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IMPACT ON HEALTH CARE DELIVERY SYSTEM DUE TO THE WORST FLOOD OF THE CENTURY IN KASHMIR, INDIA: AN OBSERVATIONAL ANALYSIS

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ABSTRACT: INTRODUCTION: Flood is the most common natural disaster in the world both in the developed and developing nations. This year one of the greatest floods, worst in over a decade hit the nation in Jammu and Kashmir on 7th September 2014, due to continuous downpour for about 4 days. Study design: Observational. **RESULTS:** SKIMS Medical College and Hospital, Bemina was inundated first followed by the oldest tertiary care SMHS hospital. Health care was affected at all the three levels viz. primary, secondary and tertiary the total losses to the health care was estimated to be 200 million. **CONCLUSION:** More than 1.5 million of the population was affected. People were rendered homeless. Unlike flash flood the present flood in Kashmir was a plain flood which occurs due to extensive rainfall lasting several days.

KEYWORDS: Flood, health care, Jhelum.

INTRODUCTION: Flood is the most common natural disaster in the world both in the developed and developing nations.⁽¹⁾ The effects are diverse and the effect on health is extensive ranging from immediate effects like injuries to chronic long term effects like mental health problems. India is the most flood affected nation in the world after Bangladesh.⁽²⁾ Unprecedented floods take place every year at one place or the other. Most vulnerable states being West Bengal, Andhra Pradesh, Madhya Pradesh and Jammu And Kashmir.⁽²⁾ Over the years it has been observed that with a continuous rains for 2 to three days in Kashmir valley, the city is threatened with floods in river Jhelum.⁽³⁾ This year one of the greatest floods, worst in over a decade hit the nation in Jammu and Kashmir on 7th September 2014, due to continuous downpour for about 4 days which led to the overflowing of river Jhelum and started the chain of events that engulfed south Kashmir first and then most of the Srinagar city which is situated along the banks of the river. River Jhelum is the main waterway of the valley and arises from a beautiful spring called Verinag in south Kashmir. It flows a distance of 25.6km from where it is joined by many tributaries and the river navigates to Wullar lake in north Kashmir and traverses to Pakistan. Its total length in the valley is 177 km.⁽⁴⁾ over the years there has been a lot of construction along the banks of river Jhelum and no dredging of the flood channels around it. There were about 258 reported deaths from the state with 190 deaths from Jammu and 78 from Kashmir division.⁽⁵⁾ The flood destroyed homes, properties, produce, business establishments and educational institutes. Unfortunately the health sector had a huge setback.

This flood led to the collapse of the major health care facilities in the valley. The health care services were dysfunctional at all the three levels viz primary, secondary and tertiary with the tertiary health care centers badly hit leaving the people in despair. From a small needle to an advanced high tech Magnetic Resonance Imaging everything was destroyed.

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SKIMS Medical College and Hospital, Bemina, Srinagar was the first hospital to be inundated. The ground floor of the hospital was submerged and its OPD facilities, radiology department and all services were affected for about 2 weeks.

The state's oldest multispecialty tertiary hospital Sri Maharaja Hari Singh Hospital (SMHS) which was established in 1948, at Karanagar, Srinagar along with its three associated hospitals Lal Ded maternity hospital, bone and joint hospital, children's hospital were damaged. These hospitals remained inundated for more than 2 weeks which wreaked the entire system. All emergency facilities like oxygen plant, emergency genset and state of art machinery as 1.5 Tesla Magnetic Resonance Imaging, LASIK, vitech culture machines which were located in the ground floor were inundated which jeopardized the functioning of the hospital. The outpatient services were also unable to be carried out for 5 days as flood affected the movement of people. The patient and the hospital records were also damaged. The paraclinical departments were also inundated and suffered heavy losses to equipment's. The total loss to these hospitals has been estimated to be more than 200 crores Indian rupees.⁽⁶⁾

The situation was no different in the other affected hospitals which also remained inundated for weeks together. The floods also damaged essential equipment's at lone tertiary care maternity hospital situated on river Jhelum. In the lone children's hospital the important establishments like oxygen plant, x ray plant, power generator and newly established services like blood bank latest diagnostic equipment's were damaged. The inundation of the oxygen plant led to the death of 6 children who were critically ill and were on ventilators.⁽⁷⁾ The ambulance services of the hospitals were disrupted due to water logging. The disruption of the major health care services added to the sufferings of the common people. Pharmacies in Srinagar and other cities were under flood waters for 2 weeks and all drugs stored were damaged, resulting in shortages of life-saving drugs, Intravenous fluids and sanitary products. Offices of voluntary agencies such as the Red Cross in Srinagar were also flooded.

Peripheral health centers were also affected. Approximately about 40% were facing acute shortage of drugs, 45% were inaccessible, and in about 25% the buildings were damaged leaving only about 5% facilities fully functional.⁽⁵⁾

During this period the only functional tertiary care hospital was Sheri Kashmir Institute of Medical Sciences (SKIMS), a 500 bedded hospital, situated in the outskirts of Srinagar, as was not affected by the floods. Though it was overburdened due to the calamity yet it catered to the needs of the people efficiently.

Due to the deluge of tertiary health centers the district and sub district hospitals which were not affected by the floods were also overloaded. These hospitals with their limited staff and equipment's were conducting about more than 100 deliveries per day which is about 10 times their routine and were also carting to other health care needs.⁽⁵⁾ Health care services were also provided by the medical staff voluntarily at the at the camps and schools.

Post flood Recovery: The recovery phase starts after the immediate threat to human life has subsided. The immediate goal of the recovery phase is to bring the affected area back to normalcy as quickly as possible. In the aftermath of floods Kashmir is in the midst of health crisis. After our major hospitals were damaged the recovery phase was started immediately post floods to make them functional as soon as possible. OPD services by SMHS hospital were started 5 days post floods in a

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nearby mosque which was unaffected by floods, while the hospital was being cleaned. Some of the specialty services were shifted to Kashmir valley nursing home during this period. In the rehabilitation process various equipment's and medicines were procured and also donated by various organizations. Some of the operation theaters in the hospital were made functional four weeks post flood. Cleaning process of other hospitals was also started vigorously post floods and were restarted after about one month post floods.

After about one month post floods all the major health facilities were working to their maximum but it will take further resources (time, money, manpower) to get back to their normal therapeutic capacity.

DISCUSSION AND CONCLUSION: In an unfortunate incident in 2014 Sep; Kashmir valley was hit by worst ever floods, which affected people from almost all walks of life. More than 1.5 million of the population was affected. People were rendered homeless ⁽⁸⁾ with huge losses to business, health sector, agriculture sector and livestock. The catastrophe of this magnitude has been only second of this type in this century. The administrative failure, lack of timely warnings, absence of immediate rescue measures, and absence of the department of disaster management on ground created havoc with no remedy. Furthermore the deluge of health sector worsened the situation which left the valleys essential health services marooned and in need of immediate rehabilitation. Unlike flash flood the present flood in Kashmir was a plain flood which occurs due to extensive rainfall lasting several days. This type of flooding has one advantage that early warnings can be issued and catastrophes prevented.⁽⁸⁾

RECOMMENDATIONS: Natural disasters cannot be averted but the damage and destruction caused by them can be minimized by developing defense mechanisms and emergency planning. The risk of flooding on health sector has raised its importance in the agenda of UN and WHO.⁽⁹⁾ Globally WHO has been strongly involved in addressing the health dimensions of disaster management. It has highlighted the need for disaster risk reduction in health sector. In its resolution, WHA has urged its member states to give due attention to public health, including health infrastructure as a part of national emergency preparedness. To maintain the health care services in such an emergency situation there should be a pre identified health facility where all the essential laboratory and diagnostic services along with arrangement for manpower can be provided to the vulnerable population. Training of hospital staff on disaster management should be carried out. As most of the health care facilities are located in flood prone areas measures like structural protection and flood proofing should be carried out. Moreover an early warning system should be established which will provide enough time for response. Multisectoral collaboration is required between health sectors and other stake holders.

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