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FLOOD DISASTER: ALLIED HEALTH CHALLENGES AND PROBLEMS

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ABSTRACT
The major concern regarding the flood disaster is related with the post-disaster health challenges and problems. This paper aims at finding the health challenges and problems during the Kerala flood 2018. The study starts by analyzing the disease outbreaks and the challenges, and then it specifically concentrates towards the Kuttanad region. Two case studies of Kuttanad region paved the way for identifying the real challenges and problems. The result pointed out several problems like accessibility, unawareness regarding the precautionary mechanisms etc. Approaching their crisis with the help of new and advanced technologies will ease the solving methods.
KEYWORDS: *Kerala Flood 2018, Kuttanad, Health, Telemedicine, Disaster*

1. INTRODUCTION

Kerala, a state in the south-western part of India bound by the Arabian Sea in the west and states like Tamilnadu, Karnataka in the east. Geographically, the north-east alignment of Western Ghats helps to maximize the potentiality of south-western monsoon downpours. The excess down-pours in the 2018 monsoon (IMD, 2018) can be termed as one of the major flood cause.

The unprecedented flood of Kerala during the month of July-August 2018 impacted the health-care sector on a large scale. More specifically, the flood disaster uncovered the challenges and problems in the existing healthcare set up. Even though Kerala tops the NitiAayog's health index 2018, some of the fields in the healthcare sector still demand more inclusiveness.

Considering the allied health challenges and problems in a post-disaster situation, epidemic outbreaks and other injuries or trauma can be termed as major issues. In terms of epidemic out-breaks, the water-borne as well as vector-borne diseases like leptospirosis (Rat fever) and Malaria raised a challenging situation in Kerala. On the other hand, major injuries or trauma are due to the snake biting, drowning or other unexpected accidents.

Kuttanad, the only place in the world where farming is done up to 2 meters below sea level and the area is serviced by 4 major rivers: Pampa, Meenachil, Achankovil and Manimala (Tourism, 2018) . Due to these geographical features, the region was badly affected by the flood and so 99% of people evacuated from here during the flood. The case studies give broad vision about the health problems in Kuttanad.

2. METHODOLOGIES

The field study in the Kuttanad region, especially Umbikkaram and Chavara Bhavan, Kainakiri were taken as the primary data and the holistic approach of the health aspects during and the aftermath of Kerala flood 2018 are through different secondary data sources. Direct interaction with the people regarding their health pointed out the defects in the current health facilities and infrastructures. The problems raised by them assisted a lot to open the door of solutions. Community wise interaction during the field study pointed out their common diseases and needs.

3. DISCUSSION

The health aspect of a region after the flood is directly linked to some type of diseases and risks shown in table 1 (WHO, 2018) . With respect to the water-borne diseases typhoid fever, cholera, leptospirosis and hepatitis A, are considered as epidemic prone ones. But the infections caused due to the direct contact of contaminated water are not epidemic prone in nature; it includes dermatitis, conjunctivitis and other infections in sensory organs. On the other hand, the vector-borne diseases are mainly due to the habitat change of both humans as well as other vector organisms. The stagnated water due to the flood maximizes the breeding capacity of mosquitoes and the increased human exposure towards open space due to the shelter unavailability extremely affect the wide spreading of these vector-borne diseases. Certain other risks also cause the loss in lives, drowning or accidental injuries were considered as the major ones. The post-disaster situation makes the health infrastructure vulnerable; mainly the electricity eruption will affect the working of certain lab instruments and cold chain facilities. Other infrastructural collapses may isolate one region completely and so the current situation deprives their basic health need.

3.1. Challenges and problems : Kerala

Our analysis regarding the health centers and other allied health problems in Kerala uncovered some hidden problems. Even though the quantity aspects of public health centers are considerably high, the quality aspect of these centers still re-mains a problem. Most of the public health centers are working without sufficient lab equipment, doctors or medicines. Some of the health centers in the remote areas are deprived of basic hygiene. The flood disaster increased the vulnerability of these centers and so the people in some areas are not aware of the preventive measures or symptoms of epidemic diseases. The unavailability of doctors in this sector has been widening the existing trust gap between people and public health centers.

The flood damaged the existed cold chain infrastructure and so the unavailability of essential medicines worsened the situation during and the aftermath of the flood disaster. The distribution of preventive medicines for epidemics also affected, it enhanced the wide spreading of certain diseases. The medicinal infrastructure set up need a year to build it back to a normal condition. In order to address these types of problems in the future, a disaster resilient infrastructural setup can be used.

With respect to the technological inclusion in health care, only a few percentages of centers adopted certain kind of technologies. The use of the internet in this sector is minimum, most of the people using the internet for certain health information, still the authenticity of these in-formations remains a problem. Telemedicine as well as online consultation, are not used widely if that used the post-disaster health management will become more efficient. The archaic perception of people still needs doctor's physical presence and it discourages the penetration of consultation through new technologies. To bridge the gap between technology and the healthcare setup, a better holistic approach is needed. The flood damaged the traditional health record of pen and paper and so it increased the complexity of post-disaster disease curing methods. Hence, the importance of the e-health record system lies in the data analysis. A centralized e-record system also assists other departments to identify the disease spreading area and so the preventive mechanism efficiency will increase. Even though the e-commerce sector is rapidly growing, the influence of health care in terms of online medicines and all is minimal.

Considering the human resource aspect, the un-availability of doctors in the flooded area troubled the situation. Some landslides and allied flood activities damaged the road infrastructures and so the area became isolated, such conditions de- prived the doctor's access to that region. The lack of facilities regarding the online consultation put an end to that way.

Compared to other diseases, Leptospirosis, a zoonotic bacterial disease created an uneasy situation. It's the only epidemic-prone infection which can be transmitted directly from contaminated water (WHO, 2018) . When we analyzed the Leptospirosis cases in Kerala, there were 719 suspected and 372 confirmed cases and 12 deaths are reported (Hindu, 2018) .

Table 1:Diseases and risks posed by the flood (WHO, 2018)

Diseases and risks posed by the flood		
Water-borne diseases	**Vector-borne diseases**	**Other health risks**
Cholera	Dengue	Drowning
Leptospirosis	Malaria	Injuries or trauma
Hepatitis A	Yellow fever	Hypothermia
Typhoid fever	Nile fever	
Conjunctivitis		
Dermatitis		
Wound, ear, nose and throat infections		

3.2. Challenges and problems : Kuttanad

The random assessment of health aspects from the 40 residents of both Chavara Bhavan and Umbikkary region paved the way for finding their real problems in the health sector. Hygiene and sanitation as well as the healthcare institutional accessibility problem considered as the major problems for 33 and 31 persons respectively. The issues regarding economic viability and un-awareness about the precautionary measures still remains a problem for 26 and 21 persons respectively.

Considering the hygiene and sanitation problem, a majority are arguing about the contamination in the water bodies. The flood scenario worsened the situation, this mainly due to the de-position of waste materials. Some are concerned about the rate of hazardous pollutants after the disaster, lack of an appropriate checking mechanism and the unavailability of purified water indicates an alarming situation.

Accessibility problem of healthcare centers still remains a worrying factor for most of the people. Distance and the regulated 2 or 4 hours working time of these health centers were the major cause. In addition to that, lack of specialist doctors, lab facilities, medicine availability, and the quality level perception reduces the affinity of people towards these centers. The current situation made them to either avoid the health conscious nature or to depend on telephonic doctor consultation. With respect to the economic aspect, a huge sector is employed as a daily wage laborer in some agricultural or constructional plot. So their earnings are limited to their daily needs, and they considered the healthcare cost as an out-of-pocket expenditure. In some cases, the perceptions of people towards certain lab costs are higher than the actual. While analyzing their arguments about healthcare costs, most of them are not aware of the long-term cost benefit of doing regular health checkups. The current economic cost or the perception worsened the vulnerability of elder class in the poor and middle-class family.

The unawareness of precautionary measures is not in an alarming situation but still, it needs some improvements. Awareness campaign through social media platforms and other traditional oral exchange of information increased the importance and the reach of precautionary measures. But the authenticity aspects of these measures are much concerning and it may affect the situation badly, especially some fake messages in the online platforms. In order to arrest the con- fusions regarding the authenticity factor, a better technologically collaborated solution is needed.

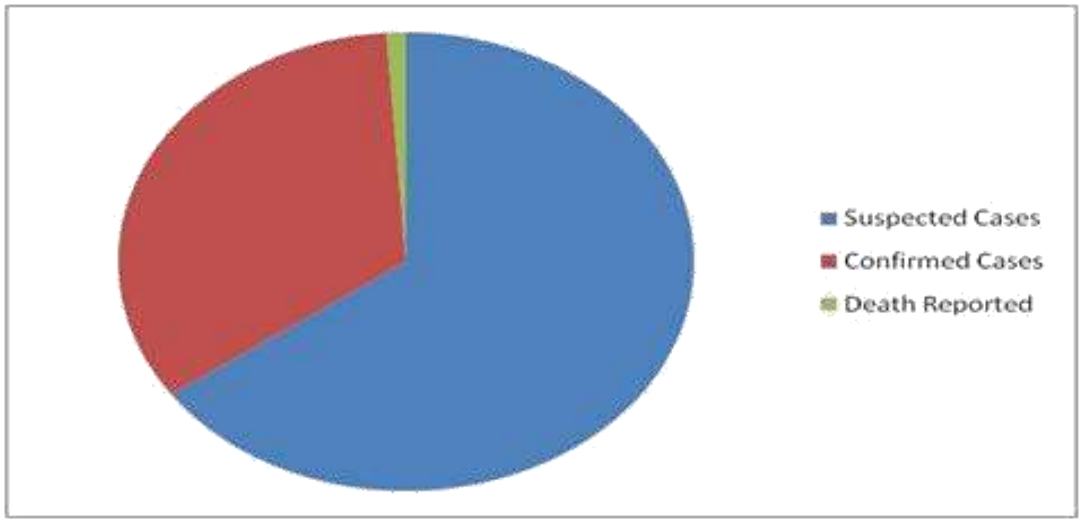

Figure 1: Leptospirosis cases (Hindu, 2018)

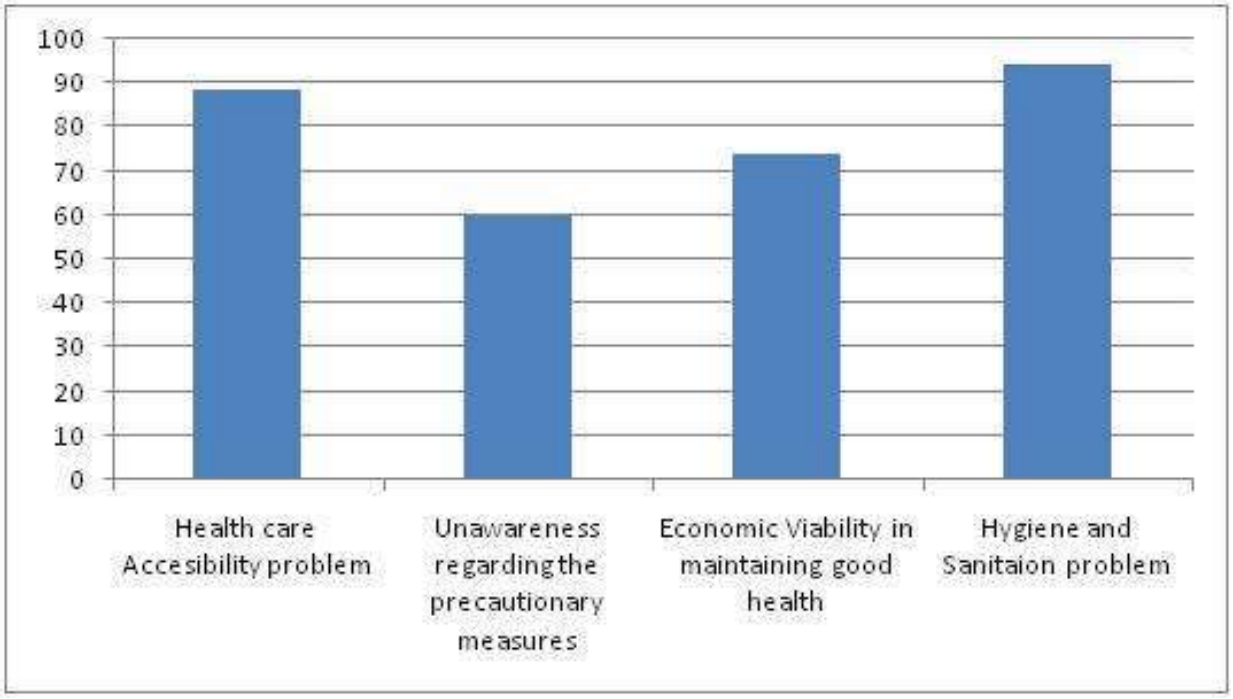

Figure 2: Survey result of Kuttanad region

4. CONCLUSION & RECOMMENDATIONS

The effective management of healthcare facilities avoided a large scale of epidemic outbreaks in Kerala, but the spreading of Leptospirosis re-mains a concern to all. In order to arrest these types of situations in the future, a better disaster resilient infrastructure for cold-chain facilities and a technologically inclined healthcare setup is needed. The unavailability of medicines can be solved through more desirable infrastructure. Technological inclusion towards the healthcare will solve the problems with respect to the health records and human resource. The quality aspects of public health centers in Kerala are creating a challenging situation too. With regards to Kuttanad region, water contamination remains a problem and it affects them poorly in every aspect, especially the healthcare sector.

1. Revamping the healthcare sector with the help of new technologies.
2. Centralized e-health record keeping system.
3. Widening the influence of telemedicine through e-health centers.
4. Renovate current public health centers with more facilities.
5. Address the water contamination problem by reconditioning the purification methods.

These recommendations will help to improve the existing healthcare setup and it reduces the concerns regarding epidemic outbreaks after disasters. And so the post-disaster management process will simplify on a large scale.

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