



A One Health surveillance approach to guide rabies elimination

Introduction

Rabies is a neglected zoonotic disease that causes an estimated 59,000 human deaths annually. The main burden lies in Africa and Asia where surveillance capacity is limited in both animal and human health sectors, disease detection is hampered by inadequate laboratory facilities, and there are difficulties of submitting samples from remote areas to laboratories for confirmation. Nevertheless, a target of zero human deaths from dog-mediated rabies has been set for 2030 and large-scale control programmes are being rolled out in parts of sub-Saharan Africa. However, there is limited guidance on rabies surveillance to improve case detection as elimination is approached, or how to manage control programmes once progress towards elimination has been made.

Key Message: Active case findings have the potential to increase case detection, thus improve post-exposure prophylaxis administration and strengthen intersectoral partnerships and capacity needed for control of emerging zoonoses. Moreover, the need for genomic approaches to guide the strategy and implementation of elimination programmes is increasingly recognized to identify sources of incursions and minimize their frequency.

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Objective

The project will involve the pilot implementation of active surveillance approaches including genomic surveillance to:

- (a) determine case detection in different settings;
- (b) assess costs of active case finding and feasibility within a One Health framework;
- (c) evaluate critical criteria to identify and confirm rabies cases;
- (d) pilot field sequencing approaches of rabies virus using minION technique (Figure 1). The latter is to assess sources of incursion, describe the viral diversity and determine how genetic data on rabies can inform elimination programmes and be incorporated into surveillance.



Figure 1: MinION sequencing device



Figure 2: the rapid rabies diagnostic kit

Expected Results

- At the end of this project we expect to have developed :
- A surveillance-response systems focussing on validating disease elimination processes
 - Protocols for veterinary-led and health worker's investigations on suspected cases and real exposures respectively
 - Established hotline for disease surveillance
 - The study is expected to promote dialogue between sectors, stimulate public health policy debate, and have direct positive impacts on local communities

Methodology

- Integrated bite case management (IBCM) will be set up across the study area to investigate case detection, feasibility, cost and public health benefits of this enhanced surveillance approach.
- Mobile phone-based surveillance will be established in clinics that provide PEP, together with IBCM protocols for collection of clinical criteria and bite histories from patients to form the basis of contact tracing.
- Hotlines for both public generated surveillance and interaction with the livestock departments will be developed to ensure investigation of any suspect case reported.
- A dashboard to monitor key questions relating to incidence, PEP use and demand will be developed.
- Community meetings with ward and village leaders will be conducted to report all outbreak cases. Where possible, samples from rabid suspect animals will be collected and tested in the field using a rapid diagnostic test kit (Figure 2)

Conclusion

Rigorous surveillance tools are supportive in improving public health surveillance and response systems for prevention and control of priority-set diseases at all levels of a national health system. Surveillance-response systems that rely on validation of diseases and how to maintain disease freedom through early detection and response to incursion should be encouraged. This will drive evidence-informed knowledge, translation into policy decisions and actions with a feedback process to facilitate adaptation.