Application of Call Centre as COVID 19 Alert and Surveillance System in Pastoralist Communities of Somali Region of Ethiopia

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Authors' contributions

This work was carried out in collaboration among all authors. Author OO conceived the documentation, analyzed the data and drafted and finalized the manuscript. All the authors read, reviewed and approved the final draft of the manuscript.

Original Research Article

ABSTRACT

Aims: Ethiopia recorded the first confirmed case of COVID 19 pandemic on 13th March 2020 and the surveillance and alert systems were immediately activated. In Somali Region, the toll-free call center was used as alert and surveillance system in addition to the routine health facility surveillance system because of poor coverage of health facilities and pastoral lifestyle in the region.
Study Design: This was a retrospective chart review of COVID 19 alerts and surveillance database.
Place and Duration of Study: Somali Region between 13th March and 30th June 2020.
Methodology: A retrospective chart review of alert database from the two COVID 19 alert and surveillance systems. The sensitivity for each system was calculated as the proportion of confirmed cases and test of association was done using chi-square test at significant level of 5%.

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Results: 414 alerts were reported during the study period, 259(62.5%) alerts from the toll-free call centre,(49.3%) of which met the criteria as suspected cases and 22(8.5%) confirmed positive for COVID compared to 155(37.5%) alerts from the health facilities,145(50.7%) of which met the criteria as suspected cases and 43(27.7%) confirmed positive. The positivity rate was statistically significant, p=0.045. However, alerts were received from all the 11 zones in the region through the call centre compared to six zones through the health facilities.
Conclusion: The call centre is an effective system with wide coverage for monitoring alerts and can be explored as a long-term surveillance system during disease outbreaks and other public health interventions post COVID pandemic.

1. INTRODUCTION

Ethiopia recorded the first confirmed case of COVID 19 pandemic on 13th March 2020 and in order to ensure effective containment of the pandemic among susceptible community population, Risk Communication and Community Engagement (RCCE) and surveillance and alert system were immediately activated in all the regions in the country in line with the national and regional prevention and response plans.

In Somali region the routine health facility-based surveillance and alert system was also activated, however the use and effectiveness of this surveillance system alone was a concern in Somali region, one of Ethiopia's four Developing Regional States (DRS) and the second largest region in the country in terms of land mass with population of over 6 million people, predominantly pastoralists (85 per cent), with most people living in hard to reach/remote areas [1]. The region has poor coverage of health facilities and limited access to health facilities with 70% of the population living more than two hours to the nearest health facilities [1,2]. With the improvement in the mobile phone connectivity coverage, ownership and use in Ethiopia with 90% coverage and 63% ownership nationally and 70% ownership in Somali region and reported increasing use of mobile phone in disease outbreaks [3,4,5,6], the toll-free call centre initially established as risk communication and community engagement platform was designated also as an alert and surveillance system to improve the timely detection of cases for effective containment.

To study aimed to evaluate the effectiveness of the toll-free call centre for surveillance system and explore opportunities for the use of the system for public health interventions.

2. MATERIALS AND METHODS

2.1 Design

This was a retrospective chart review of monthly alert and surveillance database from the two COVID 19 alert and surveillance systems (free toll call centre and health facility) and the data from the COVID -19-line list. The database contains the details of the sources of alerts/rumors, investigation conducted and the results of the laboratory tests.

2.2 Study Population and Setting

The study was conducted in Somali Region using the data from the alert and surveillance systems set up and managed   by the Regional COVID 19 Emergency Operation Center.

The two alert and surveillance systems are:

2.2.1 Toll-Free call center alert and surveillance system

Any person who encounters suspected cases of COVID 19, calls the toll-free number monitored at the regional call center. The call centre receives the preliminary information from the callers, enters the details in the registers /database and immediately inform Rapid Response Team (RRT) in the Regional COVID 19 Emergency Operation Centre (EOC), who reviews the information provided at the call centre and notify the assigned RRT located in the areas where the calls are received for appropriate action. The RRT is made of up a team of trained surveillance, laboratory, case management, Infection Prevention and Control and risk communication experts.

The RRT is expected to investigate any reported case within 24 hours of the initial call for appropriate action, which can be either the alert

is a suspect that will be further investigated or the alert is discarded if it doesn't meet the case definition for suspected case of COVID.

The regional call center additionally functions as a source of public health information by responding to questions from the public about COVID 19 and addressing any myth or misconception about the pandemic and reinforces the preventive messages. The call centers operators work 24 hours for 7 days in a shift and have all been trained on COVID 19 risk communication and community engagement and case definition to support the community members with appropriate information relevant to the prevention and response.

In order to improve on the use and effectiveness of the call centre, community mobilization and sensitization was done using various methods of communication including mobile phone text messages (sms), calls, ring tone, TV, Radio and all other community awareness platforms in the region to enlighten the community members about the toll number and the use of the services provided at the call centre.

2.2.2 Health facility alert surveillance system

Where suspected cases are identified by health care providers in the health facilities among patients seeking healthcare services. The health worker will immediately inform the Rapid Response Team located in the areas where the health facilities are located for appropriate action.

2.2.3 Health system in Ethiopia

It is a three-tier health-delivery structure; primary, secondary and tertiary levels.

The primary care level is established at the district level ('Woreda' level) and includes primary hospitals and primary health care units (health centers, and health posts), with each health center responsible for 5 health posts.

The secondary and tertiary levels are comprised of general and specialized hospitals, and the coverage of each extends to larger portions of the population. The management, coordination, and distribution of technical support in each level is the responsibility of the Woreda District Health offices and the Regional Health Bureaus while policy and strategic guidance is provided by the Federal Ministry of Health. There are 1396 health

posts, 217 health centers, 14 hospitals (11 primaries, 3 General and 1 specialized) in the region [7].

2.3 Data Collection and Statistical Analysis

The data were extracted from the records of alerts and line listing of suspected and confirmed cases from the COVID 19 data base managed by the Regional Emergency Operation Centre between 14th March and 14th July 2020 and entered into a Microsoft Excel spreadsheet and analysed using SPSS version 21. Descriptive data with qualitative variables is presented as proportions and univariate analysis was done by generating frequencies of the variables and test of association was done using chi-square test to compare the sensitivity rate of the various alert surveillance systems and p value was set at significant level of 5%. The sensitivity for each system was calculated as the proportion of confirmed cases among the alerts reported in the data base. The outcome measure was the proportion of alerts that were confirmed positive for COVID 19 after laboratory investigation.

The following case definition for suspected cases and confirmed cases based on the national guideline was used in the study [8].

2.3.1 Suspected case of COVID 19

- A person presenting with fever (>38℃) or history of fever and symptoms of respiratory tract illness e.g. cough, difficulty in breathing and a history of travel to or residence in a country/area or territory reporting local transmission of COVID-19 disease during the 14 days prior to symptom onset.
  OR
- A person with fever (>38℃) or history of fever and symptoms of respiratory tract illness e.g. cough, difficulty in breathing and in the last 14 days before symptom onset, close contact with a person who is under investigation or confirmed for COVID-19
  OR
- A person with fever (>38℃) or history of fever and symptoms of respiratory tract illness e.g. cough, difficulty in breathing; and requiring hospitalization) and in the absence of alternative diagnoses that fully explains the clinical situation.

2.3.2 Confirmed case of COVID 19

A person with laboratory confirmation of COVID 19 infection, irrespective of clinical signs and symptoms.

3. RESULTS AND DISCUSSION

3.1 Review of Alerts Reported Through Different Surveillance Systems

Table 1 shows that out of the total 414 alerts reported in the region during the study period, 259 (62.5%) alerts were from the toll-free call centre, 155 (37.5%) from the health facilities. This represents weekly average of 16 alerts from the call centers, and 10 alerts from health facilities. In addition, there were 10,147 calls (average of 630 calls per week) received at the toll-free call center for information and clarification about the pandemic from the community members. Of the total 286 suspected cases based on the case definition reported during the period through the surveillance systems, 141 (49.3%) were reported through the toll-free call centre surveillance system and 145 (50.7%) through the health facility surveillance system. Nasopharyngeal swabs were taken from all the suspected cases for laboratory confirmation of COVID 19 viral test, out of which 65 (22.7%) of the 286 suspected cases tested positive. The contribution of each surveillance system to confirmed cases shows that 22 (33.8%) of the confirmed cases were from the toll-free call centre surveillance system and 43 (66.2%) from the health facility surveillance system. The statistical analysis done to test the sensitivity of each system to detect confirmed cases of COVID 19 which was lower in the toll-free call centre surveillance system was statistically significant, chi square of 8.0379 and p value =0.0045.

Fig. 1 shows the spread and distribution of the alerts received from the different surveillance systems across the 11 zones of the region. Alerts were received from all the 11 zones in the region through the toll-free call center surveillance system while health facility surveillance system received alerts only from 6 (54.5%) of the zones to demonstrate the coverage of each surveillance systems.

Table 1. Relationship between alerts received and confirmed cases of COVID 19 by different surveillance systems

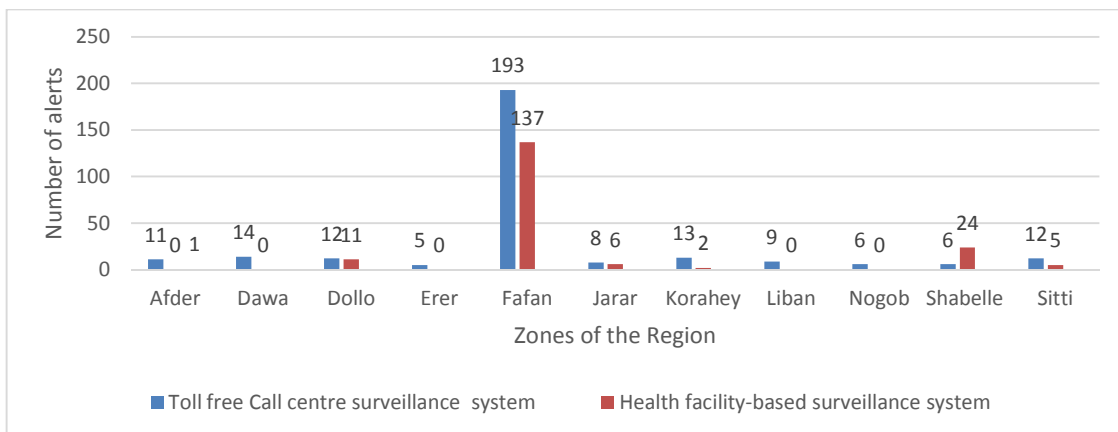| Surveillance systems	Number of alerts N= 414 n(%)	Suspected cases N=286 n(%)	Confirmed cases N=65 n(%)	Test statistic
Toll free Call centre	259(62.5)	141 (49.3)	22(33.8)	Chi square= 8.0379 P value: 0.00458
Health facility based	155(37.5)	145(50.7)	43(66.2)	

Fig. 1. Distribution of alerts received from different zones in the region through the surveillance system

3.2 Discussion

There has been no reported study so far to our knowledge that has demonstrated the use of toll-free call centers as surveillance system for the prevention and response of COVID 19 pandemic. This study shows that the health facility surveillance systems is more sensitive in confirming cases of COVID 19 than the call centre surveillance system which is similar to findings in some studies where different surveillance systems were used for the Ebola outbreak. In the Ebola study in guinea it was found that the majority of calls that resulted in identification of confirmed cases of Ebola originated from the health facility surveillance system much more than the national toll-free call center surveillance system [9]. However, two studies in Sierra lone found that Toll-free telephone call-based surveillance played significantly higher role in generating Ebola Hemorrhagic Fever suspected cases and deaths than traditional health facility and community-based sentinel Ebola Hemorrhagic Fever disease surveillance system [10,11].

This study reported more alerts from the call centers with alerts being reported from all the eleven zones in the region unlike the health facilities surveillance systems where alerts were reported form only half of the zones in the region. This finding is similar to a study in a high-risk Ebola community in sierra Leone which reported more Ebola Hemorrhagic Fever cases and mortality alerts by the community cell phone syndromic surveillance system and suggested some form of under reporting by the traditional health facility and community-based sentinel Ebola Hemorrhagic Fever disease surveillance system.

This finding in the study demonstrates that there is better reach and coverage of the call center surveillance system compared to the traditional surveillance systems and very relevant in population with wide geographical spread, hard to reach communities and pastoralist communities with limited health facility coverage and poor road network or terrain which limit access to health facilities.

Most of the calls received in the study at the toll-free call centers were request for information and clarification about the pandemic from the community members which helped in improving risk communication and community engagement by providing appropriate and accurate messages. This additional benefit of the free toll centre in disease outbreak was also reported in a study in guinea during the Ebola outbreak which reported high call volume recorded in the call center and was assessed as a valuable system in providing public health information [9]. In addition other studies in Zimbabwe, Sri Lanka and rural South Africa have reported the use of the free toll centre in addressing other public health interventions and disease outbreaks including cholera and zoonotic disease outbreaks [5,6,12], demonstrating the potential and opportunity of the free toll call centers that can be explored to improve on public health intervention.

Somali region is prone to other outbreaks like cholera, measles and zoonotic diseases which are becoming more common and especially being pastoralist community, the toll free center surveillance system with the improvement in the mobile phone connectivity coverage, ownership and use, has the advantage of being a very useful surveillance system to be adopted as one of the permanent surveillance system post COVID 19 and can be decentralized and located in each of the zones in the region.

There is also need to increase the alerts being received through the health facility surveillance system by training and orientate all the health workers in the region on alert and surveillance using the disease case definition and instituting triaging in all health facilities so more suspected cases can be identified and reported accordingly. This will complement the call centre surveillance system and ultimately improve on the alert system and surveillance in the region.

4. CONCLUSION

The study has demonstrated the toll free centre surveillance system even though with lower sensitivity for confirmation of COVID 19 cases is an effective system with great coverage for monitoring alerts and providing public health information to the communities. With the existing infrastructure and experience gained so far with the system, it offers an opportunity to be considered as a long-term surveillance system and risk communication and community engagement platform for prevention and response to all disease outbreaks including zoonotic disease and other public health interventions in the region and can be decentralized into all the zones of the region as one of the COVID 19 legacy to strengthen the health systems after the pandemic is over.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Approval for the use of the data was given by the Public Health Emergency Management unit of the Somali Regional Health Bureau and all personal identifiers were removed from the databases.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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