



Heartfile

Pakistan's
Health
Policy
Forum

D R A F T f o r c o m m e n t s

One-month Post-Quake O8 Health Assessment

O 8 h e a l t h I n f o r m a t i o n S y s t e m
November 8, 2005

This report has been authored by Dr. Sania Nishtar who also contributed time voluntarily to oversee the development of the O8 Health Information system.

The O8 Health Information System has been developed and is being maintained at Heartfile (<http://heartfile.org>) in collaboration with the Ministry of Health, World Health Organization, UNICEF and Pakistan's Health Policy Forum. The System receives data from the Ministry of Health (HMIS and Disaster Management Cell) and World Health Organization field data collection sources. UNICEF provided support for maintaining this database. The Software of the O8 Health information System was developed by Wasif Raza Mirza and is being maintained by Yasir Abbas Mirza at Heartfile. Data collation and inputs and regular quantitative reports are produced by Amina Katrina Ronis and disseminated by Azhar Iqbal.

Data collection efforts were organized under the guidance of Syed Kaiser Ali Shah by Capt. Mohammad Raza and Dr. M. Mursalin at the Ministry of Health. On behalf of the World Health Organization, data was provided for the system by Dr. Rana Kakar, Dr. Irshad, Ms. Fyza Iqbal and Ms. Racheal Levy. On behalf of the Pakistan Institute of Medical Sciences data was provided by Dr. Syed Fazle Hadi and Dr. Amjad Mehmood. Contributions were made by Dr. Mustafa Sarfaraz by providing background documents for this report. Constructive comments of Mr. Anwar Mehmood, Dr. A. Majid Rajput, Dr. Khalif Bile Mohamud and Dr. Rafah Salam Aziz helped shaping of the O8 Health Information system.

This report must be read with the understanding that there may be gaps in the data profile particularly with regards to data from NWFP, the Federal Relief Commission and possibly field sources. The report is therefore being circulated as a **draft with a view to solicit inputs and comments to bridge gaps in data and information**. The report will also be circulated to members of Pakistan's Health Policy Forum for their comments on the policy recommendations.

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Précis

The present report – the **One-Month Post-Quake O8 Health Assessment** (Report) is an output of the O 8 Health Information System (System). The System is a health information database, specially tailored to accommodate the health sector information needs in the post-earthquake scenario.¹ Its specific objectives include the consolidation, and evaluation of morbidity, mortality, and health services data; its interpretation; the generation of medium to long term policy recommendations and their dissemination for appropriate public health actions. The Report in addition to summarizing the extent of damage to health infrastructure, morbidity and mortality and health services access and delivery trends also provides relevant policy recommendations for medium term planning with regard to the present disaster and recommendations for future disaster management strategies. This report is aimed at all policy makers for the earthquake relief and rehabilitation process. The Report is configured in the following sections:

1. *Background to the O8 Health Information System*: this provides an overview of the rationale of setting up an apex information system, its envisaged outcomes and linkage with policy.

2. *The magnitude of the health systems challenges* in relation to the needs of the patients and challenges in relation to the state of the infrastructure, human resource and public health demands. It also alludes to a number of other generic systems-levels issues, which compound health systems challenges.

3. A summary of the *response of the health system* particularly with regard to the efforts underway by the Federal Relief Commission; Ministry of Health, its Disaster Management Committee and entrusted respective tasks to National Programs, vertically aligned with it; the Emergency Health Cluster and the linkages it provided with all the health relief partners and UN Disaster Assistance Coordination (UNDAC) and field operations inclusive of base camps, field hospitals and health teams. This section also provides an overview of public health interventions and initiatives aimed at rehabilitating the disabled and psychologically traumatized, currently underway. Moreover it also provides an overview of the response of the international community.

4. Based on the scale of the devastation, its perceived impact on the health system, its envisaged needs, and impressions about the state of health of the population affected, a number of *medium-term policy recommendations* are articulated. These may need to be reviewed based on information about the impact of current health-related interventions and more updated information about the status of health of the affected population. The recommendations acknowledge that factors which determine 'health status' range much broader than those that are within the realm of the 'health sector' and that 'health care' has less of an impact on population 'health outcomes' than economic status, education, housing, nutrition and sanitation. This important consideration notwithstanding, the medium-term policy recommendations in this document are relevant to the 'health care system'. These are discussed in the document under seven headings and are summarized hereunder:

1. **Coordination**: existing linkages across the various health systems within Pakistan within the context of the collaborative and coordinating efforts post-quake, should be further strengthened and dovetailed so as to avoid duplication of efforts and harmonize interventions. A central coordinating institutional mechanism for *health* should,

¹ Partner contributions are shown on the inside front page

therefore, be clearly mandated with clear and unambiguous definition and delegation of roles and responsibilities; guidelines on areas of operation and rules of engagement and clear definition of implementation arrangements that are consensus driven. This coordination mechanism should also inventorize the core competencies of international agencies in the field, solicit their and donor commitments and mainstream them into medium to long term planning.

2. **Health systems management:** initial coordination and planning support should be provided from a central level as outlined above; however this must be viewed as an expedient stopgap arrangement with the overall objective of strengthening local health management within defined health systems. The central coordinating mechanism should also be inclusive of representation from the affected areas and provide an opportunity for capacity building. Local capacity should be enhanced so as to assist with grounding planning and implementation in the context of locally determined evidence-based priorities; developing resource-appropriate outcome-orientated, indicator-driven operational plans and integrating mechanisms of monitoring and evaluation. Local capacity building should also pay attention to pilot testing of interventions so as to assist with the development of well-structured and sustainable service delivery and financing mechanisms on a long term basis.
3. **Information, evidence and policy linkage:** though data sources, collecting mechanisms, collating and analytical systems exist, there is a need to pay attention to their flows and the roles and responsibilities in this regard, particularly from an inter-agency perspective within the context of the need to centralize data management. However most important is the need to base decisions on evidence generated from these data sources as evidence is critical to effective planning of interventions and their monitoring. The central coordinating mechanism should be mandated with the development of policy positions/the adoption of policy positions, which emerge with broad-based consensus and held accountable for translation of policy recommendations into measurable action.
4. **Service delivery:** in the medium term, planning needs to focus on the delivery of services through the undamaged infrastructure, the existing damaged but repairable physical infrastructure and make shift arrangements. Each state owned health care facility should be used to deliver both, individually targeted clinical care as well as preventive and promotive services. The state should bear the costs of *community oriented preventive and promotive services*. For the delivery of *clinical services*, alternate service delivery models can be introduced into state-owned health infrastructure; these can be relevant to basic health care settings as well as hospitals. The recommendations outline a number of options available; however these necessitate overarching policy frameworks as they involve the mainstreaming of the private sector in service delivery. These are described in recommendation 5. The report also articulates a number of other financing arrangements in addition to stressing on the need to keep a conscious focus on maximizing utilization, and reducing misuse and pilferage. The recommendations also make a case for consolidating public health data and inventorizing needs so as to assist with the development of appropriate plans of action.
5. **Overarching policy concerns:** the role of the private sector being promoted in the alternate service delivery arrangements raises the issues of conflict of interest in addition to posing a risk that these may create access issues for the poor and vulnerable. Therefore introducing such changes can be detrimental to the interests of the poor and vulnerable if mechanisms to offset the risk to the poor are not factored into planning and structuring. This links in with the need to establish a 'social safety net' or a system for 'social protection'. The role of the private sector as an option for service delivery also highlights the need to develop an institutional mechanism to legitimately regulate the

private sector in a manner which is fair, participatory and conducive; develop policies, legislation, ethics, norms and standards and procedural details for combined systems of governance with careful attention to transparency, sustainability and accountability-related parameters. There is also the need to institutionalize 'corporate social responsibility' in order to capitalize on the strengths of the private sector in an attempt to mainstream their contributions in the national development agenda and develop mechanisms thus enabling the for-profit private sector to contribute towards achieving national goals and support them within this framework, albeit with attention to norms and standards.

6. **Rehabilitation of the disabled:** specifically developed plans of action must be clearly linked with resource-appropriate implementation arrangements, which must be appropriately mandated and adequately resourced with broad based control mechanisms.
7. **Disaster preparedness:** a Health Incident Management System should be established and institutionalized; this should be closely linked with an overarching disaster management agency. This institutional mechanism should be vertically linked to the Ministry of Health and its scope of work should be charted through the development of a National Health Disaster Preparedness Plan in collaboration with other stakeholders. A number of specific components are proposed for being included as part of its scope of work in this document.

1. Background

The October 8, 2005 earthquake, which originated in the Himalayan mountains of Pakistan, was the worst natural disaster ever to hit the country leaving at least 86,000 dead and injured twice that number.² One of the major components of the immediate relief and rescue operations was restoring and maintaining the health of the affected population. Immediately in the aftermath of the earthquake, this involved the provision of medical care to the affected population and proved to be a task of an unprecedented demanding scale owing to the sheer magnitude of disaster, the number of emergencies involved and the capacity of the health system in dealing with such a catastrophe. The nature and extent of devastation had totally disrupted the pre-quake health systems particularly in the hard hit areas and makeshift arrangements were made for the delivery of health services. Thousands of medical emergencies have since been treated on-site by local and international medical teams and mobile hospitals. In addition, emergencies were flown on air-ambulances from remote and inaccessible areas to secondary- and tertiary care hospitals in Rawalpindi, Islamabad, Peshawar and many other cities and the capacity of these hospitals enhanced considerably.

In addition to catering to the needs of the injured, the health sector response involved a number of public health interventions in a high-risk environment and more recently, the stepping up of rehabilitation related efforts. Given the context in which such arrangements were made, the efforts of the Federal Relief Commission, the Ministry of Health, Departments of Health, Armed Forces, other public sector agencies, the private sector and the international agencies has been laudable in terms of outreach and life-saving efforts.

However, a necessary prerequisite for effective planning, implementation and evaluation of health interventions in the setting of a disaster is access to reliable and timely information on health services, mortality, morbidity, risk factors and their socio-economic and environmental determinants. The monitoring of health services and related parameters and disease surveillance during natural disasters is as difficult as it is important. In the aftermath of the devastating earthquake, therefore the need for establishing, maintaining, and the expansion-over-time of a comprehensive, integrated, systematic, and sustainable health information system was recognized as a priority. This led to the conceptualization and the creation of the *O8 Health Information System*.

Designed to act as a decision support system, the O8 Health Information System involved the creation of a health information database, specially tailored to accommodate the health sector information needs in the post-earthquake scenario. Its specific objectives include the *systematic* collection, *consolidation*, and *evaluation* of morbidity, mortality, and health services data; its *interpretation*; the generation of medium to long term policy recommendations and their *dissemination* for appropriate public health actions.

It is generally perceived that data collection and its application are two standalone processes and that the former must precede the latter. This is a misperception. The process of data collection and action are not mutually exclusive. The idea is to tap data sources on an ongoing basis in order to provide the necessary evidence to guide and modify actions. At inception it was envisaged that the O8 Health Information System would assist in the timely, appropriate, and need-based actions under the health-related relief and rehabilitation initiatives.

² As quoted by the Government of Pakistan official sources, the World Bank and the Asian Development Bank on November 10, 2005.

The system has been designed and conceptualized by Heartfile³ in close collaboration with the Ministry of Health and WHO and is currently been managed and maintained at Heartfile with support from UNICEF. The system builds on- and keeps account of: all the information that the Ministry of Health and WHO receive from their field and other operations; data relating to all the health interventions at point of care (both in the earthquake affected areas as well as in the health care facilities of the non-affected areas serving the earthquake victims); key morbidity and mortality trends and information from authenticated private sector sources such as the Earthquake Information System.⁴ Data is handled by a central customized database.

Outputs of the System include standard reports and summaries based on information inferred from data. Since it became operational on October 17, the O8 Health Information System has been generating daily reports; these reports include a quantitative overview of health services, mortality and morbidity by location. These reports were communicated to the Ministry of Health in order to assist them in strategic planning and decision making. Reports have also been shared with international agencies and can be accessed online at Heartfile's website (<http://heartfile.org>). The O8 Health Information System has been developed and managed under difficult circumstances from resources based in Islamabad and the field. Notwithstanding, the database provides a comprehensive picture of the magnitude of the health aspects of the earthquake with the acknowledgment that the system does not contain complete data from NWFP and the National Armed Forces. It is our plan and intention to expand the data source and refine the system; therefore this first report must be read with the understanding that there may be gaps in the data profile. The O8 Health Information System envisages developing close linkages with the Federal Relief Commission so as to expand the sources of its database in addition to sharing information on a regular basis with this umbrella organization.

The present report – the **One-Month Post-Quake Health Assessment** – in addition to summarizing the extent of damage to health infrastructure, reported morbidity and mortality and health services access and delivery trends also provides relevant policy recommendations for medium term planning with regard to the present disaster and recommendations for future disaster management strategies. This report is aimed at all policy makers for the earthquake relief and rehabilitation process.

This report is being circulated as a draft with a view to solicit inputs from stakeholders about data sources and their flows. The report is also being circulated to stakeholders and members of Pakistan's Health Policy Forum,⁵ for their inputs as they are committed to playing an independent role in the formulation of health policies in Pakistan and therefore are envisaged to make a significant contribution in the local public policy development in the health sector.

³ Heartfile homepage - <http://heartfile.org>

⁴ Earthquake Information System homepage - <http://earthquake.org.pk>

⁵ Pakistan's Health Policy Forum homepage - <http://heartfile.org/policy.htm>

2. Magnitude of the health systems' challenges

The magnitude of the health systems challenges have been described hereunder in relation to the needs of the patients and challenges in relation to the state of the infrastructure, human resource and public health demands. However, these were compounded by a number of other generic systems-levels issues. In the initial period, the total disruption of electricity and communication, lack of fuel and the constraints that reliance on generators impose, the dire need of supplies and blood, generalized chaos, confusion, and a sense of doom that prevailed as casualties continued to mount, the fear of thousands being trapped under rubble, segregation of families due to airlifting of injured members, missing children, separated families and the continuous aftershocks, were amongst these. Many of these were complicated further as the respective line departments, which could have responded to these needs, were destroyed or incapacitated. The topography of the area and the difficult terrain made access to the site and the shifting of medical team members a challenge; although Army engineering has been effective in opening blocked roads; inaccessibility of some areas, the magnitude of the damage sustained to roads, the continued landslides and crumbling mountains are an impediment to restoring road links in the remote areas. Medical teams and supplies are being sent through helicopters and on animal backs as needs are identified. Initially on site, the situation with regard to the transportation of patients from one site to the other was also precarious due to paucity of ambulances, blocked roads, and the nature of terrain.

2.1 Patients in need of care

Immediately post-quake: as medical emergencies started pouring in, almost all public and Army hospitals in the *Abbottabad, Islamabad/Rawalpindi* regions and hospitals in the adjoining cities were overwhelmed by the number of trauma cases. Data maintained at the O 8 Health Information System – used as a proxy of the magnitude of the problem – shows that more than 148,000 patients needed and received care as reported on November 8, 2005 (Table 1); this table shows cumulative health facility data for the main provinces affected namely NWFP, Punjab and AJK. Data is also presented separately for health facilities providing services in Islamabad and from the Army and Field Hospitals. Data shows that the total number of operations performed (major and minor) exceeded 40,000 and reports the number of deaths within hospitals at 518, the total number of amputations at 635 and the total number of paraplegics/spinal injury cases at 488; the total number of orphan/unattended children and single ladies unattended was reported at 25 and nine respectively.

A study conducted by Ayub Medical College Abbottabad to assess patient needs (after one week of disaster) was the first attempt to quantify the extent of health interventions that would be needed in the coming weeks.⁶ This study included all consecutive patients presenting to the Ayub Medical College Hospital – a tertiary care facility in Abbottabad – between the period, October 15 to October 18. A total of 333 patients were included; of these, 63% were female, 10% were less than 5 years of age and 16% were under 16 years of age. More than 50% had lost an immediate member of the family, 49% needed rehabilitation whereas 9% had lost bread earners.

⁶ Study Reported in the WHO NWFP report on October 20, 2005

Table 1: Patient information summary from hospitals all over Pakistan⁷

	Field Hospitals	Army Hospitals	Islamabad	NWFP	Punjab	AJK	Total
Patients received*	74,390	7,098	11,108	23,018	8,501	24,822	148,937
Patients discharged/shifted*		5,516	6,743	449	6,896	532	20,136
Patients admitted**		1,509	1,735	17,800	2,025	2,236	25,305
No. of operations*		7,726	6,749	15,832	4,747	7,348	42,402
Deaths reported in the hospital*		89	209	31	84	105	518
Amputations*		54	179	47	113	20	635 [?]
Paraplegics/Spinal Injury*			139	70	121		488 [?]
Orphans/unattended children**			24		1		25
Single ladies un attended**			3		6		9

* Cumulative data as of November 8, 2005

** Situation reported as of November 8, 2005

? data reported by the Committee on Rehabilitation of the Quake Affected Patients With Spinal Injuries and Amputations.

The study showed that a majority of those that presented had sustained orthopedic injuries with fractures predominating (in 80% of the cases); of these, 44.9% had lower limb fractures, 15% had skull fractures, 14.6% had sustained fractures of the upper limb, 6% had pelvic fractures, 10% had combined fractures whereas 7.5% had fractures of the spine. Fifty two percent (52%) of those that presented also had open wounds. Amputations had to be performed in 8.7% of those that presented. This study confirms the impression of health care providers and rescue workers that casualties amongst children were disproportionately high; this is understandable given that the under-18 years of age cohort forms almost fifty percent of the country's population.

In the medium term: defined as a period commencing after initial rescue and relief, the medium term health needs and the demands on the health care system as a consequence of the effects of the earthquake are unprecedented. Patients in need of care include those who have sustained trauma and orthopedic injuries and require long-term monitoring; those that have undergone amputations and need prosthesis and rehabilitation and those that are in need for specialized long-term specialized institutional care such as in the case of spinal injuries. The burden of both these is very high post-October 8 due to the magnitude of the damage, which can be highlighted by comparisons with other similar disasters. In the *Gujrat* and *Bam* – earthquakes of roughly similar magnitude – the number of spinal injury patients was less than 160 each whereas the spinal injury toll as a result of this earthquake is currently estimated to be in excess of 488; data also show that 635 patients have undergone amputations of their limbs.

In addition there are also a significant number of those that have experienced emotional reactions and are in need of specialized assistance. It has been estimated that 20% of the quake affected population sustained emotional reactions; these can be handicapping during recovery and rehabilitation. Moreover, according to UNFPA, at least 17,000 earthquake-affected women are pregnant and are expected to give birth to children within the next two months. Of

⁷ O8 Health Information System data

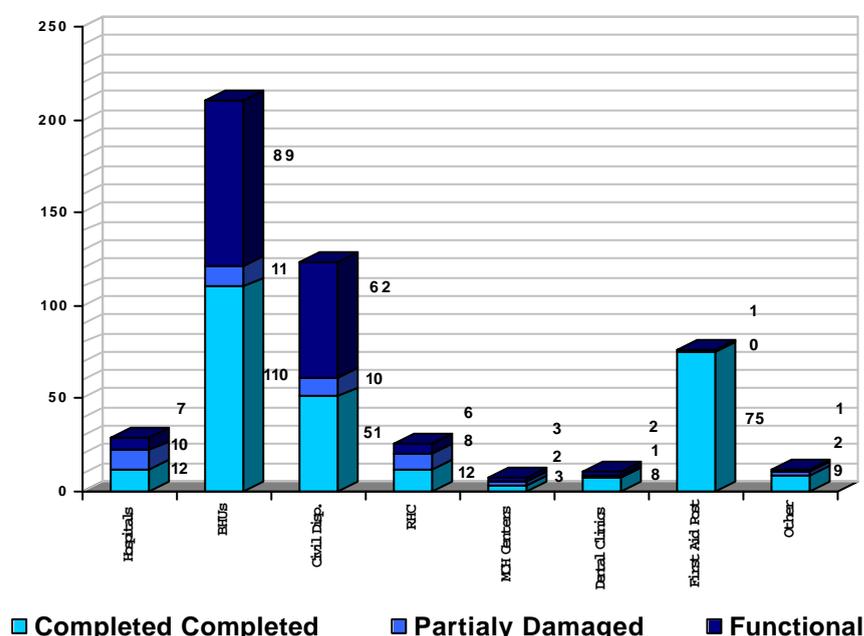
these, an estimated 1,200 are facing major complications and 400 will require surgical assistance—cases that are further complicated by the remote and scattered dwelling places. Moreover, according to UNICEF’s estimates, more than 1 million children are rendered vulnerable to mortality and morbidity as a result of this catastrophe.

In the immediate aftermath of the earthquake, clinical service-oriented needs predominate; however, these must not undermine the significance of public health-related needs of those in the affected areas, which are expected to unfold in the medium term given that most of the primary health care infrastructure-tied public health service delivery has been disrupted.

2.2 Infrastructure

The Ministry of Health reported that of the total 564 health care facilities in the area, 54% were completely damaged. Figure 1 gives an overview of the extent of damage to facilities. However, the World Bank Report of November 10, 05 reported that a total of 573 health care facilities in the area were partially or completely damaged. The report stated that 31 and 424 health care facilities in the rural and the urban areas respectively were fully damaged whereas 15 in the rural and 104 in the urban areas were partially damaged. The differences in reporting may be due to definitional differences as sub-health centers and smaller health units may not have been included in the former estimation. However both the estimates, in addition to the recent UN estimates state that more than 70% of the physical health infrastructure in the affected areas has been destroyed.

Figure 1. Damage to health infrastructure due to the earthquake



UN sources have also confirmed that 100% of the health care facilities in Tehsil *Balakot* of District *Mansehra* have been destroyed. All three assessments have not taken information on Lady Health Workers and Health Houses, given that this is currently being compiled alongside household data. Most sources have verified that the DHQs of *Muzaffarabad*, *Rawlakot*, *Battagram*, *Shangla* and *Kohistan* have been completely destroyed – the former two razed to the ground whereas the DHQ at *Bagh* has been rendered inhabitable due to the damage sustained

by its infrastructure. In *Muzaffarabad* some buildings of the Combined Military Hospital (CMH), which also served as a tertiary care site, totally collapsed and the hospital is no more functional. Damage to the DHQs and CMH *Muzaffarabad* is envisaged to have a devastating effect given the large catchment sites – owing to the scattered population – for these hospitals in the area. Furthermore the only tertiary care center in the area – *Ayub Medical College* in *Abbotabad* seems to have sustained some level of structural damage, which needs to be assessed and quantified as a priority.

2.3 Human resource

Based on field assessments, it can be summarized that the earthquake created three-fold human resource-related needs: *firstly*, in the immediate aftermath, the magnitude of orthopedic and other injuries demanded doctors especially surgeons and trauma specialists. *Secondly*, over the long term, the effects of this catastrophe will demand specialized human resource in key areas such as physiotherapists, artificial limb professionals, rehabilitation specialists, plastic surgeons and mental health professionals. And *thirdly*, the gap that currently exists with regard to the human resources lost will have to be bridged. The exact estimates of health care professionals lost in the earthquake were not available at the time of compilation of this report. However, according to the World Bank Report of November 10th, twenty one public sector health care providers have been reported dead and 141 are estimated to have suffered from injuries. The report also reveals that 19 LHWs and two supervisors have died. There are no estimates for the loss of private sector health care providers. In any case, the human resource demand, posed by the nature of the devastation is unprecedented by any standard.

2.4 Public health issues

Several factors can potentially contribute to the disaster that ensues following a natural hazard as an earthquake. Disruption of water supply, contamination of water sources, poor sanitation, compromised waste disposal in chaos stricken areas, and overcrowding can all be contributory to infectious disease outbreaks.

Water: In the disaster stricken areas particularly in the city of *Muzaffarabad*, there was an initial partial damage to the water supply system which was compounded by the destruction of a functioning public works department. The clarifiers in water treatment plant were damaged and the clean water pipeline in the old city was destroyed. Water supply system in *Bagh* too was extensively damaged; leaking water resulted in the creation of stagnant pools of water; as a result, the possibility of surface contamination was feared initially. The rural supply system of *Bagh*—the springs and the circulation systems also needed to be restored. In *Balakot*, water from the river and its branches was reported to have been colonized by pathogenic E Coli and was, therefore, declared unfit for human consumption. Additionally, drinking water in the initial days became a problem as rivers changed their course and fresh water springs dried up due to shifting earth's crust and thus, the efforts to ensure safe drinking water became imminent. Additionally, there was the danger of water sources being contaminated by dead bodies and animals and during the initial post-impact days there were fears of an upsurge in the number of cases—a fear that luckily proved unwarranted at one month assessment.

Solid waste disposal: solid waste disposal systems and sanitation measures were also disrupted by the earthquake and in some areas sewage systems overflowed; this was compounded by open defecation. However large scale contamination of rivers and well waters was not reported except possibly in *Balakot*. Solid waste disposal was compounded by lack of appropriate disposal of packaging materials of consignments of relief, unused relief items such as clothes, plastic water bottles, and building debris. Hospital waste also posed a problem. In many areas including *Bagh*, *Balakot*, and *Muzaffarabad* the hospital waste systems were meager to begin

with and sustained major damages as a result of this disaster. Most of the medical services were being delivered in field hospitals and camps or improvised sites; these were not capable of handling hospital waste. The disposal of sharp waste is therefore quite a significant problem and one that continues to be a public health hazard, to date.

Threat of infectious diseases outbreaks: the World Health Organization set up field surveillance activities in order to detect infectious disease outbreaks and confirm rumored outbreaks of infectious diseases. Based on the reported data up until November 7, 2005, infectious disease morbidity and mortality reported by location is summarized in Table 2.

In the early days post-quake, an outbreak of chest infection was detected in *Balakot* by the WHO visiting team and the situation is reported to have been brought under control. Although there are still rumors of suspected outbreaks and media reports of increases in the incidence of respiratory infections,⁸ this has not been substantiated by infectious disease surveillance data as has been shown here. There are also anecdotal reports of the increased incidence of diarrheal diseases amongst children; these need to be substantiated. Earthquakes also bring in their wake many vector borne diseases as the routine vector control activities are disrupted. In disaster-struck areas, there are anecdotal reports of the increased incidence of Leishmaniasis – a disease endemic in AJK. Its risk of spread is currently high due to the presence of the ideal breeding ground for both its reservoir and its vector – the dog and the Sandfly respectively. The threat of measles and malaria in overcrowded camps is also high as is the risk of diseases transmitted by rodents and increased risk of certain rare diseases such as Leptospirosis – a communicable disease acquired through direct contact with the urine or tissues of infected animals.

Table 2: Infectious disease mortality and morbidity surveillance data reported as of November 8, 2005⁹

	Infectious diseases	Total reported cases	Total reported deaths
1	Acute Flaccid Paralysis	1	-
2	Acute Respiratory Infections	8954	2
3	Diarrhea	6900	8
4	Dysentery	1130	-
5	Jaundice	58	-
6	Malaria	183	-
7	Measles	87	1
8	Meningitis	18	-
9	Pyrexia of unknown origin	2667	-
10	Scabies	444	-
11	Tetanus	49	5

⁸ Source: daily THE NEWS of November 7, 2005

⁹ Source: World Health Organization infectious disease surveillance unit at the Emergency Operations Centre at the Pakistan Institute of Medical Sciences, Islamabad.

3. The health-related response – summary of key events

Initial health relief work was set up and organized under the umbrella of the Federal Relief Commission, Ministry of Health and the Army; the Health Cluster, international agencies and voluntary organizations and individuals contributed to this effort. A description of the following initiatives captures some the key measures taken in a health and health related context post-quake:

- 1 The **Federal Relief Commission** was established on October the 10th, 48 hours after the earthquake as the main coordinator of all relief related operations. It was expected to play a role in coordinating the health relief operations, particularly with regard to coordinating the influx of foreign medical assistance – medical teams and supplies – as well as the evacuation of patients from the affected areas. During the past month, Pakistani and allied helicopters flew for a total of 4,584 hours to evacuate more than 25,000 patients from the affected sites. In addition, they also played a critical role in airlifting medical personnel to the affected sites.
- 2 The **Ministry of Health** established a Disaster Management Committee based at the Pakistan Institute of Medical Sciences (PIMS) in order to manage all the national and international partners' health relief operations to the crisis; to coordinate the relief distribution and monitor the progress of implementation. This committee entrusted respective tasks to the following National Programs, which are vertically aligned with it:
 - ? National EPI Program: Vaccination
 - ? National HIV/AIDS Program: blood transfusion
 - ? Malaria Control Program: fogging
 - ? Primary Health Care: district teams, LHWs
 - ? National Tuberculosis Control Program: PHC assessment
 - ? HMIS : Human resource assessment

In addition it mainstreamed the voluntary offered assistance of the NGO Heartfile and mandated it to develop and maintain the O8 Health Information system. The effort has been structured to assist the Ministry of Health with managing information and policy analysis of data.

- 3 An **Emergency Health Cluster** was established jointly by the World Health Organization and the Ministry of Health; through this, all the health relief partners were brought together in order to achieve a unified inter-agency management during emergency response operations. As part of this arrangement, initially, officials from various agencies met on a twice daily basis to achieve inter-agency cooperation. It was envisaged that through this system, relief operations would be effectively matched with existing needs in the disaster areas. Through these functions, the Ministry of Health, UNICEF and WHO were able to link with the nation-wide coordination carried out jointly by the UN Disaster Assistance Coordination (UNDAC).
- 4 Three **Base camps** were established for the mainstreaming of relief activities in *Mansehra*, *Muzaffarabad* and *Rawlakot* and 29 surgical teams were mobilized in 72 hours. In Balakot, students and doctors from Hayatabad Medical College set up a

medical camp from day three of the impact and continue to provide emergency and ambulatory medical services to the local population. The current location of field teams and the BHUs in which they are operating are shown in Figure 2.

Figure 2. The current location of Basic health centers and medical teams¹⁰



Sr. No.	Basic Health Centers	Sr. No.	Medical Teams
1.	IFRC and French RCS	11.	Korean Medical Associations
2.	Cuba	12.	Estonia
3.	Canada	13.	UNFPA
4.	Finish RC/ICRC	14.	Afghanistan
5.	Agha Khan HS	15.	IFRC Spanish RCS
6.	Pakistan Islamic Services	16.	Pakistan Islamic Services
7.	ICRC/German RC	17.	MSF H / B
8.	AKHS	18.	Sweden
9.	ICRC/Japanese RC	19.	Singapore
10.	Qatar RCS, IFRC	20.	Cuba
		21.	Jordan

By October the 13th, six **Field Hospitals** had been set up; these were manned and equipped by different foreign and local teams filling gaps where District Hospitals had been destroyed. These include the French and ICRC hospitals in Muzaffarabad; the Italian Hospital in Mansehra and hospitals set up by Belgium in Rawlakot, Saudia Arabia in Balakot and Spain in Bagh. However over the weeks the number of field hospitals increased. The current location of field hospitals is mapped in Figure 3. These hospitals are reported to have played an important part in treating medical emergencies on-site. For patients received this value was first reported at approximately 12,000 but within 11 days of data input it rose to approximately 30,000.

¹⁰ Data provided by the World Health Organization on November 7, 2005

Figure 3. The current location of field hospitals¹¹



Sr. No.	Agencies / Countries	Sr. No.	Agencies / Countries
1.	Military Malaysia	12.	PIMA
2.	Johanniter Germany	13.	Spanish Red Cross
3.	Italy	14.	Tehsil HQ Hospital
4.	IFRC	15.	Afghan Medical Services
5.	UNFPA Civil Hospital	16.	Al-Rahma Trust Clinic
6.	Iranian Mobile Hospital	17.	Saudi Arabia
7.	Kunhar Christian Hospital	18.	Ukraine
8.	IMC No. 1	19.	Norwegian RC/ICRC/Finish RC
9.	UAE Armed Forces Hospital	20.	Russian
10.	Shawal Najaf BHU	21.	NATO
11.	International Islamic Relief Organization		

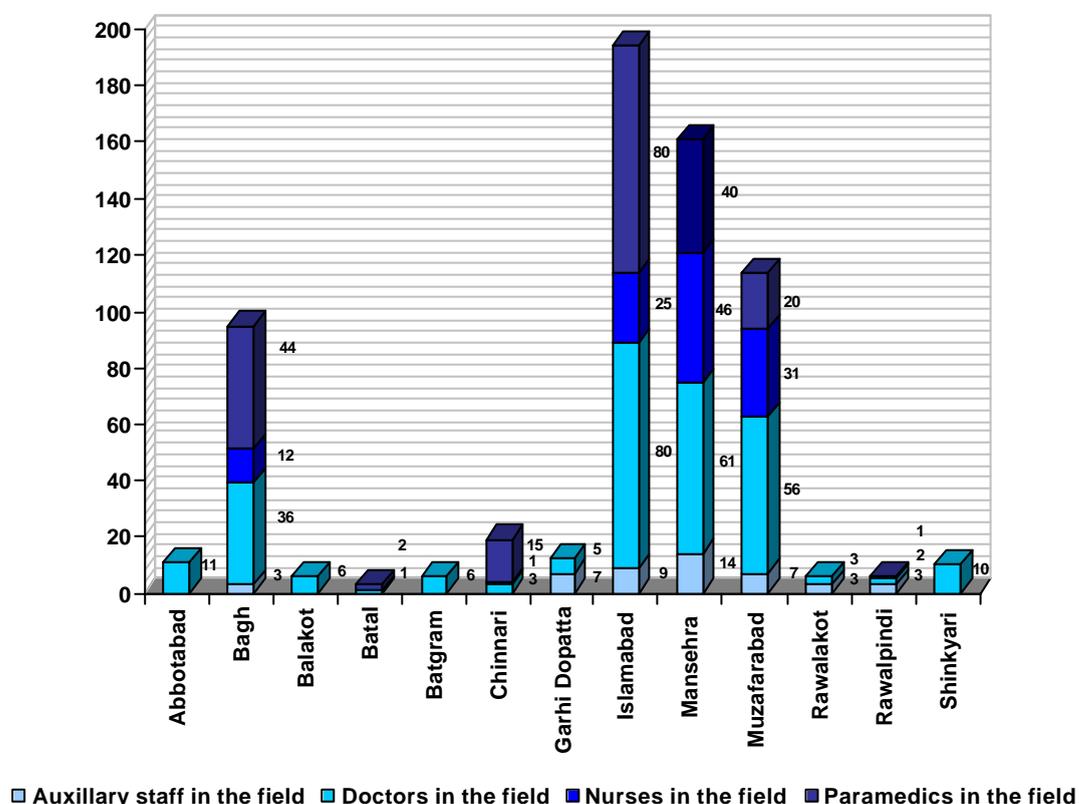
5 The Federal Government set up its base at the **Abbas Institute of Medical Sciences (AIMS)** in Muzaffarabad on the 12th of October 2005. It remains to date the major facility providing emergency care to individuals, which continue to arrive from disaster struck areas. Today this facility includes 24 hour ER services, a labor room, a fully functional operating theatre, diagnostic services, 6-bedded dialysis unit and blood transfusion services. The inpatient capacity has been increased from 68 beds to 350 beds; in addition, two tent villages have been set up for post-surgical care of patients; these can house a total of 400 beds. Surgeries are performed in this hospital and post-surgical care is provided at neighboring medical camps that have been set up by *Al-Khidmat* Foundation, *Al-Dawah* Foundation, Islamic Relief Foundation, *Al-Miraj* Medical Camp and other private initiatives. Mobile hospitals were initially set up by the Russian and German doctors who have now left and surgeons from Turkey and the US have replaced them. In the District of *Mansehra* the Post Graduate Degree College was converted into a hospital, which currently houses more than a thousand beds.

¹¹ Data provided by the World Health Organization on November 7, 2005

The National HIV/AIDS Control Program provided infrastructure support for setting up blood banks at *Abbottabad* and *Mansehra*, coordinated and managed the air-lifting of more than 500 units of screened blood and provided screening facilities at *Bagh*. In addition it is currently conducting a needs assessment at *Ghari Habibullah*. The Program also utilized the services of FM radio to raise awareness regarding the safe use of syringes in the aftermath of the quake.

- 6 A large number of **health care providers** took to the affected areas; some were sent through agencies whereas others went there voluntarily. Information exists about those that were sent formally through agencies/governments and missions since this information was documented; however there is no record of those that went on their own or through private sector sources and therefore an estimation of the exact number of health professionals in the field is difficult to ascertain. This information has been summarized in Figures 4 and 5.

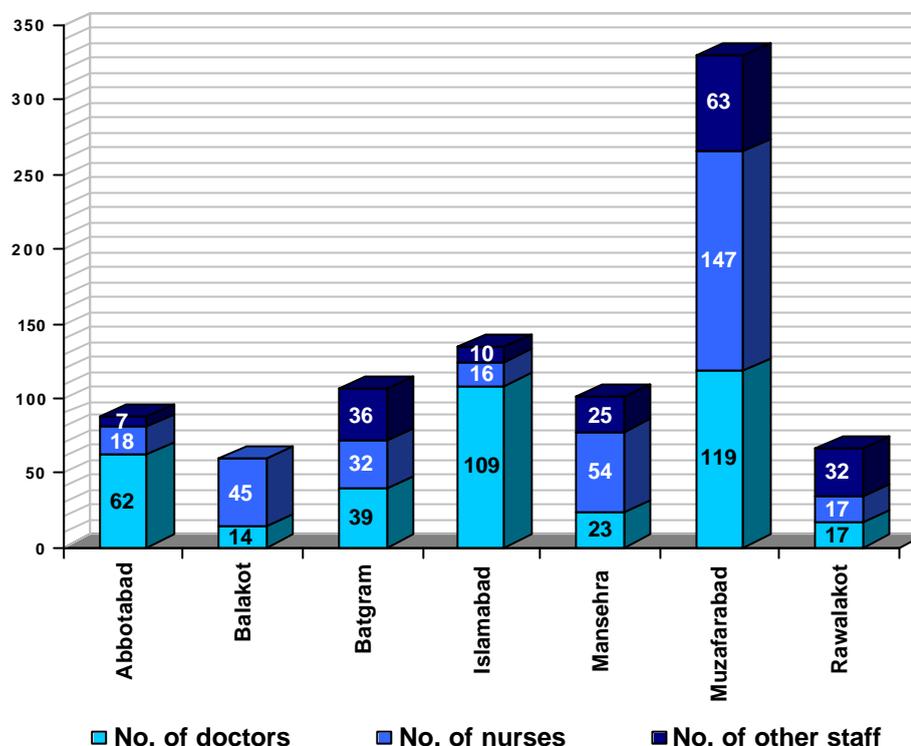
Figure 4. Field Staff deployed by the Federal Ministry of Health



Teams of doctors from hospitals in other parts of the country also provided their services; these included teams from JPMC, Dow University, SIUT and many others. The SIUT team set up three centers in *Muzzaffarabad*, *Mansehra*, and *Abbottabad* to provide emergency dialysis services to those in need – particularly those in acute renal failure due to crush injuries. A large number of Pakistani expatriates joined this effort. These included members of the Pakistani Physicians of North America (APPNA) and World Wide Doctors—a not-for-profit medical aid organization founded by Pakistani physicians. However, it is very difficult to estimate the exact number of those that have been involved with the relief work due to the unprecedented voluntary inputs. For example the National

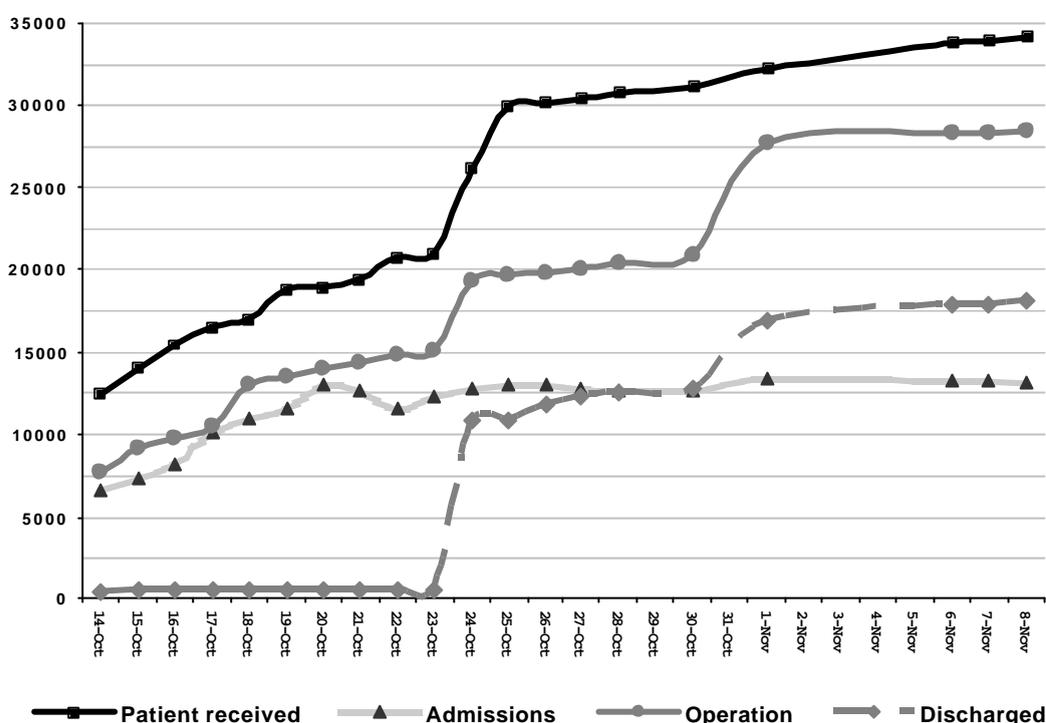
Commission for Human Resources – just one of the many voluntary organizations – provided 160 staff and 4000 workers in Balakot alone.

Figure 5. Field Staff deployed by International Agencies



7 **Hospitals in the unaffected areas:** Figure 6 shows that there was an exponential increase in the number of patients received in hospitals and other health care facilities in Islamabad, Rawalpindi and adjacent areas as helicopter sorties flew in patients from remote and inaccessible areas to these secondary- and tertiary care health facilities. Not all patients received were admitted but many received medical and minor surgical treatment as an outpatient as is shown by Figure 6. With regards to the number of operations, this initially mirrored the number of patients being admitted but after ten days it continued to increase whereas the number of patients being admitted followed a plateau. This may have been due to the fact that one patient received more than one operation of either major or minor description.

Figure 6: Patient activity post-earthquake in the hospitals of Rawalpindi/Islamabad and the adjoining areas as of November 7, 2005



8 **Response to public health issues:** these can be summarized within the context of water and sanitation and the control of infectious diseases and the setting up of surveillance systems.

In the wake of the aforementioned challenges with regard to water supply and related safety considerations, water purification measures have been underway since the early days, post-quake. The supply of clean water was assigned to the Federal Relief Commission, which in collaboration with the Pakistan Army and the Ministry of Environment has arranged for water tankers in affected areas. A German team remained involved in purifying water at the rate of 50,000 liters/day for a three week duration post quake in *Balakot*; the team left on October 28 and has been replaced by staff from Red Cross. The extensive damage to the water supply system of *Bagh* was restored on October 23rd or two weeks post-impact; at the time of the compilation of this report, it was functioning at 70 percent of its capacity. However, work needs to continue so as to construct a proper intake chamber to avoid contamination. As part of its preventive and promotive services, the Ministry of Health has been involved in the distribution of water purification tablets. Furthermore, UNICEF is supporting the restoration of water and sanitation facilities in two hospitals in *Mansehra* and has distributed thousands of bars of washing soap, toilet soap, and buckets to the affected population. UNICEF and ICRC are also participating in the restoration of municipal water treatment plant and distribution network. Moreover, ICRC through its three operational stand-alone Emergency Response Unit (ERU) Modules is providing safe water, sanitation and vector control by WHO/SPHERE standards to over 40,000 people. The O8 Health Information System is currently gathering more specific data about the water treatment efforts underway by stakeholders.

The Malaria Control program has been fogging all the affected districts with premethrin and k-orthrine synthetic pyrethrod insecticides with the help of 39 fogging teams; this is expected to act on sand flies in addition to mosquitoes, crawling insects and houseflies. Killing of stray dogs has also been conducted in many areas. The National EPI Program took charge of vaccination arrangements and arranged for 1.8 million doses of Anti-Tetanus Serum (ATS) and 200,000 doses of ATS with the help of UNICEF and WHO; in addition it also maintained a cold chain for vaccines. Vaccines were also held in stock as part of a contingency plan. As of November 8, more than 400,000 measles vaccinations, more than 67,000 DPT and more than 112,000 tetanus vaccinations have been performed.

- 9 **Non governmental sector** (Please also refer to Table 3) it has been reported that more than 73 non-governmental organizations including 55 international NGOs were participating in the relief operations; of these many were involved with health related services. Edhi, Pakistan Islamic Medical Association, Pakistan Medical Association, Islamic organizations (Al Khidmat and Al Dawah), and a number of NGOs have been actively involved in providing health services to the disaster struck population. Al-Khidmat Foundation has been very instrumental in evacuating families from inaccessible villages and also in the distribution of relief goods. Islamic Relief UK which has a good network of health and social support services in AJK has been very active in disaster relief operations.
- 10 Response of the **International community** (Please also refer to Table 4). In an unprecedented effort to assist those in need, 708 doctors and paramedics from across the globe arrived within the first week of the impact. Jordan, Turkey, Malaysia, Azerbaijan, China, Singapore, Russia, Germany, Switzerland, UAE, and the United States sent physicians, paramedical staff, and mobile/field hospitals to facilitate the MOH, Army and voluntary efforts that were underway. ICRC and MSF Belgium teams also arrived in Muzaffarabad whereas UNFPA arranged for orthopedic supplies. In addition, Mercy Corps team reached Mansehra and French Surgical teams were setting up a surgical unit in Muzaffarabad whereas International Rescue Committee based itself in Balakot. Also within the first 48 hours, WHO and UNICEF sent supplies including generators to Muzaffarabad and Mansehra and the first US military cargo plane dropped 10 tons of humanitarian aid over the most -affected areas on Oct 14. Over time, an extensive international agency network of health related relief operations has been established. This has been shown in Table 3 and 4 and is mapped in Appendix A.

Table 3: Role of multilateral agencies in the health sector

Agencies	Role
FAO	Supported the establishment of food security / nutrition initiatives.
IFRC/ICRC:	Delivered relief items; Established mobile medical teams, set up field hospitals, treated patients with injuries and fractures; Established sanitation/vector control to 40,000 people through the Watsan Emergency Response Unit (ERU) Modules, which provide safe water to WHO/SPHERE standards
UNFPA	Provided emergency obstetric and neonatal care for pregnant women in affected areas through the nine mobile service units operating in Muzaffarabad and Mansehra; Distributed clean delivery kits and other surgical equipment to health centers and referral facilities.
UNICEF	Led the Water and Sanitation Cluster response; Responded to the water, hygiene and sanitation needs of the affected population; Provided urgently needed medicines, equipment, vehicles, communication equipment, vaccines and other health supplies; Spearheaded advocacy for child protection officers in major hospitals.
WHO	Conducted health needs-assessments, coordination, communicable disease

	surveillance, outbreak control and reestablishment of primary and referral systems; Provided urgently needed medicines, equipment, vehicles, communication equipment and other health supplies; Provided more than 50 WHO regional and global experts; Mobilized the Global Outbreak and Response Network (GOARN); Developed and communicated technical guidelines tailored to meet the specific needs of the crisis; Established the Early Warning and Response Network (ERWAN).
World Bank & Asian Development Bank	Conducted a comprehensive needs assessment
UNHCR	Maintained cold chain in Muzaffarabad

Table 4: A summary of International help to date

Provided medical teams – orthopedic and trauma surgeons, plastic surgeons, paramedics, equipped with medical relief and medical supplies	Korean Medical Association (KMA) and the Korean Medical Aid Team (KEMAT), Korean Buddhist Medical Team (KOICA), Korean University Hospital, Korean NGO Good Neighbors, Korean RC, Relief International, SAWANWON, Johannitar, Canada DART, Bismillah Taraqee, B-First (Belgium), Canadian Relief Foundation, ARC International, Mercy Corps, CMDO, MDM, Australian Aid International, MSF F, UNFPA, Doctors of the World, MSF H, Green Doctors, Canadian Relief Foundation, Global Care, World Vision International and World Vision Korea, Denzig Feneri Yardimlasma ve Dayanisma Dernegi (Turkish NGO), DO-GANA Association and the Association of and Worldwide Doctors The Governments of the Czech Republic, South Africa, Estonia, Greece and Azerbaijan, Germany, Spain, Japan and Sweden
Filed Hospitals	Norwegian RC, ICRC, Finish RC, Turkish RCS, Save the Children Iran, Italy, Germany, UAE, USA, France, Malaysia, Cuba, Belgium, Russia, Saudi Arabia
Basic Health Units	Finish RC, Qatar RCS, IFRC, Japanese RC, IFRC, Spanish RCS, French RCS, German RC Government of Belgium Relief International USA, Canada, Child Advocacy international, Pakistan Islamic Service, Merlin, Aqa Khan health services
Support to private Hospitals	Cuba
EMOC services	UNFPA, Save the Children
Primary Health Care Services	WHO, Jordan, Afghanistan

12. Rehabilitation of the disabled

High level commitment has been shown to rehabilitate those that have been disabled as a result of the quake and a Federal Committee with broad-based representation has been formulated to develop recommendations for this purpose. The committee is in the final stages of compiling its plan. Its recommendations, with regards to ensuring institutional care of those with spinal injuries, include enhancing bed capacity after a careful assessment of potential within institutions to care for such patients (NIH, AFIRM); setting up of prefabricated structures (e.g. UNICEF is supporting the construction of one in NIH); using vacant buildings and extra bed space to shift stabilized patients in one large facility (Cant. Hospital Rawalpindi, and F 10 centre); procuring additional beds; hiring of physiotherapists on contractual arrangements and training of volunteers. In addition, guidelines are also being developed to assist with delivering the standard of care for spinal injury patients in these centers.

The recommendations will also focus on enhancing the current capacity to develop artificial limbs. The Fauji Foundation hospital, which has the maximum capacity to manufacture

artificial limbs in the country is being upgraded and will be running in two shifts to respond to needs. A prefabricated prosthetic-orthotic centre is being established by ICRC in Muzaffarabad; ICRC will also enhance the capacity of PEPOS – currently running at 25% of its capacity – to 100%. Handicap International is assisting in the setting up of another in Mansehra whereas the Government of Iran has offered to send two mobile units on a permanent basis. Interest has also been shown by Human Aid, UK in this area. In addition

13. Mental Health and Psychological Support

Mental and psychological support services have started functioning in all affected areas and at various healthcare facilities. A National Plan of Action has been developed for mental health and psychological relief operations. At the time of compilation of this report, mental health teams were available in all districts with eight teams in operation; each consisted of 4-8 senior psychiatrists who stay in the field for an average of two to three weeks. Two rounds of training are scheduled for next week which are being jointly coordinated by WHO and the Ministry of Health—one workshop is meant for the training of master trainers. Locally relevant health education flyers and other material have been developed in this regard. A package for the self-care of care providers has also been developed.

4. Medium Term Policy Recommendations

Rationale: the medical relief operations instituted in the aftermath of the October 8 earthquake were unprecedented by any scale. Presently, assessments are not available to judge the impact and quality of health relief operations in qualitative or quantitative terms. However, based on the scale of the devastation, its perceived impact on the health system, its envisaged needs, and impressions about the state of health of the population affected, a number of medium-term policy recommendations are being articulated. These may need to be reviewed based on information about the impact of current health-related interventions and more updated information about the status of health of the affected population.

Scope: it is widely recognized that factors which determine 'health status' range much broader than those that are within the realm of the 'health sector' and that 'health care' has less of an impact on population 'health outcomes' than economic status, education, housing, nutrition and sanitation. In line with this understanding, the definition of a 'health system', therefore regards it as comprising all the organizations, institutions and resources that are devoted to producing health actions. This encompasses personal health care, public health services or services/actions by *other sectors* whose primary purpose is to improve health. The 'health care system' on the other hand includes the provision of services within a personal health care dimension and/or a public health services framework. Within this context, it must be recognized that the health of the population affected by the earthquake is challenged by many factors, other than those, which the health care system can address and therefore in order to impact the health of the quake affected population, a vision of health outside of this framework will have to be formulated. This would entail close linkages with other sectors. It is envisaged that the Earthquake Rehabilitation and Reconstruction Authority, with a focus on housing, education and other social sector issues would play an important role in this connection. This important consideration notwithstanding, the medium-term policy recommendations in this document are relevant to the health care system. These have been discussed hereunder under seven broad categories:

4.1 Coordination

The impact of the health related interventions, post quake, is critically dependent on effective coordination, given the range of national and international stakeholders partaking in these efforts. In addition to the Ministry of Health, Provincial Health Departments, the Army, many international agencies, missions from more than 50 countries, local and international NGOs and thousands of volunteers are contributing to the health response. The numbers and the array of activities highlights the need for strengthening coordination of efforts as it is only then that partner efforts to deliver services and rehabilitate different aspects of health systems can be capitalized and maximized and, therefore, ideally positioned for contribution to health systems strengthening in the affected areas. Coordination in the present context needs to be approached at two levels: the central level and within the affected areas.

At the *central planning level*, coordination has been reasonably effective within individual vertical health and other systems. The Ministry of Health developed its own Disaster Management Committee, through which it mandated institutions under its jurisdiction with tasks and coordinated their contributions; the World Health Organization led the Emergency Health Cluster which worked to achieve a unified international inter-agency management during emergency

response operations linking it with UN Disaster Assistance Coordination (UNDAC) whereas the Armed Forces had their own coordination mechanism closely linked with the Federal Relief Commission.

Though linkages existed within these domains, they need to be further strengthened so as to avoid duplication of efforts and harmonize interventions. A central coordination mechanism for health should, therefore, be clearly mandated and institutionalized with clear and unambiguous definition and delegation of roles and responsibilities. To some extent these arrangements exist at the Federal Relief Commission. However these need to be operationally linked with other agencies with clear policy and procedural guidelines on roles, responsibilities, scope, areas of operation and rules of engagement.

The institutional mechanism should also be mandated with the development of policy positions/the adoption of policy positions, which emerge with broad-based consensus. The institutional mechanism should also be made accountable for translation of policy recommendations into measurable action. Institutional arrangements for the implementation of these plans should be defined with broad-based consensus and careful attention to specific functions such as logistics, planning, operations, finance and administration. This coordination mechanism should also inventorize the core competencies of international agencies in the field, solicit their and donor commitments and mainstream them into medium to long term planning. This is being done currently at different levels (Federal Relief Commission, Ministry of Health and the Health Cluster) and needs to be centralized.

The second aspect relates to *field coordination*. No generalizations can be made about the level of coordination in the field in the early days post-quake as this varied according to the level of resources at hand.¹² However impressions indicate that effective coordination can contribute to improving outcomes and that careful attention needs to be paid to this aspect particularly in the field. For instance, isolated pockets of expertise/strengths exists in various areas; US MASH has nine ventilators and could become a regional critical care centre; Turkish Red Cross and the Chinese mobile hospitals have facilities for plastic surgery whereas the PMA hospital is reported to have a physiotherapist; these could serve as tertiary referral centers for a defined catchment population. Similarly if local strengths in other specific areas are mapped, referral pathways outlined and specific access issues such as transportation catered for, a significant contribution can be made to the medium term needs of those in the quake-affected areas. The central coordinating mechanism should also conduct a rapid needs assessment so as to guide further deployment.

4.2 Health systems management

The individual components of the health reforms being proposed necessitate evidence based planning and robust implementation. It is proposed that initial coordination and planning support should be provided from a central level as outlined above; however this must be viewed as an expedient stopgap arrangement with the overall objective of enhancing capacity of the local health management and the building of management mechanisms where they are totally destroyed as in the case of *Muzaffarabad*. The central coordinating mechanism should also be inclusive of representation from the affected areas and provide an opportunity for capacity building.

The local health management's planning-administrative cycle should be firmly grounded in evidence in the context of locally determined priorities. Strategic plans must be closely linked with resource-appropriate outcome-orientated operational plans, which must clearly articulate indicators and their mechanisms of monitoring and evaluation. These must draw on the

¹² Personal communications relating to the impressions gathered of visiting teams

strengths of stakeholder consultations, consensus and coordination for collective decision making. The development of the *Plan for Rehabilitation of Amputees and Spinal Cord Injured Earthquake Affectees* and is a case in point.¹³ The recommendations of this committee have been drawn on broad based consensus and are reflective of coordinated pooling of strengths, which draw together local stakeholders as well as international experts that have committed resources in this area. However, the success of this plan and its recommendations are critically dependent on the manner in which they will be implemented.

Health management should also review and take into account/develop and rigorously pilot test interventions – being proposed hereunder service delivery and financing – with a view to measuring and tracking results. This can allow the evaluation of competing concepts and can therefore guide the up-scaling of such initiatives for broader systems-wide adoption. Only then can they enable the development of well-structured and sustainable service delivery and financing mechanisms on a long term basis. Health management must be primed to setting priorities for publicly financed health services; monitor the effectiveness of publicly financed health services with regard to their relevance to predetermined priorities and overseeing the public private interface from an ethical perspective.

4.3 Information, evidence and policy linkage

Access to reliable and timely information on a number of health-related variables is a prerequisite for effective planning, implementation and evaluation of health interventions during and after a disaster. This need was recognized by a range of stakeholders involved in the health relief operations, who initialized a range of data collection efforts.

From a health sector perspective, data about human resource lost; damage to facilities, equipment, diagnostics, cold chain and specific storage areas and disruption of health services, management, communication, supply chain and access pathways was gathered by a number of agencies. Morbidity data was gathered by the WHO and the Ministry of Health field teams through public health surveillance efforts. In addition, monitoring of makeshift health services with respect to the influx of medical supplies, medical resources and movement of teams in the field and needs assessment at established health facilities was also conducted. Data from hospitals serving the affected areas was collected by the Health Management and Information System (HMIS) whereas an account of inputs and process-related data was kept by most stakeholders.

Many other forms of data collected by the Federal Relief Commission and the Army is also relevant to health sector planning. This includes information about the region affected in terms of its' population; access patterns; modes of transportation; communications systems; availability of basic services (water, electricity, sanitation facilities, housing, shelter) and food; the number of deaths and the number of persons injured, disappeared, displaced and the related human and material resources in the area.

In addition, data sources were also set up by voluntary private sector efforts. The Earthquake Information System developed by a group of young volunteers' lists individual patients in a centralized database; its search options have assisted with the identification of lost patients. Heartfile has established and is maintaining the O8 Health Information System, which has been involved in the collation and consolidation of data. The present report is another output of the System and reflects its other function, which involves analysis of data and its interpretation for specific policy recommendations.

¹³ Recommendations of the Committee on the Rehabilitation of amputees and spinal chord injured earthquake affectees

Though data sources, collecting mechanisms, collating and analytical systems exist, there is a need to pay attention to their flows and the roles and responsibilities in this regard, particularly from an inter-agency perspective within the context of the need to centralize data management. However most important is the need to base decisions on evidence generated from these data sources as evidence is critical to effective planning of interventions and their monitoring.

4.4 Service delivery

Service delivery issues have been approached under different headings. However it must be recognized that these are deeply interdependent.

4.4.1 Physical infrastructure

In the medium term, planning needs to focus on the delivery of services through the following: the undamaged infrastructure, the existing damaged but repairable physical infrastructure and make shift arrangements (field hospitals, camps).

Infrastructure mapping and needs-based assessment should be conducted as a priority in the case of the former two. Based on these, decisions should be made about resource allocations; decisions must be guided by an assessment of needs rather than the traditional geographic allocations with careful attention to population migration which may have taken place after the disaster. The same principle would apply to destroyed health facilities; however planning in this area must be cognizant of the realization that plans may not come to fruition in the short term.

The makeshift physical infrastructure has already been mapped. However it is important for the central coordinating mechanism to be clear about the medium to long term commitments of contributing agencies/individuals/teams. A clear plan should be made for streamlining these contributions into permanent health care settings. Action should be initiated on this plan as soon as feasible; this is particularly relevant given that many agencies, currently working to provide services may be due to leave, therefore, creating a gap in service delivery which will need to be bridged.

4.4.2 Mechanisms

The mechanisms for service delivery proposed as part of these recommendations view service delivery within a systems scope with the understanding that strengthening health systems and making them efficient, responsive and sustainable is vital to improving health outcomes in the disaster stricken areas. These policy recommendations draw on and are linked with the overarching reforms being proposed as part of the *Gateway Paper*¹⁴ of the *Health Policy Forum*, which is envisaged to be released shortly.

State owned infrastructure: each public sector/public sector partner health care facility can be used to deliver both, individually targeted clinical care as well as preventive and promotive services.

Each facility should be used for the delivery of *community oriented preventive and promotive services*; these should include 'health-related public goods' (such as health communication) and 'priority interventions' (the seven national preventive programs). The State should bear the costs of these services. In tandem with the identification of potential facilities, operational plans should be developed by the National Programs for

¹⁴ Nishtar S. Gateway Paper: Pakistan's Health Policy Forum. 2005 – in press

the organization of services through redefined physical infrastructure and their management linkages. It is conventional to prioritize infectious diseases prevention and control in community oriented preventive and promotive services. However, careful attention should also be paid to the health needs of those that are chronically ill. Based on epidemiological assessments, there would be an estimated half a million in need of chronic disease related care in one form or the other given that there are 4 million people affected by the earthquake. These services should also focus on the establishment of EmOC services to the extent that a credible cost-effectiveness analysis suggests and mechanisms for the care of vulnerable groups such as pregnant women, children, physically and mentally challenged persons, and the elderly.

For the delivery of *clinical services*, alternate service delivery models can be introduced into state-owned health infrastructure; these can be relevant to basic health care settings as well as hospitals and may or not involve the private sector's role. However there is a need to assess the feasibility of alternate service delivery mechanisms relevant to each geographic setting. A number of options are available; these include contracting out services to NGOs, health care providers or professional managers with or without community co-management arrangements, transferring management to lower levels of government or maximizing efficiency in the same system. In the case of contracting explicit guidelines on ethical and administrative matters, sample contracts and terms for price negotiations will have to be developed. In the case of hospitals, decentralization and granting autonomy is a feasible option. However this warrants participatory support and consensus of all stakeholders and an enabling legal and policy environment. Such arrangements are known to contribute to efficiency; however, there is a risk that these may create access issues for the poor and vulnerable. Therefore introducing such changes can be detrimental to the interests of the poor and vulnerable if mechanisms to offset the risk to the poor are not factored into planning and structuring. Mechanisms to offset this risk have been discussed under overarching policy issues.

Private sector: there is scant information about the private sector, its previous role in health service delivery in the affected areas and the current need and opportunity to capitalize on it. An assessment should be conducted as a priority and needs determined.

4.4.3 Financing arrangements

Judging from the statements issued by the Government of Pakistan in the post-quake period, it is perceived that the current financing mechanisms being proposed for the building of the primary health care and secondly level infrastructure involve a major role of the state as providers of care. Major resource allocations seem to be on their way in line with this policy as is evidenced by the resource pooling at the Donors Conference on November 19, 2005. However in parallel, the role of the private sector is being actively promoted in reconstruction by the Government and the recently released joint report of the World Bank and the Asian Development Bank,¹⁵ reiterates that by highlighting the potential of alternate managements arrangements for rebuilt health care facilities. These reform measures are also supported by the Gateway Paper of Pakistan's Health Policy Forum, albeit with the appropriate safeguards.

A number of financing arrangements are clearly possible within the current context; some of these are directly linked with the service delivery options referred to above and will have to be initialized in tandem. These include the introduction of user's charges and cost-sharing programs when clinical service delivery is contracted out to non-state

¹⁵ Pakistan 2005 Earthquake: Preliminary Damage and Needs Assessment – November 15, 05. World Bank and Asian Development Bank.

partners. However in such arrangements, there is a need to protect disadvantaged populations against being discriminated against; this highlights the need to establish a 'social safety net' or a system for social protection in tandem, which has been discussed in the section on overarching policy issues.

Other financing mechanisms to increase the pool of available resources include increased tax allocations for health, the structuring of a conducive tax configuration to tap into philanthropy-related sources and mainstreaming corporate support within a corporate social responsibility framework. These too would entail appropriate policy and legislation. Other medium term measures could include expanding the base of the Employees Social Security System in NWFP to cover quake victims in less formal employment and its establishment in AJK where it is non-existent. In addition to the optional measures aimed at increasing the pool of indigenous resources on a long term basis, it critical to utilize existing resources more efficiently and transparently. A day before the release of this Report in the draft form the *International Donors' Conference* in Islamabad has concluded with more than five billion dollars pledged for the rehabilitation of the quake victims. It would be critical to keep a conscious focus on maximizing utilization, and reducing misuse, pilferage and theft.

4.4.4 Public health

A number of public health interventions are currently underway. These have been discussed above. Data on infectious disease surveillance does not indicate major outbreaks of diseases as of November 8, 05. However there are rumored reports of outbreaks of diarrheal diseases from various parts of the affected areas, which need to be verified and appropriate action taken. There is a need for further strengthening and institutionalizing the existing infectious disease surveillance process so as to make it sustainable and linked with the existing data collection systems such as HMIS. The Ministry of Health and the World Health Organization have been involved in the development of/tailoring of existing protocol and standard operating procedures in preparation for the unlikely event of an infectious disease outbreak such as malaria, acute respiratory infections. These must draw on the potential of the respective national programs and should be in close collaboration with them. The Ministry of Health should arrange to have a ready core group of trained personnel, supplies and equipment as well as logistic support to strengthen prevention and control and therapeutic services at a short notice. In planning efforts, other vector borne diseases, such as *Leishmaniasis* should also be considered.

An assessment should also be conducted about the current water sources and state of sanitation in collaboration with the Federal Relief Commission and other relevant stakeholders such as the Ministry of Environment so as to develop appropriate plans of action. Similarly due attention needs to be given to hospital waste disposal and appropriate plans of actions developed.

4.4.5 Human resource

The health sector-related human resource needs after the earthquake need to be addressed at several levels. In the immediate aftermath, the magnitude of orthopedic and other injuries demanded doctors especially surgeons and trauma specialists; this need has been met to a very large extent, albeit with gaps. Over the long term, the effects of this catastrophe will demand specialized human resource in key areas such as physiotherapists, artificial limb professionals, rehabilitation specialists, plastic surgeons and mental health professionals; in addition the gap that currently exists with regard to the human resources lost will have to be bridged. This may necessitate additional

recruitment. However decisions on recruitment must be guided by service delivery mechanisms opted-for since decisions to contract services would have implications for public sector hiring. Public sector packages offered to existing regular employees and new contractual appointees and must take into cognizance alternate options available to professionals in the quake hit areas and factor appropriate opportunities and incentives so as to ensure that their services are retained in the public sector. The restructuring arrangements proposed under the section of 'mechanisms' call for institutionalizing personnel management reforms which go beyond personnel actions and set standards for performance. This highlights the need for a comprehensive human resource policy. The envisaged policy should also developed mechanisms to train various categories of health care providers in order to impart skills which can enable them to deliver services more effectively and efficiently in the disaster hit areas.

4.5 Overarching policy concerns

A social safety net: the enhanced role of the private sector in some of the service delivery models, such as contracting arrangements raises issues of access and affordability for the poor. This risk can be offset through the development of an inclusive mechanism of social insurance/protection for the poor, which goes beyond the formally employed sector. However this necessitates overarching policy and legislation; the establishment of an institutional mechanism and a large sustainable pool of fund with per-capita cost sharing by the Government and the development of procedural parameters with regards to waiver and exemption systems in providing subsidies to health care facilities for offsetting costs incurred in treating poor patients. Work currently ongoing in the area of social protection in Pakistan jointly by the Planning Commission, the World Bank, the ADB and DFID could provide specific guidance for the structuring of a such mechanism.

Prescribing, strengthening and safeguarding the public-private interface: the role of the private sector as an option for service delivery highlights the need to develop an institutional mechanism to legitimately regulate the private sector in a manner which is fair, participatory and conducive; develop polices, legislation, ethics, norms and standards and procedural details for combined systems of governance with careful attention to transparency, sustainability and accountability-related parameters, which provide an enabling environment on the one hand, whereas on the other foster relationships that harness the potential of the private sector. There is also the need to institutionalize 'corporate social responsibility' in order to capitalize on the strengths of the private sector in an attempt to mainstream their contributions in the national development agenda and develop mechanisms thus enabling the for-profit private sector to contribute towards achieving national goals and support them within this framework, albeit with attention to norms and standards.

4.6 Rehabilitation of the disabled

Rehabilitation of the victims is a long term process after every earthquake. This entails the provision of functional housing, establishing food supplies and baseline systems of education, suited vocational placements and other social services. These interventions are envisaged to address social determinants of health, which are known to significantly impact the health of populations.¹⁶ Earthquake Rehabilitation and Reconstruction Authority has been mandated with this task. A specific component of rehabilitation relates to rehabilitating those that have suffered injuries, which render them debilitated and disabled. These include those that sustain serious limb injuries resulting in amputation(s) of their limb, which are carried out as a life saving measure. The other category includes those that suffer from spinal injuries. The burden of

¹⁶ See related conceptual clarification on page 22

damage has been referred to in the section on patients needs whereas the response to the issue has been discussed in the section on responses.

A robust action plan is currently underway to address this challenge with inputs from all stakeholders. However, specifically developed plans of action must be clearly linked with resource-appropriate implementation arrangements, which must be appropriately mandated and adequately resourced with broad based control mechanisms.

4.7 Disaster management

The earthquake has reiterated the need for the health system to develop an emergency response capacity necessary for effective disaster relief. Useful lessons can be learnt from this experience to establish a Health Incident Management System, which should be closely linked with an overarching disaster management agency – such as one which is being established on a long term basis under the umbrella of the Federal Relief Commission. The scope of work of the proposed health sector institutional mechanism vertically linked to the Ministry of Health should be charted through the development of a National Health Disaster Preparedness Plan in collaboration with the apex agency and the Army. This plan must include the following:

- ✍ Protocols and emergency guidelines for different phases of relief operations for natural as well as man-made disasters
- ✍ Protocols and systems for establishing emergency information systems, their linkage with policy development and the definition of pre-assigned roles and responsibilities in this regard
- ✍ Procedures for seeking assistance from other provinces, private sector and international community
- ✍ Mechanisms for quick credentialing of medical relief personnel that form part of international assistance operations; the issuance of identifiers and mechanisms of communicating these details to the relevant stakeholders
- ✍ Plans for hazardous waste disposal
- ✍ Mechanisms for ensuring local pharmaceutical supply flows and ensuring quality of drugs flown in from other countries particularly with regard to shelf life
- ✍ Inventorizing Public health demands in shelters and developing procedures and protocols for responding in case of outbreaks
- ✍ Contingency plans for the provision of medical supplies and the identification of potential sources
- ✍ Mapping of human resource possibly needed in disaster situations and the charting of contingency plans. This can be structurally integrated with the Presidents Volunteer Program and a skill set should be developed in order to prime them to their roles in the event of a disaster
- ✍ Mapping of health sector infrastructure in terms of services available in specific geographic locations and the charting of contingency plans.

Glossary

AA	Action aid
ACF USA	Action contrela faim – USA
AFIRM	Armed Forces Institute of Rehabilitation Medicine
AIMS	Abbas Institute of Medical Sciences
AKHS	Aga Khan Health Services
CIP	Care International Pakistan
CMH	Combined Military Hospital
Concern	Concern
CRS	Catholic Relief Services
CW	Concern Worldwide
DHQ	District headquarter
E – BE	Belgian Embassy
E-FR	French Embassy
E-JP	Embassy of Japan in Pakistan
ERRA	Earthquake Rehabilitation and Reconstruction Authority
HMIS	Health Management Information System
ICRC	International Committee of Red Cross
IFRCRCS	International Federation of Red Cross and Red Crescent
ILAP	Interfaith League against Poverty
IMC	International Medical Corps
IRC	International Rescue Committee
JCCP	The Japan Centre for Conflict Prevention
JEN	Japan Emergencies NGO's
LHW	Lady Health Worker
MC	Mercy Corps
MDM	Medicins Du Monde
NATO	North Atlantic Treaty Organization
NIH	National Institute of Health
PIPOS	Peshawar International Prosthetics and Orthotics Society
PHC	Primary Health care
PIN	People in Need
PPAF	Pakistan Poverty Alleviation Fund
RC	Red Cross
RescueNe	Rescue Net International
RP	Relief Pakistan
SC-UK	Save The Children UK
SC-US	Save The Children US
SRSA	Swedish Rescue Services Agency
The netw	The Network for Consumer Protection
TJ	The Johanniter
UNDAC	United Nation Disaster Assessment and Coordination
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	UN Population Fund
UNICEF	United National International Children's Emergency Fund
WFP	World Food Programme
WVI	World Vision International

Appendix A

