Experiences from the mobile phone-based surveillance (Mp-bS) for rabies in Tanzania

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PARACON meeting at Glenburn Lodge, Gauteng, Republic of South Africa,
9-11 June 2015
Infectious Diseases and the Cycle of Neglect

Regional and national priorities based on burden of disease

Accurate DATA & proper MANAGEMENT and ANALYSIS of such data

Low priority for research and control

Neglect
Opportunity: An environment for innovative surveillance methods
Opportunity: An environment for innovative surveillance methods

![Image of a tower and rural landscape]

![Bar chart showing comparison between computer and mobile phone]

Ownership  
- Computers: 80% ± 5%  
- Mobile Phones: 60% ± 5%

Use  
- Computers: 40% ± 5%  
- Mobile Phones: 20% ± 5%

Data exchange (email vs SMS)  
- Computers: 10% ± 5%  
- Mobile Phones: 50% ± 5%
Paper- vs. mobile phone-based surveillance

Phone-based

- Date of Exposure
  - The day when victim encountered animal bite

- Attend to clinic

- Patient information Recorded into Mobile Phone-based Surveillance System

- Data submission

- Central server

- Validation

- Rabies focal person at MoHSW

- MoHSW National Database

Paper-based

- Date of Clinic Presentation
  - The day when patient went to clinic seeking for treatment

- Health Workers

- Paper-forms collation

- Data Unit

- Data Entry & Cleaning

- Transport/postage

- District Level

- Regional

PARACON - Jun 9 - 11, 2015, RSA
Rabies Elimination Demonstration Project:
Southeast Tanzania

Key features

- > 150 workers (vet + health)
- > 100 vet & health units
- 28 districts
- ~ 8 mill. people
Mp-bS System architecture
Field user interface

1. Users select software
2. Users Login
3. and choose data entry form
4. Enter data according to prompted questions
5. Finally submit data
Data access

Go to: www.esurveillance.or.tz
Raw data can be downloaded, saved & analyzed.
Experience: Very few problems encountered during online form submissions.
MASS DOG VACCINATION:

- Numbers vaccinated in 2000+ villages
- Improving campaigns as project continues
EPIDEMIOLOGICAL INSIGHTS FROM SURVEILLANCE

MASS DOG VACCINATION:

- Vaccination coverage of between 34%-80% across the districts
- Identifies problem areas (e.g. 2 districts with vaccination coverage < 50%)
EPIDEMIOLOGICAL INSIGHTS FROM SURVEILLANCE

SUSPECT RABIES CASES

Ilala

Kinondoni

- Suspect rabies cases
- Samples collected
- Samples not collected

19/06/2015
EPIDEMIOLOGICAL INSIGHTS FROM SURVEILLANCE

INCIDENCE OF BITE INJURIES REPORTED AT CLINICS:

- Village of origin of patients recorded
- Considerable decline in demand for PEP
- Likely reflects health-seeking
PEP: ADMINISTRATION ROUTE, UTILIZATION & SHORTAGES:

- Transition from IM to ID
- Alerts of PEP shortages
Mass dog vaccination campaigns have brought the island close to canine rabies elimination.
THE WAY FORWARD

• Sustainable integration within government health systems and with other technical networks to improve system
• Develop application for direct download to users’ own phone
• Explore the potential role of public-private partnerships (e.g. mobile phone companies, service providers) to offset costs
• Improve the feedback and bidirectional flow of information to increase participation of frontline workers (e.g. SMS alerts to relevant stakeholders)
• Expand the system to other zoonotic and infectious diseases in close collaboration with ministries
Acknowledgments
Acknowledgments

- WHO Country Office, TZ
- Ministry of Livestock and Fisheries Development, TZ
- Ministry of Health and Social Welfare, TZ
- Directorate of Veterinary Services, TZ
- Tanzania Veterinary Laboratory Agency, TZ
- Sokoine University of Agriculture (SUA), TZ
- University of Glasgow, UK
Thank You! 😊
Mobile Phone and Clicker Technology

Global Alliance for Rabies Control

PARACON 2015
Introduction

• Need for improved surveillance

• Accurate data

• Easy-to-use methods

• “Real-time” data collection
Benefits of mobile phones

• Mobile phones:
  – Multi-functional tools
  – Variety of uses
  – Improving technology

• Increasing growth of Mobile phone market
  – More mobile phones than laptops and PCs
  – Increased network coverage
  – Reducing prices of smartphones
Benefits of mobile phones

• Paper based systems
  – Slow
  – Loss of info
  – Cumbersome
  – Transmission of data to electronic format
  – Error prone

• Mobile phone apps
  – Mission rabies
    • Data not freely available
    • Too complicated
  – Epicollect etc.
Why should a new app be developed?

• Simplify
  – Too complicated for single person vaccinator
  – Problems of loss, theft and breakage

• Target specific info
  – Ties in with info from bulletin
  – Supplement to country reports
  – Useful data on a large scale
  – Compare with government reported figures

• Data freely accessible
Overcoming challenges

- Challenges
  - Difficult conditions
  - Theft
  - Breakage
  - High costs related to devices
  - Insufficient time
  - Multiple tasks required of vaccinators
  - Single person vaccinators
Proposed solution: Clicker system
Proposed solution: Clicker system

- Remote polling device
- Works on RF or IR
- Multiple clickers to a single device
- Simple, cheap
Ideal data collected

• Owner details

• Dog population numbers
  – Dog population turnover
  – Dog:human ratio
  – Reproductive status
  – Gender ratio

• Vaccination
  – Vaccine used
    • Batch
    • Type
  – GPS co-ordinates
  – Time and date
  – Previous vaccination status
Proposed data collected

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Envisioned App

VacciTrac

User log in

Password
Campaign selection

Campaign name

Gauteng, South Africa
Bushbuckridge, South Africa
+Add new campaign
Campaign selection

Gauteng, South Africa

Description^  
Fixed point

Vaccine^  
Vaccine brand 1

Vaccine batch number  
Lot-34-523-2355
Select an animal

1) Dog

2) Cat
Select Sex and status

A) Adult female
   >3 months

B) Adult male
   >3 months

C) Juvenile female
   ≤3 months

D) Juvenile male
   ≤3 months
Other possible features

• Follow-up survey function
  – using the same device
  – Determine number of marked vs unmarked animals

• Can also use for basic dog population numbers survey
  – Simply click appropriate button when animal sighted
Mobile technology summary

• Easy to use
  • Can be mounted onto a clipboard

• Simple
  – Yet gathers accurate data

• Cheaper

• Reduces costs of theft/breakage/loss
Overall Envisioned Results

• Freely available data

• Cohesion of different reporting systems within a country/region

• **Multiple sources of information** on a single database

• Interactive maps
World Rabies Day
PARACON - June 2015
What is World Rabies Day?

WHAT: A day of communication, motivation, and action

WHY: To raise global awareness about rabies
To promote education in local communities to control and prevent rabies

WHERE: Worldwide

WHEN: Annually on September 28

HOW: Events organized regionally, nationally, and locally

WHO: At risk populations, stakeholders, donors & fundraisers
World Rabies Day launched 2007

GOALS

✓ Engage the support of all international health organizations and all stakeholders

✓ Establish a central website for information on WRD activities, educational material, reports

✓ Provide basic ‘toolkits’ for conducting events

✓ Create media interest through coverage of events

✓ Use WRD as a ‘reminder’ to get pets vaccinated

✓ Encourage communities at risk to ‘do something’ on WRD

✓ Set a goal of engaging 55,000 people to do something to increase awareness on WRD
Global Impact of World Rabies Day

- Since September 2007…
  - Reached over 200 million people
  - Events held in at least 51 countries

WRD parade in Indian village
Photo: Dr Ashwath Narayana

Children bringing pets to be vaccinated in Napak, Uganda during WRD 2010
Photo: Dr Inangolet Francis Olaki
**Increase global commitment to rabies elimination**

**At global level**
- Global One Health Challenge for WRD events
- Promotion of Blueprint/SARE progress

**At regional network meeting**
- Country commitment to hold WRD events
- Promotion of Blueprint/SARE progress

**At country level**
- Support for target country WRD events
- Promotion of Blueprint/SARE progress

**Delivery Platforms**
- Mid East
- Africa
- Asia

**Country Specific Messaging**

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*GRADEUT* S4/5
Global One Health Challenge

- Coordinated by GARC in partnership with IVSA and IFMSA
- 28 “One Health” events
- Teams had to include medical and vet students
- Total impact
  - > 12,000 animals vaccinated
  - > 1,600,000 reached with rabies prevention messages
  - Including 105,446 directly educated
Another global event 2014

Me and My Dog
• One Health message
• New audiences – social media
• Engagement 123,500 people
• Reached > 6,000,000 people
• 2nd most mentioned hashtag in Mumbai
• Also trended nationally in India
An example national event

Sri Lanka

“National Commemoration of World Rabies Day”

- Walk with the participation of school children, nursing trainees, and primary health care staff.
- Display of messages on rabies prevention developed by school children.
- Followed by seminar and prize giving. Chief guest honourable Minister of Health.
An example local event

Quiz Night

• Rabies awareness lecture for medical professionals including
  – doctors
  – interns
  – nurses
  – para-medical staff
• Followed by a quiz and social evening
## Who holds World Rabies Day events?

Anyone who cares about ending rabies - organisers are people from all walks of life, including:

<table>
<thead>
<tr>
<th>Physicians</th>
<th>Veterinarians</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health workers</td>
<td>Students</td>
<td>Scientists</td>
</tr>
<tr>
<td>Municipalities</td>
<td>Animal welfare NGOs</td>
<td>Hospitals</td>
</tr>
<tr>
<td>Government departments</td>
<td>Fundraisers</td>
<td>Businesses</td>
</tr>
<tr>
<td>Clinics</td>
<td>Volunteers</td>
<td>Parents</td>
</tr>
<tr>
<td>Community leaders</td>
<td>Public health NGOs</td>
<td>And groups working together!</td>
</tr>
</tbody>
</table>
Tools

• Guides and tips to taking action on World Rabies Day
  http://rabiesalliance.org/world-rabies-day/publicizing-your-event/
  – Organisers’ summary
  – Ideas
  – Key messages
  – Event planning
  – Communications
  – Modifiable press releases
  – Presentation for getting buy-in from in-country stakeholders
  – Policy toolkit

• Share World Rabies Day events
  http://rabiesalliance.org/world-rabies-day/report-event/

• World Rabies Day logos in different languages
  http://rabiesalliance.org/world-rabies-day/logos/
Resources

- **Posters**  
  to raise awareness of rabies prevention; to advertise events

- **Leaflets**  
  to raise awareness of rabies prevention

- **Teaching materials**  
  age appropriate lesson plans and worksheets in various target languages

- **Coloring pages**  
  for younger children

- **Video links**

All available from  
http://rabiesalliance.org/resources/
2015 Country Specific Messages

- Recent publications on Notifiability & Global Burden facilitate World Rabies Day messages specific to the needs of your country
  - to increase the relevance your messaging
  - To maximise the impact of your World Rabies Day efforts
Next Steps

• Determine your country’s priorities
• Develop country specific key messages
• Use GARC resources to support your efforts
• Share your event on rabiesalliance.org/world-rabies-day
  – this raises the profile of the disease and demonstrates your engagement to donors
• Work with and support your neighbours
Keep in touch

Stay up to date with our latest news

Quarterly newsletter  http://rabiesalliance.org/about-us/subscribe/

facebook.com/GlobalAllianceforRabiesControl

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