

Evaluating the acceptability and usability of digital tools for implementing a long-lasting insecticidal net distribution campaign in Northern Bahr el Ghazal state, South Sudan

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Digitalisation of long-lasting insecticidal net distribution is possible in areas with low network coverage

Introduction

Long-lasting insecticidal nets (LLINs) have been the backbone of malaria prevention for decades.^[1] Typically, LLINs are distributed by volunteers and data are collected using paper-based systems (PBSs). Use of PBSs can lead to data inaccuracies and hinder the use of data for decision-making. In 2022, Malaria Consortium, in partnership with South Sudan's National Ministry of Health, developed a digital tool for collecting and reporting data during LLIN campaigns, with the aim of improving data accuracy, supporting timely decision-making and assisting with overall LLIN distribution workflow.

The digital tool has been designed with two key requirements. The first is offline functionality, so it can be used in areas without internet access, while the second is interoperability with the Digital Health Information System2 (DHIS2), to improve real-time decision-making.

Methods

- The digital tool was piloted in Central Equatoria and later scaled up to be used throughout the state of Northern Bahr el Ghazal.
- We used semi-structured interviews to assess the acceptability of the tool to users, their supervisors and other key senior stakeholders in five counties of Northern Bahr el Ghazal.
- We determined usability using a modified and validated system usability scale (SUS) approach,^[2] with primary users of the digital tool as respondents.

Results

- A total of 93 respondents participated in the acceptability and usability assessments. The mean (±standard deviation) usability score across 10 SUS-scoring items was 60.91 (12.87), indicating a reasonably good level of usability.
- Most users said that the LLIN digital tool was easy to use, reduced workload, and helped in stock management and real-time campaign monitoring. Usability did not differ significantly across genders, roles and counties.
- Respondents perceived the digital tool to be acceptable. Most preferred the tool to the paper-based version and recommended its use in future LLIN campaigns.
- Challenges reported were: slow loading and updating of GPS data, tablet charging issues, poor internet connectivity and short training time.

Conclusion

Overall, our results show that users and stakeholders found the LLIN digital tool to be acceptable, usable and useful in terms of improved reporting and workflow. However, this was not without operational challenges. The results underscore the need for optimising future LLIN digitalisation to improve user experience and implementation outcomes.

Results

Table 1. Mean system usability scale score distributions across respondents' characteristics

Variable	Number of respondents	Mean (±SD) SUS scores [#]	p value [*]	
All	93	60.91 (12.87)		
County	Aweil Centre	5	73.00 (4.11)	0.542
	Aweil East	41	57.32 (14.98)	
	Aweil North	18	64.31 (5.61)	
	Aweil South	10	72.25 (3.99)	
	Aweil West	19	56.32 (11.44)	
Gender	Female	3	50.83 (17.74)	0.204
	Male	90	61.25 (12.67)	
Role	County Health Department	5	73.00 (4.11)	0.062
	Manager	21	60.71 (9.91)	
	Payam supervisor	10	68.25 (8.90)	
	Registrar	56	58.66 (14.09)	
	State Ministry of Health	1	57.50	

SD: standard deviation
[#]mean SUS scores have a range of 0–100, calculated by adding the scores of 10 items in the rating scale, which covered various aspects of system usability. These included ease/difficulty of use, need for support, complexity and perceived usefulness of the tool.
^{*}ANOVA test of comparison of means

Figure 1. Maps showing the study counties

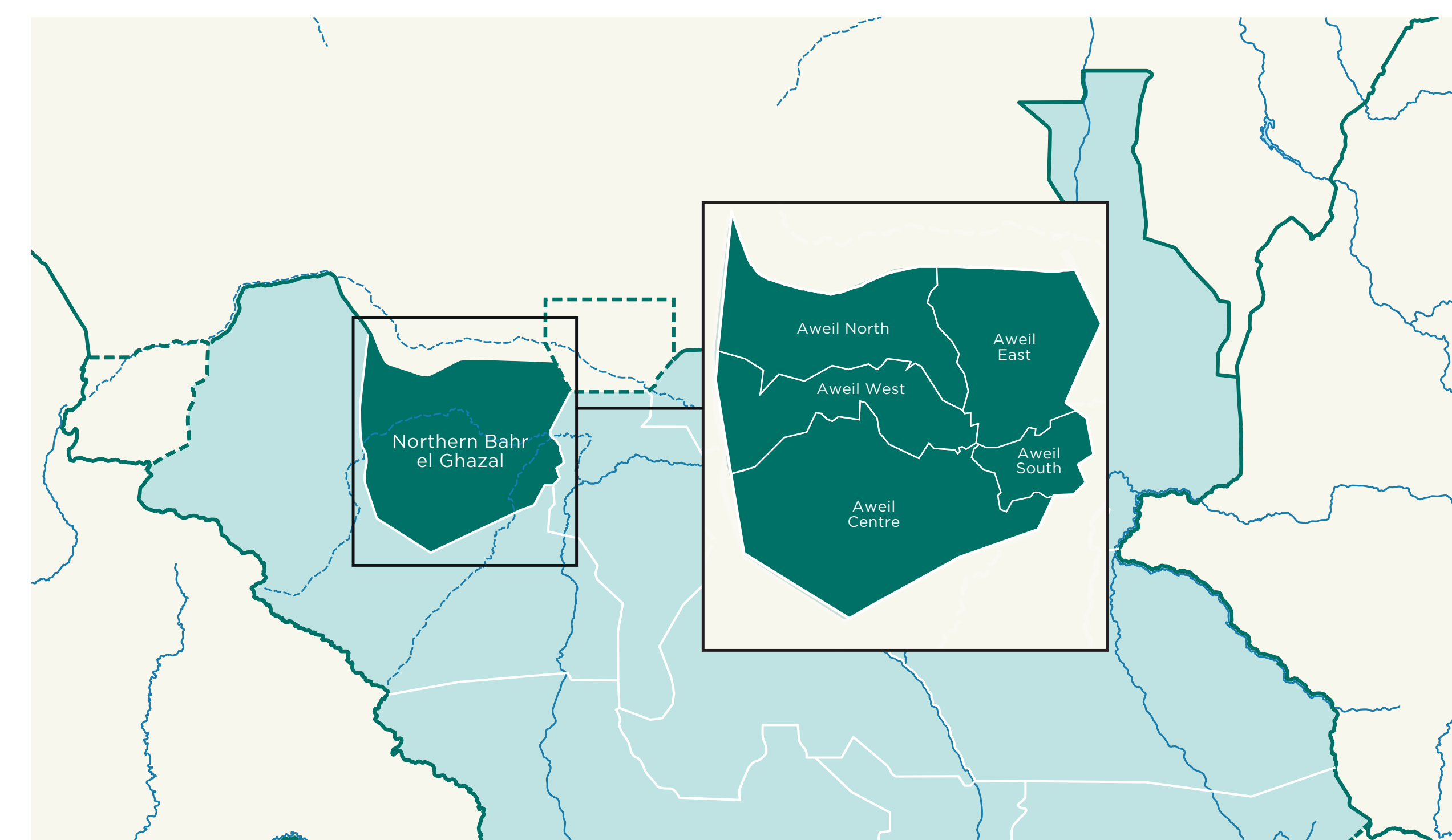


Image 1. Households that have received nets are marked with chalk to indicate successful distribution. Simultaneously, this information is recorded in the digital tool to capture the distribution centrally



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Further reading

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