

# Lassa fever seroprevalence in three southern Nigerian states: A cross-sectional survey within the SCAPES project

David Simons<sup>1</sup>, Christina Harden<sup>1</sup>, Sunday Eziechina<sup>1,2</sup>, Diana Marcus<sup>2</sup>, Helen Ezigbo<sup>2</sup>, Fisayomi Aderibigbe<sup>2</sup>, Nzube Michael<sup>2</sup>, Kate Thompson<sup>1</sup>, Natalie Imlirzan<sup>3</sup>, Rory Gibb<sup>4</sup>, Lina Moses<sup>5</sup>, David Redding<sup>3</sup> and Sagan Friant<sup>1,2</sup>

<sup>1</sup>The Pennsylvania State University, USA, <sup>2</sup>The Cross River Ecology and Health Project, Nigeria, <sup>3</sup>The Natural History Museum, UK, <sup>4</sup>University College London, UK, <sup>5</sup>Tulane University, USA



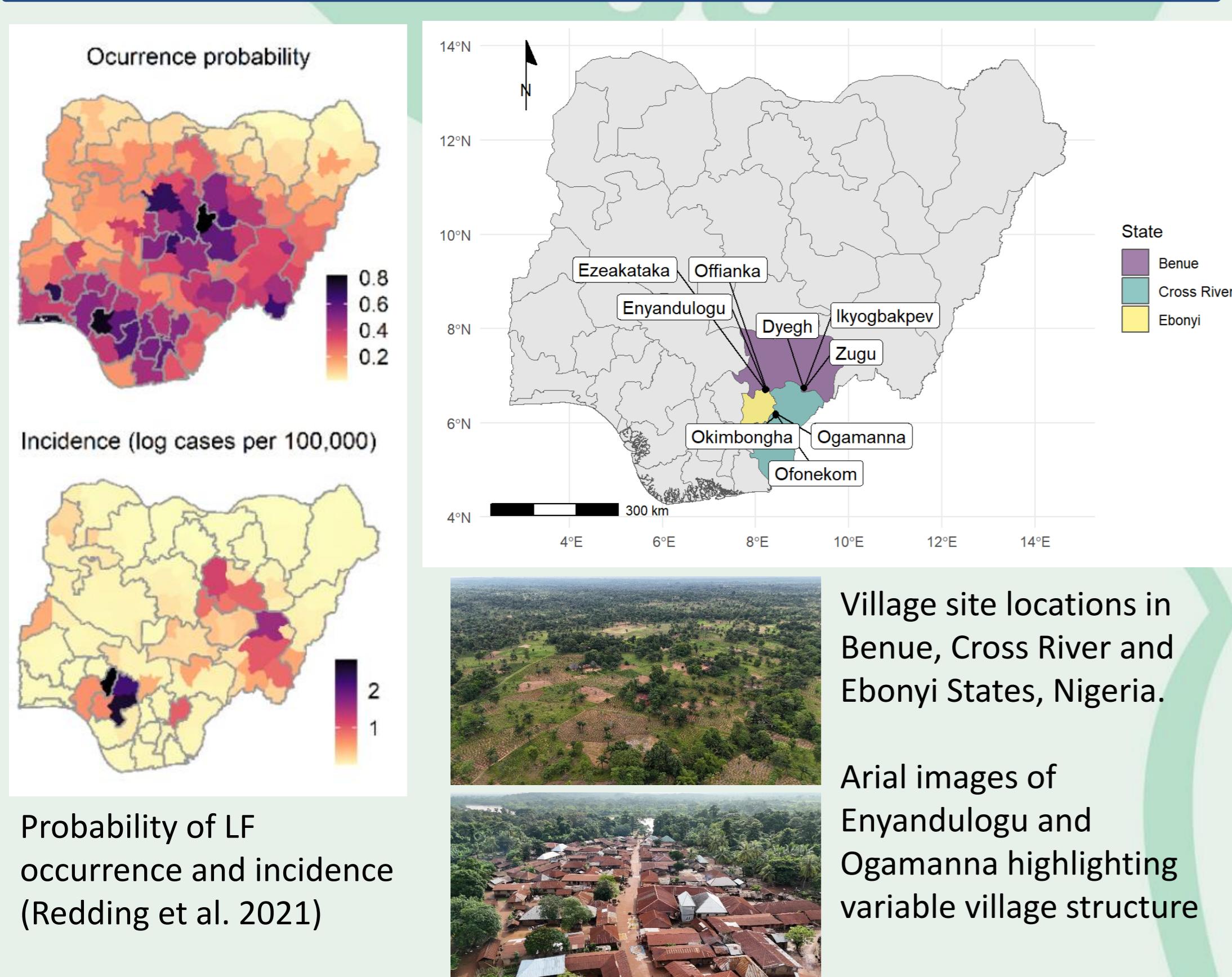
## Background and objectives

*Mammarenavirus lassaense* (LASV) is a viral zoonosis endemic to West Africa and causes Lassa fever (LF). Outbreaks of Lassa fever are dominated by spillover from rodent hosts to humans in rural settings.

Environmental and ecological conditions strongly influence LASV transmission among rodents. Socio-ecological factors, including human behaviour are expected to moderate the hazard of human infection in endemic settings.

We aimed to investigate LASV exposure in residents across nine communities in three neighbouring Nigerian states along an expected gradient of high, medium and low risk regions to:

1. Estimate LASV seroprevalence
2. Characterise individual- and household-level behaviours associated with seropositivity
3. Explore spatial heterogeneity in LASV exposure



## Methods

**Site selection:** Potential village communities were selected using a tool incorporated predicted LF occurrence, land use types and socio-ecological data. Sites were confirmed following visits.

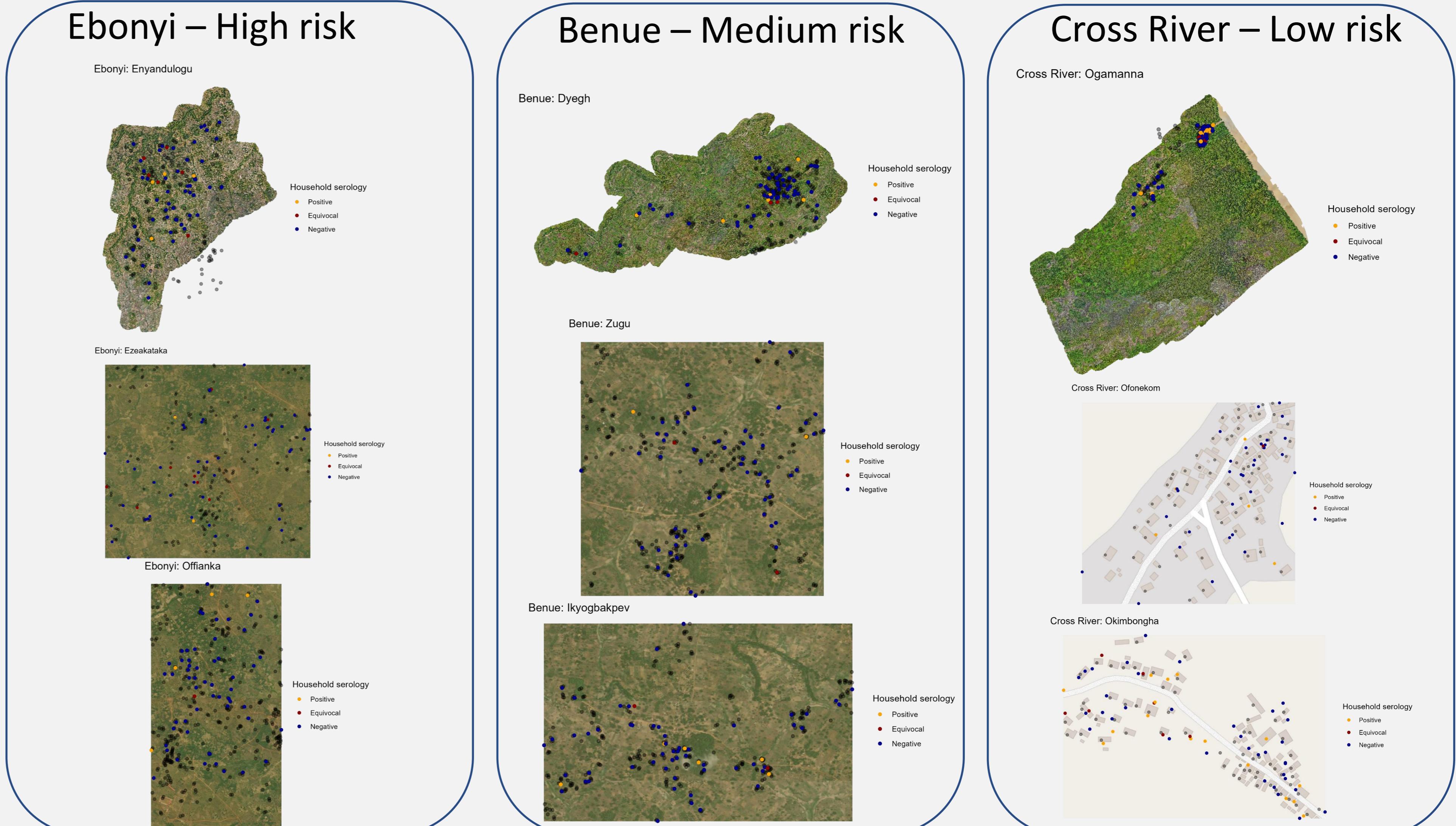
**Participant selection:** Systematic sampling of ~70 households within each village was conducted to enrol >180 individuals per village. The household head completed a household questionnaire. Participants >12 years completed an individual questionnaire and provided a blood sample. Participants <12 years only provided a blood sample.

**Household and individual questionnaires:** Questionnaires were developed to elicit information about expected risk factors for LF exposure. These were designed following a systematic review of the published literature and comprised the following domains:

1. Demographic (e.g., age, sex)
2. Environmental (e.g., housing quality, sanitation)
3. Behavioural (e.g., rodent contact, food storage)
4. Occupational (e.g., agricultural, forestry work)

**Serology:** All blood samples were tested for the presence of LASV IgG antibodies by ELISA (Panadea GmbH)

## Community structure and spatial distribution of seropositivity



## Results

Between 16 December 2023 and 22 July 2024, we enrolled 1,926 individuals from 577 households, representing 27% of all households (577/2,129) in the study villages.

Of 1,874 individuals tested, 61 were seropositive. None reported a prior diagnosis of LF. Seropositive individuals came from 59 households, with two households (both in Ikyogbakpev) containing >1 seropositive individual. Estimated LASV IgG seroprevalence were highest in Cross River State (5.15%, 95% Credible Interval [Crl]: 3.66–7.07), followed by Benue State (2.6%, 95% Crl: 1.54–4.09), and Ebonyi State (1.62%, 95% Crl: 0.86–2.83).

Household composition and structure varied significantly across sites. Median household size was largest in Benue (7) and smallest in Cross River State (5). Households typically comprised multiple buildings, with single-room structures more commonly used in Benue and Ebonyi than in Cross River. Proximity to bush and farms was common but varied by location (51% near bush, 66% near farms overall).

**Rodent entry into homes was near universal** (94%), the methods used to control them varied significantly across villages. **Rodents killed in buildings were rarely consumed or sold** (<5% and 0.5% respectively).

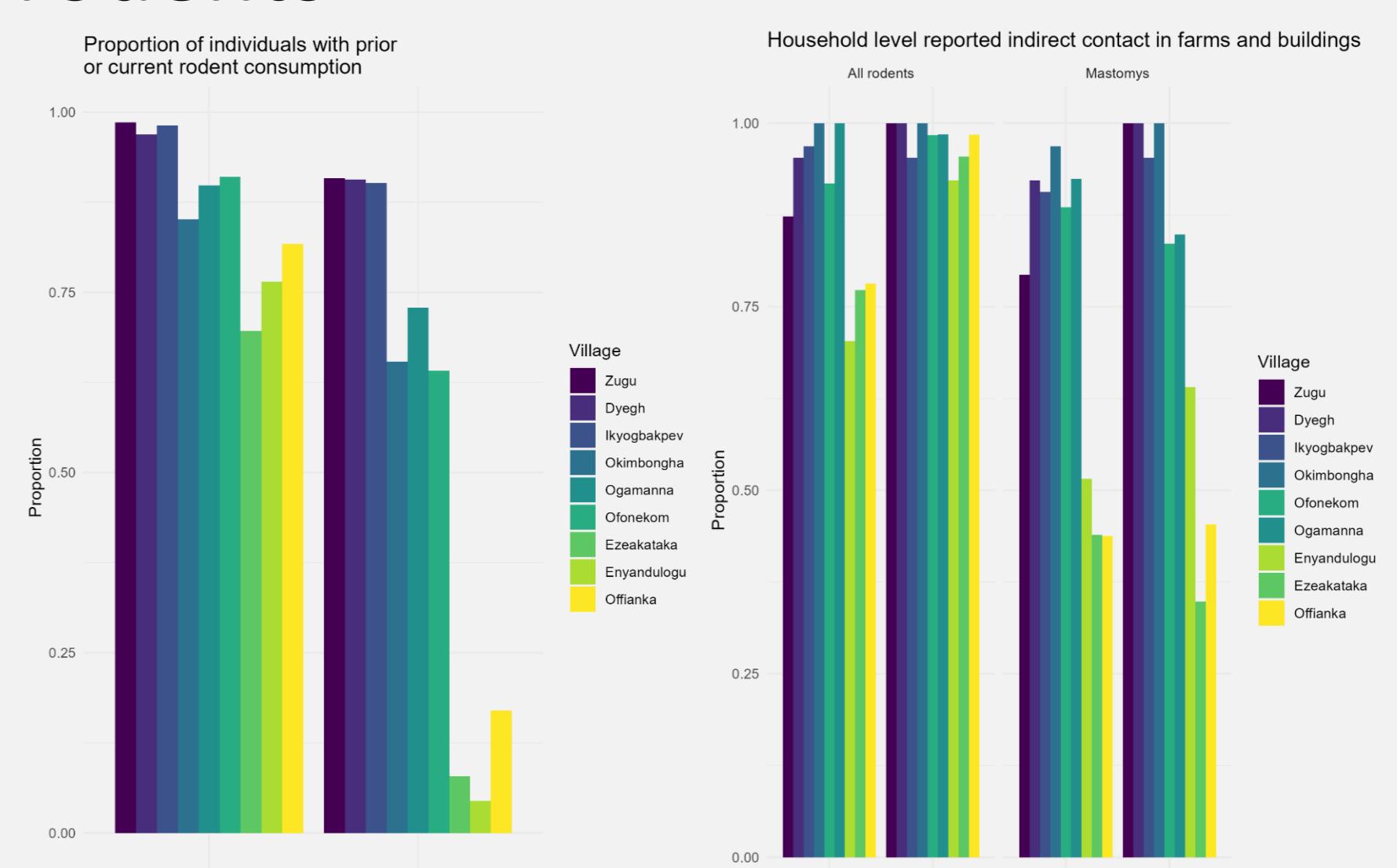
**Rodent consumption in the past year was common in Benue and Cross River villages** (>62%) but substantially lower in Ebonyi villages (<17%) although in those locations most individuals reported past rodent consumption (>67% of those who had not consumed rodents in the past year). Taste and availability of rodent meat was the most reported reason for current and past rodent consumption.

No *a priori* risk factors were found to be associated with seropositivity in univariable analyses.

## State and Village level LASV IgG prevalence

State/Village	N sampled	N positive	Prevalence (%)	95% Crl	Posterior
Benue	605	16	2.60	1.54-4.09	
Dyegh	213	6	2.67	1.1-5.47	
Ikyogbakpev	210	8	3.68	1.7-6.82	
Zugu	182	2	0.94	0.18-3.22	
Cross River	654	34	5.15	3.66-7.07	
Ofonekom	180	5	2.61	1-5.7	
Ogamanna	231	13	5.50	3.04-9.09	
Okimbongha	243	16	6.46	3.85-10.09	
Ebonyi	658	11	1.62	0.86-2.83	
Enyandulogu	211	4	1.73	0.54-4.21	
Ezeakataka	238	2	0.73	0.13-2.46	
Offianka	209	5	2.25	0.87-4.88	

## Consumption and contact with rodents



## Discussion

- We found substantially lower seroprevalence than expected in settings considered high risk for LASV spillover.
- We did not observe any clear associations between risk factors and serological status in our sampled population
- We did not identify substantial clustering of seropositivity within households or within villages

Read more about the SCAPES project here



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