

Original Article

CHALLENGES OF HOSPITAL PREPAREDNESS IN DISASTERS IN BALOCHISTAN

Saleem ullah¹, Noureen Latif², Ali Nasre Alam², Tabinda Zaman²,¹Department of Community Medicine Quetta Institute of Medical Sciences Quetta. Balochistan²Sarhad University Islamabad Campus**Correspondence:** Tabinda Zaman. Email: tabindazaman@gmail.com

Abstract

Background: Unique geo-climatic conditions, natural calamities, political conflicts and skeptic social wellbeing with frequent acts of terrorism has made Balochistan more prone to disasters. The hospitals need to be prepared to save lives of large number of patients in a limited time.

Objective: The purpose of this study was to identify the challenges faced by Public hospitals of Balochistan while preparing to deal with mass casualty incidents.

Methods: A cross sectional descriptive, exploratory methodology was applied to study. Ten hospitals were selected on the basis of capability and locations so as to cover all regions of the province. An opinion survey and few semi structured informal interviews were also conducted with key hospital personnel. Questionnaire was based on standards specified by WHO on the subject. The study was completed in one and half year period.

Results: Health sector in Balochistan is generally mismanaged and poorly developed where majority of population is deprived of healthcare facilities. People mostly rely on the trauma management facilities of military hospitals in emergency situations. Study revealed that 80 percent of the hospitals were without any formal written plan. Major weaknesses observed were regarding training of staff, mental health services, hospital networking, security of facility, and lack of an organized system of pre-hospital management of casualties.

Conclusion: There is dire need of establishment of central command and crisis control system especially for Quetta city in case of disaster. Starting a prehospital care rescue service such as 1122 is needed. The Security issues of health care facilities should be dealt with in view of the threat perception and possible tactics adopted by terrorists nowadays. Thus a workable plan is required which needs review and refinement after each drill or crisis situation to meet the challenges of timely and efficient medical response.

Keywords: Hospital preparedness, disaster drills, medical response, pre hospital care, disaster Plan.

Introduction

Due to unique geo-climatic conditions Pakistan is one of the most disaster prone countries in the world [1]. Besides the major threats of terrorist act due to instability in neighboring Afghanistan, our 40% of landmass is vulnerable to earthquakes, 6% to cyclones, 60% to floods and 25% of the Barani land under cultivation is vulnerable to drought [2]. 21st Century of seeing the skeptic social wellbeing has witnessed an increase in low intensity conflicts. These conflicts are taking shape as man made disasters causing casualties and dislocation of various services which require to be restored not only to normal life pattern but also to bring down panic reaction at its lowest [3].

Hospital would be among the first institution to be affected after natural or man made disasters. Because of the heavy demand placed on their services at the time of a disaster, hospitals need to be prepared to handle such an unusual workload [4]. Whenever a health care facility is confronted by a situation when it has to provide care and save lives of large number of patients in a limited time, which is

beyond its normal capacity, infrastructure, trained manpower and organization, the hospital can be said to be in disaster. The situation and additional contingency measures are required to control the event. When disaster strikes the society falls back upon the hospitals and they are required to provide immediate services in the form of emergency medical care. An event may have a problem for a smaller hospital and not so far a bigger hospital. Therefore disaster for a hospital is a temporary lack of resources which is caused due to sudden influx of unexpected patient load. So it is quite logical for hospitals to be prepared to deal with disasters. This necessitates a well documented and tested disaster management plan with regular test drills. Not only do these procedures allow for an organized response to a disaster but also allow for an ongoing process of quality improvements since these are the standards against which performance can be measured. It is essential to formulate a process plan which must be unique to specific situation in various types of disaster. Hospitals capacity and enhanced requirement of power, water, food and

natural disasters, biological and chemical warfare, explosive incendiary terrorism incidents, collaboration with outside organizations like public health department and emergency medical services like 1122, Edhi Ambulance, Chipa, Alkher, fire departments, civil defence, law enforcing agencies. The key hospital personnel should be trained to implement a formal command system, which is an organized procedure for managing resources and personnel during an emergency. The concern has been voiced about our health care system's ability to respond in disasters, there is both regional variability and variability in preparedness for specific types of events [6].

In Pakistan disaster management is viewed in isolation from the process of main-stream development. Within the disaster management organizations there is lack of knowledge and information on hazard identification, risk assessment and management. The linkages between various organizations and bodies are faulty. Disaster management policies generally not influenced by methods and tools for cost effective and sustainable interventions. It is imperative to develop a national disaster management strategy in which the roles of all key players should be identified and ensured [7].

Methodology:

This was a cross sectional descriptive study done to explore the challenges of establishing a workable hospital disaster plan to help the hospitals dealing with disaster preparedness. Sample size was 10 hospitals in Balochistan. Sampling technique used for data collection was structured questionnaire. Questionnaire was developed on the basis of guidelines and international protocols for preparedness of disasters according to the criteria of accreditation of health care organizations and the

personnel discussions with the various experts in disaster management. It contained mainly dichotomous items. Questionnaire was pretested at 2 hospitals and after some amendments, it was finalized for data collection. Study setting and location were government hospitals of Quetta and other parts of Balochistan. The schematic plan for the selection of hospitals was as follows: 1) Firstly, the hospitals were grouped on the basis of the number of beds available to patients for treatment as an indoor patient. They were classified into two categories, a) Hospitals with bed capacity of more than 100 beds. b) Hospitals with bed capacity less than 100 beds. 2) Secondly, the hospitals with less than 100 beds capacity were further divided/segreated on basis of their location so as to represent almost all the areas of the province. Key hospital's technical staff dealing with the planning decisions in case of emergency situation, its execution monitoring and evaluation (like CEO'S / Medical superintendents) was selected for data collection. Study duration was one and half year (January 2015 to August 2016). Data was coded and then analyzed by using SPSS 20 version.

Results

A total of 10 hospitals from different locations of the province were selected and following results were found out.

Levels of hospital preparedness for disasters within the hospitals of Balochistan were shown in the table-2. Majority of these hospitals had available infrastructure and manpower, few hospitals had reported that they were involved in conducted the regular trainings, rest of the hospitals had very limited existence of disaster plan, process and material regarding the disasters preparedness

Table 1: Organizational Framework for high emergency care response

Sr.No		No(%)
1	Awareness about emergency response	6 (60)
2	Training of staff	2 (20)
3	Management of incident command center	3 (30)
4	Drills	2 (20)
5	Behavioral health care	1 (10)
6	Hospital utility services maintenance	4 (40)
7	Maintenance of water & power supply	5 (50)
8	Transport Arrangements for Patient Transfer	7 (70)
9	Emergency supply of medical and non-medical materials	4 (40)
10	Decontamination system	2 (20)
11	Fatality Management	6 (60)
12	Triage system	2 (20)
13	Maintenance and Repair of Medical Equipment	3 (30)
14	Fire Safety Plan	4 (40)

Table 2: Level of Hospital Preparedness for Disasters in Balochistan.

HOSPITAL	Disaster Plan	Process	Manpower	Material	Training	Hospital Infrastructure
Bolan Medical Complex Hospital Quetta (Beds.861)	0%	0%	35%	40%	0%	20%
Sandeman Provincial (Civil) Hospital Quetta (Beds.780)	30%	20%	30%	40%	10%	20%
DHQ Hospital Loralai (Beds.200)	10%	0%	25%	25%	10%	5%
DHQ Hospital Khuzdar (Beds.150)	15%	10%	20%	25%	5%	20%
DHQ Hospital Turbat (Ketch)(Beds.128)	0%	25%	60%	45%	10%	50%
DHQ Hospital Sibi (Beds.100)	0%	15%	20%	20%	0%	20%
DHQ Hospital Zhob (Beds.50)	0%	5%	60%	50%	10%	70%
DHQ Hospital Panjgore (Beds.50)	0%	15%	60%	25%	5%	75%
DHQ Hospital Gwadar (Beds.35)	10%	5%	60%	40%	10%	50%
Rural Health Centre Nukandai (Beds.20)	0%	15%	60%	20%	0%	20%

Regarding relative severity on disaster preparedness within the hospitals. Most of the hospitals were found that they had very high vulnerability of various

hazards. However, others hazards had high, medium, low and very low vulnerability for disaster reporting. Table 3: Relative severity of various hazards per district

S.No	District		Earthquake	Floods	Drought	Cyclones	Communicable disease	Fire	Tsunami	Landslides	Locusts/ Pests	Industrial & Mines Accidents	Transport Accidents	Refugees & IDPs	Comments
1	Awaran	-	3	2	3	-	-	-	-	-	-	-	-	-	-
2	Bolan	3	2	5	3	-	-	-	-	-	-	2	2	-	-
3	Barkhan	2	1	2	-	-	-	-	-	-	-	-	-	-	-
4	Chaghi	1		1	4	3	-	-	-	-	-	-	1	-	-
5	DeraBugti	3	1	1	3	-	-	-	-	-	-	-	-	-	-
6	Gawadar	1	3	5		2	-	-	4	-	-	-	-	-	-
7	Harnai	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Lehri	-	1	3	3	-	-	-	-	-	-	-	-	-	-
9	Sohbatpur		2	2	2			1			1				
10	Jafferabad	-	-	1	-	-	-	2	-	-	1	-	-	-	-
11	JhalMagsi	-	-	2	3	-	-	-	-	-	-	-	-	-	-
12	Killa Abdullah	-	3	1	1	-	-	-	-	1	-	-	2	2	-
13	KillahSaifullah	1	3	2	1	-	-	-	-	-	1	-	-	-	-
14	Kohlu	2	1	2	3	-	-	-	-	-	-	-	-	-	-
15	Kharan	4	-	2	4	2	-	-	-	-	-	-	-	-	-
16	Kalat	3	4	2	2	-	-	-	-	-	1	-	1	-	-
17	Khuzdar	3	4	3	3	-	-	-	-	-	-	-	2	-	-
18	Kech	2	2	4	4	-	-	-	-	-	2	-	-	-	-
19	Lasbela	1	1	4	2	-	-	-	2	-	2	-	2	-	-
20	Loralai	1	4	3	3	-	-	-	-	-	1	-	1	-	-
22	Mastung	4	5	2	2	-	-	-	-	-	1	-	1	-	-
22	Musakhail	1	4	2	3	-	-	-	-	-	-	-	-	-	-
23	Naushki	2	1	2	4	2	-	-	-	-	-	-	1	-	-
24	Nasirabad	-	-	2	2	-	-	2	-	-	2	-	-	-	-
25	Panjgur	3	2	2	-	-	-	-	-	-	3	-	-	-	-
26	Pishin	-	5	2	1	-	-	-	-	-	2	-	-	-	-
27	Quetta	5	5	-	-	-	-	-	-	-	2	2	1	-	-
28	Sibi	3	3	4	2	-	-	-	-	-	-	-	-	-	-
29	Sherani	-	3	2	2	-	-	-	-	-	-	-	-	-	-
30	Washuk	1	-	2	4	3	-	-	-	-	-	-	-	-	-
31	Ziarat	-	3	2	-	-	-	-	-	2	2	-	-	-	-
32	Zhob	1	4	2	2	-	-	-	-	-	1	-	-	-	-

Vulnerability levels of various hazards per district in Baluchistan province

SCORING KEYS	
Very High	5
High	4
Medium	3
Low	2
Very Low	1
None	-

Discussion

Like other regions of our country Balochistan is also facing disaster problems most of which are bomb blast / terrorism, earthquakes, floods, droughts, communicable diseases, fire and road accidents. Balochistan is the only region in Pakistan which has witnessed a rise in terrorism related fatalities in recent past. The frequency of sabotage incidents in Balochistan especially those related to bomb-blast, landmines, hand grenades, rocket fire is common in districts of Quetta, Mastung, Kharan, Sibi, Bolan, Khuzdar, Panjgur, Kalat, DeraBugti, Kohlu, Noshki and Lasbela[8,9]. study revealed that disaster preparedness plan was held in only 20 percent of the hospitals, lying without any implementation thus not helped in identifying the lack of resources which can be rectified before an emergency occurs. 80 percent hospital has not formulated an standing operative procedure for triage. Plan also lacks important aspect of coordination with other stake holders like PDMA, civil defense and army who can contribute significantly during mass casualty incidents. Hospitals have Poorly organized security arrangements despite past precedents. Job action plan was held in 50percent of the hospitals, shown only routine duties and not the essential part of multi role duties in case of unforeseen emergency situation. Similarly 80 percent of the hospitals not held disaster committees except two hospitals of Quetta city which lacks trained doctors, staff and availability of essentially required medical equipment. In trauma settings an essential element of the presence of multidisciplinary surgical team consists of specialists, well trained thoracic, vascular and , neurosurgeon was also found deficient. Balochistan is also lacking a burn centre which should be an integral part of a tertiary care hospital to provide life saving treatment to burn patients of bomb blast incidents and also give health care coverage to other burn patients of Quetta and far off places of Balochistan. Identification of dead bodies in mass casualty incidents especially due to bomb blasts is problematic and time consuming procedure which required refrigerated mortuary arrangements and DNA testing facilities which have been lacked by almost all hospitals in Balochistan. Awareness about emergency response has been a situational factor as the staff mostly gained their experience out of frequently occurring mass casualty incidents in Balochistan. Hospital staff must be aware of the hospital environment, action / roles regarding emergency evacuation, use of equipment for calling staff, special alarms, phone lines for all departments, special exits, drills, hospital facilities, water, electricity, gas supplies and contingency resources. The lack of awareness about a disaster plan is quite alarming, as lack of required knowledge would lead to inability to manage disaster even if there is written plan [9]. The training aspect is found totally lacking specially

the planned simulator exercises / drills. The implementation of plan in coordination with other stakeholders is completely ignored. Disaster response requires a unique set of capabilities related to knowledge, skills and abilities. The disaster care competencies are intended to establish a baseline of knowledge for all levels of hospital personnel. This will enable staff in assigned disaster roles to function efficiently and effectively during emergency situations. Therefore, hospital staff is required to be trained on competency based strategy of training in capabilities based planning process to define specific activities in order to achieve the mission [10]. Disaster drills have been identified as a critical component of preparedness because they allow the institutions to test response capabilities in real time. Evaluation of those activities is essential to understand the strength and weakness of an institution's disaster response [11]. Evaluation is based on accurate observation using a standardized observation and evaluation approach allowing for a consistent record. Using a standardized evaluation also allows comparison between one drill and the next to determine improvement in areas where weaknesses have been identified.

There is no concept of management of psycho trauma cases during the recovery phase of disasters in hospitals of Balochistan. The knowledge and acceptance of mental health issues is an integral part of the impact of disaster and the availability of mental health services during and well after the relief operation. The mental health relief plan is an integral part of hospital disaster plan. The plan must dictates the availability of psychological first aid to maximum, early detection, intervention and establishing a chain of referral for the severely effected cases, incorporating psychological care and rational use of psychotropic in medical and surgical care at all tiers of health services. The plan also includes strategies for public mental health education, community mobilization, caring for the relief workers and capacity building of local professionals, PHC physicians, teachers and groups of volunteer workers [12]. Load shedding of power supply is managed by backup generators, which were in functional state in only 50 percent of hospitals. The problems they face is that the generator fuel is not always available and causes a burden on the hospital budget. Hospitals need to be prepared for a potential loss of their water supply and electrical power. Hospital are required to have emergency generators, which must be sized to carry specific electrical loads based on design occupancy and provision of power to critical life safety equipment distribution panel for essential systems [13]. In case of water disruption, the hospital must plan the measures by assessing the response capabilities after conducting a water use audit. In addition to power and water needs, hospitals will also need supplies,

including medical supplies, medications and food. In a worst case scenario not only that the hospital will not be able to receive new shipments of supplies, but there will be an increased demand for medical needs. The joint commission on accreditation of health care organizations (JCAHO) mandates that accredited hospitals be able to survive without outside help from the community for up to 96 hours after a disaster [14]. Besides, disaster management in hospitals can be improved by using management systems, such as the Hospital Emergency Incident Command System (HEICS), appropriate organization of administrative assignments, human resources, and establishing the unity-of-command principle [15-18]. It has been observed that the hospital plans have not addressed the important aspect of disaster drills in any hospital of Balochistan, therefore implementation of plan in coordination with other stakeholders who can contribute in emergency response is completely ignored. It is required that Hospital disaster plans be tested, evaluated at least twice a year by conducting the combined drills with other hospitals, public health and public health engineering departments blood banks, district and traffic police, frontier corps, Army, Ambulance services, Fire services Bomb disposal squad, civil defense PDMA, information department and other public safety and rescue services. [19-21]. Results revealed that hospitals, have not planned and organized participation and training of volunteers to work in emergency Hospitals have sufficient manpower as per their authorized strength but during mass casualty incidents they need more manpower. Therefore hospitals may avail the services of skilled volunteers in an organized manner. Spontaneous volunteers can be a significant resource, but they are often ineffectively used and can actually hinder emergency activities by creating health safety and security problems and distracting responders from their duties. Volunteer service can also be used to augment emergency staff. Using volunteers with basic skills to address common tasks allows responders to focus upon specialized work. There are two major categories of risk associated with disaster volunteer response: 1) the failure to effectively utilize volunteers and 2) the actions of untrained and uncoordinated volunteers. In the first category, the failure of emergency managers to effectively utilize volunteers may create a poor public perception of the disaster response. In the second category, the actions of untrained and uncoordinated volunteers can harm disaster victims, emergency responders, and the volunteers themselves. Volunteers may arrive unequipped and require significant logistical support such as food and shelter. "More effort on the part of a strained system than they contribute to the resolution of the problem" [22-24]. At present the pre-hospital care and on the scene triage service are non-existent in Quetta and other towns.

There is no government run ambulance service with trained paramedics for this purpose. However charity / Private Ambulance services work independent of each other and without a central dispatch centre, because of the absence of any disaster response plan. Majority of casualties are directed at their own to two major government run and a military tertiary care hospitals with mass trauma management facilities. Pre-hospital management is the integral part of the preparedness plan. Onsite triage of the victims and coordinated transfer will control the chaotic mismanaged influx of non triaged patients in to the trauma centers of the hospitals. It is further very disappointing to note that all serious casualties received by two major government hospitals of Quetta transferred to military hospital due to poor management, lack of facilities and non availability of staff for adequate standard of patient care at two biggest government hospitals of the province. The major Challenges that hospitals in Balochistan face in mass casualty incidents are Surge Capacity issues. The lack of trained doctors and Staff and non availability of additionally required medical equipment without back up support are the major shortcomings. Administrative and security concerns also need more emphasis in future policies [23]. The less severely injured patient received at the hospitals without having been triaged and arrived before more severely injured patients. It over whelms the receiving hospital and cause delay in treatment of more critically injured patients. Effective use of hospital resources and request for outside assistance hinges on knowledge of resources available within the institution. Lists of emergency supplies should be available in the Incident Command system (ICS). Stocks of common medicines, cots, and other emergency supplies should be purchased ahead of time in relation to the size and mission of the institution. The facility should have plans to operate and sustain itself for 96 hours without supplies / support from outside the region. Additional beds and flat-space areas should be identified prior to an event. During an event, additional triage and treatment areas needed. The newly arriving patients would require admission for definitive treatment therefore plans should be there to increase the bed capacity when needed. This can be achieved by reverse triage i.e. by discharging the stable recovering patients and stop admitting non emergency cases. Most of the surge capacity would have been available within 24 to 48hrs in an actual disaster situation. How many and what type of staff are needed may vary by incident. Mechanisms for calling back an appropriate number of staff may include initial, automatic callbacks with subsequent callbacks dependent on staffing worksheets and situational information. Staffing for the next operational period and subsequent staffing needs should be part of the planning process. For supplies

hospitals in a geographic area often depend on same vendors/suppliers. Pre-existing agreements may be needed with additional vendors or with jurisdictional emergency management. The mechanism to request supplies from community private and public partners should be understood and practiced [24-26]. This study has attempted to find out the challenges in preparedness of these hospitals for disaster management. A review of the available resources along-with their mobilization plan has been conceived and presented for meeting the crisis of disaster. The need for addressing the common issues of human resources, training, multi-sectoral coordination, pre hospital care, surge capacity, supplies, and security has been highlighted [27].

Conclusion

Disasters rarely, if ever are preceded by warning and when they occur the shock effect of devastation or carnage paralyses even the most sane and poised planners. In emergency hospitals are most vital organizations whose preparedness and offering on time service play vital role in reduction of injuries and death. It was seen that only trained staff through effective disaster prepared drills can act quickly to cope with crises situation. To meet the challenges of efficient medical response in disasters the study reiterates the need for addressing the issues of human resources, training, multi-sectoral coordination, pre hospital care, supplies and security which all can be adopted by viable strategies and with little customized approach.

References

1. Ishtiaque A. Household-level disaster-induced losses and rural-urban migration: Experience from world's one of the most disaster-affected countries. *Natural Hazards*. 2016;84(249):pp 1-12
2. Mabbott I. Nutrition and Well-being in Vulnerable Adults. *Nursing Standard*. 2011; 25(24): 30-30
3. Gupta I, Anil A. Guidelines for Resource-Sharing Response to Natural and Man-Made Disasters. *Reference & User Services Quarterly*. 2010; 50(2):197-198
4. Christopher A. Curtis. Understanding communication and coordination among government and service organisations after a disaster. *Disasters*. 2015;39(4): 611-625
5. Pandey N. Are our hospitals prepared for disasters? Evaluation of health-care staff vis-à-vis disaster management at a public hospital in India. *International Journal of Health System and Disaster Management*. 2016;4(2):63
6. Malcolm D. Devine. Emergency Medical Responder: First Responder in Action. *JEMS: Journal of Emergency Medical Services*. 2007; 32(11):148
7. Terry Fulmer. Organization-based Incident Management: Developing a Disaster Volunteer Role on a University Campus. *Disaster Management & Response*. 2007.;5(3): 74-81
8. Michael Brown, Mohammad Dawood, ArashIranlatab, and Mahmud Naqi, Balochistan Case Study, INAF 5493-S: Ethnic Conflict: Causes, Consequences and Management, June 21, 2012, available at www4.carleton.ca/cifp/app/serve.php/1398.pdf.
9. HematAbdlezeeem, Samia Adam, Gehan Mohamed: Awareness of hospital internal disaster management plan among health team members in a university hospital life science journal (2011):8(2) 42-52
10. TCLS-Target Capabilities list. US Department of home land security. Retrieved on 20.7.2013. Retrieved from www.fema.gov/pdf/government/training/tcl.pdf
11. Ahrq Archive Tool for evaluating core elements of hospital disaster drills (2011). Retrieved on 20.7.2013. Retrieved from archive.ahrq.gov/prep/drill/elements/drill/elements1.htm.
12. MuwadatH.Rana.Editorial, Mental Health Care An Integral Part of Disaster Management. *PAFMJ*, 2006, 56(4): 327-32.
13. OSHPD-Electrical Requirement for Health Care Facilities (2011) Retrieved on 20.7.2013. Retrieved from <http://www.oshpd.ca.gov/FDD/Plan-Review/electrical.Pdf>
14. Board Brief, 2011 - The hospital Boards Role in disaster readiness. Retrieved on 20.7.2013. Retrieved from www.htnys.org/2011-05-17-board-brief-disaster-preparedness.pdf
15. Sasuie Abbas Leghari, "The Balochistan Crisis," *News International*, August 25, 2012, www.thenews.com.pk/Todays-News-9-128196-The-Balochistan-crisis.
16. Muhammed Amir Rana, "The Growing Nexus: Ethnic/Sectarian Violence Is Expected to Continue to Be a Long Term Challenge," *News*, July 29, 2012.
17. "Balochs Welcome U.S. Human Rights Intervention at UNHCR," *Tamil Guardian*, March 28, 2012.
18. Frederic Grare. Balochistan the State Versus the nation South ASiA | April 2013. <http://carnegieendowment.org/files/balochistan.pdf>
19. Pakistan 2010 Flood Relief – Learning from Experience Observations and Opportunities. http://www.ndma.gov.pk/Documents/flood_2010/lessonlearned/Pakistan%202010%20Flood%20Relief-Learning%20from%20Experience.pdf
20. Ready or Not: Pakistan's resilience to disasters, one year on from the floods; Oxfam GB Briefing

- paper 150, July 2011.
21. Paper No. 286, Integrated Water Resource Management in Pakistan, Symposium on Changing Environmental Pattern and its impact with Special Focus on Pakistan <http://pecongress.org.pk/images/upload/books/4-Integrated%20Water%20Resource%20management%20in%20Pakistan%20%284%29.pdf>"Balochistan quake: toll jumps to 825"
 22. [The Nation \(Pakistan\). 1 October 2013. "Powerful earthquake strikes Pakistan's Balochistan"](#)
 23. BBC News. 25 September 2013.
 24. Khan, Ilyas. ["Pakistan quake island off Gwadar 'emits flammable gas'". BBC News. 27 September 2013](#)
 25. Government of Balochistan, (2011). District Development Profiles (DDPs) of Different districts. Quetta, Planning and Development Department.
 26. Government of Balochistan. (1947-2010). Agriculture Statistics of Balochistan. Quetta, Department of Agriculture Extension, Balochistan, Pakistan.
 27. Government of Balochistan. (2013-2014). Agriculture Statistics of Balochistan. Quetta, Department of Agriculture Extension, Balochistan, Pakistan.