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The fight against rabies in Africa: From recognition to action

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ABSTRACT

As a follow-up to the first AfroREB meeting, held in Grand Bassam (Côte d'Ivoire) in March 2008, African rabies experts of the AfroREB network met a second time to complete the evaluation of the rabies situation in Africa and define specific action plans. About 40 French speaking rabies specialists from northern, western and central Africa and Madagascar met in Dakar (Senegal), from 16 to 19 March 2009. With the participation of delegates from Tunisia, who joined the AfroREB network this year, 15 French speaking African countries were represented. Experts from the Institut Pasteur in Paris, the Alliance for Rabies Control, and the Southern and Eastern African Rabies Group (SEARG, a network of rabies experts from 19 English speaking Southern and Eastern African countries) were in attendance, to participate in the discussion and share their experiences.

It was unanimously agreed that the priority is to break the vicious cycle of indifference and lack of information which is the main barrier to human rabies prevention.

1. Introduction

As a follow-up to the first AfroREB meeting, held in Grand Bassam (Côte d'Ivoire) in March 2008 [1], African rabies experts of the AfroREB network met a second time to complete the evaluation of the rabies situation in Africa and define specific action plans. About 40 French speaking rabies specialists from northern, western and central Africa and Madagascar met in Dakar (Senegal), from 16 to 19 March 2009. With the participation of delegates from Tunisia, who joined the AfroREB network this year, 15 French speaking African countries were represented. Experts from the Institut Pasteur in Paris, the Alliance for Rabies Control, and the Southern and Eastern African Rabies Group (SEARG, a network of rabies experts from 19 English speaking Southern and Eastern African countries) were in attendance, to participate in the discussion and share their experiences.

2. Break the cycle of indifference

African rabies experts, from both the AfroREB and SEARG networks, unanimously agree that the priority is to break the vicious cycle of indifference and lack of information which is the main barrier to human rabies prevention. Without reliable epidemiological data, health authorities cannot appreciate the scope of this disease in terms of public health; therefore it is not considered a priority and resources are not dedicated to rabies monitoring or healthcare for bite victims. Many rabies cases are neither identified nor reported. The victims often die at home, undiagnosed. Hospital diagnosed cases are rarely reported or may be attributed to other diseases such as cerebral malaria or meningitis. Bite victims do not receive appropriate post-exposure prophylactic care because they are unaware of what first-aid to administer, because healthcare agents are not informed, or because necessary biologicals are not accessible. Thus, the number of rabies deaths increases and the authorities are not alerted because they are not reported (Fig. 1). Thus the vicious cycle leading to the current situation continues. The AfroREB representatives from Benin and Congo both indicated that not one single case of human rabies was officially reported in 2008 in their respective countries, while infection has been described in all bordering countries. In this context, how can they justify setting-up rabies control programmes?

3. Rabies is largely under-reported

AfroREB members documented 146 known human rabies cases in all represented countries combined for 2008, for a total population of 209.3 million, or an incidence of 0.07 cases per 100,000 people (Table 1). Even admitting that the experts do not have access to all reported cases, this is far from the WHO estimation of 2 rabies deaths per 100,000 people in urban areas and 3.6 per 100,000 in rural Africa [2]. According to the authors of this study, the real number of rabies cases may be between 100 and 160 times higher than reported [2]. SEARG representatives noted the same alarming situation: 95% of human rabies cases are not reported in eastern and southern Africa.

4. Identify and report rabies cases

AfroREB members renew the call that was sent out following their first meeting [1]. "We must reinforce rabies epidemic surveillance and further involve the public health authorities to put rabies on the agenda as a human and veterinary health priority", declared Prof. Bernard Marcel Diop, of the Infectious Diseases Department of the Fann University Hospital Centre (Senegal).

It is essential, above all, to count all rabies cases, so that the authorities of each country can be aware of the real disease bur-

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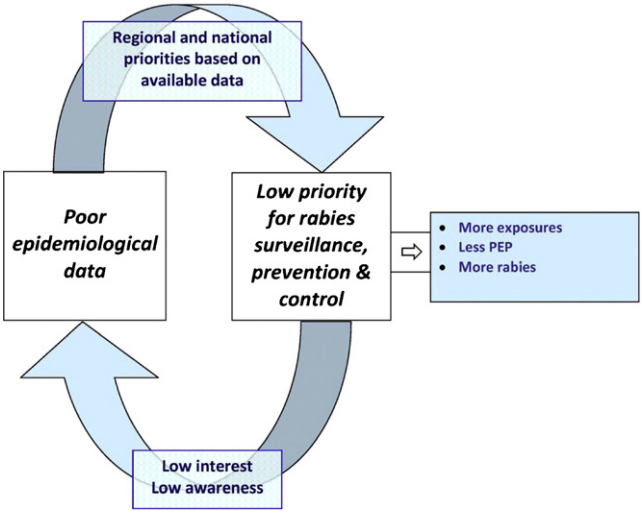

Fig. 1. The cycle of indifference.

Table 1
Number of declared rabies cases in AfroREB countries in 2008.

	Population (million habitants)	No. of human rabies cases	No. of laboratory confirmed cases	No. of cases per 100,000 population
Algeria	35.1	23	8	0.06
Benin	8.5	0	0	–
Burkina Faso	13.7	4	0	0.03
Cameroon	18.5	5	0	0.02
Côte d'Ivoire	19.7	7	2	0.03
Gabon	1.5	0	0	–
Madagascar	19.0	4	3	0.02
Mali	12.2	24	24	0.20
Morocco	30.9	25	11	0.08
Niger	13.7	3	0	0.02
CAR	4.0	2	1	0.05
Rep. Congo	3.5	0	0	–
Senegal	12.8	4	4	0.03
Togo	6.2	39	0	0.60
Tunisia	10.0	6	4	0.06
Total	209.3	146	49	0.07 *WHO Estimation: 2.00–3.60*

den and justly give it the place it deserves in their public health programmes. The first step thus consists of making reporting of rabies cases compulsory. Since the Grand Bassam meeting in March 2008, reporting of rabies cases has become compulsory in four additional AfroREB countries, Côte d'Ivoire, Mali, Senegal and the Central African Republic (CAR), so that rabies cases must now be declared in 11 out of the 15 AfroREB countries. The four remaining countries are also moving towards a reporting system, for example Cameroon, where currently only reporting of animal rabies is mandatory, but which is going to integrate human rabies into its epidemiological monitoring systems (Table 2).

Epidemiological data monitoring and collection programmes already in place also need to be activated and optimised. The data collected often only concerns the capital, or sometimes even only one hospital. Thus, in Mali, where rabies control efforts were initiated 1 year ago, monitoring is essentially centred on Bamako.

Most of the time, diagnosis is based on clinical criteria, without laboratory confirmation. Ten AfroREB countries have adopted a clear case definition for rabies, some only recently (Table 2). Only a few sub-Saharan countries are equipped with a laboratory capable of performing the tests for establishing a confirmed diagnosis (Table 2). Inter-country collaborations are being studied, so that countries that do not yet have a laboratory can have analyses done in another AfroREB network country. The laboratory confirmation of rabies cases, with the reference method, is seldom done because it is performed post-mortem using a brain sample, which poses several problems, notably with respect to obtaining consent from the victim's family. On the other hand, new techniques have been developed. Dr. Hervé Bourthy (Institut Pasteur, Paris) noted that it is now possible to perform a diagnosis on a sample of saliva from the patient, or a skin biopsy from the neck, upon admission to hospital [3], with a sensitivity of nearly 100%.

Several African countries benefit from the support of the Institut Pasteur International Network for setting-up and reinforcing rabies monitoring circuits, notably within the framework of Inter-Pasteurien concerted actions (ACIP). Thus, Instituts Pasteur and various hospitals from eight AfroREB countries (Algeria, Tunisia, Morocco, Cameroon, Senegal, Côte d'Ivoire, CAR, and Madagascar) participate in the *RageStandbio* ACIP, which aims at reinforcing biological diagnosis of rabies with laboratory personnel training and reagent and technology transfer. Three AfroREB countries (Côte d'Ivoire, Senegal and CAR) participate in the *StopRage* ACIP, coordinated by the Institut Pasteur in Abidjan, with the objective of setting-up and reinforcing human rabies monitoring circuits, and normalising and standardising patient management.

Eleven AfroREB countries have established animal rabies monitoring systems, an important step in rabies prevention. Burkina Faso

Table 2
Rabies monitoring in AfroREB countries.

	Declaration of human rabies cases	Rabies monitoring system		Case definition	Rabies diagnostic lab	
		Human	Animal		Human	Animal
Algeria	Since 1984	Yes	Yes	Yes	1 (Institut Pasteur)	Yes
Benin	No	Not really effective	No	Projected	No	No
Burkina Faso	Since 2001	Yes	Since 2001 RESUREP	Yes	No	Yes
Cameroon	No	No (projected)	±Veterinarian network	Underway	2	Yes
Côte d'Ivoire	Since July 2008	Since July 2008	Yes	Yes	1 (Institut Pasteur)	Yes
Gabon	Since 2007	Passive, since 2007	No	No	No	No
Madagascar	Long established	As of several years ago	±Lack of veterinarians	Yes since 2007	1	Yes
Mali	Since June 2008	Yes	No	Yes	2	Yes
Morocco	Since 1967	Yes	Yes	Yes	1 (Institut Pasteur)	Yes
Niger	No	No	Yes	No	1	Yes
CAR	Since 24 April 2009	Yes	Yes	Yes since 2007	1 (Institut Pasteur)	Yes
Rep. Congo	No	No	No	No	No	No
Senegal	Since June 2008	Since June 2008	Yes	Yes since 2009	1 (Institut Pasteur)	Yes
Togo	Since 1985 (but not applied)	No	Yes	Yes	No	No
Tunisia	Since 1969	Since 1986	Yes	Yes	1	Yes