>Service delivery 2: Health sector response domains</b>			
<p><b>Environmental health</b></p> <p>Proportion of people with less than 15 litres of water/day            % population urban/rural, access to improved water sources and sanitation by sex            Distance to nearest water access point, by sex and age            Distance to nearest sanitation facility, by sex and age</p>	<p>Destruction of clean water supply            Health hazards resulting from stagnant waters and deteriorated water quality</p>	<p>Provision of safe drinking water            Provision of wastewater and solid waste disposal            Environmental vector control (in crowded places)            Disposal of medical waste</p>	<p>Drinking water supply restoration to prevent the further spread of water-borne diseases            Reconstruction of wastewater and solid waste disposal</p>
<p><b>Leadership and Governance</b></p> <p>Disaster and emergency risk management capacities in the MoH            Existence of a health sector preparedness and response strategy document linked to national needs and priorities that includes the role of the lead and partner agencies            Existence of a functioning coordination mechanism at central level and subnational level within the health sector and crosscutting themes (from DRM and health sector development)            Health sector policies and guidelines, standard operating procedures for response; oversight and regulation; governance capacity</p>	<p>Reduced national capacity to respond to disaster            Many stakeholders already present, and new stakeholders entering, further challenging health coordination            Governments likely to send technical assistance/experts to strengthen MoH functions for longer term            MoH infrastructure and governance capacity compromised (loss of human resources, infrastructure and equipment damaged)            PDNA/Recovery Framework as opportunity to guide new investments coming 6-18 months</p>	<p>Coordination mechanism in the acute response/leadership (humanitarian health cluster - government)            Ensure adherence to national policies and guidelines by international actors            Ensure/promote national ownership</p>	<p>Link recovery planning to coordination with development partners (e.g., SWAp, IHP+, UNDAF)            Exit strategy for international humanitarian NGOs, and/or use capacity of (I)NGOs to support recovery process and capacity building of district and central health authorities            Integrating disaster risk reduction and disaster management in health strategy            Preparedness strategies and plans: identification of hazards, vulnerabilities and capacities, hazard early warning systems, established disaster risk management, risk awareness and educational programmes for disaster and emergency risk, risk prevention and avoidance programmes and preparedness programme</p>

	Pre-disaster baselines and challenges - key indicators	Disaster impact - key issues	Possible humanitarian responses	Possible (early) recovery response
<b>Service delivery 2: Health sector response domains</b>				
<b>Health Workforce</b>	<p>National workforce policies and investment plans; human resource norms, standards and data; distribution and competencies of health workers</p> <p>Infrastructure for training/production of human resources for health and its capacity</p> <p>Supervision mechanisms</p> <p># of health workforce (doctor, nurse, midwife) per 10,000 population by admin unit (by sex)</p> <p># of Community Health Workers per 10,000 by admin unit</p> <p>Annual number of graduates of health professions from educational institutions per 100,000 population by level and field of education</p>	<p>Loss of workforce, health staff affected by the disaster - (displaced, family members to care for, etc.)</p> <p># of health workforce (doctor, nurse, midwife) per 10,000 population by admin unit (by sex) remaining; effect of human resources for health displacement on distribution</p> <p>Damages in schools for health workers, # of training facilities affected</p> <p>Damages to institutes of public health and research and effects on and capacities of training institutions</p>	<p>Replacing, strengthening, and/or reactivating workforce</p> <p>Financial incentives to re-activate the health workforce</p> <p>Train and deploy community outreach workers (with a sex and age balance)</p>	<p>Replacing/strengthening/reactivating workforce</p> <p>Reconstruction and reopening of training facilities</p> <p>Adapt training programmes on new relevant issues</p> <p>Task shifting</p> <p>Capacity building in first aid, disaster preparedness, response and recovery</p>
<b>Information</b>	<p>National guidelines and formats for facility and population based information and surveillance systems</p> <p># of health facilities routinely collecting and reporting relevant data</p>	<p>Break down of information system and reduced analysis capacity for decision making</p>	<p>Strengthen early warning system, including disease surveillance</p> <p>Coordinate information collection and analysis by all partners</p>	<p>Re-establish routine health information system and reporting by age and sex (as relevant)</p> <p>Risk assessment, including hazards, vulnerabilities and capacities</p>

	Pre-disaster baselines and challenges - key indicators	Disaster impact - key issues	Possible humanitarian responses	Possible (early) recovery response
<b>Service delivery 2: Health sector response domains</b>				
<b>Financing</b>	<p>National health financing policies</p> <p>Existence of user fee protection for those unable to pay</p> <p>Tools and data on health expenditures (national health accounts)</p> <p>Costing of services; financial barriers to access services; ability to pay, catastrophic health expenditures</p> <p>External resources for health as a % of private expenditure on health</p> <p>Per capita total expenditure on health at average exchange rate</p> <p>Per capita government expenditure on health at average exchange rate (US\$)</p> <p>Out-of-pocket expenditure as a % of private expenditure on health</p>	<p>Further loss of livelihood and reduced ability to pay for health services</p> <p>Increased dependence on external funding</p> <p>Loss of revenue due to health facilities rendered non functional, and temporary waiving of user fees</p> <p>Increased expenses for treatment, including due to increased demand</p> <p>Increased costs for transport, etc.</p>	<p>Ensure health services and access to essential medicines are free of charge at point of delivery in public and private not-for-profit facilities: initially three months, then review</p> <p>NB: Consider the effect of providing essential medicines free to the private sector also, in particular if the private sector also waives or reduces service delivery fees.</p>	<p>Establish capacity to analyse possible consequences on quality and access when waiving user fees</p> <p>Establish mechanism to compensate for loss of revenue, in particular in private not-for-profit, that work on the basis of cost recovery schemes</p> <p>Creation of social solidarity or emergency fund to finance purchasing of services</p> <p>Medium-long term reform of financing system, exploring different modalities of (mixed) prepayment mechanisms, that include adequate social protection for health, and that includes all groups of service providers</p>
<b>Medical products and technology</b>	<p>Access to essential medical products, vaccines and technologies, assured quality, safety, efficacy, norms, standards</p> <p>Existence of an essential medicine list that satisfies the priority health care needs of the population and that is adequate for the competence level of health workers</p> <p>National pharmaceutical infrastructure for production capacity and pharmacies</p> <p>Procurement and supply chains; quality assurance; drug donations guidelines; health transport and logistics, warehouses, cold chain</p> <p>% of health facilities without stock out of a selected essential drug in four groups of drugs by admin unit</p>	<p>Break down of supply chain and medical logistics</p> <p>Damage to pharmaceutical factories, pharmacies, warehouses, equipment and stocks</p> <p>(Inappropriate) drug donations</p> <p>NB: consider effect on private pharmacies when donated medicines are provided for free;</p> <p>possible increase in sales of counterfeit medicines;</p> <p>increase of traditional medicines; also due to lack of financial resources</p>	<p>Provision of kits, medicines and medical inputs; replacement of drug kits, vital medicines</p> <p>Advocate for application of national essential medicine list by service providers</p> <p>Free access to medicines during the emergency phase (first three months, then review)</p> <p>Waiving of customs fees for medical supplies for humanitarian partners</p>	<p>Procurement of medicines, safe delivery kits, medical equipment and generators</p> <p>Reestablishment of the cold chain</p> <p>Integrate access to essential medicine within the new financing modalities (including creation of social solidarity or emergency fund to finance purchasing of services and essential medicines)</p>

## ANNEX 3: WORKSHEET ON BASELINE UNIT COSTS FOR INFRASTRUCTURE AND ASSETS TO ESTIMATE DAMAGES (EXAMPLE)

**Baseline unit costs for infrastructure and assets to estimate cost of damage in the health sector**

Health center	Type of center*	Number of units	Replacement cost, US\$	Furniture, US\$**	Equipment***, US\$	Medical supplies, US\$****	Ownership	
							Public	Private
Full Destruction								
	1							
	2							
	3							
Partial Damage								
	1							
	2							
	3							
Totals								

**Sources:**

- \* Define each type of center
- \*\* Define furniture in center, using standard lists and their costs for each type of health facility
- \*\*\* Define equipment, using standard lists and their costs for each type of health facility
- \*\*\*\* Define medical supplies, using standard lists of medical supplies and stocks for each type of health facility

## ANNEX 4: WORKSHEET ON BASELINE UNIT COSTS TO ESTIMATE LOSSES (EXAMPLE)

Baseline unit costs for loss estimation in Health Sector		Assumptions	Estimated Cost, US\$	Ownership
Component	Item	Provide explanation for each estimate of unit cost		Public Private
Infrastructure	Demolition and rubble removal	Average costs for demolition and rubble removal per type of health facility		
	Temporary health facilities	Costs for tent or other temporary infrastructures for emergency hospital and other health facilities (both to replace damaged infrastructure, as well as additional facilities in IDP settlements) Average rental costs of temporary premises		
Service delivery and access	Costs for temporary increased health care provision	Transport of injured to other centers and average costs per injured patient		
		Overtime salary payment to staff		
		Above-normal use of medical supplies		
		Costs per patient for medium to long term medical and psychological care		
		Average costs per patient for increased overall disaster related patient case load		
Costs related to loss of revenue	Duration of period with increased case load, and additional numbers of patients estimated per month			
	Average costs per patient for which there was a revenue loss in health facilities, or people no longer able to pay health insurance premium			
Governance	Costs for additional coordination and disaster management needs	Duration and numbers of patients for revenue loss		
		Average costs per admin unit in affected areas of staff and other resources required to manage the response and recovery process, including community participation		
		Costs for disaster response and recovery management at national level		
Risks	Interventions above normal budget allocations to mitigate disaster related risks	Cost of Early warning and alert systems to detect morbidity increases, and other temporary emergency related health information systems (per admin unit and/or standard # target population)		
		Costs for health promotion and public awareness campaigns (per admin unit and/or standard # target population)		
		Control of possible outbreaks costs, including for example vaccination campaigns (by each disease per admin unit and/or standard # target population)		
	Vector control costs (for each intervention per admin unit and/or standard # target population)			

# ANNEX 5: DISTRICT DATA COLLECTION FORM (EXAMPLE)

**Sector:** Health

**Province:** add province name

**District:** add district name

**Data provided by:** add staff name

**Data provided on:** add date

Institution Type	Baseline Number	Number (and %) of Infrastructure		Furniture**		Equipment***		Medical supplies	Ownership (no. or %)	
						Totally Destroyed	Partially Damaged	Destroyed	Public	Private
Hospital										
Health centre										
Health Clinic										
Blood Bank										
Dispensary										
Labouratory										
Mobile Healthcare Unit										
etc										
	3									
Totals										

## Estimation of Losses

Duration of reconstruction period, months

Cost of demolition and rubble removal

Higher expenditures for treatment of injured\*

Lower revenues for attending lower number of patients

Pre-Disaster number of patients:

Post-disaster number of patients:

Difference:

Average cost of treatment per patient:

Loss of revenue:

Duration of increased morbidity and/or outbreaks:

Cost of EWARN and surveillance:

Cost of health promotion campaigns:

Cost of vector control:

Cost of prevention (vaccination, etc):

Higher expenditures for increased case load:

Pre-disaster morbidity, #

Post-Disaster morbidity, #

Increased morbidity, #

Treatment cost per person

Total estimated cost

## ANNEX 6: WORKSHEET TO ESTIMATE COSTS OF DAMAGES AND LOSSES (EXAMPLE)

			Damage, million US\$			Losses, million US\$		
			Damage	Public	Private	Losses	Public	Private
<b>Infrastructure and assets</b>	<b>Estimation of Damage</b>							
	a) Facilities fully destroyed	Hospitals						
		Health Centers						
		Others						
	b) Facilities partially destroyed	Hospitals						
		Health Centers						
		Others						
	c) Equipment							
	d) Furniture							
	e) Medications and supplies destroyed							
	f) Other assets destroyed							
	g) Summary of estimated damage, million US\$							
	<b>Estimation of Losses</b>							
<b>Infrastructure</b>	Cost of demolition and rubble removal	Hospitals						
	Creation of temporary facility	Health Centers						
	Renting temporary space for health facility	Others						
<b>Service delivery and access</b>	Duration of reconstruction period, months							
	Higher expenditures for treatment of injured*							

		Damage, million US\$				Losses, million US\$			
		Damage		Ownership		Losses		Ownership	
		Public	Private	Private	Losses	Public	Private		
	Higher expenditures on patients referred to other facilities**								
	Reduction of revenues due to temporary closure to patients in damaged/dysfunctional facilities			Pre-Disaster number of patients paying					
				Post-disaster number of patients paying					
				Difference					
				Average cost of treatment per patient, US\$/person					
				Loss of revenue					
	Higher expenditures for overall increased case load			Pre-Disaster total number of patients/month					
				Post-disaster total number of patients/month					
				Difference					
				Average cost of treatment per patient					
				Increased costs					
	Reduced revenues in case of temporary waiving user fees, or reduced ability to pay health insurance premium								
	Costs for additional coordination and disaster management needs			Average costs per admin unit in affected areas of staff and other resources required to manage the response and recovery process, including community participation					
<b>Governance</b>				Costs for disaster response and recovery management at national level, million US\$					
				Cost of Early Warning systems to detect morbidity increases, and other temporary emergency related health information systems, million US\$					

		Damage, million US\$			Losses, million US\$		
		Damage	Public	Private	Ownership Losses	Public	Private
<b>Risks</b>	Higher expenditures to mitigate disaster related risks	Duration of period with increased risks for outbreaks					
		Cost of health promotion campaigns, million US\$					
		Cost of vector control, million US\$					
		Cost of prevention (vaccination, etc), million US\$					
		Mitigation of other health risks as identified					
	Estimated summary of losses, million US\$						

\* Physical and psychological injuries; cost over and above normal budget assignments, including personnel overtime when necessary  
 \*\* Cost of transport and of treatment of injured sent to undamaged facilities, whether privately or publicly owned

**Additional Information for Macro-Economic Impact Estimation**

Per cent value of imported component for hospital reconstruction

Per cent value of imported component for equipment and materials

# ANNEX 7: FORM TO CALCULATE LOSS OVER TIME IN THE HEALTH SECTOR (EXAMPLE)

Loss per component	Months after the disaster																		Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Duration of recovery period, months																			
<b>A. Loss of revenues</b>																			
1. Pre-disaster number of patients																			
2. Post disaster number of patients (in damaged health facilities)																			
3. Lower number of patients, post disaster (1 - 2)																			
4. Average revenue per patient, \$/patient																			
5. Loss of revenue, \$ (3 * 4)																			
<b>B. Costs of increased services</b>																			
6. Increased cost of medical treatment of injured during emergency stage, \$*																			
7. Increased costs of treatment due to increased morbidity, \$																			
8. Increased cost of medical treatment in higher cost, private facilities, \$																			
9. Increased cost of disease surveillance after disaster, \$																			
10. Increased cost of disease prevention and health promotion campaigns, \$																			
11. Increased cost of vector control campaigns, \$																			
12. Cost for long-term disability and psychological treatment, \$																			
13. Total increase in costs, \$ (6 + 7 + 8 + 9 + 10 + 11 + 12)																			
<b>C. Other losses</b>																			
14. Costs for demolition and clearing of debris																			
15. Costs for reinforcements of infrastructure, temporary facilities																			
Total losses (5 + 13 + 14 + 15 + 16)																			

## ANNEX 8: SAFE HOSPITAL INTERVENTIONS (EXAMPLES)

- Development of comprehensive national policies as well as specific policies focusing on building safety and emergency preparedness of health facilities and staff.
- Coordination of programmes related to the safety of health facilities and emergency preparedness in the ministry of health, other health agencies, emergency services and civil protection organisations and other sectors, such as water, power, transport and communications.
- Ensuring development proposals and plans for all new health facilities include hazard and vulnerability assessments.
- Assessment of existing health facilities to identify the priorities for retrofitting and other action (e.g., by using the Hospital Safety Index).
- Implementation of independent mechanisms to control and supervise infrastructure projects, such as by involving qualified professionals to work with a project team.
- Development and application of comprehensive and integrated system design, including land-use planning, architectural design, and building codes standards for the development and maintenance of health facilities.
- Guidance and promotion of best practices for:
  - assessment and maintenance of safety of health facilities before and after disasters, including structural, non-structural and functional safety;
  - emergency preparedness programmes in health facilities;
  - multi-task training to manage basic life-saving emergency and surgical interventions;
  - development of safe and resilient health facilities in safe locations;
  - retrofitting and reconstruction of existing vulnerable facilities;
  - safe working environments for health workers; and
- Safe infrastructure for health facilities, including continuity of essential services for power, water and waste disposal, and of medical and health supplies of during times of emergency.
- Development and delivery of training courses in safety and emergency preparedness in undergraduate, graduate and continuing professional courses, for construction, health and other sectors.
- Case study development and promotion of good practices in safety and emergency preparedness of health facilities.

## ANNEX 9: DISASTER RISK REDUCTION AND PREPAREDNESS INTERVENTIONS (EXAMPLES)

- Integration of emergency and disaster management into legislative frameworks, policies and plans.
- A multidisciplinary unit in the MoH with authority, capacity and resources to provide coordination of health emergency management activities at all levels within the health sector and with other sectors.
- Risk assessments, including hazard identification and vulnerability (population and health system vulnerabilities) and capacity assessments in collaboration with the multisectoral disaster management authority.
- National capacity development programme for health emergency and disaster risk management with necessary resources.
- Health sector capacity to conduct risk awareness campaigns, including health education, health promotion and social mobilisation to reduce risks and prepare to respond to emergencies.
- All hazards early warning systems which takes into account risks to public health and to the health sector.
- Integration of disaster and emergency risk management into undergraduate, graduate and professional education of health and relevant human resources for health and other sectors.
- Programmes to reduce underlying risk factors (such as improving the safety and preparedness of health facilities).
- Risk reduction and preparedness programmes for epidemic/pandemic disease prevention and control, reproductive health, mass casualty management systems, nutrition, environmental health, mental health and other noncommunicable diseases, maternal and child health, prevention of and service delivery for SGBV, and management of the dead and missing.
- Health sector response and recovery planning and other elements of the preparedness programme, including pre-positioning of supplies and exercises to test plans, with other sectors.

# ANNEX 10: WORKSHEET FOR A RESULTS-BASED RECOVERY PLAN (EXAMPLE)

Priority recovery needs	Interventions			Expected outputs	Recovery costs			Intended outcomes
	Short-term	Medium-term	Long-term		Short-term	Medium-term	Long-term	
By region	To repair/rebuild damaged infrastructure and physical assets, and Build Back Better							
By region	To resume service delivery and access to goods and services, and Build Back Better							
By region	To restore governance and social processes, and Build Back Better							
By region	To address immediate new risks, and disaster risk reduction							

## ANNEX 11: GLOSSARY

The definitions below are from the United Nations Office for Disaster Risk Reduction (UNISDR) 2009.

### DISASTER

A serious disruption of the functioning of a community or a society involving widespread human, material, economic, or environmental losses and impacts which exceeds the ability of the affected community or society to cope using its own resources.

### DISASTER RISK

The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.

### DISASTER RISK REDUCTION

The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

## RECOVERY

The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.

## RESILIENCE

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

## RESPONSE

The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

## RETROFITTING

Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards.

# ANNEX 12: REFERENCES AND FURTHER READING

Health Metrics Network. Guidance on recommended Indicators for HIS Strengthening. [www.who.int/healthmetrics/tools/GFGuidanceOnRecommendedIndicators09.pdf](http://www.who.int/healthmetrics/tools/GFGuidanceOnRecommendedIndicators09.pdf)

Inter-Agency Standing Committee (IASC) (2008). Humanitarian Action and Older Persons: An essential brief for humanitarian actors.

IASC, Needs Assessment Task Force (2010). Operational Guidance for Coordinated Assessments in Humanitarian Crises.

IASC Reference Group for Mental Health and Psychosocial Support in Emergency Settings (2010). Mental Health and Psychosocial Support in Humanitarian Emergencies: What Should Humanitarian Health Actors Know? Geneva,

Pan American Health Organisation (PAHO) (2010). Health Sector Self-Assessment Tool for Disaster Risk Reduction. Washington, D.C.

PAHO, WHO, ICRC and IFRC (2006). Management of dead bodies after disasters. A field manual for first responders.

United Nations Development Group (2009).

Integrating Disaster Risk Reduction into the Common Country Assessment and United Nations Development Assistance Framework. Guidance Note for United Nations Country Teams,

World Bank (2008). Data against natural disasters: establishing effective systems for relief, recovery and reconstruction. Editors Samia Amin and Markus Goldstein.

World Bank GFDRR (2010). Damage, Loss and Needs Assessment guidance notes, volume 1, 2 and 3.,

World Bank (July 2008). Good Practice Notes 1 Health.

World Health Organisation (WHO) (2009). Analysing Disrupted Health Sectors, Module 12: Formulating strategies for the recovery of a disrupted health sector. [www.who.int/hac/techguidance/tools/disrupted\\_sectors/en/](http://www.who.int/hac/techguidance/tools/disrupted_sectors/en/).

WHO (2007). Everybody's Business. Strengthening Health Systems to Improve Health Outcomes. WHO's Framework for Action. [http://whqlibdoc.who.int/publications/2007/9789241596077\\_eng.pdf](http://whqlibdoc.who.int/publications/2007/9789241596077_eng.pdf).

World Health Report (2000). Health Systems: Improving Performance.

Guidance Note for Integration of Disaster Risk Reduction in Bank Projects in the Health Sector 16 March 2009. Work in progress.

WHO. Health Cluster Guide. A practical guide for country-level implementation of the Health Cluster.[www.who.int/hac/network/global\\_health\\_cluster/guide/en/index.html](http://www.who.int/hac/network/global_health_cluster/guide/en/index.html)

WHO. Global Health Cluster tools.[www.who.int/hac/global\\_health\\_cluster/guide/tools/en/index.html](http://www.who.int/hac/global_health_cluster/guide/tools/en/index.html).

**Further reading:**

*Early Warning Systems*, World Health Organisation  
[www.who.int/csr/labepidemiology/projects/ewarn/en/](http://www.who.int/csr/labepidemiology/projects/ewarn/en/)

*Emergency Risk Management for Health*, World Health Organisation  
[www.who.int/hac/techguidance/preparedness/en/index.html](http://www.who.int/hac/techguidance/preparedness/en/index.html)

*Hospitals Safe from Disasters*, 2008-2009 World Disaster Reduction Campaign  
[www.unisdr.org/2009/campaign/wdrc-2008-2009.html](http://www.unisdr.org/2009/campaign/wdrc-2008-2009.html).

*The Hospital Safety Index*, tool developed by the Pan American Health Organisation  
[new.paho.org/disasters/index.php?option=com\\_content&task=view&id=964&Itemid=911](http://new.paho.org/disasters/index.php?option=com_content&task=view&id=964&Itemid=911)