Lessons learnt and challenges from digitalisation of long-lasting insecticidal net distribution campaigns in South Sudan
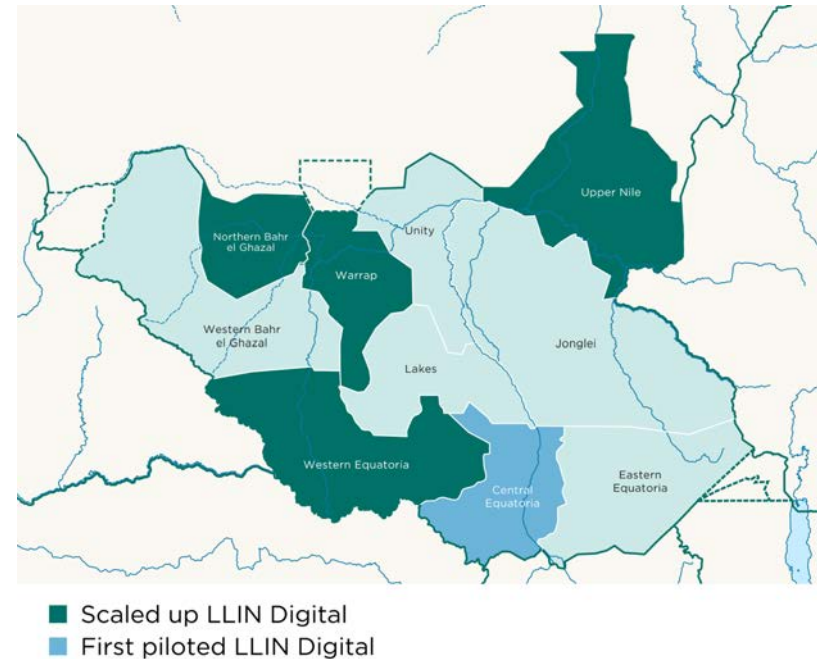
Aweno Norman, Malaria Consortium South Sudan

Alliance for Malaria Prevention Campaign Digitalization Meeting
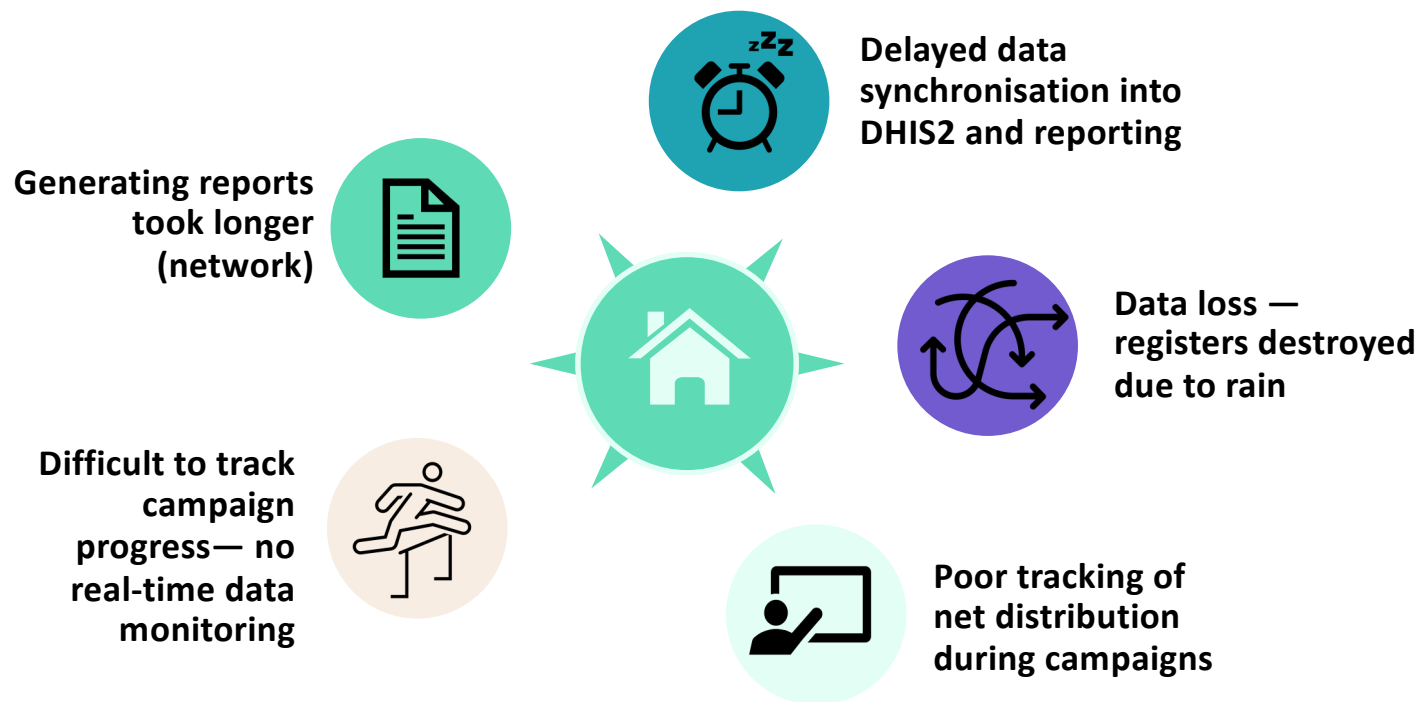9–11 April 2025, Nairobi, Kenya

Background and context

- Long-lasting insecticidal nets (LLINs) have been the backbone of malaria prevention in South Sudan for decades.

- Overall, 63.9 percent of households own a net and 68 percent of them use their nets.

- LLINs are typically distributed by volunteers, with campaign data collected using paper-based systems.

- South Sudan has prioritised digitalisation to support attainment of universal health coverage by 2030 in South Sudan (National Malaria Strategy).

- Use of digital solutions in healthcare has increased rapidly over the last two decades (World Health Organization).

Scaled up LLIN Digital
First piloted LLIN Digital

Digitalised LLIN distribution campaigns in South Sudan

Challenges faced before digitalisation

Delayed data synchronisation into DHIS2 and reporting

Generating reports took longer (network)

Data loss — registers destroyed due to rain

Difficult to track campaign progress— no real-time data monitoring

Poor tracking of net distribution during campaigns

Campaign digitalisation implementation experience

- In 2022, Malaria Consortium supported the South Sudan Ministry of Health (MoH) to transition from paper-based to digital LLIN campaigns.

- A digitalised LLIN campaign was piloted in two *payams* (second lowest administrative division) in Central Equatoria state and later scaled up to four other states.

- The MoH engaged HISP Tanzania to develop DHIS2 for digitalisation of South Sudan's health system and provide ongoing capacity strengthening.

- The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) and Against Malaria Foundation (AMF) extended the scope of LLIN campaigns to incorporate digitalisation.

- Community structures were placed in charge of campaign micro-planning and community mobilisation.

Unique or innovative aspects of digitalisation

- Online troubleshooting of challenges identified in the field (MoH M&E department)

- Volunteers marked households (with unique numbers) so targeted households could be easily identified where GPS failed

- Volunteers linked to facilities with available solar power for charging tablets

- Charging booths in towns identified for volunteers to charge tablets

- Offline mechanism incorporated into the application, allowing data capture and storage until online connection and synchronisation available.

Collaborations and partnerships

- Technical support group formed for system support: Health Management Information System (HMIS) and National Malaria Control Programme (NMCP)

- Collaboration with security agencies to ensure safety of tablets, staff and nets

- Coordination framework established linking national, state and community implementation

- Collaboration with HISP Tanzania (application developer) to strengthen capacity

- Data validation taskforce including HMIS, NMCP, UNICEF, Global Fund, AMF, country coordination mechanism.

Improvements in campaign planning and implementation

- Strengthened accountability — easier to monitor net distribution

- Reference to dashboard during campaign planning (data-informed decision-making)

- Bottom-up approach to planning adopted — from *boma* (lowest administrative division) to state and national levels

- Data generated can be used inform planning of future campaigns

- Ability to track nets to household level by capturing GPS.
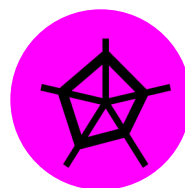
Achievements resulting from digitalisation

Strengthened LLIN digital distribution framework — 3,111 volunteers empowered for digital campaigns

Successful scale-up of digitalised LLIN campaigns to five states

Ability to track nets to household level — system captured GPS

2.7 million nets distributed to more than 4.5 million community members using digitalisation

National MoH ownership and engagement demonstrated — planning and implementation phases

Achievements resulting from digitalisation

Access to real-time data facilitated government ownership at national, state and community levels, strengthened interactions and improved accountability

Improved accuracy of data collection facilitated real-time data use by the NMCP for reporting and planning

Stakeholders found data from LLIN digital campaigns to be more reliable for population coverage estimates than previous paper-based approaches

Improved decision-making on reverse logistics, re-allocation and filling for areas with gaps in net allocation

Useful data generated for planning of future campaigns

Challenges faced during implementation

- Low human resource capacity (limited personnel, high digital illiteracy, staff turnover)

- Logistical challenges (poor roads and bridges)

- System challenges (poor internet/call connectivity, tablet charging issues)

- Insecurity – some people suspicious of tablet use (due to collection of GPS data).

Lessons from the digitalisation process

- In total, 94 percent of volunteers agreed that the digital tool was an improvement from the paper-based system (usability research).

- Despite operational challenges, digital tools were preferred over traditional paper-based systems.

- Users found the tools helpful for managing workflows, reducing workloads, and supporting stock management and campaign monitoring.

- Including security organisations in the LLIN digital campaigns was essential for safety and completion.

- DHIS2 review (event reports) and LLIN campaign reports found that the digitalised net tracking system recorded movements of insecticidal nets more quickly and easily, and records were harder to fake (GPS tracking).

Recommendations for future digitalisation efforts in similar campaigns

Encourage multisectoral collaboration and robust governance structures, with active private sector engagement to effectively and sustainably scale up digital LLIN campaigns across the country.

- The national MoH should develop a digital strategy with a clear partnership framework with the private sector.

- Establish localised state/regional frameworks for system support and to secure digital health investments (data privacy, cybersecurity practices and related country regulations, tailored to local context).

- Co-opt the private sector into strategy planning, costing and roadmap development to reduce overreliance on donors.

Recommendations for future digitalisation efforts in similar campaigns

Advocate for localisation as a pathway to sustainability, with a particular emphasis on strengthening local capacity.

- Strengthen in-country technical capacity to reduce the turnaround time in addressing existing system issues (HISP South Sudan).

- Establish state or regional frameworks for system support.

- Connect local talent from NGOs or government with institutions and organisations that have better digital capacity (UN, INGOs).

Recommendations for future digitalisation efforts in similar campaigns

Support government-led advocacy for sustainable and improved ownership of health digitalisation efforts.

- Improve government commitment and funding for the health budget given the reduction in donor funding.

- Ensure LLIN and other campaign digitalisation is part of a broader digital health strategy with shared infrastructure and governance structures to ensure efficiency.

- Plan for national scale-up — discuss national scale-up considerations from the initial stages of digitalisation efforts, including the total cost of ownership.

Scan to read the research

Thank you

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