POST-DISASTER NEEDS ASSESSMENTS GUIDELINES

Volume B

Social Sectors - Health

2014

GFDRR
Global Facility for Disaster Reduction and Recovery

ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care
BEmOC	Basic Emergency Obstetric Care
BoP	Balance Of Payments
BBB	Build Back Better
CBO	Community-Based Organizations
CEmOC	Comprehensive Emergency Obstetric Care
CFR	Case Fatality Rate
CHW	Community Health Worker
CMR	Child Mortality Rate
CSO	Civil Society Organizations
DaLA	Damage And Loss Assessment
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
ECLAC	Economic Commission for Latin America
EU	European Union
EWARN	Early Warning System
FP	Focal Point
GAM	Global Acute Malnutrition
GDP	Gross Domestic Product
GFDRR	Global Facility For Disaster Reduction and Recovery
GIS	Geographical Information Systems
HCT	Un Humanitarian Country Team
HDI	Human Development Index
HFA	Hyogo Framework For Action
HIMS	Health Information Management System
HIV	Human Immunodeficiency Virus
HRH	Human Resources for Health
HRNA	Human Recovery Needs Assessment
IASC	Inter Agency Standing Committee
IFIs	International Finance Institutions
IMCI	Integrated Management of Childhood Illnesses
IMR	Infant Mortality Rate
IPD	Inpatient Department
MDG	Millennium Development Goals
MDTF	Multi Donor Trust Fund
MoH	Ministry of Health
NCD	Non Communicable Disease
NDMA	National Disaster Management Authority
NGO	Non-Government Organization
NHSP	National Health Strategic Plan
OPD	Outpatient Department
PAHO	Pan American Health Organization
PDNA	Post-Disaster Needs Assessment
PRSP	Poverty Reduction Strategy Paper
RBPF	Results-Based Planning Framework
RF	Recovery Framework
RS	Recovery Strategy

SADD	Sex- and Age-Disaggregated Data
SAM	Severe Acute Malnutrition
SGBV	Sexual- and Gender-Based Violence
SRH	Sexual and Reproductive Health
ToR	Terms Of Reference
U5MR	Under Five Mortality Rate
UN	United Nations
UNAIDS	Joint United Nations Programme On HIV/AIDS
UNCT	United Nations Country Team
UNDP	United Nations Development Programme
UNDAC	United Nations Disaster Assessment And Coordination
UNDAF	United Nations Development Assistance Framework
UNISDR	United Nations Office For Disaster Risk Reduction
WB	World Bank
WHO	World Health Organization

Contents

1. INTRODUCTION

This document provides guidance to national and international stakeholders involved in the health sector part of the Post Disaster Needs Assessments (PDNA) and recovery planning. While PDNAs strive for consistency in methods, they also need to be adapted to each specific country. The guidance is based on an integrated approach[1] undertaking the PDNA process. Updates and additional tools for PDNAs and guidance for recovery in the health sector can be found on the websites of the International Recovery Platform2, ECLAC 3, World Bank (WB) Global Facility for Disaster Reduction and Recovery (GFDRR) 4, WHO 5 and PAHO 6.

This guidance brings together the four components that are needed for a comprehensive PDNA analysis;
1. Health i**nfrastructure** and assets
2. D**elivery** of health services, a**ccess** to and changes in demand for services
3. Health **governance** processes
4. Vulnerability and health **risks** of the affected population

These elements will be used consistently for the description of 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 and it's costing.

Recovery and reconstruction should not only aim at restoring the health system to its pre disaster conditions, but also to address underlying vulnerabilities that may have contributed to the extent of the disaster's effects, to strengthen the resilience of the health system and communities to manage better future disasters and their risks to health.

[1] An integrated approach refers to the use of the standard DaLA methodology and the inclusion of a recovery strategy that pays special emphasis on the human condition..
[2] http://www.RecoveryPlatform.org
[3] http://www.eclac.org/default.asp?idioma=IN
[4] www.gfdrr.org
[5] http://www.who.int/hac/en/
[6] http://new.paho.org/disasters/

2. ASSESSMENT PROCESS

2.1 Multi-sectoral 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, 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 3 main groups of sectors: the Productive, Social and Infrastructure Sectors. Health falls under the social sector, together with Education, Housing and Culture. Nutrition is often integrated under health.

2.2 Recovery coordination and consultation

The health sector PDNA process is led by the Ministry of Health (MoH). The Minister of Health needs to designate a Focal Point (FP) to manage the health part of PDNA and recovery process. The MoH recovery FP will work together with the other sectoral FP appointed by the government, which will allow synergies with other sectors relevant to health. Depending on national context, the recovery process may fall under a National Disaster Management Authority (NDMA). When the MoH has a FP responsible for health Disaster Risk Management functions connected to such NDMA, this person may also be appointed as the FP for recovery.

The MoH recovery FP will establish a health sector recovery coordination mechanism that allows mobilisation of technical resources from relevant departments in the MoH and consultation with sub-national health authorities. When a governments requests support for a PDNA process, the MoH recovery FP will be supported by recovery experts from WHO, the WB and the EU. Together, a smaller Steering Group can be established with clarified roles and responsibilities assigned to different stakeholders involved. For examples of practical steps to take in managing the PDNA process, including timelines, see Annex 1.

Beside the UN, WB and EU, it is important to involve all relevant health development partners in the PDNA process, such as other UN agencies, development banks, donors, NGOs, faith and community based organisations, civil society, professional associations, and private sector.

Link to Health Sector Development Coordination

Where a national health sector development coordination mechanism exists, such as the Sector Wide Approach or the International Health Partnership, the recovery FP should be connected to this group, and the development partners need to be consulted to assist in the PDNA process. This ensures optimal harmonization and alignment of the recovery strategy to the National Health policy and Strategic Plan. If such sector wide development coordination mechanism does not yet exist, the PDNA process can be used as opportunity to initiate this.

Link to Humanitarian Coordination

It is particularly important to ensure that the PDNA builds on the humanitarian assessments to the extent possible. Information collected to inform the humanitarian response, for example through the Multi-sectoral Initial Rapid Assessment (MIRA) and the Health Resources Availability Mapping System (HeRAMS), is also essential for the PDNA and recovery strategy.

As such, the PDNA process also needs to be linked to the national and subnational coordination for the humanitarian response. Since the humanitarian reform of 2005, the national emergency coordination mechanisms are supported through the Inter Agency Standing Committee's Cluster Approach as indicated.

2.3 Health Sector Recovery Assessment Framework

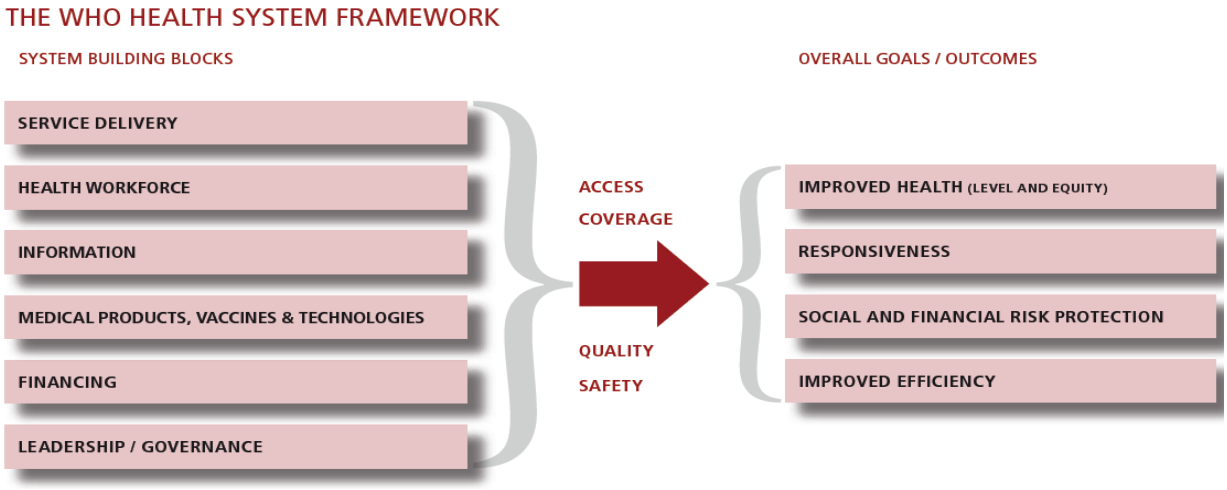
While the health sector part of the PDNA is harmonised with the other sectors, it makes use of the existing specific health system frameworks and assessment methods. This section will describe how these can be used to identify the relevant issues that need be assessed to inform the various elements of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

Health sector assessment and analysis framework

Health sector analyses are based on the health system framework using the six building blocks, as defined by WHO in 2007.[7] The health system framework is used in an assessment and analysis matrix that guides the health recovery team to establish the baseline, a systematic assessment of changes in the epidemiology of the burden of disease, the performance of the main health programmes and the six health system building blocks. It takes into consideration the assets, stakeholders, and processes that are typically included in the sector and how they may be affected by a disaster. This enables analysis of how pre-existing performance and constraints may affect the recovery needs to restore access to essential services, meet new health needs, and identify priorities for Building Back Better. Using the health systems framework allows linking recovery planning with the longer term national health development plans.

Health system framework

WHO defines the health sector as a system which 'consists of all organizations, 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.[8] The health system framework is made up of six building blocks, with a strong interdependence between the building blocks.[9]



[7] Everybody's business. Strengthening health systems to improve health outcomes. A framework for action. http://whqlibdoc.who.int/publications/2007/9789241596077_eng.pdf
[8] Expanded from the World Health Report 2000. Health Systems: Improving Performance
[9] http://www.who.int/health-systems-performance/about.htm

Health sector response domains:

Linked to service delivery, WHO lists a number of health sector response domains.[10] They represent the main health programmes that need to be taken into account when doing a PDNA to determine the pre-existing burden of disease related to each domain, and how the disaster affected this. Other information that is required is the assessment of performance of respective health programmes to address the morbidity, and how this capacity is affected by the disaster. The health sector response domains are;

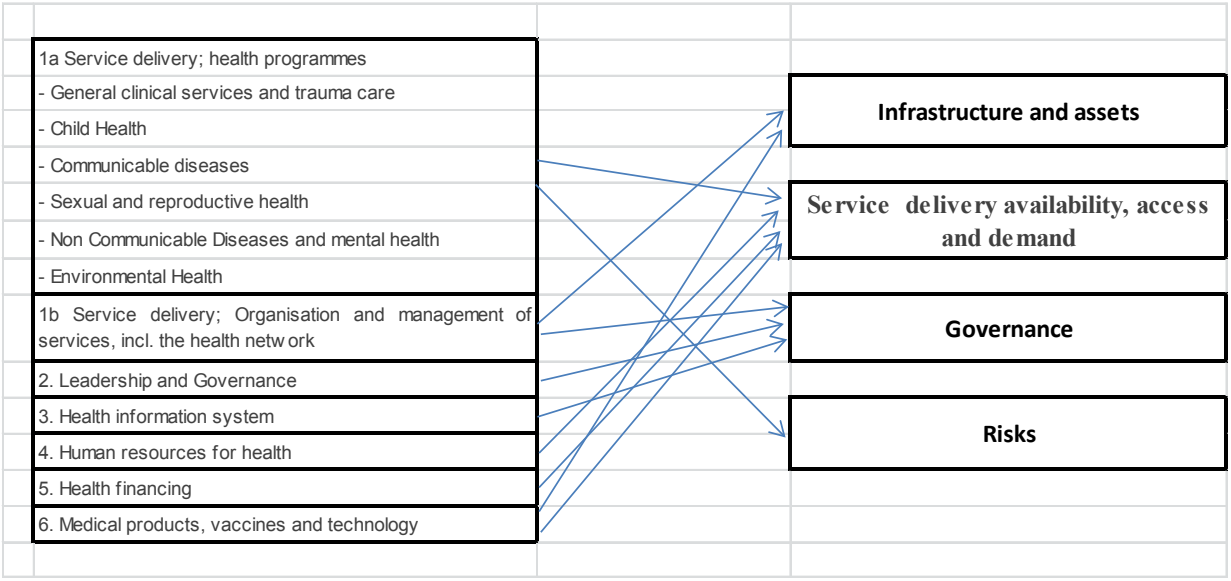
1. General clinical services and essential trauma care
2. Child Health (including treatment of malnutrition)
3. Communicable diseases
4. Sexual and reproductive health (incl. STI & HIV/AIDS, Maternal & Newborn Health, and sexual violence)
5. Non Communicable Diseases and Mental Health
6. Environmental Health

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. For 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 the PDNA: Infrastructure, Service Delivery, Governance and Risks.



Health sector assessment and analysis matrix

[10] http://www.who.int/hac/network/global_health_cluster/herams_services_checklist_eng.pdf

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

This will assist the assessment team to collect information that is also aligned with key chapters of the PDNA sectoral reports: Sector overview and baseline, disaster effect, and recovery needs including BBB approaches. The health sector team collects and provides the information based on the best available data, evidence and/or professional expert judgments. Annex 2 provides examples baseline data and indicators, common disaster effects, constraints and responses in relation to the immediate relief and early to medium recovery responses. [11]

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 BBB, for the short medium and long term	Key indicators for monitoring
1a Service delivery; health programmes - General clinical services and trauma care - Child Health - Communicable diseases - Sexual and reproductive health - Non Communicable Diseases and mental health - Environmental Health					
1b Service delivery; Organisation and management of services, incl. 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					

2.4 Assessment methods

The data collection strategy and information requirements for the health sector recovery should be seen as a process and placed in the cycle of disaster management. This means that assessments and information required for (early) recovery build on data that is collected before the disaster happened, from normal HIMS and other reports, including from disaster preparedness, as pre-disaster baseline, and rapid assessments in the early humanitarian phase.[12][13] It should then become a monitoring system of the health system performance that can also measure progress of the humanitarian response and recovery activities.

The scope and depth of the assessment is constrained by the limited time in which it needs to be accomplished. While wherever possible evidence should be used but it also involves expert judgements of the team on the validity and accuracy of estimates. In particular for the estimates of costs, both for

[11] See also fact sheets on health effects of hazards: http://www.who.int/hac/techguidance/tools/WHO_strategy_hazards.pdf
[12] See also Word Bank 2008. Data against natural disasters : establishing effective systems for relief, recovery and reconstruction. Editors Samia Amin and Markus Goldstein.
[13] For health sector humanitarian assessment methods see Health Cluster Guide. http://www.who.int/hac/network/global_health_cluster/guide/en/index.html

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).

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

PDNA are based on mixed assessment methods, as there is no single source or a 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.[14] An example of data to be collected from district health authorities on the effects of the disaster, as required to estimate damage and loss can be found in annex 5.

Care must be taken to ensure that women and men from the affected community can participate. When interviewing people, there needs to be a sex balance of the assessment team as well as of informants and participants in focus group discussions, and where appropriate, separate, private interviews with men and women, attention to the time and venue of the assessment, etc. 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 (SADD) and indicators, qualitative information sources and consultations and interviews with women and men in communities and among key stakeholders.

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

- WHO statistics information system[15]
- National Statistics and Health Information Management System reports (incl. 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 the health infrastructure network, private and public, 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 the cost of an outpatient consultation, daily hospital admission, differences between private and public sector, etc.
- Demographic Health Surveys and Multi Indicator Cluster Surveys
- Vulnerability and Risk Assessment and Mapping
- World Bank and UNDP Millennium Development Goals websites
- Humanitarian assessments and surveillance reports (MIRA, Public Health Risk Assessments, Disease Early Warning Systems)
- Health strategies in the IASC Flash Appeal and/or the Humanitarian Strategic Response Plan
- Humanitarian general and health sector sitreps (humanitarian dashboard)
- Common indicators [16] [17] [18],

[14] See Operational Guidance for Coordinated Assessments in Humanitarian Crises. Inter-Agency Standing Committee. Needs Assessment Task Force. 2010
[15] http://www.who.int/whosis/en/
[16] http://www.who.int/healthmetrics/tools/GFGuidanceOnRecommendedIndicators09.pdf
[17] See Global Health Cluster tools; http://www.who.int/hac/global_health_cluster/guide/tools/en/index.html

2.5 Expected outputs of sector chapter

The PDNA usually has two outputs: The first is a summary as a contribution to the overall PDNA report. The sectoral components are usually no more than 3 to 4 pages. The second output is a 15 to 20 page document that provides a more detailed report from the assessment, and a more detailed strategy for the recovery. These reports include a set of typical data tables or annexes, see annexes 6 and 7. The time horizon for the recovery strategy is determined by the government, but usually ranges from 2 to 5 years.

The more extensive health sector recovery strategy and plan can then be used as a basis to review and revise 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 WB[19] and the International Recovery Platform[20].

2.6 The Assessment Team

The health sector assessment team would be headed by a MoH designated leader, with experts from different professional disciplines as required for the assessment, and supported by experts from international organizations. 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 may estimate the value of production losses. Depending on the areas affected by the disaster, the respective subnational health authorities need to be involved in the assessment to ensure full access to information at all levels and areas of 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, and one member should be appointed gender focal point of the team, responsible for coordinating findings with other teams and the gender advisor, and 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 as indicated. Provisions for engagement with representatives of the 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 representatives of the health authorities in the affected area and managers of the affected health facilities. The transport for the PDNA assessment should be organized with support from the development partners, so the national authorities can dedicate their transport capacity to the emergency response.

[18] http://www.who.int/hac/techguidance/tools/disrupted_sectors/en/index.html
[19] https://www.gfdrr.org/node/118
[20] http://www.recoveryplatform.org/resources/tools_and_guidelines

3. PRE-DISASTER BASELINE

This section describes how to develop a health sector overview and pre-disaster baseline, and what 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 its characteristics were prior to the event. In this section the most important pre-disaster challenges and constraints for service delivery need to be highlighted. Some examples are given here, further details can be found in annex 2, the column on '*pre-disaster baseline and challenges'*. In addition, 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 (DRM) and preparedness functions.

3.1 context analysis

- Description of the development status of the country (for example ranking on the Human Development Index, and health sections in Poverty Reduction Strategies)
- Progress in achieving (health related) Millennium Development Goals
- Political context

3.2 Infrastructure and assets:

- Description of the health network, their location and the different levels of the health system (community, primary, secondary and tertiary levels), and referral mechanisms.
- Data on the numbers of the various levels of the health infrastructures (for example based on Service Availability and Readiness Assessments).
- Infrastructure includes facilities for vertical health programmes, public health institutes, laboratories, pharmaceutical factories and warehouses. Also the logistics, transport of patients and pharmaceuticals are included.
- Infrastructure needs to be described for the public and private not for profit , and private for profit sectors
- NB: Administrative infrastructure for the health authorities is part of the health sector infrastructure
- NB: Infrastructure for schools and universities for health workers is usually included under tertiary education in the education sector.

3.3 Service delivery, availability, access and changes in demand:

- 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 different 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 where 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 where these factors affect coverage and access to services.
- Access, as defined by coverage and utilization, 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.

3.4 Governance:

- Organization, management and regulatory functions of the health authorities for general service delivery
- (Disaster) Laws and regulations affecting the access of segments or sub-groups of the population to certain health services e.g. reproductive health services
- Health development and humanitarian/DRM coordination mechanism.
- Capacity to manage the response and recovery process
- Funding sources and mechanisms for the health sector
- Vision and mission statements from the National Health Strategic Plan (NHSP), priorities for health sector reform
- Health sector preparedness plans
- Participatory governance mechanisms related to health service provision and processes at all levels, including community level, including existence of complaints mechanisms for patients.
- Functionality of Health Information Management and EWARN systems

3.5 Risks and vulnerabilities

- 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)
- Marginalized and/or disadvantaged sub-groups of the population with a special risk profile

4. ASSESSMENT OF DISASTER EFFECT

The section below will provide key questions to 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', further examples can be found of effects of disasters on the health system building blocks and the health sector response domains, and the typical humanitarian responses.

4.1 Introduction: general description of the disaster

- Geographical scope, population affected number of people that died and were injured, the evolution till date, etc.
- Priorities for the immediate humanitarian response

4.2 Effects on Infrastructure and Physical Assets

- Physical damage to infrastructure: total numbers and percentage against baselines of different levels of health facilities partially or fully damaged, disaggregated by administrative units, private and public facilities.
- Physical damage to furniture, equipment and medical supplies
- Types and numbers of temporary health facilities established to replace damaged health facilities or in settlements of displaced populations.

4.3 Effects 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 pattern, in particular injuries, mental health[21], 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' to access health services for affected households 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.

4.4 Effects on Governance and Social Processes

- 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 HIM Systems affected by the disaster, and are the health authorities able to establish EWARS systems?

4.5 Effects on Risks and Vulnerabilities

- What was the impact of the disaster on the health of women and men of all ages and sub-groups of the affected population?
- Consider the status of children, pregnant and lactating women, older persons, persons with disabilities and persons living with long-term or chronic illnesses
- 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 increased risks for the transmission of communicable diseases, but also health risks due to the interruption of emergency and routine services such as emergency obstetric care services and care for chronic and Non-Communicable diseases (e.g. HIV, TB, diabetes, etc).
- Risks include also possible exposure to SGBV, which can increase after disasters and during crises.

[21] See http://www.who.int/mental_health/emergencies/en/

5. THE VALUE OF THE DISASTER EFFECTS

This section gives guidance on how to estimate the value of Damage and Loss, extracting from the section on effects those elements that have financial implications, either in damage of infrastructure and assets, as well as loss due to changes in financial flows as linked to infrastructure, service delivery, governance and risks. Damage and loss need to be disaggregated for public and private facilities.

The **damage** analysis looks at health infrastructure including hospitals, health centres and other health sector related facilities including the building for the administration of the health authorities, 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 they had prior to the disaster. In principle assessment of damage to infrastructure is done on a facility by facility basis, usually based on detailed estimates of numbers of square meters 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, based for example on reports from subnational health authorities and initial humanitarian assessments, and using average estimates of their value based on standards for each type of health infrastructure, and average costs for repair and rehabilitation for partially damaged facilities by each 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 percentage of full replacement costs against national standards.

Loss refer 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; they normally include higher expenditures over and above the normal budgetary appropriations for the health sector, and lower revenues[22]. 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.

See typical examples for damage and loss in table 2 below. For example tables for baseline unit costs and assumptions on Damage and Loss for the health sector as included in PDNA sector reports, see annexes 3 and 4. It is important to determine the time needed for rehabilitation and reconstruction of health facilities, for planning of 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 under methods, it is required to produce an assumption sheet, 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 the WB GFDRR guidance notes.

Table 2 Typical elements included in the assessment of damage and loss

Damage	Loss
Infrastructure and assets • Buildings disaggregated in community, tertiary, secondary, and primary levels (Hospitals, health centres, clinics,	**1. Increased expenditures for:** ***Infrastructure*** • Removing debris, mud and other bio-hazardous materials from the destroyed or damaged facilities

[22] *Damage, Loss and Needs Assessment: Guidance Notes*. Volume 2. The World Bank GFDRR. 2010.

dispensaries, pharmacies, health posts, blood banks, laboratories, etc) • Equipment and furniture • Medical supplies • Transport and logistics, ambulances, etc. • Infrastructure of the Ministry of Health at national and subnational levels Ambulances are included under the secondary and tertiary facilities. Pharmaceutical factories are included under the industry sector 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.	• Establishing temporary health facilities, or mobile clinics for displacement settlements or in vicinity of damaged facilities till they are reconstructed ***Service delivery and access*** • Treating increased number of patients due to new and/or increased health risks • Additional cost per patient treated in alternative, temporary medical facilities • Long term medical treatment for disabilities and psychological care of affected people ***Governance*** • Costs for increased coordination needs, support management capacity for service delivery • Costs for establishing EWARN systems ***Risk reduction*** • Additional expenditures for surveillance and control of possible epidemics • Health prevention campaigns, vaccinations, vector control, etc. • Health promotion campaigns **2. Loss of revenue** • Due to interrupted service delivery in damaged facilities during the period of rehabilitation and/or reconstruction • Temporary suspension of user fees for affected population

6. ASSESSMENT OF DISASTER IMPACT

6.1 Macro-Economic Impact

The macro-economic impact analysis includes an estimation of the disaster's 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 (GDP), the balance of payments (BOP) 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 the Total Health Expenditures.

The health sector assessment team should deliver the following estimates of values to the appropriate assessment team members handling the economic impact analysis:[23]

- The estimated imported portion of the health sector reconstruction costs (including all items that are not produced locally in the affected country and that will have to be imported from abroad), expressed in percentage (%) of reconstruction needs once they have been estimated. This information will be used for the impact analysis on the BoP.
- The estimated imported portion of recovery (including the items of prevention and mitigation for the sector) that must be imported from other countries in the absence of local production, to be used for the analysis on the BoP.
- The total value of higher government expenditures and lower revenues, over and above its regular budget appropriations, to be used for the analysis of fiscal sector impact.
- For the analysis of personal or household impact, make estimates of the increased costs of obtaining medical or health care

6.2 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 and Multidimensional Poverty Index, the Millennium Development Goals (MDG), and/or the new Sustainable Development Goals. To estimate the human development impact of the disaster it is useful to:

- Analyze 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)
- Consequences of the effects with 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 they were not designed as dynamic measures and 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, Ante Natal 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

[23] Worldbank GFDRR, 2010. Damage, Loss and Needs Assessment guidance notes, volume 2

MDGs remains complicated. Service availability and access to health programmes are often interrupted 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 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 1 year-old children immunised 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 bednets 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

7. CROSS-SECTORAL LINKAGES, including cross cutting issues

Inter sectoral 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 therefore cross sectoral analysis. The health sector needs to work closely together 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 health considerations need to be integrated in these sectors. Furthermore, it is needed to clarify which sector aspects are addressed in other sectors, as to avoid double counting, for example damage to health training facilities are usually included under the education sector.

Cross cutting 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. Cross cutting issues and gender and age analysis are integrated as relevant in the four components under the pre-disaster baseline, disaster effects and recovery strategy.

Gender & Age: In disaster situations, women and men, boys and girls are affected differently and have different resources available and different coping strategies. Available data suggest 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 risk 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, women 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 different needs. Older people can be particularly vulnerable, for example, of those who died in the wake of Hurricane Katrina in 2005, 71% of were 60 years and older.[24] Older age can result in decreased mobility, sight, hearing and muscle strength, as well as in greater vulnerability to heat and cold. Chronic diseases common to older age, such as coronary heart disease, hypertension, diabetes and respiratory diseases, can worsen when treatment is interrupted.

[24] IASC 2008. Humanitarian Action and Older Persons. An essential brief for humanitarian actors

8. THE SECTOR RECOVERY STRATEGY

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

8.1 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 it 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 better so as to contribute to reduction in morbidity and mortality and improve health status of the disaster affected population. Health system recovery aims to strengthen and build upon humanitarian activities while also correcting the negative impact of disasters on the health system. This means the system will have safer infrastructure, be prepared for key public health hazards and future disasters, and provide equitable and affordable services to all. The post-disaster period offers important, but not unlimited and often short, windows of opportunities for health sector reform.[25]

The key reference that should inform the recovery vision is the NHSP. Ambitions for health sector reform formulated in the NHSP need to be reflected in the recovery process. Sometimes, the recovery process can be used to accelerate introduction of health sector reforms. The enthusiasm for reconstruction may be high, the generosity of donors considerable, and resistance to change reduced.

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 where relevant. However, stakeholders involved in PDNAs need to be cautious with the 'window of opportunity' to introduce institutional and regulatory reforms or to aim for significant improvements in the short recovery period. The need for reform needs to be balanced with what can be practically achieved in the context of a disaster recovery strategy. There can be high expectations, but there is limited evidence that major reforms in such context 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 following **guiding principles** apply to the recovery process in the health sector:

- Government commitment, leadership and ownership at all levels is critical for successful health system recovery, and use the process to strengthen their capacity
- Planning health system recovery should start early, in parallel to the humanitarian response
- 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 connection to development coordination processes, and take into account national strategies on health development and poverty reduction
- Maintain synergies with humanitarian actions
- Work in partnership with civil society, donors, NGOs, WB and other UN agencies, and the private sector
- Ensure coordination with other sectors
- Use the disaster as opportunity to reinforce national capacities for DRM and DRR

[25] World Bank Good Practice Notes 1 Health July 2008

Table 4 summarises the main elements of the assessment of the disaster effects and health recovery needs for the development of a health recovery strategy to guide the restoration and improvement of economic and human development, and to build resilience to future events.

Table 4 Disaster effects, recovery and reconstruction needs, including BBB

	Disaster effect	Health Recovery and reconstruction needs	
		Restore pre-disaster conditions	Building Back Better
Infrastructure and assets	• 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 heath infrastructure, replace assets lost.	• Ensure all hazard resilient infrastructure (safe hospital approach). • Modernisation and rationalisation of the health network.
Service delivery, access and demand	• Reduced availability of health services and disrupted procurement of pharmaceuticals • Reduced access to and possible increased demand for health services delivery	• Restore capacity to deliver health services, and procure pharmaceuticals. • Additional capacity in availability of services to meet increased and possible new demands for services • Ensure equitable access to health service delivery, and ensure utilization of services, in particular for pre-existing and new vulnerable groups by reducing old and new barriers for access and utilisation	• Address possible pre-existing constraints in capacity and performance of service delivery. • Adapt the health workforce as required and availability of pharmaceuticals • Reduce pre-existing and new inequities in access to health services. Improve utilization and reduce barriers for access, taking into account reduced ability to pay
Governance	• Effects on capacity of the health authorities to manage service delivery, including community participation, and capacity to manage the response and recovery process	• Restore governance role for service delivery of health authorities at national and subnational level, including community participation. • Manage the response and recovery process and coordination mechanisms, within the health sector and between different sectors • Support to HIM and EWARN systems	• Strengthen governance role of national health authorities to better manage equitable service delivery and disaster risks, based on a DRM capacity assessment, including Health Information Management and Early Warning systems
Risks	• Effects on pre-existing risks to health, new health risks caused by the disaster, and effect on the health status of the affected population	• 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	• Reduce vulnerabilities and risks to health, support to community resilience. • Longer term DRR interventions, based on a more detailed Vulnerability and Risk Assessment and Mapping.

8.2 Reconstruction and Recovery needs, including Building Back Better

This section provides guidance on how to define needs for reconstruction and recovery, distinguishing the needs to restore and resume to pre-disaster levels, from needs that will improve disaster resilience of infrastructure and access to services and goods, catalyze the economy, build livelihoods, strengthen DRM of the government and communities and reduce risks and vulnerabilities to future disasters.

The recovery and reconstruction needs follow from the assessment of the effects of the disaster on the health sector and the health needs of the affected population. The analysis of recovery and reconstruction needs aims at restoring the situation at least to pre-disaster levels, and identifies needs and opportunities for BBB approaches, While the recovery plan should be harmonised with the existing national health develop plans and any proposed sector reform reflected in these, it cannot aim to include measures that address the full development objectives. During the PDNA it will be important to

have inter-sectoral consultations to avoid double counting in the identification of recovery needs and costs.[26]

8.2.1 Reconstruction needs for infrastructure and assets:

The needs with regards to infrastructure is to repair and/or reconstruct damaged infrastructure, and repair or replace assets. Consider credit schemes for reconstruction and repair of private hospitals and other private health service related facilities.

For reconstruction needs related to BBB approaches, several elements can be taken into consideration:

- ensure that buildings are able to withstand future hazards and remain functional when a next disaster happens: the safe hospital approach, making infrastructure more resilient to common hazards, and training of health staff in managing the disaster response, including mass casualty management.[27] For the buildings, this can be done by adherence to building codes or retrofitting. A more detailed assessment of the safety of health infrastructure is often not feasible during the first 3 months after a disaster happened, but such assessment can be included in the recovery plan.[28] For examples of interventions of safe hospital programmes, see annex 8.
- When standards for health infrastructure have changed, the reconstruction can be used for the 'modernisation' 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.

8.2.2 Recovery needs:

Restore temporary health infrastructure:

While waiting for the more permanent reconstruction of the infrastructure, which may take several years, it is necessary to establish temporary structures (this can also be done through renting a building) and/or mobile health units in the vicinity of damaged health facilities that are not functional, and/or 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 appropriate triage and referral systems for emergency medical, surgical, trauma and obstetric care.

Primary Health Care services should be easily accessible to remaining populations in the affected areas, and at the temporary resettlement sites where people live 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, and how these may need to be adapted to changes in disease profiles and increased Burden of Disease as often seen after disasters. If infrastructure related to the production of pharmaceuticals had been destroyed, their production capacity will need to be restored as well as the functionality of the cold chain.

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[26] See Also Worldbank, GFDRR, 2010. Damage, Loss and needs Assessment Guidance Notes Volume 3
[27] See http://www.unisdr.org/2009/campaign/wdrc-2008-2009.html
[28] See http://new.paho.org/disasters/index.php?option=com_content&task=view&id=964&Itemid=911

For service delivery needs related to BBB approaches, several elements can be taken into consideration:

- 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, for example:
- Shortages of Human Resources for Health: adapt health workforce capacity to meet priority gaps and new health demands, packages to encourage staff to return to or be (re)deployed to the affected areas
- Shortages of pharmaceuticals or the presence of poor quality medicines: Restored and possibly increased capacity for national production of pharmaceuticals, improved regulation or other quality assurance initiatives.
- Analysis of pre-existing constraints in performance of and access to services is part of the baseline analysis. Such constraints could have included aspects related to the health system building blocks, for example:
    - Financial barriers to access services: consider suspension of user fees for displaced persons and other populations that have reduced ability to pay for health services as they 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: reduce barriers for access (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 the gender analysis).
    - Damaged roads or bridges may pose new geographic barriers to access still functional health facilities. Repairing them may make it unnecessary to establish temporary facilities in the affected area.

Restoring and/or strengthening governance capacity, including DRM

If it has been interrupted, the governance role for service delivery of the health authorities at national and subnational 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 entered the country to assist, these will 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 as appropriate (for example more regular reporting, using simplified reporting formats). This includes the activation of Early Warning (EWARN) systems.[29]

For governance related BBB needs, the recovery phase poses opportunities to integrate or strengthen the existing national DRM program for the health sector in coordination with the national disaster management authorities.[30, 31] It 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 strategy can plan for such further analysis and include a budget to address obvious gaps.[32]

- Strengthen governance role of national health authorities to better manage equitable service delivery, including health information management and EWARN systems
- Strengthen the role of communities in the management and planning of health services, and support to community resilience.

[29] http://www.who.int/csr/labepidemiology/projects/ewarn/en/
[30] http://www.who.int/hac/techguidance/preparedness/en/index.html
[31] United Nations Development Group 2009 Integrating Disaster Risk Reduction into the CCA and UNDAF. Guidance Note for UN Country Teams
[32] See for further information: Health Sector Self-Assessment Tool for Disaster Risk Reduction: Washington, D.C.: PAHO, 2010

- To strengthen governance for DRM, including updating of the national disaster management laws. Depending on what is already known about the DRM 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 assessment can be included in the recovery plan
- Revise and/or update preparedness plans, and consolidate EWARN systems
- If not already specifically mentioned in the NHSP, ensure that DRM capacity will be included in the next Joint Annual Review and in the revision of the NHSP.
- Promote participatory processes and systems inclusive of women, girls, boys and men with national stakeholders

Addressing health risks and Disaster Risk Reduction (DRR) for future risks

The immediate need is to control and mitigate the effects of pre-existing and new risks to health, and support to community resilience. Risks need to be translated in prevention and/or DRR programmes, by looking at the probability of the risk occurring, the severity of its consequences when it occurs, and who is exposed to the risks and how.[33]

The PDNA analysis should look at the root causes of disaster including the vulnerability of assets, sectors and communities to all hazards. This should be based on an in-depth Vulnerability and Risk Assessment and Mapping when such analysis is available. For further examples of DRR and preparedness interventions, see annex 9.

The most common risks that need to be addressed include the following interventions:

- Prevent disease outbreaks and ensure capacity for early detection and rapid response to public health emergencies by strengthening EWARN and ensuring outbreak preparedness and prepositioning of supplies.
- Resume vaccination services as soon as possible and consider mass vaccination in crowded settings/camps or other populations at increased risk.
- Ensure vector control and preventive measures to reduce the risk of vector-borne diseases
- Intensify community social mobilization including health risk communication, to promote safe water, sanitation and hygiene practices, and key information messages.[34]
- 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 non-communicable)
- Prevention of and response to SGBV

8.3 The Sector Recovery Plan

8.3.1 Prioritization and sequencing of recovery needs

Following the rational of the recovery strategy, it is necessary to identify key outcomes, outputs and interventions based on the needs identified, then prioritize 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 BBB interventions.

[33] See also Guidance Note For Integration of Disaster Risk Reduction in Bank Projects in the Health Sector March 16, 2009 Work in progress
[34] See for examples http://infoasaid.org/

The following considerations should be taken into account for the prioritization:

- Be informed by/aligned with the national health development objectives, as reflected in for example national health development policies, poverty reduction strategies, etc.
- Address/prioritise against key risks and vulnerabilities that contributed to the extent of the effects/impact on communities, systems and infrastructure, and that can be avoided (most obvious example: for damaged infrastructure is rebuilding according to proper building codes or disaster retrofitting, to ensure continued services and protect investments in infrastructure reconstruction during future hazards)
- Where possible, the BBB interventions should also have a positive contribution on the recovery from the current disaster
- Be based on a consultative process
- Consultations and communications with the other sectors in order to avoid contradictory recommendations, gaps or overlaps.

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

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

Single criteria Analysis

1. Burden of Disease analysis (e.g. top 10 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: the short, medium and longer term, whereby 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 specialized equipment.

The humanitarian and early recovery phase should ensure access to an essential health care package and public health programs 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.

8.3.2 Costing

This section explains the logic of how costs for reconstruction and recovery are calculated based on the projected needs and realistic approaches to estimates costs for BBB.
All assumptions, possible formulas and references used for unit costs for each budget line item need to be made explicit, including for BBB, and attached as an annex to the sector chapter.

The following considerations should be taken into account for the costing:

- The costs for BBB should be proportionate to the costs of recovery and reconstruction needs, as well as the type of disaster (slow onset drought may have very low reconstruction needs, but high needs to invest in resilience/BBB)
- The costs for BBB should be realistic compared to the recovery budget the government can allocate, and the financial envelope pledged by the government and international development partners, taking into account that most funds will be needed for physical reconstruction and compensation of losses.
- The costs for BBB should be realistic toward the absorption capacity of the country
- 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 3 years.

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. For post disaster donor pledging conferences the development partners are accustomed to look at the size of the damage and loss, and pledge 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 specific structural design criteria that the destroyed buildings were originally built on and on the improved degree of construction standards or norms defined in the reconstruction strategy adopted after the disaster. The additional costs have been found to range from 10 to 50 per cent 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 need to be taken into account. Furthermore, the reconstruction strategy may include a rationalisation 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 continue its function of health care provision uninterruptedly. The financial needs are estimated by specialized structural or civil engineers after defining the standards for retrofitting and the degree of disaster resilience to be achieved.

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 mobilising emergency medical response teams, training

of health facility staff and conducting 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
TOTAL	$230,000- $1million

Costing for health sector recovery

With regards to the needs for recovery of the sector, the financial requirements to provide health service under temporary conditions while the destroyed infrastructure is being built (over several years in some cases) – whether using tent hospitals and clinics or alternative, rented premises for it – are to be estimated. Additionally, funding is required for re-establishing essential services, addressing crucial issues as access and quality in the context of possibly increased morbidity and lower purchasing power, support to governance and management capacity, and to manage risks to health.

The costs for the basic recovery needs are guided by the value of estimated losses, minus any amounts already spent at the time of the assessment and which cannot be covered by the regular budget of the government without negatively impacting the sector's normal development activities, and that occur over the time required until reconstruction of destroyed assets is achieved.

The costing for investments related to BBB for the health system is more complicated and needs to take into account the BBB consideration mentioned above. 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'. For examples of interventions under recovery needs and subsequent BBB approaches can be found in table 4, and annex 2. The assumption sheet needs to be used to explain how cost estimates were made, including those for BBB, see annexes 3 and 4.

8.3.3 Structure of the recovery plan

In line with the PDNA guidance on the recovery strategy (in Volume A), the sector recovery plan should be formulated following the 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 the recovery plan.

There is no blueprint for the 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 rationalising of the health network in case of 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 main constraints in the health system.[35] Table 4 and annex 2 include examples of typical early to longer term responses, based on previous PDNAs.

[35]Analysing Disrupted Health Sectors, Module 12: Formulating strategies for the recovery of a disrupted health sector, and annex 13, pages 382-385. http://www.who.int/hac/techguidance/tools/disrupted_sectors/en/index.html

The reconstruction and recovery strategy for the health sector of the PDNA follows the same main headings as used for describing the effects of the disaster, and the interventions are based on the priorities of the identified needs. Furthermore, expected outputs and outcome indicators need to be added.

8.4 Implementation Arrangements

8.4.1 Partnerships, Coordination and Management

The mechanisms that need to be in place for the implementation of the health recovery strategy follow the same principals as discussed in section 2.2, and should be led by the MoH, and be part of the multisectoral implementation by the government entity that has this 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.

Mechanisms need to be established to involve the regional and/or district health authorities, and to ensure links with the development partners to use the recovery strategy for updating/revising 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 for recovery linked to development, with bottom up budgets. During this process it will be more realistic to expand consultation and involvement of subnational health authorities and communities.

Many humanitarian health organisations will offer assistance to a country after a major disaster. Beside support to life saving interventions, there are also humanitarian agencies that support early recovery approaches in their humanitarian programming, and/or support recovery programmes of the MoH. Humanitarian health partners need to be informed about the PDNA, which can be used as guidance to integrate Early Recovery approaches in their humanitarian programmes to support the recovery process.

8.4.2 Monitoring and Evaluation

Establishing a monitoring system, where 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 clearly defined frequency and timeline, and preferably be implemented by a multi-sectoral team comprising surveyors and evaluators as part of the overall strategy of recovery M&E. For an example of such monitoring system, see the Tsunami Recovery Impact Assessment and Monitoring System.[36] A budget, usually 5 to 10% of the recovery and reconstruction budget, should be set aside for this purpose.[37]

8.4.3 Resource Mobilisation and Funding Mechanisms

Reaching consensus on funding mechanisms often poses a major challenge during the recovery phase. Decision on which funding mechanisms to use should be based on the local context and aim at achieving the best efficiency. Such decisions should be based on dialogue between the national

[36] http://whqlibdoc.who.int/hq/2006/a91183.pdf
[37] *World Bank Good Practice Notes* 1 ***Health*** *July 2008*

government and international partners and should consider the pros and cons of each to arrive at a mechanism that is agreeable to all parties. Financial modalities are often influenced by the Financial Management Assessment done by the WB, and the funding preferences of specific donor. The result is often a mix of on and of budget funding mechanisms, and may include pooled funding arrangements 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.

8.4.5 Challenges to sector recovery planning and implementation

- Focusing only on infrastructure and service delivery, and neglecting the support components that enable access to service
- 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
- When national policy making capacity is weak, international stakeholders can push politically oriented policy options or apply standard solutions that may have worked elsewhere but that are not appropriate for that country
- The timeframe is usually limited and often unrealistic, which leads to limited consultation of all stakeholders.
- Unreliable and incomplete information is always a major challenge in countries with 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.

9. References

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Annex 1: Steps for the PDNA process

1. When a disaster occurs:

- Start collecting baseline information: can be done in country, as well as remotely `off site`, and start filling in relevant information in the analytical matrix.
- Establish 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 sending health recovery expert(s) to assist the country

2. When the PDNA is requested by government:

- Government to appoint Focal Points in the respective ministries whose sectors will be included in the PDNA, including recovery FP in MoH
- WB-EU-WHO Health experts to liaise with MoH FP,
- Establish Steering Committee to oversee the PDNA process and divide tasks
- Prepare for the training of the health component of the PDNA as part of the usual 1-2 day workshop on PDNA to formally initiate 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 PDNA process and objectives to the humanitarian health coordination, identify humanitarian partners, including donors, with an interest and capacity to support the (early) recovery process.
- Develop time schedule, according to the overall deadlines of the PDNA, including:
  - site visits to verify reports of damages
  - national and sub-national workshops or FGD with health authorities to discuss needs and constraints in health system functions, and recovery needs and priorities
  - regular meetings with the Steering Committee
  - periodical engagement with other relevant sectors and cross cutting topics
  - periodical meetings with the humanitarian coordination mechanism
  - periodical reporting to the national health sector development coordination
  - validation workshop of first draft
- Assist the MoH to prepare for the donor conference when this is organized
- Meetings with donors and government, to advocate for the importance of health in the recovery strategy
- Inclusion of 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, establish M&E system for health system recovery based on the recovery strate

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	CMR; U5MR; disability Proportional mortality Life expectancy (by sex) Morbidity patterns	Increased number of deaths due to the immediate impact of the disaster New health risks (e.g. potential outbreaks or interruption of services for chronic diseases). Effects on the health related MDGs	Top 5 causes of mortality and morbidity to prioritise the health interventions, and adjust these as morbidity patterns evolve over time Appropriate management of dead bodies[38]	Rehabilitation of disabled persons
Service delivery 1: **Organisation and management** **(including infrastructure, equipment and transport)**	Database of health facilities (e.g. SARA) Availability of functioning 24/7 referral system between levels of care Average population covered by functioning health facility by type of health facility (HF) and by admin unit #of hospital beds per 10,000 population by admin unit; # of outpatient consultations per person per year by admin unit; # of consultations per clinician per day by admin unit; Cost per case (treatment, transportation etc) Costs for campaigns Average revenue per patient Proportional mortality; # and % of HF that meet basic service capacity standards, #HF with BEmOC/500.000 pop by admin unit; #HF with CEmOC/500.000 pop by admin unit;	Availability of health resources and services: HF damaged/ destroyed, including equipment and furniture and records Assess damage and loss Estimate reconstruction costs by type and extend of destruction ($) Effect on transport, logistics for supplies and referral between levels of care, including communication network, accessibility by roads that may be blocked, etc. Blood banks destroyed Staff killed, injured or displaced? Increased demand for health services in unaffected areas due to population movements	(Re) establish provision of essential service package services: - cost per case/per capita per year When necessary set up temporary health facilities, and deploy medical brigades, supported by international assistance; Support health facilities in areas that received high numbers of IDPs Temporary Pre-hospital units to treat injuries, and/or medical evacuation (Temporary) Increase outreach services Make buffer emergency medical supplies and emergency medical teams available; establishment of semi-permanent structures, mobile health units	Support to the decentralization process when this is part of the national health policy Support to management of health facilities Repair of health facilities Replacement of damaged health and medical equipment (based on safe hospital concept, see section DRR); Replacement of furniture; Relocation of facilities Re-establish blood banks Review health network and rationalize numbers, types, and distribution of health facilities when appropriate

[38] See Management of dead bodies after disasters. A field manual for first responders. PAHO, WHO, ICRC and IFRC. 2006

	Pre-disaster baselines and challenges. Key indicators:	Disaster Impact - key issues	Possible Humanitarian responses	Possible (Early) Recovery response
	% of HF with availability of clinical management of rape survivors +EC +PEP; % of births assisted by skilled attendant;			
Service delivery 2: Health Sector Response Domains:				
Child Health	Under-five mortality rate Infant mortality rate Proportion of 1 year-old children immunised against measles (and estimate of coverage 6 months - 15 years); Coverage of DPT3 in under 1 year by admin unit;	Increased child mortality/ U5MR/ neonatal mortality Disruption of routine vaccination services? Increase in malnutrition/disease interactions among vulnerable children?	Total cases of respiratory tract infection + cost per case Total cases of U5 diarrhea + cost per case Mass measles vaccination campaigns (combined with vitamin A and bednets, deworming, ect) Basic neonatal care for newborns linked to deliveries in health facilities (see MISP for EmOC)	Re-establish routine vaccination 2x/year deworming campaigns in schools Scale up IMCI as part of Essential Package of Health Services, including a strengthened community component
Nutrition	# of admissions to SFT and TFC (age/sex); Proportion/number of U5 GAM and SAM cases detected at OPD/IPD; Prevalence of underweight children under-five years Proportion of population below minimum level of dietary energy consumption Prevalence of GAM + SAM. Level of food-security based on IPC	Food shortage, lack of access to food by vulnerable populations, reduced diversity in diets, changes in breastfeeding practices as a result of the disaster; treatment of malnutrition disrupted by disaster? Increased risk of malnutrition (women, children and older persons?)	Incorporate vitamin A, zinc, and iron foliate in ongoing immunization campaigns screening for malnutrition in health facilities and population based Supplementary and therapeutic feeding programmes Treatment of medical complications of malnourished children	Growth monitoring Nutrition programmes within IMCI
Communicable Diseases	# or incidence rates for selected diseases relevant to the local context by age/sex. (cholera, measles, acute meningitis, hemorrhagic fever, zoonotic diseases, others); CFR for most common diseases; Incidence, prevalence and death rates or CFRs associated with tuberculosis # and proportion of tuberculosis	Increased incidence and CFR, possible outbreaks Treatment disruption for patients on ARV (including for PMTCT) and TB/DOTS; Increased risk of HIV transmission increased risk of malaria (increased exposure due to loss of homes, bed-nets etc); Total cases of typhoid/ fever + cost per case	Treatment of increased morbidity Reactive mass vaccination in epidemic settings (Yellow fever epidemic, meningitis epidemic, measles) Disease control surveillance; Tracing and treatment of known TB patients Ensure appropriate HIV prevention measures Tracing and provision of ART for	Community health education/promotion Restore or establish a comprehensive TB, Malaria and HIV control programme Preventive vaccination campaigns in risk areas (Yellow fever, meningitis Further integration of vertical

	Pre-disaster baselines and challenges. Key indicators:	Disaster Impact - key issues	Possible Humanitarian responses	Possible (Early) Recovery response
	cases detected and cured under directly observed treatment short course Incidence and CFR associated with malaria Proportion of children under 5 sleeping under insecticide-treated bednets Proportion of children under 5 with fever who are treated with appropriate anti-malarial drugs 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	Total cases of diarrhea + cost per case Total cases of malaria/ dengue + cost per case prevention and control of disease outbreaks;	people previously on treatment, including PMTCT Mass distribution of bed-nets Environmental vector control (in crowded places); Establish standard precautions (Distribution of hygiene kits, Provision of disinfectants; and safety boxes)	programming with other services.
SRH	% 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	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	Ensure provision of reproductive health services guaranteeing availability of MISP and expanding as possible Clinical management of rape services and emergency obstetric care (basic and comprehensive) Financial protection maternity services: free access deliveries, to EmOC, and follow up post-partum	Ensure sustainable provision of MISP and beyond establish minimal availability for MISP, including EmOC Integration of interventions, including antenatal care (ANC), PMTCT, nutrition and immunisation Strengthening of national Family Planning programme
NCD	Prevalence of hypertension and diabetes, mental health, renal dialysis	Interruption of treatment Patients lost for treatment of hypertension and diabetes, renal dialysis Worsening of diabetes and	Ensure continuity of treatment for chronic diseases Tracing of patients cases on hypertension, diabetes and/or mental health treatment, renal	Reestablish data system for patients on treatment Strengthen home care for patients with chronic diseases (Communicable and non-communicable)

	Pre-disaster baselines and challenges. Key indicators:	Disaster Impact - key issues	Possible Humanitarian responses	Possible (Early) Recovery response
		hypertension status after disaster due to changes in diet and stress	dialysis;	
Injuries	% of population with severe or extreme difficulties in functioning	Potentially high number of injuries Increase # people with disabilities Untreated wounds and infections of wounds are major public health problem, risks for tetanus	Treatment of injuries - prevention of long-term disability # of total cases of injuries and cost per case Field hospitals, Surgery and basic EmOC Set up referral mechanism, including international evacuation of patients Vaccination campaigns to include tetanus Amputations follow up care to be done at primary care level;	Rehabilitation of persons with disability Strengthen capacity for prostheses and rehabilitation Disability care to be taken into consideration in new health system;
Mental health and psychosocial support[39]	% of population with severe or extreme difficulties in functioning Severe disorder (e.g., psychosis, severe depression, severely disabling form of anxiety disorder): 2-3% Mild or moderate mental disorder (e.g., mild and moderate forms of depression and anxiety disorders, including mild and moderate PTSD): 10%	Interruption of treatment of mental health diseases Decrease in functioning On average prevalence of severe mental disorder increases 1% On average rates of mild or moderate mental disorder increases 5-10% Mild or moderate: 15-20%	Strengthen community self-help and social support Ensure access to psychological first aid to people in acute distress Ensure continuity of treatment, managing new and pre-existing severe mental disorders in general health care Address the safety, basic needs and rights of people in mental hospitals + cost per case	Initiate development of sustainable community mental health system : build long-term, basic, sustainable community mental health services in areas affected by emergencies. 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. Include mental health in curriculum and of PHC staff
Environmental health	Proportion of people with less than 15 l 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	Destruction of clean water supply Health hazards resulting from stagnant waters and deteriorated water quality	Provision of safe drinking water; provision of wastewater and solid waste disposal Environmental vector control (in crowded places) Disposal of medical waste	Drinking water supply restoration to prevent the further spread of water-borne diseases Reconstruction of wastewater and solid waste disposal

[39] IASC Reference Group for Mental Health and Psychosocial Support in Emergency Settings. Mental Health and Psychosocial Support in Humanitarian Emergencies: What Should Humanitarian Health Actors Know? Geneva, 2010.
http://www.who.int/mental_health/emergencies/what_humanitarian_health_actors_should_know.pdf

	Pre-disaster baselines and challenges. Key indicators:	Disaster Impact - key issues	Possible Humanitarian responses	Possible (Early) Recovery response
	facility, by sex and age			
Leadership and Governance	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 cross-cutting themes (from DRM and health sector development) health sector policies and guidelines, standard operating procedures for response; oversight and regulation; governance capacity;	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/RF as opportunity to guide new investments coming 6-18 months	Coordination mechanism in the acute response/ leadership (humanitarian health cluster - Gov) Ensure adherence to national policies and guidelines by international actors Ensure/ promote national ownership	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 programs for disaster and emergency risk, risk prevention and avoidance programs and preparedness programme
Health Workforce	National workforce policies and investment plans; human resource norms, standards and data; distribution and competencies of health workers. Infrastructure for training/production of HRH and its capacity Supervision mechanisms # of health workforce (MD, nurse, midwife) per 10,000 population by admin unit (by sex) # of CHWs per 10,000 by admin unit; Annual number of graduates of health professions educational institutions per 100.000 population by level and field of education	Loss of workforce, health staff affected by the disaster - (displaced , family members to care for etc) # of health workforce (MD, nurse, midwife) per 10,000 population by admin unit (by sex) remaining; effect of HRH displacement on distribution Damages in schools for health workers, # of training facilities affected Damages to institutes of public health and research and effects on and capacities of training institutions	Replacing, strengthening, and/or reactivating workforce Financial incentives to re-activate the health workforce. Train and deploy community outreach workers (appropriate sex and age balance)	Replacing/strengthening/reactivating workforce Reconstruction and reopening of training facilities Adapt training programs on new relevant issues Task shifting Capacity building in first aid, disaster preparedness, response and recovery
Information	National guidelines and formats for facility and population based information & surveillance systems;	Break down of information system and reduced analysis capacity for decision making	Strengthen Early Warning System, including disease surveillance Coordinate information collection	Re-establish routine health information system and reporting by age and sex (as relevant)

	Pre-disaster baselines and challenges. Key indicators:	Disaster Impact - key issues	Possible Humanitarian responses	Possible (Early) Recovery response
	# of HF routinely collecting, and reporting relevant data		and analysis by all partners	Risk assessment, including hazards, vulnerabilities and capacities
Financing	National health financing policies; Existence of user fee protection for those unable to pay; tools and data on health expenditures (National health Accounts) Costing of services; and financial barriers to access services; ability to pay, catastrophic health expenditures; External resources for health as % of private expenditure on health; Per capita total expenditure on health at average exchange rate; Per capita government expenditure on health at average exchange rate (US$) Out-of-Pocket expenditure as % of private expenditure on health	Further loss of livelihood and reduced ability to pay for health services Increased dependence on external funding; Loss of revenue due to health facilities rendered non functional, and temporary waiving of user fees; Increased expenses for treatment, including due to increased demand, Increased costs for transport etc.	Ensure health services and access to essential medicines free of charge at point of delivery in the public and private not for profit facilities: initially 3 months then review, NB: Consider effect of waiving fees on private sector, in particular if they also waive or reduce fees.	Establish capacity to analyse possible consequences on quality and access when waiving user fees Establish mechanism to compensate loss of revenue, in particular in private not for profit, that work on the basis of cost recovery schemes. creation of social solidarity or emergency fund to finance purchasing of services. 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.
Medical products and technology	Access to essential medical products, vaccines and technologies, assured quality, safety, efficacy. norms, standards, Existence of an essential medicine list that satisfy the priority health care needs of the population and that is adequate for the competence level of health workers National pharmaceutical infrastructure for production capacity and pharmacies. Procurement and supply chains; quality assurance; drug donations guidelines; health transport and logistics, warehouses, cold chain % of HF without stock out of a selected essential drug in 4 groups of drugs by admin unit	Break down of supply chain and medical logistics; Damage to pharmaceutical factories, pharmacies, warehouses, equipment and stocks; (Inappropriate) drug donations NB: consider effect on private pharmacies when donated medicines are provided for free Possible increased sales of counterfeit medicines on the market Increase of traditional medicine or due to lack of financial resources	Provision of kits, medicines and medical inputs; replacement of drug kits/ vital medicines/ Advocate for application of national essential medicine list by service providers Free access to medicines during the emergency phase (first 3 months, then review) Waiving of customs fees for medical supplies for humanitarian partners	Procurement of medicines, safe delivery kits, medical equipment and generators; Reestablishment of the cold chain 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 medicine).

Annex 3 Baseline unit costs and Assumptions for Damage:

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 Baseline unit costs and assumption sheet for Loss:

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 remval 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				
		Duration of period with increased case load, and additional numbers of patients estimated per month				
	Costs related to loss of revenue	Average costs per patient for which there was a revenue loss in health facilities, or people no longer able to pay health insurance premium				
		Duration and numbers of patients for revenue loss				
Governance	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				
		Costs for disaster response and recovery management at national level				
		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)				
Risks	Interventions above normal budget allocations to mitigate disaster related risks	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				
		Vector control costs (for each intervention per admin unit and/or standard # target population)				

Annex 5: Example form district data collection

Sector:	Health									
Province	*add province name*		**Data provided by:**	*add staff name*						
District:	*add district 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**	**Totally destroyed**	**Partially Damage**	**Totally destroyed**	**Partially Damaged**	**Destroyed**	**Public**	**Private**
Hospital										
Health centre										
Health Clinic										
Blood Bank										
Dispensary										
Laboratory										
Mobile Healthcare Unit										
etc										
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:							
Increased morbidity and outbreaks			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: Table for damage and loss cost estimation

				Damage, million US$			Losses, million US$		
					Ownership			Ownership	
				Damage	Public	Private	Losses	Public	Private
Infrastructure and assets	**Estimation of Damage**								
	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$								
	Estimation of Losses								
Infrastructure	Cost of demolition and rubble removal	Hospitals							
	Creation of temporary facility	Health Centers							
	Renting temporary space for health facility	Others							
Service delivery and access	Duration of reconstruction period, months								
	Higher expenditures for treatment of injured*								
	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$/person							
		Loss of revenue							
	Higher expenditures for overall increased case load	Pre-Disaster total number of patients/month							
		Post-disaster total number of patients/month							
		Difference							
		Average cost of treatment per patient							
		Increased costs							
	Reduced revenues in case of temporary waiving user fees, or reduced ability to pay health insurance premium								
Governance	Costs for additional coordination and disaster management needs	Average costs per admin unit in affected areas of staff and other resources required to manage the response and recovery process, including community							
		Costs for disaster response and recovery management at national level, million US$							
		Cost of Early Warning systems to detect morbidity increases, and other temporary emergency related health information systems, million US$							
Risks	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 assignations, 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: Example of loss over time in the health sector

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																			
A. Loss of revenues																			
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. Costs of increased services																			
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)																			
C. Other losses																			
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: Examples for safe hospital interventions

- 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 organizations 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 practice 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;
  - 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 practice in safety and emergency preparedness of health facilities.

Annex 9: Examples of DRR and preparedness interventions

- 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 systems vulnerabilities) and capacity assessments in collaboration with the multi-sectoral 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 mobilization to reduce risks and prepare to respond to emergencies
- All hazards early warning systems which takes account of risk to public health and to the health sector.
- Integration of disaster and emergency risk management into undergraduate, graduate and professional education of health and other relevant human resources for health and other sectors.
- Programs 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 non-communicable 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: Example of a Results-based Recovery Plan

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 BBB							
By region	To resume service delivery and access to goods and services, and BBB							
By region	To restore governance and social processes, and BBB							
By region	To address immediate new risks, and DRR							

Annex 11: Glossary

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. UNISDR 2009.

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. UNISDR 2009.

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. UNISDR 2009.

Recovery
The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors. UNISDR 2009.

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. UNISDR 2009.

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. UNISDR 2009.

Retrofitting
Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards. UNISDR 2009.

GFDRR

Global Facility for Disaster Reduction and Recovery