Towards a Spatial-Temporal Model of Prevalence of Nodding Syndrome and Epilepsy

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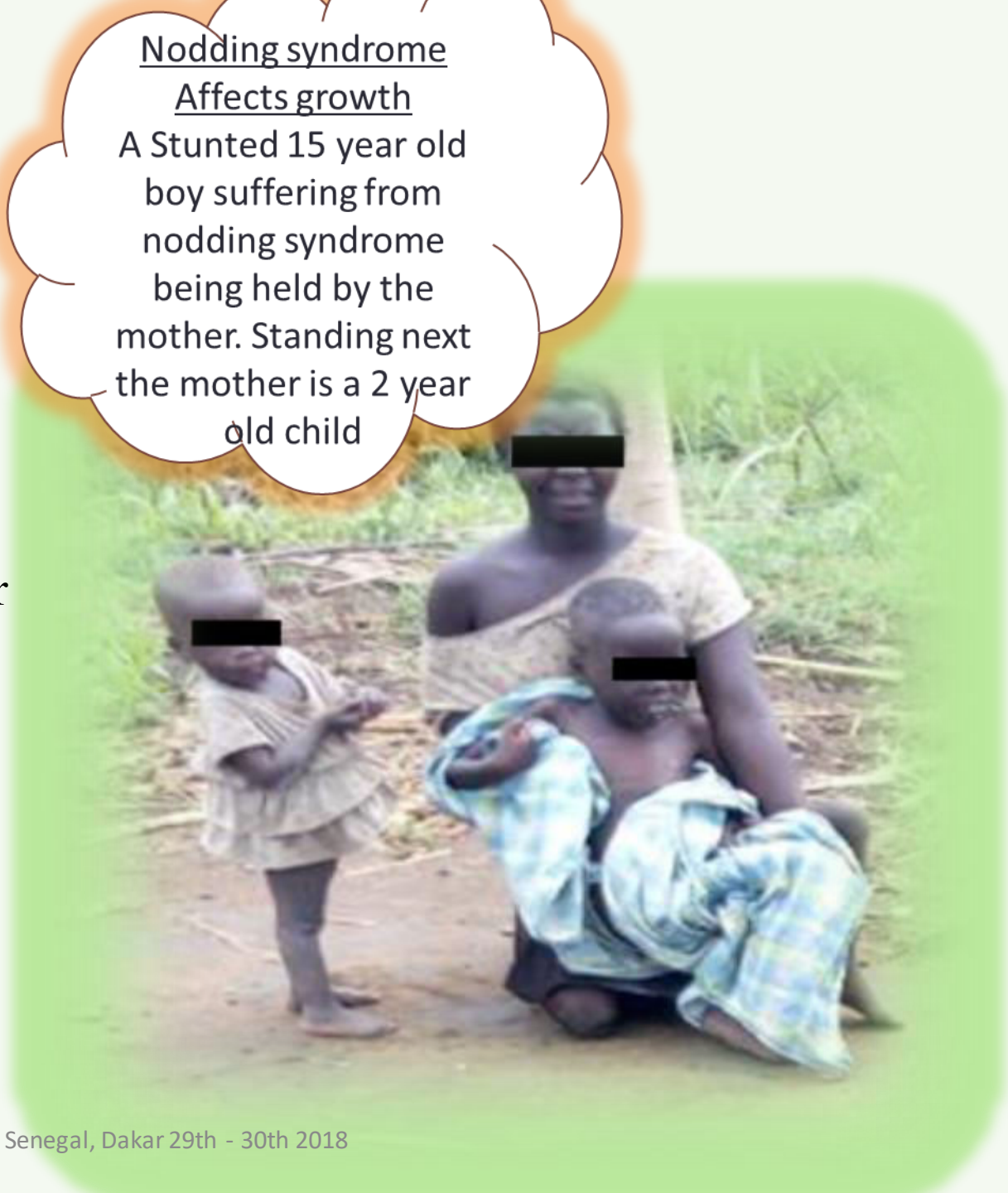
Introduction

- An emerging disease with various hypothesis of NS….
- Spatial-temporal analysis may provide a quick mechanism to establish comparative understanding of the various hypotheses
- Hypothesis ….NS as a form of epilepsy

Introduction

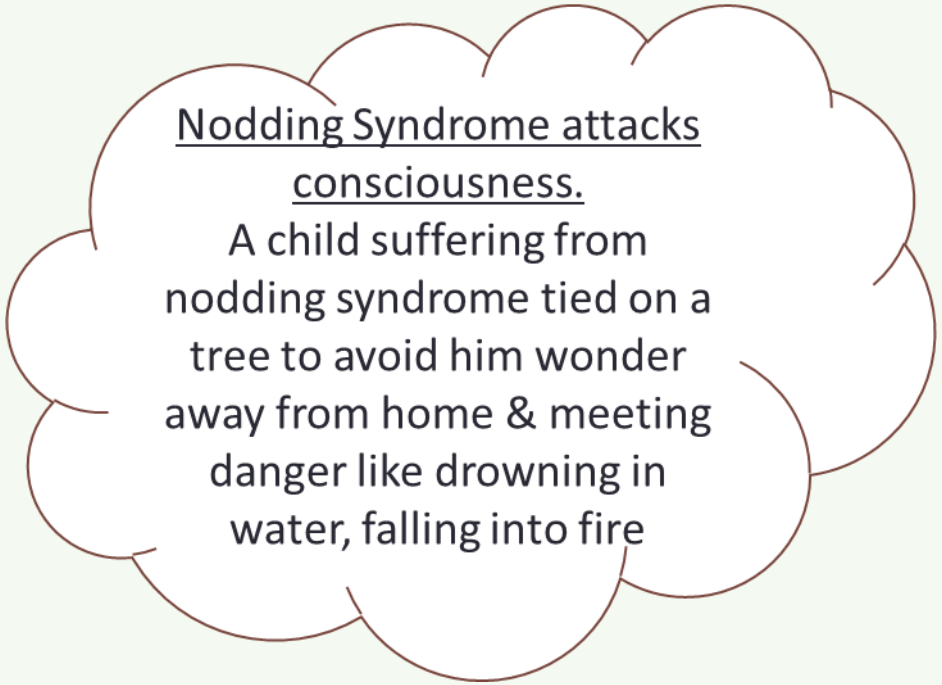
- NS is an emerging illness that has eluded surveillance models in Africa for over six decades since its discovery in the 1960's [7], [14].
- There is hardly any surveillance model for investigating spatial diffusion.
- Spatial diffusion patterns, and transmission models are not properly understood [18], the characteristics, risk factors as well as aetiological factors are also not well established [15], [18], [4] complicating surveillance efforts.



What is known about NS?

- Nodding Syndrome is a childhood neurological disorder which affects communities in Northern Uganda [13].

- There is a believe that NS is form of epilepsy" [11], [14], [8], and [12].



Disease Burden

- Epidemiological prevalence inaccurately presented by different organizations [1].
- NGO Forum estimates 5,000 in Kitgum alone
- MoH estimate 3,200 infected children
- Other scholars 1,876

Disease Burden

- Victims fall in fire, drown in water
- Results to serious socio-economic implication to families
- Victims wonder off from home & get abused
- Difficulties in attending school
- Social stigma to the families

Objectives of the paper

The compelling issues of this paper therefore are:

The *aim* of the paper is to establish relationships between ailments diagnosed as nodding syndrome and ailments diagnosed as epilepsy.

1) To establish the health facilities providing services to NS patients.

1) The need to establish spatial relationship of NS reporting and and epilepsy.

2) To model the relationship between the two ailments

Methodology

- Ethical procedures; clearance from DHOs, CAOs
- NS Focal persons key in identifying health centres reporting NS.
- Retrospective records used
- Diagnosis identified as NS
- Diagnoses identified as epilepsy

Methodology

- **Data collection tools**

Two questionnaires were used for data collection

1) The first was to elicit basic information on the gravity of nodding syndrome in the communities and also provide some statistical overview of patients attended to from a particular health centre.

2) The second was designed for health centres and hospitals data managers.

3) Although attempt was made to capture information for a span of 10 years, only five years were adequately accessible from almost all the health centres.

4) Global Positioning System (GPS) was used e to plot positions of the health centers.

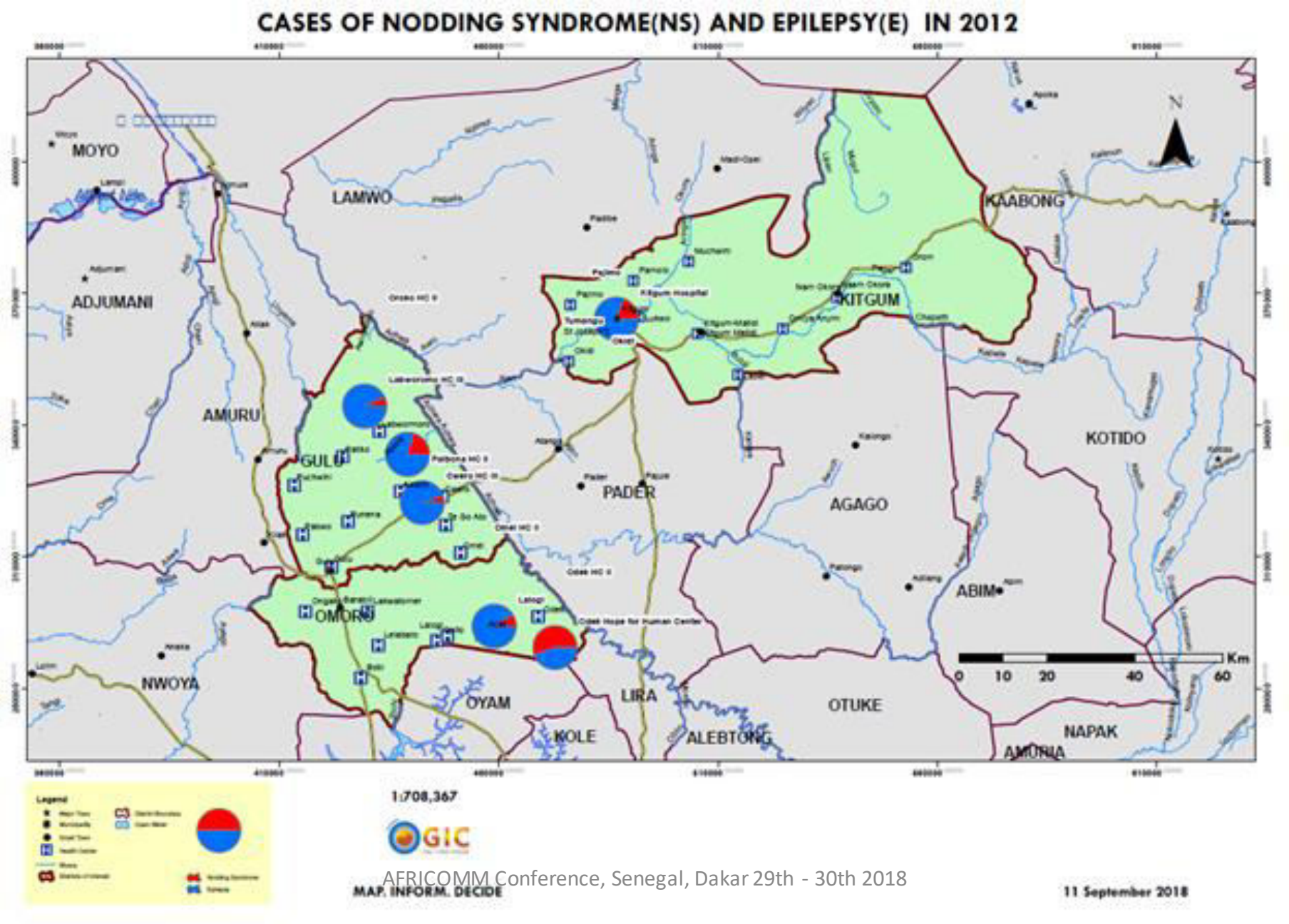
Methodology

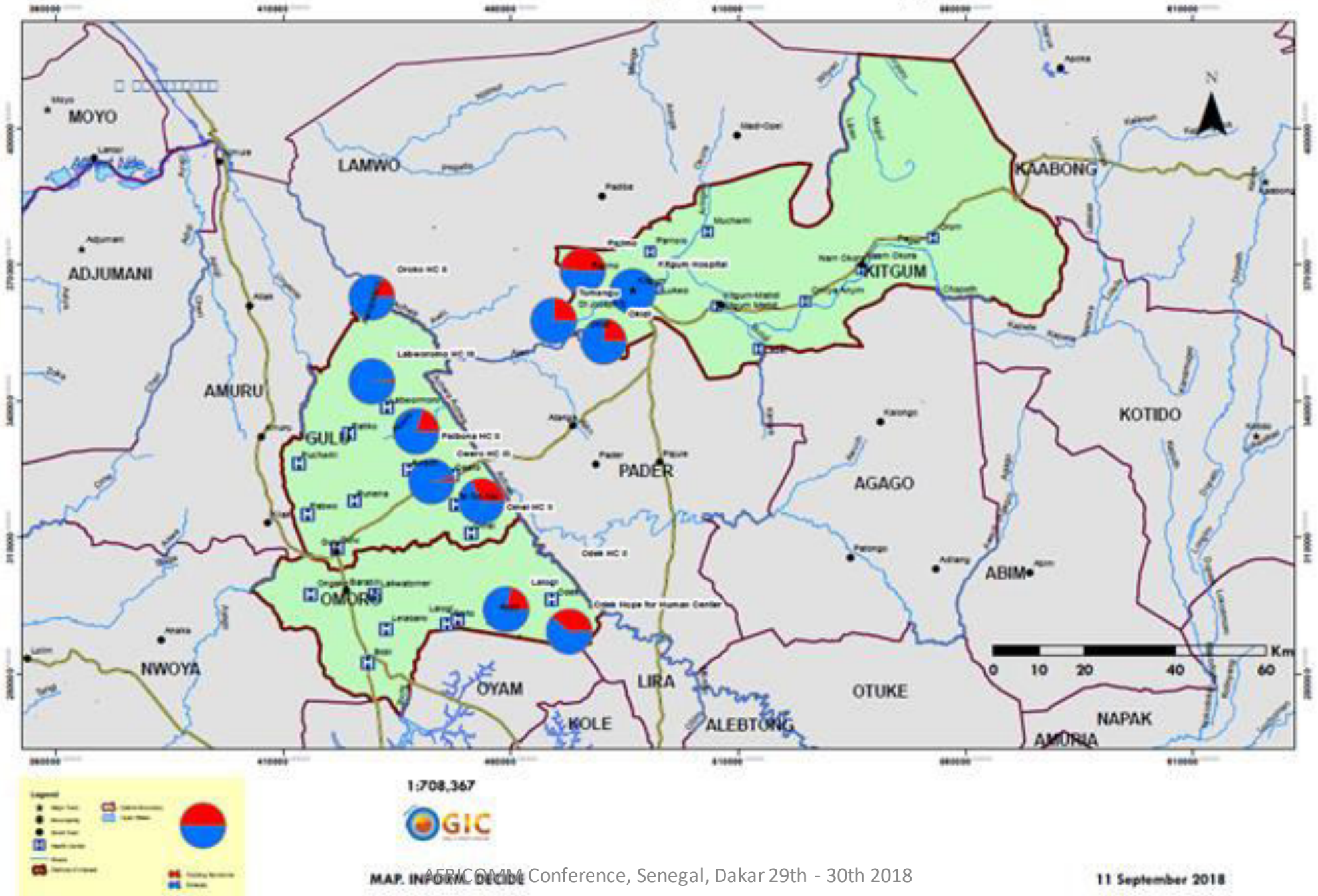
- **Data Analysis**

- Environmental System Research Institute (ESRI) ArcView Software.

- Statistical analysis was done using ANOVA while spreadsheet was used for trend analysis

The Study Findings




CASES OF NODDING SYNDROME(NS) AND EPILEPSY(E) IN 2014
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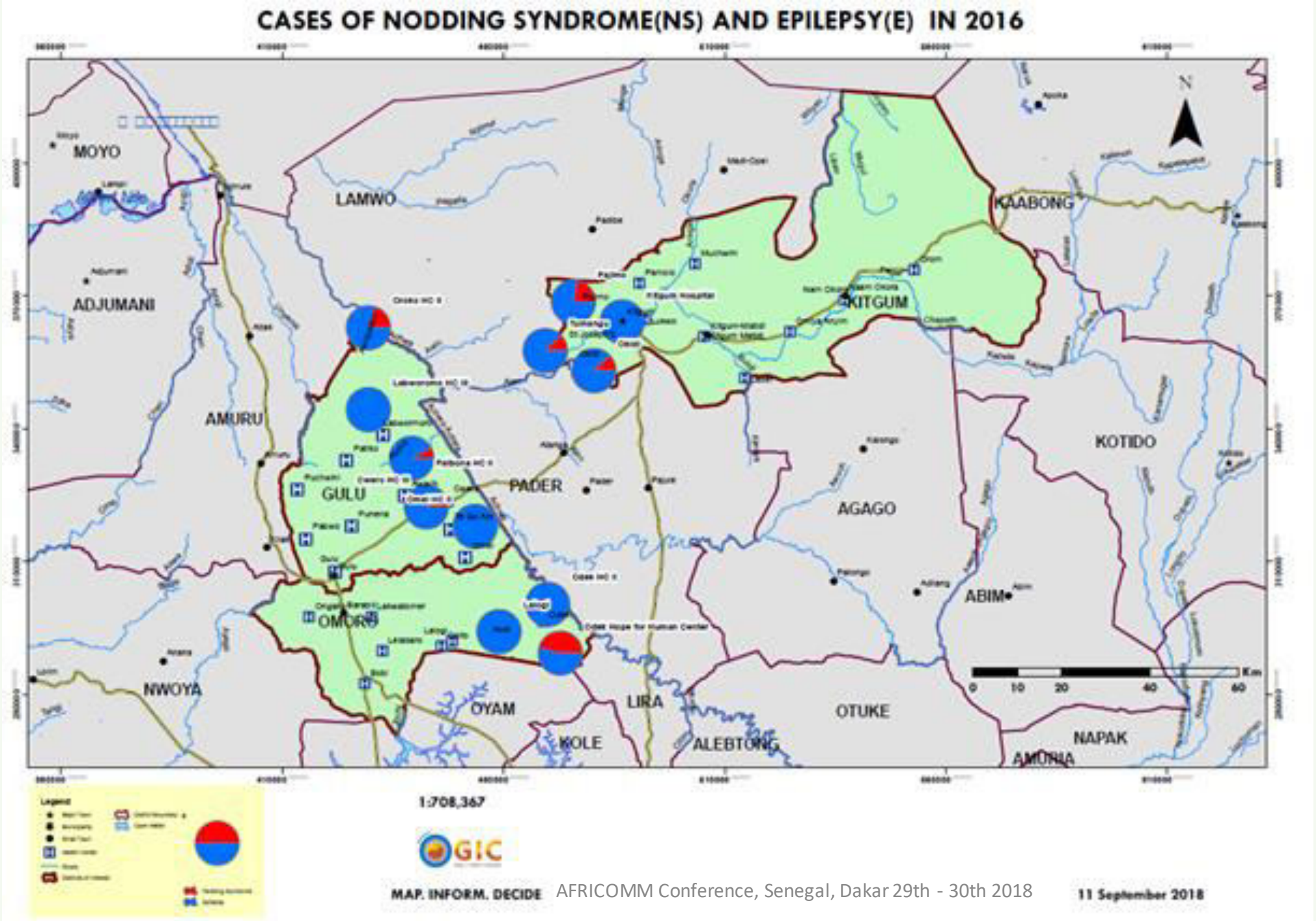
MAP. INFORM. DECIDE
11 September 2018


CASES OF NODDING SYNDROME(NS) AND EPILEPSY(E) IN 2016
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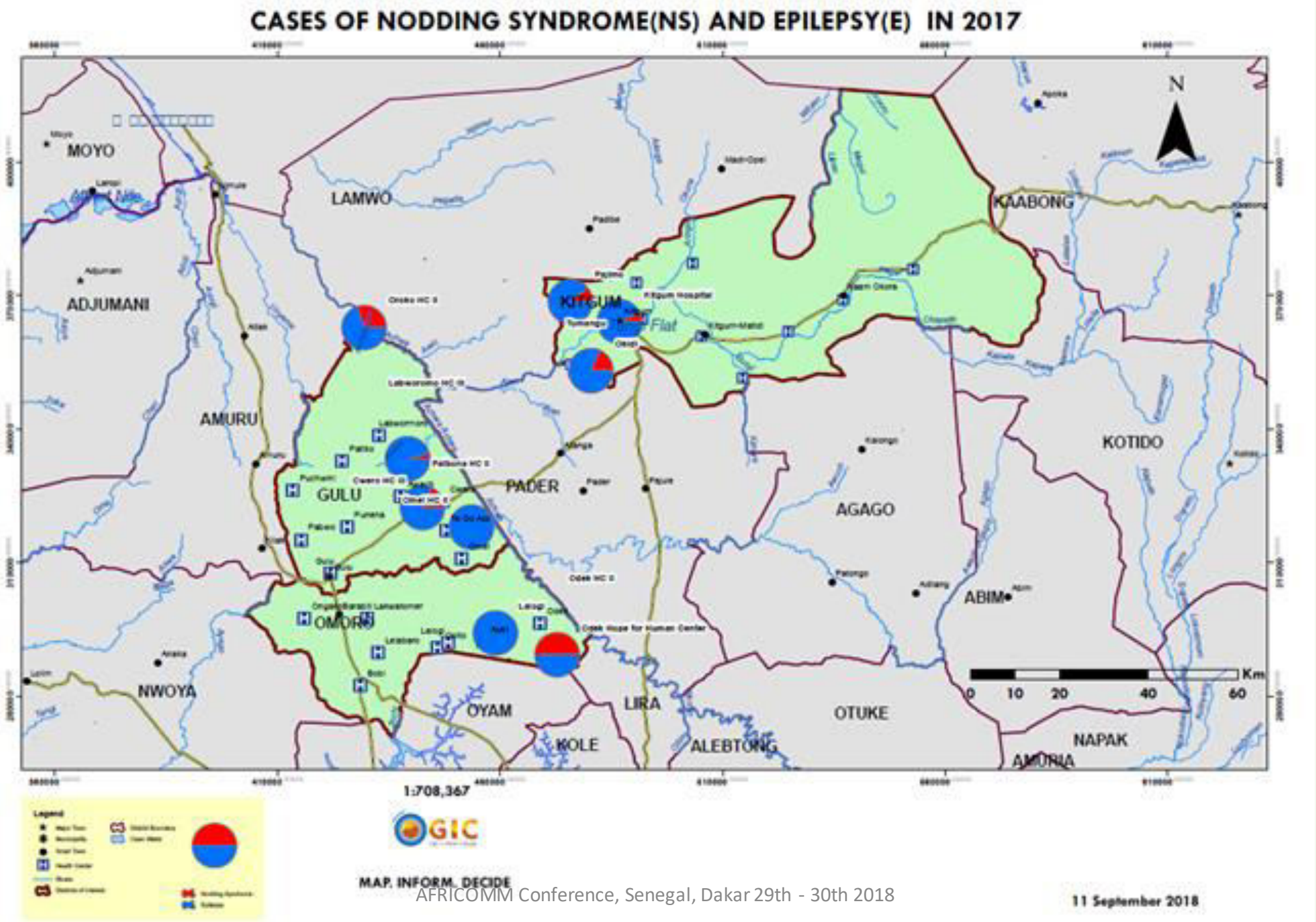
CASES OF NODDING SYNDROME(NS) AND EPILEPSY(E) IN 2017
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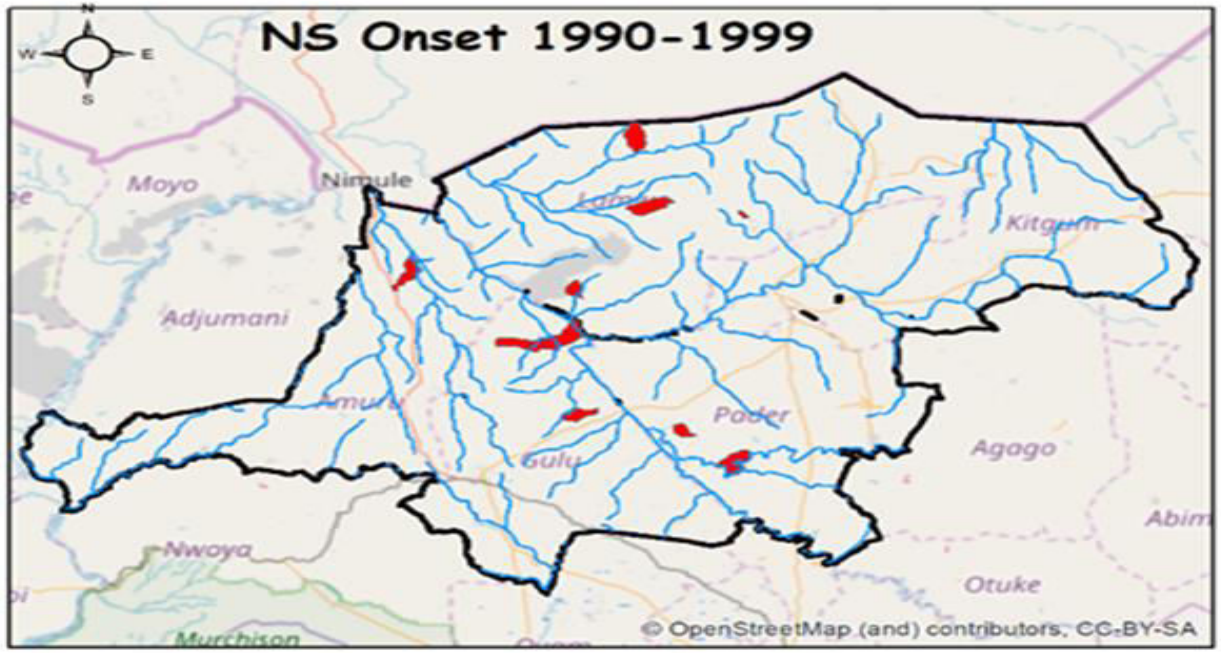
NS Onset 1990-1999
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Moyo
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Adjumani
Amuru
Gulu
Pader
Kitgum
Agago
Abim
Nwoya
Otuke
Murchison
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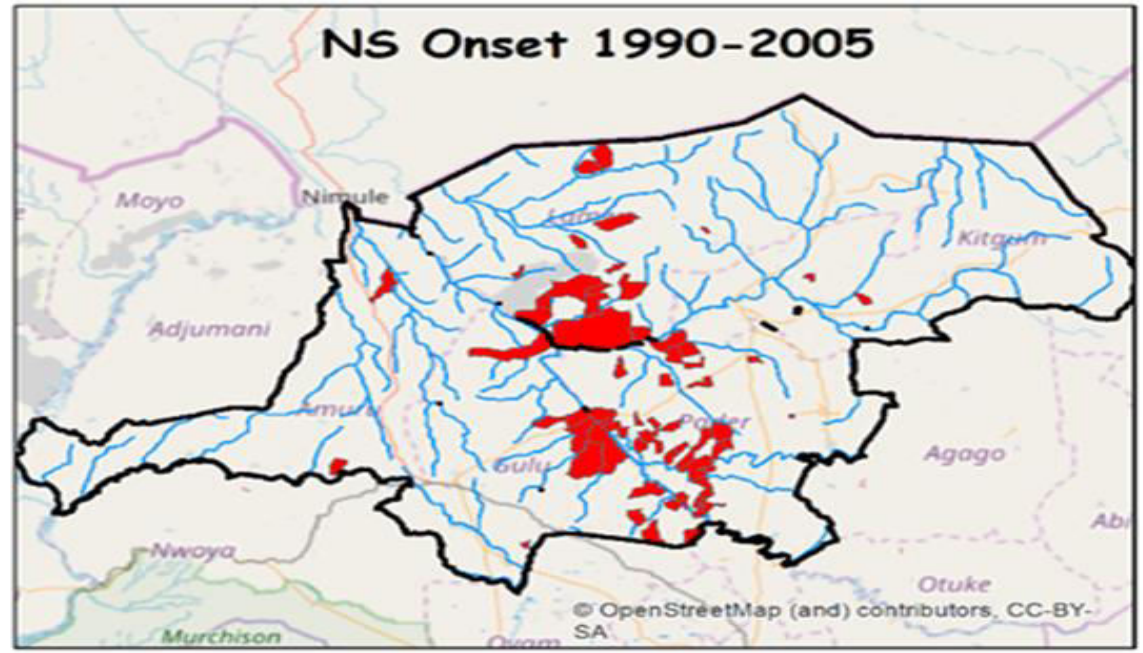
NS Onset 1990-2005
Moyo
Nimule
Adjumani
Amuru
Gulu
Pader
Kitgum
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Abim
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Otuke
Murchison
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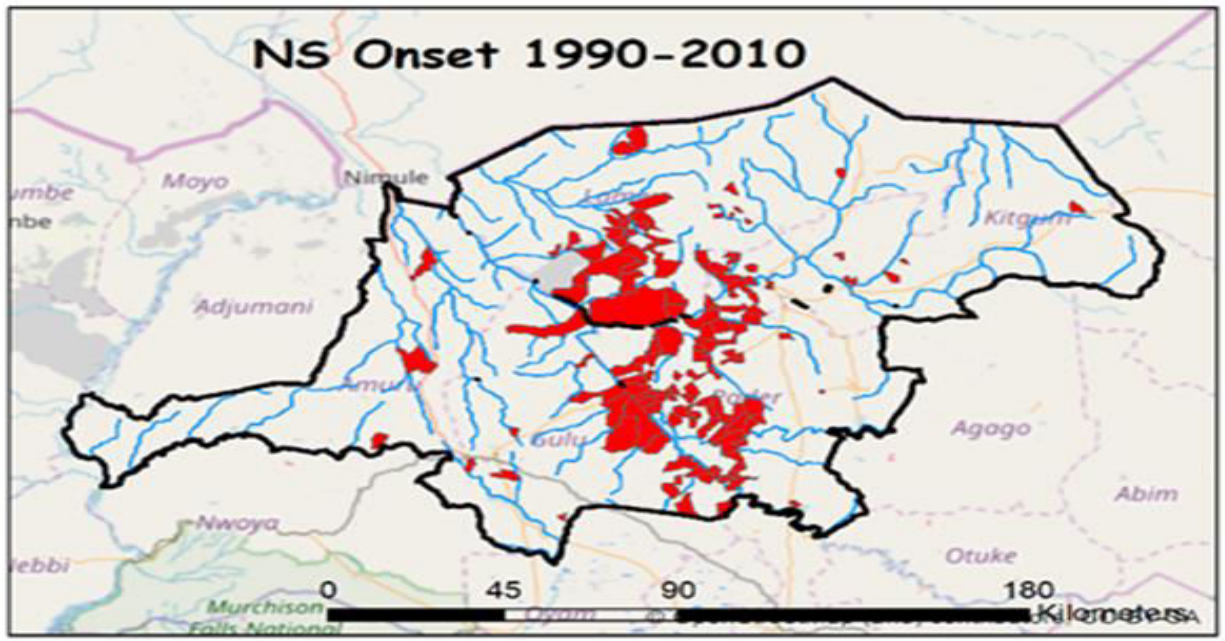
NS Onset 1990-2010
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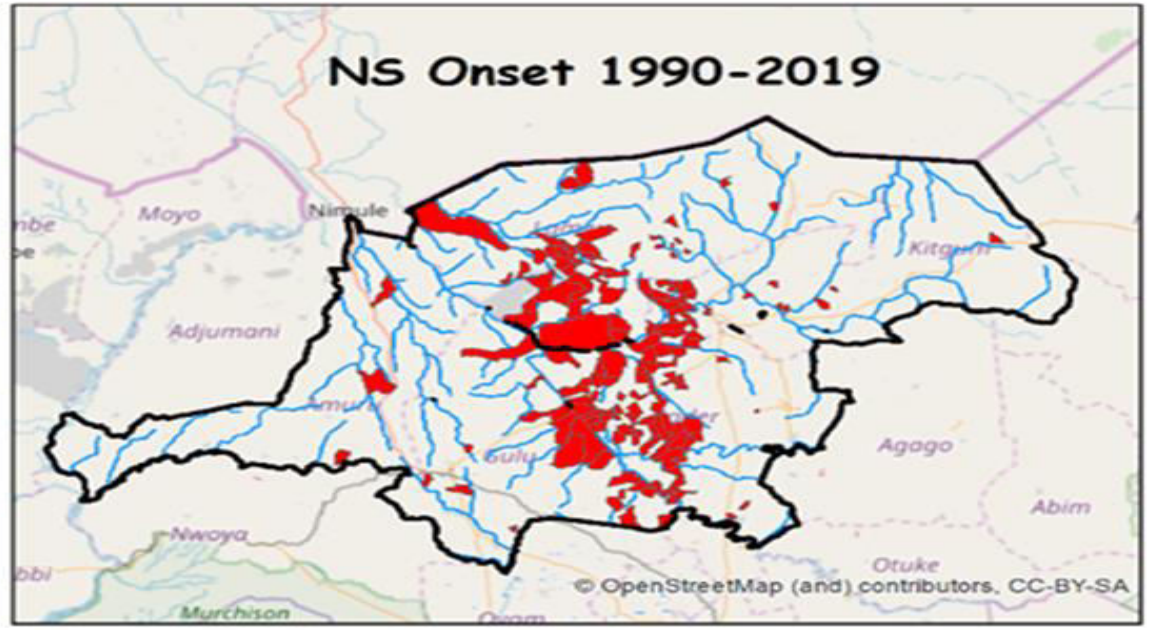
NS Onset 1990-2019
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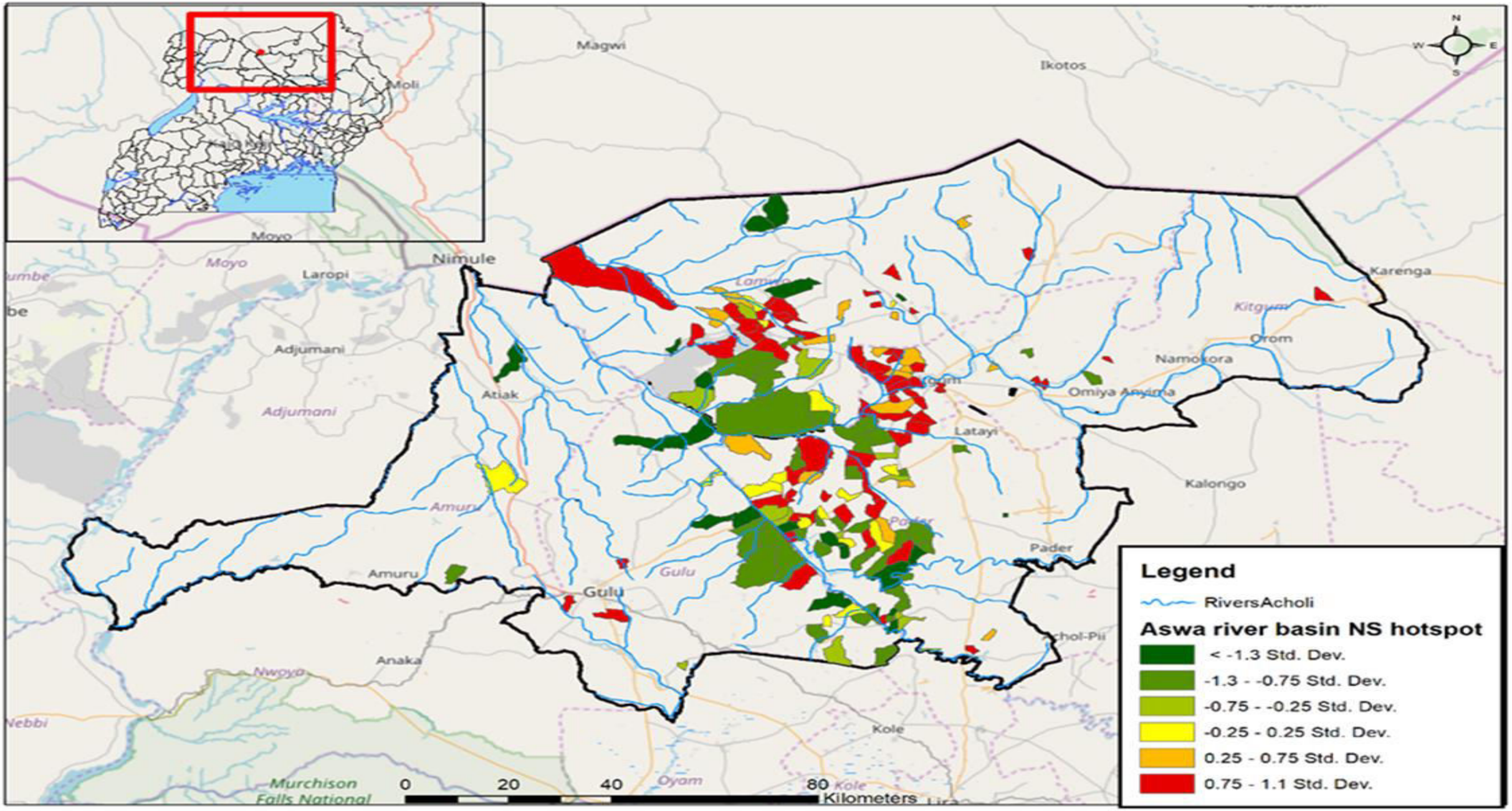
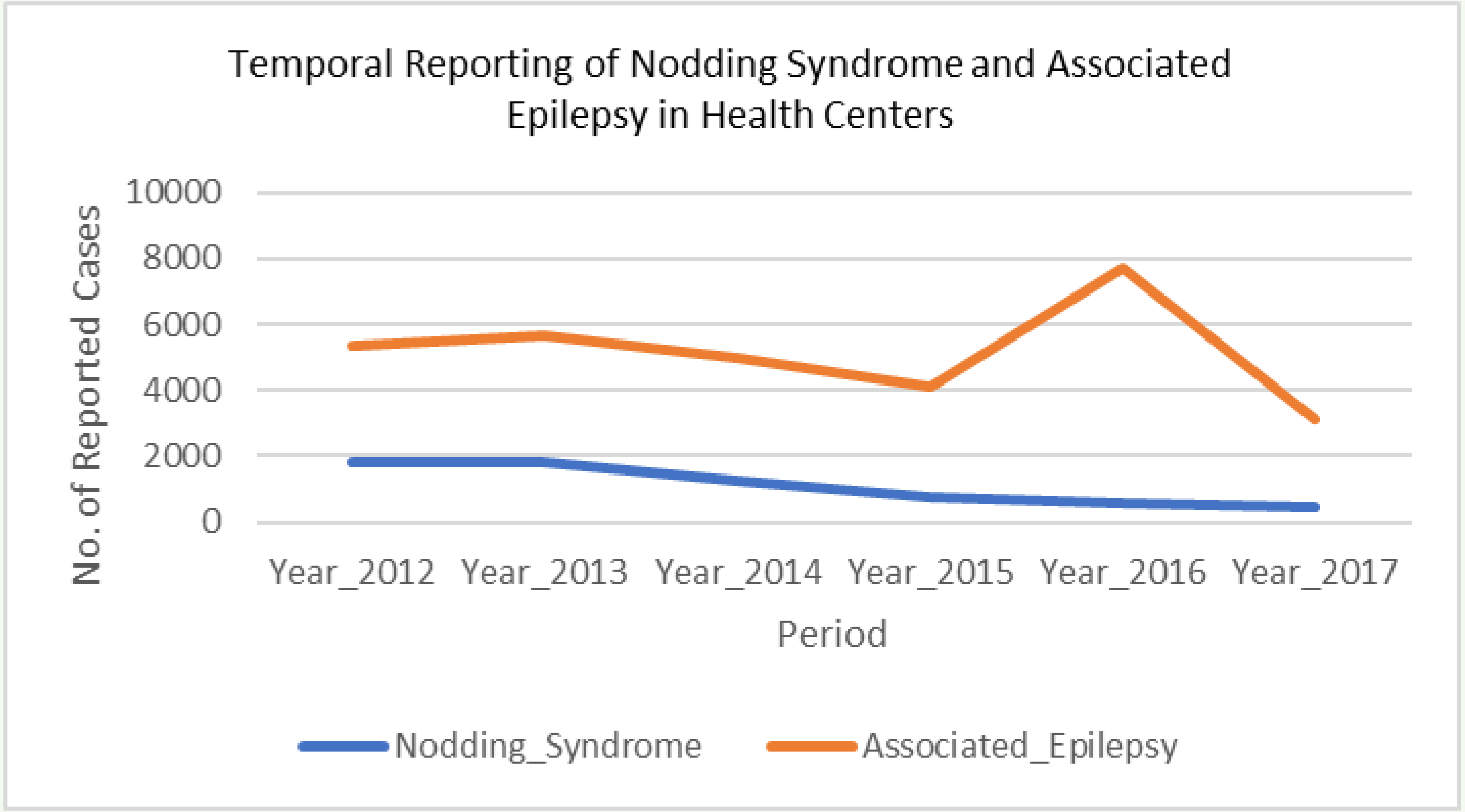
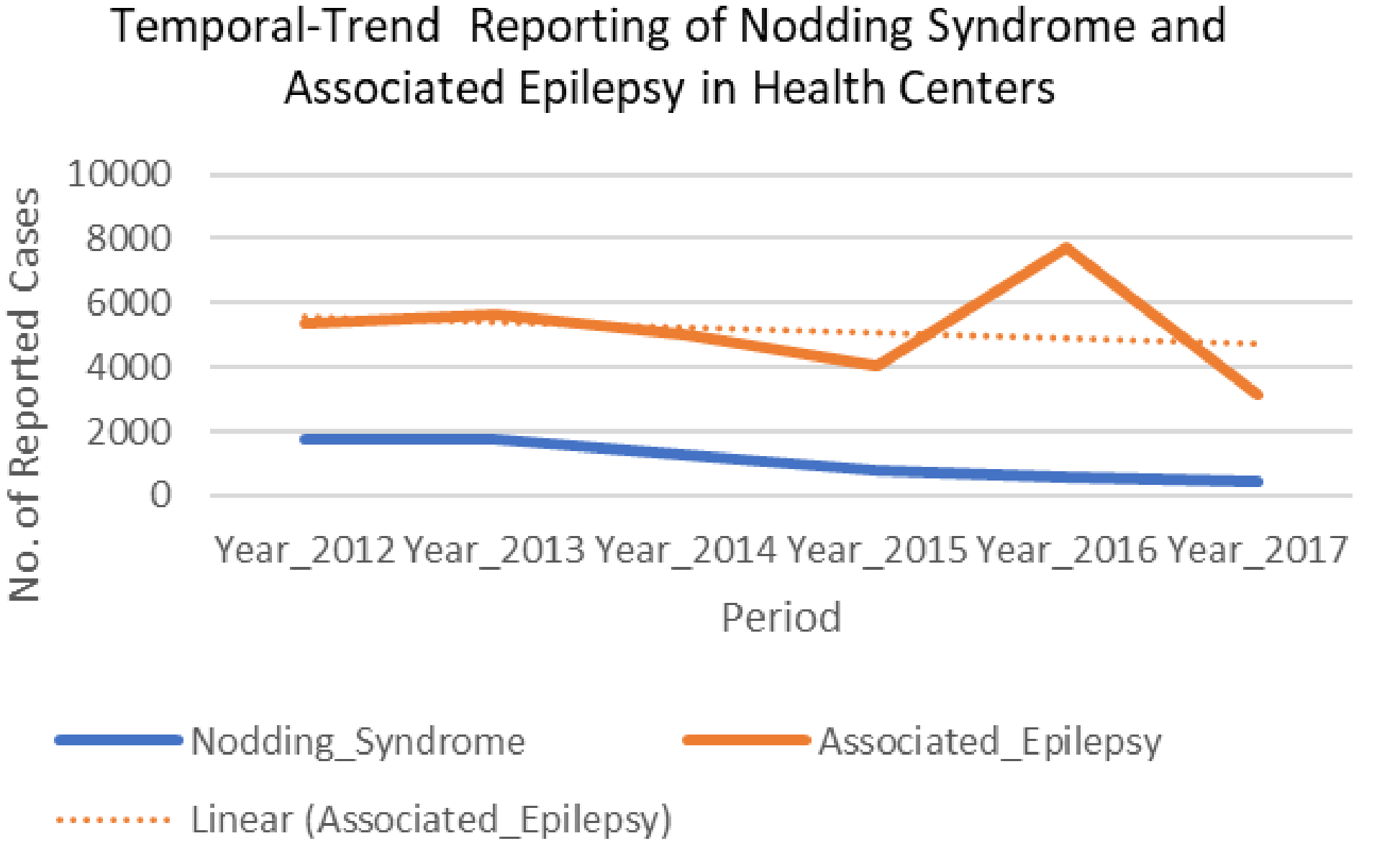
Hotspot Analysis



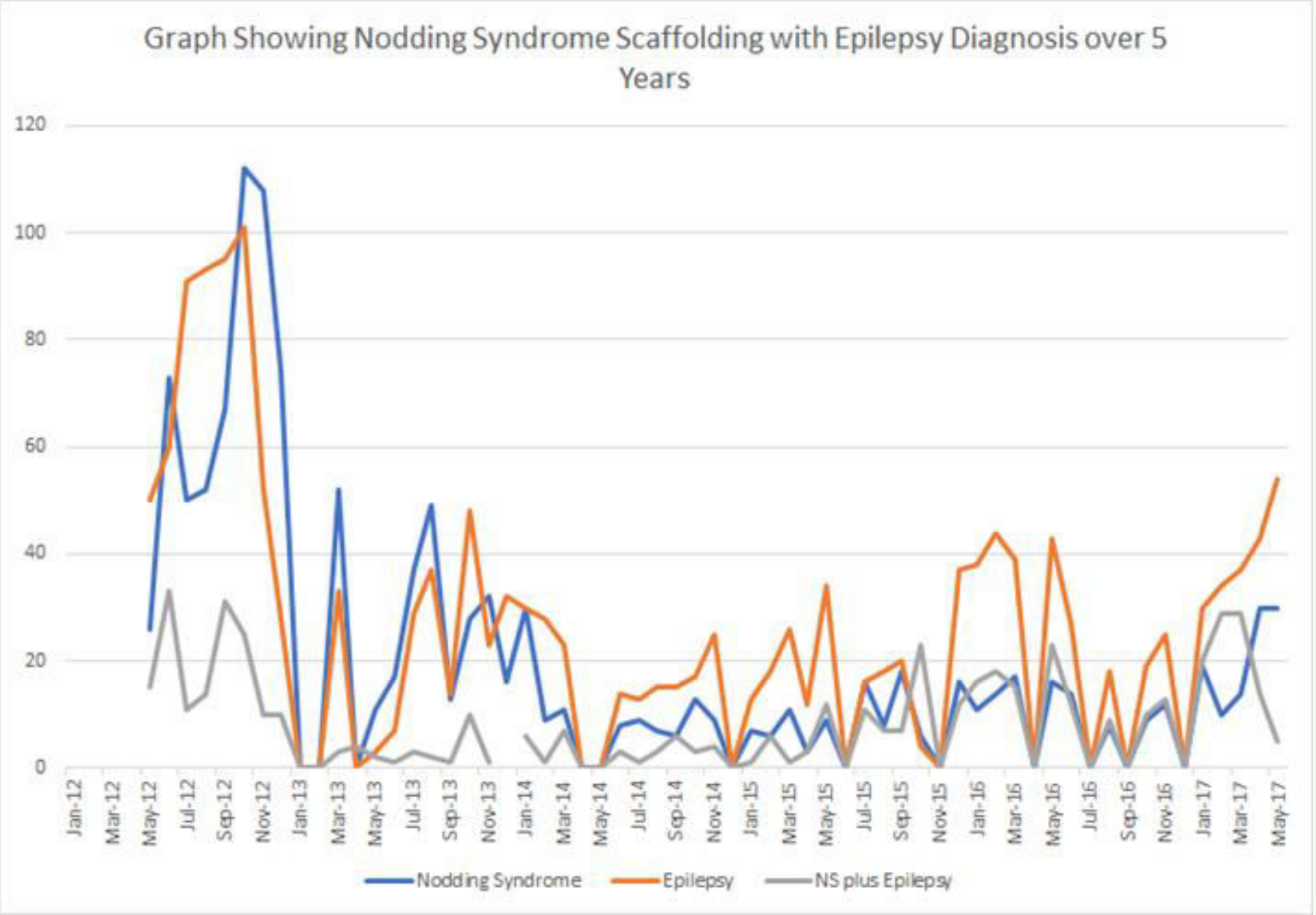
Analysis and Discussions



Best fit line overall



Temporal Scaffolding Pattern of Nodding Syndrome and Epilepsy –Hope for Human Center



Regression Analysis

Regression Statistics	
Multiple R	0.763688212
R Square	0.583219685
Adjusted R Square	0.576155612
Standard Error	16.07864554
Observations	61

- Overall, epilepsy significantly ($p<0.05$) explains about 58% of Nodding syndrome variability. This is given by the R^2 value (0.58).

Variance

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	21344.00476	21344.00476	82.56138826	8.20481E-13
Residual	59	15252.8477	258.5228424		
Total	60	36596.85246			

The F-statistic shows a very highly significant value ($p = 8.20481E-13$; $p<0.05$), meaning that the output of the regression is not by chance.

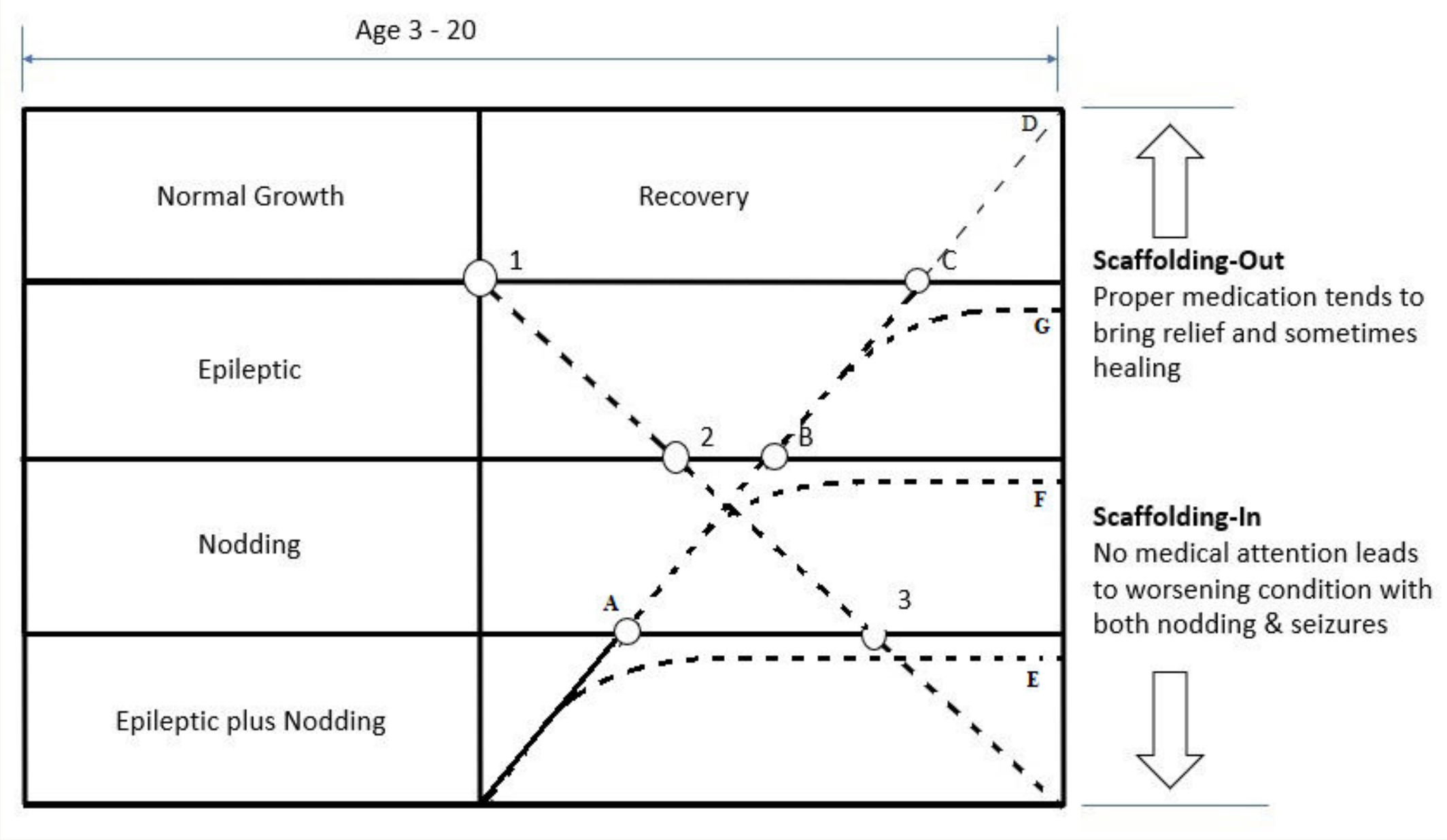
Contribution of epilepsy to NS

- The contribution of epilepsy to Nodding Syndrome is highly significant ($p<0.05$)

- The overall equation for this Epilepsy-NS association is given by equation

$$y = -0.572 + 0.7741(x)$$

Scaffolding Model of Nodding Syndrome and Associated Epilepsy



Conclusion

- Reporting NS started in the year 2012
- The trend of prevalence of NS and epilepsy over the years were very much the similar.
- There is scaffolding relationship in prevalence diagnosis of nodding syndrome and epilepsy.
- The study confirms that spatial-temporal distribution nodding syndrome is associated with spatial-temporal distribution of epileptic condition.

Conclusion

- Therefore, we can affirm that surveillance of nodding syndrome should be critical on pandemic outbreak of epilepsy.

- At the same time, we can also affirm that in the event of occurrence of emerging disease…..GIS approaches can be effective alternative investigation mechanisms to establish relationships between hypothetically similar outbreaks.

Special Thanks

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For Community Transformation

The End

Thank you