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## Background

- Rift Valley fever virus (RVFV) is a zoonotic arbovirus infecting mainly ruminants and human.
- Madagascar experienced two major outbreaks of Rift Valley Fever in 1990-1991 and more recently in 2008-2009. Previous studies have shown that RVFV spread widely and heterogeneously through the entire island in ruminants and amongst at-risk individuals (butcher, slaughterhouse workers) <sup>(1)</sup>.
- Regions of Madagascar differ by their ecosystems.
- We formulate the hypothesis that vectorial transmission of RVFV can be more or less favourable according to the ecosystems, leading to the existence of different transmission mechanisms in Madagascar ; additional transmission routes may also exist <sup>(2)</sup>.
- The aim of our study was to assess the RVFV seroprevalence (SP) in human and ruminant and its endemism/enzootism in Madagascar.

## Materials & Methods

- Sera were randomly collected from 1,680 adults living in 56 urban and rural sites selected for their representativeness of the different ecosystems encountered in Madagascar (middle-west=sub-tropical, central-highlands=humid, east-coast=per-humid and south-west=semi arid).
- Sera were tested for the presence of IgG directed against RVFV using ELISA method.
- RVFV SP for ruminants were obtained from previous study conducted in 2009 at the national level <sup>(3)</sup>.
- Univariate statistical test ( $\chi^2$ ) was used.

## Results

- Overall, 9.5% (IC 95% [8.2 ; 11.0]) of the 1,680 individuals enrolled and tested had IgG.
- RVFV SP is statistically different between rural sites (SP=13.0%, IC 95% [10.8 ; 15.4]) and urban sites (SP=6.1%, IC 95% [4.6 ; 7.9]) in human ( $p < 0.0001$  ; Figure).
- RVFV SP is statistically different according to the ecosystems in human and in ruminants ( $p < 0.05$  and  $p < 0.0001$  respectively ; Table).
- RVFV SP increase with age in both human and ruminant at the island level ( $p < 0.001$  and  $p < 0.0001$  respectively).

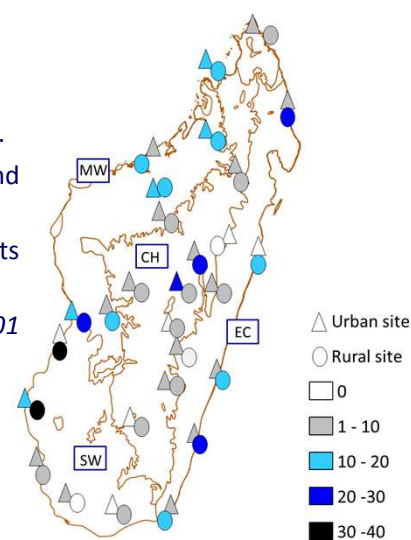


Figure : SP in human in urban and rural sites  
(CH= Central-highlands ; EC= East-coast ; SW= South-west ; MW= Middle-west)

Table : SP in ruminants and human according ecosystems

Ecosystem	Ruminant			Human		
	Tested	SP (%)	IC 95%	Tested	SP (%)	IC 95%
Central-highlands	860	21.5	[18.8 – 24.4]	660	6.2	[4.5 – 8.3]
<b>East-coast</b>	153	<b>23.5</b>	<b>[17.1 – 31.1]</b>	300	<b>12.0</b>	<b>[8.5 – 12.2]</b>
South-west	1264	19.1	[16.9 – 21.3]	300	10.7	[7.4 – 14.7]
<b>Middle-west</b>	422	<b>39.3</b>	<b>[34.6 – 44.2]</b>	420	<b>12.2</b>	<b>[9.2 – 15.7]</b>

## Conclusions

Our preliminary results suggest that RVFV transmission and exposure are distinct according to ecosystems (SP is higher in east-coast and middle-west) and the increasing of SP with age reflect an endemic transmission of RVFV in Madagascar.

Advanced statistical analysis are on going and sampling methodology is included in these analysis. Statistic association between RVFV SP amongst human and ruminants and environmental variables are currently tested.

The identification of environmental components associated to entomological data should allow us to decipher epidemiology of RVFV in Madagascar and therefore identify ecosystems at higher risk of RVFV transmission.

Improving our knowledge on mechanisms of RVFV transmission and maintenance in the different ecosystems of Madagascar should help Malagasy authorities to develop strategies aiming at implementing surveillance and rapid detection of outbreak.

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