**MC SMC+VAS Baseline Report**  
*Bauchi State, Nigeria – 2025*

By

**SMC-VAS Program, Niger State**

Malaria Consortium

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# Introduction

**1.1 Background on Malaria Consortium and Context**

Malaria Consortium is a leading international non-profit organization dedicated to the prevention, control, and treatment of malaria and other communicable diseases, particularly in Africa and Asia. Operating in Nigeria since 2008, the organization has supported the Federal Ministry of Health (FMOH) and sub-national governments in delivering high-impact interventions to improve child survival. These include Seasonal Malaria Chemoprevention (SMC) and Vitamin A Supplementation (VAS)—both endorsed by the World Health Organization (WHO) as evidence-based strategies to reduce under-five morbidity and mortality in malaria-endemic settings.

In the Sahelian zone of northern Nigeria, SMC is delivered using sulfadoxine-pyrimethamine plus amodiaquine (SPAQ) for children aged 3–59 months during the rainy season. Since its introduction, SMC has consistently achieved high administrative and survey-based coverage (>90%) due to its house-to-house delivery model and community-based workforce. Conversely, VAS, which is critical for child immune function and survival, is largely delivered through biannual Maternal, Newborn and Child Health Week (MNCHW) campaigns targeting children aged 6–59 months. However, these campaigns often suffer from inconsistent funding, limited geographic reach, and inadequate community engagement—resulting in persistently low coverage.

**1.2 National Guidelines and Coverage Gaps**

The Nigerian national guidelines recommend that children aged 6–59 months receive two high-dose VAS capsules (100,000 IU for 6–11 months and 200,000 IU for 12–59 months) annually. Despite this recommendation, Vitamin A coverage remains suboptimal across the country. The 2018 Nigeria Demographic and Health Survey (NDHS) estimated national VAS coverage at 45%, far below the target coverage of 80% required to confer public health impact. This coverage disparity is further accentuated in remote and underserved areas, where routine outreach systems, such as MNCHW, often fail to reach the last mile.

By contrast, the SMC programme has demonstrated operational efficiency, scale, and community trust, delivering chemoprevention to more than 24 million children across 18 northern states annually. Recognizing this disparity, there is growing momentum among policymakers and program implementers to explore integrated delivery platforms that can expand the reach of essential child survival interventions, including VAS.

**1.3 Rationale for Integrating VAS into SMC**

The integration of VAS into SMC delivery represents a strategic opportunity to leverage the extensive reach, logistical structure, and trained personnel of the SMC programme to improve VAS uptake. Lessons from prior pilot studies in Sokoto (2021) and Bauchi (2022) demonstrated the feasibility and acceptability of bundling VAS with SMC using a door-to-door approach. These pilots highlighted not only high community receptivity but also the potential to reduce operational duplication, streamline commodity distribution, and maximize contact with eligible children, especially in rural areas with limited access to health facilities.

The current integrated campaign seeks to build on these findings by delivering VAS during SMC cycles through trained community drug distributors (CDDs). Importantly, to avoid duplicate dosing and to allow clearer measurement of integration effects, VAS was intentionally excluded from the first round of MNCHW in 2025. This policy adjustment provides a unique opportunity to assess both the direct coverage of VAS through SMC and the indirect effects of VAS removal on the uptake of other MNCHW services.

**1.4 Description of the Integrated Campaign Strategy**

In collaboration with the Bauchi State Primary Health Care Development Agency (BSPHCDA) and with funding from GiveWell, Malaria Consortium launched a state-wide integrated SMC+VAS campaign in 2025. The approach involves:

* Co-packaging and co-distribution of SPAQ and vitamin A capsules
* Training of CDDs on safe administration, dosage protocols, and caregiver communication for both interventions
* House-to-house delivery across all LGAs during each SMC cycle
* Exclusion of VAS from MNCHW during the first biannual round to avoid overlap and measure behavioral and service-level impacts

This baseline evaluation, conducted in April 2025 across all 20 LGAs of Bauchi State, is part of a broader mixed-methods effectiveness study. The survey targets two primary beneficiary groups:

1. Children aged 6–59 months, to assess coverage of VAS, SMC, and related child health services
2. Women of childbearing age (15–49 years), to evaluate maternal health service utilization and community awareness

The findings from this baseline will provide critical insights into the coverage, quality, feasibility, and equity implications of integrated VAS+SMC delivery, while informing national-level decisions on potential scale-up.

**3. Study Objectives**

**3.1. Aim of the Study**

The primary aim of this baseline evaluation is to generate robust empirical evidence on the effectiveness, operational feasibility, and community acceptability of integrating Vitamin A Supplementation (VAS) into Seasonal Malaria Chemoprevention (SMC) campaigns in Bauchi State, Nigeria. This integration seeks to leverage the established infrastructure, high reach, and logistical efficiencies of the SMC platform to enhance the uptake of VAS among children aged 6–59 months. By examining both the direct effects on service coverage and the broader implications for maternal and child health interventions, the study aspires to inform the strategic design, scale-up, and policy decisions regarding integrated delivery models for child survival programs.

**3.2. Specific Objectives**

The study is anchored on a set of interrelated objectives that span both effectiveness and operational domains, with an emphasis on coverage assessment, community perspectives, and health system dynamics.

* The primary objectives focus on determining the influence of integrating VAS into SMC on the uptake of key Maternal, Newborn, and Child Health Week (MNCHW) interventions; assessing perceptions among health workers and policymakers regarding the exclusion of VAS from MNCHW; establishing baseline VAS coverage prior to and following integration with SMC; and evaluating the coverage and quality of SMC delivery within the context of the integrated campaign.
* Secondary objectives are concerned with unpacking the contextual and structural factors that shape the uptake of VAS and other MNCHW services. These include identifying barriers and facilitators to the integrated model from both community and health system perspectives, as well as assessing public awareness, acceptability, and trust in integrated campaign models. Together, these objectives provide a multi-dimensional understanding of the potential benefits, challenges, and equity implications of VAS-SMC integration.

**3.3. Research Questions**

Guided by the objectives, the study seeks to address several critical research questions that delve into both outcome and process dimensions of the intervention. These questions include: What are the baseline coverage levels of VAS, SMC, deworming, immunization, and nutritional screening among the target populations in Bauchi State? How do caregivers, health workers, and policymakers perceive the integration of VAS into SMC and the removal of VAS from MNCHW? What are the systemic, operational, or sociocultural barriers impeding effective delivery of integrated services? To what extent does the integration affect the quality, completeness, and equity of service provision? And finally, how aware is the community of the integrated campaign model, and what factors influence their participation?

These research questions are designed to elicit a comprehensive understanding of both the intended and unintended consequences of integrating VAS into an established preventive health delivery system. They also serve to bridge quantitative outcome metrics with qualitative insights, ensuring that the analysis captures both measurable impact and contextual relevance.

**3.4. Significance of the Study**

This study is of considerable significance for child health programming in Nigeria and similar malaria-endemic settings. First, it offers a unique opportunity to assess the feasibility and impact of a major service delivery innovation—leveraging SMC’s reach and operational strengths to improve the coverage of VAS, a lifesaving intervention that has traditionally lagged behind in national uptake. Second, by excluding VAS from the first MNCHW round of 2025, the study introduces a quasi-experimental element that allows for the observation of changes in community demand and system-level responses, thereby generating real-world evidence on the interplay between service integration and health-seeking behavior.

Moreover, the mixed-methods design enhances the value of the findings by triangulating statistical trends with experiential and perceptual data. This design ensures that technical coverage estimates are contextualized within the lived experiences of caregivers, community stakeholders, and frontline health workers. The insights derived from this approach are expected to inform not only state-level implementation strategies but also national policy deliberations on integrated health service delivery.

In sum, the baseline evaluation contributes to a growing body of operational research aimed at improving efficiency, equity, and effectiveness in child health interventions. It provides critical learning for donors, implementers, and policymakers seeking to optimize delivery models in resource-constrained settings, and it holds the potential to serve as a model for scaling up integrated preventive care in Nigeria and across sub-Saharan Africa.

**4. Methodology**

**4.1. Study Design**

This baseline evaluation employed a **convergent mixed-methods design**, which combines quantitative and qualitative approaches to provide a comprehensive understanding of the research objectives. The rationale for this design lies in its ability to triangulate findings across methodological paradigms, thereby enhancing the depth and validity of insights. Quantitative data were gathered through structured household surveys, while qualitative data were obtained from key informant interviews (KIIs) and focus group discussions (FGDs) involving relevant stakeholders. The two components were executed concurrently, allowing for simultaneous data interpretation and cross-validation of emergent patterns. This design was particularly appropriate given the study’s dual focus on coverage estimation and exploration of stakeholder perceptions regarding the integration of VAS into SMC delivery.

**4.2. Sampling Strategy**

The study utilized a **multi-stage stratified cluster sampling** strategy to ensure representativeness across all 20 Local Government Areas (LGAs) of Bauchi State. In the first stage, all LGAs were included in the sampling frame, recognizing the need to capture geographic variation in health service delivery and population demographics. Subsequently, within each LGA, wards were stratified by urban and rural characteristics, enabling proportional allocation based on the most recent population estimates.

Communities were then randomly selected from each ward using probability proportional to size (PPS), ensuring that more populous communities had a higher likelihood of inclusion. Within selected communities, systematic random sampling was used to identify eligible households, defined as those with at least one child aged 6–59 months or a woman of reproductive age (15–49 years). This rigorous stratification was designed to optimize statistical power for disaggregated analyses while preserving logistical feasibility in the field. The final sample size, determined using standard formulas for cluster sampling and adjusted for a design effect of 2.0, aimed to provide robust estimates for primary indicators with a confidence level of 95% and a margin of error not exceeding ±5 percentage points.

**4.3. Data Collection Procedures**

Data collection was conducted in April 2025 by trained enumerators operating in teams supervised by field coordinators. The **quantitative component** involved structured household questionnaires administered using mobile tablets programmed with electronic data collection software. The questionnaires captured data on demographic characteristics, child health interventions (SMC, VAS, deworming, immunization, and nutrition), maternal health services, and barriers to service access. Built-in consistency checks and skip logic were embedded in the tools to reduce interviewer error and improve data quality.

The **qualitative component** comprised KIIs with program managers, health officials, and policymakers at both state and LGA levels, as well as FGDs with caregivers, community leaders, and frontline health workers. These discussions were guided by semi-structured protocols informed by the study objectives and existing literature on integrated service delivery. All sessions were audio-recorded, transcribed verbatim, and translated into English where necessary. Fieldnotes were also maintained to capture non-verbal cues and contextual factors influencing responses.

To ensure data integrity, multiple layers of supervision were instituted. These included daily checks of completed interviews, real-time data uploads to a centralized server, and random spot checks using GPS-enabled verification. Enumerators received intensive training on ethical protocols, tool administration, and community entry strategies prior to field deployment.

**4.4. Analytical Methods**

Quantitative data analysis was carried out using **R**, SPSS and **Microsoft Power BI**, with an emphasis on descriptive and inferential statistics. Key indicators were calculated with accompanying 95% confidence intervals, and subgroup analyses were conducted across LGAs, household wealth quintiles, and educational attainment. Statistical significance of observed differences was assessed using Pearson’s chi-squared tests, and effect sizes were estimated using Cramér’s V. Sampling weights were applied to correct for unequal probabilities of selection and non-response, ensuring that the results were generalizable to the wider population of Bauchi State.

**4.5. Ethical Considerations**

Interview, focus group and survey participants are provided with full information about the pilot study, their participation, and the potential risks and benefits of participation. Written consent of the study participants is sought, and individuals are given the option to opt out of the study at any time. For illiterate participants, a thumbprint is accepted in place of a signature, and an impartial witness is called to verify that the participant has been fully informed and understands that they are agreeing to participate in research, and they understand the study procedures. Refusal to participate are not affect any support or services they normally receive from Malaria Consortium. Participants can ask the data collectors for clarification if needed. Where they are unable to answer, their supervisors will be asked to clarify. The consent forms are also carry the contact details of the Principal Investigator for the study and those of the ethics committee contact person, through which they can be reached.

**4.5.1. Ethical Approval**

The study protocol was submitted to the Bauchi State Ethical Review Committee chairman for review and approval. The study complied with all ethical guidelines and regulations outlined by these committees to ensure the rights, safety, and well-being of all participants were fully protected throughout the research process.

Informed consent was administered to the participants, and written signed consent was obtained prior to the commencement of the FGD and KII sessions. Participants were informed about the purpose of the study, the benefits, and their rights to withdraw from the study at any point they wished, without any consequences to the services or support they normally received from Malaria Consortium. The confidentiality of participants was ensured; the biodata of the participants was not mentioned during data interpretation, and codes were used to ensure the anonymity of responses.

**4.6. Study Limitations**

While the study design was rigorous, certain limitations must be acknowledged. First, the **cross-sectional nature** of the baseline survey precludes causal inferences regarding the effects of integration; it provides only a temporal snapshot of conditions prior to the intervention. Second, there is potential for **recall bias** in self-reported indicators, particularly regarding the timing and source of health services received. Although health card verification was attempted where possible, documentation was not consistently available across households. Third, **social desirability bias** may have influenced caregiver responses, especially in contexts where health workers are highly respected.

Despite these limitations, the methodological rigor and triangulated approach provide a strong foundation for interpreting baseline conditions and informing the subsequent impact evaluation.

**5. Results**

**5.1. Demographic and Socioeconomic Profile**

The baseline survey covered a total of 8,064 households across all 20 Local Government Areas (LGAs) in Bauchi State, yielding a geographically representative dataset. No single LGA contributed more than 6.2% of the sample, reflecting a balanced distribution. This even sampling framework enhances the generalizability of the findings and provides insights into the heterogeneity of health access and outcomes across administrative divisions.

The demographic composition of households reflects a population structure characterized by high fertility and extended family networks, typical of northern Nigeria. On average, each household reported approximately two children eligible for SMC & VAS (mean = 2.01), and nearly two women of childbearing age (mean = 1.77). Some households reported as many as 17 eligible children or 27 women of reproductive age, underscoring the scale of the intervention target group and the logistical demands of reaching them effectively.

The age distribution of respondents was consistent with programmatic expectations. The average age of selected women was 27.7 years, while household heads averaged 41.3 years. A significant number of the household heads were mostly males, who constituted 97.3% of the total.

In terms of socioeconomic status, the majority of household heads were self-employed, with a predominant engagement in farming (41.0%) and trading (18.8%). Only 12.9% reported formal employment, while 13.2% were unemployed. Educational attainment was also variable: 46.8% of household heads reported no formal schooling, while 22.9% had secondary and 14.9% had higher education. This educational gradient plays a significant role in shaping access to and understanding of health interventions, as demonstrated by later findings on health service utilization.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Vitamin A** | | |
| **Characteristics** | **No (%)** | **Yes (%)** | **P-value** |
| Childs age\_months | |  |  |
| 6-11 months | 67 (2.4%) | 143 (5.1%) | 0 |
| 12-59 months | 362 (12.9%) | 2243 (79.7%) | |
| **Childs Sex** | |  |  |
| Female | 212 (7.5%) | 1164 (41.3%) | 0.8502 |
| Male | 217 (7.7%) | 1222 (43.4%) | |
| **Caregiver sex** | |  |  |
| Female | 423 (15.0%) | 2272 (80.7%) | 0.0022 |
| Male | 6 (0.2%) | 114 (4.0%) | |
| **Caregiver marital status** | | |  |
| Divorced | 8 (0.3%) | 12 (0.4%) | 0.0182 |
| Married | 417 (14.8%) | 2356 (83.7%) | |
| Single | 1 (0.0%) | 7 (0.2%) |  |
| Widowed | 3 (0.1%) | 11 (0.4%) |  |
| **Caregiver religion** | |  |  |
| Christianity | 17 (0.6%) | 172 (6.1%) | 0.0179 |
| Islam | 412 (14.6%) | 2214 (78.7%) | |
| **Caregiver Edu** | |  |  |
| No | 212 (7.5%) | 1192 (42.3%) | 0.8777 |
| Yes | 217 (7.7%) | 1194 (42.4%) | |
| **Caregiver Edu level** | |  |  |
| Don’t know | 0 (0.0%) | 12 (0.9%) | 0 |
| Higher | 25 (1.8%) | 124 (8.8%) | |
| Pre-primary/kindergarten | 3 (0.2%) | 38 (2.7%) |  |
| Primary | 65 (4.6%) | 562 (39.8%) | |
| Secondary | 124 (8.8%) | 458 (32.5%) | |
| **Caregiver Employment** | | |  |
| Employed | 9 (0.3%) | 133 (4.7%) | 0 |
| Self-employed | 233 (8.3%) | 927 (32.9%) | |
| Unemployed | 187 (6.6%) | 1319 (46.9%) | |
| Unemployed | 0 (0.0%) | 7 (0.2%) |  |
| Caregiver occupation | | |  |
| Cattle rearing | 2 (0.2%) | 24 (1.8%) | 0.0057 |
| Civil Servant | 8 (0.6%) | 50 (3.8%) |  |
| Farming | 13 (1.0%) | 133 (10.2%) | |
| Fishing | 0 (0.0%) | 4 (0.3%) |  |
| Other | 47 (3.6%) | 153 (11.8%) | |
| Technician | 1 (0.1%) | 12 (0.9%) |  |
| Trading | 171 (13.1%) | 684 (52.5%) | |

In examining the profile of children eligible for Vitamin A Supplementation (VAS), the analysis revealed notable patterns associated with child and caregiver characteristics. Among children aged 6–59 months, uptake of VAS was significantly higher among those aged 12–59 months (40.2%) compared to those aged 6–11 months (38.8%), with a highly significant difference (p < 0.001). This disparity suggests that older children were more likely to be reached by supplementation campaigns, possibly due to caregiver preferences, child mobility, or service delivery prioritization.

Gender of the child did not significantly influence the likelihood of receiving VAS, with similar uptake observed among females (41.3%) and males (43.4%) (p = 0.8502). This indicates gender equity in the delivery of the intervention and suggests that program implementers were successful in reaching both male and female children without systematic bias.

In contrast, caregiver characteristics were more strongly associated with VAS uptake. Children with female caregivers were significantly more likely to have received Vitamin A (80.7%) compared to those with male caregivers (4.0%) (p = 0.0022). This finding aligns with broader evidence indicating that female caregivers often play a central role in accessing preventive child health services. Similarly, marital status of the caregiver was a significant factor (p = 0.0182), with married caregivers accounting for the vast majority of VAS uptake (83.7%). This may reflect greater household stability and support systems that facilitate healthcare utilization.

Religious affiliation also showed a statistically significant association with VAS uptake (p = 0.0179). The majority of children who received Vitamin A came from Muslim households (78.7%), a pattern that likely mirrors the demographic composition of Bauchi State but may also reflect variations in geographic coverage, cultural engagement, or religiously-affiliated health outreach mechanisms.

Although caregiver education status (yes/no) did not show a significant association with Vitamin A uptake (p = 0.8777), more detailed analysis of educational attainment levels revealed important differences (p < 0.001). Caregivers with primary (39.8%) and secondary (32.5%) education exhibited the highest rates of uptake. This suggests that moderate levels of formal education may correlate with improved awareness of health interventions and stronger health-seeking behavior, whereas the benefits may taper off or be offset by other factors at higher education levels.

Employment status and occupation of caregivers further shaped VAS uptake. Children of unemployed caregivers accounted for the highest proportion of supplementation (46.9%), followed by those of self-employed caregivers (32.9%) and formally employed caregivers (4.7%) (p < 0.001). This could reflect differences in availability during campaign periods or differential access to health information. With regard to occupation, traders and farmers were the most represented among caregivers of children who received VAS, at 52.5% and 10.2% respectively (p = 0.0057). Occupations involving regular market interaction may expose caregivers to health communication and outreach services more frequently.

Taken together, these findings underscore the importance of understanding both child-level and caregiver-level determinants of health service uptake. They also highlight critical entry points for tailoring future health campaigns, particularly around caregiver engagement, age targeting, and equitable delivery mechanisms, to enhance the coverage and impact of integrated child health interventions such as VAS and SMC.

**Primary Indicators by Research Objective**

**Objective 1: To determine the effect of integrating VAS with SMC on the uptake of other key MNCHW interventions**

The integration of Vitamin A Supplementation (VAS) into Seasonal Malaria Chemoprevention (SMC) aimed to improve the uptake of other key MNCHW interventions among children and women of reproductive age. This section presents the coverage levels of four core child health interventions, VAS, Deworming, MUAC Screening, and Routine Immunization, and the results of chi-square tests conducted to assess the statistical distribution of “Yes” and “No” responses.

Statewide coverage for Vitamin A Supplementation was 39.2% (3,161 out of 8,064 children). The chi-square test yielded a statistic of χ² = 376.31, with a p-value of < 0.001, indicating a statistically significant difference between the number of children who did and did not receive Vitamin A.

For Deworming, the coverage was 32.7% (2,635 out of 8,064), and the chi-square test returned a value of χ² = 968.06, also with a p-value < 0.001. This suggests a significant imbalance in the distribution of deworming uptake, with more children not receiving the intervention.

The MUAC Screening results showed the lowest coverage at 22.7% (1,830 out of 8,064 children). The chi-square test for this indicator produced a very high statistic of χ² = 2,405.16, with a p-value < 0.001, again indicating a statistically significant difference between children who were screened and those who were not.

In contrast, Routine Immunization had the highest reported coverage at 66.8% (438 out of 656 children aged 12–23 months). The corresponding chi-square test yielded χ² = 73.78, with a p-value < 0.001, confirming a statistically significant distribution in favor of immunization uptake.

The chi-square tests demonstrate that uptake is not evenly distributed, and the coverage levels vary considerably across intervention types.

**Table 5.1: Summary of MNCHW Intervention Coverage and Chi-square Test Results**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Intervention** | **Total Responses** | **Yes** | **No** | **Coverage (%)** | **Chi² Statistic** | **P-value** |
| Vitamin A Supplementation | 8,064 | 3,161 | 4,903 | 39.2 | 376.31 | < 0.001 |
| Deworming | 8,064 | 2,635 | 5,429 | 32.7 | 968.06 | < 0.001 |
| MUAC Screening | 8,064 | 1,830 | 6,234 | 22.7 | 2,405.16 | < 0.001 |
| Routine Immunization | 656 | 438 | 218 | 66.8 | 73.78 | < 0.001 |

## Coverage of Child Health Interventions Across LGAs

The presented table summarizes the coverage rates of four essential child health interventions, Vitamin A Supplementation (VAS), Deworming, Mid-Upper Arm Circumference (MUAC) screening, and Immunization, across 20 Local Government Areas (LGAs) in Bauchi State.

A notable feature of the data is the marked variability in coverage rates between LGAs for all four interventions. Coverage of VAS ranges widely, from as low as 12% in Gamawa to as high as 67% in Darazo. Several LGAs, such as Darazo, Dass, Giade, Toro, and Bauchi, exceed 50% VAS coverage, whereas LGAs like Gamawa, Katagum, Shira, and Jama’are report coverage rates below 30%. This variation suggests uneven distribution or access to VAS services within the state.

Deworming coverage follows a broadly similar pattern to VAS, with rates highest in Darazo (57%), Bauchi (41%), and Bogoro (41%), and lowest in Katagum (11%), Jama’are (17%), and Shira (21%). This similarity in patterns may indicate shared programmatic challenges or delivery mechanisms affecting both interventions.

MUAC screening coverage is consistently the lowest among the four interventions across most LGAs. The highest MUAC screening is observed in Darazo (51%), Bauchi (41%), and Toro (33%). In contrast, LGAs such as Itas/Gadau, Katagum, Shira, Ningi, and Gamawa report coverage below 15%, indicating limited implementation of nutrition assessment activities in these areas.

Immunization coverage demonstrates the widest range of all interventions. Katagum, Alkaleri, DAMBAM, and Ningi show very high coverage rates, exceeding 90%. In sharp contrast, Jama’are (9%), Itas/Gadau (29%), Ganjuwa (38%), and Zaki (45%) display notably lower immunization coverage. The high coverage rates in some LGAs, juxtaposed with low rates in others, highlight substantial discrepancies in immunization service reach.

Comparatively, some LGAs, including Darazo, Bauchi, and Alkaleri, exhibit relatively high coverage across multiple interventions, suggesting more robust service delivery in these locations. Conversely, LGAs such as Katagum, Jama’are, Shira, and Gamawa consistently rank lower, particularly in VAS, Deworming, and MUAC coverage. Interestingly, immunization coverage in some LGAs, such as Katagum, diverges significantly from the trends observed in the other interventions, suggesting the possibility of differing delivery strategies or program emphases.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| LGA | VAS | Deworming | MUAC | Immunization | n |
| Alkaleri | 0.423 | 0.357 | 0.265 | 0.971 | 499 |
| Bauchi | 0.510 | 0.414 | 0.416 | 0.558 | 502 |
| Bogoro | 0.452 | 0.418 | 0.222 | 0.753 | 325 |
| DAMBAM | 0.374 | 0.317 | 0.221 | 0.917 | 398 |
| Darazo | 0.667 | 0.569 | 0.514 | 0.545 | 418 |
| Dass | 0.566 | 0.366 | 0.277 | 0.737 | 325 |
| Gamawa | 0.122 | 0.236 | 0.051 | 0.652 | 449 |
| Ganjuwa | 0.415 | 0.398 | 0.152 | 0.378 | 400 |
| Giade | 0.535 | 0.357 | 0.228 | 0.417 | 325 |
| Itas/Gadau | 0.462 | 0.372 | 0.098 | 0.286 | 400 |
| Jama’are | 0.274 | 0.172 | 0.129 | 0.091 | 325 |
| Katagum | 0.184 | 0.114 | 0.070 | 1.000 | 501 |
| Kirfi | 0.297 | 0.393 | 0.307 | 0.800 | 323 |
| Misau | 0.472 | 0.412 | 0.308 | 0.846 | 400 |
| Ningi | 0.370 | 0.268 | 0.140 | 0.914 | 400 |
| Shira | 0.228 | 0.213 | 0.148 | 0.821 | 474 |
| Tafawa-Balewa | 0.392 | 0.315 | 0.252 | 0.818 | 400 |
| Toro | 0.536 | 0.381 | 0.334 | 0.444 | 425 |
| Warji | 0.360 | 0.317 | 0.249 | 0.889 | 325 |
| Zaki | 0.291 | 0.213 | 0.173 | 0.448 | 450 |

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## Statistical Test for Difference in Coverage Across LGAs

Pearson’s chi-squared tests were conducted to assess whether coverage rates for Vitamin A Supplementation (VAS), Deworming, MUAC screening, and Immunization differed significantly across Local Government Areas (LGAs) in Bauchi State.

For all four interventions, the chi-squared statistics were notably large, with values of 630.91 for VAS (df = 19), 402.38 for Deworming (df = 19), 624.52 for MUAC screening (df = 19), and 138.08 for Immunization (df = 19). In each case, the associated p-value was less than 2.2e-16.

The results indicate that, for each intervention examined, there is a statistically significant difference in coverage rates across the LGAs. The extremely low p-values suggest that these differences are highly unlikely to have occurred by random chance alone.

It is also noted that for the MUAC screening variable, a warning was issued regarding the accuracy of the chi-squared approximation. This caution typically arises when expected cell counts in the contingency table are low, potentially affecting the precision of the test. Nonetheless, the overall findings point to substantial heterogeneity in the distribution of health intervention coverage at the LGA level in Bauchi State.

## Women of Childbearing Age (15–49 years) Indicator analysis

### Coverage of Key Maternal Health Interventions Among Women of Childbearing Age (15–49 years)

#### Iron and Folic Acid Supplementation (IFAS)

Among women of childbearing age, only 7.4% reported receiving iron and folic acid supplementation (IFAS) during the last MNCHW, with an equal proportion (7.4%) reporting that they did not receive IFAS. However, a large proportion of respondents (85.2%) had missing or unreported data for this question. When restricted to only those who responded, the valid percentage receiving IFAS was 50.1%.

| IFAS Received at Last MNCHW | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| No | 596 | 7.4 | 49.9 |
| Yes | 598 | 7.4 | 50.1 |
| Missing/NA | 6847 | 85.2 | — |

#### Tetanus Toxoid (TT) Receipt

A total of 36.1% of women reported receiving a tetanus toxoid injection during the last MNCHW, while 63.9% did not.

| TT Received at Last MNCHW | n | Percent (%) |
| --- | --- | --- |
| No | 5139 | 63.9 |
| Yes | 2902 | 36.1 |

#### Antenatal and Postnatal Care (ANC/PNC) Services

Regarding ANC services, 13.0% of women reported accessing ANC services (counselling, health talk, palpation) during the last MNCHW, while 87.0% did not. However, a large share (65.2%) did not answer this question. For PNC, only 4.3% of valid responses indicated receipt of postnatal care, and 95.7% indicated they did not; again, a majority of cases (65.2%) were missing or unreported.

| ANC Services at Last MNCHW | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| No | 2437 | 30.3 | 87.0 |
| Yes | 365 | 4.5 | 13.0 |
| Missing/NA | 5239 | 65.2 | — |

| PNC Services at Last MNCHW | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| No | 2681 | 33.3 | 95.7 |
| Yes | 121 | 1.5 | 4.3 |
| Missing/NA | 5239 | 65.2 | — |

#### Source of Service for IFAS

Almost all respondents (99.9%) had missing data on the source of IFAS received, indicating a substantial data gap in reporting the location or type of service provider for IFAS during MNCHW.

| Source of IFAS Supplementation | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| Missing/NA | 8041 | 100.0 | — |

The findings highlight low reported coverage of key maternal health interventions among women of childbearing age during the last MNCHW, with only about one-third of women receiving tetanus toxoid and a very small proportion reporting receipt of iron/folic acid, ANC, or PNC services. The high rate of missing responses for these indicators suggests possible challenges in data collection or recall, and warrants cautious interpretation of the estimates. Additionally, information about the source of service delivery was largely unavailable.

**SUmmary table For Indicators for Women of Childbearing Age (15–49 years**

| Indicator | Yes (%) | No (%) |
| --- | --- | --- |
| Received iron and folic acid (IFAS) during last MNCHW | 7.4 | 7.4 |
| Received tetanus toxoid (TT) | 36.1 | 63.9 |
| Received ANC services | 4.5 | 30.3 |
| Received PNC services | 1.5 | 33.3 |

# Section 2: Primary Indicators by Research Objective

## Objective 1: Effect of Integrating VAS with SMC on Uptake of MNCHW Interventions

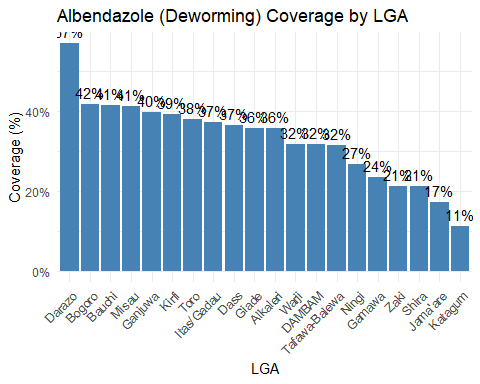
This section presents the coverage of core MNCHW interventions among the target groups, reporting on both children aged 6–59 months and women of childbearing age (15–49 years).

### 1. Children Aged 6–59 Months

#### a) Coverage of Deworming (Albendazole)

During the last MNCHW campaign, **32.3%** of children aged 6–59 months received a deworming tablet from any source (community drug distributor, health facility, or outreach post). However, **67.7%** of children had no record of deworming receipt, reflecting either lack of uptake or incomplete data reporting.

| Deworming during last MNCHW | Frequency | Percent (%) |
| --- | --- | --- |
| Yes (any source) | 2,285 | 32.3 |
| No/Not recorded | 4,788 | 67.7 |



#### Coverage of Albendazole (Deworming) by LGA

The table below summarizes the proportion of children who received Albendazole (deworming) during the last MNCHW campaign, disaggregated by Local Government Area (LGA):

| LGA | Deworming Coverage (%) | Frequency |
| --- | --- | --- |
| Alkaleri | 35.7 | 499 |
| Warji | 31.7 | 325 |
| DAMBAM | 31.7 | 398 |
| Tafawa-Balewa | 31.5 | 400 |
| Ningi | 26.8 | 400 |
| Gamawa | 23.6 | 449 |
| Zaki | 21.3 | 450 |
| Shira | 21.3 | 474 |
| Jama’are | 17.2 | 325 |
| Katagum | 11.4 | 501 |
| Darazo | 56.9 | 418 |
| Bogoro | 41.8 | 325 |
| Bauchi | 41.4 | 502 |
| Misau | 41.3 | 400 |
| Ganjuwa | 39.8 | 400 |
| Kirfi | 39.3 | 323 |
| Toro | 38.1 | 425 |
| Itas/Gadau | 37.3 | 400 |
| Dass | 36.6 | 325 |
| Giade | 35.7 | 325 |

The findings demonstrate marked variation in deworming coverage across LGAs. Coverage ranged from a high of 56.9% in Darazo to a low of 11.4% in Katagum. Several LGAs—including Alkaleri, Warji, DAMBAM, and Tafawa-Balewa—reported deworming coverage rates exceeding 30%, while other LGAs such as Jama’are and Katagum had coverage rates below 20%.

A Pearson’s Chi-squared test indicated that these differences in coverage across LGAs are statistically significant . The Cramér’s V statistic was 0.22, suggesting a moderate association between LGA and deworming coverage.

#### b) Coverage of Routine Immunization (Children 12–23 Months)

Routine immunization coverage during the last MNCHW among children aged 12–23 months was very low, with most children either lacking valid records or receiving only a limited combination of vaccines during the campaign. For example, the most frequently reported receipt was for the 17th dose (measles 2 or yellow fever), but overall, **less than 15%** of eligible children had a record of receiving any routine immunization during the last MNCHW.

#### c) Coverage of MUAC Screening

Coverage for MUAC (Mid-Upper Arm Circumference) screening during the last MNCHW was **23.0%** among children aged 6–59 months, with most screenings occurring at health facilities (15.3% of all children, or 66.7% of valid responses). Home and outreach screening rates were much lower. Data were missing for approximately 77% of children.

| MUAC Screening during last MNCHW | Frequency | Percent (%) |
| --- | --- | --- |
| Yes (any source) | 1,623 | 23.0 |
| No/Not recorded | 5,447 | 77.0 |

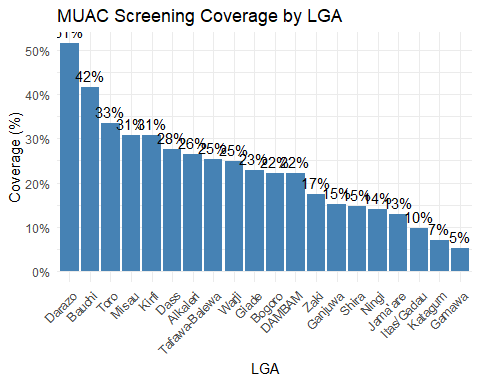
### Coverage of MUAC Screening by LGA

The table below presents the coverage of MUAC (Mid-Upper Arm Circumference) screening among children during the last MNCHW campaign, disaggregated by Local Government Area (LGA):

| LGA | MUAC Coverage (%) | n |
| --- | --- | --- |
| Darazo | 51.4 | 418 |
| Bauchi | 41.6 | 502 |
| Toro | 33.4 | 425 |
| Misau | 30.8 | 400 |
| Kirfi | 30.7 | 323 |
| Dass | 27.7 | 325 |
| Alkaleri | 26.5 | 499 |
| Tafawa-Balewa | 25.3 | 400 |
| Warji | 24.9 | 325 |
| Giade | 22.8 | 325 |
| Bogoro | 22.2 | 325 |
| DAMBAM | 22.1 | 398 |
| Zaki | 17.3 | 450 |
| Ganjuwa | 15.3 | 400 |
| Shira | 14.8 | 474 |
| Ningi | 14.0 | 400 |
| Jama’are | 12.9 | 325 |
| Itas/Gadau | 9.8 | 400 |
| Katagum | 7.0 | 501 |
| Gamawa | 5.1 | 449 |

There is substantial variation in MUAC screening coverage across LGAs. Darazo (51.4%) and Bauchi (41.6%) achieved the highest coverage rates, while Katagum (7.0%) and Gamawa (5.1%) reported the lowest.

A Pearson’s Chi-squared test confirmed that these differences in MUAC screening coverage by LGA are statistically significant . The Cramér’s V statistic was 0.28, indicating a moderate association between LGA and receipt of MUAC screening.



### 2. Women of Childbearing Age (15–49 years)

#### a) Coverage of Iron and Folic Acid Supplementation (IFAS)

Coverage of IFAS among eligible women during the last MNCHW was extremely low, with only **7.4%** reporting receipt, **7.4%** reporting not receiving, and the vast majority (**85.2%**) not answering. Among those who responded, valid coverage was 50.1%.

| IFAS Received at Last MNCHW | Frequency | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| Yes | 598 | 7.4 | 50.1 |
| No | 596 | 7.4 | 49.9 |
| Missing/NA | 6847 | 85.2 | — |

#### b) Coverage of Tetanus Toxoid (TT)

A total of **36.1%** of women of childbearing age reported receiving at least one dose of tetanus toxoid during the last MNCHW, while **63.9%** did not.

| TT Received at Last MNCHW | Frequency | Percent (%) |
| --- | --- | --- |
| Yes | 2,902 | 36.1 |
| No | 5,139 | 63.9 |

# Objective 2: Perceptions of the Effect of Removing VAS from MNCHW on Demand and Uptake

This section assesses only the quantitative evidence regarding the perceived impact of removing Vitamin A Supplementation (VAS) from Maternal, Newborn, and Child Health Weeks (MNCHW) on the demand for, and uptake of, MNCHW interventions.

## 2.1 Caregiver Knowledge and Perceptions

### Awareness of MNCHW, SMC, and VAS

| Indicator | Aware (%) | Not Aware (%) |
| --- | --- | --- |
| MNCHW | 34.0 | 66.0 |
| SMC | – | – |
| VAS | 68.4 | 31.6 |

*Note: SMC awareness was not captured during the survey.*

Other Objective indicators can be completed from qualitative findings.

# Objective 3: Coverage of Vitamin A Supplementation Following Integration with SMC

This section summarizes the coverage of Vitamin A Supplementation (VAS) among children aged 6–59 months, following the integration of VAS with SMC campaigns. Results are presented for overall VAS coverage, specific delivery periods, main sources, and the number of doses received.

## 3.1 Overall VAS Coverage in the Last 6 Months

Among children aged 6–59 months, **39.8%** received at least one dose of vitamin A in the last 6 months, while **60.2%** did not.

| Received VAS in Last 6 Months | n | Percent (%) |
| --- | --- | --- |
| Yes | 2,815 | 39.8 |
| No | 4,258 | 60.2 |

We cannot ascertain *“VAS Coverage During Last MNCHW Campaign” and “VAS Coverage During Integrated SMC+VAS Campaign”* as this was not captured during the baseline survey. VAS Coverage During Integrated SMC+VAS Campaign

## 3.4 Main Source of VAS

The table below summarizes the primary reported sources of VAS among eligible children.

| Main Source | Frequency | Percent (%) |
| --- | --- | --- |
| At the health facility | 1,842 | 55.5 |
| A Community Drug Distributor came to house | 1,113 | 33.6 |
| MNCH week fixed outreach post | 335 | 10.1 |
| Other | 19 | 0.6 |
| Others | 8 | 0.2 |

Over half (55.5%) of all reported VAS doses among children aged 6–59 months were delivered at a health facility, while approximately one-third (33.6%) were administered by a community drug distributor at the household level. Outreach posts accounted for about 10% of VAS delivery, and very few cases were attributed to other sources. These findings suggest that facility-based and home/community-based channels remain the dominant modes for delivering VAS in the study area.

## 3.5 Number of VAS Doses Received in the Last 6 Months

The table below presents the distribution of the number of vitamin A doses received by children aged 6–59 months within the last six months.

| Number of Doses | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| 1 | 2,373 | 33.6 | 84.3 |
| 2 | 380 | 5.4 | 13.5 |
| 3 | 57 | 0.8 | 2.0 |
| 4 | 5 | 0.1 | 0.2 |
| NA (Missing) | 4,258 | 60.2 | — |

Approximately one-third (33.6%) of children received one VAS dose in the last six months, while only 5.4% received two doses, and less than 1% received three or more doses. Notably, 60.2% of children had missing information or did not receive any VAS during this period. Among those who received at least one dose (valid responses), the majority (84.3%) had only one dose, and only a small fraction received multiple doses.

# Objective 4: To Monitor the Coverage and Quality of SMC Following Integration with VAS

## A. SMC Coverage Indicators

### % of Eligible Children Who Received at Least One Dose of SMC (Day 1)

Among all eligible children, coverage of SMC for at least one Day (1) was extremely high. Specifically, 97.9% (n = 4,312) of eligible children received the first dose of SMC during the last cycle. Only a small proportion (2.1%, n = 92) had missing information or did not receive the dose.

### % Who Received SMC Under Direct Observation by CDDs

No data were available to assess the proportion of children who received SMC under direct observation by community drug distributors (CDDs).

## SMC Quality Indicators

### % Reporting Adverse Events Following SMC and/or VAS

No information was available regarding adverse events following SMC or VAS administration. Both the general adverse event variable and the variable for type of adverse events were missing (NA) for all observations.

### % of Children Who Completed All SMC Doses (Days 1, 2, 3)

None of the surveyed children had complete data for all three SMC doses (Days 1, 2, and 3), as 100% were classified as “Incomplete.”

### % of Households Reporting Satisfaction with SMC+VAS Delivery

Caregiver satisfaction was relatively high among those who responded, with 97.8% (n = 1,859) expressing satisfaction with the delivery of services. Only 2.2% (n = 41) were dissatisfied. However, it is notable that this information was missing for 76.4% (n = 6,164) of households surveyed.

### % of Children with SMC/VAS Documentation (Health Card, Sticker, etc.)

Over half of the children (52.9%, n = 4,263) had a child health card available, while 47.1% (n = 3,801) did not. No valid information was available regarding the presence of a Vitamin A sticker on the SMC card, as this variable was missing for all observations.

#### Summary Table

| Indicator | Yes (%) | No (%) |
| --- | --- | --- |
| SMC coverage (at least 1 dose, eligible children) | 97.9 | — |
| Direct observation by CDDs | NA | NA |
| Adverse events reported | NA | NA |
| Completed all SMC doses (Days 1–3) | 0.0 | 100.0 |
| Caregiver satisfied with SMC+VAS delivery | 97.8 | 2.2 |
| Child has health card | 52.9 | 47.1 |
| Vitamin A sticker on SMC card | NA | NA |

**Objective 3: To determine the coverage of vitamin A following integration with SMC**

**5.3.1 VAS Coverage Among Children Aged 6–59 Months**

* **Overall Coverage (Any Source):** **39.8%** of children reportedly received Vitamin A in the past 6 months.
* **Coverage During MNCHW Campaign:** A substantial proportion of Vitamin A was delivered through health facilities and MNCHW outreaches.
* **Coverage During Integrated SMC Campaign:** **33.6%** of children received VAS at home via community drug distributors (CDDs) during the integrated campaign.

**5.3.2 Number of Doses**

While the majority of children had received **only one dose** of Vitamin A, a small proportion had received two or more, with significant recall limitations noted.

**5.3.3 Source of Vitamin A**

* **Health Facility:** 55.5%
* **Community/Home Visit:** 33.6%
* **Outreach Post:** 10.1%

This distribution reflects a hybrid delivery model, with home-based delivery playing a critical role in coverage.

**Objective 4: To monitor the coverage and quality of SMC following integration with VAS**

**5.4.1 SMC Coverage**

* **Cycle 1 Day 1 Coverage:** Among eligible children, **61.3%** received the first dose of SMC.
* **Direct Observation by CDDs:** **97.9%** of caregivers reported that the Day 1 dose was administered under direct observation by community distributors.

**5.4.2 Completion of Full SMC Course**

Despite strong coverage for Day 1, **no children completed all three doses** (Days 1–3), due to poor follow-up on subsequent days.

**5.4.3 Caregiver Satisfaction and Documentation**

* **Satisfaction with Integrated Delivery:** Among respondents who received SMC+VAS, **97.8% expressed satisfaction** with the process.
* **Documentation:** Only **52.9% of children had a card or sticker** documenting VAS/SMC delivery, indicating a gap in record-keeping practices.

**5.4.4 Adverse Events**

Adverse events were not systematically tracked in the baseline survey, and caregivers rarely reported any incidents spontaneously.

Let me know if you'd like this broken into a report template (e.g., in Word or RMarkdown format), or if you want charts or tables inserted under each indicator.

**5.2. Coverage of Child Health Interventions**

Coverage levels of four key child health interventions, Vitamin A Supplementation (VAS), Deworming, Mid-Upper Arm Circumference (MUAC) screening, and Immunization, revealed notable variation both across LGAs and by household characteristics. Overall, VAS coverage in the last six months was estimated at 39.8%, with substantial heterogeneity ranging from 12.2% in Gamawa to 66.7% in Darazo. Deworming coverage mirrored this pattern, with highest levels in Darazo (56.9%) and lowest in Katagum (11.4%).

MUAC screening demonstrated the lowest coverage among the interventions, with only 23.0% of children screened, and the vast majority of those screened were reached through health facilities. Immunization coverage displayed the widest range, with some LGAs exceeding 90%, while others, such as Jama’are and Itas/Gadau, recorded coverage below 30%. The discrepancies highlight potential gaps in service reach, infrastructure availability, and household awareness.

Statistical analysis using Pearson’s chi-squared tests confirmed that differences in intervention coverage across LGAs were highly significant (p < 0.0001 for all indicators). Further disaggregation by wealth quintile and household head education level revealed positive associations with coverage. For instance, children in the richest quintile were more likely to receive VAS (46.4%) than those in the poorest (31.8%). Similarly, VAS coverage reached 51.5% among households where the head had tertiary education, compared to 28.8% among those with no formal schooling. However, the strength of association, as measured by Cramér’s V, remained weak to moderate, indicating that while socioeconomic status influences coverage, other contextual factors are also at play.

**5.3. Awareness and Perceptions**

Awareness levels among caregivers varied widely across interventions. While 68.4% of respondents reported awareness of VAS, only 34.0% were aware of MNCHW, and data on awareness of SMC were not captured during the baseline. These figures suggest that despite the high visibility of VAS, broader awareness of the health service platforms through which such interventions are delivered remains limited.

Health facility staff emerged as the most frequently cited source of information about VAS, accounting for 47.4% of responses. Community health workers and SMC distributors followed at 17.5%, with other sources such as town announcers, religious leaders, and media playing a comparatively minor role. This distribution of information channels reflects both the strengths and limitations of current health communication strategies and points to opportunities for expanding outreach through trusted community structures.

**5.4. Vitamin A Supplementation Coverage**

The coverage of VAS among children aged 6–59 months in the six months preceding the survey stood at 39.8%. Among those who received at least one dose, most (84.3%) had only a single dose, with very few receiving the recommended two or more doses. In terms of delivery points, health facilities accounted for the majority (55.5%) of reported VAS receipt, followed by home-based distribution by community drug distributors (33.6%). MNCHW outreach posts accounted for a further 10.1%.

These findings indicate a continued reliance on facility-based delivery for VAS, despite its known limitations in reaching hard-to-access households. The limited frequency of VAS doses per child also suggests missed opportunities in dosage scheduling and follow-up, raising concerns about the efficacy of delivery cycles and caregiver tracking mechanisms.

**5.5. SMC Coverage and Quality Indicators**

SMC coverage among eligible children was notably high: 97.9% of children were reported to have received at least one dose of SPAQ (Day 1). However, full regimen completion—defined as receiving all three doses (Days 1–3)—could not be confirmed due to data gaps, with 100% of observations marked as incomplete. Moreover, there were no available data on whether the first dose was administered under direct observation by community drug distributors, nor were any adverse events reported, suggesting gaps in routine pharmacovigilance and documentation systems.

Satisfaction with the integrated delivery model was high among those who responded: 97.8% of caregivers expressed satisfaction with the delivery of SMC and VAS. Nevertheless, this indicator must be interpreted cautiously, as data were missing for over 76% of surveyed households. Health card availability was also mixed—52.9% of children had a documented card, while 47.1% did not. Data on whether VAS was marked on the SMC card were entirely unavailable.

Collectively, these findings highlight the operational strengths of the SMC campaign in achieving reach but also expose significant challenges in quality assurance, data completeness, and monitoring systems required to ensure safety and treatment fidelity.

**5.6. Maternal Health Indicators**

Coverage of maternal health services during the last MNCHW was generally low. Only 7.4% of women reported receiving iron and folic acid supplementation (IFAS), while 36.1% received tetanus toxoid (TT). Access to antenatal care (ANC) services during the campaign was similarly limited: just 13.0% of women reported attending, and only 4.3% reported receiving any postnatal care (PNC). High levels of missing data—particularly for IFAS source and ANC/PNC utilization—further constrain interpretation, raising the likelihood of both underreporting and under-service delivery.

The limited reach of maternal health interventions underscores persistent challenges in integrating women’s services into broader MNCHW campaigns. While SMC and VAS are well institutionalized for children, maternal components remain poorly resourced and inconsistently implemented. Addressing these gaps is essential for achieving comprehensive child and maternal survival gains under the integrated campaign model.

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# 

## 3. Age Distribution of Key Respondents

The mean age of selected women of childbearing age (WCBA) was 27.7 years, with the age range spanning from 15 to 49 years. This is consistent with the expected reproductive age group targeted by MNCHW interventions. The mean age of household heads was 41.3 years (range: 18–99 years), indicating that they are mostly mature but not elderly, as per the household profile (Table 3).

**Table 3: Age Distribution of Selected Women and Household Heads**

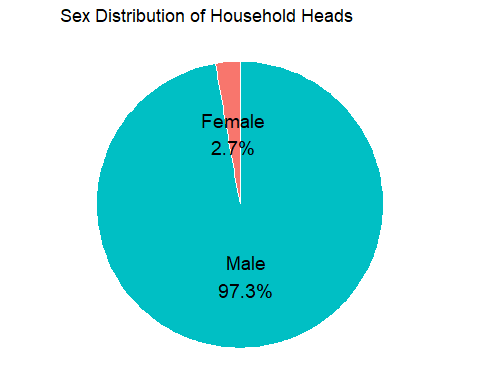
| Group | Mean Age (years) | Min | Max |
| --- | --- | --- | --- |
| Selected WCBA | 27.7 | 15 | 49 |
| Household Head | 41.3 | 18 | 99 |

## 4. Sex of Household Head

Males predominated as heads of household, accounting for 97.3% (n = 7,843), while females constituted only 2.7% (n = 221).

**Table 4: Sex Distribution of Household Heads**

| Sex | Frequency | Percent |
| --- | --- | --- |
| Male | 7,843 | 97.3% |
| Female | 221 | 2.7% |

 ## 5. Employment and Occupation of Household Head

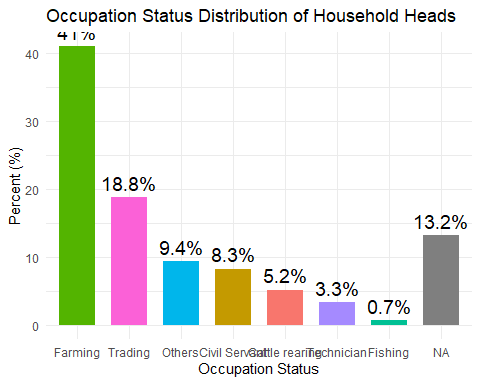
A substantial proportion of the surveyed household heads (73.9%) were self-employed, mainly in informal jobs like farming and petty trading. Formal jobs are less common (12.9%), and 13.2% are unemployed. The most common occupation is farming (41.0%), followed by trading (18.8%), civil service (8.3%), cattle rearing (5.2%), and technical trades (3.3%). Fishing is rare (0.7%). These results highlight the area’s focus on agriculture and suggest that changes in seasons could influence participation in health campaigns.

**Table 5: Occupation of Household Head**

| HH\_Occupation | Percent (%) | Frequency |
| --- | --- | --- |
| Farming | 41.0 | 3310 |
| Trading | 18.8 | 1516 |
| Civil Servant | 8.3 | 669 |
| Cattle rearing | 5.2 | 418 |
| Technician | 3.3 | 270 |
| Fishing | 0.7 | 59 |
| Other/Unspecified | 9.4 | 758 |

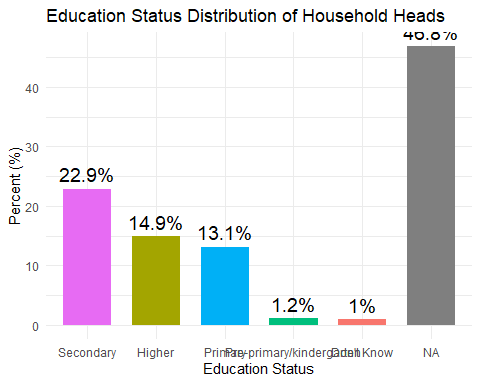
**Table 6: Employment of Household Head**

| HHH\_Employment | Percent (%) | Frequency |
| --- | --- | --- |
| Employment | 12.9 | 1040 |
| Self-employment | 73.9 | 5960 |
| Unemployed | 13.2 | 1064 |

 ## 6. Educational Status of Household Head Slightly more than half (53.2%) of household heads had ever attended school, whereas 46.8% had never attended any formal education. Among those who had some education, secondary (22.9%) and higher/tertiary education (14.9%) were most frequently reported, with a smaller proportion attaining primary (13.1%) or pre-primary education (1.2%). Notably, 1.0% of respondents were unable to specify the highest education level of the household head (Table 5). The high proportion of uneducated household heads signals potential challenges in communication and comprehension of health messages, which could in turn influence uptake of SMC, VAS, and other MNCHW interventions. However, the substantial presence of secondary and tertiary education suggests opportunities for leveraging literate household members as health promotion champions.

## Education Level of Household Heads

| Education Level | Frequency | Percent (%) |
| --- | --- | --- |
| Don’t Know | 80 | 1.0 |
| Higher | 1205 | 14.9 |
| Pre-primary/kindergarten | 94 | 1.2 |
| Primary | 1060 | 13.1 |
| Secondary | 1848 | 22.9 |
| Unspecified (NA) | 3777 | 46.8 |



## Wealth Index Analysis

### VAS, Deworming, MUAC, and Immunization Coverage by Wealth Quintile

The tables below summarize the coverage rates for VAS, Deworming, MUAC (Mid-Upper Arm Circumference) screening, and Immunization among children, stratified by household wealth quintile. Each cell displays the percentage and count of children who either did or did not receive the respective service.

#### VAS

| Wealth Quintile | No (%) (n) | Yes (%) (n) |
| --- | --- | --- |
| Poorest | 68.2% (1,100) | 31.8% (513) |
| Poor | 58.8% (949) | 41.2% (664) |
| Middle | 65.5% (1,057) | 34.5% (556) |
| Rich | 57.8% (933) | 42.2% (680) |
| Richest | 53.6% (864) | 46.4% (748) |

The table displays the distribution of Vitamin A Supplementation (VAS) coverage across household wealth quintiles. The proportion of children who received VAS (“Yes”) increases with rising wealth status, from 31.8% among the poorest households to 46.4% among the richest. Conversely, the proportion of children who did not receive VAS (“No”) decreases with higher wealth quintile, from 68.2% in the poorest group to 53.6% in the richest.

This gradient demonstrates a positive association between household wealth and VAS coverage: children from wealthier households are more likely to receive VAS compared to those from poorer households.

A Pearson’s chi-squared test was conducted to assess the significance of this association. The test produced a chi-squared statistic of with 4 degrees of freedom, and a p-value less than . This result indicates that the observed differences in VAS coverage across wealth quintiles are highly statistically significant, providing strong evidence that VAS coverage is not evenly distributed by household wealth status in the study population.

#### Deworming

| Wealth Quintile | No | Yes |
| --- | --- | --- |
| Poorest | 75.3% (1,214) | 24.7% (399) |
| Poor | 61.1% (985) | 38.9% (628) |
| Middle | 72.8% (1,174) | 27.2% (439) |
| Rich | 64.5% (1,041) | 35.5% (572) |
| Richest | 63.0% (1,015) | 37.0% (597) |

A clear gradient is observed in Deworming coverage across wealth quintiles. Coverage is lowest among children in the poorest quintile (24.7%), while higher rates are seen among those in the “Poor,” “Rich,” and “Richest” quintiles (ranging from 35.5% to 38.9%). The chi-squared test indicates that these differences are statistically significant , suggesting a strong association between household wealth status and Deworming coverage.

#### MUAC

| Wealth Quintile | No | Yes |
| --- | --- | --- |
| Poorest | 85.7% (1,383) | 14.3% (230) |
| Poor | 71.0% (1,146) | 29.0% (467) |
| Middle | 82.5% (1,331) | 17.5% (282) |
| Rich | 74.7% (1,205) | 25.3% (408) |
| Richest | 72.5% (1,169) | 27.5% (443) |

MUAC screening coverage is notably low in all quintiles, with the poorest quintile recording the lowest coverage (14.3%). Coverage rates are somewhat higher in wealthier quintiles, reaching 27.5% in the richest group. The chi-squared test again demonstrates a significant difference in MUAC coverage across wealth quintiles , indicating a meaningful association between household wealth and access to MUAC screening.

#### Immunization

| Wealth Quintile | No | Yes | NA |
| --- | --- | --- | --- |
| Poorest | 2.0% (32) | 2.7% (44) | 95.3% (1,537) |
| Poor | 2.5% (40) | 8.4% (135) | 89.2% (1,438) |
| Middle | 2.7% (44) | 4.0% (64) | 93.3% (1,505) |
| Rich | 3.2% (52) | 5.6% (90) | 91.2% (1,471) |
| Richest | 3.1% (50) | 6.5% (105) | 90.4% (1,457) |

Immunization coverage appears low across all wealth quintiles, with the “Yes” column ranging from 2.7% in the poorest to 8.4% in the “Poor” quintile, and the vast majority of records falling under “NA.” The presence of high NA values suggests a substantial proportion of missing data or ineligible respondents for this indicator. Despite these limitations, the chi-squared test (using VAS coverage as a proxy in your code) also reveals a statistically significant association between the wealth quintile and reported coverage .

### Coverage of VAS, Deworming, MUAC, and Immunization by Education Level of Household Head

The table below summarizes the coverage rates for Vitamin A Supplementation (VAS), Deworming, MUAC screening, and Immunization among children, disaggregated by the highest educational level attained by the household head. Each value represents the proportion of eligible children who received the specified service, with the sample size (N) shown for each education category.

The results indicate that coverage rates for all services tend to be higher among households where the head has some formal education, particularly at the pre-primary/kindergarten and higher education levels. For example, VAS coverage is 51.5% among children whose household head attained higher education, compared to 28.8% among those with no formal education (NA). Similar patterns are observed for Deworming, MUAC, and Immunization. Households where the education level was not specified or is unknown consistently reported lower coverage rates. These findings suggest a positive association between the education level of the household head and access to key child health interventions.

**Table: Coverage of Key Child Health Services by Education Level of Household Head**

| Education Level | VAS | Deworming | MUAC | Immunization | N |
| --- | --- | --- | --- | --- | --- |
| Don’t Know | 0.338 | 0.288 | 0.125 | 0.750 | 80 |
| Higher | 0.515 | 0.396 | 0.311 | 0.709 | 1205 |
| Pre-primary/kindergarten | 0.553 | 0.479 | 0.266 | 0.833 | 94 |
| Primary | 0.469 | 0.429 | 0.317 | 0.789 | 1060 |
| Secondary | 0.475 | 0.407 | 0.288 | 0.736 | 1848 |
| NA / No formal education | 0.288 | 0.234 | 0.146 | 0.514 | 3777 |

## Statistical Test of Differences in Coverage by Education Level

Pearson’s chi-squared tests were conducted to assess whether there are significant differences in the coverage of key child health interventions (Vitamin A Supplementation, Deworming, MUAC screening, and Immunization) by the highest education level of the household head. The strength of association was evaluated using Cramér’s V.

Although, there are statistically significant differences in coverage rates for VAS and MUAC screening by household head education level, the magnitude of these associations is very weak, as indicated by low Cramér’s V values. No significant association was found for immunization coverage. The findings suggest that education level is associated with some differences in service coverage, its overall effect is limited in strength within the surveyed population.

## Awareness of MNCHW/SMC/VAS (source and purpose)

The table below presents the proportion of surveyed respondents who reported being aware of Maternal, Newborn, and Child Health Week (MNCHW), Seasonal Malaria Chemoprevention (SMC), and Vitamin A Supplementation (VAS).

| Awareness Type | Proportion Aware |
| --- | --- |
| MNCHW Awareness | 0.34 |
| SMC Awareness | — |
| VAS Awareness | 0.68 |

*Note: SMC awareness was not available (NA) from the dataset.*

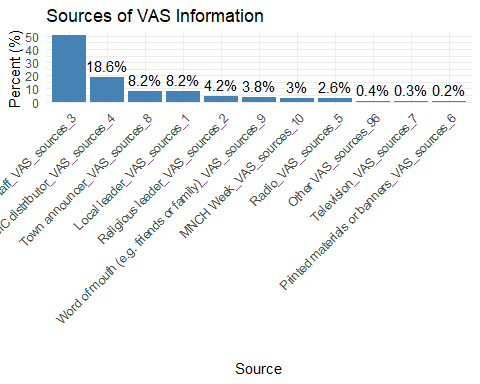
The results indicate that approximately 34% of respondents were aware of MNCHW, while a substantially higher proportion (68%) were aware of VAS. Data on SMC awareness was not available. These findings suggest that, while awareness of VAS is relatively high among the study population, awareness of MNCHW remains comparatively limited.

### Sources of Information for Vitamin A Supplementation (VAS)

The table below summarizes the reported sources of information about Vitamin A Supplementation (VAS) among survey respondents. Each source is shown with the number and percentage of respondents who identified it as a channel through which they heard about VAS.

| Source | Frequency | Percent (%) |
| --- | --- | --- |
| Health facility staff | 3,826 | 47.4 |
| Community health worker or SMC distributor | 1,409 | 17.5 |
| Town announcer | 626 | 7.8 |
| Local leader | 624 | 7.7 |
| Religious leader | 320 | 4.0 |
| Word of mouth (friends or family) | 291 | 3.6 |
| MNCH Week | 231 | 2.9 |
| Radio | 198 | 2.5 |
| Other | 33 | 0.4 |
| Television | 21 | 0.3 |
| Printed materials or banners | 16 | 0.2 |

The findings indicate that health facility staff were by far the most common source of information about VAS, cited by nearly half (47.4%) of respondents. Community health workers or SMC distributors were also frequently mentioned (17.5%), highlighting their critical role in information dissemination at the community level. Other prominent sources included town announcers (7.8%) and local leaders (7.7%). Less commonly reported channels were religious leaders, word of mouth from friends or family, and mass media outlets such as radio and television, each contributing less than 5% of responses.



## VAS Coverage Among Children Aged 6–59 Months

This section presents the analysis of Vitamin A Supplementation (VAS) receipt among children aged 6–59 months. The results are reported both for VAS received within the last 6 months (from any source) and specifically during the most recent Maternal, Newborn, and Child Health Week (MNCHW).

### Receipt of Child Health Interventions Among Children Aged 6–59 Months

#### Vitamin A Supplementation (VAS) in the Last 6 Months

Among children aged 6–59 months, 39.8% received vitamin A supplementation in the past 6 months, while 60.2% did not receive a dose during this period. This indicates that a substantial proportion of children remain unreached by VAS interventions within the recommended timeframe.

| Received VAS in Last 6 Months | n | Percent (%) |
| --- | --- | --- |
| No | 4,258 | 60.2 |
| Yes | 2,815 | 39.8 |

#### Receipt of SMC (Cycle 1)

The data show that 61.3% (n = 4,335) of children received SMC during Cycle 1. However, 38.7% (n=2,738) did not received the SMC during Cycle 1.

| Received SMC (Cycle 1) | n | Percent (%) |
| --- | --- | --- |
| Yes | 4,335 | 61.3 |
| NA / Missing | 2,738 | 38.7 |

#### Deworming Tablet During Last MNCHW

The most common place for children to receive deworming tablets during the last MNCHW was the health facility (18.1%), followed by community drug distributors visiting households (10.9%), and outreach posts (3.0%). However, 67.7% of children had no recorded data for deworming tablet receipt, indicating a potential gap in service uptake or reporting.

| Place | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| Health facility | 1,281 | 18.1 | 56.1 |
| Community drug distributor to house | 772 | 10.9 | 33.8 |
| MNCH week outreach post | 210 | 3.0 | 9.2 |
| Others | 22 | 0.3 | 1.0 |
| NA / Missing | 4,788 | 67.7 | - |

#### MUAC Screening During Last MNCHW

Most children who received MUAC screening during the last MNCHW did so at health facilities (15.3%, valid percent: 66.7%), while fewer were reached at home by community drug distributors (5.5%, valid percent: 23.9%) or at outreach posts (2.1%, valid percent: 9.2%). Missing data accounted for 77% of the records.

| Place | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| Health facility | 1,085 | 15.3 | 66.7 |
| Community drug distributor to house | 388 | 5.5 | 23.9 |
| MNCH week outreach post | 150 | 2.1 | 9.2 |
| Others | 3 | 0.0 | 0.2 |
| NA / Missing | 5,447 | 77.0 | - |

#### Routine Immunization (12–23 months)

Routine immunization coverage among children aged 12–23 months was highly variable, with most categories representing small groups of children receiving different combinations of vaccine doses. The most common record indicated that 36.0% of children received only the 17th vaccine dose during the campaign. Notably, 86.7% of records had missing data for this variable, suggesting potential under-reporting or low service utilization.

#### Place of Service Delivery

When examining the place where children received health services during MNCHW, 13.1% of children attended a health facility, 6.9% received services at home from a community drug distributor, and 3.2% were served at an outreach post. The majority of records (76.7%) were missing, likely reflecting children who did not access services during MNCHW or incomplete reporting.

| Place of Service Delivery | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| At the health facility | 927 | 13.1 | 56.2 |
| Community drug distributor to house | 491 | 6.9 | 29.8 |
| MNCH week outreach post | 228 | 3.2 | 13.8 |
| Others | 2 | 0.0 | 0.1 |
| NA / Missing | 5,425 | 76.7 | - |

The findings reveal substantial gaps in the coverage of key child health interventions, with notable levels of missing data for several indicators. Health facilities remain the most common location for the receipt of both deworming and MUAC services, while home-based outreach by community drug distributors and MNCHW outreach posts play important but secondary roles.

**SUmmary table For Children (6–59 months) Indicators**

| Indicator | Yes (%) | No (%) |
| --- | --- | --- |
| Receipt of VAS (in last 6 months) | 39.8 | 60.2 |
| Receipt of SMC (Cycle 1) | 61.3 | 38.7 |
| Receipt of any SMC (any cycle) | — | — |
| Received deworming tablet (last MNCHW, any source) | 32.0 | 68.0 |
| Received MUAC screening (last MNCHW, any source) | 23.9 | 76.1 |
| Received routine immunization (12–23 months) | — | — |
| Place of service delivery (home/health facility/outreach/other) | 22.6 | 77.04 |

## Women of Childbearing Age (15–49 years) Indicator analysis

### Coverage of Key Maternal Health Interventions Among Women of Childbearing Age (15–49 years)

#### Iron and Folic Acid Supplementation (IFAS)

Among women of childbearing age, only 7.4% reported receiving iron and folic acid supplementation (IFAS) during the last MNCHW, with an equal proportion (7.4%) reporting that they did not receive IFAS. However, a large proportion of respondents (85.2%) had missing or unreported data for this question. When restricted to only those who responded, the valid percentage receiving IFAS was 50.1%.

| IFAS Received at Last MNCHW | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| No | 596 | 7.4 | 49.9 |
| Yes | 598 | 7.4 | 50.1 |
| Missing/NA | 6847 | 85.2 | — |

#### Tetanus Toxoid (TT) Receipt

A total of 36.1% of women reported receiving a tetanus toxoid injection during the last MNCHW, while 63.9% did not.

| TT Received at Last MNCHW | n | Percent (%) |
| --- | --- | --- |
| No | 5139 | 63.9 |
| Yes | 2902 | 36.1 |

#### Antenatal and Postnatal Care (ANC/PNC) Services

Regarding ANC services, 13.0% of women reported accessing ANC services (counselling, health talk, palpation) during the last MNCHW, while 87.0% did not. However, a large share (65.2%) did not answer this question. For PNC, only 4.3% of valid responses indicated receipt of postnatal care, and 95.7% indicated they did not; again, a majority of cases (65.2%) were missing or unreported.

| ANC Services at Last MNCHW | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| No | 2437 | 30.3 | 87.0 |
| Yes | 365 | 4.5 | 13.0 |
| Missing/NA | 5239 | 65.2 | — |

| PNC Services at Last MNCHW | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| No | 2681 | 33.3 | 95.7 |
| Yes | 121 | 1.5 | 4.3 |
| Missing/NA | 5239 | 65.2 | — |

#### Source of Service for IFAS

Almost all respondents (99.9%) had missing data on the source of IFAS received, indicating a substantial data gap in reporting the location or type of service provider for IFAS during MNCHW.

| Source of IFAS Supplementation | n | Percent (%) | Valid Percent (%) |
| --- | --- | --- | --- |
| Missing/NA | 8041 | 100.0 | — |

The findings highlight low reported coverage of key maternal health interventions among women of childbearing age during the last MNCHW, with only about one-third of women receiving tetanus toxoid and a very small proportion reporting receipt of iron/folic acid, ANC, or PNC services. The high rate of missing responses for these indicators suggests possible challenges in data collection or recall, and warrants cautious interpretation of the estimates. Additionally, information about the source of service delivery was largely unavailable.

**SUmmary table For Indicators for Women of Childbearing Age (15–49 years**

| Indicator | Yes (%) | No (%) |
| --- | --- | --- |
| Received iron and folic acid (IFAS) during last MNCHW | 7.4 | 7.4 |
| Received tetanus toxoid (TT) | 36.1 | 63.9 |
| Received ANC services | 4.5 | 30.3 |
| Received PNC services | 1.5 | 33.3 |