



# TechnoHealth Surveillance Newsletter



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## Editorial address

TechnoHealth Surveillance  
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Southern African Centre for  
Infectious Disease Surveillance,  
Sokoine University of Agriculture  
P.O. Box 3297  
Chuo Kikuu, Morogoro, Tanzania  
E-mail: [onehealthnews@sacids.org](mailto:onehealthnews@sacids.org)

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## From the Editor's Desk

Dear reader,

We are delighted to welcome you to the 5th issue of *TechnoHealth surveillance*. Kindly find in this issue how SACIDS researchers addressed the challenges that community health reporters experienced while using digital disease surveillance tools. It is interesting to learn our achievements and upcoming activities to enhance early detection, timely reporting and prompt response to cholera outbreak.

In this issue, we also report how unsafe burial practices resulted in the spread of cholera in the community. We are pleased to share with you a simulation on how One Health Knowledge Repository could support presumptive diagnosis of the recently unidentified mysterious disease outbreak in the central Tanzania.

Looking back, we have been impressed by feedback from our esteemed readers, and we are now much more confident that we have been keen to respond to their interests. We look forward to your feedback and comments on this 5th edition.

Kindly do not hesitate to share with us stories on health related events occurring in humans, animals and environment for the sustainability of our newsletter.

We wish you an informative read!

*Enjoy your reading!*

## SACIDS researchers and CHRs jointly address the challenges of using mobile phones for digital disease surveillance

From April 24 to May 1, 2016, a team of researchers (Eric Beda, Mpoki Mwabukusi, Moses Ole Neselle and Calvin Sindato) from the Southern African Centre for Infectious Disease Surveillance (SACIDS) visited the community health reporters (CHR) in their respective villages in Ngorongoro and Kibaha districts. The aim was to discuss and address the challenges that CHRs have been facing while using digital disease surveillance technology, an initiative being implemented by SACIDS using mobile phones to enhance early detection, reporting and response to health events.

The frequently reported challenges included:

### *Concept of finalized and un-finalized form in open data kit (ODK)*

Some CHRs were not certain when to mark the data collection form finalized or un-finalized. In this case the reports were kept under “edit” section in the open data kit (ODK) instead of being under “send”, and were therefore not synchronized with the SACIDS server at the Sokoine University of Agriculture in Morogoro. The CHRs were educated further on how to manage ODK.

### *Accessing and using the Geographical Information System (GIS) in the mobile phones*

During the quality control exercise, health events data from CHRs were projected onto maps and some mismatch was observed between the location of events and geographical coordinates. The outputs were shared with the CHRs.

It is known that the internet is not evenly distributed throughout the study villages. Customarily, while in the locations without

or with poor internet connection, the CHRs record the health events together with geographical coordinates, save data in the mobile phones and finally submit data after having accessed locations with reliable internet connection. Some CHRs had, however, assumed that given poor or no internet connectivity, it was not possible to record the geographical coordinates of the data source-location. As a result, the recorded location was the reporting location that they had accessed to submit recorded data rather than the incident location.

Another challenge was when the CHRs were called by community members to attend health events at household level, and upon arrival, the CHRs found that the clients had left for health care facility. Then the CHRs followed up the clients to the health facility, recorded the health event and geographical coordinates at health facility. This contributed to many health events incorrectly being aggregated around health facilities, and not reflecting the actual location of their occurrence. The CHRs were refreshed on how to record health events at the location the illness began and geographical coordinates using mobile phones.

### *The ODK lost from mobile phones*

Some CHRs had unintentionally deleted ODK from their phones and were therefore not able to record health events. The forms were re-installed, and the SACIDS ICT programmers are working to configure the phones such that once installed, the user will not be able to delete the important software.



## SACIDS conducts planning meeting with stakeholders to support control of cholera outbreaks in Tanzania

Cholera has been a menace to society in different parts of Tanzania since August 2015; it disappears for a while and comes back, affecting the most vulnerable of populations in high risky areas. The disease is caused by *Vibrio cholerae* bacterium. The affected individuals develop severe dehydration or die from acute watery diarrhoea and vomiting. If cholera control activities are not coordinated, they can cause panic and public health authorities may resort to closing down food vending places locally called ‘Mama Lishe’ in an attempt to stop the spread. Such actions although necessary, might disrupt local economic activities, induce fear and attaches stigma to families who have a suspected cholera patient(s).

Thanks to Skoll Global Threats Fund, the SACIDS through project titled “Enhancing Community-Based Disease Outbreak Detection and Response in East and Southern Africa (DODRES)” extended its activities to support national cholera control efforts. This support is being implemented in partnership with National Institute for Medical Research (NIMR), Ministry of Health Community Development Gender Elderly and Children as well as Local Government

Authorities in Morogoro region (Morogoro-Urban, Kilosa and Mvomero districts) and Dar es Salaam region (Kinondoni and Temeke districts).

A planning meeting was held at NIMR headquarters in Dar es Salaam on June 14, 2016 to discuss and agree on the activities to be implemented to support control of cholera outbreaks in Morogoro and Dar es Salaam, Tanzania. The meeting was attended by DODRES team, District Medical Officers (from Temeke, Kilosa and Morogoro-urban districts), Health Officers (from Morogoro-urban and Temeke districts), representatives from the Ministry of Health (National Health Laboratory Quality Assurance and Training Centre), Sokoine University of Agriculture and National Institute for Medical Research.

Resolutions from the planning meeting included the need to conduct inventories of laboratory facilities in Morogoro and Dar es Salaam to identify gaps in cholera confirmation and differential diagnosis of cholera, development of protocols and guidelines for sample collection and processing, procurement of consumables and mobile phones and development of data/information flow model, development of tools to support capture, submission and

access to cholera data/information. Other planned activities included development of intervention designs/protocols, development of training manual/tools for community health reporters (CHRs) and district officials, training of CHRs and district

officials, deployment of the system in the community, improved data collection and analysis via mobile phones, and sharing of reports with stakeholders. The plan is to conduct these activities in the next four months.



## Designing of a community-based model to fight cholera

During a consultative planning meeting to control cholera outbreaks that was held at NIMR Headquarters in Dar es Salaam on June 14, 2016, a community-based model was designed to support early detection, diagnosis and managing of cholera and other diarrheal diseases.

It was agreed that community engagement for early detection of cases and reporting of risky behaviors and practices that contribute to environmental contamination was essential. In this regards, it was recommended to use both Community Health Reporters and Health Officers

residing in the community to capture information on cholera cases as well as other environmental risky practices occurring at community level. Use of mobile technology was recommended to expedite sharing of information between District Cholera Control and Response team (dCRT), Cholera Treatment Camps (CTC), nearby health facilities, laboratories and DODRES team. A typical scenario and flow of information is summarized as follows:

A community-based CHR or Health Officer identifies a suspected cholera case or risky behavior and practice (e.g. release of toilet

effluents in the environment) in the community, captures the event and activates flow of information to dCRT, the CTC and the neighboring health care facilities.

The patient will be advised and referred to the CTC or may also seek medical service from a nearby health facility. The facility will refer the patient to a CTC in case symptoms and signs are suggesting the patient to be suspected cholera case.

At CTC, the patient is registered in a paper-based cholera line register and a sample is taken and submitted to regional laboratory for confirmation. The meeting recommended the adoption and use of a bar-coded sampling container whose information will be automatically shared with other authorized staff at the diagnostic facility, dCRT and DODRES Project members in digital format using a 'Master Register'.

In case of reported contamination of the environment, the CHR or Health Officer will share this information with dCRT so that the latter could mount community sanitation and hygiene awareness campaigns.

At the diagnostic laboratory, the diagnosis will be confirmed and results of uniquely identified sample will be keyed in and automatically virtually shared with CTC, dCRT and DODRES in near to real time.

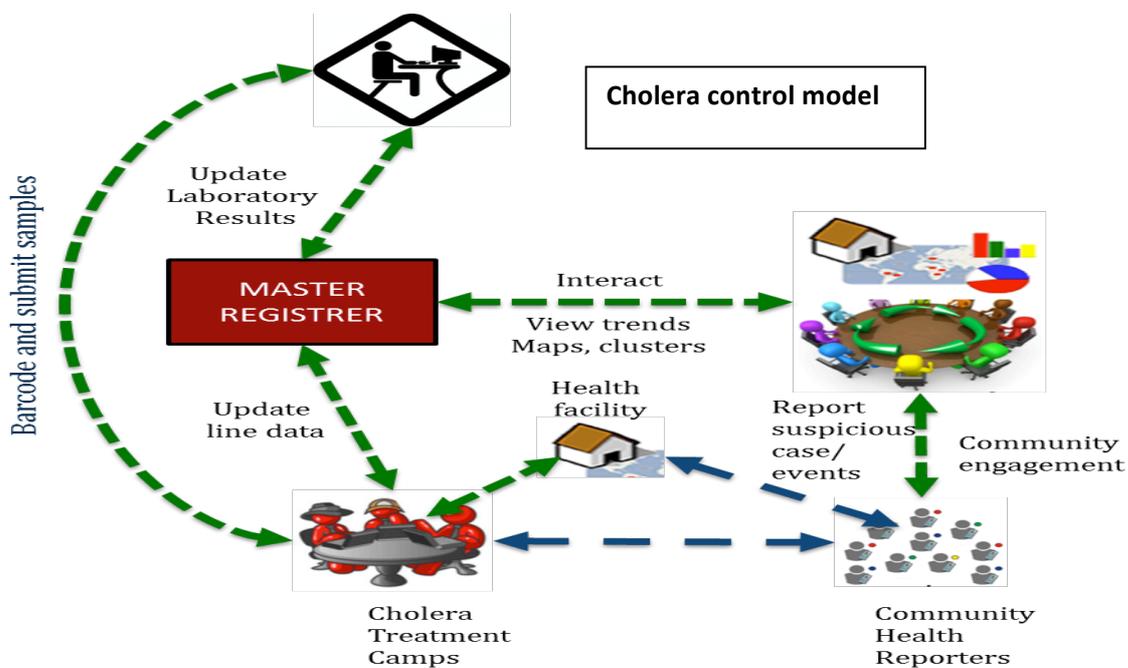
For the suspected cholera cases, the dCRT will use data on the bar-coded sample, which includes laboratory results and physical location of the suspected patient, to update and plan appropriate responses.

At the CTC, appropriate case management based on results from the laboratory will be

done while at dCRT a cholera line list registry will be updated as they receive laboratory results from the laboratory.

With the proposed model, it is envisaged that when properly implemented, it would significantly reduce number of challenges that affect the efficiency of the daily operations related to detection, diagnosis and management of cholera. Of particular importance was the need to revolutionize the paper based-system currently being used to share information and management of cholera cases. The model also exploited the opportunity of engaging the community in assisting reporting, referring and tracking suspected cholera cases. In addition, other risky practices and behaviors occurring in the community could be easily detected, reported and attended promptly by the district health authorities.

As from July 2016, the DODRES will customize and use *AfyaData* ICT tools to assist in cholera management and co-ordination using the proposed community-based model. The community-based reporters, health officers as well as district cholera response team members will be trained on how to use the technology in detection, response and management of cholera cases in the pilot districts in Morogoro region (Morogoro-Urban, Mvomero and Kilosa) and Dar es Salaam region (Temeke and Kinondoni).



## Cholera outbreak linked to a funeral event in Kilosa

As of May 27, 2016, cholera has been reported in 106 persons and killed three patients in Kilosa district, Morogoro since the epidemic began there on May 1, 2016. Cholera is transmitted principally by ingestion of food or water contaminated with the bacterium *Vibrio cholera* and can kill humans within hours if left untreated.

Contact with the bodies and fluids of persons who have died of any cause is especially common in Tanzania, where family and community members often wash the body of the deceased ones in preparation for funerals. This cultural practice was associated with onset of cholera outbreak in Msimba village Kilosa district on May 1, 2016. The outbreak involved two index cases of adult men who participated in the preparation of deceased body of a community member on April 29, 2016 (whose cause of death had not been established).

The major clinical manifestations of the index cases were diarrhoea and vomiting. By May 27, 2016 additional 28 cases of cholera were reported in Msimba village. The outbreak spread to 13 neighbouring villages namely (number of cases in parentheses) Mgoma (19), Kidoma (15), Molemu (8), Tambukareli (8), Igoji (6), Mfilisi (5), Vikweme (3), Kikwalaza (3), Iyovi (2), Mbegesela (2), Ng'apa (2), Mikumi mjini (2) and Rwele-kota (1). The two patients from Mbegesela and one patient from Igoji villages died. All other cases were treated successfully at the cholera treatment camp established following the reports of index cases in the district. Other control measures that were implemented included public health education, ban of food vending and sales of local brews, disinfection of affected premises and treatment of water for domestic use. The control measures implemented were perceived by the district authority to be effective as there were no

more reports of cholera cases in the district after May 27, 2016. There is however a need to scale-up public health education and inform the implementation of national

standard operating procedures for safe burial practices to facilitate prevention and control of cholera and other potential infectious diseases.

## Simulated performance of One Health Knowledge Repository for enhancing detection of mysterious disease outbreak in central Tanzania

Recently the Southern African Centre for Infectious Diseases Surveillance (SACIDS) through the research project titled Enhancing community-based disease outbreak detection and response in East and Southern Africa (DODRES) developed One Health Knowledge Repository (OHKR). This a database of expertly authored health content of priority infectious diseases of human and livestock, and it includes guidelines, fact sheets, standard case definitions, response protocols and recommendations and first aid advice from human and livestock health perspectives.

The OHKR serves as a knowledge-based decision support tool to enhance early detection, reporting and prompt response to disease outbreaks. It works by creating automatic targeted intelligent responses to key public health stakeholders and community based on the information collected and submitted from community by community health reporters (CHRs) using the *AfyaData* tool. *AfyaData* is a tool developed by SACIDS to enhance participatory disease surveillance in selected districts of Tanzania. This system is being tested in Ngorongoro and Morogoro-Urban districts in Tanzania with ambition to expand it to other areas of East and Southern Africa.

The DODRES team comprising of ICT programmers and epidemiologists simulated how the recently developed OHKR could

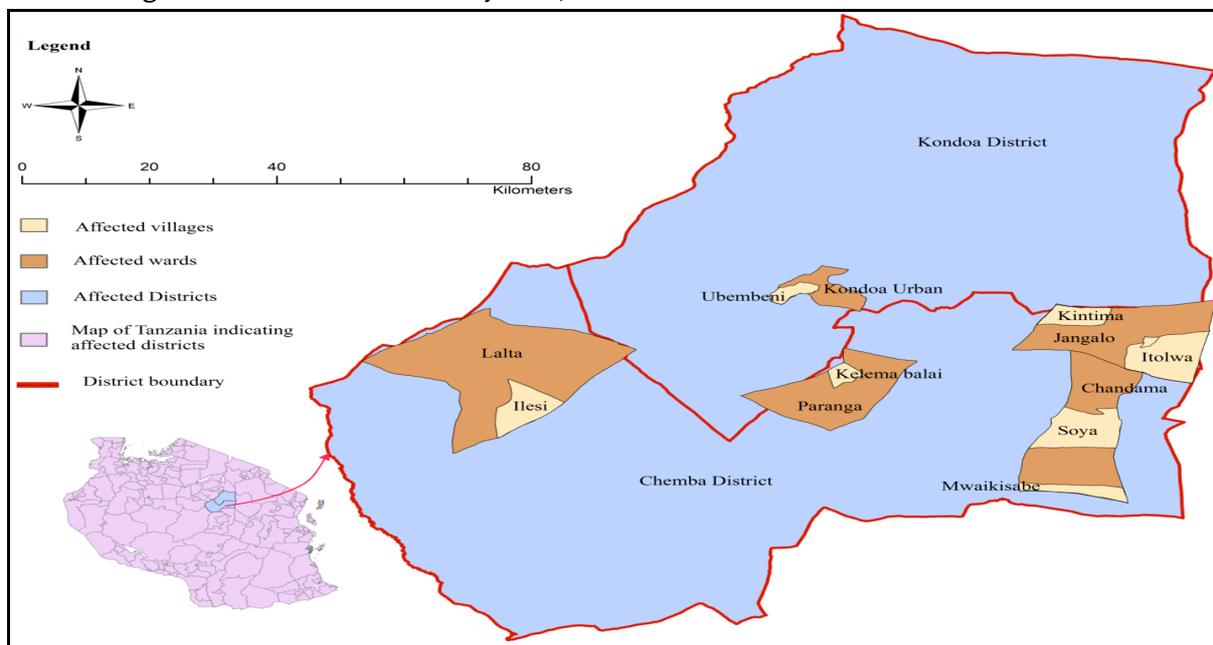
support presumptive diagnosis of the unidentified mysterious disease outbreak that killed seven people in Chemba and Kondoa districts of Dodoma region in central Tanzania. The Government of Tanzania, through the Ministry of Health Community Development Gender Elderly and Children (MoHCDGEC), officially reported an outbreak of unidentified disease on June 13, 2016. It all started in Mwaikisabe village in Chemba when nine members of the same family consumed meat of a cow slaughtered on emergency after it had sustained a broken leg. However, other people (number not available) who also consumed meat from the same cow were unaffected. It was further reported that nine people (who did not consume the meat) from neighboring villages of Chemka, Gubali, Ilesi, Itolwa, Kelema Balai, Kintima and Soya in Chemba district and Ubembeni village in Kondoa district developed similar symptoms of the mysterious disease. Based on these observations it was reasonably suggested that the cow with broken leg was unlikely to be the source of the outbreak.

As of June 25, 2016 the Ministry reported 32 people to have been affected by the disease and seven of them died, translating to Case Fatality Rate of 21.9%. The major symptoms presented by affected people include vomiting, diarrhea, jaundiced mucous membranes especially those of eyes and skin turning yellow as well as swollen abdomen.

It was further reported that affected people complained of abdominal pains. To prevent the disease from spreading further; patients were managed at Dodoma Regional Hospital and Kondoa District Hospital.

Based on the symptoms being reported, the OHKR identifies potential likely diseases, and sends tips to key stakeholders who then makes appropriate actions including asking more questions to the reporter. The most probable infectious conditions identified by the OHKR and likelihood percentage (p) were Yellow fever (p=90.0%), Cholera (p=77.5%) and Dengue (70.0%). The team also acknowledged some deficits in the system,

including restriction of the contents to infectious diseases only thus unable to capture involvement of the non-infectious conditions. It is further recommended that more epidemiological information would be needed to improve prediction of possible disease(s) involved. As we go to press, the aetiology of the disease is being investigated the MoHCDGEC. There is a need to establish the source of infection, mechanism of onset and spread and proportion of community in the two districts that were affected. The TechnoHealth Surveillance team will update the readership on confirmatory diagnosis when official information is released.



Map showing districts and villages that reported mysterious disease in humans in central Tanzania.

### Key Partners:

