Rabies Epidemiological Bulletin

On behalf of the Global Alliance for Rabies Control
PARACON meeting
Pretoria, South Africa
13-15 September 2017
We know data collection is difficult
There is a problem with current data
Discrepancies in Data Reporting for Rabies, Africa

Louis H. Nel

Human rabies is an ancient disease but in modern times has primarily been associated with dog rabies—endemic countries of Asia and Africa. From an African perspective, the inevitable and tragic consequences of rabies require serious reflection of the factors that continue to drive its neglect. Established as a major disease only after multiple introductions during the colonial era, rabies continues to spread into new reservoirs and territories in Africa. However, analysis of reported data identified major discrepancies that are indicators of poor surveillance, reporting, and responsible data reporting. Analyses of examples from Africa indicate that the above aspects are seriously compromised.

Factors Leading to Complacency and Neglect of Rabies

Rabies virus, a classical zoonotic pathogen, has an extensive host range and can probably infect all terrestrial mammals. Although vampire bat rabies has a major effect
<table>
<thead>
<tr>
<th>Location</th>
<th>Nat database</th>
<th>OIE WAHID</th>
<th>Meeting</th>
<th>Oral comms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>1000–2000</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Lesotho</td>
<td>3</td>
<td>11</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Liberia – Libéria</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madagascar</td>
<td>50</td>
<td>Unknown – Inconnu</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Malawi</td>
<td>2</td>
<td>Unknown – Inconnu</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mali</td>
<td>2</td>
<td>Unknown – Inconnu</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mauritania – Mauritanie</td>
<td>40</td>
<td>72</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Mozambique</td>
<td>18</td>
<td>10</td>
<td>1</td>
<td>62</td>
</tr>
<tr>
<td>Namibia – Namibie</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niger</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PARACON 2015 concept
Rabies Epidemiological Bulletin

- Based on the DHIS2 platform
  - Open source software
  - Used in more than 60 countries in MoH

- Rabies Epidemiological Bulletin active for 13 months
  - Launched at PARACON 2016

- Available in English, French and other languages
International reporting

PARACON data collection

Awareness and public info

Stakeholders

National reporting

MoA

MoH

sub-National data collection

Vaccinators

CHWs

Facilities
### Tracker capture

<table>
<thead>
<tr>
<th>Registering unit</th>
<th>Tracker_First Name</th>
<th>Tracker_Surname/Family Name</th>
<th>Tracker_Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya (KE)</td>
<td>mimi</td>
<td>wewe</td>
<td>Male</td>
</tr>
<tr>
<td>Kenya (KE)</td>
<td>momo</td>
<td>karuki</td>
<td>Male</td>
</tr>
<tr>
<td>Kenya (KE)</td>
<td>ashman</td>
<td>mwatondo</td>
<td>Male</td>
</tr>
<tr>
<td>Kenya (KE)</td>
<td>Mzee</td>
<td>Makoto Mserengeki</td>
<td>Male</td>
</tr>
<tr>
<td>Makueni District Hospital</td>
<td>Louise</td>
<td>Taylor</td>
<td>Female</td>
</tr>
<tr>
<td>Makueni County</td>
<td>Celeste</td>
<td>Schepers</td>
<td>Female</td>
</tr>
</tbody>
</table>

Number of pages: 1
Number of rows per page: 50
Jump to page: 1
Rabies Data Collector (RDC) and its integration into the Rabies Epidemiological Bulletin
Rabies Data Collector

• Robust, lightweight handheld device

• Works solely on GPS
  • No running costs
  • Works anywhere in the world

• Collects essential data
  • GPS
  • Time and date
  • 3 questions
  • Campaign information
Rabies Data Collector integration

• Direct integration into DHIS2
  • Simple upload of data

• Once in DHIS2 data is automatically:
  • aggregated into national figures
  • drawn into maps and other visuals (e.g. graphs, tables)
  • generated estimating vaccination coverage
  • generated into a report format for download
Total number of rabies samples diagnosed per animal species
Zanzibar Archipelago
Awareness and Public Information

Global Alliance for Rabies Control

Working to eliminate deaths from canine rabies by 2030

How can we help you today?
Let us take you to the right page

Choose an option

Nominate your community champions for a 2017 World Rabies Day Award
Data Sharing

• Transparency to work together
  • Address that rabies is transboundary

• Automated reporting to international organisations
  • WHO
  • Working to include others OIE and others

• Encourage you to sign your permission form
### Standardised indicators

**TABLE 1 | Description of and rationale for using initial basic indicators in the Pan-African Rabies Control Network bulletin.**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Disaggregation</th>
<th>Description</th>
<th>Rationale</th>
<th>Reporting period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of bite cases in humans</td>
<td>Age: &lt;5 years, 5–14 years; ≥15 years; unknown age  Sex: male, female; unknown  Wound category: I, II, or III</td>
<td>Number of bite cases reported at a health-care facility, disaggregated by age, sex, and wound category</td>
<td>To determine at-risk populations (children, adults) and the numbers of people who have been potentially exposed to a rabid animal; this indicator influences decisions regarding human vaccine procurement and targeted education. This indicator also excludes snake bites</td>
<td>Annual</td>
</tr>
<tr>
<td>Doses of human vaccines purchased</td>
<td>None</td>
<td>Number of human vaccines purchased for the country</td>
<td>To determine the number of vaccines available in the country and whether this complies with PEP requirements</td>
<td>Annual</td>
</tr>
<tr>
<td>Cost per vaccine (US$)</td>
<td>Private sector  Public sector</td>
<td>Cost per vaccine administered in a government institution (including all associated costs such as doctor’s fees, consumables, etc.)</td>
<td>To determine the costs associated with procurement and administration of vaccine for budgetary purposes and to advocate the allocation of funds toward rabies control efforts</td>
<td>Annual</td>
</tr>
</tbody>
</table>

Automated sharing of data

Click on the 'Download preview' button to download a .csv file containing all the events that are going to be sent. Once ready click on the 'Send data' button and wait until the events are uploaded to the server.

When the event uploading finishes the message 'Events sent successfully' will be shown in this box.

Then the two buttons above will become available and you will be able to download the following files:

- data-summary.json: The json file with all the events sent.
- data-attachments.tar.gz: A compressed folder with all the files related to those events.
Making a statement with data

Africa: Annual Cost of Rabies

$1,282,462,412 USD

- Dog vaccination: $14,830,793
- PEP treatments: $1,059,047
- Surveillance: $128,878

Avoidable losses: $1,286,514,109

Human population: 1,028,700,000

847,326 exposures, 1,345,643 DALYs lost, 21,502 deaths

14% of all 90% dogs are vaccinated

Current Spending on Rabies Vaccination

Africa: 1.40, Asia: 1.00, Latin America: 0.10

$125,514,109 production losses

$275,914,725 livestock losses

$775,514,000 productivity losses

WHY WE NEED TO END RABIES NOW

Canine rabies is one of the world’s oldest diseases, eliminated in countries like the US and the UK, but still a daily threat to millions around the world.

Every 9 minutes, a person dies from rabies.

Domestic dogs cause over 99% of human rabies deaths.

Vaccinating 70% of dogs in at-risk areas can eliminate canine rabies.

95% of human rabies deaths occur in Africa and Asia.

Canine rabies kills more than 59,000 people every year.

Mass canine vaccination programmes reduced rabies by 90% in Latin America.

100% of human cases are preventable.

2.9 million lives are saved annually due to preventative measures.
Data supporting the estimates

![Bar chart showing total number of human cases across 2015 and 2016]

- **2015**:
  - Total Human Negative: 0
  - Total Human Positive: 38
  - Human Rabies Deaths Estimates: 0

- **2016**:
  - Total Human Negative: 0
  - Total Human Positive: 727
  - Human Rabies Deaths Estimates: 523
We aim to make data entry child’s play!
Rabies Data Collector

Andre Coetzer

2\textsuperscript{nd} sub-Regional PARACON Meeting

South Africa, 2017
Overview
Background

• Data collection is often difficult, especially during vaccination campaigns
  • There is little time for vaccinators to gather data while vaccinating
• Often a dedicated data capturer is required
  • Costly
• Thus, a need for a simple, yet comprehensive data collection method became evident
• Automatically collects:
  • Time
  • Date
  • GPS coordinates

• Captures inputted data via 3 questions each with 2 options
  • Example output: Adult, Male, Dog, GPS, Time, Date
Hardware Advantages

• Durable
• Lightweight
• Easy-to-use
• Easily waterproofed (works through a ziplock bag)
• Can be used with a nitrile/latex glove
• Simple micro-USB charge – can be charged off of a standard smartphone charger, from wall socket or laptop
Connectivity Advantages

- Works solely on GPS
  - Not reliant on mobile networks
  - No data/internet access required
- Data stored on device until download onto computer
- Can be used in the most remote areas
Software Advantages

• High memory capacity (stores 500 records)
• Can be run on any Windows compatible machine
• Software programme file small enough to be emailed (<2mb in size)
  • No need for complicated programme installation
• Data outputs in Excel file
  • Compatible with most reporting bulletins and programmes (GIS, Google maps, etc.)
  • Easy to create quick graphs and outputs
RDC: Data collection and usage
RDC usage

Static point vaccination
Vaccine distribution and usage

• The first vaccine was used at 09:09

• The last vaccine was used at 09:39

• In 30 minutes – vaccinated 27 dogs

• Expect to see clustered locations – fixed point campaign

<table>
<thead>
<tr>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Adult</th>
<th>Juvenile</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>10</td>
<td>17</td>
<td>22</td>
<td>5</td>
</tr>
</tbody>
</table>
• Output is a CSV file – opens in Excel

• Can be used immediately and is the property of the owner of the device
Uploading data onto the Epidemiological Bulletin
Versatility
Versatility

• Decal design is interchangeable

• Software programme enables functional interchangeability

• Can be used in any situation
  • Limited to 3 questions with 2 options per question
Possible uses

• Rabies vaccination campaigns
• Post-vaccination surveys
• Sterilisation campaigns
• Basic KAP surveys
• Dog population estimates
• Healthcare facilities – wound category information
• Other diseases/other uses non-rabies related
THANK YOU
Towards the first dog-mediated rabies elimination in an African region

Department of Livestock Development-Zanzibar
Dr Khadija Noor Omar

PARACON Meeting, Pretoria South Africa 13-15 September 2017
Background

- The Zanzibar archipelago is situated off the eastern coast of Africa
  - Semi-autonomous region of the United Republic of Tanzania
  - Consists of two main islands, Unguja and Pemba.
  - The largest and most populated island is Unguja / Zanzibar island
Background

• Rabies has been endemic within the Zanzibar archipelago since the 1990’s

• No diagnostic capacity had been established prior to 2016 and diagnostic confirmation was done on the mainland

• Various disease intervention campaigns have been implemented over the years
Pemba island

- Pemba island was one of the chosen sites for the BMGF project (2010 – 2015)

Lushasi et al., 2017. Progress towards rabies elimination from Pemba Island, Southern Tanzania
Zanzibar (Unguja) island


- Project consisted of multi-year mass dog vaccination campaigns (Vaccination coverage - Min: ±15% - ±100%)

- A steady decline in the number of clinical canine rabies cases was observed until 2015 when no cases were detected

- Zanzibar island was ready to undertake a canine-mediate rabies-free self declaration
Zanzibar island

• In support of the rabies-free self declaration, the next step was to establish a working surveillance system on both islands

• Support provided by Global Alliance for Rabies Control and World Animal Protection
Rabies surveillance using the DRIT assay
DRIT surveillance

• The DRIT assay has been implemented in both Unguja and Pemba

• All of the DRIT results are confirmed using a real-time PCR assay

• Rabies cases have been detected in both Unguja and Pemba with a large number of samples being rabies-positive
DRIT surveillance: Zanzibar island

- The DRIT assay has been used for routine rabies surveillance on Zanzibar island since July 2016

- 33 samples submitted
- 76% positivity
DRIT surveillance: Pemba island

- The DRIT assay has been used for routine rabies surveillance on Zanzibar island since January 2017

31 samples submitted
97% positivity
Strategic mass dog vaccination in Zanzibar island
Strategic mass dog vaccination using the Rabies Data Collector

- Zanzibar island was chosen as the location for strategic intervention
  - Relatively small dog population (±10 000 dogs)
  - Strong network of animal health technicians
  - History of mass dog vaccinations being implemented
Strategic mass dog vaccination using the Rabies Data Collector

- Static points were selected for the rural areas of the island

- A combination of static and roaming campaigns are used for the urban areas of the island
Strategic mass dog vaccination using the Rabies Data Collector

- The Rabies Data Collector
  - Directs the mass dog vaccination campaign
  - Monitors vaccine usage
  - Ensures good coverage in all locations
Summary of the MDV campaign

• The mass vaccination campaign is ongoing – **vaccinating ±1.5% of the dog population per day.**

• End July: <1% coverage. One month later: ±16%

• Aim to have the entire dog population vaccinated within the next 10 weeks
Conclusion

• Zanzibar is on track to be the first region in Africa to be declared free from canine-mediated rabies by mass dog vaccination

• Continued surveillance and strategic dog vaccination will ensure that our objective is achieved
“Zanzibar Free from Rabies is Possible”

Thank you

This work is made possible by the generous support of World Animal Protection. The contents, however, is the responsibility of the Global Alliance for Rabies Control and the Ministry of Agriculture, Natural Resources, Livestock and Fisheries (Zanzibar) and do not necessarily reflect the views of World Animal Protection.