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## Introduction

- ❖ Parasitological confirmation of all suspected malaria cases recommended by the WHO 'Test and Treat' Policy contributed to rational antimalarial prescription.
- ❖ Lack of malaria testing facilities prompts presumptive treatment of suspected malaria cases with an antimalarial, antibiotic, or both.
- ❖ Policy impact on antibiotic use among those with negative malaria tests is unknown.
- ❖ Antibiotic misuse drives antimicrobial resistance since bacterial infections are not routinely confirmed.
- ❖ We assessed antibiotic prescription practices among patients attending Malaria Reference Health Centres (MRCs) in Uganda following the introduction of the malaria 'Test-and-Treat' policy.

## Methodology

Figure 1: Study Area



- ❖ Descriptive Cross-sectional Study
- ❖ Purposive sampling.
- ❖ Analysed individual level antibiotic prescription data from Outpatient Department (OPD) Registers 6 Malaria reference centres (Level III/IV public health facilities in 6 districts in Uganda) from September 2008 – September 2017.
- ❖ Sites included: Walukuba HCIV – Jinja District; Kamwezi HCIV – Kabale District; Kihihi HCIV – Kanungu District; Kasambya HCIII – Mubende District; Aduku HCIV – Apac District & Nagongera HCIV – Tororo District.
- ❖ Compared malaria testing and antibiotic prescription data.
- ❖ Multivariate analysis using Logistic Regression model used to determine the association between malaria testing rates and antibiotic prescription patterns.

## Results

Table 1: Summary of population characteristics and Key Indicators

Variable	Time Period	
	2008 -2012	2013 -2017
Age in years, median (IQR)	18 (5 - 30)	19 (6 - 33)
Gender Female , n (%)	402,571 (62.9)	505,885 (65.2)
Malaria suspected, n (%)	372,914 (58.2)	357,579 (46.1)
Testing rates, n (%)	348,096 (93.3)	341,786 (95.6)
Tested by microscopy, n (%)	314,775 (90.4)	287,253 (83.8)
Confirmed Malaria, n (%)	127,418 (36.6)	122,308 (35.8)
Prescribed antibiotics, n (%)	369,597 (57.7)	477,436 (61.3)
Negative test result & received antibiotics	138,304 (62.7)	147,324 (66.9)

Table 2: Bivariate analysis: antibiotic prescription and key variables.

Variable	Prescribed antibiotics, N=1,419,798	Unadjusted OR (95% CI)	P value
Age Categories	<5 yrs	198,759 (23.5%)	
	≥5 yrs	646,265 (76.5%)	0.84 (0.83 – 0.85) <0.0001
Sex	Male	299,731 (35.4%)	
	Female	546,946 (64.6%)	1.05 (1.04 – 1.06) <0.0001
Type of Malaria Test done	Microscopy	325,447 (88.4%)	
	RDT	42,835 (11.6%)	0.79 (0.78 - 0.81) <0.0001
Malaria Test Result	Positive	82,636 (22.4%)	
	<b>Negative</b>	<b>285,628 (77.6%)</b>	<b>3.72 (3.69 – 3.76) &lt;0.0001</b>

Figure 2: Higher odds of antibiotic prescription with a negative malaria result

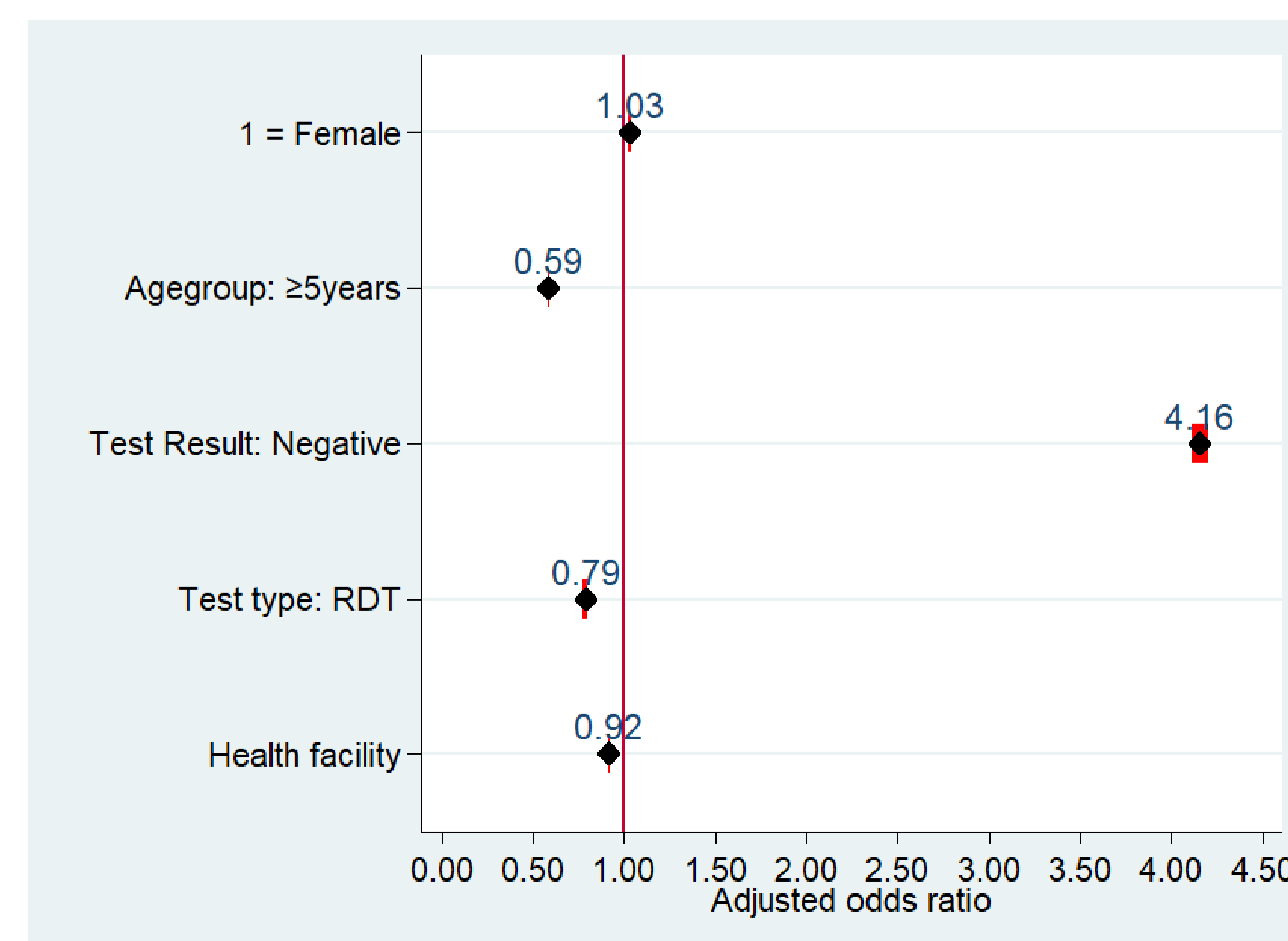


Figure 3: Trends in malaria testing rates and antibiotic prescription among patients with a negative malaria test result.

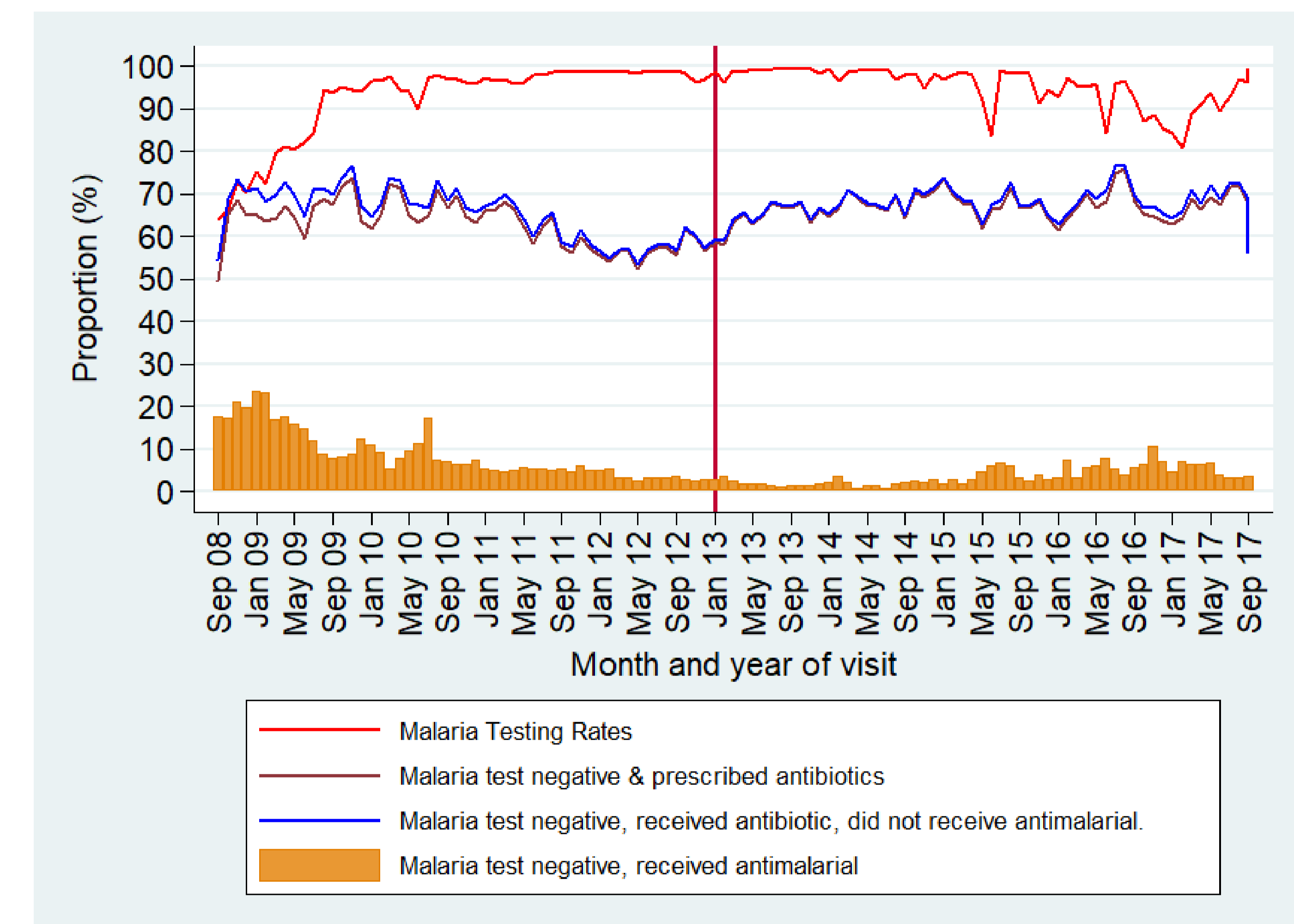


Table 3: Comparison between antibiotic prescription before and after introduction of the 'test and treat' policy.

Variable	Before (2008 -2012)	After (2013 - 2017)	d* (%)	(95% CI)	P value
Prescribed antibiotics, n (%)	369,597 (57.7)	477,436 (61.3)	3.6	(3.4 - 3.8)	<0.0001
Negative result, prescribed antibiotics, n (%)	138,304 (62.7)	147,324 (66.9)	4.2	(3.9 - 4.5)	<0.0001
Negative result, prescribed antibiotic, no AM** given, n (%)	131,299 (64.6)	144,116 (67.8)	3.2	(2.9 - 3.5)	<0.0001

\*d: difference. \*\*AM: antimalarial

## Key Findings and Conclusion

- ❖ Malaria testing rates increased from 93.3% before to 95.6% after the policy.
- ❖ The odds of antibiotic prescription were 4.16 times higher for malaria negative as compared to malaria positive patients.
- ❖ 3.6% increment in overall antibiotic prescription at OPD after the policy.
- ❖ Prescription of antibiotics 3.2% higher when clinicians adhere to negative malaria test results.
- ❖ The odds of antibiotic prescription were 4.16 times higher for malaria negative as compared to malaria positive patients.