



Mobile phone-based syndromic surveillance system for early detection and control of livestock diseases



Benson Long'or¹, Boku Bodha¹, Absolomon Kihara², Haret Hambe³, Viola Chemis³, Adan Kutu³, Osman Abdisemet³, Henry Kiara³, George Wamwere-Njoroge³, Bernard Bett³

1. Department of Agriculture, Livestock and fisheries, Directorate of Veterinary Services, Nairobi, Kenya
2. Badili Innovations Limited, Nairobi, Kenya
3. International Livestock Research Institute, Nairobi, Kenya

Introduction

- Livestock diseases cause substantial losses on livestock production and trade. Some of these diseases are zoonotic and are a leading cause of ill-health in people
- In many developing countries, animal health service delivery systems are poorly equipped to effectively manage these diseases due to persistent underfunding and low staffing levels
- New technologies including smart phones and the internet provide opportunities for introducing innovative ways of deploying surveillance and control measures
- We introduce a mobile phone-based syndromic surveillance system that has been piloted in northern Kenya in partnership with the Department of Veterinary Services, Ministry of Agriculture and private sector actors such as agro-veterinary drug suppliers

Materials and methods

Intervention area: Five counties in northern Kenya (Figure 1)

System components: A cloud server linked to a series of data collection smart phones operated by field veterinarians based at the sub-county locations, agro-veterinary drug suppliers, abattoir workers and livestock market managers

Operations: Agents collect data using the smart phones loaded with electronic reporting forms. The data are posted to an on-line server at the end of each day, or as soon as they are captured in data collection tool (ODK – Collect)

Analyses: The server has automated scripts that processes and analyse the data as they are received, and generates trends in syndromes or diseases in tables, maps or graphs which can be used by the County veterinarians to inform targeting of response interventions in space and time

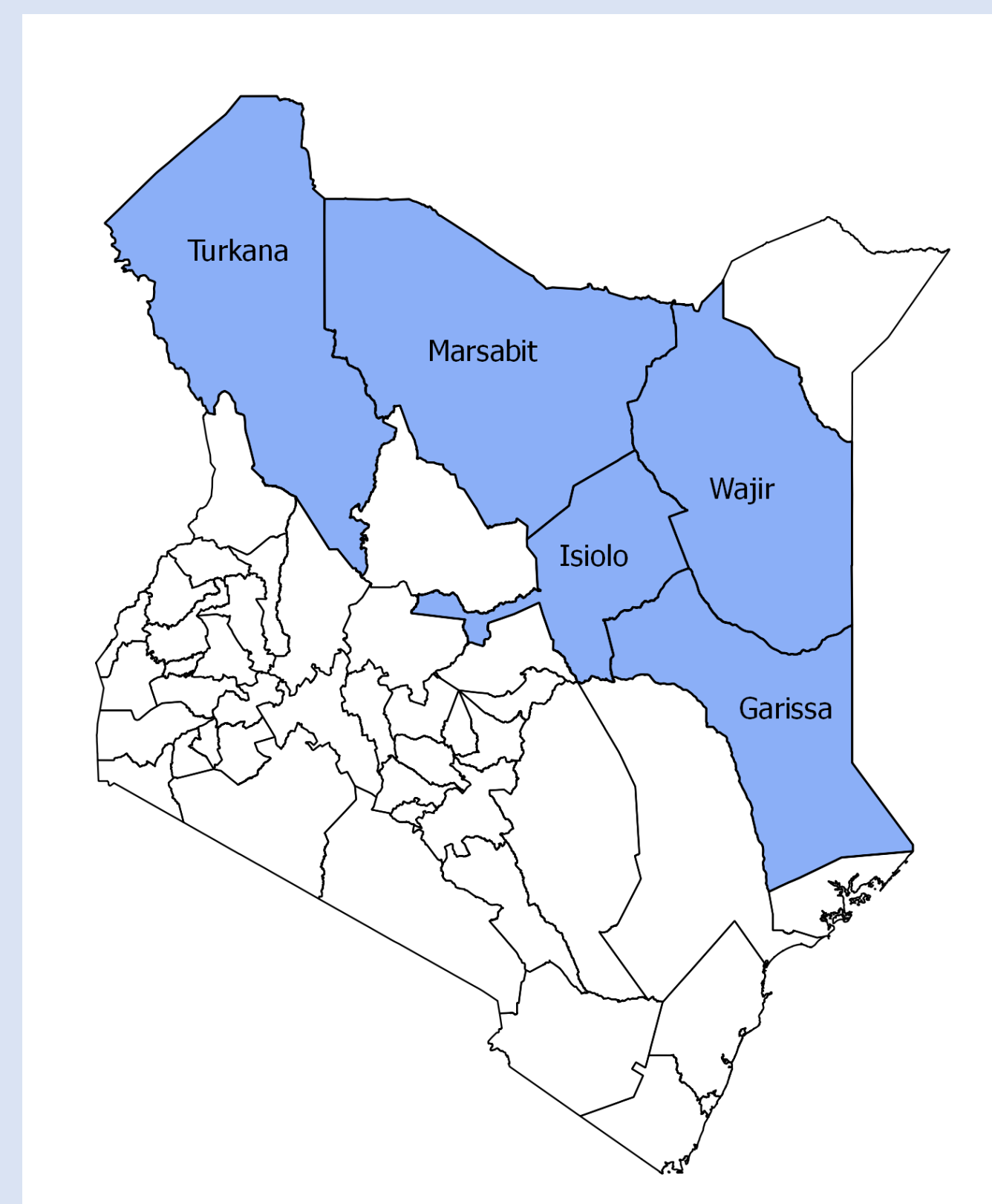


Figure 1. Map of Kenya highlighting the counties where the system has been established (i.e., Turkana, Marsabit, Isiolo, Wajir and Garissa counties)

Achievements

- Some of the outputs from system are given in Figure 2. These include word clouds on syndromes, bar graphs on observed diseases, types and volumes of drugs sold in representative agro-veterinary shops, and lesions from abattoirs. These outputs, together with risk maps (not shown), are used by veterinary authorities to target interventions such as vaccination
- The engagement of multiple actors as surveillance agents enables veterinary authorities to triangulate the data obtained. It also fosters public-private partnerships that would ultimately boost service delivery
- The implementation of the system has precipitated policy dialogue on types of animal health service delivery models that the country should use. More work is being done to integrate it with the national surveillance system managed by the Directorate of Veterinary Services

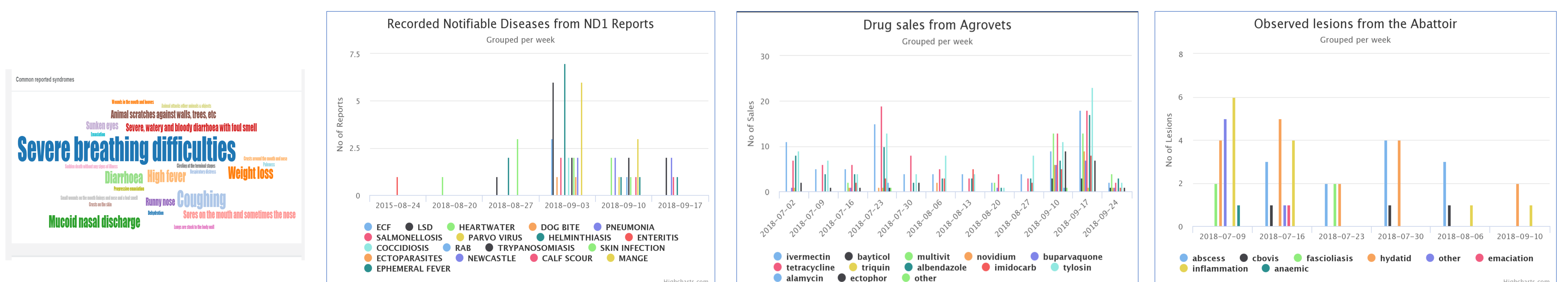


Figure 2. Outputs generated by the system including: (i) word cloud to showing the prevalent syndromes, (ii) incidence of notifiable diseases, (iii) types and volumes of drugs sold in agrovets and (iv) lesions identified during meat inspection in abattoirs in that order

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