IMMUNIFY LIFE ZAMBIA

REPORT ON THE MALARIA HEALTH SYSTEM STRENGTHENING PILOT PROJECT IN CHONGWE URBAN, KANAKANTAPA AND ZNS CHONGWE IN CHONGWE DISTRICT CONDUCTED BY IMMUNIFY LIFE AND MINISTRY OF HEALTH -MINISTRY OF ZAMBIA

By Guy Newing, 2024

Background

Malaria remains a significant global public health concern accounting for 593,000 deaths in 2023, with direct costs of over US$12 billion and 95% of the burden seen in sub-Saharan Africa. Such a burden poses substantial challenges to the healthcare system and the overall well-being of the population. As one of the leading causes of illness and mortality in the country, malaria places a considerable burden on individuals, families and communities, particularly in rural and underprivileged areas.

According to the World Health Organization (WHO), Zambia accounted for a significant proportion of global malaria cases in recent years, with an estimated 11.1 million confirmed cases in 2023 alone. The prevalence of malaria is particularly high among children under five years of age and pregnant women, making them vulnerable to severe illness and adverse outcomes. Despite intensive efforts by the Zambian Ministry of Health (MOH), little impact has been seen on malaria in recent years. In light of the WHO recommendation "All countries where malaria is endemic should have an effective health management information system in place to help the national malaria programs direct resources to most affected populations, identify gaps in program coverage, to track outbreaks and assess the impact of interventions in order to guide national strategic planning and delivery"[1].

Immunify Life and the Zambian Ministry Of Health developed a project to evaluate the practicality of implementing a digital health management platform focused on malaria on the issuance and tracking of the routine distribution of insecticide treated nets through the antenatal care clinic (first ANC visits) and the expanded programme for immunisation (as the child receives the first measles vaccination). This approach is directly aligned to the Global Fund's strategy for building Resilient and Sustainable Systems for Health:

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[1] *World Malaria Report 2022 published by the World Health Organisation (WHO)*

"we need to strengthen the formal and community health systems and responses that make up resilient and sustainable systems for health (RSSH) by boosting the quality of care, data tracking, accountability and governance, and service delivery[2]

Three pillars of the Global Funds strategy informed aspects of the projects' design:

    i.   Support the integration of community health workers into primary healthcare systems, investing in their training and supervision and advocating for them to be paid as workers, rather than treated as volunteers.

Potential Impact: CBVs (community based volunteers) are embedded into the service delivery and management model.

    ii.   Strengthen creation and use of health data at all levels so countries and communities can make decisions based on the latest evidence.

       Potential Impact: The digital heath management system collects real time data (on and offline) to transform the way data is collected and managed.

    iii.   Strengthen country oversight of the overall health system, better engage and harness the private sector to improve the scale, quality, and affordability of services wherever patients seek them.

       Potential Impact: potential to provide quality tools that can scale to a wide range of locations including remotely.

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[2] https://www.theglobalfund.org/en/resilient-sustainable-systems-for-health/*Dec 2023*
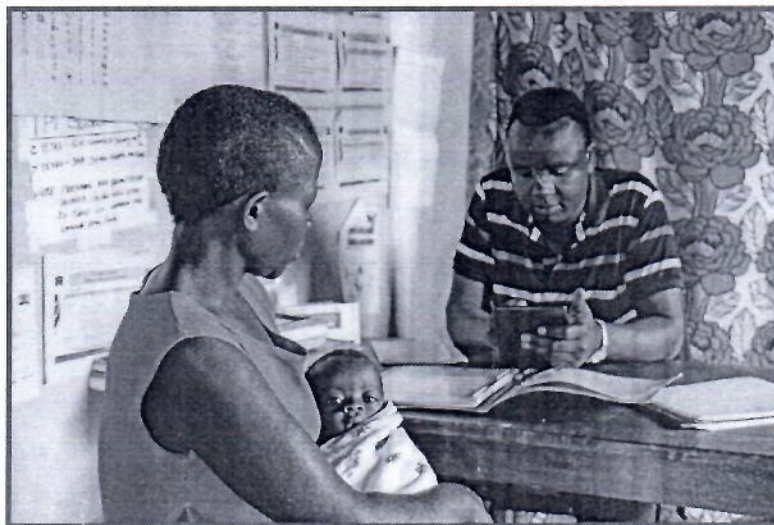
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Executive Summary

The Immunify Life pilot project was a collaboration between Immunify Life and the Ministry of Health in Zambia, with an objective of exploring benefits of implementing an accurate real-time (malaria relevant) platform to replace the paper based systems in data management and tracking of interventions. This would enhance data-driven decision making, improve resource allocation and strengthen collaboration among stakeholders.

Objectives

a) to develop and deploy a real time system that enables accurate and real-time data collection on malaria prevention activities, including the distribution and utilization of Insecticide-Treated Nets, Indoor Residual Spraying campaigns and community health education initiatives.

b) to implement robust data validation mechanisms within the mobile platform to ensure the timeliness, accuracy and reliability of collected information resulting in real-time data synchronization to provide up-to-date . and timely insights for decision-making processes.

c) To utilise a range of data collection hardware (tablets and smartphones), to assess the practicality of real time data collection in remote locations where power and data networks are frequently unavailable.

d) To facilitate evidence-based decision making by providing stakeholders with accurate and up-to-date information on malaria prevention strategies. Empower decision makers to assess the effectiveness of interventions, identify areas for improvement, and optimize resource allocation.

e) To foster collaboration among healthcare workers, community volunteers, and relevant stakeholders by providing a platform for seamless data sharing and communication which will enable stakeholders to exchange best practices, share success stories, and coordinate efforts to improve malaria prevention strategies.

Methodology
(Pilot Description)

The pilot was conducted over a 10 week duration, evaluating a mobile platform specifically designed to collect accurate real-time data on malaria prevention activities.

During the pilot, a team of technical experts, healthcare professionals, and community workers collaborated to refine the malaria prevention platform and deploy in the field on both a mobile smart phone, low cost handset and tablet. The platform enabled the collection of real-time data on various malaria prevention activities, including the distribution and utilisation of Insecticide-Treated Nets, Indoor Residual Spraying campaigns, and community health education initiatives.
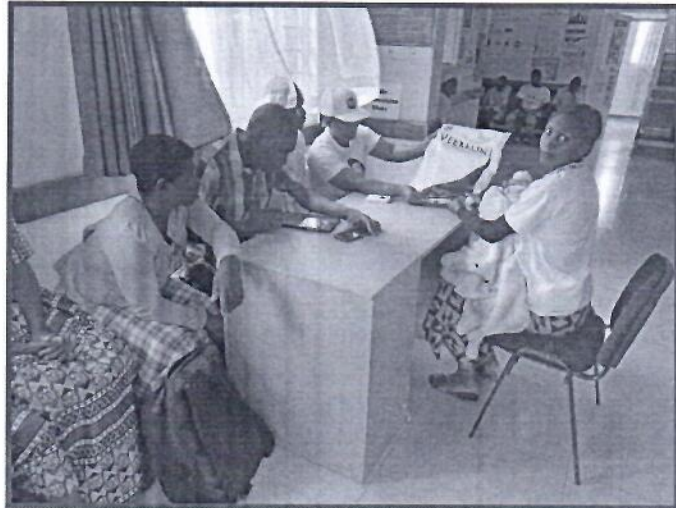
The mobile platform was designed to be easily used by frontline healthcare workers, community volunteers and relevant stakeholders involved in malaria prevention efforts. The project trained healthcare workers and volunteers on how to effectively use the mobile platform for data collection and reporting. Training sessions focused on ensuring accurate data entry, data security measures, and troubleshooting common issues that may arise during field operations.

The platform was deployed in three clinics in the Chongwe district. A total of 800 records were to be created to capture and monitor the distribution of 400 mosquito nets. The software allowed the collection of socio-demographic and disease data, and verification of usage through home visits. Initial data was collected during the net distribution and a follow up home visit was completed 2- 4 weeks later, confirmed with an SMS reminder, to verify the correct usage of the net (confirmed with photograph)

At the end of the pilot, a comprehensive evaluation was conducted with both a data audit and an online survey with CBVs. The evaluation considered factors such as data accuracy, timeliness, usability and the platform's potential to enable evidence-based decision making.

The first ITN was distributed on 15th October, 2024 and the last home visit was completed on January 15th December, 2024.

Data Collection

A structured interview was conducted with 6 CBVs who were involved in the project using a questionnaire. A total of 23 questions were used to evaluate the system. The goal of the survey was to gain real world feedback from system users.

Results

A total of 405 initial client records were created, for clients who received ITNs, which is slightly higher than the original target of 400. Over 120 individual data fields were captured for each participant. Data included socio demographic, disease history and exposure to malaria prevention activities. All participants were female (with an average age of 20.4 years). In terms of the highest education level attained, 2% had no formal education, 5% vocational training, 31% attained primary school, 60% received secondary education and 2% respondents reported university qualifications. In terms of employment status, 66% reported being unemployed, 14% salaried and 20% self employed. The vast majority of houses were of brick construction with a small number of mud / thatched and stone. 45% of houses were owned by the respondents, 50% rented and the remainder living as squatters or in hostel accommodation.

A total of 379 home visits were successfully conducted to assess the use of the net, with the SMS reminder system playing an important role in ensuring visit compliance.
In 80% (308) of households visited nets were in use and deployed over a bed.
23% of nets were passed to children under 5 years old by the recipient. There was generally only 1 net per household with an average of 5 household members. 36 % of respondents reported multiple people sleeping under 1 net (typically) 2-3 people.

Net recipients positively rated other malaria prevention activities in terms of their usefulness, with the most prevalent and positive feedback for "government advice from clinic,". Virtually all respondents rated the support as very positive. There was low recall of TV commercials (less than 15% and this was generally rated as less impactful, the low survey numbers may reflect restricted TV access). There was a very low recall of any Indoor Residual Spraying which was reported in less than 1% of responses.

The incidence of travel to other areas during the study was low (so low risk of additional mosquito exposure). However, 50% of those who travelled reported recent malaria infection.

The incidence of malaria infection between the first and second visit (4 weeks on average) was very low at 1% and half of those infected were not sleeping under nets. Around 5% of respondents reported ever having malaria, with the majority being diagnosed by smear test (80%). The treatment was with Coartem in 80% of cases.
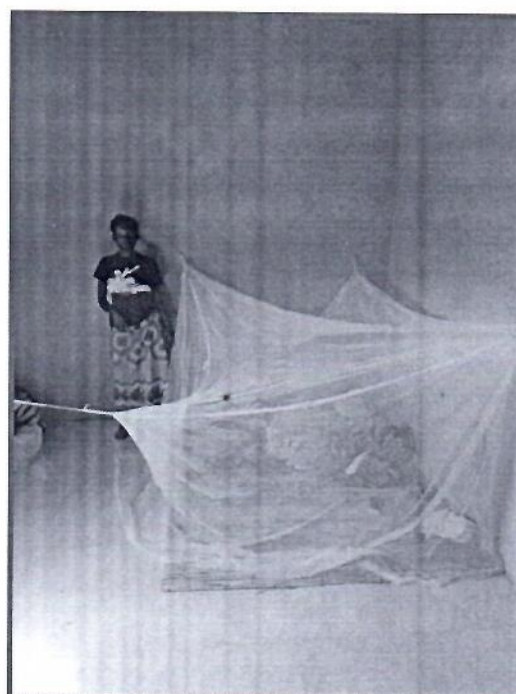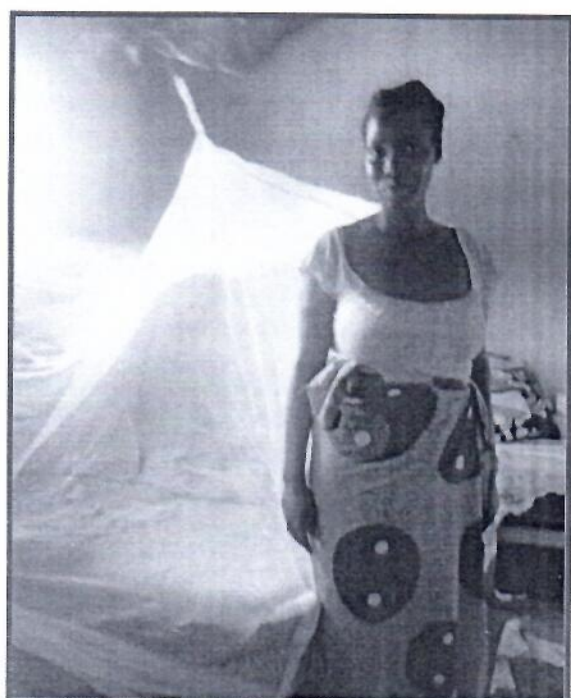
Net Distribution

	Chongwe Clinic	Zambia National Service Clinic	Zambia National Service Clinic	Total
Nets distributed	203	152	50	405
Follow up visits	192	144	43	379
Nets in use	180	122	39	341

Reasons for no follow up visit: client moved out of the house (relocated to another place for delivery mostly) or did not answer the phone.

The CBVs involved rated the system as easy to learn and use. Training and ongoing support was highly rated. *"System was brilliant"* Rocky, CBV 6 Kanakantapa Clinic.

All types of data collection hardware (tablets and phoneswere effective in allowing data capture, although the low cost handset was scored slightly lower in usability.

There was a unanimous desire to continue using the system if available and a belief that it would enhance their work in malaria prevention. Most participants owned or had access to a mobile phone, aiding communication and operational efficiency.

SMS reminders were instrumental in ensuring client attendance and readiness; thus improving overall project efficiency.

Health System Strengthening

"Clients are friendly to me even when we meet in public,
Clients now freely have conversations with me concerning malaria issues; others even ask when we will be giving nets to other family members" Memory CBV2 Chongwe Referral clinic.

CBVs felt empowered, and community trust in healthcare significantly improved. Clients now recognise and interact positively with CBVs, often seeking additional malaria-related advice.

ITN Usage

Most households had only one net despite having multiple family members, indicating a gap in resource allocation. Observations showed that while the majority of families were using ITNs effectively (supported by photographic evidence) including for babies during the day, 20% of households were not using the nets that were issued. Some nets hung

outside homes suggesting preparation for installation, although some instances might have been performative.

Clients travelling for childbirth showed varied adherence to carrying or using nets. A majority of homes demonstrated proper net installation. A small portion of the respondents (1%) did suffer from a bout of Malaria and half of them were those who travelled and others did not sleep under mosquito nets.

Lessons Learned

a. Training should occur closer to deployment to enhance memory retention.
b. Addressing synchronisation issues is essential for seamless offline-to-online transitions.
c. Transportation limitations, such as reliance on bicycles, impacted field operations.
d. Occasional privacy concerns and inaccurate contact information were barriers to effective outreach.
e. SMS applications for follow-ups and real-time updates can be leveraged more to enhance effectiveness.
f. Households appeared to have inadequate net supplies to cover all family members.
g. Greater emphasis on proper usage techniques and benefits during training sessions with CBVs to help ensure better briefing of net recipients.
h. During demographic data collection, respondents can provide alternative addresses of the places they wish to travel to for delivery.

Future Use Of the Technology

Based on the results of the pilot project the following areas represent significant opportunities to utilise the technology in the future:

i. Expand usage of the malaria module to other high risk communities.
ii. Conduct follow-up visits to assess ITN usage and health outcomes.
iii. Further research into potential issues raised including the impact of travelling to malaria risk areas, 20% of issued nets not being effectively used, better understanding the nets being used per household vs nets available, research the number of malaria positive clients receiving an alternative to Coartem.
iv. Use the technology to better manage net distribution and inventory. Compare the number of malaria diagnoses with the number of treatments provided to identify

resource gaps or anomalies and also reconcile the number of nets distributed with numbers of nets seen in houses.

v.   Build a unified system for all diseases to streamline data collection and decision-making.

vi.   Integrate the data set with other data sources to build an integrated view and enable deep insights into malaria prevention.
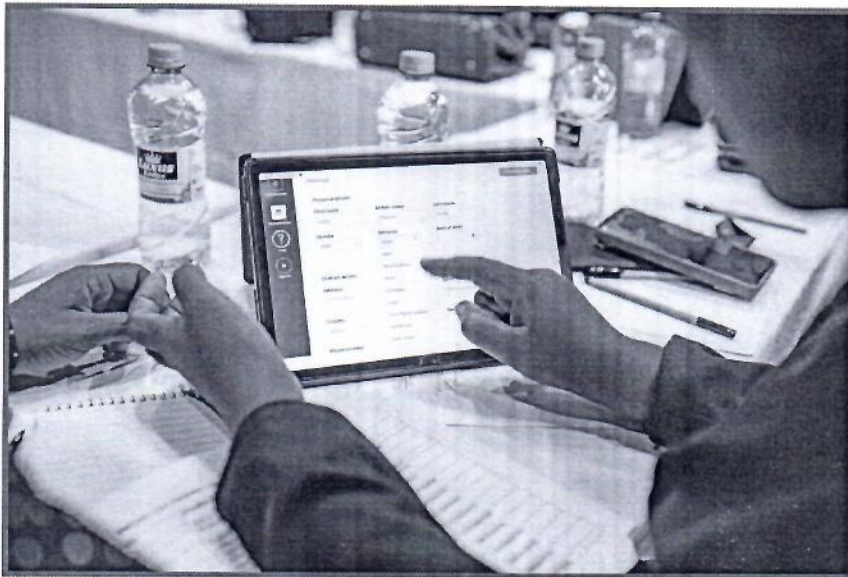
Conclusion

The software was very effective at collecting granular real time data. All hardware assessed (tablet, handset, and low cost hand set) were effective in data collection. Offline capture of data (when internet is not available) was achievable and successful. The data collection system worked effectively in an environment where power outages and internet connectivity were unreliable. CBVs were very positive about the technology, found the system easy to learn and use, and significantly improved their sense of commitment and engagement in malaria prevention activities.

By addressing logistical and technological challenges, the platform has the potential to revolutionise public health strategies in Zambia and beyond. Strategic investment in this initiative will strengthen the healthcare system, improve malaria prevention, and pave the way for scalable, sustainable health solutions.

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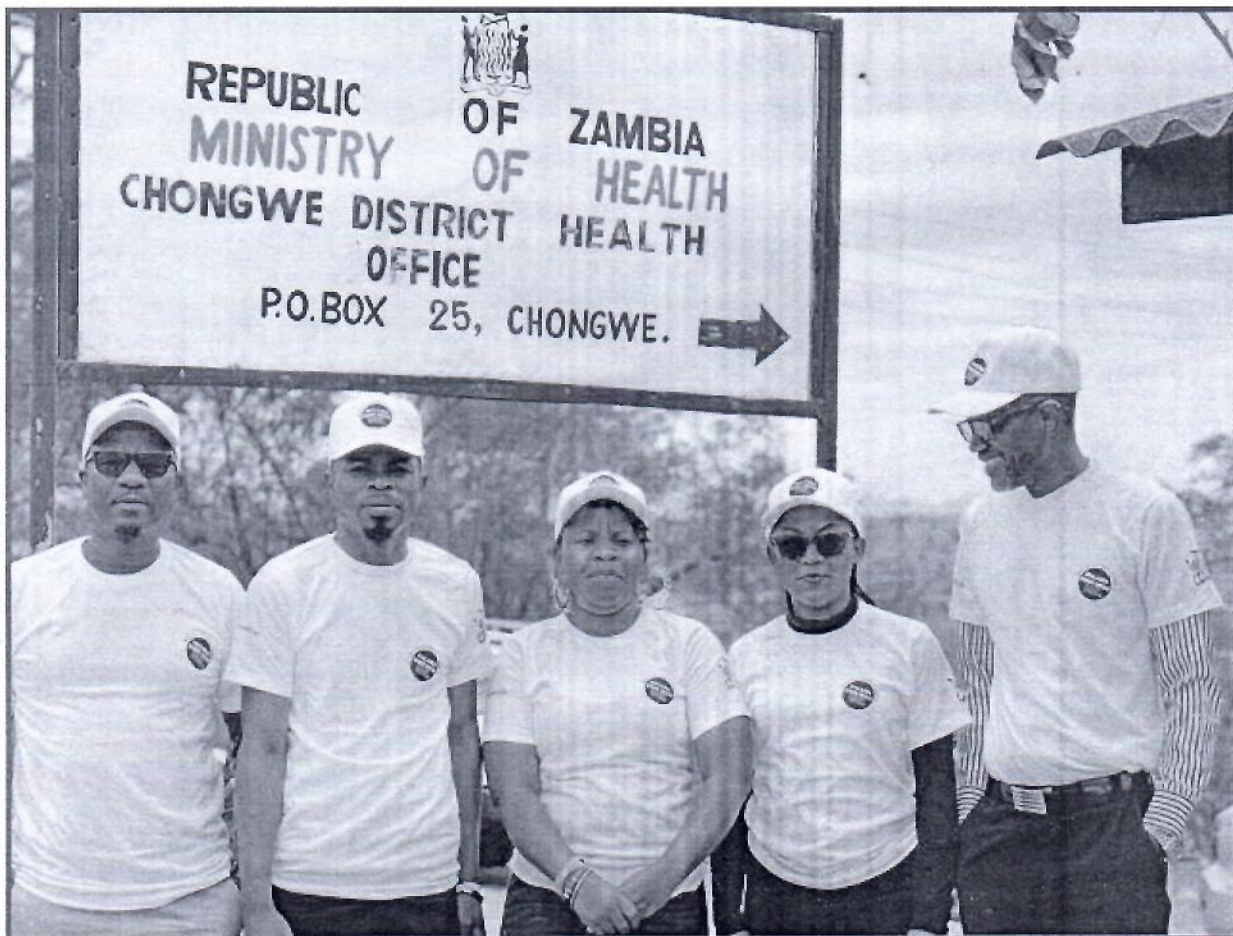
Appendix 1: Sample of data captured

General Data
Name
Gender
date of birth
Ethnicity
NRC number
Address
Email
Mobile number

Client Social Situation
Head of household
Highest education level
Is the client disabled
Occupation
What type of house does the client live in
Characteristics of the house?
What is the condition of the home

Environmental Risk Factors
Dams nearby

History
Previously found to have malaria
Diagnosis date
Method of diagnosis
Previous episode date
Medication for malaria
Is the client on prophylaxis

Travel History
Since your last visit have you travelled overnight
Province of destination
Town of destination
Did your accommodation have ICTN

Net Usage

Was an ICTN provided today
Have you previously been given an ICT
Number of family members
How many people sleep under the net?
How do you sleep in the net?
Net status
Indoor residual spraying ?
Other sources of malaria prevention activities such as radio ads, TV, ads, education programs and information from clinics or the government.

Follow Up Visit

Malaria since last visit
Net in place
Net being used correctly

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REPORT ENDORSEMENT

Endorsed by: Dr. George Sinyangwe

Title: PS

Date: 19.05.25

Signature: _[signature]_