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PERSPECTIVE OF FRONTLINE HEALTH WORKERS ON THE CHALLENGES THAT HINDER THEIR WORK IN AN OUTBREAK AND INITIATIVES FOLLOWED TO OVERCOME: A QUALITATIVE STUDY IN A DISTRICT OF TAMIL NADU, INDIA, 2018

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ABSTRACT **Background:** In India, the frontline health workers (medical officers and health inspectors) play an important role in conducting syndromic surveillance, analysing data, identifying disease trends based on trigger levels and responding in their catchment areas. In this context, it is useful to understand the role of the health workers in the event of an outbreak investigation and response**.**

Method: Using an interview guide the health workers were asked questions regarding the interviewee's opinion on the training, outbreak investigation preparedness and response, the difficulties faced during investigation. The health workers of primary, block and district health care levels of a district of Tamil Nadu were interviewed during March to May 2018. The interview was conducted in the language comfortable to the participant and audio recorded with prior consent. We transcribed the responses in Tamil to English verbatim with the help of the translator. Following transcription of all the records the information was analysed using the method of thematic analysis.

Results: We interviewed 13 medical officers and 6 health inspectors from all the three tiers of the public health system. We identified key challenges during an outbreak investigation including; failure to prepare prior to an outbreak, missing cases in an outbreak, blanket measures following outbreak investigation, poor community response and non-availability of funds**.** However, digital initiatives were also taken by health workers to overcome these challenges.

Conclusion: We conclude that though health workers faced operational challenges digital initiatives and ensuring accountability to duties helped in supporting the health system even in the face of challenges. We recommend timely training of health workers and involving the community members through volunteer programmes to ensure ownership of health issues in the community.

KEYWORDS : Health worker, outbreak, surveillance, outbreak investigation

INTRODUCTION

Health workers play an important role of linking the community with the health system and services. In 2014 the Ebola viral disease (EVD) outbreak in Africa unveiled the fact that the frontline health workers were challenged with their existing disease expertise and approach to handle outbreak of a novel disease over and above an ill prepared health system. (1) The ongoing Coronavirus disease 2019 (COVID-19) pandemic has exposed the poor status of the health system in many Low and Middle Income Countries (LMICs).(2).

During the Ebola outbreak in West Africa an estimated 818 health workers were infected and 513 died from the infection. (4) In view of the risk of such disease outbreaks among the health force it has been difficult to recruit and maintain continuity in the quality of services that is required from health workers. (4) The COVID-19 pandemic is no different than Ebola and places health workers at higher risk of infection and death.

In India, the public health system has been under strain for many years. On the other hand, the proportion utilizing private sector has been increasing over the period due to various reasons. This could potentially affect the tenacity of the health workers who continue to work in their limited capacity. (3)

In India, the frontline health workers (medical officers and health inspectors) play an important role in conducting syndromic surveillance, analysing data, identifying disease trends based on trigger levels and responding in their catchment areas. However, a study from India reported lack of knowledge among health workers and insufficient training to play this role. Further, it reported lack of understanding of significance of their role and its impact in a disease outbreak. (5)

In this context, it is useful to understand the role of the health workers in the event of an outbreak investigation and response. An outbreak simulation exercise was used to evaluate the performance of health workers in a district in South India. The exercise identified a poor performance among health workers in outbreak investigation and response. To further identify the reasons for this poor performance, We have conducted an in depth study with the primary objective to describe the challenges faced by frontline health workers in outbreak investigation and initiatives taken by them to respond to these challenges.

METHODS

The scope of the study was broadly based on the activities conducted by the health workers in an outbreak and prior to it with regards to outbreak preparedness. Using an interview guide the health workers were asked questions regarding the interviewee's opinion on the training, outbreak investigation preparedness and response, the difficulties faced during investigation. This interview guide was developed on the basis of investigator's past experience during an outbreak investigation, identified gaps from a systematic review of use of steps in outbreaks (10) and inputs from health official. The interview guide was prepared in English and then translated to Tamil and retranslated to ensure validity. The interview was a one hour process and conducted until the saturation achieved. Approval was obtained for the study from the Institutional Human Ethics Committee of National Institute of Epidemiology- ICMR, Chennai and from district chief of health services before the study was conducted. Written informed consent was also obtained from the participants.

The health workers of primary, block and district health care levels of District A of Tamil Nadu were interviewed during March to May 2018. The interview was conducted in the language comfortable to the participant and audio recorded with prior consent. We transcribed the responses in Tamil to English verbatim with the help of the translator. Following transcription of all the records the information was analysed using the method of thematic analysis . The scope of both an inductive approach was followed when we used the information from the experiences of the participants and deductive approach as it was based on a framework that was built from poor performance in outbreak investigation that was seen among health workers in the prior study and the challenges at the field level that the interviewer had also observed in outbreak investigations. This approach was used to map and identify the themes and sub themes with their interconnections.

RESULTS

Profile of the participants

We interviewed 13 medical officers and 6 health inspectors from all the three tiers of the public health system. We identified key challenges during an outbreak investigation.(Table1)

Failure to prepare prior to an outbreak

Both doctors and health inspectors often missed training. The government conducted training on a yearly basis and based on requirements. The health workers who are provided this training are done after being listed into specific batches. There were instances where doctors who joined later missed such trainings , and those who were trained had left their positions. These trainings were dependent on funds available hence not a continuous process. The methodology followed for this training was also found to be ineffective by the trainers and doctors alike.

Missing cases in an outbreak

The district health surveillance system was facing challenges in availability of human resources for the position of health inspectors due to which the positions filled were less than 30% of required. Doctors at the primary health care centre were affected by the lack of health inspectors especially in case reporting from the field during an outbreak alert.

To support the health inspectors, it was expected that the Village Health Nurse (VHN) who was assigned in the rural structure to conduct Maternal and child health (MCH) services would support. However, the VHN have reportedly felt burdened by their existing duties hampering their interest in supporting the HI.

In some locations it was seen that persons affected by the disease visiting the hospitals were not reported under the disease surveillance if they refused hospitalization. Further more, the system lacked measures in following up the patients in the community.

An interesting concern was raised by the doctors regarding the communication patterns. The communication between health workers were stronger during working hours alone. Emergency requirements that were reported after working hours often went unanswered.

Blanket measures following outbreak investigation

It was consistently seen among the doctors that they were unable to follow a systematic method of disease control and prevention following an outbreak. Even with a presence of a Rapid Response Team (RRT) in most of the locations, their role has been reduced to a supervisory role of blanket measures rather than an investigative role in an outbreak. These were measures that were already approved and hence rolled out and did not look into the specific disease.

The lack of time and lack of trained staff were other reasons for not following the systematic methods in an outbreak investigation.

During an outbreak the disease is assumed based on previous patterns rather than using laboratory investigations to confirm and conducting environment assessment to conclude.

Poor community response

The community's response to an outbreak was always challenging. The main reason cited for community's behaviour was due to the lack of basic amenities like water in the community due to the geographic location and failure of the public services in ensuring basic provisions This was a general concern specifically during outbreaks of dengue fever where puddles of water collection lead to breeding of larvae. In some houses water collection for future use also led to such breeding.

Another concern expressed was the lack of trust of the community in health system. Many episodes of attacks on health workers during an outbreak situation have been reported. This has increased the fear among health workers and also affected the initiatives in outbreak response

It was also seen that the community members preferred self-management or trusting the tribal healers during disease outbreaks. Even when there was a good access to health services, patients often failed to reach in time. The fatal outcomes due to delayed access were also blamed on the health workers.

Non-availability of funds

The lack of availability of funds affected the routine training efforts of the government, thus affecting the outbreak preparedness activities among health workers. Often in an absence of immediate availability of funds, it was a routine to utilise the funds under a different category for an outbreak situation. However, the medical officers were not for such repurposing since this can be objected to by auditors.

The lack of funds has also affected the quality of the outbreak

response activities and a failure in disease mitigation activities:

Table : Key Challenges faced in an outbreak preparedness and response and Intervieww response

Themes	Sub themes	Responses of Health workers (D-doctor, Hi- Health inspector)
Failure to prepare prior to an outbreak	**Lack of competent training**	*“We can't expect 100% quality because even if we are getting trained. What the state level training we are getting the same material only we are speaking and using here but we can speak only half of the 70% ,in that 70% only they have to gather something and up to their knowledge they can gather and collect only up to 20%-30% that only we are going to work on the field”(D 3)*
	Lack of funds	“*Refresher training so far we are not given, just once in a year I am giving that is also not planned properly because that also needs some funds for giving training*” *(D 3)*
Missing Cases in an Outbreak	**Lack of staff**	“*Long back when I joined here I had only one HI, previously one HI for one HSC (Health sub centre) now the whole PHC (Primary health centre) only one HI is there. How can he manage 6-7 HSC ?, he cannot go around supervising, only that day's work he will do*”(D4)
	Overburdened staff recruited to conduct other programs	*“They (VHN) are already overloaded with so many programs other than this disease control activities like MCH activities immunisation and national programs in the state , so they are not giving more response in control and disease surveillance in the village in the HSC whenever they go” –(D 3)*
	Lack of mechanism to follow up cases identified in the hospital	*If I am going to General hospital , in my hometown and I have fever, they will do a cell count(lab investigation), they found that my platelets are low they won't care, they will ask me to admit , if I don't admit then I am not accountable, I will not come under any system” (D 4)*
	Poor communication after working hours	**“** *In the evening the supervisor said there will be reporting of more cases, I said, I am in field sir, just attending the area now itself and I communicated to all the junior doctors but nobody came, they did not alert. I communicated to VHN but nobody took the call I communicated the to the Mobile Medical Unit driver, he only picked up call I asked him to come to the area, I went to the area myself ”(D 4)*
Blanket measures during an outbreas	**RRT is reduced to supervisory role**	*“We are already having a RRT, the RRT is there to control the activities, they are not to investigate, if you want to do an analytic investigation by generating a hypothesis, exclusively you have to have some people, one or two people to do all the things, but here lack of staff everything we find very difficult to do study.”(D 3)*
	Failure to follow systematic methods in outbreak investigation	*“We are having a general hypothesis this may be the cause so let's just start preventing that alone, The problem arising just start preventing that we cannot confirm it, if we have to confirm we have to do analytic study and as per the 10 steps, so we have to go we can't wait also for that , to do analytic study we have to collect the data as per the procedure, protocol and you have to collect all the data and compare and do the all the rest, and all there is no time to do that.” (D 3)*
	Blanket measures	*“Considering each fever as D(dengue) fever, it's not wrong in adding a Doxy(doxycycline), what is there in adding a dox?, Instead of cipro(Ciprofloxacin) I am adding a Doxy, Cipro has no role, Doxy at least has some evidence of it helps in dengue and it has a wide spectrum it covers Scrub typhus and it covers Leptospirosis. So, its 3-fold in one, so we have instruction to all PHC doctors to keep ample amount of stock of Doxy and we are also doing that.” (D 4)*

Poor community response	**Lack of basic amentities to the community**	*"The municipality will supply water ten days once then how dengue will be eradicated? If we go and find larva in water barrels and if we want to destroy it, they (community) won't accept it. Because water is very poor in here and nearby areas"(D 4)*
	Attacks on health staff	*"I have faced many problems among the community's discussion, few problems happened, public had beaten one of our staffs and we complained to the police station and to rescue our DPC. A few village people strongly told us "don't come to our village((D 2)*
	Failure to avail the health services	*"We are not able to mobilise all the patient to the PHC, they will only come to PHC if they are not able to manage themselves, they first seek treatment from nearby medical shop, then they will go to a quack , the same thing happened before , all those 4 children even though it's a mixed infection they didn't attend the PHC on the day one itself , they came 4th - 3rd day and died , they had a quack in state border area, we cannot go and question him" (D 4)*
Non-availability of funds	**Fear of Audit**	*"They (Supervisors) say mobilize whatever fund you can possibly mobilise; they won't be any proceeding and all so. When we are going for the audit Why you took money from this account and spent for fogging? So, they will put a question mark there and we have to give explanation for audit.*"(D 4)
	Poor quality mitigation measures	*Definitely I will reduce the fogging, instead of doing it twice, I will do it once, and I will say strictly no I will not give you food. He (person responsible for fogging) will go soon he won't bring food, he will come at 7 o'clock in the morning, he won't bring any lunch by that time. So, if you are not providing him food he will wind up around 1.30 -2pm, he will not work after that so it will definitely affect the quality of work".*(D 4)

Initiatives to overcome the field challenges

There have been multiple efforts taken by the health workers to ensure the follow up of field activities during an outbreak response by the use of mobile applications and third party applications.

"*During outbreak we send reports by a "What's app group", we have all stakeholders in the block, Block Medical officer (BMO), Panchayath member, Block Development Officer, school teachers. The message contents include: What is patient condition by my view (medical officer) and BMO view, there is a format followed in the messages during feedback and reports on per day platelet count and any blood transfusion*."(D 1)

This initiative of use of digital applications is also reinforced by a sense of accountability by the health workers and diligence to ensure that work is complete.

"*For people working at the office level it's an advantage only but for us no, if we put in leave also we go to some other place they will ask the report we will have to ask people and then send the report only. No, I am on leave, I will not do the work, I cannot say*."(D 1)

Use of digital applications has also supported in ensuring that a consistent feedback system is set in place, and enabled in bring together an integrated health response

"*We give feedback to the epidemiologist when an outbreak is under control. Twice a week there are meeting for an outbreak or at any time. There is a dengue review meeting every Friday. This meeting has all the BMO and the in-charge MO of the outbreak area to discuss. This is running for the last 1 year every Friday*."(- D 4)

DISCUSSION

We did a qualitative study to document the perspectives and challenges faced by health workers in the field during an outbreak investigation and a priori. The study helped us in understanding the basic needs at the field level and also identified methodologies followed by the health system to overcome these challenges in a low resource setting <>

The lack of health inspectors who play a primary role in an outbreak investigation puts a burden to the existing health force working in other disease programs. A lack of willingness to conduct outbreak response duties has also been observed in our study. Previous studies have reported that the confidence of health workers in executing their duties was dependent on their perception of existing knowledge regarding the impact of the epidemic and timely information 5)In this context, it may be useful to consider involving the health personnel in systematic investigational procedures rather than limiting their role merely to data collection and maintaining records. Such engagement may be helpful in increasing their participation and improving their perceptions of an outbreak situation(6)

Poor community response to the outbreak response activities and the delay in seeking treatment from a primary health facility was another important finding in our study. According to the health department, the community members have low level of trust in their operations. Previous studies have shown the importance of public participation and a sense of ownership in combating infectious diseases (8). Even with the continued efforts in the form of information campaigns and medical camps there is a lack of initiative and support from the side of community. This requires further efforts to understand whether the communicated messages are understood . Efforts need to be taken to assess the skills of the health workers in therapeutic communication and empathy while interviewing or educating the general public.(10)

The absence of funds that could be used specifically for disease surveillance activities puts a burden on the medical officers of the district and in challenging situations during the audit. This points to a need of transparency in the allocation and use of emergency funds for an outbreak with administrative support. Such lessons were key findings that were highlighted in the Ebola response in Sierra Leone.(8) Allocation of funds for disease surveillance could help in planning training and covering the unexpected requirements during an outbreak situation enabling quality work from staff.(9) In some places it could be also used by the health workers to plan community driven activities to prevent an outbreak occurrence

Our study shows that the investments in technological initiatives by the district health system has improved the reporting of an outbreak in hard to reach locations and where the health staff are limited in numbers. The use of third party applications in locations where internet connectivity is available has improved timelines data collection and reduced efforts while integrating multiple public health departments for surveillance activities.

The major limitation of our study was that participants were identified based on exposure to recent outbreak events to understand the challenges and initiatives taken at the field level and reduce recall bias. Hence our study could suffer from selection bias. In order to minimize this bias, the interview was conducted till saturation was achieved.

Conclusions and Recommendations

On the basis of our findings, we conclude that the health workers faced challenges like training, communication, funds, ineffective measures and poor community response. However, they also took initiatives by using digital applications and remaining accountable to their duties hence supporting the health system even in the face of challenges.

We recommend timely training with information relevant to the health workers role in an outbreak, setting emergency funds for outbreak investigations and involving the community members through volunteer programmes to ensure ownership of health issues in the community and support the health personnel in outbreak response activities.

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