Rabies Situation in Cameroon: Role of a pilot initiative of surveillance system reinforcement in improving health authorities awareness

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Centre Pasteur of Cameroun
• Cameroon: general information

• Rabies situation in Cameroon

• Pilot rabies surveillance system
  • Objectives and reinforcement of the surveillance system
  • Results

• Strength and weakness points

• Conclusions
Cameroon: general information

- Population: 19.4 millions inhabitants (2010)
  - 52% in city / 48% in rural
  - Median age: 17.7 years
  - ≥65 years: only 5%
  - 10 administrative regions

Area: 475,650 km²
Rabies situation in Cameroon (1)

- Very limited data about the frequency of both animal and human rabies despite the existence of lab facilities

  - Among 91 dogs specimen received from 2010-2013 at Centre Pasteur of Cameroon, 74.2% were tested positive (Sadeuh-Mba et al, BMC Research Notes, 2015)

- Rabies laws defining the general strategy for the control of animal rabies exist but not applied
Rabies situation in Cameroon (2)

- Lack of awareness among the population, medical practitioners and health authorities is common

- No rabies control program exist.
  - A national zoonosis control program has been launched recently and still in the implementation phase

- Persons who are bitten by suspect rabid animals have to pay for post-exposure prophylaxis
  - Animal rabies vaccination is also paid by the owner
  - Domestic animal mass vaccination campaign against rabies is organised at least once a year at reduced price
Infrastructures for management of rabies exposure is scarced and located in big cities:

- National veterinary Laboratory, LANAVET, Garoua
- Regional Delegation of Public Health West, Bafoussam
- Regional Delegation of Public Health Littoral, Douala
- Centre Pasteur of Cameroun annex, Garoua
- Centre Pasteur of Cameroun, Yaounde Virology Laboratory
- Anti-Rabies Clinics and laboratories
Rabies situation in Cameroon was similar to that of most of the subsaharan central and west Africa.

- As discussed within the AfroREB network meetings

- AfroREB: African Rabies Expert Bureau
  - Created in 2008
  - An informal group of 15 francophone African countries
  - Objective: identify appropriate initiatives to fight rabies

All AfroREB experts unanimously agree that the priority is to bring reliable epidemiological data.
Pilot initiative of rabies surveillance system reinforcement: Cameroon and Ivory Coast

• **Primary objective**
  - To set up a pilot rabies epidemiological information system which will help to validate tools used, identify obstacles and find solutions

• **Secondary objectives**
  - To sensitize human and animal health professionals to the rabid risk and his management
  - To systematically collect informations on rabid risk exposition, on animal and human rabies cases
  - To document obstacles to surveillance
  - To set up a network of professionals working on rabies at different level of the health pyramid
A pilot surveillance system for rabies in the west region for a one year period – 2014

• West region
  • Population: 1 million inhabitants
  • Area: ≈ 14000 km²
  • Number of health district: 20
  • Number selected for the study: 11
  • Selected sites were asked to participate in a voluntary basis

• Focal points identified and selected
  • Chief medical officer of the health district
  • Chief of the district veterinary service
Cameroon EpidemioSurveillance system design

Ministries of Public Health / livestock and fisheries

CENTRAL LEVEL
(Disease Control Directorate)

REGIONAL LEVEL
(West regional Delegation of public Health)

DISTRICT LEVEL

Compilation, analysis, feedback

Regional synthesis

District synthesis

Data collection forms

Centre Pasteur of Cameroon (virological and epidemiological units)

Samples

Health center

Health center

Health center
Reinforcement of the existing information system
Opening of an antirabic center in the West region, oct2013

Ministry of Public Health & Ministry of livestock, Fisheries and animal industries
Sensitization and training of focal points and leaders (1)

• Operative definitions and procedures including questionnaires filling and submission, collection of samples and sending to central lab in Centre Pasteur of Cameroon
Sensitization and training of focal points and leaders (2)

- World rabies day
- Other health related occasions
Distribution of coolers to health professionals and financial support to send samples to the Centre Pasteur
• Sociodemographic, clinical data of persons exposed to rabid risk, data on animal implicated, samples (animal head and human if possible)

• Follow up and action
Results
Epidemiological situation in year 2014 in the West region of Cameroon: exposition to rabid risk

- 507 notifications in the West region / 2594 in total (2014)
- 440 notifications from the sentinel sites selected for the study (87%)
- 370 notifications accompanied with a file (73%)

<table>
<thead>
<tr>
<th>District</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAFANG</td>
<td>9</td>
</tr>
<tr>
<td>BAHAM</td>
<td>11</td>
</tr>
<tr>
<td>BAMENDJOU</td>
<td>13</td>
</tr>
<tr>
<td>BANDJA</td>
<td>3</td>
</tr>
<tr>
<td>BANDJOUN</td>
<td>20</td>
</tr>
<tr>
<td>BANGANGTE</td>
<td>42</td>
</tr>
<tr>
<td>BANGOURAIN</td>
<td>3</td>
</tr>
<tr>
<td>BATCHAM</td>
<td>5</td>
</tr>
<tr>
<td>DSCHANG</td>
<td>19</td>
</tr>
<tr>
<td>FOUMBAN</td>
<td>10</td>
</tr>
<tr>
<td>FOUMBOT</td>
<td>7</td>
</tr>
<tr>
<td>GALIM</td>
<td>3</td>
</tr>
<tr>
<td>KEKEM</td>
<td>13</td>
</tr>
<tr>
<td>KOUOPTAMO</td>
<td>0</td>
</tr>
<tr>
<td>MALENTOUEN</td>
<td>5</td>
</tr>
<tr>
<td>MASSANGAM</td>
<td>0</td>
</tr>
<tr>
<td>MBOUĐA</td>
<td>30</td>
</tr>
<tr>
<td>MIFI</td>
<td>169</td>
</tr>
<tr>
<td>PENKA MICHEL</td>
<td>3</td>
</tr>
<tr>
<td>SANTCHOU</td>
<td>0</td>
</tr>
<tr>
<td>NON SIGNALE</td>
<td>4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>370</strong></td>
</tr>
</tbody>
</table>
Comparison of animal bites situation notification in year 2013 and 2014 in the West region.
Animals implicated

- Dog
- Not indicated
- Cat
- Monkey
- Other
Some characteristics of animal implicated

<table>
<thead>
<tr>
<th></th>
<th>Total N(%) ou median (EIQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=370</td>
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</table>

### Known animal (m : 8.1%)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>No</td>
<td>112 (32.9)</td>
</tr>
<tr>
<td>Yes</td>
<td>228 (67.1)</td>
</tr>
</tbody>
</table>

### Vaccinated animal (m : 23.3%)

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>No</td>
<td>162 (82.2)</td>
</tr>
<tr>
<td>Yes</td>
<td>35 (17.8)</td>
</tr>
</tbody>
</table>

### Animal vital status at patient consultation

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>killed</td>
<td>21 (5.7)</td>
</tr>
<tr>
<td>spontaneous death</td>
<td>7 (1.9)</td>
</tr>
<tr>
<td>disappeared</td>
<td>112 (30.3)</td>
</tr>
<tr>
<td>alived</td>
<td>230 (62.2)</td>
</tr>
</tbody>
</table>

### Veterinary consultation

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>No</td>
<td>193 (74.8)</td>
</tr>
<tr>
<td>Yes</td>
<td>65 (25.2)</td>
</tr>
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</table>

m: missing data
## Some characteristics of patients

<table>
<thead>
<tr>
<th></th>
<th>Total N=370</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender (m : 3.0%)</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>193 (52.3)</td>
</tr>
<tr>
<td>Male</td>
<td>166 (44.9)</td>
</tr>
<tr>
<td><strong>Age at consultation (median, IQR, years)</strong></td>
<td>19.0 (9.0-43.5)</td>
</tr>
<tr>
<td><strong>Stage WHO (m: 22.2%)</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>30 (10.4)</td>
</tr>
<tr>
<td>2</td>
<td>207 (71.9)</td>
</tr>
<tr>
<td>3</td>
<td>51 (17.7)</td>
</tr>
<tr>
<td><strong>Administration of antitetanic serum to patient (m: 8.9%)</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>53 (15.7)</td>
</tr>
<tr>
<td>Yes</td>
<td>284 (84.3)</td>
</tr>
<tr>
<td><strong>Rabies post exposition prophylaxis (only vaccine)</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>198 (53.5)</td>
</tr>
<tr>
<td>Yes</td>
<td>172 (46.3)</td>
</tr>
</tbody>
</table>

m: missing data
## Biological analysis

### Samples received 2014

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Total</th>
<th>Positive results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog heads</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Pig head</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Human (saliva and skin biopsy)</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Human rabies suspicion:** 3 cases

**Persons exposed where informed for management**: 5
• Sensitization, awareness of the professionnals concerning the risk of rabies
• Consolidation of surveillance activities in health district concerned
• Radiance of pilot sites activities to other health districts which have started to report animal bites
• Reduction of number of patients transferred to the capital city for management of animal bite
• Identification of some constraints of the surveillance system of infectious disease
Weakness points

• Subnotification
• Incomplete filling of rabies files
• Delay in transmission of data
• Suboptimal implication of certains professionals due to concurrent activities
• Most Veterinarians were alone in their district area and focused more on breeding activities
• Insufficient collaboration between human and animal health professionals

Lack of human ressources and motivation
Conclusions

• Rabies is still killing in Cameroon as in many subsaharan west and central African countries

• Organisation, follow up and coordination could help in obtaining reliable data but:
  • Full implication of professionals is needed
  • Intersectorial collaboration
  • Implication of politics with their partners

• As perspectives
  • The activity will continue for one more year (thanks to the donor) in order to identify ways for sustainability
  • The health authorities are preparing for the opening of antirabies clinics in the remaining 6 regions of Cameroon
Thanks !!!

- West Regional Delegation of Public Health
  - Dr Mache, Dr Simo and Mrs Monkam
- West Regional Delegation of livestock, fisheries and animal industries
  - Dr Otang
- Study team, different health professionnals and participants
Sanofi Initiative against Rabies in Africa
A “One Health” programme

Pan-African Rabies Control Network Conference
South Africa, June 2015

Isabelle DESCHAMPS, PhD
Head of Immunization Policy
Africa and Global health organizations
Sanofi Pasteur

Sophie RANDOUX, DVM
Director of Feline and
Rabies Vaccines Franchise
Merial
Why this initiative?

The context:
- **Human rabies is preventable but continues to kill.**
  - Rabies controlled in PAHO region, still bulk of human cases (~60K annually) in Africa and Asia
- **In Africa rabies is often misdiagnosed and underreported**
- **Rabies disproportionately burdens poor rural communities (mainly < 15 y of age)**
- **Lack of access: Rabies post-exposure prophylaxis is only available in big cities**
- **Almost all cases transmitted by a rabid dog (99%)**
- **Dog vaccination is compulsory to achieve rabies elimination**

We wish to design and propose a holistic and integrated approach based on a sustainable model:
- **Build on existing partnerships and on social responsibility**
  - Sanofi initiatives to Fight Rabies in Africa: Support the Rabies Expert Bureau, Epidemiological studies to improve rabies surveillance, Advocacy and Communication (incl WRD), Rabies clinics in FSA
- **Create a singular focus for an innovative and impactful project**
- **Define our strategy for engagement on rabies elimination in Africa**
Our Ambition

Sanofi strengthens its long-term commitment to fight against Rabies and its contribution to the ambitious objective of Rabies elimination in Africa

Our proposal

- Sanofi Pasteur and Merial promote the “One health” approach by actively engaging multi-sectorial local partners, in order
  - to break the virus circulation (focus on dogs)
  - to raise awareness and education for rabies prevention in high risk groups (i.e. children) and among health care workers.
  - to improve access to human and veterinary vaccines and to immunoglobulins by creating rabies centers in endemic and remote places
  - to create a financial mechanism which decreases the total cost of a post-exposure treatment by 80% for the patient.
How do we get there?

- **New Dog Bite Center models**
  - Multi-sectorial partnership with public and private partners committed to the fight to eliminate rabies
  - Associating Human and Animal vaccination program - One Health
    - Dog vaccination coverage: 70% of the animals in contact with Humans
  - Scalable to other countries/regions

- **A National approach: engage first at country level**
  - Country ownership
  - Contribute to the empowerment of underprivileged local populations
  - Show a positive impact prior to regional expansion
Funding Model

Private sector
- SANOFI PASTEUR
- Merial

Public Sector
- MoHealth
- MoAgriculture
- Municipalities

Rabies FUND
Administered by a local entity

Pilot centers

Affordable vaccination in remote areas

Animals

Patients

Services adapted to each step of care pathway
Developing targeted services at each step of care pathway to improve vaccination programmes

Patient is bitten by a dog

Health Care Facility

Availability of vaccine and Ig
Affordability of vaccination

Compliance

Ensure compliance
- Training for HCPs
- mHealth (compliance messages)
- Decrease the total cost of PEP for the patient (consultation fees, transport, vaccines and Ig)

KPIs measurements

Break the virus circulation:
- Among dog’s population.
- Transmission to humans

Increase Awareness on Rabies

- mHealth (awareness, alerts)
- Community rabies advocates
- Training for HCPs
- School-based awareness

Increase Awareness on Rabies Center

- mHealth (info on center)
- Call center
- Training for HCPs
- Community rabies advocates

Make sure treatment is available and affordable
- Ensure vaccines and Ig stocks
- Innovative financing model to decrease the cost of PEP for the patient

Health Care Facility

- Innovative financing model to decrease the cost of PEP for the patient
- Decrease the total cost of PEP for the patient (consultation fees, transport, vaccines and Ig)
Community’s involvement

- Associate the Dog Bite Centers with a local Initiative to the benefit of the community.
- Explore opportunities with local social entrepreneurship organizations.
  - ASHOKA, Business Fights Poverty, Aide et Action,........
### Breakdown per country (3 centers)

#### Dog Bite Centers funding

<table>
<thead>
<tr>
<th></th>
<th>Sanofi</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SP/Merial</strong></td>
<td>![Graph showing financial contribution over 3 years]</td>
<td>![Graph showing financial contribution]</td>
</tr>
</tbody>
</table>
| - Financial contribution | | - Local Private Companies, Fondations, Institutes….
| - **Ensure rabies vaccines/ig stocks** through a distribution channel agreed with partners | | Financial contribution
| - **Skills sponsorship**: i.e. Medical training | | - Patients: 20% of the treatment is paid by the patient
| | | - Ministries/municipalities: To be discussed: could be the operating costs of the centers

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**Sanofi**

**Merial**

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Impact measurement

- Measuring impact is key
  - Key Performance Indicators will be designed to measure how well Dog Bite Centres (DBC’s) meet the needs of patients as well as public and private partners
  - The KPI initiative should ensure that programs remain sustainable, accountable and effective in meeting the needs of stakeholders

- Study protocol: objectives, target indicator, measuring method, responsible person – work in progress
  - Surveillance, human vaccination, animal vaccination, national ownership and financial sustainability, services
  - Should be simple and measurable in the local context
  - Will be approved by all the project partners
Timelines and next steps

Commit to long-term WHO objective:
“Eliminate Rabies in Africa”
with innovative & sustainable models

| AMBITION |

Country 1 Senegal: Project presented to Ministry of Health, Ministry of Animal Production, Patseur Institute and local Foundations to test their interest and possible contribution. Good adhesion of all stakeholders met: The principles proposed in this model meets their needs and expectations and will be supported by the MoH and MoA.
**Next steps:** project to be presented to local foundations/companies for co-funding

Country 2 and 3: to be confirmed

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**Country 2 and 3: to be confirmed**

**Public**
MoHealth, MoAgriculture, Municipalities

**Private**
SANOFI PASTEUR, Merial

**CSR**
Local Entrepreneurship:
support development of sustainable models (economic, social, environmental)

**Multi-sectorial local partnership**

**Rabies FUND**

**Animal & Human vaccination + Service package**

**Animals**

**Patients**

**Show impact Call Global Partners**

**2014 Design**

**2015 3 years - Pilots in Africa**

**2017 Scale-up**

**Country 2 and 3:** to be confirmed

**Local administration**

**Dog Bite Centers in 3 countries**
Conclusion

- Rabies remains a regional health concern in Africa BUT 100% preventable by education and vaccination
  - For several years, Sanofi supports various activities to fight against rabies in Africa

- Sanofi is the only pharmaceutical company bringing together the expertise and solutions in animal (Merial) and human health (Sanofi Pasteur).

- Based on our experience and our pipeline, Sanofi Pasteur and Merial want to play a key role in elimination of rabies in Africa and propose new Dog Bite Centers:

A SUSTAINABLE MODEL

FACILITATE RABIES VACCINATION ACCESS

PROMOTE THE « ONE HEALTH APPROACH »
Merci

Thank you
Lutte contre la rage au Tchad (Ndjaména)

PARACON 10 Juin 2015

Naissengar Kemdongarti
La rage canine est endémique avec une incidence annuelle de 1.5/1000

Evolution du programme de lutte

2001-2002
- Introduction de l’IFD
- Étude démographique canine
- Campagne pilote gratuite (>70% couverture)

2005-2006
- Introduction du DRIT
- Campagne pilote payante 3USD (23% couverture)

2008-2009
- Estimation de la rage humaine à partir des cas de morsures → 7décés/ans

Conclusion de 10 ans de recherche: la vaccination de masse des chiens à Ndjaména est faisable!

→ Organisation de 2 campagnes de vaccination de masse 2012/2013
→ Utilisation du Test Immunochromatographique (Anigen) en parallel de l’IFD
Institut de Recherche en Elevage pour le Développement
Unité de Diagnostic de la Rage

Swiss TPH
Matériels Vaccins

IRED
Personnel Stockage

Comité d’organisation
Suivi scientifique Logistique

CSSI
Supervision médical
Institut de Recherche en Elevage pour le Développement
Unité de Diagnostic de la Rage

**Jeudi**
Emissions radio et sensibilisation mégaphone

**Vendredi**
Jour de vaccination
Emissions radio et sensibilisation mégaphone

**Samedi**
Jour de vaccination
Emissions radio et sensibilisation mégaphone

**Dimanche**
Jour de vaccination
Emissions radio et sensibilisation mégaphone

**Lundi**
Enquête ménage et transect

**Mardi**
Enquête ménage et transect

**Mercredi**
Analyse intermédiaire
Rencontre avec les autorités

10 équipes de 3 vaccinateurs
VACCINATION ET ENREGISTREMENT DES CHIENS

Institut de Recherche en Elevage pour le Développement
Unité de Diagnostic de la Rage
Chiens vaccinés: 2012 = 18182  
2013 = 21340
EFFET DE LA VACCINATION

cas de rage canine annuel

- avant campagne 2012: incidence = 0.7/1000
- Après campagne 2014: Incidence = 0.07/1000
- 5 cas en 2015 → tous dans le 9ième arrondissement
CONCLUSION GENERALE

On peut eliminer la rage dans une circoncripation donnee par la vaccination massive gratuites des chiens

Pour établir le meilleur plan opérationel il faut étudier le contexto culturel du milieu

Une surveillance intensive est sollicitee pour detecter les cas emmergents ou d’eventuelle reintroduction du virus
RAISONS DU SUCCÈS

Global

- Partenariat durable entre l’état tchadien l’ONG local (CSSI) et le Swiss TPH
- Investissement et la motivation de tous: coordination, superviseurs, vaccinateurs, maires, delegues de quartier, chefs de carres et proprietaires des chiens

Couverture élevée en 2013

- Déplacement répété des postes
- Sensibilisation mégaphone renforcee pendant les journées de vaccination
PERSPECTIVE

Court terme
Introduire le theme de la rage dans le programme scolaire primaire
Valider et etendre le test d’ANIGEN au niveau national

Longue terme:
Etablir un systeme de surveillance “one health” (contact direct entre les veto et les agents de sante publique) sur toutes les 23 regions du pays afin de guider un programme national d’elimination.
Institut de Recherche en Elevage pour le Développement
Unité de Diagnostic de la Rage

PROGRAMME NATIONAL DE LUTTE CONTRE LA RAGE AU TCHAD

Premier Draft

Budget total pour 1 année = 4 milliard FCFA = 8 million Dollars
Je vous remercie
Études démographique canine dans 963 Ménages

900’000 chiens au Tchad