TechnoHealth Surveillance

Newsletter

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From Editors' desk

Dear reader,

The Editorial Committee welcomes you to Volume 4, Number 7 & 8 of the *TechnoHealth Surveillance.* In this issue, we share the following:

- *AfyaData* team receives prize to support proper management of zoonotic diseases
- Trends and importance of research data in dengue surveillance
- Community empowered on event-based surveillance
- SACIDS at the *Nanenane* exhibitions in Morogoro and Simiyu

We look forward to your feedback and comments on this and other issues of *TechnoHealth Surveillance.*

Kindly share with us stories on health-related events occurring in humans, animals and environment for the sustainability of our newsletter.

Enjoy your reading!

It was on July 1, 2019 when the SACIDS Foundation for One Health received a prestigious award for its digital disease surveillance app 'AfyaData' (http://afyadata.sacids.org/). *AfyaData* is a set of open source mobile and digital web tools developed through support from Ending Pandemics. It works by enabling users to collect, submit and receive feedback on health-related information in human and animal populations and their environment. The knowledge repository feature embedded in *AfyaData* platform enhances detection of most-likely disease conditions based on clinical manifestations presented.

The award was presented at the 4th Annual Conference of the Fondation Pierre Fabre, a charity established to improve access to medicines and quality healthcare in the Southern Hemisphere.

Through the award, SACIDS will receive a year of technical and financial *support* to promote proper management of zoonotic diseases through e-based One Health Training of Frontline Healthcare Workers in Tanzania. SACIDS was represented in the event by Prof. Esron Karimuribo, the founder of the initiative.

Dengue outbreaks in Tanzania: recent trends and importance of research data in disease surveillance

About 40% of the world's population today lives in an area endemic with dengue in more than 100 countries. Globally, there are about 390 million dengue infections per year; of which only a quarter manifest clinically. In Africa, Dengue has been reported in 34 countries, mostly from the eastern part of the continent. The incidence of dengue has increased 30-fold over the past 50 years. The global expansion of dengue has been related to increased international travel, unplanned urbanization, changes in environmental factors, host–pathogen interactions and population immunological factors. Inadequate vector control measures have also created favourable conditions for dengue virus transmission and its mosquito vectors.

On March 19, 2019, the World Health Organization was notified of Dengue fever outbreak in Dar es Salaam, Tanzania. As of 11th August 2019, the total confirmed cases reported since the beginning of the outbreak was 6,873 cases including 13 deaths. Majority of the cases were reported from Dar es Salaam followed by Tanga. Dengue cases have also been reported from Pwani, Arusha, Kagera, Singida and Morogoro Regions.

Before 2019, Tanzania has reported Dengue epidemics in 2010, 2012, 2013-2014 and 2018. In 2013 and 2014, Tanzania experienced the first worst dengue outbreak. During this epidemic a total of 1,969 and 961 cases of suspected and confirmed dengue cases, respectively were reported. Of these, the majority (99.4%) were cases reported in Dar es Salaam. Other affected regions were Arusha, Dodoma, Kagera, Kigoma, Kilimanjaro, Lindi, Mbeya, Morogoro, Mwanza, Njombe and Ruvuma. Again, in March 2018, 11 cases dengue were reported in the coastal cities of Dar es Salaam and Tanga.

Dengue was first described in Tanzania by Spanish sailors visiting the southern coast of Tanzania during the 15th Century. The name dengue is believed to be a corruption of Kiswahili words "*Ki denga Pepo*", meaning cramp-like seizure caused by an evil spirit.

In Tanzania, several studies have reported presence of Dengue virus in both clinical samples and mosquitoes in different parts of the country (Table 1). Baseline surveillance data on febrile out-patients on Pemba island and Tosamaganga in Iringa region in February-March 2007 reported a dengue prevalence of 7.7% and 1.8%, respectively. In 2011 seroprevalence survey among 500 health adult blood donors in Zanzibar showed a Dengue virus infection prevalence of 50.6%. Higher prevalence rates of Dengue infections have been reported among febrile patients in Kilosa (38.2%) and Moshi (10%). Such seroprevalence findings are important source of evidence of the circulating pathogens in the country. They could easily be incorporated into the national surveillance systems and provide basis for preparedness and response. Studies have revealed that

patients with acute dengue infections are often misdiagnosed and treated with either anti-malarial or antibiotics.

Dengue prevalence in Tanzania, 2010-2018

District/Region	Percent of infected persons (%)
Kilosa	38.2
Moshi	9.7-10.7
Pemba	7.7
Babati	1.54
Iringa	1.8
Zanzibar	50.6
Dar es Salaam	20.9

Dengue virus is transmitted to human by mosquitoes, mainly *Aedes aegypti*. *Aedes aegypti* is highly domestic and a day-biting species that prefers to feed on humans, most often for two hours after sunrise and several hours before sunset. *Ae. aegypti* usually bites indoors, in shady areas, or when the weather is cloudy.

The mosquito prefers to breed in small and inconspicuous containers of water, both natural and artificial, such as discarded cans and cups, uncovered barrels, buckets, roof gutters, barrels, flower pots, tree holes, water tanks, toilet tanks, or tires.

The disease is under-recognized and under-reported in Tanzania because of low awareness by health care providers, other prevalent febrile illnesses, and lack of diagnostic testing and systematic surveillance. While efforts are made to strengthen the diagnostic capacity of the health facilities, it is critical for an effective surveillance system to incorporate other data sources such as research. Surveillance, reporting, and diagnosis of dengue in the country remain largely passive. Active community-based epidemiological studies with intensive vector control and engagement of community in event-based surveillance could contribute to prevention and control of dengue. A strong surveillance system coupled with research are essential tools to detect, understand, prevent, control, and respond to existing, new and re-emerging infectious diseases. Research evidences may complement government efforts and create/strengthen awareness by providing current, credible information about magnitude of epidemic-prone diseases, most often not captured by the traditional surveillance programmes. Such data hold tremendous potential to initiate epidemiological follow-up studies, big data mining and provide complementary epidemic intelligence context to traditional surveillance sources. Realising the importance of evidence from epidemiological studies, it is critical to consider the promotion of uptake of research findings to consolidate the national disease surveillance and response strategies.

Dr. Leonard E.G. Mboera
Leader in Emerging and Vector-Borne Diseases, the SACIDS Foundation for One Health.

Community empowered on event-based surveillance

SACIDS Foundation for One Health has expanded empowering Community Health Reporters (CHRs) to assume active role in event-based surveillance (EBS) using One Health approach. It was from July 24, 2019 to August 4, 2019 when a total of 80 CHRs (women: 36 and Men: 44) from Gairo district of Tanzania received training on use of digital technology in EBS.

The training team comprised Epidemiologist and ICT specialists from SACIDS, District Medical Officer, District Veterinary Officer, CHRs coordinator and Nutrition Officer from Gairo.

Trainees were drawn from 11 wards of Gairo and were trained on how to recognize, record and report clinical manifestations of priority human and animal diseases, their prevention and control measures as well as on ethics and best practices during collection and submission of EBS data.

Trainees were provided with android phones installed with *AfyaData* with data collection forms for health events including those for collection of clinical manifestations for priority disease conditions, environmental disease risk factors/signals and nutritional status in children.

They were also trained on clinical manifestations of malnutrition; how to assess, collect, record and interpret data on nutritional status of children; and provision of public health education to prevent/control/address malnutrition. They were provided with mid-upper arm circumference tape to measure nutritional status of children. In addition, they were trained on how to refer patients and malnourished children to health care facilities.

The trainees-specialist *WhatsApp* group network was established to facilitate sharing of best practices, challenges and solutions. The trained individuals were provided with certificates of participation and letters of introduction to primary health care facilities, veterinary offices, community leaders and other stakeholders at community level where they work.

In her closing remarks, the Guest of Honor, Ms. Siriel Shaidi Mchembe (The District Commissioner for Gairo District) emphasized on One Health approach at all levels in the surveillance and management of infectious diseases transmissible between animals and humans. She particularly highlighted on brucellosis, which has been undergoing undiagnosed or misdiagnosed as malaria in the district.

Can't we roll out use of *AfyaData* countrywide? Asks H.E. Jakaya M. Kikwete

SACIDS Foundation for One Health participated and showcased its research and training activities during the Agricultural Exhibitions popularly known as *Nane-Nane* from August 1 to 8, 2019. SACIDS was represented in this event in Morogoro by Mr. Andrew Robert Maduka, Mr. Onesmo Kahatano, Ms. Usinde Nzowa and Ms. Saida Rashidi. In Simiyu, it was represented by Mr. Yunus Karsan and Mr. Renfrid Ngolongolo.

On August 4, 2019 the SACIDS booth in Morogoro was privileged to host a visit by His Excellency Dr. Jakaya M. Kikwete, the fourth President of the United Republic of Tanzania (2005-2015). After

listening to features, potential use of the *AftaData* app and its scale of deployment, His Excellency Dr. Kikwete could not wait to make his confident remarks "*You guys you are doing amazing work, can't we deploy this technology countrywide?*

The *Afyadata* is a homemade open-source application that was designed

and developed by the "Enhancing Disease Outbreak Detection and Response in East and Southern Africa, DODRES" project team consisting of four Information, Communication and Technology programmers and two Epidemiologists working under SACIDS.

The project started way back in 2015 and a functional stable version of *AfyaData* was achieved in 2016. Since 2016, the mobile phone technology powered by *AfyaData* app has been deployed in Morogoro Urban, Ngorongoro, Kilosa, Malinyi, Ulanga Mvomero and Gairo districts to support Community-based surveillance using One Health approach. In addition, it has been deployed in Temeke and Kinondoni to support cholera surveillance. *AfyaData* has also been deployed to support animal health

disease surveillance in Ngara and Wete districts.

Tanzania is the 13th largest country in Africa with population estimated at more than 55 million. It has an area estimated at 947,303 km^2. The country is divided into 31 administrative regions with a total number of 169 districts. In order to capture timely information related to disease events from different parts of the country in human and animal populations, innovative approaches and technologies are required particularly when health events of epidemic and emergency potential are involved.

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