

## Chapter 23

# Web and Mobile Phone Based Rabies Surveillance System for Humans and Animals in Kilosa District, Tanzania

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### ABSTRACT

*Rabies has continued to claim human life despite different efforts to control its transmission cycles between humans and domestic dogs. New developments in ICT have provided an opportunity for increased possibilities for community involvement in rabies surveillance. The main objective of this study was to investigate on approaches and practices to improve the communication of rabies surveillance information at different levels. Specifically, a study was carried to establish the significance of applying human sensor web system. Human sensor web has a potential of strengthening rabies surveillance system and serves as applied research tools for investigating strategic spatially targeted control activities, identifying areas most at risk and early detection of rabies incursions. Web and mobile based rabies surveillance system was developed and piloted as a support tool for the detection, surveillance and control of rabies. Wide application of the developed system will pave way for effective and efficient country-wide sharing of rabies surveillance information.*

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## **BACKGROUND INFORMATION**

Rabies is a viral disease whose pathology is characterized by an acute inflammation of the brain in both humans and other warm-blooded animal. Inflammation of brain tissues lead into neurodegeneration (Fekadu, 1988). The nature and severity of clinical signs in mammals therefore depends on the viral strain as well as extend of brain cells loss due to neurodegeneration and loss of neuronal functions due to the disease. The clinical presentation of rabies in animals exhibits some species differences. In domestic dogs, rabies presents itself in two forms namely: Paralytic (dumb) and furious forms which determine the magnitude of danger the animal can cause to the human population. During early (prodromal) stage of rabies virus infection, the animal show only mild signs of central nervous system (CNS) abnormalities (Fekadu, 1988; Hemachudha et al., 2006). This is a brief stage and usually last from one to three days. Most dogs will then progress to the furious stage, the paralytic stage, or a combination of the two forms of the disease. However, a small proportion of dogs succumb to the infection without displaying any major symptoms. The furious form of the disease is characterized by extreme behavioural changes, including; aggression, abnormal barking, biting unusual objects like sticks and stones, roaming, laryngeal paralysis, and excessive salivation, tremors, ataxia, and generalized seizures. On the other hand paralytic rabies is characterized by weakness and loss of coordination, followed by paralysis. The duration between contracting the disease and the start of clinical signs is usually one to three months; however, this time window can vary from months to more than one year depending on the distance the virus must travel to reach the CNS (Jemberu, 2013).

A large number of both human and dog rabies cases go undetected due to weak surveillance systems in both human and veterinary medicine (Hiby et al., 2012). Studies have shown the enzootic status of rabies in different parts of Tanzania is brought about by: uncoordinated and poor reporting system, untimely detection of rabid animals which save as vehicles for transmission of rabies virus to humans through bites, poor temporal and spatial mapping of endemic areas. Furthermore, the zoonitary infrastructures for rabies surveillance and diagnosis nationwide are at a state of collapse. Currently only the facilities at the Central Tanzania Veterinary Laboratory Agency (TVLA) and the Faculty of Veterinary, Sokoine University of Agriculture receive samples for histopathology and FAT. The major problem in rabies diagnosis revolve around submission of appropriate samples to the diagnostic laboratories, and lack of appropriate formats for reporting, lack of the national database for processing of the data and the feed-back mechanism. However, new developments in Information and Communication Technology (ICT) including social media have provided an opportunity for increased possibilities for engagement of the community in the surveillance process.

Dogs and humans are the most affected by rabies virus infection. Domestic dogs are considered as the main transmission agent of rabies from animals to humans. Although under control in the developed world, this disease continues to kill up to 70,000 people each year throughout Africa and Asia. The disease affects not only human being and dogs, but also other domestic and wild animals such as cattle, goats, cats, horses, pigs, hyenas, jackals, lions, wild dogs, mongoose, primates and bats (Snyder and Dazzo, 2011). Although solid evince of cross transmission of rabies between humans and animals lack, the presence of a human-dog-wildlife interface in Tanzania and other countries, is likely to offer a unique environment for the persistence of the disease. Generally rabies can be eliminated by sustained mass vaccination of domestic dogs, which are the reservoir for the disease (Bardosh et al., 2014). Fur-

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