

# Investigating fever occurrence among under-fives and seasonal malaria chemoprevention protocol adherence in northern Nigeria

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## Introduction

Fever is the most common symptom of malaria among under-fives in Nigeria.<sup>1</sup> Fever prevalence is high in northern Nigeria (up to 35 percent).<sup>2</sup> Guided by a standard protocol, community distributors (CDs) provide seasonal malaria chemoprevention (SMC) to children 3–59 months in the Sahel to prevent malaria. We assessed the relationship between fever reports in children and CDs’ protocol adherence, and whether any such association had been modified by households’ concurrent use of insecticide-treated nets (ITNs).

## Methods

- Secondary quantitative analysis of data from the December 2019 SMC post-campaign coverage survey in five Nigerian states — Jigawa, Katsina, Sokoto, Yobe and Zamfara.
- Survey participants: caregivers of SMC-eligible children.
- Sample: 5,215 SMC-treated children.
- Outcome variable: fever occurrence within the preceding month.
- Main explanatory variable: protocol adherence
  - high = directly observed therapy (DOT) and three key messages given
  - medium = only DOT
  - low = no DOT.
- Adjusted odds ratios (AORs) estimated from generalised linear models, including ITN use.

## Results

- About 43 percent of SMC-treated children had had a fever within the preceding month.
- CDs’ protocol adherence was high, medium and low for 13, 58 and 30 percent of children, respectively.
- The odds of fever occurrence were significantly lower with:
  - high (AOR=0.59; p=0.03) and medium (AOR=0.74; p=0.03) compared to low protocol adherence (test for trend: p=0.012)
  - ITN use (AOR=0.53; p< 0.001).
- The largest reduction in fever occurrence was when protocol adherence was high and an ITN was in use.

## Conclusion

This study shows that fever occurrence in children reduced following an SMC campaign in which CDs’ protocol adherence was high, and that the effect was greater when an ITN was in use. This suggests that quality SMC delivery should be emphasised in CDs’ training and supervision and that universal coverage of ITNs should be prioritised. Nevertheless, our study’s ability to make malaria-related inferences is limited as fever reports may not indicate malaria infection. Further research should, therefore, investigate the relationship between confirmed malaria cases and SMC protocol adherence.

## References

1. Hamooya BM, Chongwe G, Sitali L, Halwindi H. Reported incidence of fever for under-5 children in Zambia: A longitudinal study. Archives of Public Health, 2015; 73(1): 46.
2. National Population Commission of Nigeria, ICF. Nigeria Demographic and Health Survey 2018. Abuja, Nigeria, and Rockville, Maryland, USA; 2019.

# Quality delivery of seasonal malaria chemoprevention significantly reduces fever occurrence in under-fives when used alongside insecticide-treated nets



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## Supplementary visuals

Table 1: Demographic characteristics and outcome variables

Variables		n=5,215	Percentage
Background characteristics			
Age of child	3-11 months	427	8.2
	12-59 months	4,788	91.8
Child received full course of SMC (Yes)		4,928	94.5
Child slept under ITN the night before the survey (Yes)		3,937	75.5
Child treated in all four SMC cycles (Yes)		2,114	40.5
Variables related to protocol-adherent service delivery by CD and fever occurrence			
CD administered DOT (1st dose) to child	No	1,560	29.9
	Yes	3,655	70.1
All three key messages given	No	1,711	32.8
	Yes	3,504	67.2
Level of protocol adherence by CD	High	651	12.5
	Medium	3,004	57.6
	Low	1,560	29.9
Fever occurrence within the preceding month	No	2,984	57.2
	Yes	2,231	42.8

Table 2: Regression model predicting occurrence of fever by level of protocol adherence, adjusting for other variables

Independent variables	AOR	p value	95 percent confidence interval	
			Lower limit	Upper limit
Level of protocol adherence by CD (Ref = Low)				
High	0.59	0.028	0.37	0.94
Medium	0.74	0.026	0.57	0.96
Use of ITN (Ref = No)				
Yes	0.53	0.001	0.43	0.66
Child treated in all four SMC cycles (Ref = No)				
Yes	0.73	0.048	0.54	0.99
Child received full course of SMC (Ref = No)				
Yes	0.56	0.001	0.40	0.78

Figure 1: Effect modification of the association between protocol-adherent SMC service delivery and fever occurrence by use of ITN

