
Spatial analysis of the association between LLIN use and malaria prevalence in a longitudinal cohort in northeast Uganda

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Abstract The text of your abstract. 150 – 250 words.

Keywords LLIN · Spatial analysis · Malaria · RDT · Microscopy ·

1 Introduction

Your text comes here. Separate text sections with

2 Methods

Text with citations by Galyardt (2014), (Mislevy 2006).

2.1 Subsection title

as required. Don't forget to give each section and subsection a unique label (see Sect. 2).

Paragraph headings Use paragraph headings as needed.

$$a^2 + b^2 = c^2 \tag{1}$$

Grants or other notes about the article that should go on the front page should be placed here. General acknowledgments should be placed at the end of the article.

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3 Results

Table 1: Demographic characteristics, net usage, and malaria status of study population.

	Time 1 (N=194)	Time 2 (N=198)	Time 3 (N=200)	Time 4 (N=200)	p
Demographic					
Age mean (sd)	23.1 ± 15.8	22.4 ± 15.1	25.4 ± 17.5	25.4 ± 19.1	0.165
People per HH mean(sd)	5.6 ± 3.0	5.8 ± 3.3	5.1 ± 2.9	5.4 ± 2.9	0.129
Net usage					
Nets per HH mean(sd)	1.9 ± 1.7	2.9 ± 1.6	2.4 ± 1.3	2.0 ± 1.5	< 0.001
Nets per person mean(sd)	0.4 ± 0.3	0.6 ± 0.3	0.6 ± 0.3	0.5 ± 0.3	< 0.001
Nets per two mean (sd)					< 0.001
0	120 (61.9%)	66 (33.3%)	70 (35%)	105 (52.5%)	
1	74 (38.1%)	132 (66.7%)	130 (65%)	95 (47.5%)	
Malaria					
Total sampled mean (sd)	4.7 ± 2.6	4.3 ± 2.4	4.0 ± 2.1	4.0 ± 2.2	0.005
Prop + by RDT	0.4 ± 0.3	0.5 ± 0.3	0.3 ± 0.3	0.2 ± 0.2	< 0.001
Prop + by microscopy	0.2 ± 0.2	0.2 ± 0.3	0.1 ± 0.2	0.1 ± 0.2	< 0.001

Table 2: Coefficients from spatial model

	Dependent Variable			
	RDT+		MIC+	
	Net Cov	>= 1 net per 2	Net Cov	>= 1 net per 2
netCov	0.681 (0.525, 0.873)	0.813 (0.73, 0.94)	0.702 (0.513, 0.982)	0.859 (0.709, 1.01)
Time				
stime2	1.08 (0.936, 1.26)	1.08 (0.913, 1.22)	1.48 (1.16, 1.81)	1.44 (1.18, 1.76)
stime3	0.670 (0.552, 0.796)	0.681 (0.55, 0.791)	0.815 (0.598, 1.1)	0.781 (0.591, 0.994)
stime4	0.612 (0.515, 0.717)	0.614 (0.51, 0.734)	0.791 (0.58, 1.03)	0.784 (0.575, 0.989)
Spatial				
longitude	0.00286 (0.000212, 0.108)	0.00253 (0.000115, 0.0263)	0.014 (0.000124, 1.08)	0.0104 (0.0000946, 0.61)
latitude	0.852 (0.178, 5.21)	0.751 (0.169, 5.04)	0.203 (0.0116, 2.61)	0.211 (0.0186, 3.39)
sig^2	1.01 (1.00, 1.02)	1.01 (1, 1.02)	1.03 (1.01, 1.08)	1.03 (1.01, 1.08)
phi	1.52 (1.52, 7.39)	1.04 (1.04, 6.69)	1.04 (1.04, 6.82)	1.04 (1.04, 6.96)

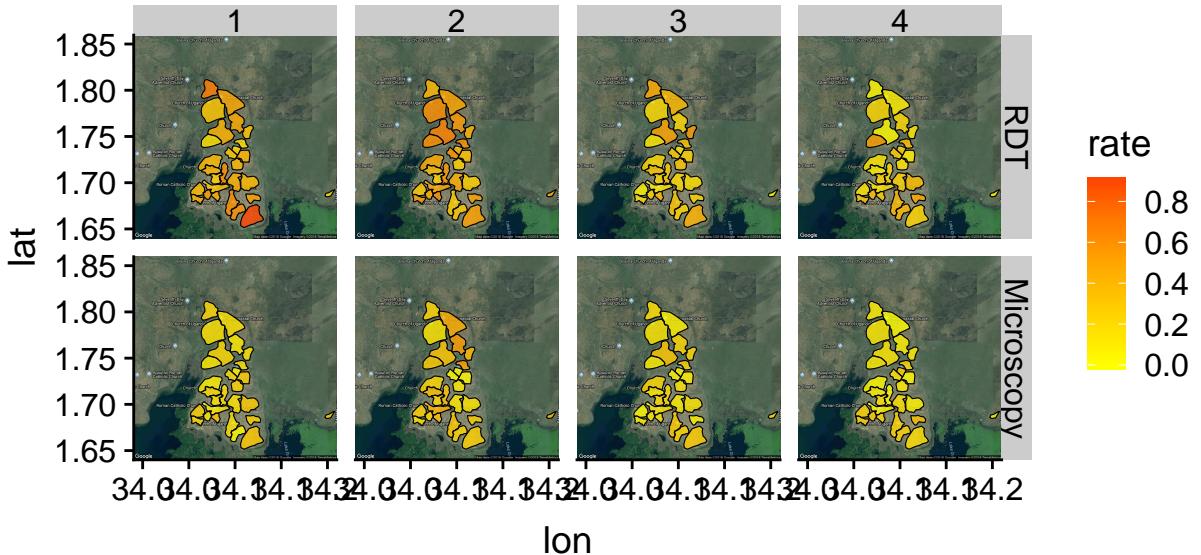


Fig. 1: Maps of microscopy and rapid diagnostic test positivity using village shapes by survey time.

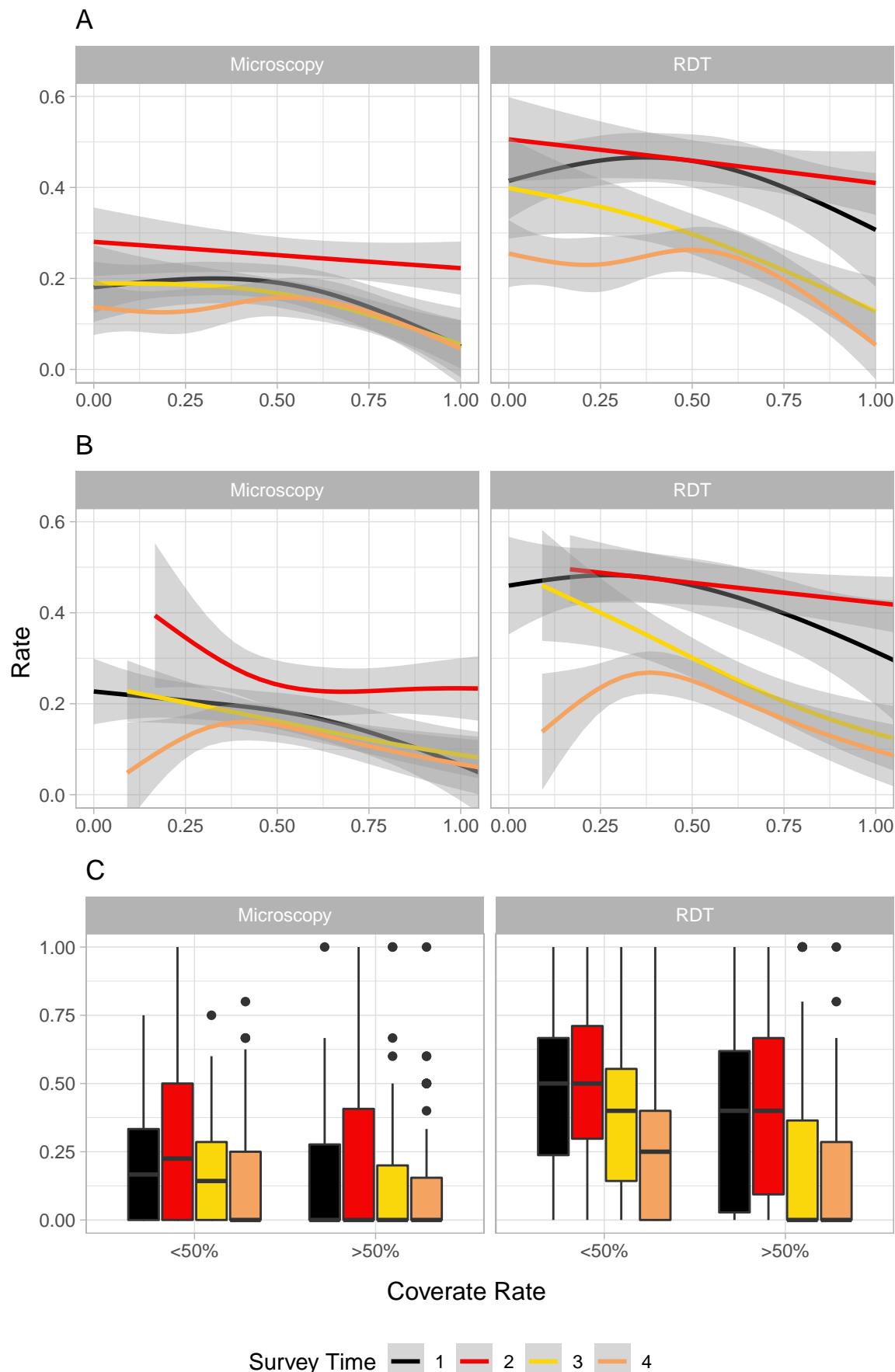


Fig. 2: Relationship between LLIN use and Positivity. **A:** Net coverage (i.e. proportion of net/tested in HH) vs. positivity. **B :** Sleeping under the net (i.e. Proportion of people sleeping under/per net in HH) and positivity. **C :** Net per two (i.e.>50% people in HH) and positivity

3.1 Subsection title

Referencing Table 1 is cool. as required. Don't forget to give each section and subsection a unique label (see Sect. 3).

Paragraph headings Use paragraph headings as needed.

$$a^2 + b^2 = c^2 \quad (2)$$

References

Galyardt, April. 2014. "Interpreting Mixed Membership Models: Implications of Erosheva's Representation Theorem." In *Handbook of Mixed Membership Models*, edited by Edoardo M. Airoldi, David Blei, Elena Erosheva, and Stephen E. Fienberg. Chapman; Hall.

Mislevy, Robert. 2006. "Cognitive Psychology and Educational Assessment." In *Educational Assessment*, edited by Robert L. Brennan. American Council on Education; Praeger Publishers.