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BRIDGING BORDERS, BREAKING BLINDNESS



**ASSESSING KNOWLEDGE, ATTITUDES, PRACTICES, AND
BEHAVIOURS (KAPB) AND STAKEHOLDER PERSPECTIVES
ON ONCHOCERCIASIS AND INTEGRATED NTD CONTROL**

IN KADUNA AND CROSS RIVER STATE

BASELINE REPORT

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LIST OF ABBREVIATIONS AND ACRONYMS:

ABR-	Annual Biting Rate
aOR-	Adjusted Odds Ratio
CDD-	Community Drug Distributor
CDTI-	Community-Directed Treatment with Ivermectin
CHW-	Community Health Worker
CR-	Cross River (State)
DSNO-	Disease Surveillance and Notification Officer
ESPEN-	Expanded Special Project for Elimination of Neglected Tropical Diseases
FGD-	Focus Group Discussion
IEC-	Information, Education, and Communication
IDP-	Internally Displaced Person
ITN-	Insecticide-Treated Net
KAPB-	Knowledge, Attitudes, Practices, and Behaviours
KII -	Key Informant Interview
LGA-	Local Government Area
LF-	Lymphatic Filariasis
MDA-	Mass Drug Administration
ND5-	NADH Dehydrogenase Subunit 5 (mitochondrial gene marker)
NHREC-	National Health Research Ethics Committee
NTD-	Neglected Tropical Disease
Ov -	Onchocerca volvulus
qPCR-	Quantitative Polymerase Chain Reaction
SD-	Standard Deviation
SDG-	Sustainable Development Goal
SEM-	Social Ecological Model
SPHCDA-	State Primary Health Care Development Agency
WASH-	Water, Sanitation, and Hygiene
WHO-	World Health Organization

EXECUTIVE SUMMARY

Survey title	Bridging Borders, Breaking Blindness: Assessing KAPB and Stakeholder Perspectives on Onchocerciasis and Integrated NTD Control
Design	Mixed-methods, cross-sectional
Geography	2 States, 6 LGAs – Kachia, Kagarko, Lere (Kaduna); Etung, Akamkpa, Boki (Cross River)
Sample	Household KAPB survey N=1,823 (Kaduna n=917; Cross River n=906); 33 KIIs; multiple FGDs
Fieldwork	January–March 2026
Funder	Global Institute for Disease Elimination

Onchocerciasis (river blindness) remains one of Nigeria's most entrenched public health challenges, and Kaduna and Cross River States together account for a disproportionate share of the national disease burden despite contrasting epidemiological trajectories. After decades of Mass Drug Administration (MDA) with ivermectin, both states continue to experience active transmission – Kaduna through post-stop-MDA recrudescence confirmed by *Ov* ND5 qPCR positivity in blackfly pools in Kagarko and Kachia, and Cross River through persistent historically high burden compounded by cross-border transmission dynamics with Cameroon. Transmission is sustained in both states by systematically missed high-risk populations, fragile community drug distributor (CDD) financing, paper-based data infrastructure, and porous cross-border corridors, and Cross River State is now actively reinfecting Abia State, which had previously achieved surveillance status, constituting a national elimination emergency requiring immediate escalation.

The study assesses the effectiveness of community-led advocacy, storytelling, and policy engagement on knowledge, attitudes, practices, and behaviours (KAPB) related to onchocerciasis and integrated disease elimination in the two states. A convergent mixed-methods, cross-sectional design was employed, anchored in the Social Ecological Model and Proctor's Implementation Outcomes Framework. The quantitative component comprised an interviewer-administered household KAPB survey (N=1,823) across six LGAs using two-stage cluster sampling, and the qualitative component encompassed 33 KIIs across national, state, and LGA levels and community-level FGDs with CDDs, community health workers, traditional and religious leaders, and media practitioners. Both components were triangulated against secondary data including entomological surveillance records, programme reports, and policy documents, and analysis used Stata v17 (descriptive, bivariate, and multivariable logistic regression) and Dedoose (hybrid inductive–deductive thematic coding).

KEY FINDINGS:

Across the sampled LGAS Knowledge is inadequate in both states. Only 48.0% of respondents achieved adequate knowledge ($\geq 10/15$), with near-identical rates in Kaduna (48.7%) and Cross River (47.2%), and farmers and fishers – the highest-risk group – showing the lowest scores. Critical and symmetrical gaps persist around co-endemicity with lymphatic filariasis (~50% incorrect in both states), malaria (~54% incorrect), and blackfly habitat avoidance (~64% incorrect), pointing to messaging problem rather than localised misunderstanding.

Kaduna. 81.2% hold positive composite attitudes (Kaduna 89.7%; Cross River 72.6%; $p < 0.001$), and willingness to definitely take ivermectin is 90.6% in Kaduna and 54.4% in Cross River. The coverage challenge is a reach problem, not a resistance problem.

CDD visit is the dominant predictor of MDA uptake. Conditional uptake once a household is reached exceeds 90% in both states (Cross River 91.3%; Kaduna 89.4%; combined aOR 39.77, 95% CI 22.61–69.96, $p < 0.001$), and the 22.3% of respondents never visited by a CDD – 30.2% in Cross River and 14.5% in Kaduna – represent the entire remaining coverage gap.

Community-led advocacy independently predicts uptake in Cross River. Advocacy exposure is an independent predictor in Cross River (aOR 3.16, 95% CI 1.79–5.57, $p < 0.001$) but not in Kaduna, establishing the national programmatic formula: build community advocacy → deploy CDDs → achieve highest uptake.

CORE RECOMMENDATIONS:

Recommendations are tiered by timeline to support decision-ready action.

Immediate (0–3 months):

- Formally partner Muslim religious leaders, imams, and mosque committees in Kaduna as lead pre-MDA messengers – the highest-return single intervention available in Kaduna State.
- Escalate the Cross River → Abia reinfection crisis to Federal Ministry of Health NTD programme leadership for emergency cross-state coordination.

Short-term (3–12 months, next MDA cycle):

- Expand CDD reach in Akamkpa (65.1%) and Boki (67.3%) in Cross River, and replicate Kagarko's 95.1% reach model across Kachia (60.3%) and Lere (70.2%) in Kaduna.
- Institute structured advocate training as the first investment in any advocacy scale-up across both states.
- Integrate onchocerciasis messaging with malaria, lymphatic filariasis, and WASH at community level to close the ~50% co-endemicity knowledge gaps.

Structural (12+ months):

- Raise CDD stipends to parity with the malaria programme and formalise CDDs as permanent community health assets to arrest attrition.
- Accelerate digital data capture and establish functional state→LGA→CDD feedback loops in all LGAs, replacing the current paper-based infrastructure.
- Strengthen cross-border surveillance coordination with Cameroon and inter-state coordination with Abia to interrupt porous transmission corridors.

1. BACKGROUND AND CONTEXT

Neglected tropical diseases (NTDs) represent a group of communicable diseases that disproportionately affect the world's poorest and most marginalised populations, thriving in conditions of poverty, inadequate sanitation, limited access to healthcare, and environmental degradation (Ca et al., 2024; WHO, 2025). Among these, onchocerciasis (river blindness) is one of the most debilitating, not only for individual health but for household productivity, community development, and national economic growth across sub-Saharan Africa. (Frallonardo et al., 2022; World Health Organization (WHO), 2025). The socioeconomic impact of onchocerciasis is profound, as infected individuals suffer from severe itching, disfiguring skin conditions, and vision loss, which significantly impairs their ability to work and perform daily activities, leading to loss of income and increased dependence on others, leading to cycles of poverty in affected communities. Nigeria, as the country with the second highest global burden of onchocerciasis, occupies a central position in global elimination efforts, shaping whether the world meets the WHO NTD Road Map 2021 to 2030 targets (Erhuotor et al., 2025; WHO, 2024). The WHO NTD Road Map 2021 to 2030 targets elimination of onchocerciasis in at least 12 countries and identifies lack of national capacity, limited stakeholder alignment, and insufficient community engagement as key gaps to achieving these elimination targets (WHO, 2024, 2026)) (Otache et al., 2023; WHO, 2026). Achieving durable elimination in Nigeria demands not only sustained programmatic delivery of Mass Drug Administration (MDA) and vector control, (Evans, 2020; Otache et al., 2023; WHO, 2026) but a rigorous and systematic understanding of the community-level knowledge, attitudes, practices, and behaviours (KAPB) that either enable or undermine population-level participation in integrated NTD control. This report presents the problem statement, rationale, background, and objectives of the study designed to precisely address these gaps, drawing on the contrasting epidemiological realities of Kaduna and Cross River States as the primary study settings.

1.1 PROBLEM STATEMENT:

Onchocerciasis, commonly known as river blindness, remains one of Nigeria's most significant public health challenges and a critical target on the global NTD elimination agenda. Caused by the filarial parasite *Onchocerca volvulus* and transmitted through the bite of *Simulium damnosum* blackflies that breed along fast-flowing rivers, the disease causes intense itching, disfiguring skin conditions, visual impairment, and in chronic cases, irreversible blindness (WHO, 2024, 2025). Despite decades of Mass Drug Administration (MDA) with ivermectin through the Community-Directed Treatment with Ivermectin (CDTI) strategy, achieving and sustaining elimination targets in Nigeria has proven more complex than biomedical indicators alone suggest. (Evans, 2020; Eigege et al., 2018; Griswold et al., 2018; Sam-wobo et al., 2018). The CDTI strategy requires that the community itself takes responsibility for organising and executing treatment of its members, ensuring that treatment essentially continues for 15-20 years with non-stop compliance and a minimum 90% community coverage (Surakat & Sam-wobo, 2018). Yet, MDA programme efficiency

is critically dependent upon community-level knowledge, attitudes, and behavioural engagement, dimensions that epidemiological surveillance data frequently fail to capture. (Eigege et al., 2018; Griswold et al., 2018; Sam-wobo & Surakat, 2018; WHO, 2024). The central public health challenge addressed by this study is the persistent and measurable disconnect between improving biomedical elimination indicators at the programmatic level and the inadequate community-level knowledge, attitudes, practices, and behaviours (KAPB) that continue to undermine MDA coverage, health-seeking behaviour, and sustained participation in integrated NTD control activities across Nigeria. Studies in endemic Nigerian communities have found that large proportions of residents remain unaware of any medication for onchocerciasis and report receiving no sensitisation on the disease (Abdissa et al., 2024). This persistent information gap, compounded by misconceptions about disease causation and transmission, represents a structural barrier to achieving and maintaining transmission interruption.

1.2 BACKGROUND:

CONTRASTING EPIDEMIOLOGICAL SETTINGS IN KADUNA AND CROSS RIVER STATES

Nigeria bears the highest burden of onchocerciasis globally (Otache et al., 2023; WHO, 2025) and its elimination programme represents one of the most ambitious and instructive case studies in sub-Saharan Africa, (Chukwuekezie et al., 2023). Nigeria accounts for approximately 3.2 million infections transmitted by blackflies of the *Simulium damnosum* complex, making it one of the most onchocerciasis-endemic nations in West Africa (Chiezies et al., 2023). By May 2022, despite challenges encountered, onchocerciasis had been eliminated in two states, transmission interruption had been achieved in four states, and a total of 10.2 million persons from 58 Local Government Areas were no longer in need of MDA for onchocerciasis (Nwoke, 2023). Kaduna and Cross River States represent two starkly contrasting epidemiological settings within this national programme, a contrast that makes their comparative examination both scientifically valuable and programmatically instructive.

Kaduna State has historically represented one of Nigeria's earliest and most celebrated onchocerciasis control success stories. Control of onchocerciasis in Kaduna started in 1954 with larviciding, which reduced the *S. damnosum* population by 94% by 1966. (Olanrewaju et al., 2025). Building on this, Kaduna State Ministry of Health and its partners implemented annual mass administration of ivermectin consistently between 1989 and 2017, which led to interruption of onchocerciasis transmission in 2018 (Isiyaku et al., 2022; Olanrewaju et al., 2025). Serological and entomological assessments confirmed that onchocerciasis transmission had been interrupted, with the 2.2 million people in Kaduna State no longer requiring ivermectin for onchocerciasis. This achievement was nationally and internationally celebrated as a milestone in NTD elimination (Isiyaku et al., 2022; Olanrewaju et al., 2025). However, the post-stop-MDA phase in Kaduna has introduced a new and alarming set of challenges. A 2023 study found that 20 out of 72 pools (27.8%) of *S. damnosum* s.l. heads analysed were positive for *O. volvulus* in Kagarko and

Kachia LGAs, with a qPCR prevalence of 0.32%, demonstrating ongoing transmission of onchocerciasis in Kaduna State five years after a stop-MDA decision (Olanrewaju et al., 2025). The study attributed this recrudescence to insecurity-induced displacement and cross-border migration from areas with ongoing transmission, and noted that interruption of transmission in Kaduna State may be difficult to sustain because of the high number of internally displaced persons (IDPs) without any organised governmental camp, as well as increased inter-state migration within the northwest region of Nigeria and the emerging influence of climate change on transmission dynamics (Olanrewaju et al., 2025).

Cross River State, by contrast, represents a setting with historically high onchocerciasis burden and ongoing, persistent transmission (Erhuotor et al., 2025). Treatment with ivermectin in Cross River State started in 1994, and by 2019, therapeutic coverage rose to 78%. Onchocerciasis epidemiological evaluations conducted in 2009 and 2012 using skin snip analysis found prevalence of 2.84% and 7.51% respectively, demonstrating that the state had ongoing transmission (Chikezie et al., 2023). Cross River's dense river network which serves as the ideal breeding habitat for *S. damnosum* combined with cross-border transmission dynamics with Cameroon and challenges in achieving consistent MDA coverage in remote forest communities, makes it one of the states where the pathway to transmission interruption remains both long and uncertain (Opoku et al., 2023).

1.3 RATIONALE:

THE DISCONNECT BETWEEN BIOMEDICAL INDICATORS AND COMMUNITY-LEVEL BEHAVIOURAL DRIVERS

The experience of both Kaduna and Cross River states reveals a fundamental gap at the heart of the onchocerciasis elimination efforts: programmatic success metrics, therapeutic coverage rates, entomological assessments, and serological surveys, paint an increasingly optimistic national picture, yet this progress remains fragile and unevenly distributed because the underlying community-level drivers of MDA compliance, health-seeking behaviour, and disease perception have received insufficient systematic attention (Olanrewaju et al., 2025). Studies on community knowledge and participation in onchocerciasis control in Nigeria reveal that while majorities may recognise the disease by its local name, significant proportions continue to misattribute its cause, associating it with physical exertion, allergies, or spiritual causes rather than blackfly bites, thereby undermining behaviour change and treatment participation (Surakat et al., 2018). Evidence from comparable NTD endemic settings demonstrates that even when respondents have heard of onchocerciasis, only a minority are aware of how it is acquired and transmitted or how to prevent it, revealing that exposure to a disease name does not translate into protective knowledge or health-seeking behaviour (WHO, 2025; Olanrewaju et al., 2025).

This disconnect can have direct implications for MDA sustainability. MDA programme efficiency is reliant upon participants swallowing treatment consistently at each treatment round, measured by the parameter compliance, the proportion of eligible participants swallowing treatment, and individually linked longitudinal compliance data is crucial for assessing MDA programmes (Griswold et al., 2018). Yet a growing body of evidence demonstrates that compliance is not simply a function of drug availability; it is critically shaped by community trust, cultural beliefs, perceived side effects, and social norms, all dimensions that require intentional behavioural and social science approaches beyond what epidemiological monitoring captures (Maddern et al., 2023; McQuaid & Landier, 2018). The survey therefore addresses a critical evidence gap: in two contrasting epidemiological settings, one approaching or having achieved transmission interruption but facing recrudescence risks, and one with persistent historically high burden.

What are the current states of community KAPB related to onchocerciasis and its integration with malaria, lymphatic filariasis, and WASH?

How do community-led advocacy strategies, storytelling, radio campaigns, and policy engagement shape these behavioural domains?

1.4 JUSTIFICATION:

WHY THIS SURVEY IS URGENT

The urgency of this survey project is driven by five converging imperatives. First, the 2030 elimination deadline is approaching rapidly. The WHO NTD Road Map 2021–2030 sets explicit targets for onchocerciasis elimination, including stopping the need for mass drug administration (MDA) in at least 12 countries and strengthening programmatic systems to achieve interruption of transmission globally (World Health Organization, 2021a). The Road map also identifies persistent challenges such as weak national capacity, limited stakeholder coordination, and insufficient community engagement as key barriers to achieving elimination targets (World Health Organization, 2023a). Nigeria, which bears approximately 40% of the global onchocerciasis burden, remains central to whether global elimination targets are achieved (PLOS Neglected Tropical Diseases, 2025).

Secondly, recrudescence in post-stop-MDA settings such as Kaduna State requires urgent behavioural and community-level evidence. Recent field evidence demonstrates ongoing transmission of onchocerciasis in Kaduna State five years after cessation of MDA, indicating that elimination gains may be reversible in the absence of sustained surveillance and engagement (Olanrewaju et al., 2025). Such recrudescence threatens achievement of the 2030 elimination targets and broader health goals, including Sustainable Development Goal (SDG) 3 on health and well-being. Understanding community knowledge, attitudes, practices and behaviours (KAPB) is therefore essential for designing targeted re-engagement and adaptive programme strategies.

Thirdly, integrated neglected tropical disease (NTD) approaches require strong community alignment. The WHO NTD Road Map explicitly promotes integrated, cross-cutting interventions across diseases and health systems, including coordination with water, sanitation and hygiene (WASH), vector control, and primary healthcare platforms (World Health Organization, 2021a; World Health Organization, 2023b). Effective implementation of such integrated approaches depends on robust community-level behavioural evidence. However, social and behavioural science evidence for community-led NTD advocacy in Nigeria remains limited. Broader systematic evidence from sub-Saharan Africa indicates that health communication strategies have been widely implemented but with mixed effectiveness, and significant gaps remain in understanding the impact of media advocacy and participatory community-driven approaches for infectious disease control (Olaoye and Onyenankeya, 2023).

Finally, cross-border transmission dynamics make collaborative evidence generation non-negotiable. Spatio-temporal modelling studies in Nigeria demonstrate that onchocerciasis persistence and resurgence are concentrated in ecological and geographic hotspots, particularly in border regions and areas near rivers where vector breeding conditions are favourable (Babalola et al., 2025). These studies further show that environmental variables such as rainfall, elevation, and temperature significantly influence infection risk and spatial clustering of disease (Babalola et al., 2025). In addition, WHO highlights that endemic areas spanning national borders require coordinated surveillance, harmonised intervention strategies, and strengthened cross-border collaboration to prevent recrudescence and sustain elimination gains (World Health Organization, 2023c). Cross River State's proximity to Cameroon therefore makes coordinated evidence generation and transboundary policy dialogue essential for sustained elimination.

2.0 | AIM AND OBJECTIVES

2.1 AIM:



To assess the effectiveness of community-led advocacy, storytelling, and policy engagement on knowledge, attitudes, practices, and behaviours related to onchocerciasis and integrated disease elimination in Kaduna and Cross River States, Nigeria.

2.2 2.2 OBJECTIVES:



- ✓ To assess baseline and endline levels of knowledge, attitudes, practices, and behaviours (KAPB) related to onchocerciasis and its integration with malaria, lymphatic filariasis, and WASH among community members in Kaduna and Cross River States.
- ✓ To evaluate the influence of community-led advocacy activities on participation in integrated disease elimination efforts.
- ✓ To examine the reach and effectiveness of storytelling and radio campaigns (Voices from the River), alongside dominant information channels and local influencers, in shaping health-seeking behaviours and public perception across both states.
- ✓ To map key stakeholders across federal, state, and local levels, and analyse their influence and interest in integrated disease elimination.
- ✓ To assess how cross-sector and cross-border collaboration, supported by policy dialogues and informed by stakeholder dynamics, contributes to improved surveillance, MDA planning, and policymaker commitment to sustainable elimination.

3.0 | METHODOLOGY

3.1 STUDY DESIGN



This survey employs a mixed-methods, cross-sectional design anchored in two complementary theoretical frameworks: the Social Ecological Model (SEM), which structures the analysis of KAPB outcomes across individual, interpersonal, community, health system, and policy levels; and Proctor's Implementation Outcomes Framework, which evaluates integrated NTD interventions across dimensions of acceptability, adoption, feasibility, fidelity, penetration, cost-efficiency, and effectiveness. The study is conducted over a 12-month period from January 2026 to January 2027, with baseline (early 2026) and endline (late 2026) assessments.

3.2 QUANTITATIVE COMPONENT: HOUSEHOLD KAPB SURVEY



A structured, interviewer-administered household KAPB survey targeted adults aged 18 years and above who resided in selected onchocerciasis-endemic communities for a minimum of six months. The survey instrument covers six thematic domains: socio-demographic characteristics; knowledge and awareness of onchocerciasis and co-endemic NTDs; MDA awareness and participation; attitudes and perceptions; preventive practices and health-seeking behaviours; and information sources and perceived barriers to integrated NTD control. Data were collected electronically using KoBoCollect on password-protected Android tablets.

Sample size was calculated using $n = Z^2 \cdot p(1-p) / d^2$ ($Z=1.96$, $p=0.50$, $d=0.05$), yielding 384. A design effect of 2.0 and 10% non-response adjustment produced approximately 845 per state. The combined sample is $N=1,823$ (Cross River $n=906$; Kaduna $n=917$). Note: Kudan LGA ($n=196$) was excluded from all analyses following data quality review.

State	LGAs Included	n (Achieved)	% Female
Kaduna State	Kachia, Kagarko, Lere	917	38.4%
Cross River State	Etung, Akamkpa, Boki	906	52.6%
Combined	6 LGAs	1,823	45.5%

Table 1: showing the distribution of respondents across both states

3.3 SAMPLING TECHNIQUE



A two-stage cluster sampling strategy was employed. In the first stage, communities were purposively selected with State NTD Programme Officers to include border and riverine communities with high blackfly exposure, historically low MDA coverage, and high population mobility. In the second stage, households within each community were selected using simple random sampling, with one eligible adult per household randomly selected. The sample is distributed proportionally across LGAs by population size and endemicity status.

3.4 QUALITATIVE COMPONENT: KIIS AND FGDS



The qualitative component employed 33 Key Informant Interviews (KIIs) and community-level Focus Group Discussions (FGDs) using semi-structured instruments, guided by the principle of thematic saturation. Participants were purposively selected to reflect the multi-tiered governance and implementation structure of NTD programmes.

National	NTD Coordinator, Onchocerciasis Programme Manager, International Partners	7	Policy, cross-border surveillance, global guidance
State (*2)	Commissioner for Health, State NTD Coordinator, Epidemiologist, D.G SPHCDA	8	State planning, coordination, service delivery
LGA (*6)	LGA Health Director, NTD Focal Person, DSNO	18	Operational MDA, implementation barriers, community surveillance
Total		33	

Table 2: Showing the list of qualitative interviews broken down by category

FGDs were disaggregated by participant category (frontline implementers, community health workers, traditional and religious leaders, media practitioners), gender, and age group.

3.5 SECONDARY DATA REVIEW



A secondary data review was conducted to contextualise primary field findings, validate observed patterns, and identify programme-level gaps not visible through primary data collection alone. The review encompassed national and state NTD policy documents, programme reports, historical MDA coverage data, entomological surveillance records (including Annual Biting Rate and ND5 qPCR vector pool data from Kaduna and Cross River States), and relevant peer-reviewed literature on onchocerciasis and integrated NTD control in Nigeria. Documents were sourced from the Federal Ministry of Health and Social Welfare, state Ministries of Health, the Expanded Special Project for Elimination of Neglected Tropical Diseases (ESPEN) database, the WHO NTD document repository, and published literature from 2020 onwards. Findings from the desk was used to triangulate quantitative trends, contextualise shifts between baseline and endline KAPB indicators, and strengthen the policy relevance of the study's recommendations by identifying gaps between programmatic intentions and community-level realities.

3.6 PARTICIPANTS AND DATA SOURCES

3.6.1 LGA SELECTION RATIONALE:



Six LGAs were selected across both study states using a tiered, evidence-informed approach that balances epidemiological risk with programmatic relevance. The selection criteria operate on two tiers: (1) documented evidence of active onchocerciasis transmission or high vector exposure, and (2) programmatic and operational factors that complicate integrated NTD control even where transmission data may be incomplete. The rationale for each selected LGA is detailed below.

3.6.1.1 KADUNA STATE: KAGARKO, KACHIA, AND LERE LGAS

Kaduna State has a complex onchocerciasis epidemiological profile characterised by historically high burden followed by substantial reductions in prevalence attributable to more than a decade of community-directed treatment with ivermectin (CDTI). However, recent molecular evidence indicates recrudescence of transmission in some endemic communities, with *Onchocerca volvulus* ND5 qPCR positivity detected in blackfly vector pools – signalling either residual or re-emerging transmission despite prior programmatic gains (Olanrewaju et al., 2025). This makes the three selected Kaduna LGAs particularly critical for understanding whether community KAPB levels are keeping pace with the shifting epidemiological picture.

Only Kachia and Kagarko LGAs demonstrated molecularly confirmed transmission via qPCR. These LGAs therefore represent all known Kaduna LGAs with confirmed recrudescence based on current published evidence (Olanrewaju et al., 2025).

LGA	Epidemiological Basis	Programmatic/ Operational Factors	Relevance to Study Objectives
Kagarko (Kenyi/Jenyer, Gurara, Dogon Daji)	Located in the Guinea Savannah ecological zone with active blackfly breeding along fast-flowing tributaries. Documented vector exposure with ND5 qPCR evidence of Ov transmission in blackfly pools.	High population mobility linked to farming and seasonal migration. Proximity to state borders increases risk of cross-community and cross-border transmission.	Provides evidence on KAPB in an active transmission context with high mobility; tests whether integration of disease messaging reaches mobile populations.
Kachia (Gidan Zango, Maidamishi)	Historically high-burden LGA with prior CDTI coverage. Recent surveillance data suggest heterogeneity in MDA uptake and possible recrudescence in riverine sub-communities.	Reports of insecurity and hard-to-reach terrain in parts of the LGA. Historical programmatic importance as a CDTI implementation site.	Allows examination of KAPB in a context of prior programme exposure; assesses whether knowledge gains are sustained and whether insecurity disrupts community engagement.
Lere (Alwalu Mai Samari, Maigamo, Kудару)	Riverine communities along fast-flowing streams with confirmed Simulium blackfly breeding. Entomological records indicate sustained human-vector contact.	Persistently low MDA coverage relative to state targets in some communities. Cross-border dynamics with neighbouring states present surveillance challenges.	Critical for understanding barriers to MDA uptake and the role of cross-border collaboration in surveillance and programme coordination

Table 3. LGA selection rationale – Kaduna State

Primary indicator: Ov ND5 qPCR positivity in black fly pools. (Source: Olanrewaju et al., 2025 PLOS Neglected Tropical Diseases).

3.6.1.2 CROSS RIVER STATE: AKAMKPA, ETUNG, AND BOKI LGAS

Cross River State represents a historically high-burden context for onchocerciasis, particularly in rainforest and riverine communities where blackfly breeding sites are abundant along fast-flowing river systems. Persistent transmission, low community awareness of disease causation, entrenched socio-cultural beliefs, stigma, and weak community-directed treatment structures continue to challenge elimination efforts (Amazigo et al., 2002; Chikezie et al., 2023; Anagbogu et al., 2022). The three selected LGAs reflect the most critical transmission and programmatic challenges in the state.

LGA	Epidemiological Basis	Programmatic/ Operational Factors	Relevance to Study Objectives
Akamkpa (Mfamosing, Aningeje, Ekong Anaku)	Situated within the Cross River rainforest zone with high Annual Biting Rate (ABR) documented along the Cross River tributaries. Chikezie et al. (2023) confirmed active onchocerciasis transmission in endemic communities of Cross River State after two decades of MDA, underscoring persistent risk.	Known implementation challenges including difficult terrain, community resistance to MDA, and stigma associated with skin manifestations. Low treatment coverage reported in integrated transmission assessment surveys (Anagbogu et al., 2022).	Offers a critical test case for assessing whether community advocacy and storytelling interventions can shift KAPB in a high-burden, high-stigma setting.
Etung (Agbokim, Itaka, Ajassor)	Border LGA sharing boundaries with Cameroon, a co-endemic country with its own onchocerciasis control programme. High cross-border population movement along the Etung-Mamfe corridor elevates transmission risk and complicates MDA coordination.	Cross-border movement from Cameroon introduces populations not covered by Nigeria's CDTI, disrupting local elimination efforts. Limited port and border health infrastructure.	Directly addresses the study's cross-border collaboration objective; provides data on how population movement and bilateral coordination gaps affect KAPB and MDA uptake.
Boki (Orimekpang, Abontakong, Bashua)	Forested LGA with multiple fast-flowing rivers and streams providing ideal Simulium blackfly breeding habitat. ABR indices consistent with sustained high-risk transmission zones.	Historically hard-to-reach communities with limited health infrastructure. Entrenched traditional beliefs about skin disease causation and low uptake of formal health services.	Tests the reach and effectiveness of the Voices from the River storytelling and radio campaign in changing health-seeking behaviours in a low-access, high-belief-driven context.

Table 4: LGA selection rationale – Cross River State

Cross-River: Although qPCR infectivity was not assessed, these LGAs represent sentinel riverine transmission zones with ABRs far exceeding WHO thresholds, indicating continued risk of onchocerciasis transmission despite long-term ivermectin MDA (Chikezie et al., 2023). LGAs were selected based on the strongest available entomological and molecular indicators of onchocerciasis transmission, including Ov ND5 qPCR positivity in black fly pools (Kaduna State) and high annual black fly biting rates indicating transmission potential (Cross River State).

3.6.2 DATA COLLECTION TECHNIQUES

3.6.2.1 QUANTITATIVE DATA COLLECTION



Quantitative data were gathered using a structured, interviewer-administered KAPB questionnaire adapted from validated instruments previously used in onchocerciasis and NTD studies in Nigeria and sub-Saharan Africa (Jaiyeola et al., 2025; Anagbogu et al., 2022). The tool was organised into five main sections aligned with the study's specific objectives: (i) socio-demographic characteristics; (ii) knowledge and awareness of onchocerciasis and co-endemic NTDs; (iii) attitudes and perceptions toward onchocerciasis and control interventions; (iv) practices and behaviours related to prevention and health-seeking; and (v) health services utilisation and information access. An additional section captures respondent exposure to and perceptions of community-led advocacy activities.

Data were collected electronically using KoBoCollect on password-protected Android tablets. The platform supports built-in validation features including skip patterns, mandatory fields, and range restrictions, which minimise entry errors and improve data completeness. All enumerators underwent standardised training in study objectives, ethical protocols, informed consent procedures, and tablet use prior to data collection. Tools were pre-tested in non-study communities with similar socio-demographic profiles, and findings from the pilot were used to refine question wording and field procedures before full-scale deployment.

3.6.2.2 QUALITATIVE DATA COLLECTION



Key Informant Interviews (KIs) were conducted using semi-structured guides that explore stakeholder perceptions of onchocerciasis control, coordination practices, barriers to integrated NTD programming, and the role of cross-sector and cross-border collaboration in supporting sustainable elimination. Guides were organised around Proctor's Implementation Outcomes Framework, assessing dimensions of acceptability, adoption, feasibility, fidelity, penetration, cost-efficiency, and effectiveness as experienced by actors at national, state, and LGA levels. At baseline, KIs focus on documenting current coordination mechanisms, perceived programme gaps, and contextual barriers.

Focus Group Discussions (FGDs) were conducted at the community level with frontline implementers like the community drug distributors (CDDs), community health workers (CHWs), and community leaders. FGDs were stratified by stakeholder type and, where applicable, by gender and age group to surface distinct perspectives. Guides explored community norms and beliefs related to onchocerciasis, perceived barriers to MDA participation. The baseline FGD guide focused on mapping current community dynamics and information landscapes.

All KIs and FGDs were audio-recorded with participant consent, transcribed verbatim, and translated into English where necessary. Transcripts were cross verified against original recordings to ensure completeness and semantic accuracy.

3.6.3 DATA MANAGEMENT AND QUALITY ASSURANCE



Robust quality assurance procedures were implemented across all data collection activities. Research Assistants received comprehensive pre-field training covering study objectives, ethical protocols, informed consent, cultural sensitivity, and standardised use of electronic data collection tools. Instruments were pre-tested in non-study communities prior to deployment. During data collection, daily supervision was conducted by trained team leads who monitor protocol adherence, resolve field challenges, and conduct random spot-checks. KoBoCollect submissions are reviewed in real time for missing data, inconsistencies, and logic errors. For qualitative data, verbatim transcripts were cross verified against original audio recordings, with discrepancies resolved collaboratively by the research team. All data were stored on encrypted drives with access restricted to authorised personnel. Participant identifiers were removed and replaced with unique codes at the point of data entry to preserve anonymity throughout analysis and dissemination.

3.6.4 DATA ANALYSIS PLAN

3.6.4.1 QUANTITATIVE ANALYSIS

Quantitative data was analysed using Stata version 17. The analysis proceeds in three stages. In the first stage, descriptive statistics were generated to characterise the study population and summarise KAPB indicators across the full sample and by sub-group. Frequencies and proportions were reported for categorical variables (e.g., disease awareness, MDA participation, preventive behaviours). Means and standard deviations were used for continuous variables (e.g., knowledge scores derived from composite indices). Results were disaggregated by state, LGA, gender, age group, educational attainment, and occupation to identify sub-group disparities in KAPB outcomes.

In the second stage, bivariate analyses, primarily chi-square tests for categorical outcomes and t-tests or ANOVA for continuous outcomes were used to assess associations between KAPB indicators and key socio-demographic and contextual variables, including exposure to MDA, community advocacy. Logistic regression models were applied in multivariate analyses to identify independent predictors of key outcomes (e.g., MDA uptake, willingness to take ivermectin, health-seeking behaviour), controlling for potential confounders including age, gender, geography, and educational level.

In the third stage, comparative analysis was conducted between Kaduna and Cross River States to examine regional variation in KAPB outcomes and to assess whether epidemiological context (approaching elimination vs. persistent transmission) moderates the relationship between project exposures and KAPB change.

3.6.4.2 QUALITATIVE ANALYSIS

Qualitative transcripts were analysed thematically using Dedoose, a mixed-methods software platform designed for coding and analysis of text-based qualitative data. Coding follows a combined inductive-deductive strategy. Deductive codes were developed a priori from the study's two theoretical frameworks – the Social Ecological Model (SEM) and Proctor's Implementation Outcomes Framework – and applied to capture expected themes related to individual knowledge, community norms, health system factors, and implementation outcomes. Inductive codes emerge iteratively from the data to capture unanticipated themes and contextually specific dynamics not pre-specified in the analytical frameworks.

Coding was conducted independently by at least two members of the research team, with regular inter-coder reliability checks to ensure consistency of interpretation. Emerging themes were iteratively refined through team discussions, and discrepant codes were resolved by consensus. Thematic saturation was used as the criterion for sufficiency of qualitative data, consistent with established qualitative methodology (WHO, 2020).

3.6.4.3 MIXED-METHODS INTEGRATION AND TRIANGULATION

Consistent with the study's convergent mixed-methods design, quantitative and qualitative findings were triangulated at the interpretation stage to produce an integrated analytical narrative. This process involved comparing quantitative indicators (e.g., proportions of respondents aware of MDA, reporting MDA uptake, or demonstrating correct knowledge of disease transmission) with qualitative themes (e.g., reported reasons for MDA refusal, community perceptions of drug distributors, or barriers to seeking care) to determine points of convergence, divergence, or complementarity.

Where quantitative and qualitative findings converge, conclusions were considered robust and are presented with high confidence in the study report. Where they diverge, the discordance was treated as an analytically important finding in itself – pointing, for example, to a gap between stated knowledge and actual practice, or between programme targets and community experience. Findings from the secondary data review were incorporated into this triangulation to further contextualise primary data patterns and to link community-level evidence to policy and programme-level realities.

3.6.5 ETHICAL CONSIDERATIONS

Ethical approval was sought from the National Health Research Ethics Committee (NHREC) of Nigeria. Additional approvals were sought from the State Ministries of Health in Kaduna and Cross River States, with permissions also secured from LGA authorities and community gatekeepers. Written informed consents were obtained from all participants, with verbal consent documented where literacy is limited. Participants were informed of their right to withdraw at any time without consequence. Confidentiality and anonymity were upheld throughout data collection, storage, analysis, and dissemination, in full accordance with the Declaration of Helsinki and international guidelines for human subjects research.

3.7 LIMITATIONS

Several limitations should be considered when interpreting these survey. First, the cross-sectional design captures associations at a single time point and cannot establish causality between advocacy exposure, knowledge, and MDA uptake; the planned endline will partially address this through repeated measurement. Second, MDA uptake, ivermectin ingestion, and preventive practices are self-reported and therefore susceptible to recall bias and social-desirability bias, particularly given the strong community-level endorsement of CDD visits; no biological validation (e.g., serology or skin-snip) was undertaken at baseline. Third, the Cross River sample is demographically skewed, with 97.5% of respondents identifying as Christian and 1.5% as Muslim, which precludes meaningful religion-stratified analysis in that state and limits direct comparison with the Kaduna religion-uptake findings. Fourth, LGAs were purposively selected on

the basis of entomological evidence, historical burden, and programmatic relevance, meaning the sample is analytically – not statistically – generalisable to all endemic LGAs in Nigeria. Fifth, Kudan LGA (n=196) was excluded after data quality review owing to inconsistencies in household enumeration and interviewer verification; this reduced the Kaduna sample against the original target but did not compromise the state-level power calculation. Sixth, insecurity in parts of Kaduna restricted enumerator access to some sampled communities, and replacement clusters were drawn from the same LGA stratum, which may have attenuated estimates of insecurity-related barriers. Finally, the qualitative sample, while reaching thematic saturation, reflects the perspectives of stakeholders willing and available to participate; dissenting voices – particularly MDA refusers – may be under-represented.

4

RESULTS/FINDINGS
AND INSIGHTSCross River
StateKaduna
State

4.1

SAMPLE DESCRIPTION

DEMOGRAPHIC PROFILE OF THE STUDY SAMPLE:

The survey sample (N = 1,823) draws from two states with markedly different demographic profiles, and these contrasts shape the KAPB outcomes reported below. Cross River is religiously homogeneous, younger, and more mobile, with 97.5% of respondents identifying as Christian and 34.2% aged 18–30. Its economy is dominated by trading (34.7%), and only 25.7% of respondents are lifelong residents, reflecting a more transient population.

Kaduna, by contrast, is religiously mixed, older, and residentially more stable. Christians account for 86.6% and Muslims 13.3% of respondents, with 25.8% aged 18–30 and 6.3% aged over 60. The workforce is largely engaged in farming and fishing (61.0%), and 62.4% of respondents have lived in the state all their lives. Taken together, these differences in religion, age structure, livelihood, and residential mobility provide the demographic backdrop against which the knowledge, attitude, practice, and behaviour (KAPB) findings should be interpreted.

Study Sample - Combined N= 1,823

All States (N= 1,823)

1823

Cross River (n=906)

906

Kaduna (n=917)

917

Figure 1: A snapshot of the study sample in Kaduna and Cross River

Domain	Characteristic	All States n(%)	Cross River n(%)	Kaduna n(%)
Religion	Christian	1677(92.0%)	883(97.5%)	794(86.6%)
	Muslim	136(7.5%)	14(1.5%)	22(13.3%)
	Traditional Worshiper	10(0.5%)	9(1.0%)	1(0.1%)
Age Group	18–30	547(30.0%)	310(34.2%)	237(25.8%)
	31–40	613(33.6%)	312(34.4%)	301(32.8%)
	41–50	423(23.2%)	206(22.7%)	217(23.7%)
	51–60	173(9.5%)	69(7.6%)	104(11.3%)
	>60	67(3.7%)	9(1.0%)	58(6.3%)
Highest Level of Education	No formal education	547(30.0%)	310(34.2%)	237(25.8%)
	Quranic/ Informal Education	12(0.7%)	2(0.2%)	10(1.1%)
	Primary Education	262(14.4%)	68(7.5%)	194(21.2%)
	Secondary Education	1037(56.9%)	546(60.3%)	491(53.5%)
	Tertiary Education	399(21.9%)	262(28.9%)	137(14.9%)
Main Occupation	Farming/Fishing	839(46.0%)	280(30.9%)	559(61.0%)
	Trading	480(26.3%)	314(34.7%)	166(18.1%)
	Civil Servant	126(6.9%)	78(8.6%)	48(5.2%)
	Artisan	69(3.8%)	9(1.0%)	60(6.5%)
	Student	93(5.1%)	72(7.9%)	21(2.3%)
	Unemployed	148(8.1%)	117(12.9%)	31(3.4%)
	Others	68(3.7%)	36(4.0%)	32(3.5%)
Length of Residence	1–2 yrs	121(6.6%)	108(11.9%)	13(1.4%)
	3–5 yrs	184(10.1%)	160(17.7%)	24(2.6%)
	5–10 yrs	271(14.9%)	198(21.9%)	73(8.0%)
	>10 yrs	442(24.2%)	207(22.8%)	235(25.6%)
	All my life	805(44.2%)	233(25.7%)	572(62.4%)

Table 5: showing the socio-demographic characteristics of respondents across all states and by Cross River and Kaduna, including religion, age group, education level, occupation, and length of residence.

RESULTS/FINDINGS AND INSIGHTS

Three structural differences account for most of the variation in outcomes between the two states. The first is religion: Kaduna's Muslim population (13.3%) is substantially larger than Cross River's (1.5%) (Table 5), introducing distinct faith-based influences on health knowledge and practices. The second is occupation, with 61.0% of Kaduna respondents engaged in farming or fishing compared with 30.9% in Cross River (Table 5), reflecting sharply different livelihood patterns and daily exposure risks. The third is residency: Cross River's population is considerably more mobile, which has direct operational implications for community drug distributor (CDD) enumeration and necessitates a more dynamic, adaptive enumeration approach.

4.2 KNOWLEDGE OF ONCHOCERCIASIS

The results indicate that overall knowledge is moderate, with small differences between states. The average score was 9.05 out of 15, meaning respondents got just over half of the questions right. Kaduna scored slightly higher (9.42) than Cross River (8.67), and this difference is statistically significant ($p < 0.001$), so it is unlikely due to chance.

However, fewer than half of respondents (48%) reached the adequate knowledge level ($\geq 11/15$), and the rates are very similar in Cross River (47.2%) and Kaduna (48.7%). This shows that knowledge gaps are common in both states, not limited to one state.

Three structural differences account for most of the variation in outcomes between the two states. The first is religion: Kaduna's Muslim population (13.3%) is substantially larger than Cross River's (1.5%) (Table 5), introducing distinct faith-based influences on health knowledge and practices. The second is occupation, with 61.0% of Kaduna respondents engaged in farming or fishing compared with 30.9% in Cross River (Table 5), reflecting sharply different livelihood patterns and daily exposure risks. The third is residency: Cross River's population is considerably more mobile, which has direct operational implications for community drug distributor (CDD) enumeration and necessitates a more dynamic, adaptive enumeration approach.

Knowledge Item	All States	Cross River	Kaduna	p(χ^2)
1.1 Ever heard of river blindness	1500 (82.3%)	704 (77.7%)	796 (86.8%)	<0.001 *
1.2 Correctly identifies blackfly as vector	1378 (91.9%)	662 (94.0%)	716 (89.9%)	0.005 *
1.3a Severe itching is a symptom	1252 (83.5%)	612 (86.9%)	640 (80.4%)	<0.001 *
1.3b Skin changes is a symptom	762 (50.8%)	382 (54.3%)	380 (47.7%)	0.014 *
1.3c Vision problems/blindness is a symptom	928 (61.9%)	349 (49.6%)	579 (72.7%)	<0.001 *
1.4a Preventive medicine prevents it	1240 (82.7%)	558 (79.3%)	682 (85.7%)	0.001 *
1.4b Avoiding blackfly areas prevents it	533 (35.5%)	297 (42.2%)	236 (29.6%)	<0.001 *
1.5 Treatable with specific medicines	1425 (78.2%)	637 (70.3%)	788 (85.9%)	<0.001 *
2.1 Related to malaria	840 (46.1%)	446 (49.2%)	394 (43.0%)	0.008 *
2.2 Related to lymphatic filariasis	799 (43.8%)	445 (49.1%)	354 (38.6%)	<0.001 *
2.3a Eyes are affected body part	1264 (69.3%)	529 (58.4%)	735 (80.2%)	<0.001 *
2.3b Skin is affected body part	1048 (57.5%)	457 (50.4%)	591 (64.4%)	<0.001 *
2.4 Identifies ivermectin as treatment	1337 (73.3%)	675 (74.5%)	662 (72.2%)	0.288
2.5 WASH reduces blackfly breeding	1092 (59.9%)	594 (65.6%)	498 (54.3%)	<0.001 *
2.6 Supports integrated disease control	1093 (60.0%)	504 (55.6%)	589 (64.2%)	<0.001 *

Table 6: Knowledge Items – Correct Responses with Between-State p-values

The data show a similar pattern of misunderstanding in both states, with the same three main gaps:

- Link with lymphatic filariasis (~50% incorrect)
- Link with malaria (~54% incorrect)
- Blackfly habitats/avoidance (~64% incorrect)

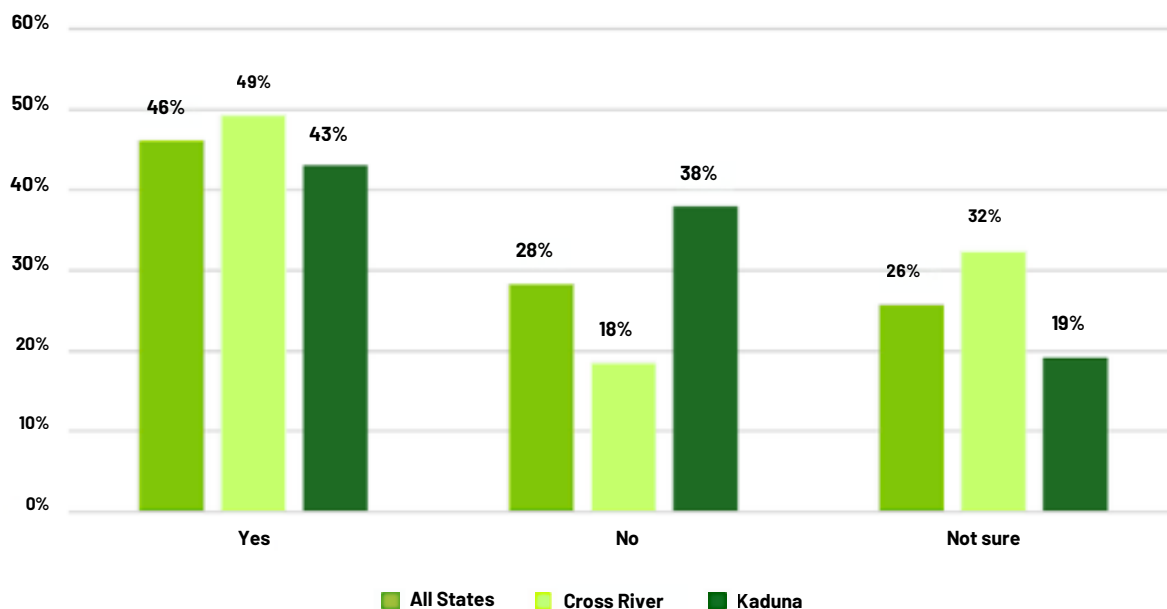
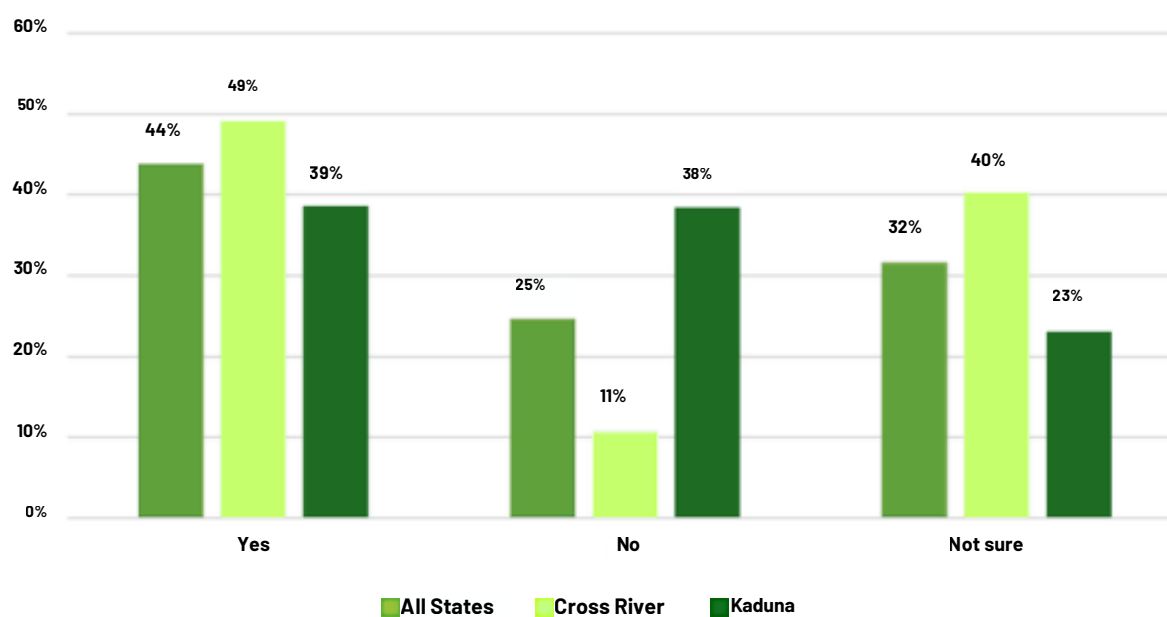
Because these gaps are almost identical in Cross River and Kaduna, the problem is likely due to broader messaging issues, not local differences. These areas should be top national priorities for communication, especially explaining disease differences and how transmission works.

Another key point is that higher average scores do not mean better understanding. Although Kaduna has a higher average score, the share of people with adequate knowledge is almost the same in both states. This means people may be getting more answers right overall but still missing the most important concepts.

Overall, the issue is not just how much people know, but what they know. Both states share the same key misunderstandings, so efforts should focus on correcting these specific gaps, rather than simply increasing general awareness.

Question & Response	All States	Cross River	Kaduna
Q2.1: Related to malaria?			
Yes	46.1%	49.2%	43.0%
No	28.3%	18.4%	37.9%
Not sure	25.7%	32.3%	19.1%
Total	100.0%	100.0%	100.0%
Q2.2: Related to lymphatic filariasis?			
Yes	43.8%	49.1%	38.6%
No	24.6%	10.6%	38.4%
Not sure	31.6%	40.3%	23.0%
Total	100.0%	100.0%	100.0%

Table 7: Response Distributions for Key Knowledge Questions

Q2.1: Related to malaria?**Figure 2: Response Distributions for Key Knowledge Questions****Q2.2: Related to lymphatic filariasis?****Figure 3: Response Distributions for Key Knowledge Questions**

Communities in Kaduna demonstrate strong experiential recognition of cardinal onchocerciasis symptoms, itching, skin changes, visual impairment, grounded in lived experience among farming and riverine populations. The blackfly (locally called Buzu or Gyekpai) is widely and correctly identified as the vector. Historical burden is powerfully expressed: a community leader in Lere recalled the area once being called 'the Village of the Blind.'

However, misconceptions persist. The predominant error is the malaria analogy – transmission framed as 'blood transfer' from person to person via the blackfly, blurring the distinction between vector-mediated infection and direct transmission. Environmental conflation is also common: proximity to rivers is correctly identified as a risk factor, but this is often misread as waterborne transmission.



Even through our drinking water we come in contact with this sickness because the flies are everywhere and our water is gotten from the river

In Cross River, knowledge of the blackfly vector (locally called Mutumutu) is broad, but additional explanatory frameworks layer on top. Spiritual causation – illness described as Oponukot (stepping on objects placed by enemies) – is present alongside biomedical understanding, reflecting indigenous conceptions of misfortune. Confusion between onchocerciasis and lymphatic filariasis is pronounced, with elephantiasis and scrotal swelling misattributed to river blindness.



In the village here, when it happens, some people will say Oponukot - (a colloquial term for a charm placed for you) has attacked you, believing that someone had dropped Oponukot for you

Messaging must address context-differentiated misconceptions: the malaria analogy and blood-transfer framing in Kaduna; spiritual causation and LF/onchocerciasis conflation in Cross River; and the shared waterborne transmission misconception in both. Disease-specific IEC materials with visual distinctions between onchocerciasis, malaria, and LF are needed nationally. Communities must also be explicitly told that, although symptoms typically appear only 9 months to 2 years after the infecting blackfly bite, adult *Onchocerca volvulus* worms can survive in the body for 10–15 years and continue producing microfilariae throughout that period, meaning treatment adherence must be sustained well beyond the resolution of visible symptoms.

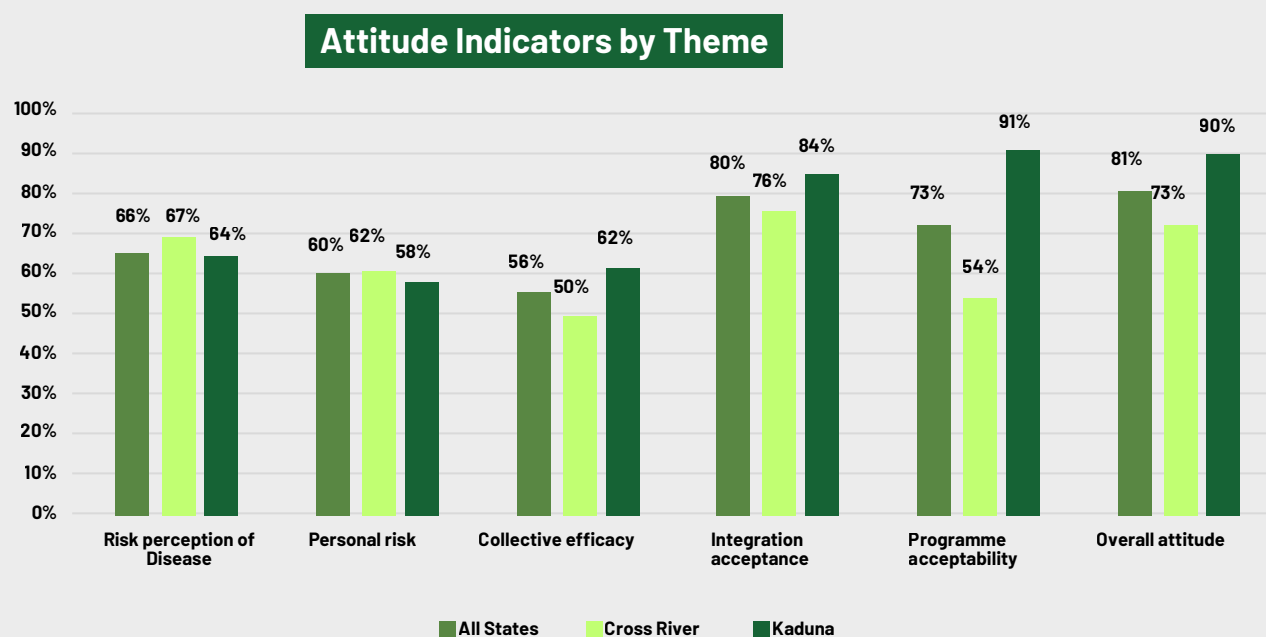
4.3 ATTITUDES AND PERCEPTIONS

Respondents across both states generally hold positive attitudes toward mass drug administration (MDA). On a 17-point attitude scale, the combined mean score was 13.93 (SD 3.0), indicating that, on average, respondents agreed with most of the favourable statements about MDA. However, the two states differed meaningfully: Cross River scored 13.37 while Kaduna scored 14.49, and this difference was statistically significant ($p < 0.001$), meaning it is very unlikely to have occurred by chance. When attitudes are categorised using a cut-off of 12 out of 17, 81.2% of all respondents fall into the "positive attitude" group. Here again, Kaduna leads clearly, with 89.7% of respondents holding positive attitudes, compared with 72.6% in Cross River. In short, people in both states view MDA favourably, but Kaduna residents are noticeably more enthusiastic about it than their Cross River counterparts.

The most striking insight from these data is a paradox. Despite Kaduna's significantly more positive attitudes toward MDA (89.7% vs 72.6%), actual MDA uptake is almost identical in the two states at roughly 75%. In other words, believing strongly in the value of MDA has not translated into higher rates of actually taking the medicine in Kaduna. This mismatch tells us something important about what is really standing in the way of higher uptake. If attitudes were the main driver, Kaduna's uptake should be clearly higher than Cross River's – but it is not. The gap between willingness and action points to structural delivery barriers: problems in how, where, and to whom the drugs are actually being distributed.

A key contributor appears to be a religion-based service gap, where segments of Kaduna's more religiously mixed population – particularly Muslim communities – may be under-reached by current distribution channels, community mobilisers, or outreach messaging. The qualitative evidence reinforces this interpretation: Muslim uptake in Kaduna remains at only 31.7% versus 74.8% among Christians despite strong overall attitudes, with respondents pointing to a religion-based delivery gap (predominantly church- and village-head-led mobilisation), economic disincentives for farmers ('If I take it and go to work, the drug affects my work'), and household-level rumour fears ('if they take it, it may cause another different sickness'), confirming that the barrier is access and trusted delivery, not refusal.

Domain	Indicator	All States	Cross River	Kaduna	p-value
Risk perception of Disease	Perceived seriousness rated high	65.8%	67.3%	64.3%	<0.001
Personal risk	Personal concern about getting disease rated high	60.0%	61.7%	58.3%	<0.001
Collective efficacy	Belief that community action can reduce disease	55.7%	49.7%	61.7%	<0.001
Integration acceptance	Importance of integration	80.0%	75.7%	84.3%	<0.001
Programme acceptability	Willingness to take ivermectin (definitely willing)	72.6%	54.4%	90.6%	<0.001
Overall attitude	Positive composite attitude ($\geq 12/17$)	81.2%	72.6%	89.7%	<0.001

Table 8: Attitude Indicators disaggregated by themes**Figure 4: Attitude Indicators disaggregated by themes**

Attitudes toward mass drug administration (MDA) are broadly positive across both states, but the patterns beneath the headline numbers tell a more nuanced story. When asked whether they would "definitely take" ivermectin, 90.6% of Kaduna respondents said yes, compared with just 54.4% in Cross River. On the surface, this suggests Kaduna is the more receptive environment. Yet when actual MDA uptake is examined within Kaduna, a sharp inequity appears only 31.7% of Muslim

respondents reported taking ivermectin, compared with 74.8% of Christian respondents ($p < 0.001$). This religion-based uptake gap is absent in Cross River, whose population is overwhelmingly Christian and whose uptake is more uniform across groups. The clear implication is that Muslim residents in Kaduna are not refusing the drug – they are simply not being reached effectively by current delivery and communication channels. Formally engaging Muslim religious leaders, such as imams and mosque committees, as trusted messengers and programme partners should be considered in Kaduna, because the willingness to participate is already in place; what is missing is culturally trusted access.

Risk perception follows a somewhat opposite pattern to willingness. Overall, 65.8% of respondents rated the seriousness of the disease as high, with Cross River (67.3%) slightly ahead of Kaduna (64.3%; $p < 0.001$), and a similar pattern held for personal concern, at 60.0% overall (Cross River 61.7%; Kaduna 58.3%; $p < 0.001$). In plain terms, Cross River residents feel a more immediate personal threat from the disease, while Kaduna residents, although more enthusiastic about the drug, do not perceive the same level of personal danger. Belief in collective action – the sense that "if we all take part, this will work" – is moderate overall (55.7%) but noticeably stronger in Kaduna (61.7%) than in Cross River (49.7%; $p < 0.001$), suggesting that Kaduna communities are more inclined to trust group-based health efforts, while Cross River residents are more skeptical that communal action will deliver results.

Qualitative data below further provided insights into the attitudes and perception for onchocerciasis in Kaduna and Cross river states.

Programme acceptability reinforces Kaduna's readiness. Four in five respondents overall (80.0%) endorsed integrating ivermectin distribution with other health services, again with Kaduna (84.3%) ahead of Cross River (75.7%; $p < 0.001$), and willingness to take ivermectin specifically was far higher in Kaduna (90.6%) than in Cross River (54.4%; $p < 0.001$). The composite attitude score tells the same story: 81.2% of all respondents fall into the "positive attitude" category (≥ 12 out of 17), with Kaduna at 89.7% and Cross River at 72.6% ($p < 0.001$). Taken together, these findings point to a consistent conclusion – attitudes toward MDA are strong in both states and especially strong in Kaduna, but positive attitudes alone do not guarantee uptake. Closing the remaining gap, particularly among Kaduna's Muslim population, depends less on persuading people and more on fixing delivery: building inclusive, religiously trusted distribution channels so that the goodwill already present in the community can translate into actual coverage.

In both states, people trust Community Drug Distributors (CDDs) because they are neighbours and familiar faces, not because they represent the health system. In Kaduna, one respondent put it simply: "We have community volunteers... they handle it like it's their personal issue... so we know that it's from a genuine source." A Cross River participant echoed the same idea: "These people are people that are living with them. They know them, they are interacting every day. So, there's always that trust in them."

This kind of trust is powerful but fragile. It depends on consistent performance and can collapse quickly if a CDD leaves, underperforms, or is suspected of diverting drugs, a concern already reported in Cross River. Programmes in both states need to gradually shift trust from individual distributors to the system itself, through visible supervision, transparent accountability, and clear continuity plans when CDDs change.

Rumours work in two directions in Kaduna. Some fear the drug itself, "if they take it, it may cause another different sickness", while others embrace it for the wrong reasons, believing it kills bed bugs. The first suppresses uptake; the second creates expectations that, once unmet, can damage trust. Cross River faces a harder problem: globally circulated conspiracy theories sit alongside local fears tied to specific incidents, such as a child reportedly unable to walk after treatment or a death blamed on the drug. As one respondent recalled, "Taking Mectizan to them was like 'okay this is the medicine Bill Gates was bringing to come and kill us, to reduce our population.'" Both states need active rumour monitoring and rapid counter-messaging, but Cross River requires responses tailored to conspiracy narratives that reach far beyond the community.

In Kaduna, where most people farm or fish, side effects are judged partly by the income they cost. A day of dizziness or weakness is a day of lost earnings, as one respondent explained: "If I take it and go to work, the drug affects my work... that sometimes stops me from taking it." Non-compliance here is often a rational economic choice, not resistance.

In Cross River, reactions like swollen face, dizziness, and severe itching are interpreted in two ways: some see them as the drug "fighting" the disease, while others find them too disruptive and drop out. A critical cross-state pattern is that people with the heaviest parasite loads experience the strongest reactions and are therefore the most likely to refuse future doses, removing the most important cases from the programme. Strengthening adverse effects reporting must go hand in hand with clear messaging that reframes reactions as signs the drug is working.

Social influence is the strongest positive driver of uptake in Kaduna, working through traditional leaders, mosques, churches, town criers, and community meetings. Leaders go beyond advocacy and actively investigate why people refuse the drug. Yet this same structure is not reaching everyone: Muslim uptake in Kaduna remains at only 31.7% versus 74.8% among Christians, confirming that formal engagement of Muslim religious leaders is the single highest-return intervention available in the state.

In Cross River, social influence can become coercive. Leaders may "call to order" or threaten to evict residents who refuse treatment, as one respondent described: "In my community, any person that does not take this thing, will be called to order because those are the people who want to harbor the parasite. We don't joke with that." This reflects strong community ownership of elimination goals but raises clear concerns about voluntary participation that programme managers must monitor.

IMPLICATIONS:

Across both states, the central shift needed is from relationship-dependent trust to system-resilient compliance. Four priorities follow:

- Build rumour surveillance and rapid counter-messaging, tailored to local fears in Kaduna and conspiracy narratives in Cross River
- Strengthen adverse effects reporting and referral while reframing side effects as signs of therapeutic action, especially for high-parasite-load individuals
- Use social influence structures deliberately, while protecting voluntary participation — particularly in Cross River
- Engage Muslim religious leaders formally in Kaduna, the single highest-return action for closing the religion-based uptake gap

Across every theme, the qualitative evidence reinforces the quantitative finding: the main barrier to MDA is access and trusted delivery, not community resistance.

4.4 PRACTICES, BEHAVIOURS, AND HEALTH SERVICES

MDA UPTAKE AND CDD COVERAGE:

MDA uptake is high and remarkably similar across both states. Among respondents who were visited by a Community Drug Distributor (CDD), 90.3% (1,278) reported taking the medicine, with Cross River at 91.3% (577) and Kaduna at 89.4% (701). CDD reach, the share of all respondents actually visited by a CDD, was 77.7% overall (1,416), with Kaduna (85.5%, n = 784) well ahead of Cross River (69.8%, n = 632).

Looking across the full sample, 70.4% of respondents (1,284) reported taking MDA medicine in the past 12 months, with Kaduna (74.3%) ahead of Cross River (66.6%). Overall, 22.3% of respondents (407) were either not visited by a CDD or unsure, a gap that was nearly twice as large in Cross River (30.2%) as in Kaduna (14.5%). The most important finding is what happens after a CDD visit: conditional uptake among those visited is 90.3%, and almost identical across the two states (Cross River 91.3%; Kaduna 89.4%). In plain terms, when CDDs reach people, people take the drug, the barrier is not refusal at the door but the households the CDD never reaches.

MDA Indicator	All States	Cross River	Kaduna
Took MDA medicine past 12 months (Yes)	1284 (70.4%)	603 (66.6%)	681 (74.3%)
Visited by CDD past year (Yes)	1416 (77.7%)	632 (69.8%)	784 (85.5%)
Took medicine when visited by CDD	1278 (90.3%)	577 (91.3%)	701 (89.4%)
Not visited by CDD (No+Not sure)	407 (22.3%)	274 (30.2%)	133 (14.5%)

Table 9: Breakdown of MDA uptake and CDD coverage indicators by state

(Denominator for "Took medicine when visited by CDD" = respondents visited by a CDD (All = 1,416; CR = 632; Kaduna = 784). All other rows use the full sample (N = 1,823).

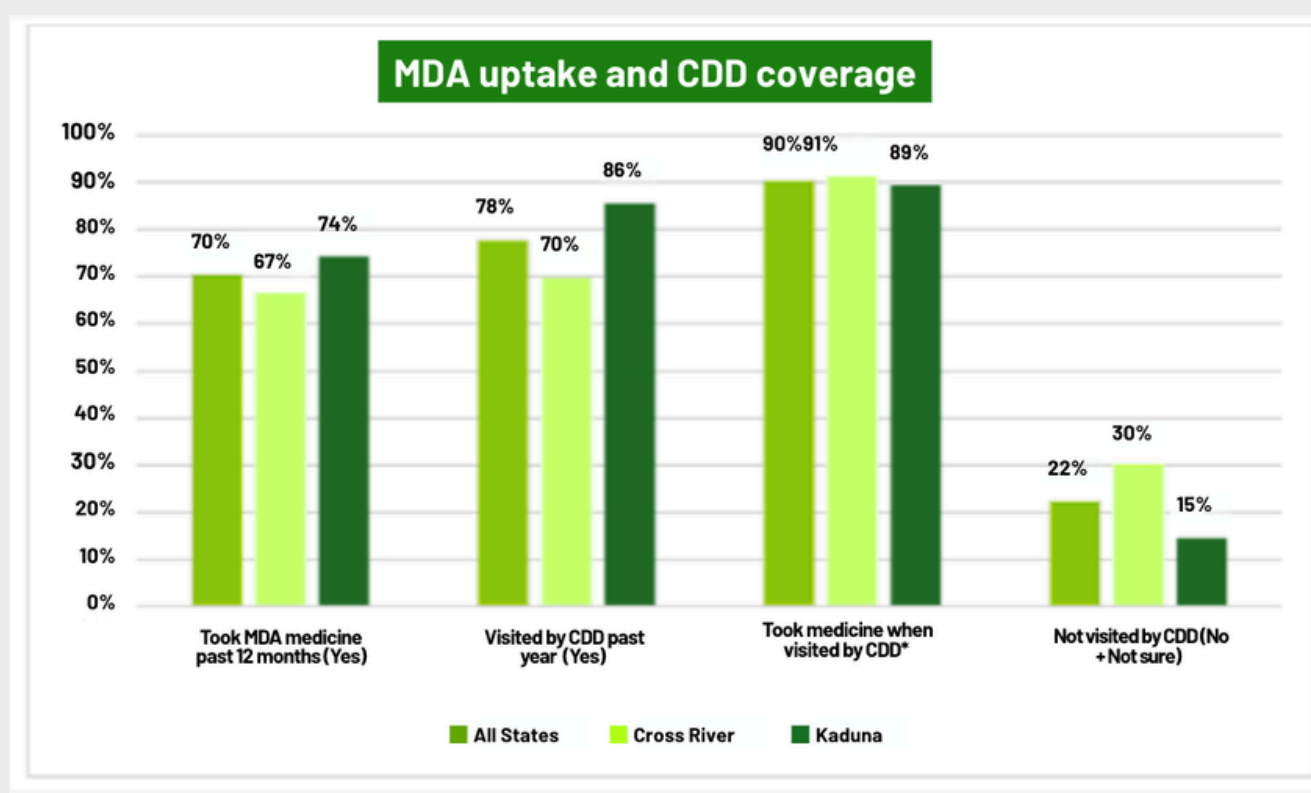


Figure 9: Breakdown of MDA uptake and CDD coverage indicators by state

Kagarko achieved 95.1% MDA uptake, the strongest result in the entire study and a clear benchmark for what effective CDD deployment looks like. By contrast, Kachia (60.3%) and Lere (70.2%) show a 25–35 percentage point coverage gap that can realistically be closed through CDD re-deployment and stronger community advocacy.

One nuance deserves attention: among respondents who were visited by a CDD, Kachia's uptake (75.2%) is notably lower than Kagarko's (96.2%) and Lere's (98.8%). This points to a quality-of-contact issue rather than a pure reach issue, and may reflect differences in community trust, CDD training, or the profile of households willing to receive a visit. A Kachia-specific qualitative follow-up is warranted before the next campaign.

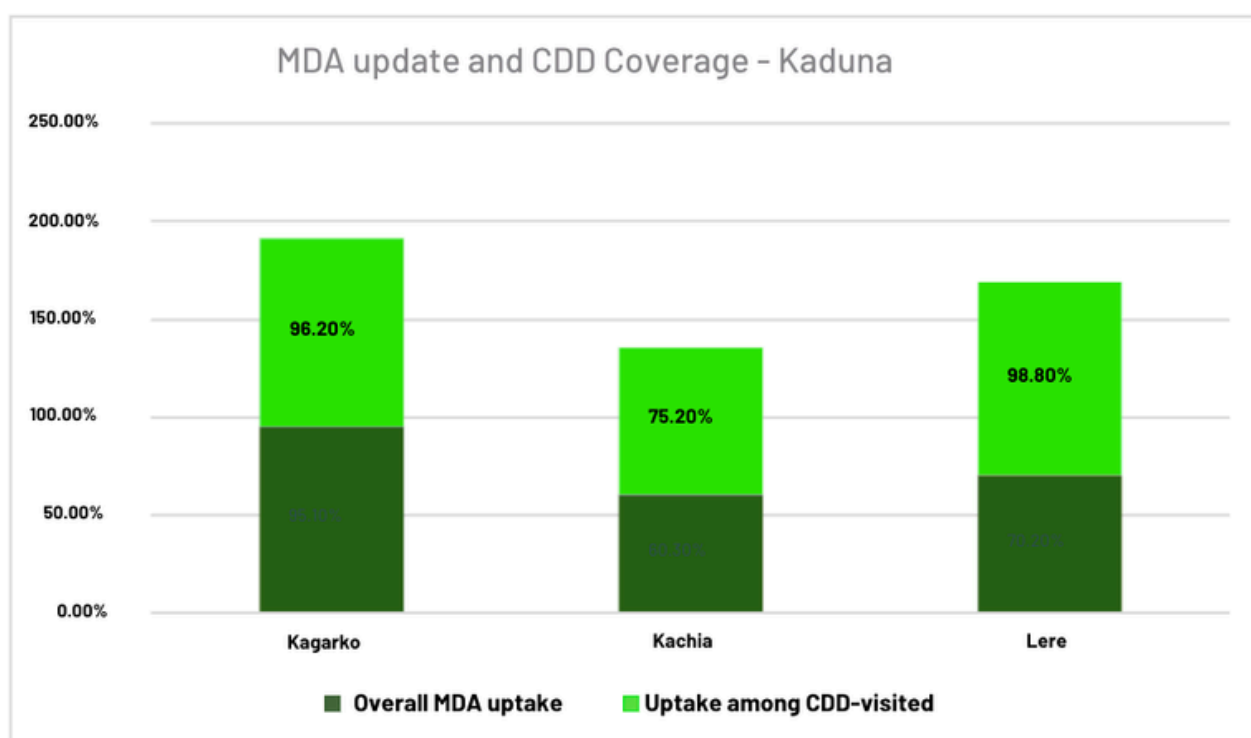


Figure 10: Breakdown of MDA uptake and CDD coverage indicators in Kaduna only

On CDD reach, 7.4% ($n = 158$) of Cross River respondents were not visited by a CDD, and 12.8% ($n = 116$) were unsure – together, 274 respondents who represent a coverage gap that can only be closed by expanding CDD deployment. LGA-level variation is actionable: Etung reached 76.7%, Akamkpa 65.1%, and Boki 67.3%, making Akamkpa and Boki the operational priorities for CDD re-deployment before the next round.

Crucially, among those who were visited, uptake in Cross River LGAs is very high – Etung 82.9%, Akamkpa 95.4%, and Boki 97.0%. The conclusion is unambiguous: the issue is not refusal at the point of delivery, but the 30.2% of Cross River respondents who were never reached in the first place. Programme focus should therefore sit squarely on closing CDD deployment gaps, not countering community resistance.

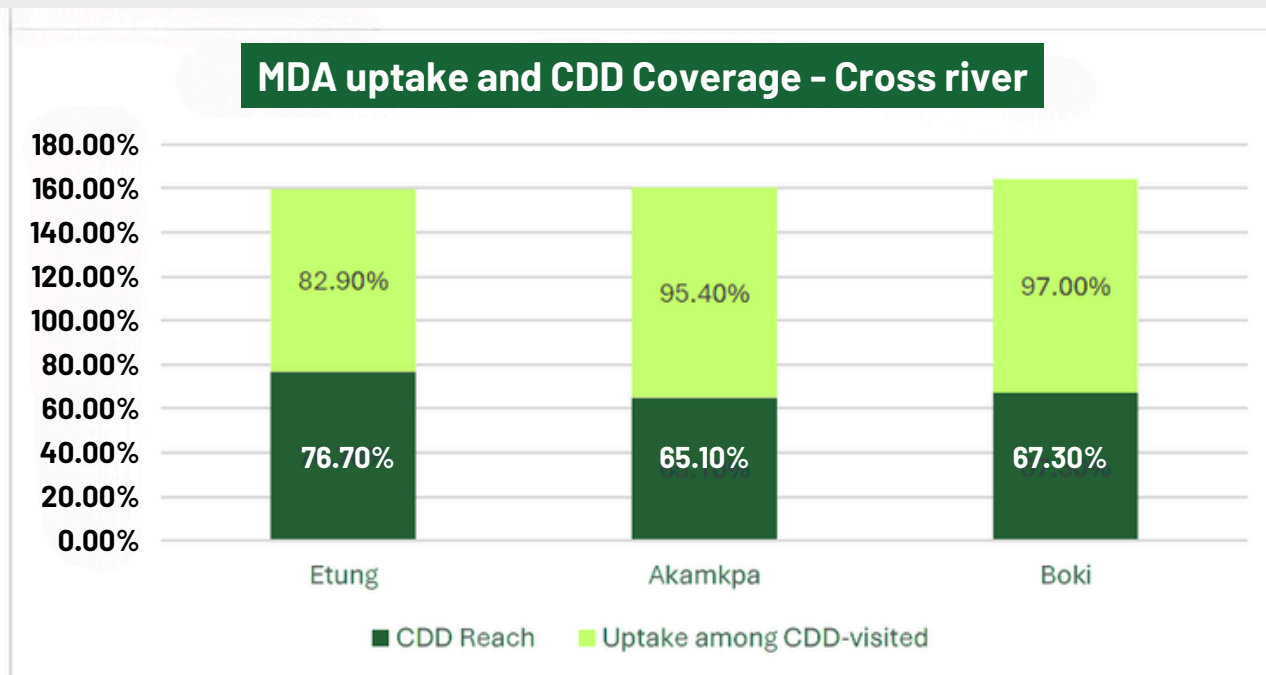


Figure 11: Breakdown of MDA uptake and CDD coverage indicators in Cross river only

The survey shows a clear pattern: when CDDs reach people, uptake is very high (91.3% in Cross River, 89.4% in Kaduna), yet 22.3% of respondents were never visited, and this gap is twice as large in Cross River (30.2%) as in Kaduna (14.5%). The qualitative evidence explains why: the problem isn't refusal, it's reach. Drug shortages, outdated population figures, rigid timing, and the absence of mobile workers all quietly shrink effective coverage well below what the headline numbers suggest.

In Kaduna, official figures and community accounts disagree. LGA officials cautiously estimate 65–70% coverage, while community voices suggest near-universal uptake. A real supply ceiling sits beneath both: "the supply of the drugs is not up to the target... it's not reaching all the people in the settlement." This matches the survey's LGA picture, Kagarko reached 95.1%, but Kachia (60.3%) and Lere (70.2%) fell far behind.

Cross River is better tracked, with Akamkpa reporting 80% coverage in the November 2025 round and Carter Center support across 16 of 18 LGAs. Demand is visibly strong; residents actively ask for the drug when supplies run out. But the survey reveals the same blind spot: Akamkpa's CDD reach was only 65.1% and Boki's 67.3%, even though uptake among those actually visited rose to 95.4% and 97.0%. High acceptance among people who are present doesn't capture those who are absent.

The same groups are missed in both states: farmers, fishermen, pastoralists, plantation workers, and border migrants, the very people most exposed to blackfly transmission. A CDD summed it up simply: "Like for the farmers and the fishermen, sometimes when we want to go and give them the

drugs, we discover that they are not around, they have gone to the farm, some of them have gone to the riverside to catch their fish." In Kaduna, add Fulani pastoralists in remote grazing areas, security-displaced households, and forest-dwelling communities. In Cross River, add youth on cocoa plantations and border communities cut off by poor mobile coverage. These aren't random gaps – the same people are missed round after round, becoming persistent untreated reservoirs that sustain transmission.

Micro-planning in both states relies on static population figures while real populations are fluid. Kaduna's denominators are disrupted by seasonal migration and security displacement; Cross River's are disrupted further by large inflows from Cameroon. Follow-up does happen, evening revisits, house marking, tracking of late-night workers, but it depends on individual CDD initiative rather than formal protocol. Some Boki communities have no revisit system at all. Whether a missed person is ever treated comes down to which CDD they live near, not programme design.

Timing is the single most cited driver of missed coverage in Kaduna, operating daily (farming schedules), seasonally (rainy season), and across the calendar. Distribution is programme-driven rather than community-driven. Cross River runs two rounds a year, but rainy-season roads cut off many riverine communities during the April round, hiding real coverage losses behind clean programme data. Communities are explicit about what works, as one respondent put it: "They don't fix a specific day; it is held on the day of the community meeting when nobody goes to the farm and everyone is around." Aligning distribution with market days, community meetings, and farming calendars can close much of the reach gap at minimal extra cost.

4.5 POTENTIAL PREDICTORS FOR MDA UPTAKE:

RELIGION AND MDA UPTAKE – KADUNA CRITICAL FINDING

Religion predicts MDA uptake in Kaduna ($p < 0.001$) but not in Cross River ($p = 0.054$). Muslim respondents in Kaduna achieve only 31.7% MDA uptake compared to 74.8% among Christians – but when visited by a CDD, Muslim respondents take medicine at 97.1%, the highest rate of any sub-group. The entire religion-uptake gap is therefore a delivery problem: CDDs are simply not reaching Muslim households, not a problem of refusal.

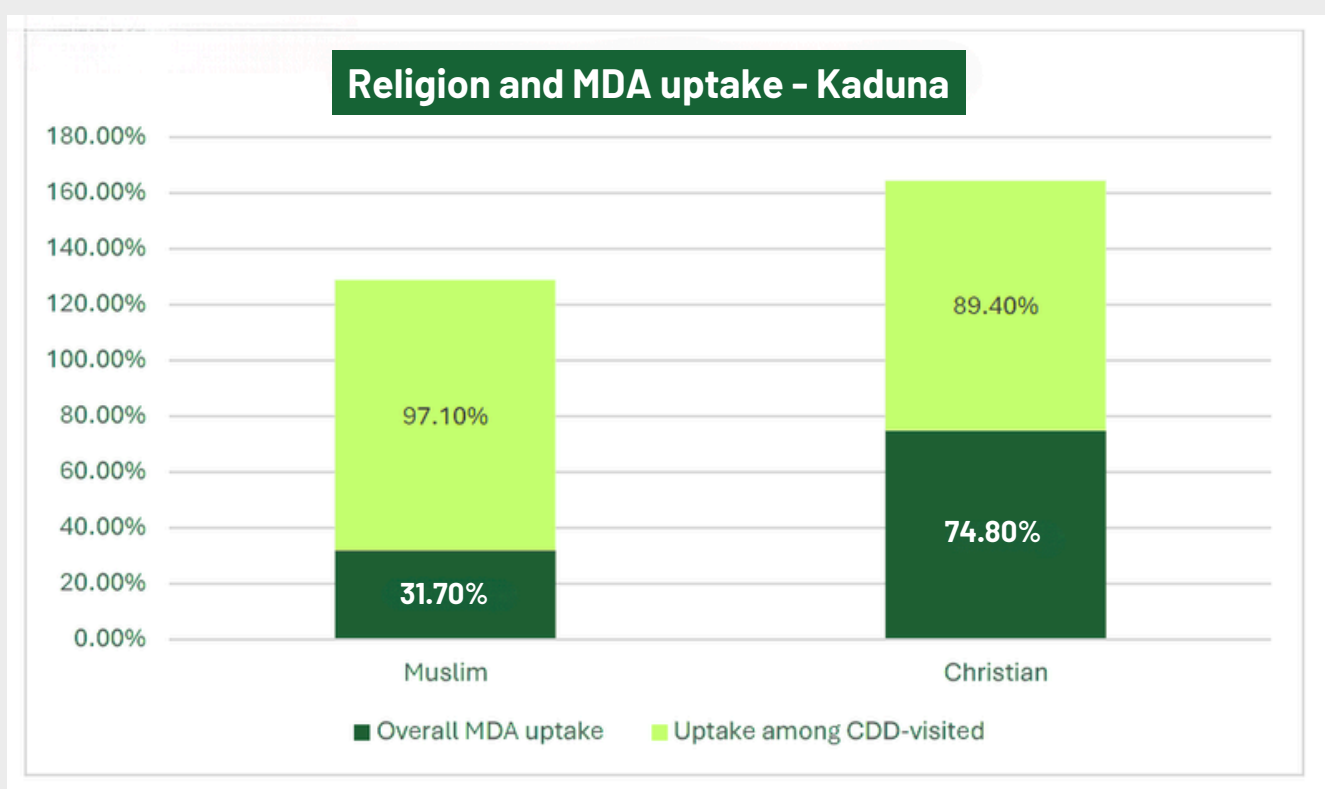


Figure 12: Breakdown of relationship between religion and MDA uptake in Kaduna

4.6 LENGTH OF RESIDENCE AND UPTAKE:

Length of residence significantly predicts MDA uptake in Cross River ($p < 0.001$) but not Kaduna ($p = 0.122$). Short-term residents in Cross River (1–2 years) achieve only 58.3% uptake vs 80.8% for lifelong residents, reflecting systematic exclusion of migrants from static CDD enumeration lists. Dynamic household enumeration is urgently needed in Cross River; the challenge is less acute in Kaduna where 62.4% of respondents are lifelong residents.

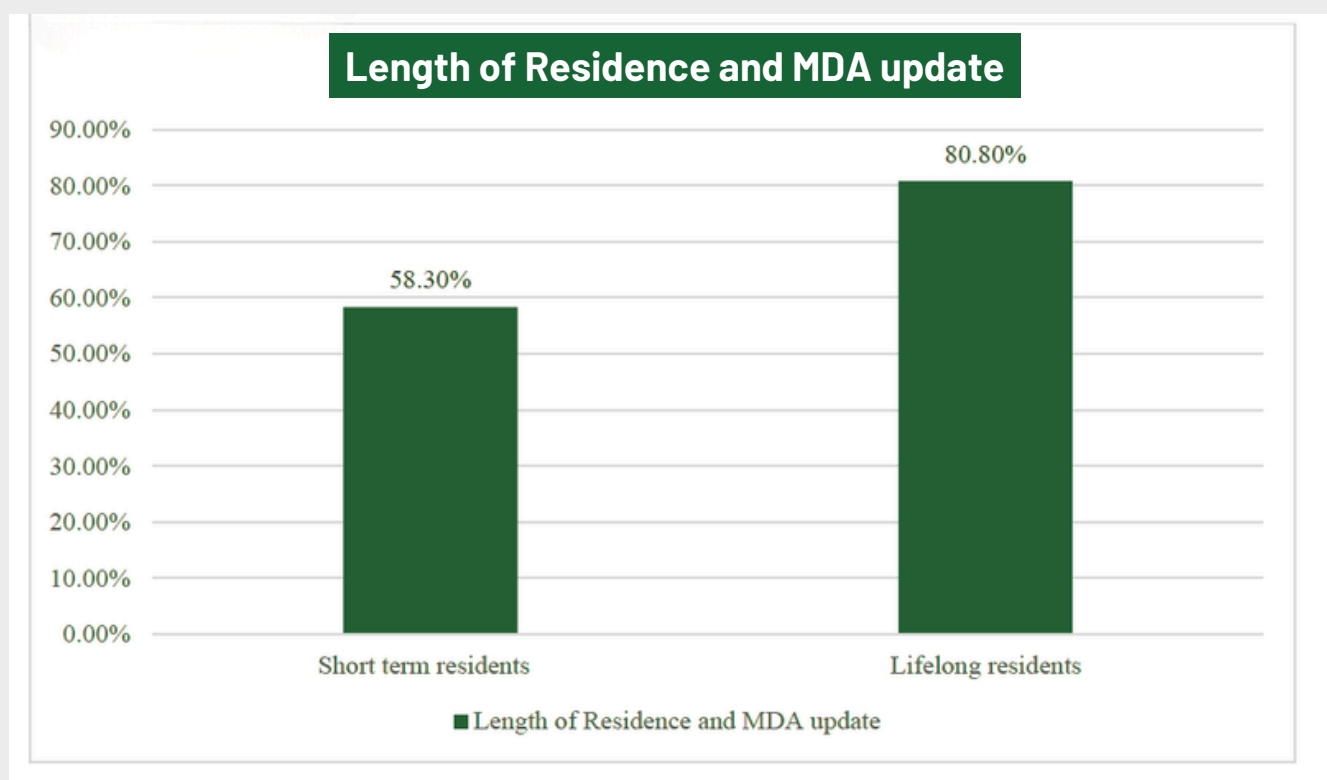


Figure 13: Breakdown of relationship between length of residence and MDA uptake in Cross river

4.7 PREVENTION PRACTICES AND HEALTH-SEEKING BEHAVIOUR

Across both states, protective clothing is the most common way people try to prevent blackfly bites (57.9% overall; Cross River 61.8%; Kaduna 54.1%). Other practices are far less consistent – only 32.0% avoid rivers or streams, 29.0% use insecticide-treated nets (ITNs), and 27.8% use insect repellent. Two state-level patterns are worth highlighting. ITN use is higher in Kaduna (32.2% vs 25.7%), likely reflecting stronger malaria-programme penetration rather than any onchocerciasis-specific effort. In Cross River, the relatively low "avoid rivers" rate (30.8%) is not about awareness, fishing and riverine livelihoods make river avoidance impractical, leaving MDA as the only realistic prevention tool for these communities.

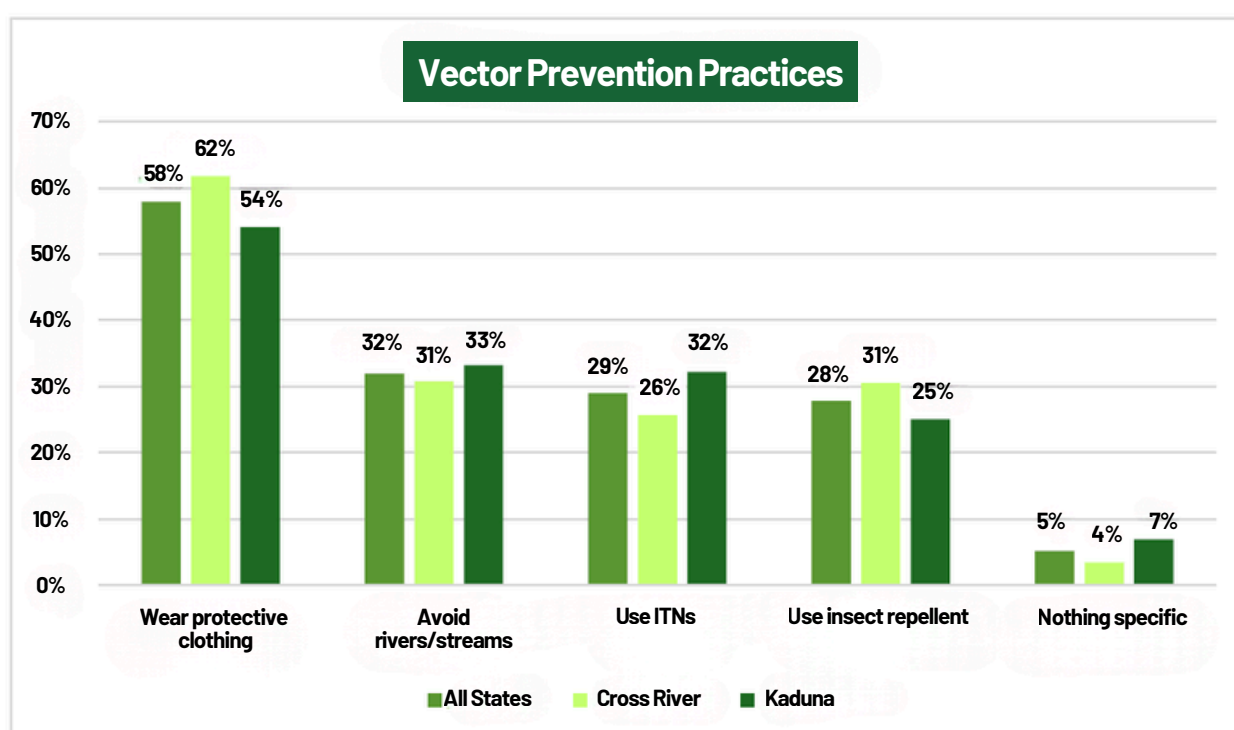


Figure 14: Breakdown of prevention practices in Kaduna and Cross River

In Kaduna, MDA is seen as the main and most trusted way to prevent onchocerciasis, and taking the annual drug is consistently described as the central preventive act. This matches the quantitative finding that protective clothing (54.1%) and other behavioural measures are used inconsistently, they are recognised as helpful but treated as secondary to the drug.

Behavioural strategies are mentioned but rarely followed through. Protective clothing is widely seen as important, especially for farmers, but daily routines and practicality often get in the way. As a female respondent in Kagarko explained, "if a person doesn't wear proper clothing, the Buzu will bite and when you hit it you'll see blood," showing that awareness of risk does not automatically translate into consistent behaviour.

Environmental measures follow a similar pattern. Clearing or burning bushy areas around farms is a common, intuitive attempt to reduce blackfly habitats, as one health worker put it: "since the area is bushy... how to prevent it, they can burn the area... so the fly will not be available". Avoiding rivers during peak fly activity is also mentioned but is rarely possible for households whose livelihoods depend on farming and water use. The overall picture is a prevention approach that is heavily treatment-dependent rather than fully integrated, strong on MDA, weak on consistent behaviour change.

Cross River communities also place MDA at the centre of prevention but pair it with clearer, more practical demands on the system. Residents emphasise the need for a steady drug supply, with one respondent saying: "Another way would be that they should at least provide the drugs constantly. ... At least every year, we should be receiving ivermectin. With that, we can control the river blindness". This aligns with the quantitative finding that Cross River residents actively seek and request the drug.

Behavioural advice in Cross River is grounded in everyday riverine life. Respondents highlight protective clothing during water activities – "We advise them also to wear protective clothes during washing if they go to the stream to wash, so that the thing will not bite them and affect the skin" – and reinforce the same point more broadly: "We should try and avoid the things that cause it. ... if we are trying to put on our clothes, we should not be leaving bare bodies". These recommendations help explain why the quantitative "avoid rivers" rate is low (30.8%): communities adapt by covering up rather than staying away, because fishing and washing at the river are unavoidable.

Cross River residents go a step further by recommending an environmental fix: providing boreholes to reduce dependence on fly-infested river water for daily activities. This is a notable contrast with Kaduna, where environmental responses focus on clearing bush around farms rather than changing water access.



HEALTH SEEKING BEHAVIOUR:

Responses to early skin and itching symptoms, key warning signs of onchocerciasis, differ sharply between states. Use of traditional medicine ranges from 14.5% in Kaduna to 19.0% in Cross River, each episode representing a missed opportunity for early diagnosis that CDD referral training can address.

The most striking finding is in Kaduna: 20.7% of respondents do nothing when symptoms appear, compared with just 2.1% in Cross River, a tenfold gap. This points to a large passive health-seeking population that current programme messaging is not reaching, allowing early symptoms to progress unnoticed.

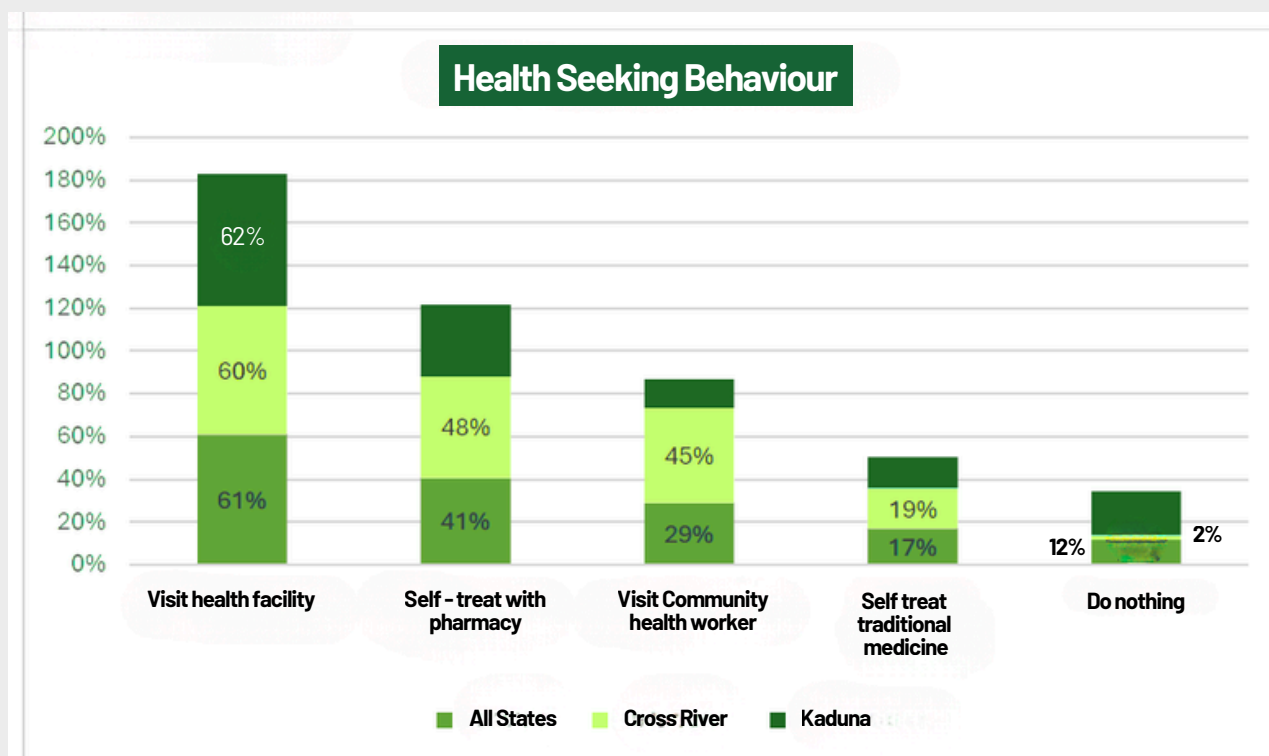


Figure 15: Breakdown of health seeking behaviour practices in Kaduna and Cross River

WASH PRACTICES:

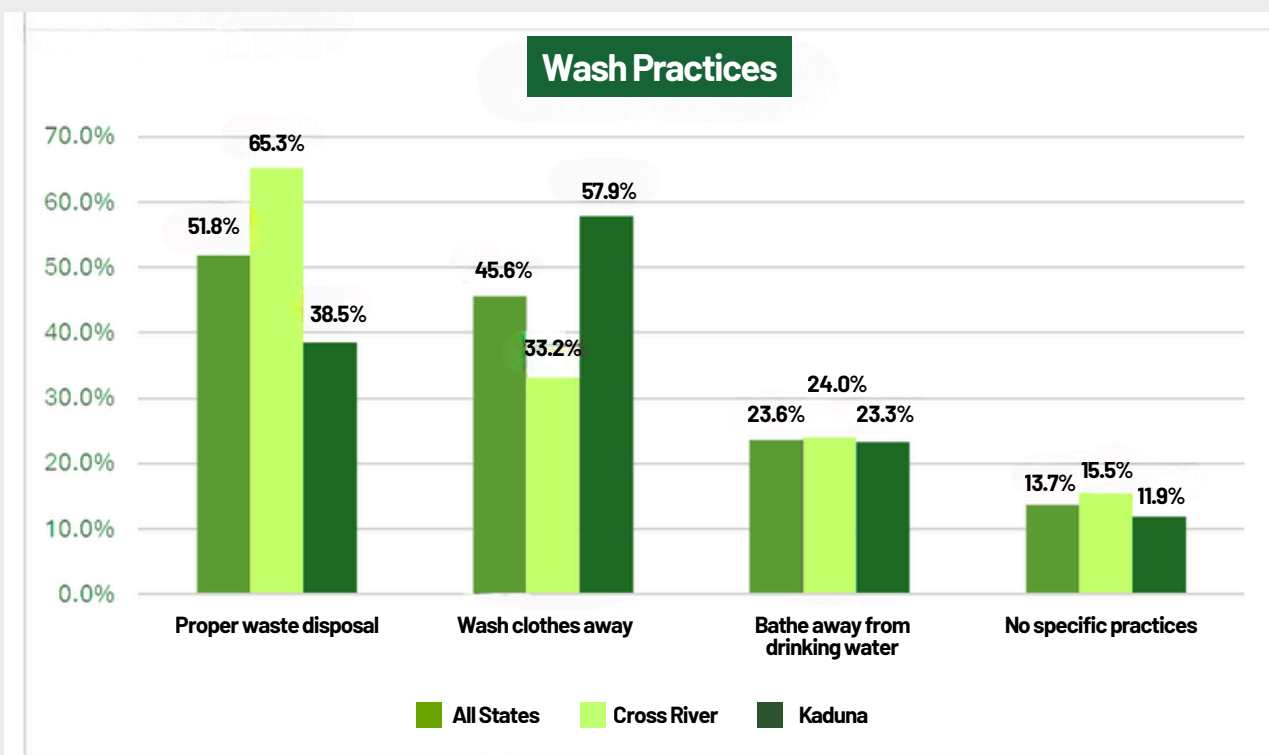


Figure 16: Breakdown of WASH practices in Kaduna and Cross River

Proper waste disposal is practiced by 51.8% overall, with major LGA-level variation. In Cross River, Akamkpa (79.1%) and Boki (80.0%) substantially outperform Etung (37.4%). In Kaduna, 11.9% report no specific WASH practices. WASH integration offers a complementary platform for NTD programming in both states, particularly through existing UNICEF and RUWATSA partnerships.

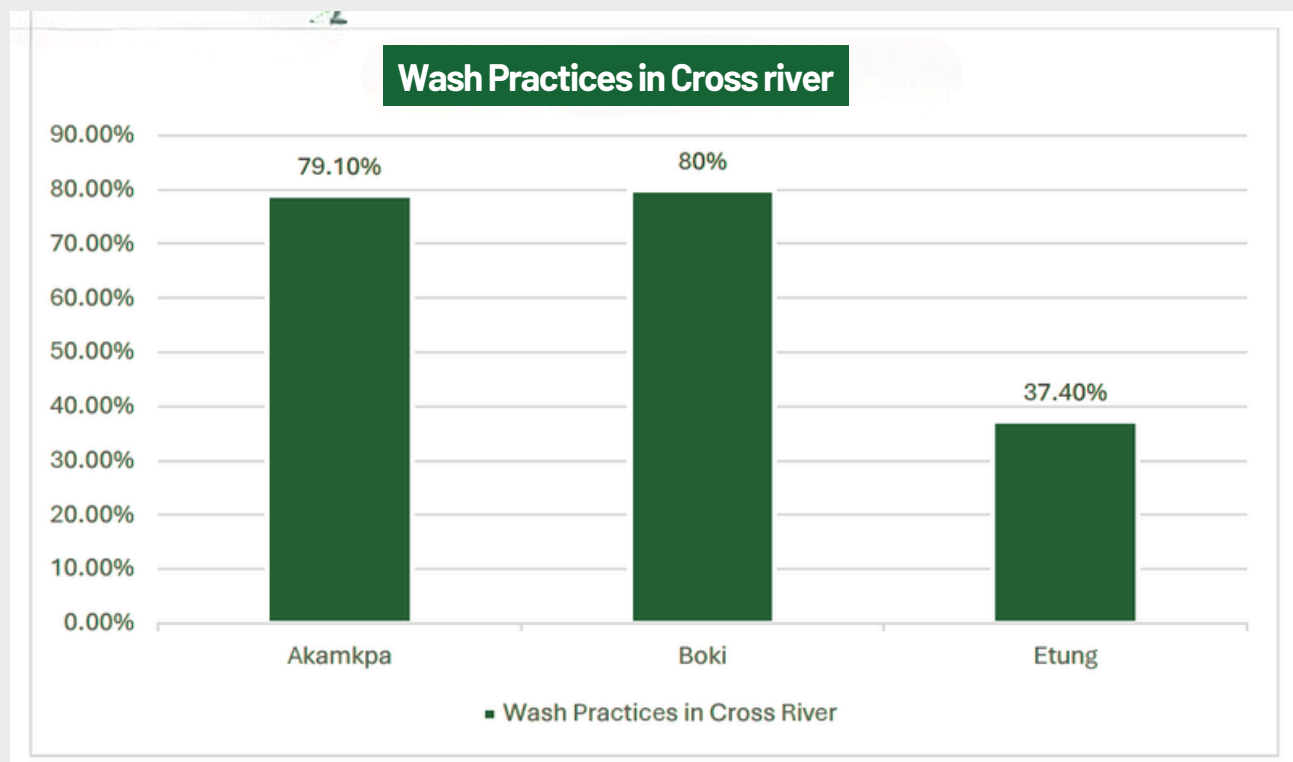


Figure 17: Breakdown of WASH practices across 3 LGAs in Kaduna

4.8 COMMUNITY PARTICIPATION IN DISEASE PREVENTION:

36.1% of Cross River respondents and 24.5% of Kaduna respondents reported no participation in any disease prevention activity in the past year. LF community participation is near-zero across all LGAs in both states (overall 3.3%) despite co-endemicity, representing the most consistent integrated NTD programming gap identified by this study.

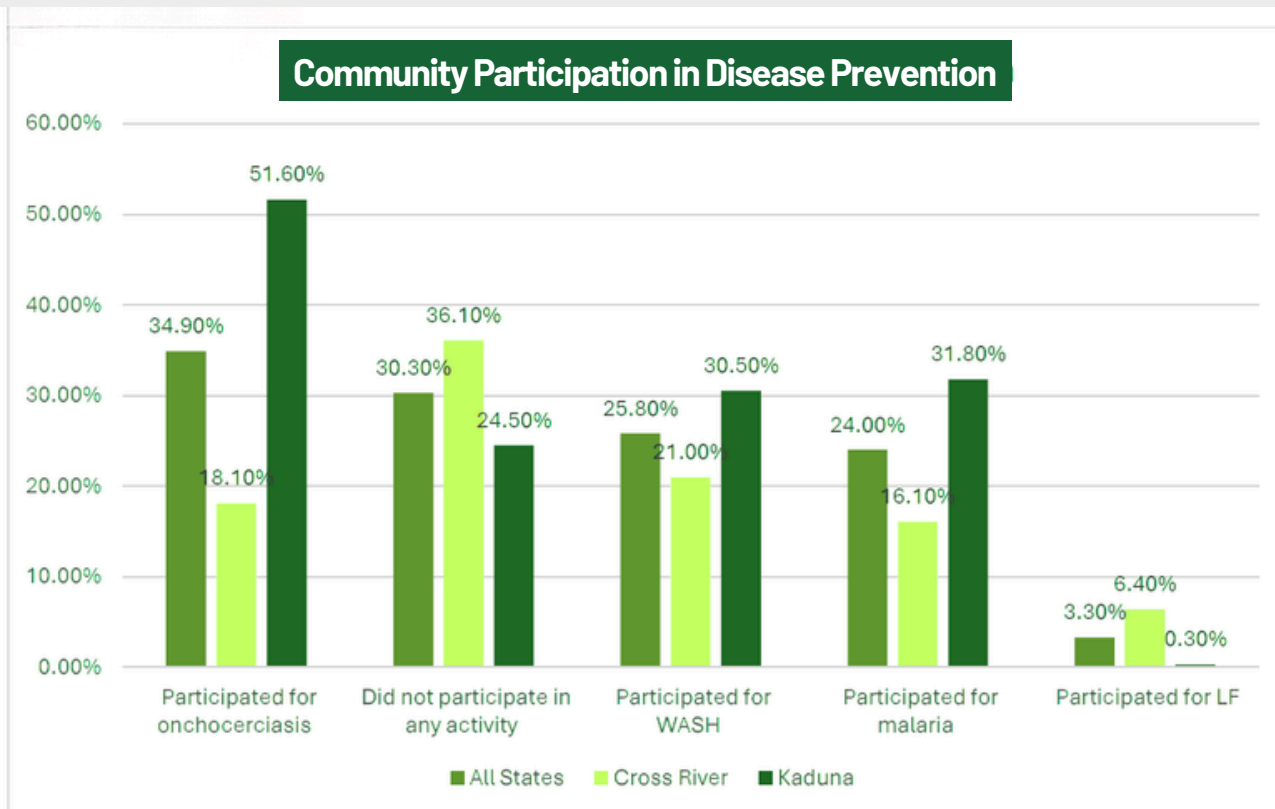


Figure 18:
Breakdown of community participation in disease prevention across Kaduna and Cross River

4.9 INFORMATION SOURCES AND PREFERRED CHANNELS:

The quantitative data show that community health workers are the leading information source in both states (55.3%), followed by health facilities (49.0%) and community meetings (42.6%), while radio and TV reach only 6.9%. Crucially, 10.0% of Cross River respondents and 3.6% in Kaduna have never received any onchocerciasis information at all, and these individuals account for disproportionate shares of poor knowledge and non-participation.

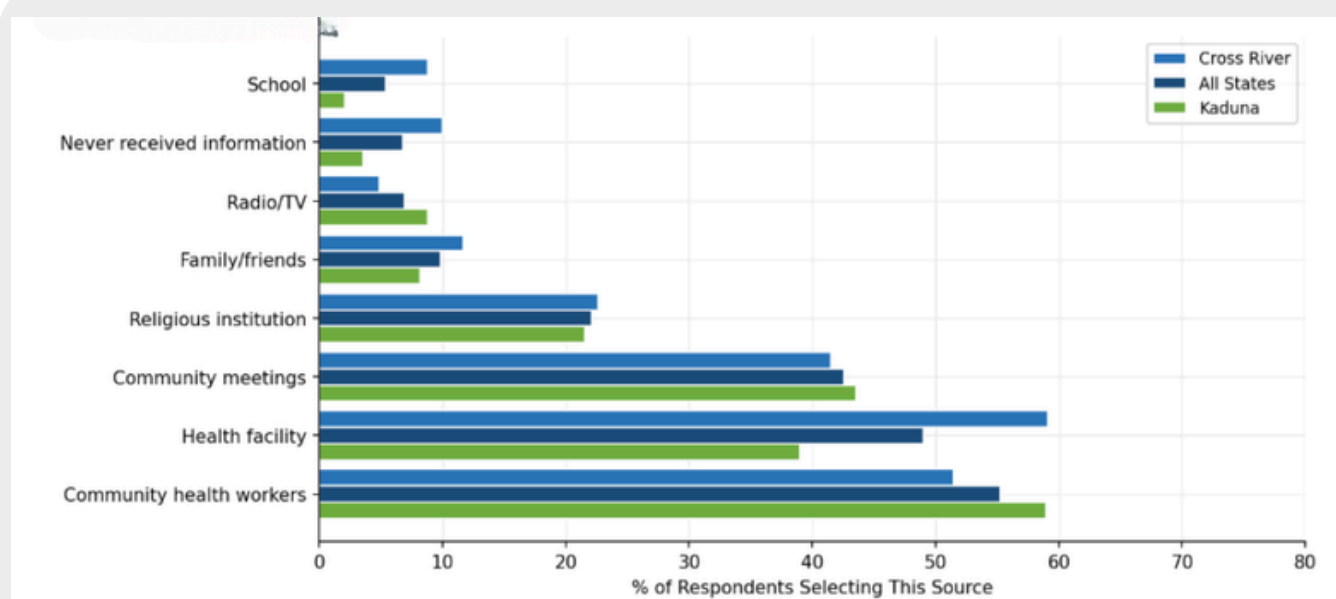


Figure 19: Sources of Information on Onchocerciasis – ranked by All States prevalence.

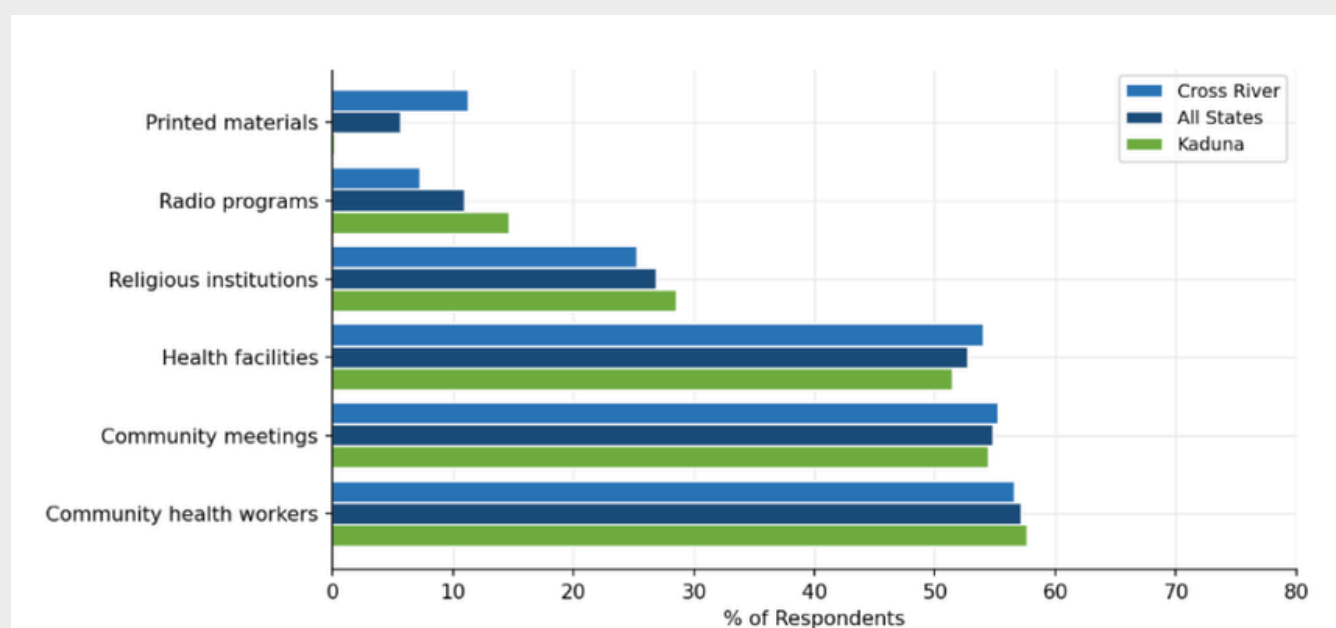


Figure 20: Preferred Health Information Channels (Q5.4) – All States, Cross River, and Kaduna.

Cross River runs a multi-channel, community-anchored communication system that blends traditional, religious, and modern platforms, with a clear preference for local, physical methods because radio access and mobile networks are weak in remote areas. The most cited channel is the town crier, who only acts after the village head confirms the information: "Our chief confirms the

information and then send the town criers, but people in camp 2, those around the border, they are hard to reach because of network... but everyone within the community is not hard to reach". Traditional whistles still carry remarkable reach: "There's one native whistle that's in my village... If they use that whistle and blow here in the morning or in the night, somebody at eight miles... will hear that whistle".

Churches and mosques outperform mass media because they reach people during high-trust gatherings, as one stakeholder explained: "If you check our community, we do not have up to twenty persons that have radios. ... The best way to give out this information is... through community, churches, age grades, and all those places". Where radio is used, success depends on language localisation into Efik and Pidgin: "We try to patronize Ebonyi [radio] in most cases to ensure that they get information... even the common villager has this small radio that he's listening to".

The dominant messengers are gatekeepers, paramount rulers, village chiefs, and pastors, whose endorsement effectively unlocks community participation: "Once the paramandula buys into this program, you know it's community ownership... The paramandula can tell his chiefs... you have to tell them, they must take this medicine". CDDs and nurses are trusted because they live in or interact daily with the community, and peer advocates who have personally benefited from the drug carry significant weight: "It is for those of us who have already taken the medicine to advise others to take it, by saying that the medicine is good and that it works if you take it".

Message content moves beyond awareness to action by emphasising personal benefits, addressing fears of side effects, and using clear physical instructions: "We like using the word 'swallow' because they must swallow. So, once they have swallowed, we are good to go". Visual storytelling is central, with role-plays contrasting acceptors and refusers – "We did a drama... This person was saying ah, me I like. I will continue to take... I'm shining because of Mectizan", and posters that help people recognise the disease in themselves: "They display the play cards, the posters, the flyers... I saw something like this in somebody... it means that I have to be taking". Lived testimony anchors all of this: "It's the person that get the disease and takes drugs and is ok now, he is the only that knows what he went through".

Language is the connective tissue. English is used for formal communication, but Pidgin, Efik, and other local dialects are essential for reaching elders, women, and "interior people": "Many people don't understand English. So, it would be better to use a local language to tell them, especially the women in the community".

Kaduna's communication system is similarly plural and layered, but more explicitly cascaded through traditional authority structures. Information moves from the Primary Health Centre (PHC) to the village head, and only then into the community: "the PHC... will contact the village head... he will come back and let us know". House-to-house sensitisation remains a backbone channel because it allows clarification in low-literacy and low-media settings, with distributors going "from house to house" to ensure coverage. Religious gatherings amplify reach further, since "where they can get a large number [of] people is in place of worship". Town criers, clan representatives, and community meetings ensure that once a message enters these channels, "the message gets out immediately". Mass media, particularly radio, complements but does not replace these local systems, and digital platforms are emerging mainly among younger or more connected populations. This explains the quantitative pattern: radio and TV reach only 6.9% overall, while interpersonal channels carry the bulk of the work.

The most decisive variable in Kaduna is who delivers the message, not what is delivered. Traditional and religious leaders are the most trusted messengers, with respondents emphasising that "our traditional and religious leaders play a very big role in sensitizing the people". Crucially, this trust is actively constructed: leaders "investigate and ask questions before informing the community," and once they endorse a message, "we go because we know... it is genuine". Health workers and CDDs play technical and last-mile roles, but their influence usually flows through community leaders first, and respondents repeatedly prefer information delivered by "the one we know". Trust is highly localised, and unfamiliar external messengers are routinely rejected regardless of message quality, a finding that helps explain why the 3.6% in Kaduna who have never received any information are disproportionately disengaged.

Message content combines biomedical clarity with experiential framing. Health workers explain "what they are carrying... the importance, the target group... and the drugs that cannot be given". But information alone is insufficient; communities respond strongly to drama, testimony, and visual demonstration, with respondents specifically recommending "drama & testimony" and "storytelling" as preferred formats. References to blindness or visible disease manifestations make abstract risks tangible, and behavioural guidance is most effective when embedded inside these narratives rather than delivered as standalone instructions.

Language is again decisive. Hausa is the dominant lingua franca, and elders in particular cannot be reached without it: "most of our elders are Hausa speakers; they don't understand English... that language will give everyone the opportunity to understand". In some communities, even Hausa is not enough, and further localisation into Jaba or Koro is required because "until you translate it to their language... they understand".

4.10 BARRIERS AND FACILITATORS: THEMATIC ANALYSIS

This section presents findings from KIIs and FGDs identifying cultural norms, stigma, geographic barriers, and programme-level facilitators that shape service access and MDA participation across both states.

4.11 COMMUNITY TRUST AND RELATIONAL ARCHITECTURE

Kaduna

Trust in CDDs is consistently high, rooted in proximity, familiarity, and repeated positive interaction. This is relational trust — built on community embeddedness — rather than institutional confidence. Critically, this architecture is fragile: trust can be rapidly disrupted by perceived lapses in delivery, communication, or professionalism. When individual CDDs leave or perform inconsistently, coverage can decline significantly because there is no institutional trust floor to fall back on.



Even through our drinking water we come in contact with this sickness because the flies are everywhere and our water is gotten from the river

Cross River

The same relational architecture applies in Cross River, supplemented by a more explicit social enforcement dimension. In some communities, traditional leaders 'call to order' residents who refuse treatment, framing non-participation as harbouring parasites. While effective, this coercive dimension requires monitoring against voluntary participation principles.



"In my community, any person that does not take this thing, will be called to order because those are the people who want to harbour the parasite. We don't joke with that."

4.12 RUMOURS, MISINFORMATION, AND FEAR OF SIDE EFFECTS

Kaduna

Rumours operate dually — as barriers and inadvertent uptake drivers. Fear narratives centre on beliefs that the drug causes other illnesses. Conversely, rumours that the drug eliminates bed bugs generate demand beyond its intended purpose, creating misaligned expectations. Both dynamics create programmatic instability. Side effects are interpreted through an economic lens: farmers whose livelihoods depend on daily physical labour rationally defer treatment to avoid productivity loss.



"If I take it and go to work, the drug affects my work... that sometimes stops me from taking it."

Cross River

Cross River's rumour landscape includes globally circulated conspiracy theories – particularly the 'Bill Gates population control' narrative – alongside local fears rooted in specific incidents (a child reportedly unable to walk after treatment). These specific incidents carry emotional and social weight that makes them particularly difficult to address.



"Taking Mectizan to them was like 'okay this is the medicine Bill Gates was bringing to come and kill us, to reduce our population.'"

Implication:

Both states require proactive rumour surveillance and rapid-response communication systems. CDDs must function as first-line communicators, not just distributors. Adverse events must be managed clinically and narratively (reframing reactions as therapeutic evidence). The individual with the highest parasite loads and thus the most intense post-treatment reactions are paradoxically the most likely to refuse future doses – the most epidemiologically dangerous compliance gap.

4.13 CULTURAL NORMS AND RELIGIOUS INFLUENCE

Spousal Consent Norms

In both states, married women requiring spousal consent before taking medication are identified across multiple communities. This household decision-making barrier disproportionately affects women in patriarchal household structures and requires household-level CDD engagement strategies that include male heads of household in sensitisation.

Pregnancy Uncertainty – Cross River Specific

Women of childbearing age in Cross River express reluctance to take ivermectin due to uncertainty about pregnancy status. Co-locating pregnancy screening with distribution events, or training CDDs on clear eligibility guidance, would address this barrier without excluding eligible women.

FACILITATORS OF ENGAGEMENT

Kaduna

Social influence through community leaders is the most powerful uptake driver in Kaduna. Town criers, mosque announcements, church bulletins, and clan meetings create multi-channel reinforcement. Narrative approaches – storytelling, peer testimonies, community drama – are preferred over clinical messaging. The perceived economic benefit of itching relief and improved mobility is a stronger motivator than disease elimination framing.

Cross River

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"There's one native whistle that's in my village... somebody at eight miles... will hear that whistle. It's a signal of either passing negative information or positive information."

Acceptance is mediated through social structures, not information exposure. Cross River's explicit use of observed ingestion and peer advocacy represents a model for ensuring actual drug consumption beyond distribution that should be standardised nationally.

4.14 EQUITY AND HARD-TO-REACH POPULATIONS

A fundamental equity problem emerges from both states: the populations with the highest environmental exposure to blackfly bites – farmers, fishers, pastoralists, and cross-border migrants – are systematically excluded from MDA cycles by distribution models that prioritise presence over targeted reach. This is not marginal; it is the structural feature most likely to prevent elimination.

In Kaduna, Fulani pastoralists achieve coverage as low as 70% even when services are nominally available. In Cross River, farmers and fishers absent during daytime distribution rounds are the primary missed group. Cross-border migrants entering from Cameroon represent an additional, largely uncontrolled exposure pathway with simultaneous drug supply implications: absorbing migrants into existing stocks systematically under-supplies resident communities.

Equity must be repositioned as a central performance indicator. Mobile distribution points at farm clusters, fishing sites, and grazing areas; early-morning and late-evening distribution rounds; and dedicated multilingual sensitisation for migrant populations are essential rather than supplementary strategies.

5 | STAKEHOLDER MAPPING

5.1 STAKEHOLDER MATRIX

The table below categorises key actors identified through KIs, FGDs, and secondary data review across federal, state, and local levels in both states. Each actor is assessed across their primary function in the NTD elimination programme.

Stakeholder	Role in NTD Elimination	Level	Both States / State-Specific
Federal Ministry of Health (FMOH)	National NTD policy, technical coordination, WHO liaison	Federal	Both states
ESPEN / WHO Nigeria	Technical guidance, data management, global reporting	Federal / International	Both states
Carter Center	Primary MDA funding and implementation support, Cross River 2025–	State(CR)	Cross River (16 of 18 LGAs)
Sightsavers / CBM / International Partners	Technical support, drug procurement, capacity building	National	Both states
State Ministry of Health (SMoH)	State NTD coordination, budget allocation, policy implementation	State	Both states
State NTD Coordinator	Programme planning, MDA coordination, partner liaison	State	Both states
SPHCDA / PHC Board	Community health workforce management, CDD deployment	State	Both states
State Epidemiologist / DSNO	Disease surveillance, outbreak response, data validation	State	Both states
Ministries of Education / Environment / Information	Cross-sectoral integration — school health, WASH, media	State	Cross River (formalised); Kaduna (limited)
SPHCDA / PHC Board	Community health workforce management, CDD deployment	State	Both states
RUWATSA / UNICEF	WASH integration, community water infrastructure	State	Cross River (primary); Kaduna (secondary)

LGA Health Director	LGA-level MDA planning, resource coordination	LGA	Both states (6 LGAs)
LGA NTD Focal Person	Field coordination, CDD training and supervision	LGA	Both states
Traditional Leaders (Paramount Rulers, Chiefs, Agwam Adara)	Community entry, social mobilisation, enforcement of participation norms	Community	Both states – critical gatekeepers
Religious Leaders (JNI, CAN, Pastors, Imams)	Mobilisation platform, trust channel, Kaduna Muslim community access	Community	Kaduna (Muslim gap = critical); Cross River (supportive)
Community Drug Distributors (CDDs)	Primary MDA delivery, house-to-house distribution, community education	Community	Both states – core delivery workforce
Women's and Youth Associations	Secondary mobilisation, peer advocacy, reaching female and youth populations	Community	Both states – underutilised
Cameroonian Border Health Authorities	Cross-border MDA synchronisation, migrant population management	International	Cross River (ad hoc – needs formalisation)
Abia State NTD Programme	Cross-state coordination on reinfection crisis from Cross River border areas	National	Cross River (urgent – reinfection crisis)

5.2 INFLUENCE-INTEREST SCORING

The following matrix scores key actors on their estimated influence over NTD programme outcomes (High/Medium/Low) and their current interest or willingness to support integrated disease elimination (High/Medium/Low), based on evidence from KIIs, FGD data, and programme observation.

Stakeholder	Influence	Interest	Quadrant	Strategic Implication
Carter Center	High	High	MANAGE CLOSELY	Primary partner — sustain engagement; develop transition
Traditional Leaders	High	High	MANAGE CLOSELY	Non-negotiable gatekeepers — formal pre-MDA engagement required
Religious Leaders (Muslim, Kaduna)	High	Medium	KEEP SATISFIED	HIGHEST-RETURN INVESTMENT: Convert to active advocates for Muslim community access
State Commissioners for Health	High	Medium	KEEP SATISFIED	Require sustained advocacy; budget release decisions rest here
State NTD Coordinators	High	High	MANAGE CLOSELY	Core technical partners — invest in capacity building and resources
FMOH / National NTD Programme	High	Medium	KEEP SATISFIED	Escalate Cross River–Abia reinfection crisis to this level immediately
State Governors / Budget Committees	Very High	Low–Medium	KEEP SATISFIED	High-level advocacy needed — fund release decisions are political, not technical
CDDs / Community Volunteers	High (delivery)	High	MANAGE CLOSELY	Core workforce — compensation, training, and retention are existential programme priorities
Women's / Youth Associations	Medium	High	KEEP INFORMED	Underutilised — activate as secondary advocacy channels and peer networks
UNICEF / RUWATSA (WASH)	Medium	High	KEEP INFORMED	Natural integration partner — coordinate joint community mobilisation
Cameroonian Border Authorities	Medium	Medium	KEEP INFORMED	Formalise ad hoc coordination into standing bilateral agreement
Media / Radio Stations	Medium	High	KEEP INFORMED	Key Voices from the River partners — commission local-language content

6 | MEDIA MAPPING

Media mapping identifies the dominant information channels, local influencers, and communication infrastructure available across both states to inform the Voices from the River campaign strategy and ongoing health communication.

6.1 CHANNEL LANDSCAPE BY STATE

Channel Type	Kaduna State	Cross River State
Radio	Higher penetration (14.7% preferred). Hausa-language programming dominates. Key stations include state and community FM outlets. Strong rural presence via small battery-powered sets.	Lower penetration (7.3% preferred overall). Etung highest at 16.4%. Ebonyi and local state radio cited. Limited reach in forest and border communities with no electricity.
Town Crier	Active across all LGAs; mosque announcements and market-square calls supplement. Village heads control town crier access.	Primary information channel in remote communities. Native whistles (audible 8+ miles) used for urgent announcements. Chiefs control the system.
Religious Institutions	CRITICAL in Kaduna. Mosques reach Muslim communities otherwise outside programme access. JNI and CAN structures are organised communication networks.	Churches near-universal (97.5% Christian). Pastors and parish announcements are high-trust platforms reaching weekly congregations. Mosques supplement in minority Muslim areas.
Community Meetings	Preferred by 54.5%. Village meetings and market-day gatherings used for scheduled sensitisation sessions.	Preferred by 55.3%. Market days and community meetings preferred over fixed distribution dates — highest attendance guaranteed.
Drama / Theatre	Cited as highly effective but underutilised. CDD role-plays for	Role-plays contrasting MDA takers vs refusers are explicitly cited as effective by
School Platforms	8.8% of Cross River respondents cite school as an information source; less prominent in Kaduna (2.1%).	School health integration recommended by stakeholders as a youth-reach multiplier. LGA officers specifically propose it.
Print / Flyers	Very low preference (0.2% Kaduna). Literacy limitations and low physical distribution reduce impact.	Moderate interest in Boki (24.3%). Visual play cards and posters used for symptom recognition — effective for low-literacy audiences when image-based.
SMS / Mobile	Limited by mobile penetration in rural LGAs. Used for CDD-to-supervisor reporting. Not yet a community health channel.	Network connectivity is a documented barrier particularly in border Akamkpa communities. SMS-based mobilisation currently non-functional in these areas.

6.2 LOCAL INFLUENCERS BY TIER

TIER 1: STRUCTURAL GATEKEEPERS – NON-NEGOTIABLE FIRST CONTACT

Paramount rulers and LGA traditional councils control community entry in both states. In Kaduna, the Agwam Adara and equivalent traditional authorities must sanction all health interventions before CDDs are deployed. In Cross River, paramount rulers ('paramandula') trigger community-wide ownership through endorsement. Both states demonstrate that without this gatekeeper engagement, programme penetration stalls regardless of technical quality.

TIER 2: INSTITUTIONAL MESSENGERS – TRUSTED VOLUME CHANNELS

In Kaduna: JNi (Jama'atu Nasril Islam) leadership, CAN leaders, PHC facility heads, and LGA NTD Focal Persons. In Cross River: Pastors, church health committee chairs, PHC nurses, and CDD supervisors. These actors have established communication platforms (mosques, churches, health facilities) that guarantee regular audience access.

TIER 3: PEER ADVOCATES – AUTHENTIC EXPERIENCE-BASED INFLUENCERS

Community members who have experienced visible symptom relief from ivermectin are the most persuasive individual-level influencers in both states. Their credibility derives from lived experience rather than positional authority, making them resilient to leadership transitions and capable of reaching household-level decision-making spaces that formal leaders may not penetrate. Deliberately recruiting and supporting peer advocates is the highest-impact low-cost communication investment available to the programme.



"It is for those of us who have already taken the medicine to advise others to take it, by saying that the medicine is good and that it works if you take it."

TIER 4: SECONDARY NETWORKS – UNDERUTILISED REACH MULTIPLIERS

Women's associations, age-grade associations, youth groups, and cooperative societies in both states represent organised networks with regular meeting schedules and internal communication infrastructure. These are currently underutilised as NTD channels and offer a cost-effective way to reach groups not consistently addressed by household distribution or mass media.

6.3 VOICES FROM THE RIVER – CAMPAIGN STRATEGY GUIDANCE

Campaign Element	Kaduna Specification	Cross River Specification
Primary Channel	Radio (community FM) + mosque announcements + town crier	Town crier / native whistle + church announcements + community drama
Language	Hausa (primary) + Jaba and Koro dialects in specific communities	Pidgin English (broad reach) + Efik + Ejagham + Boki for interior communities
Key Message Frame	'Treating yourself protects your family and farm productivity.' Address malaria conflation explicitly. Decouple onchocerciasis from malaria.	'Mutumutu bites bring river blindness – ivermectin stops the cycle.' Address spiritual causation respectfully. Distinguish onchocerciasis from LF symptoms.
Optimal Timing	Market days / Friday mosque gatherings / early morning before farm departure	Market days / church services / dry season to maximise road access in remote communities
Story/Drama Format	Two characters: one who takes medicine (healthy, productive) vs one who refuses (vision loss, skin disease). Include Fulani pastoral setting.	Role-play showing drug 'fighting' the parasites with temporary reactions normalised. Include fisherman character. Direct observation of swallowing as drama element.
Rumour Response Script	Address malaria-conflation rumours and productivity-loss fears. Train JNI and CAN leaders to counter with evidence-based talking points.	Address Bill Gates narrative and child-harm rumours with community leader counter-messaging. Reframe adverse effects reactions as therapeutic evidence
Reach Gap Priority	Kachia and Lere LGAs (replicate Kagarko CDD model). Muslim community penetration in all LGAs.	Etung LGA (highest radio preference + 46.6% no advocacy exposure). Border communities in Akamkpa and Boki.

7 | RECOMMENDATIONS AND CONCLUSION

7.1 WHERE BOTH STATES CONVERGE – NATIONAL PRIORITIES

Before state-specific recommendations, seven nationally consistent findings establish shared programmatic priorities applicable across both contexts:

- MDA uptake is approximately 75% in both states, indicating that the primary challenge is reach rather than outright resistance.
- CDD contact is the strongest predictor of MDA uptake in both states, confirming that expanding CDD reach is the most direct route to improving coverage.
- Conditional uptake exceeds 90% in both states, showing that communities are generally willing to take the medicine once they are reached.
- Community leader endorsement remains the strongest advocacy influence nationally.
- Lack of advocate knowledge is the leading advocacy barrier nationally, making advocate training the first priority investment.
- Knowledge gaps around LF, the relationship between malaria and onchocerciasis, and blackfly avoidance are consistent across both states and should guide national messaging.
- Willingness to take ivermectin is very high nationally, representing the programme's strongest attitudinal asset.

7.2 KNOWLEDGE AND COMMUNICATION

A. BOTH STATES

- Develop state-specific IEC materials that visually distinguish onchocerciasis from malaria in Kaduna and from lymphatic filariasis in Cross River, while reinforcing the shared MDA treatment platform.
- Explicitly address the waterborne transmission misconception in both states through river ecology messaging that separates blackfly habitat from transmission mechanism.
- Communicate the prolonged asymptomatic progression of onchocerciasis clearly to support sustained treatment adherence even in the absence of symptoms.
- Systematically adapt all materials to mother-tongue and local dialects, including Hausa and relevant Kaduna variants, as well as Efik, Ejagham, Boki, and Pidgin in Cross River.

- Reframe post-treatment adverse reactions as evidence of therapeutic action through coordinated clinical guidance and community narrative strategies.
- Strengthen the knowledge of health workers on onchocerciasis so they can serve as accurate and trusted sources of community education.
- Integrate onchocerciasis messaging into routine health education platforms so that awareness is sustained beyond campaign periods.
- Expand communication beyond general audiences to target farmers, traders, and other mobile groups through chiefs, religious leaders, and other trusted community structures.

B. KADUNA-SPECIFIC

- Develop a focused communication package that explicitly decouples onchocerciasis from malaria and addresses the “blood transfer” misconception through visual and narrative formats.
- Deploy Voices from the River content on Hausa-language community FM stations and extend it through social media channels to better reach youth audiences.
- Use Muslim community structures, including JNI-affiliated stations and mosque announcement systems, to strengthen message penetration among faith-based audiences.

C. CROSS RIVER-SPECIFIC

- Address spiritual causation beliefs such as Oponukot through culturally respectful dialogue facilitated by trusted community and religious leaders rather than direct dismissal.
- Prioritise radio over television for awareness creation because of electricity constraints and the broader accessibility of radio in rural communities.
- Focus the Voices from the River campaign first in Etung LGA, where radio preference is highest and advocacy exposure is lowest, before expanding to Boki and Akamkpa border communities.

7.3 MDA PERFORMANCE AND COVERAGE

A. BOTH STATES

- Redefine coverage metrics from administrative coverage to effective coverage that confirms ingestion and reflects population-specific uptake.
- Establish formal, supervised mop-up protocols as standard programme components to replace informal follow-up with documented and accountable processes.
- Develop occupation-sensitive distribution strategies, including early-morning and late-evening rounds for farming and fishing households and mobile distribution at farm clusters, fishing landing sites, and market squares.
- Align distribution scheduling with agricultural and fishing calendars as well as community gathering days to maximise population presence during campaign windows.
- Engage teachers more deliberately in supervision and community-level reinforcement of MDA activities.
- Use surveillance officers more systematically for follow-up, local monitoring, and reporting around MDA delivery.
- Institutionalise regular task-force meetings to improve planning, accountability, and campaign follow-through.
- Strengthen the identification, recruitment, and retention of CDDs so that delivery capacity is more stable and predictable.

B. KADUNA-SPECIFIC

- Formally partner Muslim religious leaders as co-delivery agents before every MDA campaign, with JNI leadership engaged at both state and LGA levels.
- Replicate Kagarko LGA's high CDD reach model in Kachia and Lere by documenting and adapting its operational practices, including timing, follow-up, and chief engagement.
- Develop security-responsive delivery protocols in banditry-affected LGAs, including community-embedded distributors, adaptive scheduling, remote supervision, and contingency plans for displacement events.
- Develop dedicated distribution strategies for Fulani pastoralists through mobile distribution points, collaboration with Miyetti Allah Cattle Breeders Association, and seasonal schedule alignment.

C. CROSS RIVER-SPECIFIC

- Prioritise CDD reach expansion in Akamkpa and Boki through dedicated recruitment and deployment planning before each campaign.
- Establish dynamic household enumeration systems that capture short-term residents and migrants who are not on existing CDD lists.
- Re-evaluate the April MDA round against rainy-season road accessibility data and adjust scheduling for the most remote riverine and border communities.
- Implement real-time population surge reporting in border communities linked to automatic buffer drug stock activation to prevent shortages during migrant influxes.

7.4

EQUITY AND ACCESS

- Prioritise resource allocation for hard-to-reach areas in proportion to operational cost, replacing uniform LGA budgeting with risk- and cost-adjusted allocation.
- Integrate rapid multilingual sensitisation with drug distribution for Cameroonian migrants entering Cross River to ensure both disease education and treatment for populations with no prior MDA exposure.
- Address gender-specific barriers in both states through household-level engagement strategies that include male household heads and, in Cross River, clear eligibility guidance for pregnancy-related concerns.
- Activate women's associations and youth groups as secondary advocacy and distribution support networks, since they remain underused community assets in both states.
- Improve CDD motivation through more competitive stipends and stronger community recognition mechanisms that reinforce local ownership of the programme.
- Provide CDDs with uniforms and identification materials to strengthen trust, visibility, and professional identity.

7.5 DATA, SURVEILLANCE, AND FEEDBACK

- Accelerate digital data capture in both states through mobile-based tools, tablet-assisted registers, or ODK to reduce paper-based fabrication risks and enable real-time validation.
- Establish consistent feedback loops to frontline CDDs and health workers in all LGAs, including silent LGAs where workers currently receive little or no performance information.
- Support DCNOs with practical training on identification, reporting systems, and digital platforms so they can better manage case reporting and programme oversight.
- Strengthen active surveillance in Kaduna by integrating community informant networks and routine case detection activities rather than relying mainly on survey-triggered response.
- Adopt Cross River's three-mode surveillance framework, Watch → Alert → Response, as a national model and expand it to Kaduna.
- Integrate NTD surveillance data with broader infectious disease reporting systems in both states to reduce silos and improve early detection capacity.

7.6 GOVERNANCE, FINANCING, AND SUSTAINABILITY

- Conduct high-level policy advocacy targeting state governors and budget committees in both states, using elimination cost-benefit analyses and cross-border reinfection data as the main evidence package.
- Advocate for legally binding NTD financing instruments such as executive orders, dedicated budget lines with automatic release triggers, or legislative mandates to reduce dependence on political cycles.
- Formalise CDD compensation so that it is competitive with other community health programmes and reflects the scale of their workload.
- Move CDDs from episodic campaign volunteers to recognised community health assets with continuous competency development and clearer role definition.
- Strengthen ACSM technical working groups on NTDs across all LGAs to improve coordination, consistency of messaging, and local ownership.
- Improve linkage between advocacy technical committees, Health Security TWGs, NTD subcommittees, and ACSM structures to correct the weak coordination currently seen in Kaduna.
- Ensure that health workers, teachers, surveillance officers, and CDDs are all aligned under a clearer coordination framework with shared reporting and supervision arrangements.

7.7 CROSS-BORDER AND SYSTEMIC RISK

- Elevate Cross River's reinfection of Abia State to national NTD programme leadership as an elimination risk requiring immediate cross-state coordination.
- Institutionalise cross-border synchronisation with Cameroon through a standing bilateral agreement with defined communication protocols, joint MDA scheduling, and real-time drug supply coordination.
- Develop geospatial transmission risk maps for both states using entomological data, hydrological breeding site surveys, and population movement intelligence to enable hotspot-driven interventions.
- Monitor climate change impacts on vector ecology and incorporate them into long-term elimination planning, particularly in Cross River where environmental change may already be affecting transmission patterns.

7.8 CONCLUSION

This combined baseline assessment presents a programme characterised by genuine community strength, committed frontline workers, and a population that overwhelmingly accepts treatment when reached. These are substantial achievements in two of Nigeria's most operationally challenging states, and they establish a strong foundation for the Bridging Borders, Breaking Blindness project's intervention.

Yet the evidence is equally clear that a consistent set of structural failures threatens to prevent both states from achieving and sustaining elimination thresholds. The populations with the highest transmission risk – farmers, fishers, pastoralists, cross-border migrants – are systematically missed by every distribution cycle. Data systems document effort but cannot yet measure impact. Financing is committed on paper but withheld in practice. CDDs are underpaid and leaving. Transmission corridors that transcend administrative boundaries remain structurally unaddressed. And in Kaduna, a religion-based access gap persists that, despite having a clear and actionable solution, has not been structurally resolved.

The path forward does not require programme redesign. It requires programme deepening: from measuring effort to measuring effective coverage; from relational trust to institutional resilience;

from paper to digital data systems; from ad hoc cross-border meetings to standing bilateral agreements; from volunteer sacrifice to supported workforce sustainability; from political commitment on paper to domestic fund release in practice; and from awareness campaigns to precision advocacy that reaches the communities which drive transmission.

The analytical evidence presented in this report provides the foundation for these transitions. The communities willing to engage, the implementers committed to elimination, and the institutional architecture for coordination are all present in both states. What is required is the systematic investment and political will to reach those who have been consistently missed – because Nigeria's elimination will ultimately be determined not by how many people are counted, but by whether those who drive transmission are consistently, equitably, and sustainably treated.

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GLOSSARY TABLE

Local Term	Language/Region	English Meaning	Contextual Use in This Report
Buzu	Hausa (Kaduna)	Simulium blackfly	The local name used by Kaduna communities to identify the blackfly vector of onchocerciasis. Term appears in community narratives about risk awareness and vector identification.
Gyekpai	Local dialect (Kaduna)	Simulium blackfly	Alternative local-dialect name for the blackfly vector used in specific Kaduna LGA communities, particularly among non-Hausa-speaking groups.
Mutumutu	Efik/Pidgin (Cross River)	Simulium blackfly	The dominant local name for the blackfly vector across Cross River communities. Used broadly in community dialogue, health worker communication, and Voices from the River campaign materials.
Oponukot	Cross River (indigenous)	Spiritual affliction ('something placed by an enemy')	An indigenous explanatory framework in which disease symptoms — including onchocerciasis skin manifestations — are attributed to an enemy having 'placed' a harmful object in the victim's path. Represents a spiritual causation belief that competes with biomedical disease understanding.
Paramandula	Cross River (traditional governance)	Paramount traditional ruler	The highest-ranking traditional ruler in a Cross River community, equivalent to a paramount chief. Identified in this report as a Tier 1 gatekeeper whose endorsement is required before any health intervention is accepted at community level.
JNI	Hausa/national	Jama'atu Nasril Islam — Supreme Islamic Council of Nigeria	The principal umbrella organisation for Muslim communities in Nigeria. In this report, JNI leadership at state and LGA levels is identified as the most critical institutional partner for closing the Muslim community MDA access gap in Kaduna State.



CAN	National	Christian Association of Nigeria	The umbrella body for Christian denominations in Nigeria. Identified as a key mobilisation platform in both states, particularly in Cross River where 97.5% of survey respondents identify as Christian.
Agwam Adara	Adara community (Kaduna)	Traditional ruler of the Adara people	The paramount traditional leader of the Adara ethnic group, which has significant presence across Kachia and Kagarko LGAs. Recognised in this report as a key Tier 1 gatekeeper whose endorsement directly enables MDA acceptance.
Mectizan	Brand name (international)	Ivermectin (donated brand)	The trade name of ivermectin as donated by Merck for onchocerciasis MDA. Used interchangeably with 'ivermectin' in community narratives across both states. Community members often refer to the drug by this brand name rather than by its generic name.



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