



Overview of Lassa fever epidemiology and current surveillance systems in Guinea

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GUINEA

The Area 245.857 kms²

Population 12 670 313 HBTS

52% Female

Heath districts 38

**Heath Care centers :410 et PS:
860**

Tx alphabétisation : 41%





Introduction: LV activity in Guinea

- In Guinea, the first seroprevalence studies were undertaken in 1990 by Lukashevich *et al.* (1993)
- More than 3,100 households in 27 selected villages distributed in the main geographic regions of Guinea were surveyed for the presence of Lassa virus-specific IgG antibodies (LVA), using ELISA
- The highest prevalence of LVA (25-55%) was found among inhabitants of tropical secondary forest and Guinea savannah (Faranah and Kindia areas), near the southern frontiers with Sierra Leone and Liberia.



LV activity in Guinea

He found no discernible differences in LVA prevalence between males and females or among various age groups. Testing of 406 hospital staff members of the eight central hospitals in these areas for LVA revealed a similar distribution of seropositivity among hospitals in various prefectures.



Lassa virus activity in Guinea

DG Bauch 2001

Undertook a prospective cohort study, to investigate the epidemiology and clinical presentation of Lassa fever, where the disease has been infrequently recognized. A surveillance system was established, and suspected cases were enrolled at five Guinean hospitals. Clinical observations were made, and blood was taken for ELISA testing and isolation of patients with Lassa fever. LF was confirmed in 22 (7%) of 311 suspected cases. Another 43 (14%) had Lassa IgG antibodies, indicating past exposure. Both sexes and all age groups were equally infected.



LV activity in Guinea

Clinical presentations between those with Lassa fever and other febrile illnesses were essentially indistinguishable. Clinical predictors of a poor outcome were noted, but again were not specific for Lassa fever.

Case-fatality rates for those with Lassa fever and non-Lassa febrile illnesses were 18% and 15%, respectively. Seasonal fluctuation in the incidence of Lassa fever was noted, but occurred similarly with non-Lassa febrile illnesses.



Epidemiology of LF

Our team undertook a population-based study, we correlated possible risk factors for rodent-to-human transmission of Lassa virus with markers of Lassa fever in two different regions of the Republic of Guinea

We observed three major risk factors in Gueckedou favoring Lassa virus transmission: rodent infestation was much higher where food was more often stored uncovered and where, peridomestic rodents were hunted as a protein source by 91.5% of the population as opposed to 0% in Pita.

Rodent consumption was analyzed as a risk factor for transmission of Lassa virus comparing rodent consumers (RC) and nonconsumers (NC) : 14.6% of RC had Lassa virus antibodies versus 7.4% of NC ($P = 0.1$) and 23.0% of RC reported a history of a febrile illness with hearing loss (the most common sequel of Lassa fever) versus 6.1% of

The years 2000

- Research has been focussed on: Diagnostics, Ecology, and Epidemiology of LF.
- One former project (LAROCS project) investigates:
 - The association of LASV prevalence in the rodent reservoir and seroprevalence in humans.
 - The impact of rodent control measures on both parameters in villages around Faranah

Ecology

- Based on investigations conducted by Lukashevich *et al.*, research on reservoir ecology has been undertaken since the 2000s. Thus, 2 species, *M. natalensis* and *M. erythroleucus* have been found LASV positive in Guinea (Lecompte *et al.*, 2006, Olayemi *et al.* 2016).
- They are highly infected in areas where human seroprevalence is high (Demby *et al.* 2001, Lecompte *et al.*, 2006). In the hyperendemic zone of Faranah, *M. natalensis* varies seasonally in abundance and alternately frequents human habitat such as the surrounding fields (Fichet-Calvet *et al.*, 2007, Mariën *et al.*, 2018)

Sample collection



Blood and splen: liquide nitrogen

➔ virology

Lver : alcochol

➔ Gentyping of rodents : formol

➔ morphology (MNHN, Paris)

Pattern of rodent dispersal

Are rodent populations inside and outside houses the same or different?

objective is to investigate patterns or LASV migration, household determinants of rodent-to-human transmission

Outside



?

Inside





Public health importance

- To access the disease burden we establish surveillance system in health facilities where our project is active by setting up sentinel sites for screening of patients seeking care in health centers.
- Lassa fever suspect cases has been admitted at the isolation unit for epidemic diseases in Faranah Regional Hospital. If the test was positive for LASV the patient has been treated with Ribavirin and contacts followed and put under prophylaxis with oral Ribavirin
- This allowed us to include LF in the national surveillance system

CONCLUSIONS

- High Lassa virus seroprevalence in recently febrile patients indicates that Lassa fever is a significant public health problem in the region.
- There is a need to establish a sustainable national surveillance system in endemic areas to have more overview on LF burden in the community.
- Appropriate training of health care workers on case definition and laboratory technicians will improve the detection of LF cases.

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