Impact of climate change on Lassa Fever: A 10-year trend analysis of Lassa fever incidence and climatic elements in Edo State, Nigeria.

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Introduction

- Lassa fever outbreaks continue to occur in Nigeria with increasing frequency and spread to new geographical areas.
- The drivers of this epidemics are not well understood.
- We therefore carried out a 10-year trend analysis of Lassa fever (LF) incidence and climatic elements in Edo State, the epi-centre of LF in Nigeria, to determine the relationship between LF and climatic elements.

Method

- LF incidence data for Edo state, between 2009 and 2018, were obtained from the database of the Institute of Lassa Fever Research and Control, Irrua Specialist Teaching Hospital (ISTH), while data on climatic elements; rainfall, temperature, humidity and wind speed were sourced from the Rubber Research Institute of Nigeria (RRIN), Benin-City, Edo State.
- Data were processed, monthly averages calculated and analyzed using descriptive and inferential statistics to depict trends and variability.

Results

- Cumulative annual incidence was consistently higher in 4 of the 18 Local Government Areas (LGA) of the state while in 2009, 5 LGAs reported cases of LF, and in 2018, 15 LGAs reported cases of LF.
- Analysis of monthly LF incidence and monthly climatic elements showed a significant inverse relationship between rainfall and incidence of Lassa fever ($p<0.001$).

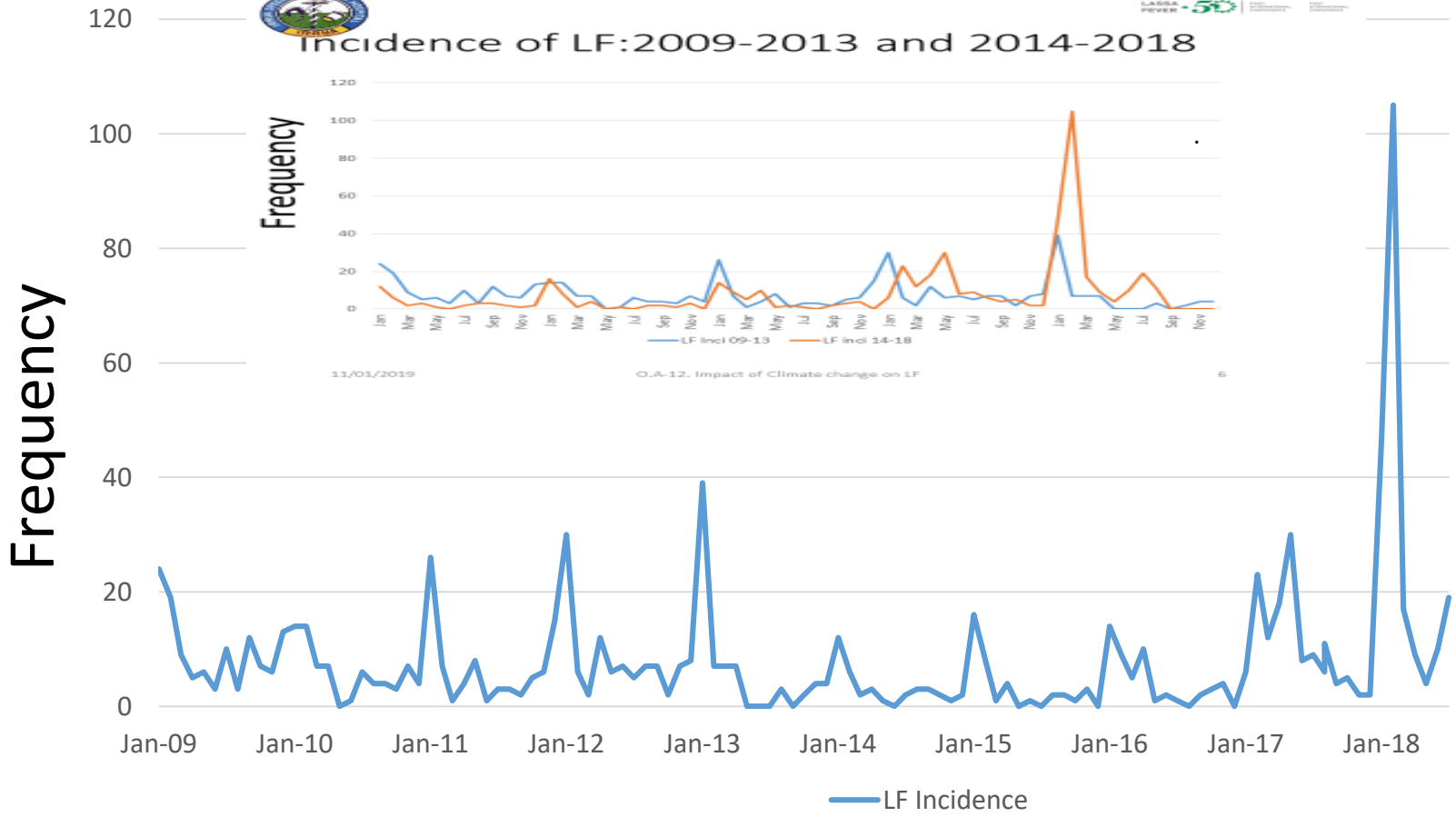

Figure 1: A 10 year trend analysis of LF incidence in Edo State.

In 2009-2014, peak incidence of LF was observed between October and March, while from 2015-2018 there seems to be a gruadual shift in the peak incidence to between January and May of each year.

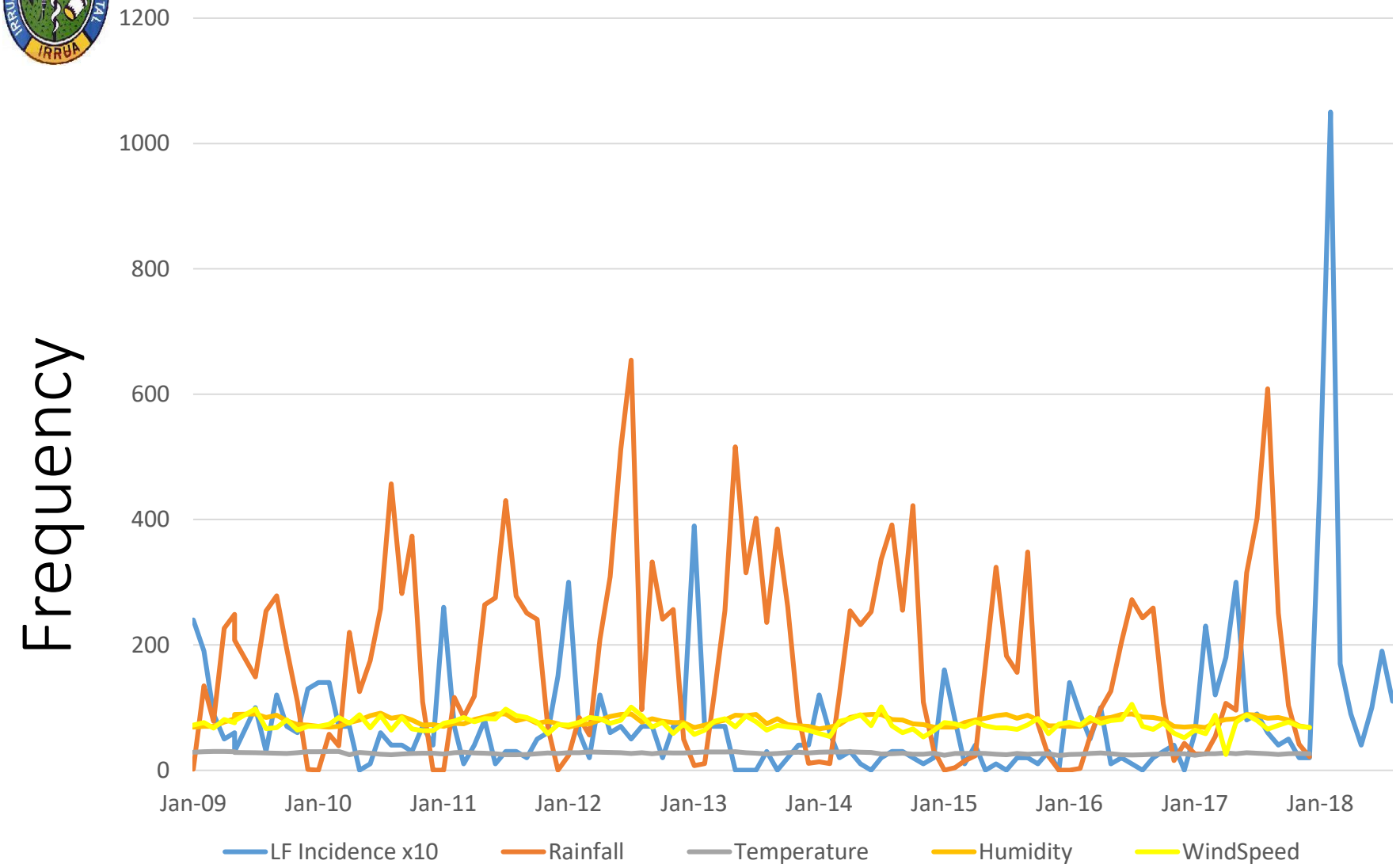

Figure 2: 10 year trend of LF incidence in relation to selected climatic factors

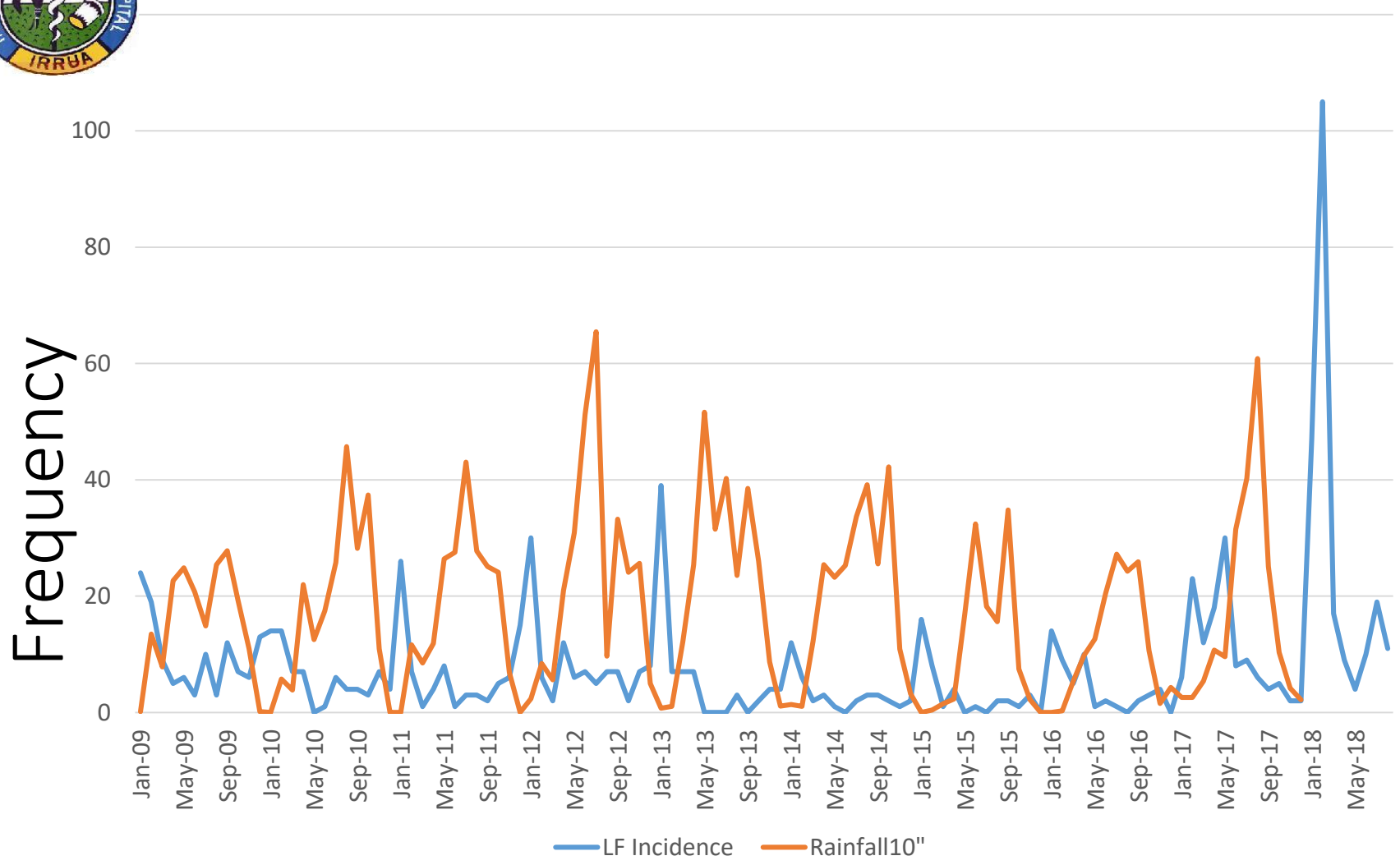

Figure 3: 10 year trend of LF incidence in relation to rainfall

Discussion

- The gradual shift in the annual peak incidence of LF observed seems not to have been reported in previous literatures.

- Knowledge of LF ecology, epidemiology, and distribution is limited, these present barriers to both short-term disease forecasting and the prediction of long-term impacts of environmental change on Lassa virus zoonotic transmission dynamics.

Discussion…

- The inverse relationship of monthly LF incidence and monthly climatic elements as showed in the result is consistent with a report by Clegg in which he stated that regions where pathogenic arenaviruses circulates, there is significant effects that are likely to include increases in surface temperature, changes in the extent and distribution of rainfall (Clegg, 2009).

Conclusion and Recommendation

- A seasonal shift in the distribution and occurrence of LF in Edo State was observed with a reduction in rainfall associated with increase in the incidence of LF.

We therefore recommend that

- Future research should also focus on the rainfall pattern as well as other climatic elements in order to improve the prediction of LF epidemic to inform epidemic preparedness for LF in LF endemic areas in Nigeria.
- **THANK YOU**.