NutriVax-Measles: Increasing measles vaccination coverage through supplementation with an SQ-LNS incentive in children aged 6-23 months

Protocol of a pragmatic parallel cluster-randomized controlled trial in Yobe State, Northern Nigeria

Short title: **NutriVax-Measles**

Version n°*1.1* Protocol Number NCT06387511 (clinicaltrials.gov)

A study by

The Alliance for International Medical Action (ALIMA)

and

Institut national de la santé et de la recherche médicale (Inserm) and University of Bordeaux, France

and

The Yobe state Ministry of Health of Yobe state, Nigeria

Final V1.1

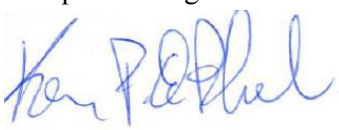
Dated: June 26, 2024

Responsible for the conduct of the study

Function	Name/Organization	Address	Contact
Sponsor Sponsor Representative	ALIMA - The Alliance for International Medical Action Dr Moumouni Kinda, general director	Route des Almadies, Lot n° 22 zone 9 BP 15530, Dakar - Sénégal	moumouni.kinda@alima.ngo Phone: +221762238143
Principal Investigator ALIMA	Kevin P.Q. PHELAN Nutrition Advisor, ALIMA	15 rue des immeubles industriels 75011 Paris - France	kevin.phelan@alima.ngo
Principal Investigator INSERM	Dr Renaud Becquet University of Bordeaux, National Institute for Health and Medical Research (INSERM) UMR 1219, Research Institute for Sustainable Development (IRD) EMR 271, Bordeaux Population Health Research Centre, Bordeaux, France	Université de Bordeaux 146 rue Léo-Saignat 33076 BORDEAUX cedex - France	renaud.becquet@u-bordeaux.fr Phone: +33 (0)5 57 57 15 80
Principal co-Investigator	Dr. Baba Goni Waru, Chief Medical Director, Yobe State University Teaching Hospital (YSUTH), Damaturu, Yobe State, Nigeria	Yobe State, Nigeria	babawaru@gmail.com Phone: +234 (0)803 928 2285 and +234 (0)708 507 9346
Principal co-Investigator	Dr. Nuru Mohammed Suleiman, Director Operations, Yobe State Health and Health Related Facilities Inspection and Monitoring Agency (YOHFIMA)	Yobe State, Nigeria	nurusulemuhammad@gmail.com Phone: +234 (0)703 632 3713 and +234 (0) 701 252 1421
International scientific and methodological center Representative	Dr Raoul Moh PAC-CI research program	CHU de Treichville-18BP1954 Abidjan18 – Ivory Coast	raoul.moh@pac-ci.org
International scientific and methodological coordinator and associated investigator	Dr Cécile Cazes University of Bordeaux, National Institute for Health and Medical Research (INSERM) UMR 1219, Research Institute for Sustainable Development	Université de Bordeaux 146 rue Léo-Saignat 33076 BORDEAUX cedex - France	cecile.cazes@coral.alima.ngo

	(IRD) EMR 271, Bordeaux Population Health Research Centre, Bordeaux, France		
Implementation research associated investigator	Dr Mélanie Plazy, University of Bordeaux, National Institute for Health and Medical Research (INSERM) UMR 1219, Research Institute for Sustainable Development (IRD) EMR 271, Bordeaux Population Health Research Centre, Bordeaux, France	Université de Bordeaux 146 rue Léo-Saignat 33076 BORDEAUX cedex - France	melanie.plazy@u-bordeaux.fr
Cost-efficiency associated investigator	Dr Katherine Adams, Assistant Researcher: Institute for Global Nutrition at the University of California – Davis	University of California – Davis, USA	kpittenger@ucdavis.edu Phone: +1 520-260-9996
Associated Investigator	Pierrot KALUBI BALONDA Project coordinator –Yobe project, ALIMA - The Alliance for International Medical Action	Yobe State, Nigeria	pc.northyobe@nigeria.alima.ngo Phone:+234 (0)912 478 0682
Associated Investigator	Dr Ousmane ABDOULAYE, Deputy Medical Coordinator, ALIMA - The Alliance for International Medical Action	Abuja, Nigeria	deputy.medco@nigeria.alima.ngo
Associate Investigator	Dr Abass Assoumane BAOUA, Medical Coordinator, ALIMA – The Alliance for International Medical Action	Abuja, Nigeria	medco@nigeria.alima.ngo
Senior statistician	Dr Delphine GABILLARD, University of Bordeaux, National Institute for Health and Medical Research (INSERM) UMR 1219, Research Institute for Sustainable Development (IRD) EMR 271, Bordeaux Population Health Research Centre, Bordeaux, France	Université de Bordeaux 146 rue Léo-Saignat 33076 BORDEAUX cedex - France	delphine.gabillard@u-bordeaux.fr

Protocol approval and authorisation

Names, Signatures and DatesOn behalf of the sponsor ALIMA, Dr Moumouni KINDA	
	Date: **June 26th, 2024**
Principal Investigator ALIMA, Kevin P.Q. PHELAN	
	Date: **June 2026th, 2024**
Principal Investigator INSERM-IRD, Dr. Renaud Becquet	
	Date: **June 26th, 2024**
Co-Principal Investigator NIGERIA, Dr. Baba Goni Waru	
	Date: **June 26h, 2024**
Co-Principal Investigator NIGERIA, Dr. Nuru Suleiman Muhammad	
	Date: **June 26th, 2024**

Financial support: The research project is funded by the Eleanor Crook Foundation (ECF) and by Gavi, the Vaccine Alliance. The research will not be interrupted due to lack of funds.

Table of contents

Synopsis 6

1 Background and rationale 8

1.1 The vicious cycle of malnutrition and infectious diseases 8

1.2 Benefits of SQ-LNS supplementation 9

1.3 Study rationale: why using SQ-LNS mass supplementation as vaccination incentive? 10

1.4 Potential barriers for accessing to vaccination or SQ-LNS supplementation program 10

1.5 Hypothesis 11

1.6 Theory of Change 11

1.7 Benefits 12

2 Study objectives and endpoints 13

2.1 Objectives 13

2.2 Endpoints 13

3 Methods 14

3.1 Study Design 14

3.2 Study sites 17

3.3 Study population 19

3.3.1 Eligibility criteria 19

3.3.2 Sampling methods 20

3.4 Interventions 21

3.5 Study sites and human resources 24

3.5.1 For the study implementation 24

3.5.2 For the research data collection 25

3.6 Randomization and intervention allocation 25

3.7 Sample size calculation 25

4 Data entry, management and quality control 26

4.1 Data collection 26

4.1.1 Cross-sectional household surveys 26

4.1.2 Longitudinal follow-up survey 27

4.1.3 Qualitative feasibility and acceptability survey 28

4.1.4 Cost-efficiency survey 29

4.1.5 Aggregated data collected at health centers 29

4.2 Quality assurance 29

5 Analysis 30
5.1 Statistical methods 30
5.2 Precision 31
6 Responsibility 33
7 Ethical considerations 34
7.1 Regulations 34
7.2 Community involvement 34
7.3 Approval 35
7.4 Informed consent 35
7.5 Data confidentiality 36
7.6 Site clearance and archiving 36
7.7 Voluntariness 36
7.8 Incentives 36
7.9 Insurance 37
7.10 Safety 37
7.11 Protocol amendment 38
8 Use of study results and data presentation 38
9 Study duration 38
10 Financing/ Budget breakdown 39
11 References 40

List of figures, tables and appendices

Figures

Figure 1: A 20g SQ-LNS sachet 9
Figure 2 Summary of the evidence base for SQ-LNS supplementation (6–9) 9
Figure 3 : NutriVax Theory of change 12
Figure 4: Study design and timeline 15
Figure 5: Location of Karasuwa and Nguru LGAs in Yobe State, Nigeria - *Source: REACH Initiative, Nigeria: Yobe State Reference Map (As of December 2019)* 18
Figure 6 : Sampling survey using 3-stage random sampling method 21
Figure 7: Standard EPI and NutriVax arms 22

Tables

Table 1: Primary and secondary endpoints (vaccination coverage and anthropometric parameter) in the NutriVax-Measles study 16
Table 2: Demographic information for Nguru and Karasuwa LGAs, Yobe State, Nigeria (As provided by State Ministry of Health authorities) 17
Table 3: Malnutrition Indicators in Karasuwa and Nguru LGAS, Yobe State, Northeast Nigeria, August to September 2022 18
Table 4: Dietary Minimums in Karasuwa and Nguru LGAS, Yobe State, Northeast Nigeria, August to September 2022 18
Table 5: Vaccination Coverage in Karasuwa and Nguru LGAS, Yobe State, Northeast Nigeria, August to September 2022 19
Table 6 : Schedule for vaccinations for children in Nigeria 23
Table 7 Budget breakdown of the NutriVax-Measles study 39

Appendices

Appendix 1 Population estimates according wards, health facilities and settlements in Karasuwa LGA, 2023 43
Appendix 2 Population estimates according wards, health facilities and settlements in Nuguru LGA, 2023 43
Appendix 3 Sample size calculation details for the primary outcome 44
Appendix 4 Sample size calculation details for the main secondary outcome 44
Appendix 5 Study information note and informed consent form for the baseline and endline household surveys in English and Hausa 45
Appendix 6: Study information note and Informed Consent Form for the longitudinal follow-up survey in English and Hausa 49
Appendix 7: Written informed consent for the qualitative feasibility and acceptability survey 59
Appendix 8: Case report form for the cross-sectional and the longitudinal follow-up household surveys. 62
Appendix 9: Participant schedule 84

Appendix 10: Interview guide for the qualitative feasibility and acceptability survey 84
Appendix 11 : List of the aggregated data collected at health centres 88
Appendix 12 Detailed Gantt chart on the implementation of the NutriVax-Measles study 90
Appendix 13 : Curriculum vitae of main investigators 91

List of abbreviations

ALIMA	The Alliance for International Medical Action
CCS	Caregiver cost survey
CHW	Community Health Worker
CHEW	Community Health Worker
ECF	Eleanor Crook Foundation
GAVI	the Vaccine Alliance
GCP	Good Clinical Practice
GLMM	Generalised Linear Mixed Model
HHS	Household Survey
HP	Health Posts
IDPs	Internally Displaced Persons
IYCF	Infant and Young Child Feeding
INSERM	the French National Institute for Health Research
LS	Longitudinal follow-up survey
LGA	Local Government Areas
MDD	Minimum Dietary Diversity
MUAC	mid-upper arm circumference
NFSS	Nutrition and Food Security Surveillance
NGO	Non-governmental Organization
OPD	Outpatient Pediatric Department
OTP	Outpatient Treatment Programs
PCT	Pragmatic cluster Randomized Trial
PHCC	Primary Health Care Center
PHC	Primary Health Clinics
PPS	probability proportional to size
QFAS	Qualitative Feasibility and Acceptability Survey
PCT	Pragmatic Cluster randomized controlled Trial
SAM	Severe Acute Malnutrition
WHZ	weight-for-height z scores
SQ-LNS	small-quantity lipid-based nutrient supplements
UNICEF	United Nations International Children's Emergency Fund
USAID	U.S. Agency for International Development
WFP	World Food Program

Synopsis

Title	**Increasing measles vaccination coverage through supplementation with SQ-LNS incentive in children aged 6-23 months,** *a pragmatic parallel cluster-randomized controlled trial in Yobe State, Northern Nigeria*
Acronym	**NutriVax-Measles**
Background/ Rational	Malnutrition and infectious disease form a vicious cycle and pose a double threat to vulnerable children in low- and middle-income countries. Every year, hundreds of thousands of children are treated for severe wasting while experiencing repeated and prolonged outbreaks of vaccine-preventable illnesses, most notably measles. Despite progress over the last decade in delivering routine vaccinations to children everywhere, at least 20 million children annually still do not receive immunizations. Northeast Nigeria is at the epicentre of this dynamic, recording some of the worst malnutrition indicators and lowest vaccination coverage rates in the world. Small-quantity lipid-based nutrient supplements (SQ-LNS) are a class of ready-to-use food supplements which are highly nutrient-dense and fortified designed for preventing malnutrition and improving child survival, growth, and development. A recent meta-analysis on SQ-LNS reveals that feeding a child just one sachet of SQ-LNS a day for a year can reduce their risk of mortality by 27%, reduce iron-deficiency anaemia by 64%, and reduce cases of severe wasting by 31% and severe stunting by 17%. The overall strength of evidence on SQ-LNS benefits led the authors of a 2021 Lancet review to call scaling-up SQ-LNS a priority action. Provision of SQ-LNS also holds promise in incentivizing vaccination as well as other health services. Various operational experiences suggest it likely has an impact on increasing vaccination coverage and a modelling simulation suggests it would lead to a significant reduction in measles morbidity and mortality.
Primary objective	To estimate the effectiveness of a SQ-LNS mass supplementation program added to routine immunization program compared to routine immunization program alone in terms of measles vaccine coverage, after 12 months of program implementation, in children aged 12-23 months in the endline cross-sectional household survey.
Main secondary objective	To estimate the effectiveness of a SQ-LNS mass supplementation program added to routine immunization program compared to routine immunization program alone in terms of measles vaccine coverage, after 12 months of program implementation, in children aged 6-12 months at inclusion in the longitudinal 12 months follow-up survey.
Secondary objectives	- To estimate the effectiveness of a SQ-LNS mass supplementation program added to routine immunization program compared to routine immunization program alone in children aged 6-23 months, after 12 months of program implementation, in terms of 1) all other infant vaccines uptake, 2) timeliness of age-eligible vaccinations; 3) anthropometric status, 4) uptake of paediatric curative and preventive health consultations and activities. - To assess the barriers and facilitators to SQ-LNS mass supplementation implemented as part of a routine immunization program in health facilities, from the perspectives of parents/legal guardian of children aged 6-23 months, health care providers and community health workers. - To assess the cost-efficiency of a SQ-LNS mass supplementation program compared to routine immunization program in terms of cost per child supplemented and vaccinated.
Study sites	20 wards covering the Karasuwa and Nguru Local Government Areas (LGAs) in Yobe state, Northeast Nigeria
Study design	A pragmatic parallel cluster randomized trial (PCT) with baseline measure with different populations and data collection modes: 1) baseline and endline cross-sectional household surveys of children aged 12-23 months, 2) a longitudinal follow-up survey (LS) of children aged 6-12 months at inclusion, 3) a qualitative feasibility and acceptability survey of parents of children aged 6-23 months, of health providers, of community health workers and community representatives and 4) a cost survey of parents/legal guardian of children from the longitudinal follow-up cohort, and 5) a health facility cost survey of a randomized sub-sample of health facilities.

Study population and sampling	• Baseline and endline cross-sectional household surveys *Inclusion criteria* - Aged 12-23 months; - With oral informed consent of parent or legal guardian; - Residing in the catchment settlements of wards included in the study. *Exclusion criteria* - Included in the longitudinal follow-up. Longitudinal follow-up survey *Inclusion criteria* - Aged 6-12 months; - With written informed consent of parent or legal guardian; - Residing in the catchment settlements of wards included in the study. *Exclusion criteria* - Acute malnutrition criteria as per the WHO definition (i.e. MUAC< 125 or WHZ < -2 or nutritional edema); - Known medical complication that requires referral for hospitalization; - Known allergies to SQ-LNS or SQ-LNS contraindication; - Any other condition interfering with protocol adherence or the ability to give informed consent, in the judgment of the Field Investigator Sampling for HHS and LS will be carried out in three stages in each LGA using probability proportional to size (PPS). Qualitative feasibility and acceptability survey *Inclusion* - Parent or legal guardian of a child aged 6-23 months and residing in the catchment settlements of wards included in the study, or Health worker of the ministry of health involved in the study or Community representative or Community health workers; - With written informed consent. *Exclusion criteria* - None
Intervention	Interventions compared: 1. The standard Expanded Program on Immunization (EPI) in children aged 6-23 months delivered according to the Ministry of Health's routine plans in the community and at health centres and health posts, named the standard EPI arm. 2.The NutriVax program combining the EPI in children aged 6-23 months according to the Ministry of Health's routine plans in the community and at health centres (i.e. PHCCs) and health posts associated with SQ-LNS mass supplementation integrated into pre-existing services delivered at health centres (i.e. PHCCs) for children 6-23 months of age, named the NutriVax arm.
Randomization	The unit of randomization (cluster) will be the ward and its catchment area. Clusters will be randomly allocated at a ratio of 1:1 either to the standard EPI arm or to the NutriVax arm. Randomisation will be stratified by LGA.
Data collection	Oral (for HHS) and written informed consent (for the other surveys) will be obtained from the participants prior to data collection on tablets. To ensure anonymity, identifiers will be allocated to each participant.
Participant safety	To ensure the participants' safety, only personnel trained in study procedures, GCP, research ethics will work in this study.
Statistical analyses	All analyses will use the intention-to-treat principle and account for the stratified cluster design. Analysis will be conducted at the individual level, adjusting for clustering (as random effect) and for baseline assessment of outcome in that ward, using a logistic regression with random effects (a member of the family of generalised linear mixed model GLMM).
Ethical considerations	The study will be conducted in compliance with the protocol, the Declaration of Helsinki, the GCP guidelines and the Nigerian National Code for Health Research Ethics, in particular concerning the submission to the ethics committees and the protection of personal data as well as other national and regulatory requirements.

Timeline and budget	2 years (December 2023- December 2025) - 1,893,060 USD

1 Background and rationale

1.1 The vicious cycle of malnutrition and infectious diseases

Malnutrition and infectious diseases form a vicious cycle and pose a double threat to vulnerable children in low- and middle-income countries. Malnutrition makes children more susceptible to infectious diseases, while infectious diseases increase their chances of becoming malnourished. When trapped in this cycle, children are significantly more likely to die or suffer damaging health and developmental effects. High rates of wasting and low vaccination coverage are also a debilitating double burden for already fragile health systems. Every year in these contexts, hundreds of thousands of children are treated for severe wasting while experiencing repeated and prolonged outbreaks of vaccine-preventable illnesses, notably measles.

Despite progress over the last decade in delivering routine vaccinations to children everywhere, at least 14 million children annually still do not receive any immunizations in 2022 (1). Across the globe, the COVID-19 pandemic disrupted routine childhood immunizations in already under-resourced health systems, creating a growing cohort of unimmunized or under-immunized children and undermining years of progress against infectious disease. Conflict, extreme weather events and the rising cost of food has exacerbated pre-existing food insecurity, leaving many families without access to essential nutrition for their young children.

Northeast Nigeria is at the epicenter of this dynamic, recording some of the worst malnutrition indicators and lowest vaccination coverage rates in the world. Good nutrition is the bedrock of a functioning immune system, both protecting against infection and supporting recovery, and shockingly, only 1% of children under two years of age consumed a minimally acceptable diet (1).

Nigeria has some of the worst malnutrition indicators and lowest vaccination coverage rates in the world. Country-wide, stunting affects 31.5% of children under 5 (U5) and wasting affects 6.5%, both of which are higher than the Africa average (2). Measles and pentavalent 3 vaccination coverage are estimated to be extremely low at 54% and 57%, respectively (3), while an estimated 14%, or 3.1 million, of the world's zero-dose or missed-dose children reside in Nigeria (4). This contributes to a U5 mortality rate of 111 per 1,000 live births, which translates to an estimated 885,000 annual childhood deaths (5). High rates of wasting and low vaccination coverage are a debilitating double burden for fragile health systems as in Nigeria, where hundreds of thousands of children are treated for severe wasting and there are repeated, prolonged outbreaks of vaccine-preventable illnesses like measles.

This situation is even worse in Northeast Nigeria's Yobe State, where the vicious cycle of malnutrition and infectious disease is driven by proximity to conflict and banditry, extreme weather events, and economic deprivation. The health system in Karasuwa and Nguru Local Government Areas (LGAs) is fragile, under-resourced and at times physically inaccessible to many people due to annual flooding. While ALIMA's team

in Yobe reports that the vaccine supply-chain functions reasonably well, the low vaccination rates seem to be driven by a combination of factors including distance or physical access to health facilities, low maternal education, and a lack of awareness of the importance of vaccines (4).

1.2 Benefits of SQ-LNS supplementation

Small-Quantity Lipid-Based Nutrient Supplements (SQ-LNS) are food supplements designed for preventing malnutrition and improving child survival, growth, and development. Lipid-based nutritional supplements are a class of ready-to-use food supplements that are highly nutrient-dense and fortified with milk powder, essential fatty acids, vitamins and minerals at levels designed to treat and prevent acute malnutrition.



Figure 1: A 20g SQ-LNS sachet

They can be consumed directly from the package, do not require refrigeration, and are safe from bacterial contamination. They range in ration sizes based on their use to either treat or prevent acute malnutrition, with ready-to-use therapeutic (RUTF) or supplementary foods coming in 92- or 100-gram sachets, medium-quantity LNS in 50-gram sachets, and 20-gram sachets of SQ-LNS.

SQ-LNS come in 20-gram sachets and are considered a type of fortification of local diets for young children. (The recommended dose of one sachet per day (at a cost of 0.09 USD per sachet) can be mixed with home prepared foods (or eaten directly from the sachet) to improve children's complementary feeding and nutrient intake.

The evidence around SQ-LNS supplementation among children 6-23 m (accompanied by messaging to reinforce infant and young child feeding recommendations) for up to one year is strong. Feeding a child just one sachet of SQ-LNS a day for a year can reduce their risk of mortality by 27% (6). It has also shown significant reductions on iron deficiency anaemia by 64% (7), on severe wasting by 31% (8), on severe stunting by 17% (8) as well as on prevalence of children in the lowest decile of three development scores (language, social-emotional and motors scores) by 16% to 19% (9) as illustrated Figure 2.

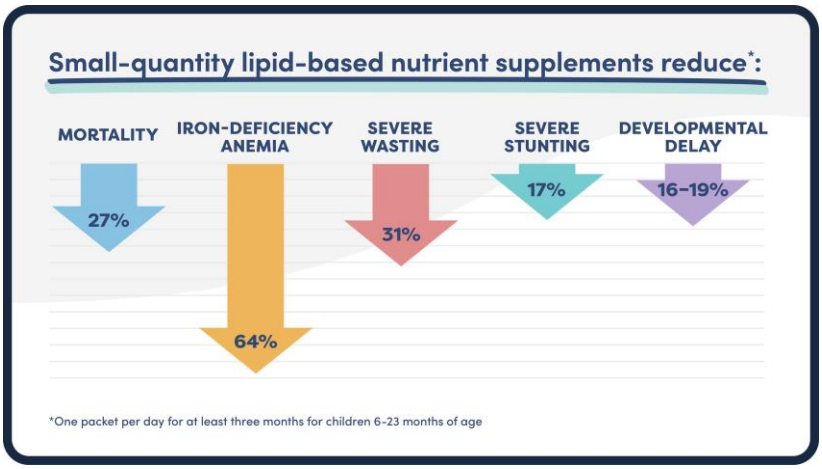


Figure 2 Summary of the evidence base for SQ-LNS supplementation (6–9)

Another retrospective study showed how children who had received SQ-LNS and subsequently received treatment for an episode of acute malnutrition under a simplified protocol was associated with fewer hospitalizations compared to children who did not receive SQ-LNS before being treated for wasting (10). The overall strength of evidence led the authors of a 2021 Lancet review to call SQ-LNS a priority action (11).

In 2023, key decision-makers in nutrition at USAID, WFP, UNICEF, the World Bank, and others called for moving to scale with SQ-LNS in vulnerable populations (12). With such solid evidence, it is not surprising that SQ-LNS is part of Nigeria's 2021 National Guidelines for the Prevention and Control of Micronutrient Deficiencies in Nigeria, and finding a "sustainable strategy for community access to nutrition supplements" is a research priority (13).

1.3 Study rationale: why using SQ-LNS mass supplementation as vaccination incentive?

A lot of research has been conducted on actions aimed at preventing various forms of malnutrition(14), while a separate body of evidence has been generated on incentive mechanisms for increasing uptake of childhood vaccines with various results across settings (15,16).

There is a growing use of incentives – whether non-financial or monetary – in immunization programs, and even modest incentives of cash or food have shown to increase vaccination coverage in resource-limited settings. A systematic review found that "nudges" like reminders via SMS or invoking social norms through storytelling proved most effective when coupled with incentives for parents and healthcare workers (17). SMS reminders coupled with a small amount of cash proved effective in Kenya, where there was an already high baseline measure (18). A conditional cash transfer program in Northwest Nigeria had a substantial positive impact on vaccination coverage (19). A randomized controlled trial in India found that modest family food incentives combined with improved provision of vaccination outreach services significantly increased full immunization more than improved provision of vaccination services alone (20). And a modeling simulation found that provision of SQ-LNS with measles vaccine would lead to a strong reduction in measles morbidity and mortality (21).

Thus, SQ-LNS holds promise in incentivizing vaccination as well as other health services. NutriVax-Measles study is built on this evidence as well as on operational experience from ALIMA in Niger and Doctors Without Borders in Niger and Mali that suggests mass supplementation with LNS products likely contributed to high vaccination coverage and utilization of other preventive and curative services seen in the participating health zones.

1.4 Potential barriers for accessing to vaccination or SQ-LNS supplementation program

A combination of factors can influence preventive or curative health care access and also preventive and curative health intervention at the health facilities level. In the context of Northeast Nigeria's Yobe State, some health facilities are known to be hard to reach all year long due to geographical constraints or during

the rainy season, for instance due to flooding. 'Zero-dose' refers to a person who does not receive a single dose of any vaccine in the routine national immunization schedule, while ‘missed dose’ refers to a person who does not complete the schedule. A recent literature on risk factors and interventions for zero- and missed-dose children in Nigeria showed factors influencing childhood vaccine uptake were among others : maternal education, access to ante- and perinatal care, location, population composition, awareness about immunization – including safety, efficacy, importance, and schedules (4). To our knowledge, only one study assessed facilitators and barriers to SQ-LNS mass supplementation program participation. This qualitative study conducted in Malawi showed perceptions of the LNS were positive but family priorities could constitute to SQ-LNS program participation (22). We therefore consider it essential to investigate the barriers and facilitators to access to vaccination and participation in the SQ-LNS supplementation programme in our study area.

1.5 Hypothesis

The NutriVax-Measles study will test the hypothesis that a SQ-LNS supplementation program coupled with a standard Expanded Program on Immunization (EPI) in health facilities for children aged 6-23 months (NutriVax program) could increase vaccination coverage, particularly measles, after twelve months of implementation. NutriVax-Measles will also assess the barriers, facilitators and cost of NutriVax plus EPI compared to EPI alone in children aged 6-23 months. Thanks to NutriVax-Measles study, we will be able to see if SQ-LNS as an incentive for immunizations leads to cost-efficient benefits compared to EPI alone. Thus, it will build evidence about whether it is possible to achieve a double impact on increased vaccination coverage and improved malnutrition indicators.

1.6 Theory of Change

Our Theory of Change (Figure 3) is that by adding SQ-LNS distributions - accompanied by robust counselling to reinforce recommended IYCF, including the need to consume a diverse nutritious diet, and support for continued breastfeeding - to the core provision of routine activities at health facilities, more children will receive immunizations, especially for measles, while also receiving other health services (e.g. clinical exams, treatment as indicated, acute malnutrition screening and referral) in a cost- efficient way. We believe that the incentive of high-quality food for their infant children will overcome barriers to caregivers visiting the health center (e.g. distance, lack of awareness of the vaccine schedule, etc) that contribute to the high number of zero-dose and under vaccinated children in Yobe State.

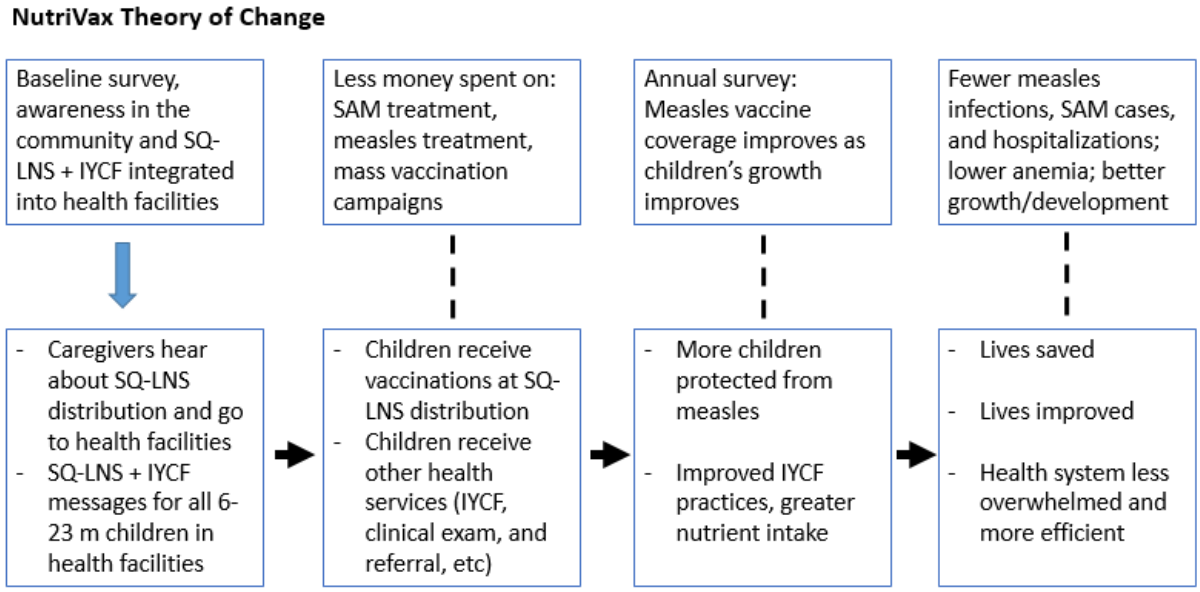


Figure 3 : NutriVax Theory of change

SQ-LNS distributions also provide repeat opportunities for educating caregivers about the importance of vaccinations and addressing vaccine hesitancy, thus improving immunization coverage on schedule or by catching-up. Simultaneously, SQ-LNS will fill the major nutrient gaps in children's diets, improving growth and development outcomes. In the short- and mid-term, this will lead to a more efficient delivery of services to more people while reducing the burden of malnutrition and infectious disease and the costs associated with the response to both. The long-term trend of fewer measles infections, fewer SAM cases, fewer hospitalizations, lower anaemia, and better growth/development will result in lives saved, lives improved, and a health system that is less overwhelmed and operates more cost-effectively.

1.7 Benefits

NutriVax-Measles will be the first study to test whether an effective supplement designed for preventing malnutrition can also incentivize vaccine uptake. It has the potential to add value by showing an important complementary benefit to SQ-LNS supplementation program above and beyond its positive impact on growth and development. Such a mutually beneficial and mutually reinforcing outcome could also provide a road map for other states or countries in the region for addressing similar challenges, and provide national governments and donors with a solid evidence base for financing such programs elsewhere.

ALIMA (The Alliance for International Medical Action) and its research partners INSERM (the French National Institute for Health Research) and PAC-CI (INSERM's research affiliate in Ivory Coast) are proposing the NutriVax-Measles study in Yobe State, Northeastern Nigeria. If successful, NutriVax could simultaneously prevent deadly forms of malnutrition and increase immunization coverage, replacing the vicious cycle of malnutrition and infectious disease with a virtuous cycle of improved growth and better health for some of the most vulnerable children in the world.

2 Study objectives and endpoints

2.1 Objectives

Primary objective:

To estimate the effectiveness of a SQ-LNS mass supplementation program added to routine immunization program compared to routine immunization program alone in terms of measles vaccine coverage, after 12 months of program implementation, in children aged 12-23 months in the endline cross-sectional household survey.

Main secondary objective:

To estimate the effectiveness of a SQ-LNS mass supplementation program added to routine immunization program compared to routine immunization program alone in terms of measles vaccine coverage, after 12 months of program implementation, in children aged 6-12 months at inclusion in the longitudinal follow-up survey.

Secondary objectives:

- To estimate the effectiveness of a SQ-LNS mass supplementation program added to routine immunization program compared to routine immunization program alone in children aged 6-23 months, after 12 months of program implementation, in terms of 1) all other infant vaccines uptake, 2) timeliness of age-eligible vaccinations; 3) anthropometric status, 4) uptake of paediatric curative and preventive health consultations and activities.
- To assess the barriers and facilitators to SQ-LNS mass supplementation implemented as part of a routine immunization program in health facilities, from the perspectives of parents/legal guardian of children aged 6-23 months, health care providers, community health workers and community representatives.
- To assess the cost-efficiency of a SQ-LNS mass supplementation program versus routine immunization program in terms of cost per child supplemented and vaccinated.

2.2 Endpoints

The primary endpoint is the measles vaccine coverage, defined as the proportion of children aged 12-23 months in the endline survey who have received at least one dose of measles vaccine, as reported on their vaccination card.

The main secondary endpoint is the measles vaccine coverage, defined as the proportion of children aged 6-12 months at inclusion in the longitudinal follow-up survey, who have received at least one additional dose of measles vaccine, as reported on their vaccination card, administered between inclusion and the end of follow-up.

Secondary endpoints:

- Proportion of children with at least one measles vaccines as reported on their vaccination card or by recall.
- Timeliness of measles 1 vaccination (i.e. within 30 days of turning 9 months), as reported on their vaccination card.
- Timeliness of measles 2 vaccination (i.e. within 30 days of turning 15 months), as reported on their vaccination card.
- Proportion of children with each of the following vaccine doses, as reported on their vaccination card or by recall: measles 1, measles 2, pentavalent 1 and 3, yellow fever, and meningitis.
- Proportion of children with age-eligible vaccines such as measles 1, measles 2, yellow fever, meningitis, and catch-up vaccines like pentavalent 1 and 3, as reported on a vaccination card or by recall.
- Proportion of zero-dose children as reported on a vaccination card or by recall.
- Proportion of fully immunized children, i.e. children who received all age-eligible vaccination.
- Anthropometric parameters mean change in children: MUAC, z scores for MUAC for age, weight for age, weight for height, and height for age.
- Proportion of vitamin A dose 1 given at 6 months and dose 2 given at 12 months
- Evolution of aggregate data collected routinely at health facilities, mean and proportion: paediatric curative and preventive consultations, vaccination activities, SQ-LNS activities, activities on vaccination and Infant and Young Child Feeding (IYCF) sensitization, vaccine and SQ-LNS consumption.
- Barriers and facilitators to access health care centres and receive SQ-LNS mass supplementation implemented as a routine preventive program nested in health facilities activities.
- Adherence to SQ-LNS supplementation.
- Barriers and facilitators to vaccination uptake at health facilities activities.
- Cost per child vaccinated and supplemented compared to cost per child vaccinated only, using a facility and caregiver perspective (see 5.1.4 Cost-efficiency survey section for precision) to identify all provider and caregiver costs associated with treatment.

The primary and secondary endpoints regarding immunization and anthropometric parameters by population, data collection modes and timepoint are presented **Table 1**.

3 Methods

3.1 Study Design

This NutriVax-Measles study will consist in conducting a **pragmatic parallel cluster randomized trial (PCT)** with baseline measure with different populations and data collection modes: **1) a baseline and an endline cross-sectional household surveys (HHS)** of children aged 12-23 months, **2) a longitudinal 12**

months follow-up household survey (LS) of children aged 6-12 months at inclusion, **3) two cross-sectional Qualitative Feasibility and Acceptability Survey (QFAS)**

of parents/legal guardian of children aged 6-23 months, health care providers, community health workers, 4) **caregiver cost survey (CCS)** of the caregivers of children from the longitudinal cohort (population 2), and 5) a health facility cost survey of a randomized sub-sample of health facilities.

Thanks to these different data collection modes, measles vaccination coverage and the quantitative secondary endpoints will be measured both at the community level using the endline HHS and at the individual level using the LS **(Figure 4).**

The NutriVax program will be assessed within a routine program implemented at scale. PCT pragmatic studies are designed to guide decision-making in the real-world clinical practice and policy settings while maintaining the strengths of individual randomized controlled trials if they are systematically designed and performed properly. The pragmatic attitude increases external validity to ensure that the results can be generalized in everyday practice in this context and other similar settings (23,24).

The unit of randomization (i.e. cluster) will be a ward and its catchment area. We will include exhaustively all wards of each LGA where the study will take place (see 4.2).

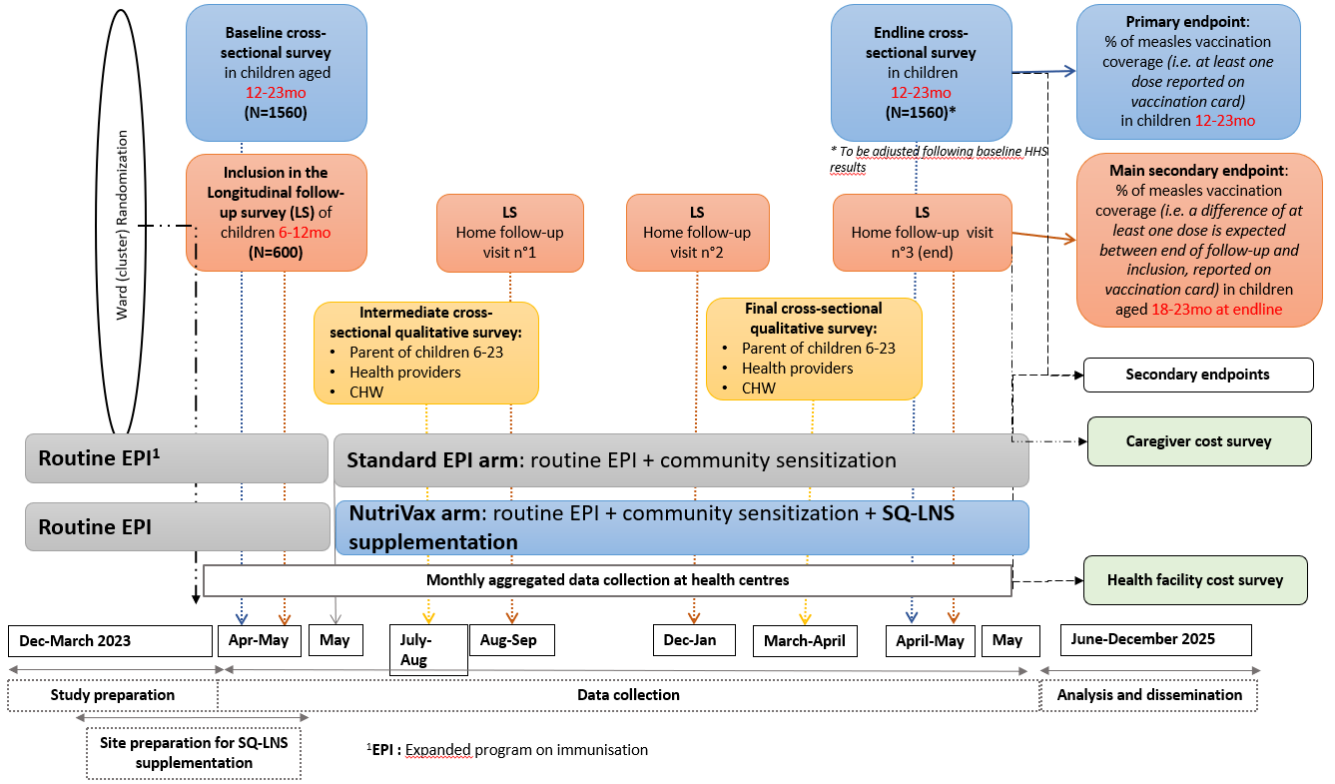


Figure 4: Study design and timeline

Table 1: Primary and secondary endpoints (vaccination coverage and anthropometric parameter) in the NutriVax-Measles study

Endpoints	Measurement variable	Denominator and data collection mode	Method of aggregation	Timepoint
Primary				
Measles vaccine coverage	At least one dose of measles vaccine reported on vaccination card	Children aged 12-23 months in the cross-sectional endline survey	Proportion	After one year of the SQ-LNS program (measured in the endline HHS)
Main secondary				
Measles vaccine coverage	At least one additional dose of measles vaccine reported on vaccination card administered between inclusion and the end of follow-up	Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	Between inclusion and the end of longitudinal follow-up
Secondary				
Measles vaccine coverage	At least one measles vaccine as reported on a vaccination card or by recall	Children aged 12-23 months in the cross-sectional endline survey	Proportion	After one year of the SQ-LNS program (measured in the endline HHS)
	At least one additional dose of measles vaccine reported on vaccination card or by recall, administered between inclusion and the end of follow-up	Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	End of follow-up
	Measles 2 vaccine as reported on a vaccination card or by recall	Children aged 12-23 months in the cross-sectional endline survey	Proportion	After one year of the SQ-LNS program (measured in the endline HHS)
		Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	End of follow-up
Timeliness of measles 1 vaccination.	Measles 1 vaccine received within 30 days of turning 9 months by card	Children aged 12-23 months in the cross-sectional endline survey	Proportion	After one year of the SQ-LNS program (measured in the endline HHS)
	Measles 1 vaccine received within 30 days of turning 9 months by card or by recall	Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	End of follow-up
Timeliness of measles 2 vaccination.	Measles 2 vaccine received within 30 days of turning 15 months by card or by recall	Children aged 12-23 months in the cross-sectional endline survey	Proportion	After one year of the SQ-LNS program (measured in the endline HHS)
	Measles 2 vaccine received within 30 days of turning 15 months by card or by recall	Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	End of follow-up
Other infant vaccines coverage	Pentavalent 1 and 3, yellow fever, and meningitis vaccine by vaccination card or by recall	Children aged 12-23 months in the cross-sectional endline survey	Proportion	After one year of the SQ-LNS program (measured in the endline HHS)
		Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	End of follow-up
Additional infant vaccines coverage	Catch-up pentavalent 1 and 3, and age-eligible yellow fever, meningitis, by vaccination card or by recall	Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	End of follow-up
Zero-dose	No measles + pentavalent + yellow fever + meningitis	Children aged 12-23 months in the cross-	Proportion	After one year of the SQ-LNS program (measured in the endline HHS)

	vaccines reported by vaccination card or by recall	sectional endline survey		
		Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	End of follow-up
Proportion of children fully immunized	Children who had received all childhood vaccinations recommended by the Nigeria MOH, by vaccination card or by recall.	Children aged 12-23 months in the cross-sectional endline survey	Proportion	After one year of the SQ-LNS program (measured in the endline HHS)
		Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	End of follow-up
Anthropometric parameters	MUAC, z scores for MUAC for age, weight for age, weight for height, and height for age	Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Median/mean	End of follow-up
Vitamin A supplementation coverage	Dose 1 given at 6 month and dose 2 given at 12 months by vaccination card or by recall	Children aged 12-23 months in the cross-sectional endline survey	Proportion	After one year of the SQ-LNS program (measured in the endline HHS)
		Children aged 6-12 months at inclusion in the longitudinal follow-up survey	Proportion	End of follow-up

3.2 Study sites

The study will take place in the Karasuwa and Nguru LGAs within Yobe State in Northeast Nigeria (**Figure 5**). The population in 2023 is estimated at 158,567 and 252,792 inhabitants in Karasuwa and Nguru LGAs, respectively, and the annual birth rate is estimated at 4% (**Table 2**).

Table 2: Demographic information for Nguru and Karasuwa LGAs, Yobe State, Nigeria (As provided by State Ministry of Health authorities)

Yobe State LGA	Estimated total pop	Estimated annual births	Estimated number of infants reaching 6 months each month
Nguru	252,792	10,112	843
Karasuwa	158,567	6,343	529

This location represents a reasonable location for implementing a preventive nutritional SQ-LNS supplementation program coupled with vaccination within the PHCC. This location faces the double burden of very high malnutrition rates (>10% wasting, including >2% severe wasting, >30% stunting) and extremely low vaccination coverage (<60% of at least one dose of measles, >40% zero dose of pentavalent vaccine) (25). Finally, as the study will be conducted over an extended period of time, the relative stability of this location is also expected to allow for secure, uninterrupted access to the study population for monitoring and data collection. Both LGAs are mostly rural with some peri-urban centres.

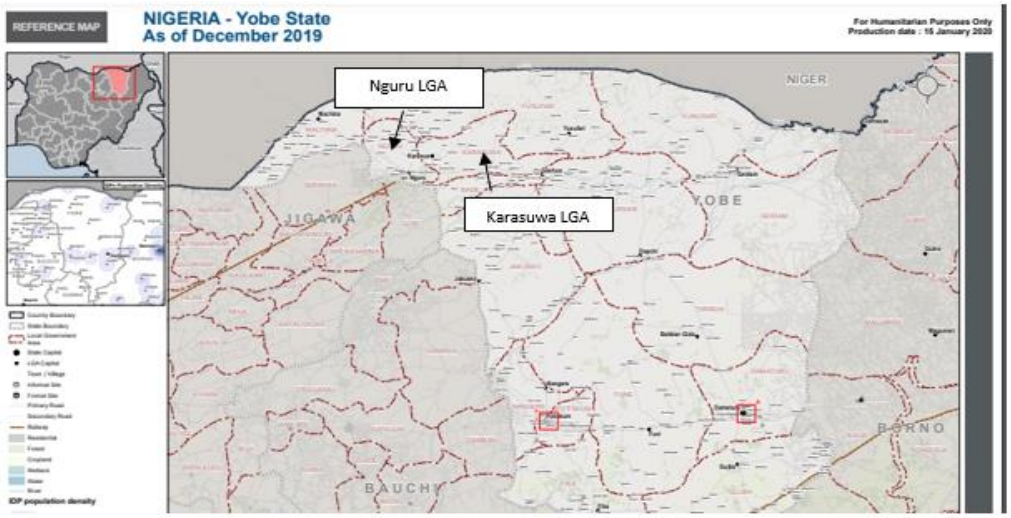


Figure 5: Location of Karasuwa and Nguru LGAs in Yobe State, Nigeria - *Source: REACH Initiative, Nigeria: Yobe State Reference Map (As of December 2019)*

The recent Northeast Nigeria Nutrition and Food Security Surveillance (NFSS) report showed that global wasting by both weight-for-height z scores (WHZ) and mid-upper arm circumference (MUAC) affected 14.2% of children in Karasuwa and Nguru, with SAM rates of 3.7% (26). Acute malnutrition rates are even higher among younger, more vulnerable children when proper nutrition is crucial to long term growth and development outcomes (**Table 3**).

Table 3: Malnutrition Indicators in Karasuwa and Nguru LGAS, Yobe State, Northeast Nigeria, August to September 2022

LGA	**WHZ 6-59 m**		**WHZ 6-17 m**		**MUAC 6-59 m**		**MUAC 6-17 m**		**Combined, 6-59 m**	
	GAM	*SAM*	*GAM*	*SAM*	*GAM*	*SAM*	*GAM*	*SAM*	*GAM*	*SAM*
North Yobe (Karasuwa, Nguru)	12,0%	2,5%	19,6%	5,3%	5,4%	2,3%	11,4%	5,2%	14,2%	3,7%
	Underweight 6-59 m		**Underweight 6-17 m**		**Stunting 6-59 m**		**Stunting 6-17 m**		**Mortality <5 y**	
	WAZ<-2	*WAZ<-3*	*WAZ<-2*	*WAZ<-3*	*HAZ<-2*	*HAZ<-3*	*HAZ<-2*	*HAZ<-3*	*Crude*	*U5*
North Yobe (Karasuwa, Nguru)	24,3%	5,3%	35,3%	11,1%	30,2%	10,6%	32,0%	14,1%	0,41%	1,02%

Poverty causes severe food insecurity for families leaving them little access to the diverse and high-quality foods children need to not only stay alive, but to thrive. A recent report found that one third of households could not afford the lowest cost nutritious diet (27), while the NFSS report found that only 1% of 6-23 mo olds in both LGAs consumed a minimally acceptable diet (26) (**Table 4**).

Table 4: Dietary Minimums in Karasuwa and Nguru LGAS, Yobe State, Northeast Nigeria, August to September 2022

LGA	**Minimum Dietary Diversity 6-23 m**	**Minimum Meal Frequency 6-23 m**	**Minimum Acceptable Diet 6-23 m**

North Yobe (Karasuwa, Nguru)	2,6%	6,1%	1,1%

Measles vaccination coverage in both locations was below 60% while the percentage of children classified as zero-dose for pentavalent vaccine was 48.4% in Karasuwa and Nguru (**Table 5**). The high number of zero-dose pentavalent children likely contributed to a current diphtheria outbreak in Northern Nigeria, including Yobe State which, as of October 2023, was recording a 6.4 % case fatality rate (28).

Table 5: Vaccination Coverage in Karasuwa and Nguru LGAS, Yobe State, Northeast Nigeria, August to September 2022

LGA	**Measles, 12-59 m**		**Measles 12-23 m**		**Penta 0-59 m**		**Penta 6-23 m**		**Penta 2-59 m**			
	All	*Card only*	*All*	*Card only*	*All*	*Card only*	*All*	*Card only*	*Zero dose*	*Penta 1*	*Penta 2*	*Penta 3*
North Yobe (Karasuwa, Nguru)	53,3 %	23,4 %	59,8 %	29,9 %	50,2 %	22,8 %	53,1 %	27,1 %	48,4 %	4,2%	9,8%	37,6%

Karasuwa and Nguru LGAs each have 10 wards, and, respectively, 305 and 158 settlements (settlements are the smallest administrative unit in Yobe State and are equivalent to villages or small towns). Each ward has at least one PHCC, which covers most primary pediatric and adult health care, and some wards have additional health facilities called Health Posts (HP) or Primary Health Clinics (PHC) which deliver a lower level of care: only Outpatient Treatment Programs for Severe Acute Malnutrition (SAM), Outpatient Pediatric Department (OPD) consultations, health promotion like counseling on recommended Infant and Young Child Feeding (IYCF) practices, Family-MUAC, as well as support for continued breastfeeding, and childhood vaccinations. Population estimates by PHCC and HP in Karasuwa and in Nguru LGAs range from 3,000 to 31,000 inhabitants. Details are presented in Appendix 1 and Appendix 2.

ALIMA has worked with the state Ministry of Health to support health and nutrition programs since June 2021 with financial support from ECHO. In Karasuwa, ALIMA supports programs in paediatric health and nutrition in 5 wards, including OTP and OPD services in 5 PHCCs and 7 HPs, and provides inpatient care and laboratory services at an IPD in the Jajimaji PHCC. Additional supported activities include community health sensitisation, Family MUAC training, IYCF, hygiene, and waste management practices. ALIMA also supports programs addressing Sexual and Reproductive Health, including antenatal care and postnatal care, family planning, basic emergency obstetric and neonatal care, and clinical and psychosocial management for survivors of sexual and gender-based violence in 5 PHCCs. ALIMA has not worked in Nguru LGA but had recently conducted an assessment.

3.3 Study population

3.3.1 Eligibility criteria

- Baseline and endline household surveys

Inclusion criteria

- Aged 12-23 months;
- With oral informed consent of parent or legal guardian;
- Residing in the catchment settlements of wards included in the study.

Exclusion criteria

- Already included in the longitudinal follow-up.

- Longitudinal follow-up survey

Inclusion criteria

- Aged 6-12 months;
- With written informed consent of parent or legal guardian;
- Residing in the catchment settlements of wards included in the study.

Exclusion criteria

- Acute malnutrition criteria as per the WHO definition (i.e. MUAC<125or WHZ < -2 or nutritional edema). Such children will be referred for treatment;
- Known medical complication that requires referral for hospitalization;
- Known allergies to SQ-LNS or SQ-LNS contraindication;
- Any other condition interfering with protocol adherence or the ability to give informed consent, in the judgment of the Field Investigator

  For instance, medical, occupational or other conditions of the participant or parent/guardian may make routine home visits and evaluation difficult or make the child a poor candidate for retention. Any such potential exclusion must be validated by the Field Investigator.

- Qualitative feasibility and acceptability survey

Inclusion criteria

- Parent or legal guardian of a child aged 6-23 months and residing in the catchment settlements of wards included in the study,
  or Health worker of the ministry of health involved in the study,
  or Community representative,
  or Community health workers,
- With written informed consent.

Exclusion criteria

- None

3.3.2 Sampling methods

Both HHS and longitudinal follow-up surveys will be carried out at community level. Household and participants will be selected through a multi-stage sampling method. We will follow the WHO reference manual for vaccination coverage cluster surveys (29). The sampling will be carried out in three stages in each randomized cluster (which will be a ward), namely: (1) random selection of 'settlement' in each cluster using probability proportional to size (PPS) method; (2) systematic random selection of households in each

settlement with equal probability using population estimation used by the MoH for the planification of health activities; (3) selection of the youngest eligible child in the household, and random selection of one among the eligible child guardians (**Figure 6)**.

We will use the following definition to identify a household: *"A person or a group of persons, related or unrelated, who live together and share a common source of food and livelihood, and recognize one person as a head.",* as per the usual definition used in population survey in Nigeria (26).

A specific and detailed standardized operation procedure for the sampling process will be developed prior to the baseline HHS and the LS inclusion.

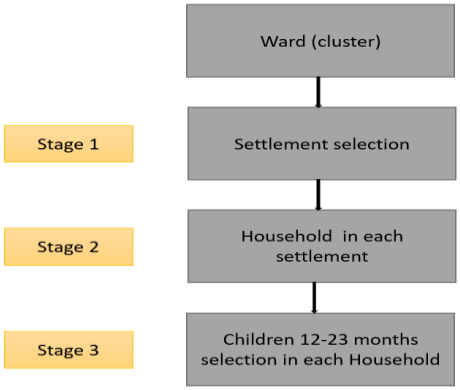


Figure 6 : Sampling survey using 3-stage random sampling method

The same sampling methods will be used for the inclusion of children in the HHS and for the inclusion of children in the LS.

For the qualitative survey, we will interview participants with a variety of socio-demographic profiles (e.g. sex, age, level of literacy and child's vaccination status for parent/guardian; sex and age for community representative; sex and years of experience for health workers) and contexts (rural, urban, distance form health centre) until we reach data saturation, meaning that we will end the interviews when they do not provide new information on the themes explored (see 5.1.3 and Appendix 10)

3.4 Interventions

The NutriVax-Measles study will compare two interventions randomly assigned to either:

1) The standard Expanded Program on Immunization (EPI) in children aged 6-23 months delivered according to the Ministry of Health's routine plans in the community and at health centres (i.e. PHCCs) and health posts, named the **standard EPI arm**,
2) The NutriVax program combining the EPI in children aged 6-23 months according to the Ministry of Health's routine plans in the community and at health centres (i.e. PHCCs) and health posts associated with SQ-LNS mass supplementation integrated into pre-existing services delivered at health centres (i.e. PHCCs) for children 6-23 months of age, named the **NutriVax arm.**

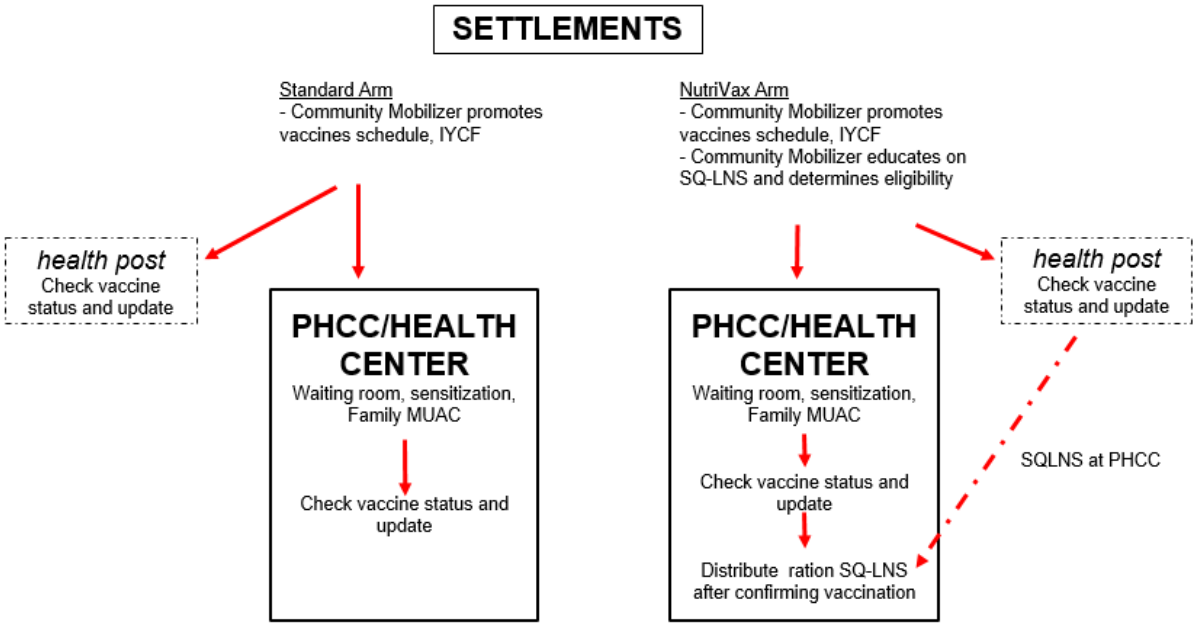


Figure 7: Standard EPI and NutriVax arms

Regardless of intervention arm:

1. Parents or guardian of children will be encouraged/sensitised to attend their scheduled preventive visits to receive other essential paediatric services;
2. Sensitization on vaccination and recommended Infant and Young Child Feeding (IYCF) practices including the need to consume a diverse nutritious diet and support for continued breastfeeding will be conducted according to the Ministry of Health's routine plans in the community and at primary health care centres;
3. Community mobilizers will promote the importance of vaccinations according to the Expanded Program on Immunization (EPI) as well as IYCF good practices messages.

Details on the Expanded Program on Immunization (EPI):

1. The vaccination schedule in use in Yobe state is specified in
2. Table 6;
3. Catch-up of early childhood vaccines (e.g. pentavalent 1 or 3) can occur at any visit to the health centres or health posts in children aged beyond 14 weeks;
4. Routine delivery of measles 1 can be done at any visit at health centre or health post from 9-15 months, and catch-up beyond 15 months;
5. Routine delivery of measles 2 can be done at any visit at health centre or health post from 15-23 months after a minimum of 4 weeks after receiving a measles 1 injection and catch-up can be done beyond 23 months;
6. ALIMA will maintain a buffer stock of measles vaccines that can be distributed in the event of a stock-out at health centres or health posts.

Table 6 : Schedule for vaccinations for children in Nigeria

Antigen	Birth	6wk	10wk	14wk	6mo	9mo	12mo	15mo
BCG	X							
HepB	X							
OPV	0	1	2	3				
PENTAVALENT		1	2	3				
PCV		1	2	3				
IPV		1	2	3				
Measles						1		2
Yellow fever						1		
Meningitis						1		

Details on the SQ-LNS supplementation program in the NutriVax study:

1. The SQ-LNS distribution program will be implemented for 12 consecutive months in the wards randomized in the NutriVax arm.

2. In addition to promoting the importance of vaccinations according to the Expanded Program on Immunization (EPI) and messages around IYCF good practices, community mobilizers in the wards randomized in the NutriVax arm will give information in the community about SQ-LNS and eligibility criteria for SQ-LNS distributions.

3. All SQ-LNS distributions will take place at the PHCC (or health center) of each ward after the child's vaccination status has been checked and updated. Children will receive vaccinations at the PHCC serving their settlement. For children living in catchment areas of health posts in intervention wards, this will mean receiving vaccines at the health post and going to the PHCC of their ward to receive SQ-LNS.

4. Eligibility criteria for SQ-LNS distributions:

    - All children residing in settlements of the catchment area of wards randomized to the NutriVax arm and 6-22 months of age and at the time of presentation at the PHCC are eligible for a monthly ration of SQ-LNS (28 sachets per month) following a check and update of his or her vaccine status.

    - All children will exit the SQ-LNS distribution program when they are 23 months of age OR after receiving a maximum of 12 consecutive monthly rations (28 sachets per month), whichever comes first.

    - The total amount of SQ-LNS a child receives will depend on when they enroll in the SQ-LNS distribution program. For example, a 6-month old child who enrolls in the SQ-LNS distribution program in month 2 of the program will be eligible for 11 months of SQ-LNS supplementation, whereas a 12-month old who enrols in month 11 of the program will receive a 1-month ration of SQ-LNS.

5. Any child eligible for SQ-LNS residing in the catchment area of wards randomized in the NutriVax arm and presenting with severe acute malnutrition (SAM) as defined by Nigeria's malnutrition treatment protocol and the WHO (i.e. MUAC <115 mm or WHZ < -3 or nutritional oedema) or moderate acute malnutrition (MAM) as defined by Nigeria's malnutrition treatment protocol and the WHO (i.e. MUAC between 115 and 124 mm or WHZ between -3 and -2), will be referred to the Community-Based Management of Acute Malnutrition (CMAM) treatment program in the area where the child resides. Such children will not receive SQ-LNS during the course of treatment for SAM or MAM, but will resume supplementation with SQ-LNS after recovering from the SAM or MAM episode until they are no longer eligible to receive SQ-LNS. If there is no functioning MAM program or there is a prolonged stock-out of MAM treatment, children with MAM will receive SQ-LNS if otherwise eligible (i.e. children who are otherwise eligible to receive SQ-LNS will not be excluded from SQ-LNS distributions in a context where there is no MAM treatment.) For both SAM and MAM treatment, ALIMA will advocate to state authorities to address any stock-outs of treatment inputs.

The timing of distributions and amount of SQ-LNS may be still be revised in case the population estimates provided by authorities dramatically underestimated the number of children present in the two LGAs. If this is the case based on real-time SQ-LNS consumption, we would first reduce the older age limit for eligibility from 22 to 21 or 20 months of age and/or reduce the maximum number of consecutive months receiving SQ-LNS from 12 to between 9-11 months.

3.5 Study sites and human resources

3.5.1 For the study implementation

Research and operational activities will take place at community level and in the 20 PHCCs of the 2 LGAs of Karasuwa and Nguru LGAs. Each LGA has 10 wards and there is one PHCC per ward.

In the 20 PHCCs, operational activities will be integrated into pre-existing services without additional staff to stay in the reality of human resources available. However, in the NutriVax arm, ALIMA will finance two positions to manage SQ-LNS distributions at PHCC because these positions do not exist in the MoH plans. In both Epi standard and NutriVax arms, we will focus on full incentives for community mobilizers and also provide financial incentives to some MoH staff in the PHCCs added to their salaries to compensate for their collaboration and additional workload.

Operationally, these are the staff to be compensated at the health centers (PHCCs) and in the community in both the standard Epi and NutriVax arms:

-Team Management Karasuwa and Nguru LGA: the nutrition focal point and immunization focal point will receive incentives.

- Staff in health center in each PHCC: 1 Community Health Worker (CHEW) for Outpatient Treatment Programs (OTP), 1 CHEW for Immunization, and 2 watchmen / crowd controllers will

receive incentives.

- At the community level 10 community health workers (CHW) per ward will receive incentives.

In PHCCs of the NutriVax arm, these are the staff to be compensated:

- Two SQ LNS distributors per PHCC.

3.5.2 For the research data collection

For conducting the data collection for the HHS, we will hire a national expert consultant in household coverage survey.

For the data collection at inclusion and during children follow-up in the LS and for aggregated data collection at health centre, we will add research staff for collecting data in the community and ensuring a good quality of data monitoring:

- 1 research assistant nurse/ LGA trained to seek written informed consent, to follow standardized operational procedures for inclusion and data collection during all enrolment and follow-up visits at home;
- 1 data monitor per LGA

Finally, for conducting the data collection for the QFAS on barriers and facilitators to SQ-LNS supplementation and routine immunization, we will hire a national expert consultant in social sciences and one research assistant in social sciences per LGA.

3.6 Randomization and intervention allocation

The unit of randomization (cluster) will be the ward and its catchment area.

Randomization will be stratified by LGA in order to promote balance of the intervention among both LGAs and to give the same opportunity to receive the intervention in both LGAs. Also, the two LGAs may have different populations or contexts that could be a potential confounding factor.

Randomization will be done prior to the baseline survey, because of logistical constraints required for preparing SQ-LNS distribution at health centres (PHCCs), but kept concealed to the data collector until the completion of the baseline survey. After baseline survey completion, the study will be open, as it will not be possible to blind participants or study staff to SQ-LNS supplementation.

In each LGA, the 10 wards will be randomized the same day, by lottery from an envelope, in presence of PHCC department, local community representatives and held in the local language (Hausa). Clusters will be randomly allocated at a ratio of 1:1 either to the standard EPI arm or to the NutriVax arm.

3.7 Sample size calculation

Primary endpoint

The primary endpoint will be collected among children aged 12-23 months included in the endline HHS about 12 months after the baseline HHS. Based on a baseline measles vaccination (i.e. at least one dose) coverage reported on vaccination card of 30% (29), a power of 90%, and an intra-cluster correlation of 0.2, an alpha risk of 5%, it will be necessary to include 74 children per cluster. With a rate of unusable data of 5%, we will need 78 children per cluster or a total of **1,560 children** to demonstrate a minimum of +10% points difference between the NutriVax and the standard EPI arms, in measles vaccination coverage, i.e. the primary outcome (see Appendix 3). This calculation was performed using the Shiny CRT calculator used specifically to estimate sample size for cluster randomised trials (30).

Main secondary endpoint

The main secondary endpoint will be collected among the children aged 6-12 months at baseline included in the LS. Based on the baseline measles vaccination coverage reported on vaccination card of 30% (29), a power of 80%, and an intra-cluster correlation coefficient of 0.2, an individual auto-correlation of 50%, an alpha risk of 5% and a rate of unusable data of 5%, it will be necessary to include 30 children per cluster or **600 children in total** to demonstrate a minimum of +10% points difference between arms in measles vaccination coverage (see **Appendix 4**). This calculation was performed using the Shiny CRT calculator used specifically to estimate sample size for cluster randomised trials (30).

Precision

These two estimates were validated by the senior statistician for this study but they may need to be adjusted thereafter according to the actual intra-cluster correlation coefficient and the baseline measles vaccination proportion results from the baseline survey.

4 Data entry, management and quality control

4.1 Data collection

Individual consent from a parent or legally acceptable representative will be required prior to data collection in the HHS (oral informed consent, **Appendix 5**), prior to data collection in the LS (written informed consent, **Appendix 6)** , and prior to data collection in the QFAS (written informed consent, **Appendix 7**).

Study staff and Ministry of Health staff involved in the study will be trained in the study's informed consent process, data collection tools and standard operating procedures before starting data collection and monitoring. The data collection mode and timeline are illustrated **Figure 4**.

4.1.1 Cross-sectional household surveys

During both HHS, we will collect for all children aged 12-23 months:
- Sociodemographic variables: age, sex, number of children in the family, number of siblings in the family, mother alive, mother’s age, parents’ or legal representant’s literacy;

- Anthropometric, nutritional and food characteristics: MUAC, breastfeeding;
- Immunizations reported on vaccine card or on maternal recall using WHO survey methodology and health interventions such as vitamin A supplementation, including date of vaccination where available by vaccine card;
- Morbidity declaration or observation: current presence of diarrhoea, vomiting, cough, fever, rash, oedema, hospitalization within the last 3 months.

All of the information required by the study protocol for the HHS (**Appendix 8**, **Appendix 9**) will be entered directly into RedCap software hosted on tablet devices and usable offline by the nurse research assistant.

Per the WHO 2018 recommendation on vaccination coverage cluster surveys (29), we intend to include a step of anonymous photographing cards and registers so dates can be verified during data cleaning. This will require some data management to track photo file names and associate them with the appropriate survey records.

4.1.2 Longitudinal follow-up survey

Data from children 6-12 months included in the LS will be collected at home at inclusion and then every four months for one year (see **Figure 4).**

At the inclusion visit, research assistants will collect the same variables on sociodemographic (in addition distance of home from health facility and means of transport to the health centre), anthropometric (in addition weight and height), nutritional, morbidity and vaccination information as those collected during the HHS mentioned above.

During all follow-up home visits, nurse research assistants will continue to collect anthropometric, nutritional, morbidity and vaccination information until the end of the study. Any child presenting with acute malnutrition or other condition warranting referral at any home visit will be referred for treatment. Between two home follow-up visits, should children presenting spontaneously for outpatient consultations or hospitalization at PHCC, nurse research assistants will also collect data on anthropometric, nutritional, morbidity and vaccination written in the medical folder.

At inclusion and during follow-up visits at home, we will add variables needed for calculating the Household Hunger Scale (HHS) (31), variables needed for calculating the minimum dietary diversity (MDD) in children 6–23 months (32).

Finally, the data necessary for the cost-effectiveness investigation will be collected at inclusion and during a follow-up visit whose season will be different from that of inclusion.

All of the data required by the study protocol for the LS (provided in **Appendix 8**) will be entered directly into RedCap software hosted on tablet devices and usable offline by the nurse research assistant. Nurse

research assistants will also enter into RedCap data from consultations or hospitalizations found in children's medical files.

4.1.3 Qualitative feasibility and acceptability survey

Qualitative data will be collected through individual interviews and/or focus groups among parents or legal guardians, health workers, community health workers and community representatives. Interviews among parents/legal guardians, community representatives, and community health workers will explore their perceptions of the coupling of SQ-LNS distribution and vaccination during the same visit to the health centre as well as the barriers and facilitators with respect to the immunisation schedule and access to the health care centres to receive the SQ-LNS distributions. Interviews among providers will focus on their perceptions regarding the NutriVax intervention, as well as on their experience regarding the integration of this new activity into their work.

The qualitative feasibility and acceptability survey will be based on the following conceptual framework: 1) the Consolidated Framework for Implementation Research (33) in order to evaluate the different barriers and facilitators regarding the implementation of this new NutriVax intervention, 2) the expanded Andersen's model framework (34) as well as Levesque framework (35) in order to explore factors associated with access to health facilities and acceptability of receiving the SQ-LNS and of being vaccinated 3) the Peh's conceptual framework (36) to explore drivers of SQ-LNS adherence.

For qualitative data collection, we will involve a national social science specialist. Under the supervision of the investigator associated to this survey, a literature review on factors associated with barriers and levers to vaccination, attendance at preventive paediatric consultations, and dietary supplementation will be realised in order to refine the interview guides (**Appendix 10**). The interview guides include around ten questions designed to explore themes corresponding of the objectives of the research study. Interviews will be conducted in Hausa and recorded with the agreement of the participants (**Appendix 7).**

All qualitative data will be transcribed and translated from the local tongue into English and coded by the national social science specialist.

Qualitative data will be collected three months after the start of the intervention (intermediate phase) in order to reveal any issues that need to be addressed to ensure successful implementation of the intervention. A final data collection two months before the end of the study would enable us to interpret the main result, whether positive or negative.

Finally, we will describe whether other concomitant activities in the field of vaccination or nutrition activities were carried out alongside our intervention during the 12 months of the study, which could be a confounding for our primary endpoint.

4.1.4 Cost-efficiency survey

We will undertake costing studies to enable estimates of the total and relative cost and cost-efficiency of integrated routine vaccination services plus SQ-LNS supplementation compared to the standard of care (routine vaccination services alone). We will use an activity-based approach to estimate economic costs from a facility-level and caregiver perspective. We will collect time and resource use data from health center staff and other study personnel, as relevant, using questionnaires. Time use data will be matched with salary or wage information to estimate time-use costs. Expenditures (vaccinations (including wastage), SQ-LNS (including leakage and buffers), shipping, customs, transport, storage space, etc.) will be collected using receipts and expenditure records, which will be systematically entered, by activity, into costing spreadsheets. The relevant types of costs will include direct medical costs [e.g., management and logistics, provider time, capital costs (building space, equipment), consumables (medical supplies), and overhead (electricity, water, and maintenance)], direct non-medical costs [e.g., fees for caregiver travel, food, lodging, and child care] and opportunity costs (the value of caregiver time and any donated time, capital, or supplies). The opportunity cost of caregivers' time and expenditures incurred by caregivers to access the vaccination or vaccination + SQ-LNS services (e.g., transportation costs) will be collected using brief questionnaires. Data on resources used will be collected on standardized forms and supplemented with key informant interviews with study staff and accounting records. The cost per child vaccinated against measles will be calculated for each arm (intervention arm and control arm) as well as the incremental cost-efficiency ratio (ICER), which is the difference in cost between the two arms divided by difference in number to children vaccinated against measles, to estimate the incremental cost per additional child vaccinated in the intervention arm. Because the integrated intervention also has the potential to improve health and nutritional outcomes beyond the standard of care, we will also estimate ICERs on the basis of other health and nutrition outcomes measured by the study.

4.1.5 Aggregated data collected at health centers

In both the standard EPI and NutriVax arms, during the 12 months of the study, we will collect monthly aggregated data routinely reported in the national registers used at health facilities in order to assess the evolution of vaccination activities and stock, out-patient paediatric consultations, out-patient therapeutic nutritional activities and Infant and Young Child Feeding (IYCF) sensitization. In the NutriVax arm, we will additionally collect monthly aggregated data on SQ-LNS activities and stock. The list of aggregated data is available **Appendix 11** and may be refined and completed with other information.

4.2 Quality assurance

All the material collected in application of the protocol, i.e. the trial data, will be placed under the responsibility of the methodology and management centre of the trial. It will remain under its safekeeping throughout the trial and beyond, in the case of trial data, once the Scientific Advisory Board has been dissolved. To ensure the quality and accuracy of the data, qualified investigators and study personnel will

be selected. The protocol procedures will be reviewed with the investigators and associated personnel before the start of the study.

Source data from CRF, as well as other participant data will be reviewed for accuracy and completeness and any discrepancies will be resolved with the Principal Investigator (PI) or his/her designee, as appropriate. Some information required by the study protocol will be entered directly on standardized electronic case report forms (eCRF) by trained personnel. A designated clinical monitor will monitor study progress to facilitate compliance with good clinical practices which requires reported data to be accurate, complete and verifiable from source documents and that the study follows the current approved protocol and applicable regulatory. The centralized monitoring activities will be risk-based. They include remote and onsite monitoring activities. A data monitoring plan will be prepared with PI validation. Errors will be detected by programs designed to detect missing data or specific errors in the data. These errors will be summarized along with detailed descriptions of the specific problem in a Data Query Report, which will be sent to the Field Investigator for resolution by checking the original forms for inconsistency, checking other sources to determine the correction, and modifying the original (paper) form as appropriate. Written documentation of changes will be available via electronic logs. A complete back up of the study database will be performed monthly; incremental data back-ups will be performed on a daily basis. The data manager will provide monthly email reports with information on missing data, missing forms, and missing visits to the sponsor. The centre of data management and monitoring alone will have full access to the data.

5 Analysis

5.1 Statistical methods

A complete statistical analysis plan will be written and validated for each population and data collection mode, before the end of data collection. The statistical data analyses will be performed using an appropriate software package.

We will use standard descriptive statistics to summarize quantitative and qualitative data: mean with 95% confidence interval (CI), median with interquartile range (IQR) and proportion with a 95% CI, respectively. Data will not be weighted for PPS sampling.

Primary endpoint

All analyses will use the intention-to-treat principle and account for the stratified cluster design.

Analysis will be conducted at the individual level, adjusting for clustering (as random effect) and for baseline assessment of outcome in that ward, using a logistic regression with random effects (a member of the family of generalised linear mixed model GLMM). In addition, the logistic regression with random effects will be re-run after adjustment for the individual baseline covariates selected at baseline analysis. It will be performed to identify individual and contextual factors associated with measles vaccine coverage.

Main secondary endpoint and secondary endpoints

For the main secondary endpoint and for proportions secondary endpoints, we will aso use logistic regression with random effects for clustering. We will use mixed linear models to compare quantitative secondary endpoints such as z score of MUAC for age, weight for height, weight for age and height for age.

Qualitative feasibility and acceptability survey

For the intermediate phase (2-3 months after the start of the intervention), a rapid analysis will be conducted. After each interview, the national social science specialist will complete a matrix organized according to the main themes explored in the interview; all matrix will then be merged to highlight the potential adaptations/recommendations needed to improve the implementation of the intervention for the continuation of the study.

For the final phase, qualitative data analysis will use a standard thematic procedure guided by the themes defined in the interview guides. The transcripts will be read and coded by the researchers using the topic guide and the initial coding frame. We will draw on several conceptual frameworks such as the consolidated framework for implementation research (38) relevant for the intervention assessed to identify drivers and barriers on the implementation of the NutriVax intervention.

These data will shed light on the main results of the study and make recommendations.

Cost- efficiency survey

We will calculate and compare the cost-efficiency (measured as cost per child vaccinated against measles) of the integrated intervention to the standard of care. An incremental cost-efficiency ratio (ICER) will be calculated as the difference in cost between groups divided by the difference in number of children vaccinated between groups, expressed in dollars per additional child vaccinated.

5.2 Precision

Protocol deviation/ violation and exclusion from analysis set

A protocol deviation is a minor non-compliance with the protocol without significant consequences for the participants, the study results or the research integrity.

A protocol violation is a major non-compliance to the protocol leading to significant consequences for the participants, the study results or the research integrity. Protocol violations may lead to discontinuation from the study and/or exclusion of participants from analysis. Examples of protocol violations are inadequate informed consent, non-compliance to the protocol seriously impairing the quality or completeness of the data, or impacting participants' safety, rights, or welfare. Protocol deviations and violations will be documented.

Handling of missing data and outliers

For the cross-sectional survey with endpoints using data reported on vaccination card, we have 1 type of missing data: children without vaccination card.

For the longitudinal survey with endpoinst using data reported on vaccination card, we have 2 types of missing data: children without vaccination card and children loss-to-follow-up.

For the longitudinal survey with endpoints using data reported on vaccination card or recall, we have 1 type of missing data: children loss-to-follow-up.

We will describe these missing data.

For all endpoints using data reported on vaccination card, if the children don't have a vaccination card then vaccination will be considered as failure.

For the longitudinal survey, at first, analyses will be performed on available data only, so without loss-to-follow-up.
The endpoint will be measured at the end of follow-up, so a child may be loss-to-follow-up at M12, but at the end of follow-up may have received vaccine, and therefore be considered as in success for an endpoint.
A particular case is that of a child who does not have a vaccination card at inclusion and who has a vaccination card during follow-up, so if he is vaccinated during follow-up, he will be considered as a success.

In addition, we will perform sensitivity analyses to assess the potential impact of missing data (for children loss-to-follow-up before additional vaccination) on the study conclusions, using the most extreme scenarios:

- Extreme scenario 1 ('worst' case for intervention): all patients with missing data assumed as failure (no additional dose of measles vaccine) in the Nutrivax arm and success (at least one additional dose of measles vaccine) in the standard arm.
- Extreme scenario 2 ('best' case for intervention): all patients with missing data assumed as success (at least one additional dose of measles vaccine) in the Nutrivax arm and failure (no additional dose of measles vaccine) in the standard arm.

Design risk or limitations

Two main potential biases in this study include 1) the contamination between individuals in different clusters and 2) the effects of clustering:

1. The potential for contamination (individuals receiving second-hand or spill over NutriVax arm while they belong to the standard EPI arm) must be considered when designing a cluster randomized trial. If there are important familial or cultural links between distinct villages/settlements, it is reasonable to expect some degree of contamination. To measure SQ-LNS distribution, we have a variable in the CRF of the LS that tracks SQ-LNS sachet uptake.
2. The effects of clustering need to be accounted for during statistical analysis. Inherent characteristics of the villages, such as socioeconomic level, cultural practices and knowledge, proximity to PHCC, might play an important role in the immunization and SQ-LNS acceptance. We will use the baseline HHS for quantifying the characteristics of individuals and clusters. The intra-cluster correlation coefficient will be estimated and used to potentially adapt the sample size of the endline HHS.

6 Responsibility

This research will be conducted by the CORAL (Clinical and Operational Research Alliance) platform, a partnership between ALIMA, INSERM (the French National Institute for Health Research) and PACCI (INSERM's research affiliate in the Ivory Coast). CORAL has a solid experience of conducting high quality research in humanitarian contexts, especially in nutrition, most notably two individually randomized controlled trials on a simplified malnutrition treatment protocol in the Democratic Republic of Congo and Niger. Katherine Adams, University of California - Davis, will oversee the collection of cost data as well as any cost and cost-effectiveness analyses. A consultant will work as a senior advisor on qualitative research, developing data collection tools, overseeing data collection and analysis.

The study will be implemented in full collaboration with the Ministry of Health and community leaders in Yobe State, Nigeria. ALIMA is already present in Yobe State and collaborates closely with health authorities, health facilities, and with communities. Beyond regulatory and ethics approvals, health authorities at State level will contribute to the development of the research protocol and will be associated investigators of the study. As such, two national PIs have been designated (see above). An advisory committee will be established with major stakeholders at the local and national levels (health authorities, lead of the nutrition cluster, other NGOs, UN agencies like UNICEF and WFP) so that they can contribute to the study implementation and be updated on its progress. Joint supervision missions of the study sites will be organized regularly with local health authorities. All MoH staff involved on the study sites will be trained on the trial procedures and on good clinical practices. This will strengthen their competence to contribute to research projects in the future.

The study sponsor's responsibility is toward the study team at the study site and the health authorities. The sponsor shall take all reasonable measures to ensure the good conduct of the study with regards to ethics, protocol compliance, integrity and validity of the information recorded in the participant CRF as well as with regards to the availability of the adequate resources to ensure appropriate conduct of the study. The principal function of the project coordination team is to help the investigators and the sponsor to maintain a high level of ethical, scientific, technical and regulatory standards for all study-related aspects of ethics, regulations and administrative rules.

We don't anticipate the need for a Data Safety Monitoring Board because there is minimal risk to participants. However, we did convene a **scientific committee** with academics from various disciplines (epidemiology, nutrition, vaccination, health economy). The first meeting was organized before submission of the protocol to the ethics committee. The scientific committee consisted of the following: Kay Dewey, University of California, Davis; Indi Trehan, University of Washington; Lieven Huybregts, IFPRI; Alison Connor, IDinsights; and Saskia dePee, World Food Program.

The study personnel will be responsible for performing the study in accordance with this protocol and in accordance with the legislation and international guidelines under the direction of the respective site PI.

They are also responsible for obtaining written informed consent prior to inclusion in the study, for completing the study documents and for recording all relevant data in relation to the study. Each study team member shall ensure that the information reported in the document is precise and accurate. The study personnel must inform the patient of all relevant aspects of the study, including the information in the patient information sheet. All this information shall be provided to the patient in layman's terms. Patient confidentiality is paramount.

7 Ethical considerations

7.1 Regulations

The study shall be conducted in compliance with the Declaration of Helsinki adopted by the 18th World Medical Association Assembly in 1964, and with its amendments as well as with the Nigerian National Code for Health Research Ethics (http://nhrec.net/). This study shall be conducted in accordance with Good Clinical Practices guidelines as well as in compliance with the international and national laws and regulations in effect and in accordance with the applicable directives in Nigeria, in particular concerning the submission to the ethics committee and the protection of personal data.

The promoter of the research, ALIMA, is a non-governmental organization whose raison d'être is to save human lives and care for the most vulnerable populations, without any religious or political discrimination, through actions based on proximity, innovation and the alliance of organizations and individuals.

ALIMA has commissioned the MEREVA (France)- PACCI (Ivory Coast) for data management. Individual data are subject to Nigerian regulations on the protection of personal data but also to European and French regulations. The data recorded during this study will be processed on behalf of the promoter ALIMA. The promoter will declare the database to the Commission Nationale Informatique et Liberté (CNIL), in accordance with the French Data Protection Act no. 78-17 of January 6, 1978, amended in particular by law no. 2018-493 of June 20, 2018, and the General Data Protection Regulation Protection (RGPD - Regulation (EU) 2016/679).

Investigators from all partners will be fully responsible for the ethical and scientific integrity of the proposed project.

7.2 Community involvement

Before the start of the study, community representatives will be informed of the study's objectives. Over the course of the study, we will emphasize building local authorities' and communities' ownership of the study through co-investigation, community engagement, a national advisory committee and joint supervisions. The Federal Ministry of Public Health (MSP) has been involved since the study was conceived and will remain so throughout the study. Joint supervision will be carried out regularly at the project sites with representatives of the LGA, the study investigator. They will ensure that the protocol is well adapted to the

needs and context of the country, and that it is followed in the health facilities included in the study. This will play a key role in research results uptake. If successful, this trial will provide additional evidence for governments and donors to fund SQ-LNS supplementation as a highly cost-effective intervention in areas with a high wasting burden and low vaccination coverage, then ALIMA and its partners we will also continue our advocacy work when results will be known.

7.3 Approval

The study will seek approval from the Yobe State Human Research Ethics Committee (HREC), Nigeria. This study will be undertaken only after the HREC has given full approval of the final protocol, amendments, the informed consent form, applicable recruiting materials and the sponsor has received a copy of this approval. This approval letter must be dated and must clearly identify the EC and the documents and versions being approved.

7.4 Informed consent

The final protocol, information notes and consent form for participation in the surveys and cohort study will be submitted to the Yobe State HREC (in Nigeria ethics committees are decentralized to State level for most studies) for approval. It will be simultaneously submitted for approval to INSERM's international ethics committee.

The information note will be explained orally to those eligible to participate in these studies. Details of personal data processing and associated rights will be systematically given for participants of the HHS, the LS and the QFAS as mentioned above (see 5.1).

These documents will be translated into the local language and into English to ensure the accuracy of the content of both documents. The accompanying parent or legal representative will be informed that participation is voluntary and that he or she is free, without justification, to withdraw at any time without this having any consequence on the quality of care that will continue to be provided by the health workers. Any participant in this study requiring medical care will be treated according to national guidelines. Inclusion in the study will be voluntary, and refusal to participate will have no influence on the medical treatment received in the health facilities. After answering questions about the study, the investigator will invite the accompanying parent or legal representative whose child is eligible for the study to sign (or fingerprint, if the person cannot write) the consent form. In the event of illiteracy, a witness who is able to read and write will witness the reading of the consent form and sign it in addition to the participant's fingerprint. The date on which the person signed the consent form will be indicated on the form, as well as the name of the agent who completed the consent. If the person does not wish to take his/her copy, this information will be noted in the source file and the participant's copy of the consent will be kept in the Investigator file. The same information and consent procedure will be followed for other participants (health workers, community representatives) invited to take part in the QFAS, using a specific information leaflet and consent form.

7.5 Data confidentiality

Data entered into the database will be secure (encrypted access, access limited to the investigating team), identified non-nominally using a unique identifier (unique participant number) assigned to subjects in the study, kept confidential and not disclosed to anyone outside the research team. The study subject's identification code will be the only patient identifier in the trial's electronic database. Individually identifiable participants' information will solely be documented on a strictly confidential correspondence list with restricted access to designated site personnel. Informed consent will be stored in a lockable cabinet. During the study, and at the end of the study, the individual data collected on participants will not contain any surnames or first names, nor any ethnic or religious identification. Data will be managed in accordance with European, French and Nigerian data protection regulations. The processing of the personal data of subjects taking part in this research is for the sole purpose of carrying out the research.

7.6 Site clearance and archiving

Upon signature of the protocol, the site PIs accept to respect the instructions and procedures described in the protocol, as well as the Good Clinical Practices and Good Clinical Laboratory Practices, to which they conform.

The documents and data relating to the study constitute the essential documents that make up the investigator's binder. These documents serve to demonstrate that all those involved in the trial comply with the rules of good clinical practice, as well as with current legislation and regulations in force. Copies of the consents intended for the sponsor will be kept in a sealed, tamper-proof envelope by the participating healthcare facilities, on which the corresponding participant's study ID and the investigator's name and signature will be recorded. Investigators must ensure that source files, and in particular medical records, are available during this archiving period. No study documents should be destroyed by an investigator centre without the prior written consent of the sponsor or its representative.

7.7 Voluntariness

The parent/guardian must be informed that his/her participation is entirely voluntary, that he/she can withdraw from the study at any time and that withdrawal will not affect his/her subsequent medical treatment nor his relationship with the treating physician. If participants withdraw from the study, they will be asked whether information that has been obtained about them before they have chosen to withdraw may be used for analysis and hence may be included in reports and publications. If participants also withdraw their consent for data processing, all obtained data from them will be excluded from analysis and deleted.

7.8 Incentives

No direct financial incentives will be given in return for participating in the study. Costs which will occur to the participant regarding his/her treatment of LF (hospitalization, examinations, drugs) will be covered

by the sponsor as long as the participant is part of the study. As further incentive for participants in the study, each participant will receive one long lasting impregnated mosquito net at hospital discharge. Furthermore, the research participants will be provided with fruit juice. In exceptional circumstances, materials incentives such as candies or phone credits might be provided.

Financial incentives will be given to MoH staff but in a much lighter way than a usual humanitarian intervention.

Compensation can be viewed as the factors and/or conditions within health professionals' work environments that enable, encourage, and motivate them to stay in their jobs, in their profession and in their countries. Offering carefully planned incentives for healthcare employees will help to retain those who currently work for the MoH. It will also make sure they're able to provide excellent service or improve on their performance which ultimately affects patient satisfaction. There is a long-standing tradition among public sector health workers of commitment to service for its intrinsic value and the personal satisfaction and respect that are derived from providing care and support to patients. However, the central importance of financial security and the ability to be remunerated fairly and adequately for one's labour cannot be denied. To motivate and maintain ALIMA's standard of work in delivering at an optimum, MOH Staff who work with ALIMA Staff in the study areas are paid Incentives i.e. what ALIMA adds to their salaries to compensate for their collaboration and additional workload. It varies according to responsibility levels and is calculated based on the Memorandum of Understanding signed with the MoH and the number of hours or days worked as recorded in the attendance sheet verified by ALIMA staff.

7.9 Insurance

The sponsor will subscribe for this study under its sponsorship, an insurance covering the responsibility of the site, PIs and their teams. The sponsor's insurance shall not dismiss the investigator and his collaborators of their obligation to have their own civil liability insurance in line with the laws in force. A copy of the insurance certificate shall be available for provision to investigators and / or ethics committees who would request it.

7.10 Safety

This study is an interventional research with minimal risks and constraints, formerly known as "routine care". There is no additional risk related to the participation in the study as it is non-medicinal and involves only minimal risks and constraints for the participants. All preventive and curative care and follow-up procedures will continue to comply with national guidelines, whether at community or health facility level. On the contrary, the intervention tested may make it possible to reinforce national guidelines for the preventive monitoring of children aged between 6 and 23 months. Adverse events (death) or unanticipated problems will be reported by the field investigator in a registry, documented and shared within 48 hours to

the PI and co-PI within 48 hours by email and telephone. Before the start of the study, the personnel will receive trainings in Good Clinical Practice (GCP), research ethics, study procedures

7.11 Protocol amendment

Any substantial modification will be the subject of a written amendment which will be submitted to the sponsor, and then, depending on its scope, to the national and international ethics committees for their opinion or information. depending on its scope, for advice or information to the national and international ethics committees. Substantial modifications have a significant impact on any aspect of the study, in particular on the following criteria: the protection of individuals, including their safety; the conditions of validity of the study; research conduct procedures. In particular, new consent must have received prior approval from the national ethics and scientific committee.
After approval, the amendment will be signed by the coordinating investigators and the sponsor, in the same way as the approved version of the protocol. Non-substantial modifications, i.e. those that have no significant impact on any aspect of the research and the protocol, will be communicated to the ethics committes for information purposes.

8 Use of study results and data presentation

All results, data, documents and inventions obtained directly or indirectly from the study will be owned by the sponsor and Nigerian PIs' institution unless a law or local regulation states otherwise. The sponsor can use all results for their own purposes without any limitation of its industrial property (territory, area, duration) in consultation with the study sites. The full data base will be the property of the sponsor, the local data set will be the property of the respective PI's department and will be utilized for producing the final study report to be submitted to the applicable regulatory and safety authorities. Both study sites will have the right to participate with the sponsor in the publication of such results.

The results of the study will be made available for the sponsor and the investigators. The sponsor and the site PIs will share the responsibility for the presentations and/or publications of the results.

The final decision on the publication of a manuscript/summary/presentation will be taken by the sponsor and the site PIs together following an internal review with the possibility of providing comments. First authorship will be shared between the study sites, last authorship remains with the sponsor.

The participants will be informed about any information that may affect their continued participation or their health during the course of the study.

9 Study duration

From preparation to valorisation phase, the study lasts 2 years from 7 December 2023 to 6 December 2025: 5 months of preparation, one year of data collection and 7 months of analysis and results diffusion. The

baseline HHS will occur for one month and the inclusion in the LS for 2 months. The endline HHS will also last one month. Data collection timeline is presented **Figure 4**. Details of the timeline study preparation and implementation are presented in the Gantt chart **Appendix 12**.

10 Financing/ Budget breakdown

The study is sponsored by ALIMA and funded by the Eleanor Crook Foundation and GAVI. The budget for the 2 years of this research project is presented **Table 7.**

Table 7 Budget breakdown of the NutriVax-Measles study

BUDGET LINE	COST IN USD
International research coordination	**413,290**
International HR costs	271,800
MEREVA clinical trial unit	141,490
National research human resources	**379,924**
National research and programmatic team	201,843
MoH staff incentives	137,805
Cost-effectiveness survey	20,138
Qualitative feasibility and acceptability survey	20,138
ALIMA international and national coordination team and support	**159,067**
Expatriate staff	120,469
National staff	38,598
Functioning costs	**81,525**
Office/rent house	18,786
Maintenance costs	40,288
Consumables - Office Supplies - Software	4,868
Communication	9,679
Visibility	7,904
SQ-LNS and medical activities	**630,901**
Patient treatment	8,738
Health Structure Running Costs & Material	14,479
Consumable structure	10,310
Construction / Rehabilitation Structure	13,731
Training and Community Yobe	86,264
Drugs and medical material	497,379
Travels & transport	**77,535**
National and international flight and field mission	36,589
Vehicules	37,946
Equipment	**26,972**
Computers, laptops	14,490
Tablets	1,248
Solar System-Pharmacy warehouse	12,482
Indirect costs	**123,846**
TOTAL	**1,893,060**

11 References

1. World Health Organization. Immunization coverage [Internet]. [cité 8 févr 2024]. Disponible sur: https://www.who.int/news-room/fact-sheets/detail/immunization-coverage

2. 2022_Global_Nutrition_Report.pdf [Internet]. [cité 27 nov 2023]. Disponible sur: https://globalnutritionreport.org/documents/922/2022_Global_Nutrition_Report.pdf

3. World Health Organization. Immunization Nigeria 2023 country profile [Internet]. 2023 [cité 27 nov 2023]. Disponible sur: https://www.who.int/publications/m/item/immunization-nigeria-2023-country-profile

4. Mahachi K, Kessels J, Boateng K, Jean Baptiste AE, Mitula P, Ekeman E, et al. Zero- or missed-dose children in Nigeria: Contributing factors and interventions to overcome immunization service delivery challenges. Vaccine. 2 sept 2022;40(37):5433-44.

5. UNICEF W. UNICEF DATA. 2022 [cité 27 nov 2023]. Levels and trends in child mortality, United Nations Inter-Agency Group for Child Mortality Estimation (UN IGME), Report 2022. Disponible sur: https://data.unicef.org/resources/levels-and-trends-in-child-mortality/

6. Stewart CP, Wessells KR, Arnold CD, Huybregts L, Ashorn P, Becquey E, et al. Lipid-based nutrient supplements and all-cause mortality in children 6-24 months of age: a meta-analysis of randomized controlled trials. Am J Clin Nutr. 1 janv 2020;111(1):207-18.

7. Wessells KR, Arnold CD, Stewart CP, Prado EL, Abbeddou S, Adu-Afarwuah S, et al. Characteristics that modify the effect of small-quantity lipid-based nutrient supplementation on child anemia and micronutrient status: an individual participant data meta-analysis of randomized controlled trials. Am J Clin Nutr. 1 nov 2021;114:68S-94S.

8. Dewey KG, Arnold CD, Wessells KR, Prado EL, Abbeddou S, Adu-Afarwuah S, et al. Preventive small-quantity lipid-based nutrient supplements reduce severe wasting and severe stunting among young children: an individual participant data meta-analysis of randomized controlled trials. Am J Clin Nutr. 1 nov 2022;116(5):1314-33.

9. Prado EL, Arnold CD, Wessells KR, Stewart CP, Abbeddou S, Adu-Afarwuah S, et al. Small-quantity lipid-based nutrient supplements for children age 6–24 months: a systematic review and individual participant data meta-analysis of effects on developmental outcomes and effect modifiers. Am J Clin Nutr. 1 nov 2021;114:43S-67S.

10. Phelan K, Seri B, Daures M, Yao C, Alitanou R, Aly AAM, et al. Treatment outcomes and associated factors for hospitalization of children treated for acute malnutrition under the OptiMA simplified protocol: a prospective observational cohort in rural Niger. Front Public Health. 5 juill 2023;11:1199036.

11. Keats EC, Das JK, Salam RA, Lassi ZS, Imdad A, Black RE, et al. Effective interventions to address maternal and child malnutrition: an update of the evidence. Lancet Child Adolesc Health. mai 2021;5(5):367-84.

12. Aguayo VM, Baker SK, Dewey KG, Galasso E, Perry A, Sifri Z, et al. Benefits of small-quantity lipid-based nutrient supplements for child nutrition and survival warrant moving to scale. Nat Food. févr 2023;4(2):130-2.

13. Federal Ministry of Health Department of Family Health, Nutrition Division, Abuja. National Guidelines For the Prevention And Control of Micronutrient Deficiencies in Nigeria. 2021.

14. Hawkes C, Ruel MT, Salm L, Sinclair B, Branca F. Double-duty actions: seizing programme and policy opportunities to address malnutrition in all its forms. Lancet Lond Engl. 11 janv 2020;395(10218):142-55.

15. Bassani DG, Arora P, Wazny K, Gaffey MF, Lenters L, Bhutta ZA. Financial incentives and coverage of child health interventions: a systematic review and meta-analysis. BMC Public Health. 2013;13 Suppl 3(Suppl 3):S30.

16. Innocenti UO of R. UNICEF-IRC. 2023 [cité 27 nov 2023]. What works to increase uptake of childhood immunization: a rapid evidence assessment of the impact of interventions targeting caregivers, healthcare workers and communities. Disponible sur: https://www.unicef-irc.org/publications/1729-what-works-to-increase-uptake-of-childhood-immunization-a-rapid-evidence-assessment-of-the-impact-of-interventions-targeting.html

17. Reñosa MDC, Landicho J, Wachinger J, Dalglish SL, Bärnighausen K, Bärnighausen T, et al. Nudging toward vaccination: a systematic review. BMJ Glob Health. sept 2021;6(9):e006237.

18. Gibson DG, Ochieng B, Kagucia EW, Were J, Hayford K, Moulton LH, et al. Mobile phone-delivered reminders and incentives to improve childhood immunisation coverage and timeliness in Kenya (M-SIMU): a cluster randomised controlled trial. Lancet Glob Health. avr 2017;5(4):e428-38.

19. Ideas and insights. Impact of conditional cash transfers on routine childhood immunizations [Internet]. 2020 [cité 27 nov 2023]. Disponible sur: https://www.idinsight.org/publication/impact-of-conditional-cash-transfers-on-routine-childhood-immunizations-evidence-from-north-west-nigeria/

20. Banerjee AV, Duflo E, Glennerster R, Kothari D. Improving immunisation coverage in rural India: clustered randomised controlled evaluation of immunisation campaigns with and without incentives. BMJ. 17 mai 2010;340:c2220.

21. Noori N, Skrip LA, Oron AP, McCarthy KA, Proctor JL, Chabot-Couture G, et al. Potential Impacts of Mass Nutritional Supplementation on Measles Dynamics: A Simulation Study. Am J Trop Med Hyg. oct 2022;107(4):863-72.

22. Ruel-Bergeron J, Hurley K, Kapadia-Kundu N, Oemcke R, Chirwa E, Hambayi M, et al. Physical and sociocultural facilitators and barriers to access and utilization of a nutrition program in rural Malawi: a qualitative study. Ecol Food Nutr. 2018;57(5):405-24.

23. Macpherson H. Pragmatic clinical trials. Complement Ther Med. 2004;12(2-3):136-40.

24. Treweek S, Zwarenstein M. Making trials matter: pragmatic and explanatory trials and the problem of applicability. Trials. 3 juin 2009;10:37.

25. UK: Development Initiatives. 2022 Global Nutrition Report: Stronger commitments for greater action. Bristol, UK: Development Initiatives [Internet]. 2022 [cité 27 nov 2023]. Disponible sur: https://globalnutritionreport.org/documents/922/2022_Global_Nutrition_Report.pdf

26. Nigeria Nutrition Cluster, UNICEF. North-East Nigeria Nutrition & Food Security Surveillance (NFSS), Round 12 – August to September 2022, Final Report (December 2022) - Nigeria | ReliefWeb [Internet]. 2022 [cité 27 nov 2023]. Disponible sur: https://reliefweb.int/report/nigeria/north-east-nigeria-nutrition-food-security-surveillance-nfss-round-12-august-september-2022-final-report-december-2022

27. World Food Programme. Fill the Nutrient Gap [Internet]. 2023 [cité 27 nov 2023]. Disponible sur: https://www.wfp.org/publications/fill-nutrient-gap

28. Govt. Nigeria, Health Cluster, WHO. Northeast Nigeria Humanitarian Response: Health Sector Bulletin - August 2023 - Nigeria | ReliefWeb [Internet]. 2023 [cité 27 nov 2023]. Disponible sur: https://reliefweb.int/report/nigeria/northeast-nigeria-humanitarian-response-health-sector-bulletin-august-2023

29. World Health Organizatio. World Health Organization Vaccination Coverage Cluster Surveys: Reference Manual [Internet]. 2018 [cité 27 nov 2023]. Disponible sur: https://www.who.int/publications-detail-redirect/WHO-IVB-18.09

30. Hemming K, Kasza J, Hooper R, Forbes A, Taljaard M. A tutorial on sample size calculation for multiple-period cluster randomized parallel, cross-over and stepped-wedge trials using the Shiny CRT Calculator. Int J Epidemiol. 1 juin 2020;49(3):979-95.

31. Ballard T, Coates J, Swindale A, Deitchler M. Household Hunger Scale: Indicator Definition and Measurement Guide.

32. WHO, UNICEF. Indicators for assessing infant and young child feeding practices: definitions and measurement methods [Internet]. 2021 [cité 15 déc 2023]. Disponible sur: https://www.who.int/publications-detail-redirect/9789240018389

33. Damschroder LJ, Reardon CM, Opra Widerquist MA, Lowery J. Conceptualizing outcomes for use with the Consolidated Framework for Implementation Research (CFIR): the CFIR Outcomes Addendum. Implement Sci. 22 janv 2022;17(1):7.

34. Bradley EH, McGraw SA, Curry L, Buckser A, King KL, Kasl SV, et al. Expanding the Andersen Model: The Role of Psychosocial Factors in Long-Term Care Use. Health Serv Res. oct 2002;37(5):1221-42.

35. Levesque JF, Harris MF, Russell G. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. Int J Equity Health. 11 mars 2013;12:18.

36. Peh KQE, Kwan YH, Goh H, Ramchandani H, Phang JK, Lim ZY, et al. An Adaptable Framework for Factors Contributing to Medication Adherence: Results from a Systematic Review of 102 Conceptual Frameworks. J Gen Intern Med. 1 sept 2021;36(9):2784-95.

37. Holland L, Nelson ML, Westrich K, Campbell PJ, Pickering MK. The patient's medication access journey: a conceptual framework focused beyond adherence. J Manag Care Spec Pharm. déc 2021;27(12):10.18553/jmcp.2021.27.12.1627.

38. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci. 7 août 2009;4(1):50.

Appendices

Appendix 1 Population estimates according wards, health facilities and settlements in Karasuwa LGA, 2023

Ward	Health Facility	# Settlements	Total Pop	Total Pop <1 y (4%)
Bilal Jawa	Bukarti ***PHCC***	17	12,364	495
Bilal Jawa	Garin Ahmadu HP	6	3,206	128
Bilal Jawa	Zoro HP	7	4,130	165
Faji Ganari	Faji Ganari ***PHCC***	16	9,676	387
Faji Ganari	Kilbuwa HP	9	6,259	250
Garin Gawo	Garin Gawo ***PHCC***	22	8,054	322
Gasma	Gasma ***PHCC***	14	8,188	328
Gasma	Tabawa HP	5	4,809	197
Jajeri	Jajeri ***PHCC***	24	12,358	494
Jajeri	Boridi HP	23	3,605	144
Jajimaji	Jajimaji ***PHCC***	27	16,690	668
Jajimaji	Baderi HP	12	4 ,172	167
Karasuwa Galu	Karasuwa Galu ***PHCC***	19	8,752	350
Karasuwa Galu	Bularafi HC	15	5,607	224
Karasuwa Galu	Ladandi HP	8	3,634	145
Karasuwa Garin Guna	K Garin Guna ***PHCC***	24	10,443	418
Karasuwa Garin Guna	Kafetuwa HP	10	3,384	135
Karasuwa Garin Guna	Mattaphari HP	6	3,384	135
Wachakal	Wachakal ***PHCC***	12	11,525	461
Wachakal	Daban Giwa HC	7	4,920	197
Waro	Waro ***PHCC***	8	8,723	349
Waro	Karau Kaku HP	14	4,684	187

Total: 22 health facilities (10 Primary Health Care Centers (PHCC), 10 Health Posts (HP) and 2 Health Clinics (HC), 305 settlements.

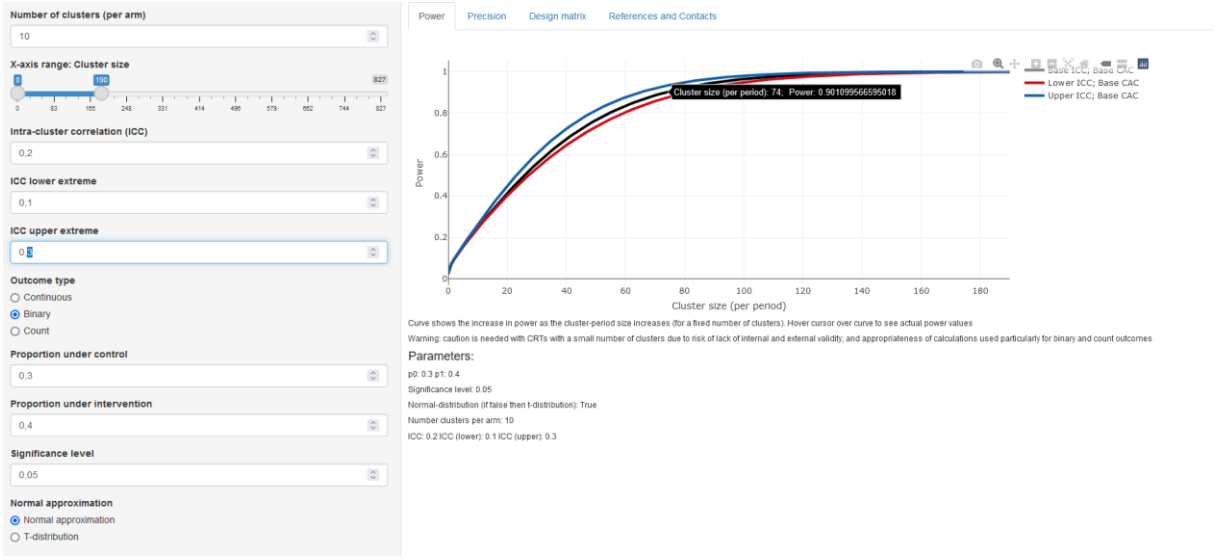
Appendix 2 Population estimates according wards, health facilities and settlements in Nuguru LGA, 2023

Ward	Health Facility	# Settlements	Total Pop	Total pop < 1 y
Afunori	Afunori ***PHCC***	10	6,879	275
Afunori	Dagirari HC	5	7,822	313
Afunori	Kurnawa HC	4	3,726	110
Afunori	Mirwa ***PHC***	4	3,105	124
Balanguwa	Balanguwa ***PHCC***	14	30,943	1,238
Bulabulin	Bulabulin ***PHCC***	11	25,988	1,040
Dabule	Dabule ***PHCC***	14	15,730	471
Dumsai	Army B. HC	5	7,064	283
Dumsai	Dumsai ***PHCC***	5	7,052	282

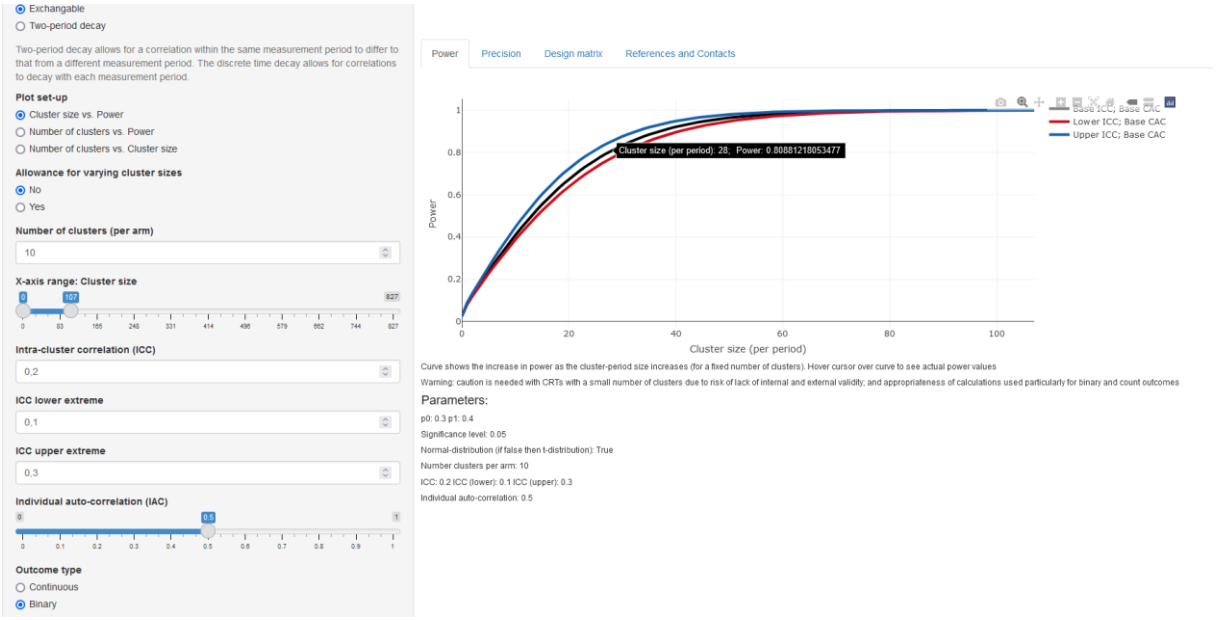
Hausari	Nguru FMC Haussari ***PHCC***	14	37,725	1 509
Maja Kura	Majakura ***PHCC***	27	16,839	674
Maja Jura	Kakori PHC	6	6,811	272
Ngarbi	Bombori ***PHCC***	6	17,119	685
Ngarbi	Ngarbi HC	6	7,920	317
Sabon Garin Kanuri	Bubari ***PHCC***	9	26,346	1,054
Tsohon Nguru	Lawan Ngoma PHC	6	11,550	562
Tsohon Nguru	Ngilewa ***PHCC***	12	17,673	707

Total: 158 settlements in 10 wards being served by 18 health facilities (10 PHCCs, 7 Health Clinics (HC/PHC), and 1 FMC)

Appendix 3 Sample size calculation details for the primary outcome



Appendix 4 Sample size calculation details for the main secondary outcome



Appendix 5 Study information note and informed consent form for the baseline and endline household surveys in English and Hausa

INFORMATION LETTER FOR CARETAKER(S)/LEGAL GUARDIAN(S) OF NutriVax-Measles STUDY PARTICIPANTS

Baseline and Endline Household Surveys, Oral consent

Hello. My name is _____. I work with ALIMA and the Ministry of Health. In Karasuwa, ALIMA recently supported programs in pediatric health and nutrition, including inpatient care, and reproductive health. ALIMA has not worked in Nguru LGA but had recently conducted a health assessment. We are conducting a survey to learn more about childhood vaccination and health indicators in two Local Government Areas (LGAs) (Karasuwa and Nguru).

WHY HAS MY CHILD BEEN PROPOSED TO PARTICIPATE IN THE NutriVax-Measles STUDY?

Your household has been selected to participate in an interview that may take up to 20 to 30 minutes. Your child is being offered to participate in this survey because he/she is aged from 12 to 23 months. Your child will participate **only if you, caretaker(s)/legal guardian, agree with his/her participation.**

WHAT WILL BE DONE TO MY CHILD IF I ACCEPT HIS/HER PARTICIPATION TO THE STUDY?

If you agree to your child's participation in this survey, you will just tell us orally your agreement. Then, I will interview you; ask information about your child's health, medical history, immunization status, and may ask you to show me your child's immunization card or the family health record, to see which vaccinations your child has had and when. I may also check the nutritional status of your child by measuring his/her middle upper arm circumference. If I ask you questions that you do not want to answer, please let me know and I will move on to the next question. You may also stop the interview at any time. If you decide not to participate in this survey or withdraw at any time.

WHAT ARE THE POSSIBLE ADVANTAGE AND DISADVANTEGES FOR MY CHILD IF HE/SHE PARTICIPATES?

Your participation is completely voluntary. There are no major risks associated with participating in this survey. You will not receive any financial benefits for participating. Your child will benefit from a clinical check-up during the survey. The research assistant will give you advice regarding vaccination and recommended Infant and Young Child Feeding (IYCF) practices.

If you do not want your child to participate or decide to stop the interview at any time, you will not be penalized in any way.

CONFIDENTIALITY

Your privacy is important to us. No part of this interview is recorded or filmed. If you agree to participate, some of the information you provide will be available on a public website that researchers and others can access without identifying you or your children. The information will be entered into a database and will NOT contain confidential information such as your name or the name of your village that could be used to

identify you. All data related to your personal information will be stored in a password protected electronic format.

Your child's information will be transferred and stored securely in a database located in the INSERM/ALIMA partnership structures (Dakar, Abidjan, Bordeaux) and at the National Nutrition Program (Nigeria). Only identified medical and study staff will be able to use or analyze your child's data. This data will be managed in accordance with European, French and Nigerian regulations on the protection of personal data. Some of the data collected during the study may be shared with other partners, in accordance with the agreements signed and the security rules mentioned below. We will publish or present the results of the study so that other interested parties can learn from our research.
Data will be stored for 15 years. However, you have the right to access your child's data or request that it be deleted from the database at any time. You also have a right of rectification, a right to refuse or limit the use of your child's data. To exercise these rights, or for any information relating to the use of your child's data, please contact the study's Data Protection Officer, whose contact details are given at the bottom of this document.

CONTACT FOR FURTHER INFORMATION

Do you have any questions about the survey or what I said? If, in the future, you have any questions about the survey or interview, or any concerns or complaints, or any questions about the rights of your child as a study participant, we invite you to contact the NGO ALIMA in Yobe by calling XXXXXXXXX, Field Coordinator Yobe State projects, ALIMA
Phone: +XXXXX.

Do you agree to participate in the survey? ☐ Yes ☐ No

If yes, Name …….

Participant ID: ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Barka dai. Sunana _____. Ina aiki da ALIMA da ma'aikatar lafiya. A Karasuwa, kwanan nan ALIMA ta tallafa wa shirye-shirye game da lafiyar yara da abinci mai gina jiki, gami da kula da marasa lafiya, da lafiyar haihuwa. ALIMA ba ta yi aiki a karamar hukumar Nguru ba amma kwanan nan ta gudanar da tantance lafiya. Muna gudanar da bincike don ƙarin koyo game da rigakafin yara da alamun kiwon lafiya a cikin ƙananan hukumomi biyu (LGAs) (Karasuwa da Nguru).

ME YA SA AKA SANYA YARO NA YA SHIGA BINCIKEN NutriVax-Measles?

An zaɓi yaronku ku don shiga cikin wata hira da za ta ɗauki kusan mintuna 20 zuwa 30. Ana ba wa yaronku damar shiga wannan binciken saboda yana da shekaru daga watanni 12 zuwa 23. Yaronku zai shiga **ne kawai idan kai, mai kula da shi/ita kun yarda da shigansa/ta.**

ME ZA A YIWA YARO NA IDAN NA YARDA SHI/TA SHIGA A CIKIN BINCIKEN?

Idan kun yarda da halartar yaranku a cikin wannan binciken, kawai za ku gaya mana yarjejeniyar ku ta baki. Sa'an nan, zan yi hira da ku; Tambayi bayani game da lafiyar ɗanku, tarihin lafiyar sa/ta, matsayin rigakafi, kuma ƙila ku nemi ku nuna mini katin rigakafi na ɗanku ko tarihin lafiyar iyali, don ganin irin rigakafin da yaronku ya yi da kuma lokacin. Hakanan zan iya duba yanayin abinci na ɗanku ta hanyar auna kewayen hannunsa na sama. Idan na yi muku tambayoyin da ba ku son amsawa, don Allah ku sanar da ni kuma zan ci gaba zuwa tambaya ta gaba. Hakanan zaka iya dakatar da hirar a kowane lokaci. Idan kun yanke shawarar kada ku shiga wannan binciken ko janyewa a kowane lokaci kuna da 'yenci yin haka ba tare da wata matsala ba.

MENENE AMFANI KO AKASIN HAKA GA YARO NA IDAN YA SHIGA BINCIKEN?

Shigar da ku gaba ɗaya na son rai ne. Babu manyan haɗari da ke da alaƙa da shiga cikin wannan binciken. Ba za ku sami fa'idodin kuɗi don shiga ba. Yaronku zai amfana daga duban asibiti yayin binciken. Mataimakin ma aikacin binciken zai ba ku shawara game da allurar rigakafi da shawarwarin ayyukan ciyar da jarirai da ƙananan yara (IYCF).

Idan ba ku son yaronku ya shiga ko yanke shawarar dakatar da hirar a kowane lokaci, ba za a hukunta ku ta kowace hanya ba.

Amana

Amanar ku yana da mahimmanci a gare mu. Babu wani bangare na wannan tattaunawar da aka nada ko dauka. Idan kun amince ku shiga, wani banagaren binciken za'a sa shi yanar gozi domin masana da al'umma su amfana ba tare da sanin ku ko yaranku ba.. Za'a tara bayanan a rumbun ajiye bincike ba tare da sa sunanku ko sunan kauyenku ba domin kada a gane ko suwa ne ne ku.. Duk bayanan da ke da alaƙa da keɓaɓɓen bayaninka za a adana su a cikin tsarin lantarki mai kariyar kalmar sirri.

Duk wani bayani akan yaranku za'a tattarashi a adanashi cikin rumbun bayanai da ke cikin tsarin haɗin gwiwar INSERM/ALIMA (Dakar, Abidjan, Bordeaux) da kuma hukumar Abinci ta Nigeria. Amintattu

Ma'aikatan lafiya da masu bincike ne kawai za’a bawa dama suyi nazari akan bayanan yaranku. Wannan bayanin za’a sarrafa shi akan ka’idojin da Faransa, Turai, da Nigeria suka gindaya na sirranta bayanan bincike.. Zai yiwu a bada bayanin wani banagaren binciken zuwa ga wasu abokan aikinmu a bisa wasu yarjejeniyar da muka dauka da Su a bayanai masu zuwa.. Zamu buga sakamakon binciken domin mutane su amafana. Za a adana bayanan tsawon shekaru 15. Kuna da damar tasarrufi da bayanan yaronku Ko ku sa a cire yaronku daga rumbun adana bayanai. Kuma kuna da damar takaita amfani Ko hana bayanan yaonku. Zaku iya cimma wannan damar Ko wani Karin bayani ta tuntubar mu a adireshi ko lamabar wayar da a ka bayar a kasar takardar nan.

TUNTUBE DON KARIN BAYANI

Kuna da wasu tambayoyi game da binciken ko abin da na ce? Idan, nan gaba, kuna da tambayoyi game da binciken ko hira, ko wata damuwa ko korafe-korafe, ko wasu tambayoyi game da haƙƙin ɗanku a matsayin wanda za’ayi amfani da bayyanan sa/ta domin bincike, muna gayyatar ku da ku tuntuɓi Hukuma Mai Zaman Kanta ta ALIMA da ke Yobe ta hanyar kiran XXXXXXXXX, Field Coordinator Yobe State services, ALIMA
Waya: +XXXX.

Shin kun yarda ku shiga cikin binciken? □Ee □A'a

Idan ee, Suna …….

Dan takara ID: ⌊__⌋ ⌊__⌋__⌋ ⌊__⌋__⌋

Appendix 6: Study information note and Informed Consent Form for the longitudinal follow-up survey in English and Hausa

INFORMATION LETTER FOR CARETAKER(S)/ LEGAL GUARDIAN(S) OF NutriVax-Measles STUDY PARTICIPANTS

Longitudinal follow-up survey

Dear caretaker(s)/legal guardian,

The child under your care, whom we will refer as **your child, is invited to participate in the research study called NutriVax-Measles.**

This information sheet is a document written for you to help you understand the study and make a decision to participate or not. You have the right to take some time to think and discuss about this study.

There may be words that you do not understand, or information that is unclear or confusing. If you have any question, now or later, you can ask the research assistant.

WHAT IS A HEALTH RESEARCH STUDY?

A health research study is a way to find out new information about a disease. Children do not participate in a research study if you, caretaker(s)/legal guardian, do/does not want him or her to be included.

WHAT IS THE PURPOSE OF THE NutriVax-Measles STUDY?

The aim of this study is to see whether adding a nutritional supplement called SQ-LNS (Small-Quantity Lipid-Based Nutrient Supplements) helps to increase immunization coverage in children.

Indeed, we already know, from many studies, that these nutritional products prevent malnutrition, anemia, decrease mortality risk and improve the development of children aged 6-23 months.

In this NutriVax-Measles study, we would like to assess whether SQ-LNS supplementation delivered at health facilities could also improve vaccination coverage and others health indicators. Indeed, increasing vaccination in children decreases morbidity and mortality risk due to infant infections.

HOW MANY CHILDREN WILL PARTICIPATE IN THE STUDY?

This study will be conducted in two Local Government Areas (LGAs) (Karasuwa and Nguru), and will include 600 children in a home follow-up, every four months, during one year.

WHY HAS MY CHILD BEEN PROPOSED TO PARTICIPATE IN THE NutriVax-Measles STUDY?

Your child is being offered to participate in this study because he/she is aged from 6 to 12 months and lives in Karasuwa/Nguru LGA.

In Karasuwa, ALIMA recently supported programs in pediatric health and nutrition, including inpatient care, and reproductive health. ALIMA has not worked in Nguru LGA but had recently conducted a health assessment.

DOES MY CHILD HAVE TO PARTICIPATE?

Your child will participate **only if you, caretaker(s)/legal guardian, agree with his/her participation**. If you accept that he/she participates to the study, you will first sign a consent form before any procedures are done.

If you do not want your child to participate in the study, he/she will continue to receive the best possible care according to the National Guidelines.

Even after signing to participate, you may change your mind at any time and ask to stop participating in the study (withdrawal). In any case, your child will continue to benefit from the routine standard care without losing any rights as a patient in this hospital. We only ask you to inform the study research assistant about your decision as soon as possible.

Data collected before your decision of withdrawal may be used for the study, unless you explicitly request for data removal.

WHAT WILL BE DONE TO MY CHILD IF I ACCEPT HIS/HER PARTICIPATION TO THE STUDY?

If you agree to your child's participation in the study, he/she will be followed-up for 12 months. The following visits will be conducted:

- **Inclusion visit (the first visit)**

After you have signed the informed consent form, the study research assistant will ask information about your child's health, medical history, immunization status, and may ask you to show him/her your child's immunization card or the family health record, to see which vaccinations your child has had and when. The study research assistant will ask you questions about food in your household., about dietary diversity in your children and some information about the family (number of brother and sisters for instance).

- **Follow up visits**

The study research assistant will return to see you and your child at home every 4 months after inclusion (the first visit) meaning at 4, 8 months and 12 months after inclusion.
He/she will ask you about your child's health since the previous visit, and whether your child has received any new vaccines since the last visit and checked the clinical conditions of your child
During these visits, the study research assistant will also ask you questions about access to food, and about dietary diversity in your household to see if there's changes since last time.

DURATION OF THE STUDY

If you agree to your child's participation, the duration of the study will be 12 months from the day he/she is enrolled in the study (inclusion visit).

You will have to respect the appointments given to you by your study research assistant at your home.

WHAT ARE THE POSSIBLE ADVANTAGES AND DISADVANTEGES FOR MY CHILD IF HE/SHE PARTICIPATES?

Your child will benefit from 12 months of clinical check-up during follow-up visits. The research assistant will also give you advice regarding vaccinations and recommended Infant and Young Child Feeding (IYCF) practices including the need to consume a diverse nutritious diet and continued breastfeeding.

For parent/legal representant of a child living in a ward randomized in NutriVax-Measles arm: when you will go to the Primary Health Care Center (PHCC) you will receive a ration of SQ-LNS for between 1 and 3 months over the course of the year following an update to your child's vaccination status. Your child's participation will help us evaluate whether this strategy can improve the vaccination of a greater number of children.

For parent/legal representant of a child not living in a ward randomized in NutriVax-Measles arm: thanks to your child's participation we will be able to compare the vaccine coverage between the wards where SQ-LNS supplementation program is implemented with those where it is not. In case of success of this program, we will advocate and do our best for scaling-up this program in every wards of the LGAs and in other location in Nigeria and abroad.

There are no major risks associated with this research. Participation in the study is completely free of charge.

CONFIDENTIALITY

During each visit, data on your child's immunization status, nutritional status and clinical condition will be recorded in a data collection tool. This tool may only be examined by authorized medical and scientific staff, or by persons authorized by the health authorities. These persons will keep the information strictly secret. This information will be analyzed anonymously; the names of children or parents or guardians will not be recorded in this tool. As soon as your child is included in the study, he/she will be identified by a code in which his/her names and address will not appear, so that he/she cannot be recognized.

Protecting and sharing information about your child

During study visits, the study research assistant collects information on your child's health and records it on tablets accessible only with a password.

Your child's information, known as "data", will be transferred and stored securely in a database located in the INSERM/ALIMA partnership structures (Dakar, Abidjan, Bordeaux) and at the National Nutrition Program (Nigeria). Only identified medical and study staff will be able to use or analyze your child's data. This data will be managed in accordance with European, French and Nigerian regulations on the protection of personal data.

Some of the data collected during the study may be shared with other partners, in accordance with the agreements signed and the security rules mentioned below. We will publish or present the results of the study so that other interested parties can learn from our research. Confidential information will not be shared, and your child's identity will never be mentioned.

Data will be stored for 15 years. However, you have the right to access your child's data or request that it be deleted from the database at any time. You also have a right of rectification, a right to refuse or limit the use of your child's data.

To exercise these rights, or for any information relating to the use of your child's data, please contact the study's Data Protection Officer, whose contact details are given at the bottom of this document.

CONTACT FOR FURTHER INFORMATION

You can ask any questions or request additional information about the study, about your child's data to:

Name …….
<Professional address>
<Phone>
<Email>

If you have any questions about the rights of your child as a study participant or have complaints about this study, please contact the <Ethics Committee> that verified the study at:

<Institution name>
<Professional address>
<Phone>
<Email>

INFORMED CONSENT FORM FOR CARETAKERS/LEGAL GUARDIAN OF NutriVax-Measles STUDY PARTICIPANTS
Longitudinal follow-up

International version n°1.0 – 2024/0X/XX

I, <NAME AND SURNAME IN CAPITAL LETTER>, confirm that:

- I have received the notice of information;
  - ❑ I have read and I understood it
  - ❑ It was read to me and I understood it.
  - ❑ It was translated for me and I understood it.
- I have had the opportunity to ask questions to the study research assistant whose name and signature are shown below, and any questions that I have asked have been answered to my satisfaction.
- I have had the possibility to take some time to make my decision between information and consent.

If Caretakers/legal guardian

❑ Furthermore, as caretaker/legal guardian, I certify that I usually assume responsibility for the child's custody, care, and maintenance as

- ❑ A family member (specify: .....)
- ❑ Other (specify: .....)
- ❑ The child's caregiver formally mandated by the Director of an institution/orphanage;

And that the child is not living with his mother and/or father.

I freely agree to the participation of my child in this study according to the terms defined in this information sheet ❑ **Yes** ❑ **No**

Name of participating Child:
……..

Name of Caretaker/legal guardian
……

Date ⌊__⌋⌊__⌋ ⌊__⌋⌊__⌋ ⌊__⌋⌊__⌋⌊__⌋⌊__⌋ Signature of parent(s):

Participant ID: ⌊__⌋⌊__⌋ ⌊__⌋⌊__⌋⌊__⌋ ⌊__⌋⌊__⌋⌊__⌋

<u>If illiterate</u>

A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Parent(s)/guardian(s) who are illiterate should include their thumbprint as well.

I have witnessed the accurate reading of the consent form to the caretaker(s)/legal guardian(s) of the child, and that they have had the opportunity to ask questions. I confirm that caretaker(s)/legal guardian(s) have given consent freely.

Name of witness:
……
……

Date ⌊__⌋⌊__⌋ ⌊__⌋⌊__⌋ ⌊__⌋⌊__⌋⌊__⌋⌊__⌋

Signature of witness AND thumbprint of caretaker(s) or legal guardian(s)

I, the NutriVax-Measles study research assistant, hereby certify that after fully explaining the relevant details of this study to the parent(s)/guardian(s) named above, I believe they have understood and have knowingly given their consent.
I solemnly promise I will respect all the terms and conditions mentioned in this consent form, keep full confidentiality, and respect the individual's rights and freedom as well as the requirements of the scientific work.

Name of study research assistant taking consent:
……

Date ⌊__⌋⌊__⌋ ⌊__⌋⌊__⌋ ⌊__⌋⌊__⌋⌊__⌋⌊__⌋ Signature:

TAKARDAR BAYANAI GA MASU BADA KULA GA YARAN DA ZA'AYI BINCIKE A AKANSU A BINCIKEN Nutri-Vax Measles

Dogon bibiya

Zuwa ga masu kulawa, ko iyaye,

Yaron da ke ƙarƙashin kulawar ku, wanda za mu kira shi **ɗan ku, an gayyace shi don shiga cikin binciken bincike da ake kira NutriVax-Measles.**

Wannan takardar bayanin takarda ce da aka rubuta don taimaka muku fahimtar binciken kuma ku yanke shawarar shiga ko a'a. Kuna da 'yancin ɗaukar lokaci don yin tunani da tattaunawa game da wannan binciken.

Akwai yuwuwar samun kalmomin da ba ku fahimta ba, ko bayanan da ba su da tabbas ko kuma masu ruɗani. Idan kuna da kowace tambaya, yanzu ko kuma daga baya, zaku iya tambayar mataimakin mai bincike.

MENENE BINCIKEN KIWON LAFIYA NA RIGAKAFIN Kyanda TA Nutri-Vax ?

Nazarin binciken lafiya hanya ce ta gano sababbin bayanai game da cututtuka. Ba za'a sa Yyara shiga cikin binciken ba idan ku, masu kula da su ko iyayen su baku amince ba.

MENENE MANUFAR NAZARIN BINCIKEN NutriVax-Measles?

Manufar wannan binciken shine don ganin ko ƙara ƙarin kayan abinci mai gina jiki da ake kira SQ-LNS (Karamin nau'in abinci mai gina jiki da ke dauke da sanadarin kitse) yana taimakawa wajen ƙara yawan alluran rigakafi da da yara ke karba.

Lallai, mun rigaya mun sani, daga binciken da yawa, cewa waɗannan samfuran abinci masu gina jiki suna kare kamuwa daga larurar cutar tamowa a yara, Karancin jini a jiki, rage haɗarin mace-mace da cututtukan yara masu shekaru wata 6 zuwa wata23.

A cikin wannan binciken na NutriVax-Measles, muna so mu tantance ko ƙarin nau'in abinci mai gina jiki da ke dauke da sanadarin kitse (wato SQ-LNS a turance) da aka bayar a cibiyoyin kiwon lafiya zai iya inganta ɗaukar allurar rigakafi da sauran alamun ci gaba a bangaren kiwon lafiyar yara. Lallai, karuwar allurar rigakafi a cikin yara yana rage cututtuka da haɗarin mace-mace saboda cututtukan jarirai.

YARAN NAWA NE ZA SU SHIGA BINCIKEN?

Za a gudanar da wannan binciken ne a kananan hukumomi biyu (LGAs) (Karasuwa da Nguru), kuma za a hada da yara 600 a cikin gidajen da za'a yi binciken, duk bayan watanni hudu, a cikin shekara guda.

ME YA SA AKE SO A SANYA YARO NA YA SHIGA NAZARI NA NutriVax-Measles?

Ana ba da yaronku damar shiga wannan binciken saboda yana da shekaru daga watanni 6 zuwa 12 kuma yana zaune a karamar hukumar Karasuwa/Nguru LGA.

A Karasuwa, kwanan nan ALIMA ta tallafa wa shirye-shirye game da lafiyar yara da abinci mai gina jiki, gami da kula da marasa lafiya da ke kwance a asibiti, da lafiyar haihuwa. ALIMA ba ta yi aiki a karamar hukumar Nguru ba amma kwanan nan ta gudanar da tantance lafiya.

SHIN YARO NA DOLE YA SHIGA?

Yaronku zai shiga **ne kawai idan ku, mai kula da (masu kula)/masu kula da yaron a bisa tsarin doka , kun yarda da shigansa/ta** . Idan kun yarda cewa shi/ta ya shiga cikin binciken, za ku fara sanya hannu kan takardar yarda kafin a yi kowace tambaya ko bincike.

Idan ba ku son yaronku ya shiga cikin binciken, zai / zata ci gaba da samun kulawa mafi kyau bisa ga tsarin Kasa na kulawa da lafiyar yara.

Ko da bayan sanya hannu don shiga, kuna iya canza ra'ayin ku a kowane lokaci kuma ku nemi dakatar da shiga cikin binciken (janyewa). A kowane hali, yaronku zai ci gaba da amfana daga daidaitattun kulawa na yau da kullum ba tare da rasa wani haƙƙi a matsayin majiyyaci a wannan asibitin ba. Muna rokonka kawai ka sanar da mataimakin mai bincike game da shawarar da ka yanke da wuri-wuri.

Ana iya amfani da bayanan da aka tattara kafin yanke shawarar janyewa don binciken, sai dai idan kun nemi cire bayanai a sarari.

ME ZA'A YIWA YARO NA IDAN NA YARDA SHI/TA SHIGA BINCIKEN?

Idan kun yarda da sa hannun yaronku a cikin binciken, za a bi shi/ta na tsawon watanni 12. Za a gudanar da ziyarorin bibiya kamar haka:

- **Ziyarar haɗawa (ziyarar farko)**

Bayan kun sanya hannu kan takardar yarda da aka sanar, mataimakin mai bincike zai tambayi bayanai game da lafiyar ɗanku, tarihin lafiyarsa , matsayin rigakafi, kuma yana iya tambayar ku da ku nuna masa/ta katin rigakafi na ɗanku ko bayanan lafiyar iyali, don ganin wane irin rigakafin Yaronku ya samu kuma yaushe. Mataimakin binciken zai yi muku tambayoyi game da abinci a gidanku., game da bambancin abinci a cikin yaranku da wasu bayanai game da iyali (yawan yan'uwa maza da mata misali).

- **Ci gaba da ziyarar**

Mataimakin mai binciken zai dawo don ganin ku da yaronku a gida kowane watanni 4 bayan haɗawa (ziyarar farko) ma'ana a watanni 4, 8 da watanni 12 bayan haɗawa.
Zai/zata tambaye ku game da lafiyar ɗanku tun ziyarar da ta gabata, da kuma ko ɗanku ya sami sabon/sabbin alluran rigakafi tun ziyarar ta ƙarshe kuma ta duba yanayin lafiyar ɗanku.
A yayin waɗannan ziyarce-ziyarcen, mataimakin mai binciken zai kuma yi muku tambayoyi game da samun abinci, da kuma game da bambancin abinci a cikin gidan ku don ganin ko akwai canje-canje tun daga ziyarar da ta gabata/ziyarar baya.

LOKACIN DA BINCIKEN ZAI DAUKA

Idan kun yarda da shigar danku cikin binciken, tsawon lokacin binciken zai kasance watanni 12 daga ranar da aka shigar da shi cikin binciken (ziyarar haɗawa).

Dole ne ku mutunta alƙawuran da mataimakin mai bincike ya ba ku a lokacin da ya ziyarce ku a gidanku.

MENENE AMFANI KOKO AKASIN HAKA GA YARO NA IDAN YA SHIGA CIKIN BINCIKEN?

Yaronku zai amfana daga duban asibiti na tsawon watanni 12 yayin ziyarar da ya biyo baya. Mataimakin MAI binciken zai kuma ba ku shawara game da alluran rigakafi da shawarwarin ayyukan ciyar da jarirai da ƙananan yara (IYCF) gami da buƙatar cin abinci mai gina jiki iri-iri da ci gaba da shayarwa.

Don iyaye/wakilin yaro a bisa doka da ke zaune a cikin Unguwar da za'ayi binciken NutriVax-Measles : lokacin da za ku je Cibiyar Kula da Lafiya ta matakin Farko (PHCC) za ku sami rabon SQ-LNS tsakanin watanni 1 zuwa 3 a tsawon shekara duk lokacin da kuka zo sabunta rigakafin yaranku . Kasancewar shigar yaranku cikin wannan bincike zai iya taimaka mana wajen tantance ko wannan dabarar zata iya inganta yawan yaran da ke karbar rigakafi.

Don iyaye / wakilin yaron a bisa doka da ba ya zaune a cikin gundumar da ake binciken s NutriVax-Measles : godiya ga sa hannu na yaranku za mu iya kwatanta abin da ke tattare da maganin alurar riga kafi tsakanin sassan da aka aiwatar da shirin SQ-LNS tare da wadanda ba'a aiwatar ba. Idan har aka samu nasarar wannan shirin, za mu bayar da shawarwari tare da yin iyakacin kokarinmu wajen inganta wannan shiri a kowace unguwa ta karamar hukumar da sauran wurare a Najeriya da kasashen waje.

Babu manyan hadari da ke tattare da wannan binciken. Shiga cikin binciken gaba daya kyauta ne.

AMINCI

Yayin kowace ziyara, za a rubuta bayanai kan matsayin rigakafin yaronku, matsayin abinci masu gina jiki da yake ci da kuma yanayin lafiyarsa a cikin kayan aikin tattara bayanai. Ma'aikatan kiwon lafiya da na bincike ne kawai da kuma wadanda aka basu izni daga hukumomin lafiya ne kadai zasu iya duba bayanan da ke cikin wannan kayan aiki na tattara bayanai . Wadannan mutanen za su kiyaye bayanan a asirce. Za a yi nazarin wannan bayanin ba tare da suna ba; Ba za a rubuta sunayen yara ko iyaye ko masu kula da su a cikin wannan kayan aikin ba. Da zaran an saka yaronka a cikin binciken, za a gane shi da lambar da ba za a bayyana sunayensa da adireshinsa ba, ta yadda ba za a iya gane shi ba.

Kare da raba bayanai game da yaranku

Yayin ziyarar binciken, mataimakin mai binciken zai tattara bayanai kan lafiyar danku kuma ya rubuta su a kan allunan da ake samun damar amfani da su kawai tare da kalmar sirri.

Za a canja wurin adana bayanan yaranku, wadanda aka fi sani da "data", kuma a adana su cikin aminci a cikin rumbun adana bayanai da ke cikin tsarin hadin gwiwa na INSERM/ALIMA (Dakar, Abidjan, Bordeaux) da kuma Cibiyar Abinci ta Kasa (Nigeria). Ma'aikatan kiwon lafiya da bincike kawai da aka ba izni o za su iya amfani ko tantance bayanan danku. Za a gudanar da wannan bayanan ne daidai da dokokin Turai, Faransa da na Najeriya kan kare bayanan sirri.

Ana iya raba wasu bayanan da aka tattara yayin binciken tare da wasu abokan tarayya, daidai da yarjejeniyoyin da aka sanya hannu da kuma ka'idojin tsaro da aka ambata a kasa. Za mu buga ko gabatar da sakamakon binciken domin sauran masu sha'awar suyi koyi da bincikenmu. Ba za a raba bayanin sirri ba, kuma ba za a taba ambaton ainihin danku ba.

Za a adana bayanan tsawon shekaru 15. Koyaya, kuna da damar isa ga bayanan danku ko neman a share su daga ma'ajin bayanai a kowane lokaci. Hakanan kuna da hakkin gyarawa, hakkin ki ko iyakance amfani da bayanan danku.

Don amfani da wadannan hakkokin, ko don kowane bayani da ya shafi amfani da bayanan danku, da fatan za a tuntubi Jami'in Kariya na binciken, wanda aka ba da bayanan tuntubar sa a kasan wannan takaddar.

TUNTUBE DON KARIN BAYANI

Kuna iya yin kowace tambaya ko neman ƙarin bayani game da binciken, game da bayanan ɗanku zuwa:

Suna
……
……
<Adireshin sana'a>
<waya>
<Imel>

Idan kuna da wasu tambayoyi game da haƙƙin ɗanku a matsayin ɗan nazarin ko kuna da gunaguni game da wannan binciken, tuntuɓi <Kwamitin Da'a> wanda ya tabbatar da binciken a:

<sunan cibiyar>
<Adireshin sana'a>
<waya>
<Imel>

TAKADAR YARDAR SA HANNU DA MASU KULA DA YARO/WAKILIN YARO BISA DOKA ZAI SA HANNU NA BINCIKEN NUTRI-VAX MEASLES DA ZA'AYI
Dogon bibiya

Ni, < SUNA DA SUNAN MAHAIFI DA MAYAN HARUFFAA > , na tabbatar da cewa:

- Na sami sanarwar bayanin;
  - ❑Na karanta kuma na gane shi
  - ❑Aka karanta min kuma na fahimce shi.
  - ❑An fassara mani kuma na gane shi.
- Na sami damar yin tambayoyi ga mataimakin mai binciken wanda sunansa da sa hannun sa aka nuna a ƙasa, kuma duk tambayoyin da na yi an amsa mini da gamsuwa.
- Na sami damar ɗaukar lokaci don yanke shawara tsakanin bayani da yarda.

<u>Idan Mai Kula da yaro/Mai kula bisa doka</u>

❑ Bugu da ƙari, a matsayina na mai kula da yaro/mai kula da yarobisa doka, na ba da tabbacin cewa yawanci ina ɗaukar alhakin kulawa, kulawa, da kula da yaron kamar yadda

- ❑ Dan uwa (kayyade: ....)
- ❑ Sauran (bayyana: ....)
- ❑ Darakta na wata cibiya/gidan marayu ya ba da izini ga mai kula da yaro;

Kuma cewa yaron baya zama tare da mahaifiyarsa da/ko mahaifinsa.

Na yarda da sa hannun yaro na a cikin wannan binciken bisa ga sharuddan da aka ayyana a cikin wannan takardar bayanin ❑Ee ❑A'a

Sunan Yaro mai halarta:
……
……

Sunan Mai Kulawa/Mai kula bisa doka
……

Kwanan wata ⌞__⌟ Sa hannun iyaye:

Idan wanda bai iya rubutu da karatu bane *Dan takara ID:* ⌞_⌟⌞_⌟⌞_⌟⌞_⌟

Dole ne mashaida wanda ya iya rubutu da karatu ya sa hannu (idan zai yiwu, yaron/yarinyar ya/ta zaɓi wannan mutumin kuma kada ya kasance yana da alaƙa da wannanbincike). Iyaye(s)/masu kulawa (s) waɗanda ba su iya karatu da rubutu ba yakamata su dangwala ɗan yatsan hannu su..

Na shaida ingantaccen karatun fam ɗin yarda ga mai kula da (masu)/masu doka waliyin yaron, da kuma cewa sun sami damar yin tambayoyi. Na tabbatar da cewa masu kulawa (masu)/masu kula da yaro bisa doka sun ba da izini kyauta.

Sunan shaida:
…… …… ……

Kwanan wata ⌞____⌟

Sa hannun shaida DA babban yatsan yatsan mai kulawa ko waliyyai na doka

Ni, mataimakin mai binciken na NutriVax-Measles, na ba da tabbacin cewa bayan cikakken bayanin da suka dace na wannan binciken ga iyaye (masu)/masu kula (s) mai suna a sama, na yi imani sun fahimta kuma sun ba da izinin da saninsu.

Na yi alkawari da gaske zan mutunta duk sharuɗɗan da aka ambata a cikin wannan fom ɗin yarda, kiyaye cikakken sirri, da mutunta haƙƙoƙin mutum da 'yancinsa da kuma buƙatun aikin kimiyya.

Sunan mataimakin binciken binciken da ke karɓar izini:
……

Kwanan wata ⌞_⌟⌞_⌟ Sa hannu:

Appendix 7: Written informed consent for the qualitative feasibility and acceptability survey

INFORMATION LETTER FOR CARETAKER(S) OF CHLDREN 6-23 MONTHS, HEALTH PROVIDERS, COMMUNITY HEALTH WORKERS, A COMMUNITY REPRESENTATIVE
Feasibility survey

Dear Madam, Sir,

My name is _____. I work with the NGO ALIMA and the Ministry of Health. We are conducting a study called NutriVax-Measles in Karasuwa and Nguru Local Government Areas.

You are a health worker from the Ministry of Public Health, a community health worker, a community representative, a parent of a child aged between 6 and 23 months. We would like to hear your views on the strategy tested in the NutriVax-Measles research being carried out in your ward.

We would like you to take part in one aspect of this research, which involves assessing the feasibility of the health intervention being evaluated in this study.

This information sheet is a document written for you to help you understand the study and make a decision to participate or not in the NutriVax-measles feasibility survey. You have the right to take some time to think and discuss about this study.

WHAT IS THE PURPOSE OF THE NUTRIVAX-MEASLES STUDY?

The aim of NutriVax-Measles study is to assess whether SQ-LNS supplementation delivered at health facilities could also improve vaccination coverage and others health indicators in children aged 6-23 months. Indeed, increasing vaccination in children decreases morbidity and mortality risk due to infant infections.

WHAT IS THE PURPOSE OF THE NUTRIVAX-MEASLES FEASIBILITY SURVEY?

Within this study, we are conducting a feasibility survey in order to identify any obstacles or facilitators to the provision of child vaccination activities and nutritional supplementation in health centres. Thanks to your points of view and the results of this feasibility survey, we will able to make improvements to these cares offer.

HOW IS THIS FEASIBILITY SURVEY ORGANIZED?

The data are collected through individual interviews with health workers from the Ministry of Public Health, community health workers, community representatives, parents of a child aged between 6 and 23 months. These interviews will take the form of an informal discussion lasting around 30 minutes. They will be conducted face-to-face, and will focus on the perceptions and experiences of those interviewed with regard to the strategy evaluated as part of the NutriVAx-Measles research. It should be noted that the interviews conducted during this sub-study may be recorded, with the participant's agreement.

The data will be collected by interviewers who will not be part of the medical team. Participation in the interviews will be on a voluntary basis. You will therefore be entirely free to confirm or refuse to take part, as well as to end your participation at any time during the interview.

WHAT ARE THE BENEFITS AND RISKS FOR YOU TO PARTICIPATE?

Your participation is completely voluntary. You will not receive any financial benefits for participating. The risks are limited, given that the research activities are limited to interviews. The interviewers will, however, ensure that you feel comfortable answering and may interrupt the interview if necessary. We will also make every effort to conduct these interviews as discreetly as possible.

CONFIDENTIALITY

Your privacy is important to us. If you agree to participate, some of the information you provide will be available on a public website that researchers and others can access without identifying you. The information will be entered into a database and will NOT contain confidential information such as your name or the name of your village that could be used to identify you. All data related to your personal information will be stored in a password protected electronic format.

Your informations will be transferred and stored securely in a database located in the INSERM/ALIMA partnership structures (Dakar, Abidjan, Bordeaux) and at the National Nutrition Program (Nigeria). Only identified study staff will be able to use or analyze your data. This data will be managed in accordance with European, French and Nigerian regulations on the protection of personal data. Some of the data collected during the study may be shared with other partners, in accordance with the agreements signed and the security rules mentioned below. We will publish or present the results of the study so that other interested parties can learn from our research.
Data will be stored for 15 years. However, you have the right to access your child's data or request that it be deleted from the database at any time. You also have a right of rectification, a right to refuse or limit the use of your child's data. To exercise these rights, or for any information relating to the use of your child's data, please contact the study's Data Protection Officer, whose contact details are given at the bottom of this document.

CONTACT FOR FURTHER INFORMATION

Do you have any questions about the survey or what I said?

If, in the future, you have any questions about the survey or interview, or any concerns or complaints, or any questions about the rights of your child as a study participant, we invite you to contact the NGO ALIMA in Yobe by calling XXXXXXXXX, Field Coordinator Yobe State projects, ALIMA
Phone: +XXXXX.

INFORMED CONSENT FORM FOR CARETAKER(S) OF CHLDREN 6-23 MONTHS, HEALTH PROVIDERS, COMMUNITY HEALTH WORKERS

Feasibility survey

International version n°1.0 – 2024-XX-XX

I, <NAME AND SURNAME IN CAPITAL LETTER>, confirm that:

- I have received the notice of information;

  ❑ I have read and I understood it
  ❑ It was read to me and I understood it.
  ❑ It was translated for me and I understood it.

- I have had the opportunity to ask questions to the study research assistant, and any questions that I have asked have been answered to my satisfaction.

- I have had the possibility to take some time to make my decision between information and consent.

I freely agree to participate in this survey according to the terms defined in this information sheet
❑ Yes ❑ No
Name of participant:
…….

Date ⌊__⌋⌊__⌋⌊__⌋⌊__⌋ Signature :

If illiterate *Participant ID:* ⌊__⌋⌊__⌋⌊__⌋⌊__⌋⌊__⌋⌊__⌋

A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Participants who are illiterate should include their thumbprint as well.

I have witnessed the accurate reading of the consent form to the caretaker(s)/legal guardian(s) of the child, and that they have had the opportunity to ask questions. I confirm that caretaker(s)/legal guardian(s) have given consent freely.

Name of witness:
……
……

Date ⌊__⌋⌊__⌋⌊__⌋⌊__⌋

Signature of witness AND thumbprint of caretaker(s) or legal guardian(s)

I, the NutriVax-Measles study research assistant, hereby certify that after fully explaining the relevant details of this survey to the participant named above, I believe they have understood and have knowingly given their consent. I solemnly promise I will respect all the terms and conditions mentioned in this consent form, keep full confidentiality, and respect the individual's rights and freedom as well as the requirements of the scientific work.

Name of study research assistant taking consent:
…….

Date ⌊__⌋⌊__⌋⌊__⌋⌊__⌋ Signature:

Appendix 8: Case report form for the cross-sectional and the longitudinal follow-up household surveys

LGA Study Ward Settlement Participant	01 - DEMOGRAPHIC CHARACTERISTICS	*FORM DEM_CHAR*
⌊_⌋⌊_⌋ ⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋		*Version 1.0 _2024-02-12*

Baseline survey (all participants)

Endline survey (all participants)

Longitudinal follow-up survey: Inclusion (all participants)

Child

Gender: ❑ Boy ❑ Girl

Child's birthday date *(DD/MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ **or** Age ⌊_⌋⌊_⌋ months

Has siblings (same mother)? ☐ Yes ☐ No

↳ If yes, number of living siblings ⌊_⌋⌊_⌋

Family

Number of people in household ⌊_⌋⌊_⌋

Father

☐ Alive ☐ Dead

↳ If alive, Father's age ⌊_⌋⌊_⌋ years

↳ If alive, can he read or write? ☐ Yes ☐ No

↳ If yes, level of education achieved

☐ Primary school ☐ Middle school ☐ High school ☐ Higher level of education

↳ If alive, main activity:

☐ Farmer ☐ Driver ☐ Employed in the private sector ☐ Trader (shopkeeper)

☐ Not working or looking for work ☐ Public agent ☐ Other, specify ……

Native language: ☐ Hausa ☐ Fulani ☐ Kanuri ☐ Other: ……

Mother

Number of births ⌊_⌋⌊_⌋

☐ Alive ☐ Dead

↳ If alive, mother's age ⌊_⌋⌊_⌋ years

↳ If alive, can she read or write? ☐ Yes ☐ No

↳ If yes, level of education achieved

☐ Primary school ☐ Middle school ☐ High school

☐ Higher level of education

↳ If alive, main activity:

☐ Farmer ☐ Housewife ☐ Employed in the private sector
☐ Trader (shopkeeper) ☐ Not working or looking for work ☐ Public agent
☐ Other, specify …….

↳ If alive, **Marital status**: ☐ Married or civil union ☐ Widowed

☐ Separated/Divorced ☐ Single

↳ If married or civil union number of domestic partner (s) └┘└┘

Native language: ☐ Hausa ☐ Fulani ☐ Kanuri ☐ Other: ……

Legal representative

Who accompanies the child?

☐ Mother ☐ Father ☐ Other family member, specify …… ☐ Other, specify …….

Is this person his/her legal representative? ☐ Yes ☐ No

↳ If no, who is his/her legal representative?

☐ Mother ☐ Father ☐ Other family member, specify …… ☐ Other, specify ……...

↳ If other family member or other, Age └┘└┘ years

↳ If other family member or other, can s/he read or write? ☐ Yes ☐ No

↳ If yes, level of education achieved

☐ Primary school ☐ Middle school ☐ High school

☐ Higher level of education

↳ If other family member or other, **native language:**

☐ Hausa ☐ Fulani ☐ Kanuri ☐ Other: ……

How long has he/she been living in this settlement? └┘└┘ year └┘└┘ month

LGA Study Ward Settlement Participant └┴┘ └┘ └┴┘ └┴┘ └┴┘	02 - ADRESS	*FORM ADS* *Version 1.0 – 2024-02-12*

Baseline survey (all participants)

Endline survey (all participants)

Longitudinal follow-up: Inclusion (all participants)

ADRESS

LGA: ☐ Nguru ☐ Karasuwa

↳ **Ward** ……..

↳ **Settlement** …….

List of Ward and settlement per LGA:

LGA Study Ward Settlement Participant └┴┘ └┘ └┴┘ └┴┘ └┴┘	03 - ANTHROPOMETRIC DATA	*FORM ATP_DATA* *Version 1.0* *2024-02-12*

Baseline survey (all participants)

Endline survey (all participants)

Longitudinal follow-up survey (all participants) : Inclusion / M4 / M8 / M12 + Additional form

Date of visit └┴┘ └┴┘ └┴┴┴┘ ❑ not performed

Middle upper arm circumference (MUAC) └┴┴┘ mm

Body weight └┴┘ . └┘ kg

Length/Height └┴┴┘ cm

Weight for Length/Height z-score ☐ <-3 ☐ ≥ -3 and <-2 ☐ ≥ -2 et < -1,5 ☐ ≥ -1,5

Nutritional edema ☐ + ☐ ++ ☐ +++ ☐ No edema

Is the child breastfeeding? ☐ Yes ☐No

LGA	Study	Ward	Settlement	Participant	04 – MEDICAL HISTORY	*FORM MED_HIST*
⌊_⌋⌊_⌋	⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋		*Version 1.0 _2024-02-12*

Baseline survey (all participants)

Endline survey (all participants)

Longitudinal follow-up (all participants) : Inclusion

Chronic disease

Any chronic disease? ☐ Yes ☐No

↳ If yes:

☐ HIV ☐ Tuberculosis ☐ Sickle cell disease
☐ Downs syndrome ☐ Congenital heart disease ☐ Neurological damage
☐ other, specify :……..

ALLERGIES

Any known allergies? ☐ Yes ☐No

↳ If yes, 1. specify …….

2. specify …….

Hospitalization event in the last 3 months ☐ Yes ☐ No

↳ If yes: **Reason of hospitalization**

☐ Stagnant weight ☐ Weight loss ☐ Watery diarrhoea
☐ Anorexia ☐ Moderate dehydration ☐ Severe dehydration
☐ Severe anaemia ☐ Malaria with signs of severity ☐ Signs of respiratory distress
☐ State of shock ☐ Intestinal verminosis ☐ Unconsciousness or disturbed consciousness
☐ Respiratory infection with signs of severity ☐ Other, specify…….

Actual medical problem

Notion of fever in the last 24 hours (or T° ≥ 37.5°C)? ☐ Yes ☐ No

↳ If yes, measure and specify T° ⌊_⌋⌊_⌋ . ⌊_⌋ °C Not measured ☐

↳ If , **Malaria RTD** ☐ Done ☐ Not done

↳ If done, result ☐ Positive ☐ Negative

↳ If positive, ATC received ☐ Yes ☐ No

Current presence of:

☐ Non-bloody diarrhea	☐☐☐ days	☐ Parasitosis - Intestinal verminosis	☐☐☐ days
☐ Anemia (suspected)	☐☐☐ days	☐ Dermatosis - cutaneous infection	☐☐☐ days
☐ Malaria (suspected)	☐☐☐ days	☐ Upper respiratory infection (e.g. Cold, Otitis)	☐☐☐ days
☐ Respiratory infection	☐☐☐ days	☐ Non-malarial fever	☐☐☐ days
☐ Vomiting	☐☐☐ days	☐ Wound, abscess, trauma	☐☐☐ days
☐ Dehydration	☐☐☐ days	☐ Other, specify……	☐☐☐ days

↳ If presence of at least one medical problem, should the child be referred to a hospital or health center? ☐ Yes ☐ No

↳ If yes, ☐ Hospital ☐ Health center

OTHERS

Has the child received deworming supplementation over the last 6 months?

☐ Yes ☐ No ☐ Don't know

Have you participated in training session for using a MUAC bracelet and to check for edema (Family MUAC)?

☐ Yes ☐ No

↳ If yes, do you currently have a MUAC bracelet? *(Show to the mother a MUAC bracelet)*

☐ Yes ☐ No

↳ If yes, what is the state of the MUAC bracelet? ☐ Bad ☐ Good

↳ If yes, how often do you use the MUAC bracelet on your child or check for edema?

☐ Each week ☐ Every two weeks ☐ One a month

☐ When my child is sick ☐ When I think of it ☐ Never

Is the child currently receiving treatment with RUTF? ☐ Yes ☐ No

↳ If yes, RUTF sachet seen by the interviewer to confirm? ☐ Yes ☐ No

Is the child currently receiving treatment with RUSF? ☐ Yes ☐ No

↳ If yes, RUSF sachet seen by the interviewer to confirm? ☐ Yes ☐ No

LGA ⌊__⌋	Study ⌊_⌋	Ward ⌊__⌋	Settlement ⌊__⌋	Participant ⌊__⌋	05 – ELIGIBILITY CRITERIA: BASELINE AND ENDLINE SURVEYS	*FORM ELI_BAS_END_SUR* *Version 1.0 _2024-02-12*

INCLUSION

INCLUSION CRITERIA FOR BASELINE AND ENDLINE SURVEYS **For the following inclusion criteria, if at least one box is ticked "No", the participant is NOT ELIGIBLE**	**NO**	**YES**
Age 12-23 months old	☐	☐
Residing in the place where the survey is taking place	☐	☐
Oral informed consent form by the child's a parent or legal guardian	☐	☐
NON-INCLUSION CRITERIA FOR BASELINE AND ENDLINE SURVEYS **For the following non-inclusion criteria, if at least one box is ticked "Yes", the participant is NOT ELIGIBLE**	**NO**	**YES**
Is the child included in the cohort of the prospective sub-study	☐	☐

I certify that I have:

☐ Explained the NutriVax-Measles study to the parents or caretaker

☐ Answered all their questions

☐ Obtained their oral consent before including their child in the study

Oral informed consent given on *(DD/MM/YYYY)* ⌊__⌋ ⌊__⌋ ⌊__⌋__⌋__⌋__⌋

☐ I certify that I have checked all eligibility criteria and I proceed with the participant's inclusion in the trial.

Inclusion date *(DD/MM/YYYY)* ⌊__⌋ ⌊__⌋ ⌊__⌋__⌋__⌋__⌋

Investigator's name …….

INCLUSION

INCLUSION CRITERIA FOR THE LONGITUDINAL FOLLOW UP SURVEY **For the following inclusion criteria, if at least one box is ticked "No", the participant is NOT ELIGIBLE**	NO	YES
Age 6-12 months old	☐	☐
Residing in the catchment settlements of wards included in the study	☐	☐
Signed informed consent of parent or legal guardian	☐	☐
NON-INCLUSION CRITERIA FOR THE LONGITUDINAL FOLLOW UP SURVEY **For the following non-inclusion criteria, if at least one box is ticked "Yes", the participant is NOT ELIGIBLE**	**NO**	**YES**
Child presents with acute malnutrition as per the WHO definition (i.e. MUAC<125 or WHZ < -2 or nutritional edema)	☐	☐
Child is known to have a medical complication that requires referral for hospitalization	☐	☐
Child is known to have allergies to SQ-LNS or to have SQ-LNS contraindication;	☐	☐
Child has any other condition interfering with protocol adherence or the ability to give informed consent, in the judgment of the Field Investigator	☐	☐

Informed consent form signature date *(DD/MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

☐ I certify that I have checked all eligibility criteria and I proceed with the participant's inclusion in the trial.

Inclusion date *(DD/MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Investigator's name …….

LGA ⌊_⌋⌊_⌋	Study ⌊_⌋	Ward ⌊_⌋⌊_⌋	Settlement ⌊_⌋⌊_⌋	Participant ⌊_⌋⌊_⌋	06 – IMMUNIZATION HISTORY	*FORM IMM1* *Version 1.0 – 2024-02-12*

Baseline survey (all participants)

Endline survey (all participants)

Longitudinal follow-up survey (all participants): Inclusion

Date of visit ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Vaccination status at time of visit

Source of information on child vaccination status:

Did you ever receive or were given a vaccination card or a family folder for (name of the child)?

☐ Yes and card Seen ☐ Yes but card Not Seen ☐ No ☐ Do Not Know

↳ If **Yes and card Seen**, take an anonymous picture of the second page of the vaccination card (only the vaccination page, not the page with child information)

↳ If **Yes and card Seen**, check the card and complete *(complete also vitamin A data):*

☐ BCG	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ OPV - 3	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ Hep B - 0	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ PCV - 3	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ OPV - 0	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ Penta - 3	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ OPV - 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ Rota - 3	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ PCV - 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ IPV - 2	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ Penta - 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ Measles 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ Rota -1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ Yellow Fever	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ IPV - 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ Meningitis	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ OPV - 2	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ Measles 2	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ PCV - 2	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ Vitamin A - 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ Penta - 2	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ Vitamin A - 2	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	
☐ Rota - 2	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date		☐ Other……..	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	

↳ If **Yes, but card not seen** or **No** or **Do Not Know**:

Has the child ever received any vaccinations, drops or injections in the past?

☐ Yes ☐ No ☐ Do Not Know

↳ **If Yes:**

↳ Has the child ever received an injection in the right upper arm or shoulder that usually causes a scar? – that is, BCG vaccination (against tuberculosis) ☐ Yes ☐ No ☐ Do Not Know

↳ If the child is present, check for evidence of a scar and record
☐ Scar present ☐ No Scar present ☐ Child not available to check

↳ Has the child ever received any "vaccination drops in the mouth" – that is, polio?
☐ Yes ☐ No ☐ Do Not Know

↳ If yes, how many times was the polio vaccine received at a health facility?
⌴ Times ☐ Do Not Know

↳ If yes, how many times was polio vaccine received during a large campaign, usually involving a large group of children (up to five years of age), and perhaps vaccinating at your house?
⌴ Times ☐ Do Not Know

↳ Has the child ever received an injection on the upper outer thigh? – that is a penta (dpt –hep b- hib) vaccination to prevent him/her from getting tetanus, whooping cough, or diphtheria, influenza & hepatitis ☐ Yes ☐ No ☐ Do Not Know

↳ If yes, how many times? ⌴ Times ☐ Do Not Know

↳ Has the child ever received Pneumococcal (PCV) vaccine? ☐Yes ☐No ☐Do Not Know
↳ If yes, how many times? ⌴ Times ☐ Do Not Know

↳ Has the child ever received an injection on the left upper arm? -that is measles injection at the age of 9 months or older – to prevent him/her from getting measles
☐ Yes ☐ No ☐ Do Not know

↳ If yes, how many times was measles vaccine given at a health facility?
- ☐ Do Not know
- ☐ One time, how many months was the child? ⌴⌴ months ☐ Do Not know
- ☐ Two times, how many months was the child? ⌴⌴ months ☐ Do Not know
- ☐ More than two times, how many months was the child at the second time? ⌴⌴ months ☐ Do Not know

↳ If yes, how many times was measles vaccine given during a large campaign, normally involving a large group of children? (The campaign can be up to five or up to fifteen years of age)
⌴ Times ☐ Do Not know

↳ Has the child ever received Yellow Fever vaccine? ☐ Yes ☐ No ☐ Do Not know

↳ If yes, how many times did the child receive it at a health facility?
⌴ Times ☐ Do Not know

↳ If yes, how many times did the child receive it during a large campaign, usually involving a large group of children (up to five years of age), and perhaps vaccinating at your house?
⌴ Times ☐ Do Not know

↳ Has the child ever received Rotavirus vaccine? ☐ Yes ☐ No ☐ Do Not know

↳ If yes, how many times? ⌴ Times ☐ Do Not know

↳ Do you think your child has received all the vaccines that are recommended?
☐ Yes ☐ No ☐ Do Not know

☐ Place of Immunization Too Far	☐ Time of immunization inconvenient	☐ Mother too busy
☐ Family problem, including illness of mother	☐ Child ill – Not brought	☐ Child ill – Brought but not given immunization
☐ Long wait	☐ Rumours	☐ No faith in immunization
☐ Fear of side reactions	☐ Place and/or time of immunization unknown	☐ Vaccines not available in the health centre ☐ Other, specify ……..

↳ If no, why hasn't the child had all recommended vaccines?
↳ Which reason above is the most important reason?

☐ Place of Immunization Too Far	☐ Time of immunization inconvenient	☐ Mother too busy
☐ Family problem, including illness of mother	☐ Child ill – Not brought	☐ Child ill – Brought but not given immunization
☐ Long wait	☐ Rumours	☐ No faith in immunization
☐ Fear of side reactions	☐ Place and/or time of immunization unknown	☐ Vaccines not available in the health centre ☐ Other, specify ……..

Did your child receive vitamin A supplementation over the last 6 months? ☐ Yes ☐ No

↳ If yes, date (MM/YYYY) ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ Don't know

↳ If **Yes, but card not seen:**

Why do you no longer have the vaccination card?

☐ Lost card ☐ Destroyed ☐ Other, Specify……..

LGA ⌊_⌋⌊_⌋	**Study** ⌊_⌋	**Ward** ⌊_⌋⌊_⌋	**Settlement** ⌊_⌋⌊_⌋	⌊_⌋⌊_⌋ **Participant**	**06 – IMMUNIZATION-FOLLOW-UP**	***FORM IMM2*** *Version 1.0 – 2024-02-12*

Longitudinal follow-up survey (all participants): M4, M8, M12 + additional form

Date of visit ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Vaccination status at time of visit

Source of information on child vaccination status:

Did the child receive a new vaccine since the last visit?

☐ Yes and card Seen ☐ Yes but card Not Seen ☐ No ☐ Do Not Know

↳ If **Yes and card Seen**, take an anonymous picture of the second page of the vaccination card *(only the vaccination page, not the page with child information)*

↳ If **Yes and card Seen**, check the card and complete *(complete also vitamin A data):*

☐ BCG	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	☐ OPV - 3	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date
☐ Hep B - 0	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	☐ PCV - 3	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date
☐ OPV - 0	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	☐ Penta - 3	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date
☐ OPV - 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	☐ Rota - 3	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date
☐ PCV - 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	☐ IPV - 2	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date
☐ Penta - 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date	☐ Measles 1	⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ ☐ missing date
☐ Rota -1		☐ Yellow Fever	

	☐ missing date		☐ missing date
☐ IPV - 1	☐ missing date	☐ Meningitis	☐ missing date
☐ OPV - 2	☐ missing date	☐ Measles 2	☐ missing date
☐ PCV - 2	☐ missing date	☐ Vitamin A - 1	☐ missing date
☐ Penta - 2	☐ missing date	☐ Vitamin A - 2	☐ missing date
☐ Rota - 2	☐ missing date	☐ Other……..	☐ missing date

↳ If **Yes, but card not seen** or **No** or **Do Not Know**:

↳ If Yes:

↳ Has the child received an injection in the right upper arm or shoulder that usually causes a scar? – that is, BCG vaccination (against tuberculosis) ☐ Yes ☐ No ☐ Do Not Know

↳ If the child is present, check for evidence of a scar and record

☐ Scar present ☐ No Scar present ☐ Child not available to check

↳ Has the child received any "vaccination drops in the mouth" – that is, polio?

☐ Yes ☐ No ☐ Do Not Know

↳ If yes, how many times was the polio vaccine received at a health facility?

⌴ Times ☐ Do Not Know

↳ If yes, how many times was polio vaccine received during a large campaign, usually involving a large group of children (up to five years of age), and perhaps vaccinating at your house?

⌴ Times ☐ Do Not Know

↳ Has the child received an injection on the upper outer thigh? – that is a penta (dpt –hep b- hib) vaccination to prevent him/her from getting tetanus, whooping cough, or diphtheria, influenza & hepatitis ☐ Yes ☐ No ☐ Do Not Know

↳ If yes, how many times? ⌴ Times ☐ Do Not Know

↳ Has the child received Pneumococcal (PCV) vaccine? ☐Yes ☐No ☐Do Not Know

↳ If yes, how many times? ⌴ Times ☐ Do Not Know

↳ Has the child received an injection on the left upper arm? -that is measles injection at the age of 9 months or older – to prevent him/her from getting measles

☐ Yes ☐ No ☐ Do Not know

↳ If yes, how many times was measles vaccine given at a health facility?

☐ Do Not know

☐ One time, how many months was the child? ⌴ ⌴ months ☐ Do Not know

☐ Two times, how many months was the child? ⌴ ⌴ months ☐ Do Not know
☐ More than two times, how many months was the child at the second time?
⌴ ⌴ months ☐ Do Not know

↳ If yes, how many times was measles vaccine given during a large campaign, normally involving a large group of children? (The campaign can be up to five or up to fifteen years of age)

⌴ Times ☐ Do Not know

↳ Has the child received Yellow Fever vaccine? ☐ Yes ☐ No ☐ Do Not know

↳ If yes, how many times did the child receive it at a health facility?

⌴ Times ☐ Do Not know

↳ If yes, how many times did the child receive it during a large campaign, usually involving a large group of children (up to five years of age), and perhaps vaccinating at your house?

⌴ Times ☐ Do Not know

↳ Has the child received Rotavirus vaccine? ☐ Yes ☐ No ☐ Do Not know

↳ If yes, how many times? ⌴ Times ☐ Do Not know

↳ Do you think your child has received all the vaccines that are recommended?

☐ Yes ☐ No ☐ Do Not know

↳ If no, why hasn't the child had all recommended vaccines?

☐ Place of Immunization Too Far	☐ Time of immunization inconvenient	☐ Mother too busy
☐ Family problem, including illness of mother	☐ Child ill – Not brought	☐ Child ill – Brought but not given immunization
☐ Long wait	☐ Rumours	☐ No faith in immunization
☐ Fear of side reactions	☐ Place and/or time of immunization unknown	☐ Vaccines not available in the health centre ☐ Other,specify ……

↳ Which reason above is the most important reason?

☐ Place of Immunization Too Far	☐ Time of immunization inconvenient	☐ Mother too busy
☐ Family problem, including illness of mother	☐ Child ill – Not brought	☐ Child ill – Brought but not given immunization
☐ Long wait	☐ Rumours	☐ No faith in immunization
☐ Fear of side reactions	☐ Place and/or time of immunization unknown	☐ Vaccines not available in the health centre ☐ Other,specify ……

Did your child receive vitamin A supplementation since the last visit? ☐ Yes ☐ No

↳ If yes, date (MM/YYYY) ⌴⌴ ⌴⌴⌴⌴ ☐ Don't know

↳ If **Yes, but card not seen:**

Why do you no longer have the vaccination card?

☐ Lost card ☐ Destroyed ☐ Other, Specify……..

LGA Study Ward Settlement Participant └┴┘ └┘ └┴┘ └┴┘ └┴┘	**07 – COST – EFFICIENCY**	***FORM COST*** *Version 1.0 _2024-02-12*

Longitudinal follow-up (all participants): Inclusion / M4

1. What type of healthcare facility do you usually attend when your child needs preventative healthcare services such as immunizations, wellness exams, or feeding advice?

☐ A primary health care center (PHCC) [continue to "**PHCC only**" questions]

☐ A primary health clinic (PHC) or health post (HP) [continue to "**multiple facilities**" questions]

☐ Other (specify) continue to "**multiple facilities**" questions]

PHCC only

2. What mode of transportation do you usually use to travel from your residence to the PHCC?

☐ Public transportation (bus, taxi, etc.)

☐ Private transportation (car, motorcycle, etc.)

☐ Walking or bicycle

☐ Other, specify …….

3. How long does it usually take you to travel, in one direction, from your residence to the PHCC? [enumerator instruction: if less than one hour, enter '0' for hours]

└┴┘ hours └┴┘ minutes

4. How much do you usually pay, per person, for transportation from your residence to the PHCC (one way)?

_____Naira

5. Do you usually use the same mode of transportation to travel back to your residence from the PHCC?

☐ Yes [skip to question 9]

☐ No

6. What mode of transportation do you usually use to travel from the PHCC back to your residence?

☐ Public transportation (bus, taxi, etc.)

☐ Private transportation (car, motorcycle, etc.)

☐ Walking or bicycle

☐ Other, specify……

7. How long does it usually take you to travel back from the PHCC back to your residence?

[enumerator instruction: if less than one hour, enter '0' for hours]

└┴┘ hours └┴┘ minutes

8. How much do you usually pay, per person, for transportation for travel from the PHCC back to your residence?

_____Naira

9. When you access the PHCC to receive preventative healthcare services for your child, do you usually incur any other costs, such as the cost of purchasing food or drink or paying for overnight lodging?

☐ Yes

☐ No [end module]

10. Please estimate the total cost, other than the cost of transportation, that you typically pay when visiting the PHCC for preventative services.

_____Naira [end module]

Multiple Facilities

11. What mode of transportation do you usually use to travel from your residence to that healthcare facility?

☐ Public transportation (bus, taxi, etc.)

☐ Private transportation (car, motorcycle, etc.)

☐ Walking or bicycle

☐ Other, specify …….

12. How long does it usually take you to travel, in one direction, from your residence to that healthcare facility? [enumerator instruction: if less than one hour, enter '0' for hours]

└┘└┘ hours └┘└┘ minutes

13. How much do you usually pay, per person, for transportation from your residence to that healthcare facility (one way)?

_____Naira

14. Do you usually use the same mode of transportation to travel back to your residence from that healthcare facility?

☐ Yes [skip to question 18]

☐ No

15. What mode of transportation do you usually use to travel from that healthcare facility back to your residence?

☐ Public transportation (bus, taxi, etc.)

☐ Private transportation (car, motorcycle, etc.)

☐ Walking or bicycle

☐ Other, specify……

16. How long does it usually take you to travel back from that healthcare facility back to your residence? [enumerator instruction: if less than one hour, enter '0' for hours]

└┘└┘ hours └┘└┘ minutes

17. How much do you usually pay, per person, for transportation for travel from that healthcare facility back to your residence?

_____Naira

18. When you access that healthcare facility to receive preventative healthcare services for your child, do you usually incur any other costs, such as the cost of purchasing food or drink or paying for overnight lodging?

☐ Yes

☐ No [skip to question 20]

19. Please estimate the total cost, other than the cost of transportation, that you typically pay when visiting the healthcare facility for preventative services.

_____Naira

20. Now I would like to ask a few additional questions about your nearest PHCC. If you needed to visit your nearest PHCC for outpatient services, how long would it usually take you to travel, in one direction, from your residence to the nearest PHCC? [enumerator instruction: if less than one hour, enter '0' for hours]

└┴┘hours └┴┘minutes

22. What mode of transportation would you use to travel from your residence to the nearest PHCC?

☐ Public transportation (bus, taxi, etc.)

☐ Private transportation (car, motorcycle, etc.)

☐ Walking or bicycle

☐ Other, specify …….

23. How much would you pay, per person, for transportation from your residence to the nearest PHCC (one way)?

_____Naira

24. Would you use the same mode of transportation to travel back to your residence from the nearest healthcare facility?

☐ Yes [skip to question 28]

☐ No

25. What mode of transportation would you use to travel from the nearest PHCC back to your residence?

☐ Public transportation (bus, taxi, etc.)

☐ Private transportation (car, motorcycle, etc.)

☐ Walking or bicycle

☐ Other, specify……

26. How long would it usually take you to travel back from the nearest PHCC to your residence?

[enumerator instruction: if less than one hour, enter '0' for hours]

└┴┘hours └┴┘minutes

27. How much would you pay, per person, for transportation for travel from the nearest PHCC back to your residence?

_____Naira

28. If you needed to go to your nearest PHCC for outpatient services, would you incur any other costs, such as the cost of purchasing food or drink or paying for overnight lodging?

☐ Yes

☐ No [skip to question 29]

29. Please estimate the total cost, other than the cost of transportation, that you would pay when visiting the nearest PHCC for outpatient services._____Naira

LGA Study Ward Settlement Participant └┴┘ └┘ └┴┘ └┴┘ └┴┘	08 - MORBIDITY DECLARATION or OBSERVATION	*FORM MBT* *Version 1.0 _2024-02-12*

Longitudinal follow-up survey (all participants) : Inclusion / M4 / M8 / M12 + Additional form

Notion of fever in the last 24 hours (or T° ≥37.5°C)? ☐ Yes ☐ No

↳ If yes, measure and specify T° └┴┘ . └┘ °C ☐ Not measured

↳ If yes, **Malaria RTD** ☐ Done ☐ Not done

↳ If done, result ☐ Positive ☐ Negative

↳ If positive, ATC received ☐ Yes ☐ No

Current presence of:

↳ If at least one

☐ Non-bloody diarrhea	└┴┘ days	☐ Parasitosis - Intestinal verminosis	└┴┘ days
☐ Anemia (suspected)	└┴┘ days	☐ Dermatosis - cutaneous infection	└┴┘ days
☐ Malaria (suspected)	└┴┘ days	☐ Upper respiratory infection (e.g. cold, otitis…)	└┴┘ days
☐ Respiratory infection	└┴┘ days	☐ Non-malarial fever	└┴┘ days
☐ Vomiting	└┴┘ days	☐ Wound, abscess, trauma	└┴┘ days
☐ Dehydration	└┴┘ days	☐ Other, specify……	└┴┘ days

disease ticked, has the child been taken to a traditional practitioner?

☐ Yes ☐ No

↳ If at least one disease ticked, has the child been taken to the health center? ☐ Yes ☐ No

↳ If at least one disease ticked, should the child be referred to a hospital or health center?

☐ Yes ☐ No

↳ If yes, ☐ Hospital ☐ Health center

Since last visit, presence of:

↳ If at least one

☐ Non-bloody diarrhea	└┴┘ days	☐ Parasitosis - Intestinal verminosis	└┴┘ days
☐ Anemia (suspected)	└┴┘ days	☐ Dermatosis - cutaneous infection	└┴┘ days
☐ Malaria (suspected)	└┴┘ days	☐ Upper respiratory infection (e.g. cold, otitis…)	└┴┘ days
☐ Respiratory infection	└┴┘ days	☐ Non-malarial fever	└┴┘ days
☐ Vomiting	└┴┘ days	☐ Wound, abscess, trauma	└┴┘ days
☐ Dehydration	└┴┘ days	☐ Other, specify……	└┴┘ days

disease ticked, has the child been taken to a traditional practitioner?

☐ Yes ☐ No

↳ If at least one disease ticked, Has the child been taken to the health center? ☐ Yes ☐ No

↳ If at least one disease ticked, Has the child been taken to the hospital or health center?

☐ Yes ☐ No

↳ If yes: **Reason :**

☐ Stagnant weight	☐ Weight loss	☐ Watery diarrhoea
☐ Anorexia	☐ Moderate dehydration	☐ Severe dehydration
☐ Severe anaemia	☐ Malaria with signs of severity	☐ Signs of respiratory distress
☐ State of shock	☐ Intestinal verminosis	☐ Unconsciousness or disturbed consciousness
☐ Respiratory infection with signs of severity		☐ Other, specify…….

** And then if possible to reach the hospital medical folder of the child, complete the hospitalization forms*.

OTHERS

Has the child received deworming supplementation since the last home visit ☐ Yes ☐ No ☐ Don't know

Is the child currently receiving treatment with RUSF? ☐ Yes ☐ No

↳ If yes, RUSF sachet seen by the interviewer to confirm? ☐ Yes ☐ No

Is the child currently receiving treatment with RUTF? ☐ Yes ☐ No

↳ If yes, RUTF sachet seen by the interviewer to confirm? ☐ Yes ☐ No

Have you participated in training session for using a MUAC bracelet and to check for edema (Family MUAC)?
☐ Yes ☐ No

↳ If yes, do you currently have a MUAC bracelet? *(Show to the mother a MUAC bracelet)* ☐ Yes ☐ No

↳ If yes, what is the state of the MUAC bracelet? ☐ Bad ☐ Good

↳ If yes, how often do you use the MUAC bracelet on your child or check for edema?

☐ Each week ☐ Every two weeks ☐ One a month
☐ When my child is sick ☐ When I think of it ☐ Never

Has the child ever received seasonal malaria prevention treatment? ☐ Yes ☐ No

↳ If yes, which months?

☐ June ☐ July ☐ August ☐ September ☐ October ☐ November ☐ December

LGA ⌊_⌋⌊_⌋	Study ⌊_⌋	Ward ⌊_⌋⌊_⌋	Settlement ⌊_⌋⌊_⌋	Participant ⌊_⌋⌊_⌋	**09- HOSPITALIZATION: ADMISSION**	***FORM HOSP_ADM*** *Version 1.0 – 2024-02-12*

Additional for participant in the longitudinal follow-up survey

Admission date *(DD/MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Unit ☐ Pediatric ☐ Stabilisation care ☐ Other, specify…….

Place of hospitalization, specify ……

Appetite test ☐ Positive ☐ Negative

Temperature ⌊_⌋⌊_⌋.⌊_⌋ °C ☐ Not measured

Body weight ⌊_⌋⌊_⌋.⌊_⌋ kg ☐ Not measured

Length/Height ⌊_⌋⌊_⌋⌊_⌋ cm ☐ Not measured

State of the MUAC bracelet ☐ Bad ☐ Good

Nutritional edema ☐ + ☐ ++ ☐ +++ ☐ No edema

Diagnosis or clinical picture on admission:

☐ Stagnant weight ☐ Weight loss ☐ Watery diarrhoea
☐ Anorexia ☐ Moderate dehydration ☐ Severe dehydration
☐ Severe anaemia ☐ Malaria with signs of severity ☐ Signs of respiratory distress

☐ State of shock ☐ Intestinal verminosis ☐ Unconsciousness or disturbed consciousness
☐ Respiratory infection with signs of severity ☐ Other, specify…….

LGA	Study	Ward	Settlement	Participant	09 - HOSPITALIZATION: DISCHARGE	*FORM HOSP_DIS* *Version 1.0 – 2024-02-12*
⌊_⌋⌊_⌋	⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋		

Additional for participant in the longitudinal follow-up survey

Admission date *(DD/MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋
Discharge date *(DD/MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋
Weight ⌊_⌋⌊_⌋.⌊_⌋ kg ☐ Not done
Height ⌊_⌋⌊_⌋⌊_⌋ cm ☐ Not done
Brachial perimeter ⌊_⌋⌊_⌋⌊_⌋ mm
Nutritional edema ☐ + ☐ ++ ☐ +++ ☐ No edema
Body temperature at discharge ⌊_⌋⌊_⌋.⌊_⌋ ˚C ☐ Not done
Maximum body temperature during stay ⌊_⌋⌊_⌋.⌊_⌋ ˚C ☐ Not done

Diagnosis or clinical picture retained at discharge
☐ Stagnant weight ☐ Weight loss ☐ Watery diarrhoea
☐ Anorexia ☐ Moderate dehydration ☐ Severe dehydration
☐ Severe anaemia ☐ Malaria with signs of severity ☐ Signs of respiratory distress
☐ State of shock ☐ Intestinal verminosis ☐ Unconsciousness or disturbed consciousness
☐ Respiratory infection with signs of severity ☐ Other, specify…….

Treatment(s) received during stay:
☐ Oral antibiotics ☐ Antibiotics for the parenteral route
☐ Intravenous ACT ☐ Oxygenotherapy
☐ Oral ACT ☐ Transfusion
☐ Oral rehydration ☐ F75 therapeutic milk: ⌊_⌋⌊_⌋ days
☐ Enteral rehydration ☐ F100 therapeutic milk: ⌊_⌋⌊_⌋ days
☐ RUTF: ⌊_⌋⌊_⌋ sachet for ⌊_⌋⌊_⌋ days ☐ Other treatment, specify…….

Number of RUTF received at discharge ⌊_⌋⌊_⌋ sachet for ⌊_⌋⌊_⌋ days

LGA	Study	Ward	Settlement	Participant	09 - HOSPITALIZATION: DATA DURING INPATIENT STAY	*FORM HOSP_STAY* *Version 1.0 – 2024-02-12*
⌊_⌋⌊_⌋	⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋		

Additional for participant in the longitudinal follow-up survey

Admission date *(DD/MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Exams

Date of exam *(DD/MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Malaria RTD ☐ Yes ☐ No
↳ If yes, result ☐ Positive ☐ Negative

Capillary blood glucose ☐ Yes ☐ No

↳ If yes, Time └┘└┘ h └┘└┘

Results └┘└┘ mmol/l or └┘ . └┘└┘ g/L

Urine dipstick ☐ Yes ☐ No

↳ If yes, └┘└┘└┘ leukocytes/ µl

Nitrites └┘ . └┘ ml/L

Protein └┘└┘ mg/L

Glucose └┘ . └┘ g/L

Bilirubin └┘└┘ mg/L

Ketone └┘ . └┘└┘ g/L

Hemoglobin ☐ Yes ☐ No

↳ If yes, Time └┘└┘ h └┘└┘

Results └┘└┘ . └┘ g/L

Blood ionogram ☐ Yes ☐ No

↳ If yes, Time └┘└┘ h └┘└┘

Results Sodium └┘└┘└┘ . └┘└┘ mmol/L

Potassium └┘└┘ . └┘└┘ mmol/L

Search for cryptosporidium in stools ☐ Yes ☐ No

↳ If yes, result ☐ Positive ☐ Negative

LGA **Study** **Ward** **Settlement** **Participant** └┘└┘ └┘ └┘└┘ └┘└┘ └┘└┘	**11 – MINIMUM DIETARY DIVERSITY 6-23 MONTHS AND NUTRITION**	***FORM MDD*** *Version 1.0* *_2024-02-12*

Additional

Longitudinal follow-up survey (all participants): Inclusion / M4 / M8 / M12

Who are you for the child? ☐ Mother ☐ Other woman aged 15 to 49 taking care of the child ☐ Other household member taking care of child

Did the child eat yesterday? ☐ Yes ☐ No ☐ Don't know

↳ If yes, list everything the child ate yesterday, from getting up to going to bed:

Grains, roots and tubers:	Porridge, bread, rice, noodles, pasta or [insert other commonly consumed grains, including foods made from grains like rice dishes, noodle dishes, etc.]	**1** ☐Yes	**0** ☐No
	Plantains, white potatoes, white yams, manioc, cassava, or [insert other commonly consumed starchy tubers or starchy tuberous roots that are white or pale inside]		
Legumes, nuts and seeds	Beans, peas, lentils, nuts or [insert commonly consumed foods made from beans, peas, lentils, nuts, or seeds]	**1** ☐Yes	**0** ☐No

Dairy products (milk, infant formula, yogurt, cheese)	Infant formula such as [insert local names of common formula]	1 ☐Yes	0 ☐No
	Milk from animals such as fresh, tinned or powdered milk		
	Yogurt drinks such as [insert local names of common types of yogurt drinks]		
	Yogurt, other than yogurt drinks		
	Hard or soft cheese such as [insert commonly consumed types of cheese]		
Flesh foods (*e.g.* meat, fish, poultry, organ meats	Liver, kidney, heart or [insert other commonly consumed organ meats]	1 ☐Yes	0 ☐No
	Sausages, hot dogs, ham, bacon, salami, canned meat or [insert other commonly consumed processed meats]		
	Any other meat such as beef, pork, lamb, goat, chicken, duck or [insert other commonly consumed meat]		
	Fresh or dried fish or shellfish		
Eggs	Eggs	1 ☐Yes	0 ☐No
Vitamin A-rich fruits and vegetables	Pumpkin, carrots, sweet red peppers, squash or sweet potatoes that are yellow or orange inside? [any additions to this list should meet "Criteria for defining foods and liquids as 'sources' of vitamin A"]	1 ☐Yes	0 ☐No
	Dark green leafy vegetables such as [insert commonly consumed vitamin A-rich dark green leafy vegetables]		
	Ripe mangoes, ripe papayas or [insert other commonly consumed vitamin A-rich fruits]		
Other fruits and vegetables	Any other fruits such as [insert commonly consumed fruits]	1 ☐Yes	0 ☐No
	Any other vegetables such as [insert commonly consumed vegetables]		

Was [NAME] breastfed yesterday during the day or at night? 1 ☐Yes 2 ☐No 9 ☐Don't know

Did (NAME) ever receive SQ-LNS at the PHCC? ☐ Yes ☐ No

- ↳ If yes, SQ-LNS sachet seen by the interviewer to confirm? ☐ Yes ☐ No
- ↳ If yes, ration card seen by the interviewer to confirm? ☐ Yes ☐ No

Did (NAME) consume SQ-LNS yesterday? ☐ Yes ☐ No

How many sachets of SQ-LNS did the child consume during the previous 7 days? ⌊_⌋ sachets

How does (NAME) consume SQ-LNS?

- ☐ Always mixed with meals
- ☐ Always directly from the sachet
- ☐ Sometimes mixed with meals, sometimes directly from the sachet

Is the SQ-LNS shared with children other than (NAME) in the house?

- ☐ Never
- ☐ Sometimes
- ☐ Often

↳ If "Sometimes" or "Often": Why Is the SQ-LNS shared with children other than (NAME)? (Check all that apply)

☐ There is little or no food in the house

☐ The other child was hungry

☐ We shared it the first time because the other children were curious about the taste

☐ Pressure from others to give some to other children

☐_____ Other (text)

LGA	Study	Ward	Settlement	Participant	11 – HOUSEHOLD HUNGER SCORE	*FORM HHS*
⌊_⌊_⌋	⌊_⌋	⌊_⌊_⌋	⌊_⌊_⌋	⌊_⌊_⌋		*Version 1.0 – 19/01/2024*

Longitudinal follow-up survey (all participants): Inclusion / M4 / M8 / M12 + additional form

Household Hunger Score calculation

Q1 In the past [4 weeks/30 days], was there ever no food to eat of any kind in your house because of lack of resources to get food? 1 ☐ Yes 0 ☐ No

↳ If yes, how often did this happen in the past [4 weeks/30 days]?

1 ☐ Rarely (1-2 times) 1 ☐ Sometimes (3-10 times) 2 ☐ Often (more than 10 times)

Q2 In the past [4 weeks/30 days], did you or any household member go to sleep at night hungry because there was not enough food? 1 ☐ Yes 0 ☐ No

↳ If yes, how often did this happen in the past [4 weeks/30 days]?

1 ☐ Rarely (1-2 times) 1 ☐ Sometimes (3-10 times) 2 ☐ Often (more than 10 times)

Q3 In the past [4 weeks/30 days], did you or any household member go a whole day and night without eating anything at all because there was not enough food? 1 ☐ Yes 0 ☐ No

↳ If yes, how often did this happen in the past [4 weeks/30 days]?

1 ☐ Rarely (1-2 times) 1 ☐ Sometimes (3-10 times) 2 ☐ Often (more than 10 times)

Household Hunger Score (HHS) ⌊_⌋

HHS Conclusion:

☐ HHS between **0 - 1**: Little to no hunger in the household

☐ HHS between **2 – 3**: Moderate hunger in the household

☐ HHS between **4 – 6**: Severe hunger in the household

LGA	Study	Ward	Settlement	Participant	12 – ADVERSE EVENT	*FORM AE*
⌊_⌋⌊_⌋	⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋		*Version 1.0 – 2024-02-12*

Longitudinal follow-up survey (all participants) : Inclusion / M4 / M8 / M12 + Additional form

Child's birthday date *(MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋ **or** Age ⌊_⌋⌊_⌋ months

Adverse event number ⌊_⌋

Event label (diagnosis – if already specified- or signs or symptoms): ……

Event occurred: ⌊_⌋ Days ago ⌊_⌋ Weeks ago ⌊_⌋ Months ago

Serious Adverse Event ☐ Yes ☐ No

↳ If yes:

☐ **Life-threatening** ☐ Yes ☐ No

↳ If yes:

☐ Respiratory failure ☐ Yes ☐ No

☐ Shock ☐ Yes ☐ No

☐ Other, specify ……

☐ **Death** ☐ Yes ☐ No

Observations:……

Event end: ⌊_⌋ Days ago ⌊_⌋ Weeks ago ⌊_⌋ Months ago ☐ Ongoing

---

Date of notification *(DD/MM/YYYY)* ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋ ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Place of notification: ……

Investigator name …….

Investigator signature: ……

LGA	Study	Ward	Settlement	Participant	13 – END OF TRIAL STATUS	*FORM END*
⌊_⌋⌊_⌋	⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋	⌊_⌋⌊_⌋		*Version 1.0 – 2024-02-12*

Additional

Participant ☐ Enrolled ☐ Not enrolled

↳ If not enrolled, reason ……

End of trial status ***(for participant enrolled in the longitudinal follow-up survey)***

☐ Alive

☐ Dead

↳ Date of death *(DD/MM/YYYY)* └┘└┘ └┘└┘ └┘└┘└┘└┘

↳ Place of death ☐ Home ☐ Hospital ☐ Other, specify…….

☐ Transferred out

Date of transfer └┘└┘ └┘└┘ └┘└┘└┘└┘

☐ Withdrew

↳Date of withdrawal *(DD/MM/YYYY)* └┘└┘ └┘└┘ └┘└┘└┘└┘

↳ If withdraw, data storage ☐ Yes ☐ No

☐ Lost to follow-up

↳Date of last contact *(DD/MM/YYYY)* └┘└┘ └┘└┘ └┘└┘└┘└┘

Appendix 9: Participant schedule

CRF FORM NAME	CROSS-SECTIONAL BASELINE SURVEY	CROSS-SECTIONAL ENDLINE SURVEY	LONGITUDINAL FOLLOW-UP SURVEY					
			Inclusion	M4	M8	M12		Additional form
DEMOGRAPHIC CHARACTERISTICS	☐	☐	☐					
ADRESS	☐	☐	☐					
ANTHROPOMETRIC DATA	☐	☐	☐	☐	☐	☐		☐+
MEDICAL HISTORY	☐	☐	☐					
ELIGIBILITY CRITERIA : BASELINE AND ENDLINE SURVEYS	☐	☐						
ELIGIBILITY CRITERIA : LONGITUDINAL FOLLOW-UP SURVEY			☐					
IMMUNIZATION 1 HISTORY	☐	☐	☐					
IMMUNIZATION 2 FOLLOW-UP				☐	☐	☐		☐+
COST-EFFECTIVENESS			☐	☐				
MORBIDITY DECLARATION or OBSERVATION				☐	☐	☐		☐+
HOSPITALIZATION : ADMISSION								☐+
HOSPITALIZATION : DATA DURING INPATIENT STAY								☐+
HOSPITALIZATION : DESCHARGE								☐+
MINIMUM DIETARY DIVERSITY 6-23 MONTHS			☐	☐	☐	☐		☐+
HOUSEHOLD HUNGER SCORE			☐	☐	☐	☐		☐+
ADVERSE EVENT								☐+
END OF TRIAL STATUS								☐+

Appendix 10: Interview guide for the qualitative feasibility and acceptability survey

Interview Guide - Parents/Guardian

Theme 1. Presentation

•1. If I am right, you have a baby under two years old. How he/she is?

oAge

oHealth status

Theme 2. Access to health care

•2a. What are your experiences of going to the health centre for your baby?

oFacilitators and barriers of health care access: baby's health status; logistical reasons; social support; quality of care

2b. What is your perception of the quality of care in the health care facility?

Theme 3. Vaccination

•3a. What do you know and think about vaccination among children?

•3b. What could you tell me regarding the vaccination status of your child?

If not cited before: I do not know if you have already heard that: babies <2 years old are eligible to be vaccinated against measles.
•3c. Could you tell me the status of your child regarding measles vaccination?
oNumber of doses
oPlace of vaccination
•3d. Could you explain me the reasons of your child's measles vaccination status?
oReasons for being vaccinated or not: Sensitization in the community; Offer by HCW; Literacy/beliefs; Values/norms; Living environment/transport/hours of opening/social support; Costs; Caregiver support/quality of care; [SQ-LNS]
•3e. If not vaccinated: What would motivate you to go to the health centre for vaccination?
Theme 4. SQ-LNS supplementation
[in the NutriVax arm only]
•4a. Have you already heard about the SQ-LNS supplementation program?
oContext in which they have already heard about SQ-LNS
oKnowledge regarding SQ-LN
•4b. What do you think about the SQ-LNS supplementation?
•4c. What do you think about the fact that SQ-LNS is given after the vaccination status is updated?
•4d. Has your baby already taken SQ-LNS? Why?
If Yes:
•4e1. Could you explain me how it goes regarding giving SQ-LNS daily to your child?
oDaily adherence
oFacilitators/barriers (taste; complexity of uptake; explanation of HCW; child's health status; living conditions; other priorities; beliefs/knowledge; norms…)
oWay of uptake (sachet or mixed with food)
•4e2. Do you know if the SQL-NS has already been shared with other children? In which contexts?

Interview Guide – Community representatives

Theme 1. Role and understanding of the project
•1a. Could you explain me what is your role within the community?
•1b. Have you ever heard about the NutriVax project?
oWhat do you know about this project
Theme 2. Access to health care centres
•2a. According to what you observe in your community, what would you say about access to care for babies under two years old?
oMain reasons to go to clinic
oMain barriers to access care
Theme 3. Vaccination
•3a. What do you think about vaccination among children?
•3b. In your opinion, what motivates members of your community to access clinic for their child to be vaccinated? And what are the main barriers?
oTo access care/to be vaccinated
oFacilitators/barriers: Sensitization in the community; Offer by HCW; Literacy/beliefs; Values/norms; Logistical aspects; Costs; Caregiver support/quality of care; [SQ-LNS]
•3c. What is your specific opinion regarding measles vaccination?
•3d. According to what you observe in your community, how community members react regarding to measles vaccination?
Theme 4. SQ-LNS supplementation
[in the NutriVax arm only]
•4a. What do you think about the SQ-LNS supplementation?
•4b. What do you think about offering SQ-LNS as an incentive to motivate parents/guardian to vaccine their children?
•4c. According what you observe in your community, how community members react regarding SQ-LNS?
•4d. What do you think about the adherence to the SQ-LNS among children in your community according what you observe/what the parents/guardian share to you?
oDaily adherence
oFacilitators/barriers (taste; complexity of uptake; explanation of HCW; child's health status; living conditions; other priorities; beliefs/knowledge; norms…)
oWay of uptake (sachet or mixed with food)
•4e. Have you already observe/be aware of SQL-NS sharing between children in your community? In which contexts?
Theme 5. Relations with NutriVax project team
5a. Could you tell me what are your interactions with people working for the NutriVax project?
•5b. Have you played a specific role for the implementation of the NutriVax project?

Theme 6. External context
•6a. Have there been any events within your district that have facilitated or, on the contrary, disrupted the access to health centre for babies?
oClimate; safety; rumours…
•6b. Have there been any events within your district that have facilitated or, on the contrary, disrupted measles vaccination?
[in the NutriVax arm only]
•6c. Have there been any events within your district that have facilitated or, on the contrary, disrupted SQ-LNS supplementation?

Interview Guide – Community health workers
Theme 1. Role and understanding of the project
•1a. You currently work for the NutriVax project. Could you explain me what you know about this project?
•1b. Could you explain me what is your role in this NutriVax project?
•1c. Could you tell me what motivates you to participate in this project?
Theme 2. Access to health care centres
•2a. According to what you observe, what would you say about access to care for babies under two years old in your community?
oMain reasons to go to clinic
oMain barriers to access care
Theme 3. Vaccination
•3a. What are the reactions of the members of your community when you talk to them about vaccination? And more specifically about measles vaccination?
oReaction of parents; facilitators/barriers to vaccinations
o1st dose versus 2nd dose
oLevers found by CHW to motivate parents/guardian to accept vaccination
•3b. In your opinion, what motivates members of your community to access clinic for their child to be vaccinated? And what are the main barriers?
oTo access care/to be vaccinated
oFacilitators/barriers: Sensitization in the community; Offer by HCW; Literacy/beliefs; Values/norms; Logistical aspects; Costs; Caregiver support/quality of care; [SQ-LNS]
•3c. Are there any specific barriers/facilitators regarding measles vaccination?
Theme 4. SQ-LNS supplementation
[in the NutriVax arm only]
•4a. What do you think about the SQ-LNS supplementation?
•4b. What do you think about offering SQ-LNS as an incentive to motivate parents/guardian to vaccine their children?
•4c. What are the reactions of the members of your community when you talk to them about SQ-LNS?
•4d. What do you think about the adherence to the SQ-LNS among children in your community according what you observe/what the parents/guardian share to you?
oDaily adherence
oFacilitators/barriers (taste; complexity of uptake; explanation of HCW; child's health status; living conditions; other priorities; beliefs/knowledge; norms…)
oWay of uptake (sachet or mixed with food)
•4e. Have you already observe/be aware of SQL-NS sharing between children in your community? In which contexts?
Theme 5. Working conditions and relations with NutriVax project team
•5a. Could you explain me how the NutriVax intervention fit into the tasks you were doing before?
oWorklad
oImportance of the NutriVax activities compared to the other tasks
•5a. Could you tell me what are your interactions with other people working for the NutriVax project?
Theme 6. External context
•6a. Have there been any events within your district that have facilitated or, on the contrary, disrupted the access to health centre for babies?
oClimate; safety; rumours…
•6b. Have there been any events within your district that have facilitated or, on the contrary, disrupted measles vaccination?
[in the NutriVax arm only]
•6c. Have there been any events within your district that have facilitated or, on the contrary, disrupted SQ-LNS supplementation?

Interview Guide – Health care workers
Theme 1. Role and understanding of the project

•1a. You currently work for the NutriVax project. Could you explain me what you know about this project?
•1b. Could you tell me what motivates you to participate in this project?

Theme 2. Access to health care centres

•2a. According to what you observe, what would you say about access to care for babies under two years old in your community?
oMain reasons to go to clinic
oMain barriers to access care
•2b. Have you observed any evolution in the number of babies coming to your clinic for vaccination since the beginning of the NutriVax project?
oExplain in detail any changes
oIndicate the types of vaccinations

Theme 3. Vaccination

•3a. What are your experiences when offering vaccination to the parents/guardian?
oReaction of parents; facilitators/barriers to vaccinations
o1st dose versus 2nd dose
oLevers found by CHW to motivate parents/guardian to accept vaccination
•3b. In your opinion, what motivates members of your community to access clinic for their child to be vaccinated? And what are the main barriers?
oTo access care/to be vaccinated
oFacilitators/barriers: Sensitization in the community; Offer by HCW; Literacy/beliefs; Values/norms; Logistical aspects; Costs; Caregiver support/quality of care; [SQ-LNS]
•3c. Are there any specific barriers/facilitators regarding measles vaccination?

Theme 4. SQ-LNS supplementation

[in the NutriVax arm only]
•4a. What do you think about the SQ-LNS supplementation?
•4b. What do you think about offering SQ-LNS as an incentive to motivate parents/guardian to vaccine their children?
•4c. How do people react when you introduce them the SQ-LNS as an incentive to vaccine their children?
•4d. What do you think about the adherence to the SQ-LNS among children in your community according what you observe/what the parents/guardian share to you?
oDaily adherence
oFacilitators/barriers (taste; complexity of uptake; explanation of HCW; child's health status; living conditions; other priorities; beliefs/knowledge; norms…)
oWay of uptake (sachet or mixed with food)
•4e. Have you already observe/be aware of SQL-NS sharing between children in your community? In which contexts?

Theme 5. Working conditions and relations with NutriVax project team

•5a. Could you explain me how the NutriVax intervention fit into the tasks you were doing before?
oWorklad
oImportance of the NutriVax activities compared to the other tasks
•5a. Could you tell me what are your interactions with other people working for the NutriVax project?

Theme 6. External context

•6a. Have there been any events within your district that have facilitated or, on the contrary, disrupted the access to health centre for babies?
oClimate; safety; rumours…
•6b. Have there been any events within your district that have facilitated or, on the contrary, disrupted measles vaccination?
[in the NutriVax arm only]
•6c. Have there been any events within your district that have facilitated or, on the contrary, disrupted SQ-LNS supplementation?

Appendix 11 : List of the aggregated data collected at health centres

NVM_ AGREG	**NutriVax Measles** Aggregated data collected at health centres	Version 1.0	2024-02-12th

Code of health facility |__|__|

01 Child immunization register

Data collection period

From |__|__| / |__|__| / | 2 | 0 |__|__| to |__|__| / |__|__| / | 2 | 0 |__|__|

Total doses of OPV3 administered |__|__|__|__|

Total doses of PENTA 3 vaccines administered |__|__|__|__|

Total doses of PCV3 administered |__|__|__|__|

Total doses of IPV administered |__|__|__|__|

Total doses of vitamin A1 administered |__|__|__|__|

Total doses of vitamin A2 administered |__|__|__|__|

Total doses of Measles 1 administered |__|__|__|__|

Total doses of Yellow fever administered |__|__|__|__|

Total doses of Meningitis administered |__|__|__|__|

Total doses of Measles 2 administered |__|__|__|__|

Total Number of days out of stock of others vaccines

- □ OPV |__|__| days
- □ PENTA |__|__| days
- □ PCV, |__|__| days
- □ IPV, |__|__| days
- □ Measles, |__|__| days
- □ Yellow fever, |__|__| days
- □ Meningitis, |__|__| days

Total number of days with no cold chain |__|__| days

02 OPD (Out-patient department) register

Data collection period
From |__|__| / |__|__| / | 2 | 0 |__|__| to |__|__| / |__|__| / | 2 | 0 |__|__|

Total consultation of children aged 12-59 months
|__|__|__|__|

03 OTP (Out-patient therapeutic program) register

Total number of children 6-59 months admitted
|__|__|__|__|

04 IYCF register

Data collection period

From |__|__| / |__|__| / | 2 | 0 |__|__| to |__|__| / |__|__| / | 2 | 0 |__|__|
Total number of mothers of child 6-23 months sensitized on IYCF pratices |__|__|__|__|
05 Health facility nutrition/growth monitoring and promotion register
Data collection period From |__|__| / |__|__| / | 2 | 0 |__|__| to |__|__| / |__|__| / | 2 | 0 |__|__|
Total number of children 6-59 months receiving Vitamine A |__|__|__|__|
Total number of children 12-59 months receiving deworming |__|__|__|__|
06 SQ-LNS supplementation program register (NutriVax arm only)
Data collection period From |__|__| / |__|__| / | 2 | 0 |__|__| to |__|__| / |__|__| / | 2 | 0 |__|__|
Total number of new admissions to the SQ-LNS supplementation program, new |__|__|__|__|
Total number of new admissions to the SQ-LNS supplementation program, OTP cured |__|__|__|__|
Total new admissions to the SQ-LNS supplementation program (new and OTP cures), children 6-11 months |__|__|__|__|
Total new admissions to the SQ-LNS supplementation program (new and OTP cures), children 12-23 months |__|__|__|__|
Total number of children discharged from the SQ-LNS supplementation program |__|__|__|__|
Total number of sachets of SQ-LNS distributed |__|__|__|__|
Total Number of days out of stock of SQ-LNS |__|__|__|__|
07 Immunization sensitization sessions register
Data collection period From |__|__| / |__|__| / | 2 | 0 |__|__| to |__|__| / |__|__| / | 2 | 0 |__|__|
Total number of mothers/guardians sensitized on vaccination practices |__|__|__|__|

Appendix 12 Detailed Gantt chart on the implementation of the NutriVax-Measles study

ECF
NutriVax
Detailed implementation plan/ Gantt chart

Activities	Responsible person	10/2023	11/2023	12/2023	01/2024	02/2024	03/2024	04/2024	05/2024	06/2024	07/2024	08/2024	09/2024	10/2024	11/2024	12/2024	01/2025	02/2025	03/2025	04/2025	05/2025	06/2025	07/2025	08/2025	09/2025	10/2025
O1. A cluster randomized trial with a nested cohort is implemented																										
A1. Development of the protocol, data collection tools, database, SOP,	Scientific and technical coordination &																									
A2. Ethics and regulatory approvals	PI& Field research manager																									
A3. Recruitment of the resarch field team	Support team (admin, HR)	X	X																							
A4. Community engagement activities	Medical referent & Field research manager&				X																					
A5. Training of the research team and health facilities personnel	Field research manager				X																					
A6. Baseline and endline survey	Field research manager						X																			
A7. Inclusions and follow-up in the cohort study with at-home visits	Field research manager& research team						X																			
A8. Individual and aggregated Data monitoring	MEREVA/PACCI/sc project leader/Field research manager						X																			
A9. Scientific committe meeting	Scientific and technical coordination																									
A10. Final monitoring and dataset freezing	MEREVA																			X						
O2. All health areas in both LGAs receive support for the routine immunization program and IYCF councelling in health facilities																										
A1. Sensibilisation of the community on immunization and IYCF	Medical referent						X																			
A2.Training staff in immunization and IYCF	Medical referent						X																			
A3.Support with incentive payment for the staff of MOH	Support team (admin, log)						X																			
A4.Supervision activities in the health facilitiy	Medical referent						X																			
A5.Provision of cold chain equipement, tools and materiels	Support team (admin, log)					X																				
A6. Mothers' training to acute malnutrition detection (Family MUAC)	Support team (admin, log)						X																			
O3. Children aged 6-23 mo. in the intervention arm health areas receive SQ-LNS accompagnied by IYCF counselling																										
A1. Supplying SQ-LNS to health facilities in a timely manner	Support team (admin, log)						X																			
A2. Sensibilisation of the community on SQ-LNS distribution	Medical referent																									
A3. SQ-LNS distribution to eligible children by MoH health staff	Medical referent & Field research manager						X	X																		
A4. Supervision of SQ-LNS distribution and data collection in the intervention areas	Medical referent & Field research manager						X	X																		
A5. Rehabilitation of waiting areas and a waste management area	Support team (admin, log)						X																			
O4. Data from the trial are analyzed, including cost-effectiveness data and shared																										
A1. Complete data analysis plan written and analysis scripts preparation	Scientific and technical coordination & MEREVA/PACCI																									
A2. Baseline survey analysis	Scientific and technical coordination & MEREVA/PACCI							X																		
A3. Data analysis for the primary and secondary research objectives (i.e. endline survey and cohort)	sc. project leader																				X					
A4. Cost -effectiveness analysis	UC Davies researcher																									
A5. Presentation of preliminary results	sc. project leader																									
O5. Qualitative data on perception of intervention's acceptability are collected and analyzed																										
A1. Individual interview and focus grids ready	sc. project leader/field research manager								X	X							X	X								
A2. Qualitative date research assistant hired	field research manager/HR							X																		
A3. Qualitative data are recorded, transcribed and translated in english or	field research manager										X	X							X	X						
A4. Qualitative data analyses	sc. project leader												X	X							X	X				

Appendix 13 : Curriculum vitae of main investigators

Kevin P.Q. Phelan, MSc, MA

51, rue Rouget de Lisle, Pantin 93500, France kevin.phelan@alima.ngo Phone: +33 6 64 23 56 28

Professional Experience

Alliance for International Medical Action (ALIMA), Paris France **June 2015 – present**

Senior Nutrition Advisor

- A member of the Operational and Medical Support Unit that develops and documents operational research and translates this research into improved practice. Responsible for technical support to country teams and program managers on innovative and pilot nutrition projects and dissemination of results to medical and nutrition communities.

Médecins Sans Frontières/Doctors Without Borders (MSF) **January 2002 – May 2015**

Nutrition Working Group Leader, MSF-International, Paris, France *2013 – 2015*

- Led Medical Working Group responsible for establishing MSF's policy and strategy in Nutrition.
- Developed five-year medical and operational strategic framework for MSF's response to childhood malnutrition based on three themes: simplification, integration, and improving clinical care for hospitalized cases.
- Coordinated common activities of the nutrition referents at MSF's five operational centers and represented MSF to internal and external actors.
- Provided analysis and field support to teams in South Sudan during 2014 emergency.
- Wrote several medical articles on MSF's experiences. Addressing malnutrition

Manager, Medical Humanitarian Communications Unit, New York, NY *2009 – 2013*

- Managed team that developed strategic plans for medical publishing, public events, and field HR recruitment.
- Represented MSF and guided MSF-USA's interface with the general public, academia, and medical community.
- Led efforts to penetrate critical centers of influence on international medical humanitarian issues in the US, particularly with regard to nutrition communications and advocacy.
- Oversaw content development, design and implementation of the *Starved for Attention* campaign, which included managing team of returned volunteers for traveling exhibit in multiple cities in the US to generate public support for MSF's call to change US food aid policy.
- Worked with MSF-USA's medical, advocacy, development, and executive teams as well as other advocacy units, reflection centers, and departments across MSF movement. Highlights included book production (*Medical Innovations in Humanitarian Situations*, *Humanitarian Negotiations Revealed*, *In the Eyes of Others)* and international conference development (*Lives in the Balance*.)

Deputy US Manager, MSF Access Campaign, New York, NY *2008 – 2009*

- Developed and implemented strategies for MSF's Access to Essential Medicines Campaign, with a strong focus on nutrition-related advocacy.
- Helped develop and manage network of contacts in the US, and represented MSF for all Access Campaign-related issues in a variety of forums.

- Facilitated MSF contacts with key US experts.
- Co-organized and co-managed the *Starved for Attention* conference that brought together nutrition experts, policy makers, civil society leaders, health ministers, representatives from lead UN agencies and non-governmental organizations from around the world.

Senior Communications Manager, New York, NY *2002 – 2008*

- Developed and implemented advocacy and communications strategies with teams in the field and at headquarters. Created first MSF podcast and the first MSF-USA e-newsletter.
- International communications work in conflict zones, during health emergencies, and with issues related to the Access to Campaign and Drugs for Neglected Diseases initiative (DNDi.)
- Communications Officer for the New York Desk and provided field support for all sections.
- Wrote, edited, and placed MSF advocacy, briefing documents, speeches, opinion pieces for major newspapers, letters to the editor, articles for medical journals, and patient testimonies.
- Conducted media relations and communications training for aid workers.

MSF Operational Field Assignments

Head of Mission Support, South Sudan July-August 2014

- Worked with five operational centers in South Sudan to analyze the nutrition situation, map activities of actors, identify locations for exploratory missions, and develop strategies for potential response to increase food insecurity.

Team Leader, Far Rockaway, New York October 2012

- Led 8-member team to set up a temporary clinic following Superstorm Sandy to meet the needs of people with chronic diseases like diabetes, hypertension, and asthma in Queens, New York.

Head of Mission, South Sudan August – November 2010

- In the months leading up to a national referendum, managed team in developing emergency response planning as well as annual plan for the pediatric and maternal health project in Aweil.
- Re-oriented nutrition programs to focus on in-patient care and improved emergency reactivity.
- Represented MSF towards high level civil and military authorities in Aweil and Juba.

Deputy Head of Mission, South Sudan March – May 2008

- Developed and implemented advocacy strategy to overcome obstacles to MSF's medical work, which included working with other NGOs, UN agencies, and government officials.
- Assisted the coordination team and desk in better understanding the context, and continued MSF advocacy efforts upon return to the US.

Deputy/Acting Head of Mission, South Sudan April – October 2006

- Helped coordinate all aspects of MSF's medical program in Aweil, South Sudan, representing MSF and maintaining contacts with external officials, and setting up office in Juba.
- Helped develop MSF France's strategic plans in the country in a post (pre)-war context.

- Interviewed hundreds of families and investigated conditions of people returning to Aweil East County after years of displacement.

MSF Communications Field Assignments

- **Niger** (July-August 2005) Implemented field-based advocacy with local and international journalists during a nutritional crisis. Produced advocacy from the field and on return to US.
- **Nigeria** (August 2005) Helped team develop communications strategy and produced communications materials for the MSF network.
- **Uganda** (June 2005) Developed and maintained contacts with local media and produced communications materials with community groups in Arua.
- **Haiti** (February 2005; July 2005; February 2006) Developed and implemented communications strategy to increase local awareness of MSF services. Provided communications support during emergencies, including preparing advocacy and organizing press conferences in Port-au-Prince.
- **Darfur, Sudan** (May-July 2004) Worked closely with Heads of Missions of all Operational Centers in the field and at Desk level to develop and implement communications strategies and MSF advocacy positions. Produced communications materials from the field.
- **Iraq** (Brussels/Paris, February-April 2003; Baghdad, April-June 2003) Served as international Crisis Information Officer. Worked closely with Desks and Heads of Missions in the field to develop and implement communications strategies and advocacy positions.
- **Palestinian Territories** (August-September 2002) Facilitated journalist visits to projects in Gaza, Jenin and Hebron. Produced advocacy and communications materials.
- **Angola** (April-June 2002) Served as intersectional Crisis Communications officer at the end of the war, which included writing weekly intersectional Situation Reports. Collected testimonies from MSF beneficiaries and produced communications materials from the field. Wrote, edited and placed advocacy upon return to the US.

Selected Nutrition Medical Writing and Advocacy

Medical Publications

- Phelan K, Seri B, Daures M, Yao C, Alitanou R, Aly AAM, Maidadji O, Sanoussi A, Mahamadou A, Cazes C, Moh R, Becquet R, Shepherd S. Treatment outcomes and associated factors for hospitalization of children treated for acute malnutrition under the OptiMA simplified protocol: a prospective observational cohort in rural Niger. Front Public Health. 2023 Jul 5;11:1199036. doi: 10.3389/fpubh.2023.1199036. PMID: 37475774; PMCID: PMC10354363.
- Cazes C, Phelan K, Hubert V, Boubacar H, Bozama LI, Sakubu GT, Senge BB, Baya N, Alitanou R, Kouamé A, Yao C, Gabillard D, Daures M, Augier A, Anglaret X, Kinda M, Shepherd S, Becquet R. Optimising the dosage of ready-to-use therapeutic food in children with uncomplicated severe acute malnutrition in the Democratic Republic of the Congo: a non-inferiority, randomised controlled trial. EClinicalMedicine. 2023 Feb 28;58:101878. doi: 10.1016/j.eclinm.2023.101878. PMID: 36915287; PMCID: PMC10006445.
- Cazes C, Phelan K, Hubert V, Boubacar H, Bozama LI, Sakubu GT, Tshiala BK, Tusuku T, Alitanou R, Kouamé A, Yao C, Gabillard D, Kinda M, Daures M, Augier A, Anglaret X, Shepherd S, Becquet R. Simplifying and optimising the management of uncomplicated acute malnutrition in children aged 6-59 months in the Democratic Republic of the Congo (OptiMA-DRC): a non-inferiority, randomised controlled trial. Lancet Glob Health. 2022 Apr;10(4):e510-e520. doi: 10.1016/S2214-109X(22)00041-9. Erratum in: Lancet Glob Health. 2022 May;10(5):e626. PMID: 35303461.
- Daures M, Phelan K, Issoufou M, Kouanda S, Sawadogo O, Issaley K, Cazes C, Séri B, Ouaro B, Akpakpo B, Mendiboure V, Shepherd S, Becquet R. New approach to simplifying and optimising acute malnutrition treatment in children aged 6-59 months: the OptiMA single-arm proof-of-concept trial in Burkina Faso. Br J Nutr. 2020 Apr 14;123(7):756-767. doi: 10.1017/S0007114519003258. Epub 2019 Dec 10. PMID: 31818335; PMCID: PMC7054246.
- Daures, M., Phelan, K., Issoufou, M., Sawadogo, O., Akpakpo, B., Kinda, M., Shepherd, S., & Becquet, R. (2021). Incidence of relapse following a new approach to simplifying and optimising acute malnutrition treatment in children aged 6-59 months: a prospective cohort in rural Northern Burkina Faso. Journal of nutritional science, 10, e27. https://doi.org/10.1017/jns.2021.18

- Sato, R., Daures, M., Phelan, K., Shepherd, S., Kinda, M., Becquet, R., Hecht, R., & Resch, S. (2021). Utilization patterns, outcomes and costs of a simplified acute malnutrition treatment programme in Burkina Faso. Maternal & child nutrition, e13291. Advance online publication. https://doi.org/10.1111/mcn.13291
- Hiebert, L., Phelan, K., Kinda, M., Dan-Bouzoua, N., Kyungu, M., Bounameaux, T., Sayadi, S., Maidadji, O., & Hecht, R. (2021). Costs of Implementing an Integrated Package of Maternal and Pediatric Interventions Including SQ-LNS in Rural Niger. Food and nutrition bulletin, 3795721211039869. Advance online publication. https://doi.org/10.1177/03795721211039869
- Briend A, Alvarez JL, Avril N, Bahwere P, Bailey J, Berkley JA, Binns P, Blackwell N, Dale N, Deconinck H, Delchevalerie P, Dent N, Gallagher M, Guerrero S, Hanson K, Kerac M, Manary M, Mwangome MK, Myatt M, Phelan KPQ, Pietzsch S, Salse-Ubach N, Shepherd S, van der Kam S, Vargas A, and Whitney S. Low mid-upper arm circumference identifies children with a high risk of death who should be the priority target for treatment. BMC Nutrition (2016) 2:63. DOI 10.1186/s40795-016-0101-7
- Fabiansen C, Phelan KP, Cichon B, Ritz C, Briend A, Michaelsen KF, Friis H, Shepherd S. Short children with a low midupper arm circumference respond to food supplementation: an observational study from Burkina Faso. Am J Clin Nutr. 2016 Feb;103(2):415-21. doi: 10.3945/ajcn.115.124644. Epub 2016 Jan 6.
- Fabiansen C, Phelan K.P.Q., Cichon B, et al. Short Malnourished Children and Fat Accumulation With Food Supplementation. Pediatrics. 2018;142(3):e20180679
- Cichon B, Yaméogo CW, Iuel-Brockdorf AS, Phelan KPQ, Wells JC, Ritz C, Filteau S, Briend A, Christensen VB, Ashorn P, Michaelsen KF, Shepherd S, Friis H. Association between admission criteria and body composition among young children with moderate acute malnutrition, a cross-sectional study from Burkina Faso. Sci Rep. 2020 Aug 6;10(1):13266.
- Alé FGB, Phelan KPQ, Issa H, Defourny I, Le Duc G, Harczi G, Issaley K, Sayadi S, Ousmane N, Yahaya I, Myatt M, Briend A, Allafort-Duverger T, Shepherd S, Blackwell N. (2016) Mothers screening for malnutrition by MUAC is non-inferior to community health workers: results from a large-scale pragmatic trial in rural Niger. Arch Public Health. 2016 (74:38). DOI: 10.1186/s13690-016-0149-5.
- Paxton A, Pillai A, Phelan KPQ., Cevette N, Bah F, Akabas S. Dietary acculturation of recent immigrants from West Africa to New York City. Face à Face [En ligne], 13 | 9 April 2016. faceaface.revues.org/1023. Accessed 14 April 2016.
- Phelan KP, Lanusse C, van der Kam S, Delchevalerie P, Avril N, and Hanson K. Simplifying the response to childhood malnutrition: MSF's experience with MUAC-based (and oedema) programming. Field Exchange 50. August 2015.
- Intra-household use and acceptability of Ready-to-Use-Supplementary-Foods distributed in Niger between July and December 2010, Appetite. August 2012. Co-author.

Conferences and Campaigns

- *Starved for Attention* (June-November 2011) Helped lead campaign and travelling exhibit.
- *Starved for Attention: The Neglected Crisis of Childhood Malnutrition*. (September 2008).

Book Projects

- *Niger 2005: A Not-So Natural Disaster*, Xavier Crombé and Jean-Hervé Jézéquel, editors. (May 2009) English-language edition edited by Kevin P.Q. Phelan.
- *Medical Innovations in Humanitarian Situations: The Work of Médecins Sans Frontières* Edited by Jean-Hervé Bradol and Claudine Vidal. Translated by Christopher Brasher, Nina Friedman, Philippa Bowe Smith, Karen Stokes, and Karen Tucker. (2011). https://www.msfaccess.org/sites/default/files/MSF_assets/Innovation/Docs/MedInov_Book_MedInovinHumanitarian_ENG_2011.pdf

- *From Ethiopia to Chechnya: Reflections on Humanitarian Action 1988-1999*. Francois Jean (2008). Edited by Kevin P.Q. Phelan Translated by Richard Swanson. https://msf-crash.org/sites/default/files/2017-06/f309-fromethiopiatochechnyab.pdf

Op-Eds

- *Profound Health Impact for Small Change*, Tido von Schoen-Angerer, Huffington Post. (November 2011) Writing support.
- *Empty calories and promises for overseas children*, Susan Shepherd, *KC Star*. (June 2011) Writing support.
- *Failing the Most Vulnerable: The Limited Impact of Food Aid on global Malnutrition* Bread for the World Annual Report, p 46. Co-author. (June 2009)
- *Instant Nutrition*, Susan Shepherd, the *New York Times.* (January 2008) Writing support.
- *Niger: August Will Be the Worst Month*, MSF Ideas & Opinions. (August 2005) Author.

Previous Work Experience

Reporter, **Radio France International – Service Anglais**, Paris, France June – September 2001

- Developed, edited, and helped produce news broadcast segments four times daily.

Freelance Writer, New York and Paris 1996 – 2001

- Wrote articles and short stories for a variety of newspapers and magazines. Work has appeared in the *New York Times*, *Harper's*, *New York Magazine*, *Brooklyn Bridge*, *Z Magazine*, *Exquisite Corpse*, *Paris Free Voice*, *Clamor*, and many other publications.

Adjunct Professor, **City College of New York**, New York 1996 – 2000

- Designed and taught the courses *Writing for the Sciences*; *Literature and Medicine*; and *Rhetoric of Composition*. Led weekly Organic Chemistry tutoring workshops. Designed and produced bi-annual newsletter for Graduate Program in Creative Writing.

Vocational Coordinator and Counselor, **Flowers With Care**, Astoria, NY 1993 – 1995

- Individual and family counseling at an alternative to High School program. Promoted to Vocational Coordinator after one year with the organization.
- Developed a student-run Desktop Publishing business, placed students with employers, and organized and supervised Summer Youth Employment Program.

Counselor, **Unitas**, South Bronx, NY 1990 – 1993

- Counseled young children and teenagers in conflict-resolution skills. Designed and led individual and group Art/Drama therapy sessions. Promoted to co-director of the summer program after one year with the organization. Hired and supervised junior counselors.

Education

MSc Nutrition Science, **Columbia University – Institute of Human Nutrition** (February 2013)

Final Thesis: *"Why all of the sudden am I developing all these issues?" Acculturation to the NYC Food Environment and its Possible Impact on Health for Immigrants from South Asia and West Africa.*

First Year, **Tulane University School of Medicine**, Leave of Absence in Good Standing (2001)

Post-Baccalaureate in Pre-medical studies, **City College of New York**, 3.9/4.0 (2000)

M.A. English Literature and Creative Writing, **City College of New York**, 3.8/4.0 (1997)

Completed coursework at **Université de Paris VIII** (1995 – 1996)

B.A. English Literature (minor in Philosophy), **Fordham University**, 3.5/4.0 (1991)

Skills and Activities

Proficient in spoken and written French. Founded literary journal *murmur*. Published fiction/non-fiction.

References Available On Request

Renaud BECQUET Director of Research – Directeur de recherche
French Citizen, single, born on March 18, 1979
Affiliation: Bordeaux Population Health Centre & Bordeaux School of Public Health
146, rue Léo Saignat
33076 BORDEAUX Cedex
Tel: +33.6.10.75.18.62
Renaud.Becquet@u-bordeaux.fr

Position title: Director of Research at the French National Institute for Health and Medical Research (Inserm)
Tenure position as a senior researcher since 2008 and then as a director of research since 2023
Co-director of the "Global Health in the Global South" team since 2016

Director of the Master "Global Health in the South", Bordeaux School of Public Health, since 2008
Professional experience as a researcher

Since 2024. Principal investigator of the NutriVax-Measles cluster randomized trial in Nigeria. A study testing the delivery of nutritional supplements (SQ-LNS) to incentive measles vaccination among children.
Since 2022. Principal investigator of the Nassamba-TBA cohort study in Central Republic Africa. A study testing a community-based mobile phone health application at destination of Traditional Birth Attendants (TBA) to improve follow-up and care for at-risk pregnant women.
Since 2019. Principal Investigator of the OptiMA Niger randomized clinical trial. This three-arm community-based individually randomized trial compares the OptiMA strategy with the COMPAS strategy and with the Niger nutritional standard protocol in uncomplicated wasted children aged 6-59 months.
Since 2018. **Principal investigator of the ANRS HIV-exposed-uninfected (HEU) study.** This individual data international pooled analysis seeks to better understand the survival trajectories of HEU children when compared to HIV-unexposed children in Africa.

Since 2013. **Principal Investigator of the IeDEA West Africa "Women & Mothers" program.** A multi-country research program aimed at describing and better addressing health outcomes of HIV-infected women in west-Africa, with a focus on sexual and reproductive health outcomes, such as pregnancy intention, incidence and complications after ART initiation and its association with maternal disease progression.

2018 - 2022. **Principal Investigator of the OptiMA Democratic Republic of Congo (DRC) randomized clinical trial.** This two-arm community-based individually randomized trial compares the OptiMA strategy with the DRC nutritional standard protocol in uncomplicated wasted children aged 6-59 months.

2016 - 2018. **Principal Investigator of the single-arm proof-of-concept OptiMA Burkina Faso trial.** The Optimizing treatment for acute MAlnutrition (OptiMA) strategy targets treatment to children with MUAC < 125 mm or oedema with one therapeutic food at a gradually reduced dose.

2015 - 2022. **Principal Investigator of the WETIV-R Cohort.** A prospective intervention cohort in Côte d'Ivoire aimed at evaluating the integration of sexual and reproductive health services into HIV care.

2014 - 2018. **Associated Investigator of the Togo Monetary Transfer program.** A community-based cluster-randomized trial in rural Togo aimed at evaluating the impact of a monetary transfer program on the prevention of maternal and child malnutrition.

2013 - 2016. **Associated Investigator of the Continuous Quality Improvement trial.** A community-based cluster-randomized trial in northern Nigeria aimed at evaluating the effect of a continuous quality improvement intervention on retention-in-care among pregnant HIV-infected women on treatment.

2010 - 2013. **Principal Investigator (PI) or Investigator (I) of a series of epidemiological studies on:**

- Quality of Life among HIV-infected women (Abidjan, Côte d'Ivoire, 2010) (PI);
- Life events and intimate partner violence among women (Lomé, Togo, 2011) (PI);
- Visual impairment among HIV-infected patients (Abidjan, Côte d'Ivoire, 2012) (PI);
- HIV prevention and care among Men who have sex with men (Ho Chi Minh City, Vietnam, 2012) (I);
- Menstrual hygiene among schoolgirls in rural and urban settings (Lomé & Kpalimé, Togo, 2013) (I);
- Nationwide prevalence study of intimate partner violence among women (Dominican Republic, 2013) (I).

2008 - 2011. **Project leader of the ANRS 12200 UMA trial** (Côte d'Ivoire, Zambia). Safety and efficacy of the Efavirenz-Tenofovir-Emtricitabine and Zidovudine-Lamivudine-Lopinavir/ritonavir combinations in pregnant and breastfeeding women to prevent mother-to-child transmission of HIV-1 in resource-limited settings. A multicentre randomized phase III clinical trial.

2007 - 2008. **Principal investigator of the ARVAM-CI AntiRétroViraux et Allaitement Maternel en Côte d'Ivoire** (Abidjan, Côte d'Ivoire). Evaluation among breastfeeding women treated by HAART of the diffusion of antiretrovirals through breastmilk and assessment of the effect of antiretrovirals on breast-milk HIV-1 RNA and DNA loads.

2006 - 2007. **Invited researcher at the Africa Centre for Health and Population Studies** (University of KwaZulu Natal, Mtubatuba, South Africa - director: Prof. Marie-Louise Newell).

2003 - 2006. **Expert technical advisor in epidemiology and data analysis, MTCT Plus initiative** (Abidjan, Côte d'Ivoire).

2001 - 2006. **Co-investigator of the Ditrame Plus ANRS 1201/1202 study** (Abidjan, Côte d'Ivoire). Interventions aimed at the prevention of HIV transmission through breastmilk were evaluated within this study.

International collaborations with United Nations (UN) agencies

Co-chair of the WHO/UNICEF/UNAIDS working group on the estimation of survival of HIV-exposed, uninfected children (since 2014, UN focal point: Nigel Rollins).

Technical advisor in epidemiology of the WHO INtegration and Scaling Up PMTCT through Implementation REsearch (INSPIRE) initiative (2013-2017, UN focal points: Nigel Rollins and Nathan Shaffer).

Core group member of the consolidated WHO guidelines development group on HIV & maternal and child health (2012-2013, UN focal point: Nathan Shaffer; 2015-2016, UN focal point: Meg Doherty).

Writer of the WHO guidelines entitled "Antiretroviral drugs for treating pregnant women and preventing HIV infection in infants: recommendations for a public health approach - 2010 version" (2010-2011, UN focal points: TinTin Sint and Nathan Shaffer).

Co-chair of the UNAIDS working group on the estimation of net survival of children HIV-infected perinatally and through breastfeeding (2009-2010, UN focal point: Peter Ghys).

Teaching experience

Since 2008. **Associate professor** in International Health, Université de Bordeaux.

Coordinator of the Master of International Health, Bordeaux School of Public Health (ISPED).

Coordinator of the following concentration courses:

- "Epidemiology of HIV-infection in developed and developing countries" (courses in English);
- "Developing and implementing epidemiological studies in resource-constrained settings";
- "International public health: Actors and interventions";
- "Public health communication in English" (courses in English);
- "Critical appraisal of health-related scientific information" (courses in English).

2005 - 2007. **Assistant professor** in biostatistics, epidemiology and public health.

- University Bordeaux. Coordination of the epidemiology courses for the Master of Epidemiology and the Master of International Public Health.
- National School of Public Health, Kigali, Rwanda. Coordination of the biostatistics courses of the Master of Public Health.
- Mauritius Institute of Health, Mauritius. Lectures in epidemiology.

2002 - 2005. **Teaching assistant** in biostatistics, epidemiology and public health, University Bordeaux.

PhD supervision

- 2011-2014. Juan BURGOS-SOTO, MD, MPH

Women's health, maternal health and HIV infection in West Africa.

- 2014-2018. Justine BRIAUX, MPH

Process evaluation and nutritional impact of a cash-transfer program targeting pregnant women and children under two in rural areas in Togo: Analysis of a cluster randomized controlled trial.

- 2016-2022. Thierry TIENDREBEOGO, MD, MPH

Reproductive health of women living with HIV on antiretroviral therapy as part of the integration of sexual and reproductive health services into HIV care in Abidjan, Côte d'Ivoire.

- 2016-2020. Luchuo ENGELBERT BAIN, MD, MSc

Decision making regarding unintended teenage pregnancies in Accra, Ghana.

- Since 2018. Cécile CAZES, BNurs, MPH

Simplified management of acute malnutrition in children aged 6 to 59 months: OptiMA-DRC, a community-based, non-inferiority, randomized controlled clinical trial in the Democratic Republic of the Congo.

- Since 2019. Maguy DAURES, MPH

Evaluation of two simplified and optimized nutritional strategies for acute malnutrition in children aged 6 to 59 months: OptiMA-Niger, an individually randomized community-based non-inferiority trial, in the Zinder region, Niger.

- Since 2021. Emelyne GRES, PharmD, MPH

Malnutrition in children under 5 years old in primary health centers in Burkina Faso, Guinea, Mali and Niger.

Education

2014

"Habilitation à diriger des recherches" in Public Health and Epidemiology
Institute of Public Health & Epidemiology, University Victor Segalen, Bordeaux, France

2002 - 2005

PhD in Public Health and Epidemiology
Institute of Public Health & Epidemiology, University Victor Segalen, Bordeaux, France

Fellow of the French Ministry of Education, Research and Technology

2001 - 2002

Master of Public Health, Biostatistics and Epidemiology
Institute of Public Health & Epidemiology, University Victor Segalen, Bordeaux, France
2000 - 2001

Post-graduate diploma in Public Health
Institute of Public Health & Epidemiology, University Victor Segalen, Bordeaux, France

Other activities

Creator and co-chair (chair: F. Barré-Sinoussi) of the Françoise Barré-Sinoussi (2008 Medicine Nobel Price) excellency scholarship aimed at supporting the training (Master of International Health, Bordeaux School of Public Health) of public health African professionals, funded by the ANRS, since 2012.

Creator and co-chair (chair: D. Mukwege) of the Denis Mukwege (2018 Peace Nobel Price) excellency scholarship aimed at supporting the training (Master of International Health, Bordeaux School of Public Health) of public health African professionals, funded by the Fondation Pierre Fabre, since 2022.

Elected member of the Board of Directors of the Bordeaux School of Public Health - ISPED (Since 2017).

Elected member of the Doctoral School College of Bordeaux University (Since 2021).

Elected member of the Academic Council of the Bordeaux University (2014-2018).

Scientific Attaché for public health at the French High Council for Evaluation of Research and Higher Education (HCERES), Paris, France (2016-2017).

Member of the Board of Directors of the French charity Sidaction, (2009-2020). Sidaction is one of the most important European funders of HIV/Aids research programs with 10,000,000€ spent each year (www.sidaction.org).

Reviewer for international scientific journals: The Lancet, The Lancet Global Health, The Lancet Infectious Diseases, PLoS Medicine, PLoS ONE, Pediatrics, Clinical Infectious Diseases, AIDS, JAIDS, WHO Bulletin, Archives of Pediatrics and Adolesent Medicine, BMC Infectious Diseases, BMC Paediatrics, Paediatric and Perinatal Epidemiology, Acta Paediatrica, Health Policy and Planning, AIDS Care.

PUBLICATIONS

Scientific publications (*: co-last author)

Phelan K, Seri B, Daures M, Yao C, Alitanou R, Aly AAM, Maidadji O, Sanoussi A, Mahamadou A, Cazes C, Moh R, **Becquet** R, Shepherd S. Treatment outcomes and associated factors for hospitalization of children treated for acute malnutrition under the OptiMA simplified protocol: a prospective observational cohort in rural Niger. **Front Public Health**. 2023;11:1199036.

Cazes C, Phelan K, Hubert V, Boubacar H, Izié Bozama L, Tshibangu Sakubu G, BinBamda Senge B, Baya N, Alitanou R, Kouamé A, Yao C, Gabillard D, Kinda M, Daures M, Augier A, Anglaret X, Shepherd S, **Becquet R**. Optimizing the dosage of ready-to-use therapeutic food in children with uncomplicated acute malnutrition in the Democratic Republic of the Congo: a non-inferiority, randomized clinical trial. **eClinicalMedicine**. 2023;58(4):101878.

Becquet R, Cazes C, Phelan K, Tshiala BK, Shepherd S. The OptiMA protocol in children with wasting and stunting - Authors' reply.

Lancet Glob Health. 2022;10(7):e958.

Cazes C, Phelan K, Hubert V, Boubacar H, Izié Bozama L, Tshibangu Sakubu G, Kalenga Tshiala B, Tusuku T, Alitanou R, Kouamé A, Yao C, Gabillard D, Kinda M, Daures M, Augier A, Anglaret X,

Shepherd S, **Becquet R**. Simplifying and optimising the management of uncomplicated acute malnutrition in children aged 6 to 59 months: a non-inferiority randomised controlled trial in the Democratic Republic of Congo. **Lancet Glob Health** 2022;10(4):e510-e520.

Daures M, Hien J, Phelan K, Boubacar H, Atté S, Aboubacar M, Aly A, Mayoum B, Azani J-C, Koffi J-J, Séri B, Beuscart A, Gabillard D, Hubert V, Cazes C, Kinda M, Anglaret X, Kangas S, Shepherd S, **Becquet R**. Simplifying and optimizing management of acute malnutrition in children aged 6 to 59 months: study protocol for a 3 arms community-based individually randomized controlled trial in decentralized Niger. **Trials** 2022;23(1):89.

Sato R, Daures M, Phelan K, Shepherd S, Kinda M, **Becquet R**, Hecht R, Resch S. Utilization patterns, outcomes and costs of a simplified acute malnutrition treatment programme in Burkina Faso. **Matern Child Nutr**. 2021:e13291.

Tiendrebeogo T, Messou E, Arikawa S, Ekouevi DK, Tanon A, Kwaghe V, Balestre E, Zannou MD, Poda A, Dabis F, Jaquet A, Minga A, **Becquet R**. Ten-year attrition and antiretroviral therapy response among HIV-positive adults: a sex-based cohort analysis from eight West African countries. **J Int AIDS Soc**. 2021;24(5):e25723.

Daures M, Phelan K, Issoufou M, Sawadogo O, Akpakpo B, Kinda M, Shepherd S, **Becquet R**. Incidence of relapse following a new approach to simplifying and optimising acute malnutrition treatment in children aged 6-59 months: a prospective cohort in rural Northern Burkina Faso. **J Nutr Sci**. 2021;10:e27.

Cazes C, Phelan K, Hubert V, Alitanou R, Boubacar H, Izie Bozama L, Tshibangu Sakubu G, Beuscart A, Yao C, Gabillard D, Kinda M, Augier A, Anglaret X, Shepherd S, **Becquet R**. Simplifying and optimising management of acute malnutrition in children aged 6 to 59 months: study protocol for a community-based individually randomised controlled trial in Kasaï, Democratic Republic of Congo. **BMJ Open**. 2020;10(12):e041213.

Briaux J, Martin-Prevel Y, Carles S, Fortin S, Kameli Y, Adubra L, Renk A, Agboka Y, Romedenne M, Mukantambara F, Van Dyck J, Boko J, **Becquet R**, Savy M. Evaluation of an unconditional cash transfer program targeting children's first-1,000-days linear growth in rural Togo: A cluster-randomized controlled trial. **PLoS Med**. 2020;17(11):e1003388.

Arikawa S, Dumazert P, Messou E, Burgos-Soto J, Tiendrebeogo T, Zahui A, Horo A, Minga A, **Becquet R**. Childbearing desire and reproductive behaviors among women living with HIV: A cross-sectional study in Abidjan, Côte d'Ivoire. **PLoS One**. 2020;15(10):e0239859.

Font H, Rollins N, Essajee S, **Becquet R**, Foster G, Mangwiro AZ, Mwapasa V, Oyeledun B, Phiri S, Sam-Agudu NA, Bellare NB, Orne-Gliemann J; INSPIRE group. Retention-in-care in the PMTCT cascade: definitions matter! Analyses from the INSPIRE projects in Malawi, Nigeria and Zimbabwe**. J Int AIDS Soc**. 2020;23(10):e25609.

Bain LE, Muftugil-Yalcin S, Amoakoh-Coleman M, Zweekhorst MBM, **Becquet R**, de Cock Buning T. Decision-making preferences and risk factors regarding early adolescent pregnancy in Ghana: stakeholders' and adolescents' perspectives from a vignette-based qualitative study. **Reprod Health**. 2020;17(1):141.

Ekat MH, Yotebieng M, Leroy V, Mpody C, Diafouka M, Loubaki G, Nsondé DM, Ossibi Ibara BR, Bernard C, Sabin C, **Becquet R**. Association between depressive symptoms and adherence among adolescents living with HIV in the Republic of Congo: A cross sectional study. **Medicine**. 2020;99(35):e21606.

Tiendrebeogo T, Anglaret X, **Becquet R**. HIV, Pregnancy, and Isoniazid Preventive Therapy. **N Engl J Med**. 2020;382(12):1184.

Daures M, Phelan K, Issoufou M, Kouanda S, Sawadogo O, Issaley K, Cazes C, Séri B, Ouaro B, Akpakpo B, Mendiboure V, Shepherd S, **Becquet R**. New approach to simplifying and optimising acute malnutrition treatment in children aged 6-59 months: the OptiMA single-arm proof-of-concept trial in Burkina Faso. **Br J Nutr**. 2020;123(7):756-767.

Ahoua L, Tiendrebeogo T, Arikawa S, Lahuerta M, Aly D, Journot V, Abrams EJ, **Becquet R**, Dabis F. PMTCT care cascade and factors associated with attrition in the first four years after Option B+ implementation in Mozambique. **Trop Med Int Health**. 2020;25(2):222-235.

Engelbert Bain L, Amoakoh-Coleman M, Tiendrebeogo KT, Zweekhorst MBM, de Cock Buning T, **Becquet R**. Attitudes towards abortion and decision-making capacity of pregnant adolescents: perspectives of medicine, midwifery and law students in Accra, Ghana. **Eur J Contracept Reprod Health Care**. 2020;25(2):151-158.

Engelbert Bain L, Zweekhorst MBM, Amoakoh-Coleman M, Muftugil-Yalcin S, Omolade AI, **Becquet R**, de Cock Buning T. To keep or not to keep? Decision making in adolescent pregnancies in Jamestown, Ghana. **PLoS One**. 2019;14(9):e0221789.

Briaux J, Fortin S, Kameli Y, Agboka Y, Romedenne M, Boko J, Martin-Prevel Y, **Becquet R***, Savy M*. Dissimilarities across age groups in the associations between complementary feeding practices and child growth: Evidence from rural Togo. **Matern Child Nutr**. 2019;18:e12843.

Giles ML, Achhra AC, Abraham AG, Haas AD, Gill MJ, Lee MP, Luque M, McGowan C, Cornell M, Braitstein P, de Rekeneire N, **Becquet R**, Wools-Kaloustian K, Law M. Sex-based differences in antiretroviral therapy initiation, switching and treatment interruptions: global overview from the International Epidemiologic Databases to Evaluate AIDS (IeDEA). **J Int AIDS Soc**. 2018;21(6):e25149.

Slogrove AL, **Becquet R**, Chadwick EG, Côté HCF, Essajee S, Hazra R, Leroy V, Mahy M, Murenga M, Wambui Mwangi J, Oyiengo L, Rollins N, Penazzato M, Seage GR 3rd, Serghides L, Vicari M, Powis KM. Surviving and thriving-shifting the public health response to HIV-exposed uninfected children: report of the 3rd HIV-Exposed Uninfected Child Workshop. **Front Pediatr**. 2018;6:157.

Arikawa S, Rollins N, Jourdain G, Humphrey J, Kourtis AP, Hoffman I, Essex M, Farley T, Coovadia HM, Gray G, Kuhn L, Shapiro R, Leroy V, Bollinger RC, Onyango-Makumbi C, Lockman S, Marquez C, Doherty T, Dabis F, Mandelbrot L, Le Coeur S, Rolland M, Joly P, Newell ML, **Becquet R**. Contribution of maternal antiretroviral therapy and breastfeeding to 24-Month survival in human immunodeficiency virus-exposed uninfected children: an individual pooled analysis of African and Asian studies. **Clin Infect Dis**. 2018;66(11):1668-1677.

Oyeledun B, Phillips A, Oronsaye F, Alo O, Shaffer N, Osibo B, Imarhiagbe C, Ogirima F, Ajibola A, Ezebuka O, Ojong-Etta B, Obi A, Falade J, Uthman A, Famuyide B, Odoh D, **Becquet R**. The effect of a continuous quality improvement intervention on retention-in-care at 6 months postpartum of pregnant women and mothers in an HIV antiretroviral programme in Northern Nigeria: results of a cluster randomized controlled study. **J Acquir Immune Defic Syndr.** 2017;75 Suppl 2:S156-S164.

Osibo B, Oronsaye F, Alo O, Phillips A, **Becquet R**, Shaffer N, Ogirima F, Imarhiagbe C, Ameh B, Ezebuka O, Sodzi-Tettey, S, Obi A, Afolabi, O, Inedu A, Oyeledun B. Continuous Quality Improvement using BreakThrough Series interventions to improve quality of PMTCT services in resource limited settings: Evidence from a Cluster Randomized Study in Northern Nigeria. **J Acquir Immune Defic Syndr.** 2017;75 Suppl 2:S165-S172.

Arikawa S, Eboua T, Kouakou K, N'Gbeche MS, Folquet M, Moh C, Amoussou-Bouah UB, Coffie PA, **Becquet R** *, Leroy V *. Pregnancy incidence and associated factors among HIV-infected female adolescents in HIV care in urban Côte d'Ivoire, 2009-2013. **Global Health Action** 2016; 9:31622.

Arikawa S, Rollins NC, Newell ML, **Becquet R**. Systematic review and meta-analysis of mortality risk and associated factors in HIV-exposed uninfected children. **Trop Med Int Health**. 2016; 21(6):720-34.

Dah TT, Orne-Gliemann J, Guiard-Schmid JB, **Becquet R**, Larmarange J. [Men who have sex with men (MSM) and HIV infection in Ouagadougou, Burkina Faso: Knowledge, attitudes, practices and seroprevalence survey]. **Rev Epidemiol Sante Publique**. 2016 Sep;64(4):295-300

Rollins NC, **Becquet R**, Orne-Gliemann J, Phiri S, Hayashi C, Baller A, Shaffer N. Defining and analyzing Retention-in-Care among pregnant and breastfeeding HIV-infected women: Unpacking the data to interpret and improve PMTCT outcomes. **J Acquir Immune Defic Syndr** 2014;67(2):S150-6.

Oyeledun B, Oronsaye F, Oyelade T, **Becquet R**, Odoh D, Anyaike C, Ogirima F, Ameh B, Ajibola A, Osibo B, Imarhiagbe C, Abutu I. Increasing retention in care of HIV-positive women in PMTCT services through continuous quality improvement-breakthrough (CQI-BTS) series in primary and secondary health care facilities in Nigeria: a cluster randomized controlled trial. The Lafiyan Jikin Mata Study. **J Acquir Immune Defic Syndr** 2014;67(2):S125-31.

Burgos-Soto J, Balestre E, Minga A, Ajayi S, Sawadogo A, Zanou MD, Leroy V, Ekouevi DK, Dabis F, **Becquet R**. Incidence of pregnancy following antiretroviral therapy initiation and associated factors in eight West African countries. **J Acquir Immune Defic Syndr** 2014;67(2):e45-54.

Burgos-Soto J, Orne-Gliemann J, Encrenaz G, Patassi A, Woronowski A, Kariyiare B, Lawson-Evi A, Leroy V, Dabis F, Ekouevi DK, **Becquet R**. Intimate partner sexual and physical violence among women in Togo, West-Africa: Prevalence, associated factors and the specific role of HIV infection. **Global Health Action** 2014;26(7):23456.

Shaffer N, Abrams EJ, **Becquet R**. Option B+ for prevention of mother-to-child transmission of HIV in resource-constrained settings: great promise but some early caution. **AIDS**. 2014;28(4):599-601.

Justumus P, Colby D, Mai Doan Anh T, Balestre E, **Becquet R ***, Orne-Gliemann J. Willingness to Use the Internet to Seek Information on HIV Prevention and Care among Men Who Have Sex with Men in Ho Chi Minh City, Vietnam. **PLoS ONE**. 2013;8(8): e71471.

Ekouevi DK, Coffie PA, Salou M, Kariyiare BG, Dagnra AC, Tchounga B, Prince-Davi M, **Becquet R**, Pitche VP. [HIV seroprevalence among drug users in Togo]. **Santé Publique**. 2013;25(4):491-8.

Ekouevi DK, D'almeida S, Salou M, Kariyiare BG, Coffie PA, Dagnra AC, Tchounga B, **Becquet R**, Prince-David M, Pitche VP. HIV seroprevalence among inmates in Togo. **Med Mal Infect**. 2013;43(2013):279–285

Becquet R, Dabis F. Turning the tide on HIV in women and children: Preventing breast-milk HIV transmission while increasing maternal life expectancy. **Clinical Infectious Diseases**. 2013;56(1):140-2.

Rollins NC, Mahy M, **Becquet R**, Kuhn L, Creek T, Mofenson L. Estimates of peripartum and postnatal mother-to-child transmission probabilities of HIV for use in Spectrum and other population-based models. **Sex Transm Infect** 2012;88 Suppl 2:i44-i51.

Becquet R, Marston M, Dabis F, Moulton LH, Gray G, Coovadia H, Essex M, Ekouevi DK, Jackson D, Coutsoudis A, Kilewo C, Leroy V, Wiktor S, Nduati R, Msellati P, Zaba B, Ghys PD, Newell ML. Children who acquire HIV infection perinatally are at higher risk of early death than those acquiring infection through breastmilk: a meta-analysis. **PLoS One**. 2012;7(2):e28510.

Ekouevi DK, Kariyiare BG, Coffie PA, Jutand MA, Akpadza K, Lawson-Evi A, Tatagan A, Dabis F, Sibe M, Pitche VP, **Becquet R**, David M. Feasibility and acceptability of rapid HIV screening in a labour ward in Togo. **J Int AIDS Soc**. 2012;15(2):17380.

Becquet R, Ekouevi DK. Breastfeeding, triple ARV prophylaxis and MTCT Prevention. **The Lancet Infectious Diseases**. 2011;11(3):154-5.

Marston M, **Becquet R**, Zaba B, Moulton LH, Gray G, Coovadia H, Essex M, Ekouevi DK, Jackson D, Coutsoudis A, Kilewo C, Leroy V, Wiktor S, Nduati R, Msellati P, Dabis F, Newell ML, Ghys PD. Net survival of perinatally and postnatally HIV-infected children: a pooled analysis of individual data from sub-Saharan Africa. **International Journal of Epidemiology**. 2011;40(2):385-396.

Stover J, Johnson P, Hallett T, Marston M, **Becquet R**, Timaeus IM. The Spectrum projection package: improvements in estimating incidence by age and sex, mother-to-child transmission, HIV progression in children and double orphans. **Sex Transm Infect**. 2010;86 Suppl 2:ii16-21.

Becquet R, Burgos-Soto J, Carrieri MP, Spire B. Quality of life assessment in HIV clinical research in resource-limited setting: better late than never. **Trop Med Int Health**. 2010;15(9):1008-1010.

Becquet R, Bland RM, Ekouevi DK, Dabis F, Newell ML. Universal ART among pregnant and post-partum HIV-infected women would improve maternal health and decrease postnatal HIV transmission. **AIDS** 2010;24(8):1239-41.

Becquet R, Ekouevi DK, Arrivé E, Stringer JS, Méda N, Chaix ML, Treluyer JM, Leroy V, Rouzioux C, Blanche S, Dabis F. Universal antiretroviral therapy for pregnant and breastfeeding HIV-infected women: Towards the elimination of mother-to-child transmission of HIV-1 in resource-limited settings. **Clinical Infectious Diseases.** 2009;49(12):1936-45.

Becquet R, Bland RM, Leroy V, Rollins NC, Ekouevi DK, Coutsoudis A, Dabis F, Coovadia HM, Salamon R, Newell ML. Duration, pattern of breastfeeding and postnatal transmission of HIV: pooled analysis of individual data from a West and South African cohort study. **PLoS One** 2009;4(10):e7397.

Desgrees-du-Lou A, Brou H, Traore AT, Djohan G, **Becquet R**, Leroy V. From prenatal HIV testing of the mother to prevention of sexual HIV transmission within the couple. **Soc Sci Med** 2009;69(6):892-9.

Rollins NC, **Becquet R**, Bland RM, Coutsoudis A, Coovadia HM, Newell ML. Preventing postnatal mother-to-child transmission of HIV: Context matters. **AIDS** 2009;23(6):740.

Tonwe-Gold B, Ekouevi DK, Bosse CA, Toure S, Kone M, **Becquet R**, Leroy V, Toro P, Dabis F, El Sadr WM and Abrams EJ. Implementing family-focused HIV care and treatment: the first 2 years' experience of the mother-to-child transmission-plus program in Abidjan, Cote d'Ivoire. **Trop Med Int Health** 2009;14(2): 204-12.

Rollins NC, **Becquet R**, Bland RM, Coutsoudis A, Coovadia HM, Newell ML. Infant feeding, HIV transmission and mortality at 18 months: the need for appropriate choices by mothers and prioritisation within programs. **AIDS** 2008;22(17):2349-57.

Ekouevi DK, Coffie PA, **Becquet R**, Tonwe-Gold B, Horo A, Thiebaut R, Leroy V, Blanche S, Dabis F, Abrams EJ. Antiretroviral therapy in pregnant women with advanced HIV disease and pregnancy outcomes in Abidjan, Côte d'Ivoire. **AIDS** 2008;22(14):1815-20.

Becquet R, Mofenson LM. Early antiretroviral therapy of HIV-infected infants in resource-limited countries: possible, feasible, effective – and challenging. **AIDS** 2008;22(11):1365-8.

Becquet R, Ekouevi DK, Menan H, Amani-Bosse C, Viho I, Dabis F, Timite-Konan M, Leroy V. Early mixed feeding and breastfeeding beyond six months increase the risk of postnatal HIV transmission: ANRS 1201/1202 Ditrame Plus, Abidjan, Côte d'Ivoire. **Preventive Medicine** 2008;47(1):27-33.

Brou H, Djohan G, **Becquet R**, Allou G, Ekouevi DK, Zanou B, Leroy V, Desgrées du Loû A. Sexual prevention of HIV within the couple after prenatal HIV-testing in West Africa. **AIDS Care** 2008;20(4):413-18.

Harambat J, Fassinou P, **Becquet R**, Toure P, Rouet F, Dabis F, Msellati P, Blanche S, Timite-Konan M, Salamon R, Leroy V. 18-month occurrence of severe events among early diagnosed HIV-infected children before antiretroviral therapy in Abidjan, Cote d'Ivoire: a cohort study. **BMC Public Health** 2008;8:169.

Orne-Gliemann J, **Becquet R**, Ekouevi DK, Leroy V, Perez F, Dabis F. Children and HIV/AIDS. From research to policy and action in resource-limited settings. **AIDS** 2008;22(7):797-805.

Leroy V, Ekouevi DK, **Becquet R**, Viho I, Dequae-Merchadou L, Tonwe-Gold B, Rouet F, Sakarovitch C, Horo A, Timite-Konan M, Rouzioux C, Dabis F. 18-month effectiveness of short-course antiretroviral regimens combined with alternatives to breastfeeding to prevent HIV mother-to-child transmission. **PLoS ONE** 2008;3(2):e1645.

Coffie PA, Ekouevi DK, Chaix ML, Tonwe-Gold B, Amani-Bosse C, **Becquet R**, Viho I, N'Dri-Yoman T, Leroy V, Abrams EJ, Rouzioux C, Dabis F. Maternal 12-month response to antiretroviral therapy following prevention of mother-to-child transmission of HIV-1, Côte d'Ivoire, 2003-2006. **Clinical Infectious Diseases** 2008;46(4):611-21.

Ekouevi DK, Inwoley A, Tonwe-Gold B, Danel C, **Becquet R**, Viho I, Rouet F, Dabis F, Anglaret X, Leroy V. Variation of CD4 count and percentage among women receiving antiretroviral prophylaxis for the prevention of mother-to-child transmission of HIV: Implication for HAART initiation in resource-limited settings. **AIDS Research and Human Retroviruses** 2007;23(12):1469-74.

Brou H, Djohan G, **Becquet R**, Allou G, Ekouevi DK, Viho I, Leroy V, Desgrées du Loû A. When do HIV-infected women disclose their serostatus to their male partners and why? Experience from a prevention of mother-to-child-transmission programme in Abidjan, Côte d'Ivoire. **PLoS Medicine** 2007;4(12):e342.

Desgrées du Loû A, Brou H, Djohan G, **Becquet R**, Ekouevi DK, Zanou B, Viho I, Dabis F, Leroy V. Beneficial effects of offering prenatal HIV counselling and testing on developing a HIV preventive attitude among couples. Abidjan, 2002-2005. **AIDS and Behaviour** (electronic publication on the 6th of November 2007).

Becquet R, Leroy V. [The challenges of preventing mother-to-child transmission of HIV in Africa - a literature review]. **La Presse Médicale** 2007;36(12):1947-57.

Bland RM, **Becquet R**, Rollins NC, Coutsoudis A, Coovadia HM, Newell ML. Breast health problems are rare in both HIV-infected and uninfected women who received counselling and support for breast-feeding in South Africa. **Clinical Infectious Diseases** 2007;45(11):1502-10.

Becquet R, Newell ML. Prevention of postnatal HIV infection: infant feeding and antiretroviral interventions. **Current Opinion in HIV and AIDS** 2007;2(5):361–366.

Tonwe-Gold B, Ekouevi DK, Viho I, Amani-Bosse C, Toure S, Coffie S, Rouet F, **Becquet R**, Leroy V, El-Sadr W, Abrams EJ, Dabis F. Highly active antiretroviral treatment and prevention of peripartum and postnatal HIV transmission in West Africa. **PLoS Medicine** 2007;4(8):e257.

Martinson NA, Ekouevi DK, Dabis F, Morris L, Lupodwana P, Tonwe-Gold B, Dhlamini P, **Becquet R**, Steyn JG, Leroy V, Gray G, McIntyre J. Transmission Rates in Consecutive Pregnancies Exposed to Single-Dose Nevirapine in Soweto, South Africa and Abidjan, Cote d'Ivoire. **J Acquir Immune Defic Syndr** 2007;45(2): 206-209.

Becquet R. Antiretroviral therapy among HIV-infected breastfeeding mothers: a promising strategy to prevent HIV transmission through breastmilk in Africa. **Future HIV therapy** 2007;1(1):17-21.

Becquet R, Bequet L, Ekouevi DK, Viho I, Sakarovitch C, Fassinou P, Bedikou G, Timite-Konan M, Dabis F, Leroy V. Two-year morbidity-mortality and alternatives to prolonged breast-feeding among children born to HIV-infected mothers in Côte d'Ivoire. **PLoS Medicine** 2007;4(1): e17.

Leroy V, Sakarovitch C, Viho I, **Becquet R**, Ekouevi DK, Bequet L, Rouet F, Dabis F, Timite-Konan M. Acceptability of formula-feeding to prevent postnatal transmission of HIV-1 infection in Abidjan, Côte d'Ivoire, Ditrame Plus ANRS 1201/1202. **J Acquir Immune Defic Syndr** 2007;44(1): 77-86.

Ekouevi DK, Toure R, **Becquet R**, Viho I, Sakarovitch C, Rouet F, Tonwe-Gold B, Bequet L, Fassinou P, Leroy V, Blanche S, Dabis F. Serum lactate levels in infants exposed peripartum to antiretrovirals to prevent mother-to-child transmission of HIV: ANRS 1209 study, Abidjan, Côte d'Ivoire. **Pediatrics** 2006; 118(4)e1071-e1077.

Rouet F, Inwoley A, Ekouevi DK, Viho I, **Becquet R**, Sakarovitch C, Bequet L, Tonwe-Gold B, Chaix ML, Leroy V, Rouzioux C, Dabis F. CD4 percentages and total lymphocyte counts as early surrogate markers for pediatric HIV-1 infection in resource-limited settings. **Journal of Tropical Pediatrics** 2006;52(5):346-354.

Becquet R, Leroy V, Ekouevi DK, Viho I, Castetbon K, Fassinou P, Dabis F, Timite-Konan M. Complementary feeding adequacy in relation to nutritional status among early weaned breastfed children who are born to HIV-infected mothers: ANRS 1201/1202 Ditrame Plus, Abidjan, Côte d'Ivoire. **Pediatrics** 2006;117(4):e701-e710.

Becquet R, Castetbon K, Viho I, Ekouevi DK, Bequet L, Ehouo B, Dabis F, Leroy V. Infant feeding practices before implementing alternatives to prolonged breastfeeding to reduce HIV transmission through breastmilk in Abidjan, Côte d'Ivoire. **Journal of Tropical Pediatrics** 2005;51(6):351-5.

Becquet R, Ekouevi DK, Viho I, Sakarovitch C, Toure H, Castetbon K, Coulibaly N, Timite-Konan M, Bequet L, Dabis F, Leroy V. Acceptability of exclusive breastfeeding with early cessation to prevent HIV transmission through breastmilk, ANRS 1201/1202 Ditrame Plus, Abidjan, Côte d'Ivoire. **J Acquir Immune Defic Syndr** 2005;40(5):600-8.

Becquet R, Leroy V. HIV and infant feeding: a complex issue in ressource-limited settings. **AIDS** 2005;19(15): 1717-8.

Becquet R, Ekouevi DK, Sakarovitch C, Bequet L, Viho I, Tonwe-Gold B, Dabis F, Leroy V. Knowledge, attitudes and beliefs of health care workers regarding alternatives to prolonged breastfeeding, ANRS 1201/1202 Ditrame Plus, Abidjan, Côte d'Ivoire. **J Acquir Immune Defic Syndr** 2005;40(1):102-5.

Dabis F, Bequet L, Ekouevi DK, Viho I, Rouet F, Horo A, Sakarovitch C, **Becquet R**, Fassinou P, Dequae L, Welffens-Ekra C, Rouzioux C, Leroy V. Field efficacy of Zidovudine, Lamivudine and single-dose Nevirapine to prevent peripartum transmission of HIV. The ANRS 1201/1202 Ditrame Plus study, Abidjan, Cote d'Ivoire. **AIDS** 2005;19(3): 309-18.

Ekouevi DK, **Becquet R,** Bequet L, Viho I, Towne-Gold B, Dabis F, Leroy V. Obtaining informed consent in HIV infected pregnant women participating in a PMTCT study in Abidjan, Côte d'Ivoire. **AIDS** 2004;18(10): 1486-8.

Ekouevi DK, Rouet F, **Becquet R**, Inwoley A, Viho I, Towne-Gold B, Bequet L, Dabis F, Leroy V. Immune status and uptake of antiretroviral interventions to prevent mother-to-child transmission of HIV in Africa. **J Acquir Immune Defic Syndr** 2004;36(2):755-7.

Rollins N, Meda N, **Becquet R**, Coutsoudis A, Humphrey J, Jeffrey B, Kanshana S, Kuhn L, Leroy V, Mbori-Ngacha D, McIntyre J, Newell ML. Preventing post-natal transmission of HIV-1 through breastfeeding: modifying infant feeding practices. **J Acquir Immune Defic Syndr** 2004;35(2):188-95.

Becquet R, Leroy V, Salmi LR. Breastfeeding, atopy, and asthma. **The Lancet** 2003;361(9352):174.

Edited book sections

Becquet R, Dabis F. Prévention de la transmission mère-enfant du VIH en Afrique. In: Girard PM. VIH, édition 2011. Wolters Kluwer France, 2011.

Becquet R. Pratiques contraceptives dans le post-partum immédiat en relation avec les modalités d'alimentation infantile chez des mères infectées par le VIH. Expérience du projet Ditrame Plus ANRS 1201/1202, Abidjan, Côte d'Ivoire. In: Desgrées du Loû A, Ferry B. Sexualité et procréation confrontées au Sida dans les pays du Sud. Paris, France: Les collections du CEPED; 2006. p. 137-150.

CURRICULUM VITAE

DR. BABA WARU GONI

MB;BS (Unimaid 1998), FWACP (2008), FMCP (Infectious Diseases/Immunology: 2009), Masters in Health Planning and Management (Unimaid: 2007), MSc Tropical Medicine and International Health (University of London: 2012), Postgraduate Diploma in Tropical Medicine and International Health (London School of Hygiene and Tropical Medicine: 2012), DTM&H (Royal College of Physicians, London: 2012), Advanced Certificate in Arabic Proficiency (Nigerian Arabic Language Village, Maiduguri 2014)

Summary

Dr. Baba Waru Goni is an Associate Professor of Infectious Diseases and Immunology with the Department of Medicine, University of Maiduguri, Nigeria and Honorary Consultant Physician, currently the Chief Medical Director Yobe State University Teaching Hospital Damaturu, Nigeria. He is a specialist in Tropical Medicine, infectious Diseases and Immunology with cognate experience and expertise in clinical/epidemiologic research/teaching; focused mainly on Infectious Diseases, Tropical Medicine, HIV/AIDS, Tuberculosis, Malaria and Immunology as well as Health Planning/Management and Public Health. He was the Executive Secretary Yobe State Hospitals Management Board, Damaturu from 8th June 2015 to 2nd November 2016. As an Executive Secretary of the HMB he was primarily responsible for the overall supervision of all the secondary and tertiary health facilities in Yobe State including personnel management and budgetary planning and implementation. He is currently the pioneer Chief Medical Director (CMD) of Yobe State University Teaching Hospital Damaturu (YSUTH- from 2nd November 2016 to Date). As the pioneer CMD he is responsible for commencement of clinical services at the Hospital including making preparation for the formal commissioning of the Hospital by Mr. President in the first quarter of 2017, recruitment of health professionals as well as other supporting staff in the Hospital and day to day administrative and clinical running of the multi-billion Naira Hospital. In addition, the CMD in collaboration with the Vice Chancellor and other council members of Yobe State University are to kick start the medical college in the Yobe State University so as to provide the ground for the training of medical and dental officers in order to breach the human resource for health gap in the state as well as the North Eastern region of Nigeria. He is also an adjunct examiner at the Department of Community Medicine, University of Maiduguri from October 2015 to Date. He was also a Consultant Physician with Harvard School of Public Health/APIN HIV/AIDS PEPFAR Programme at the UMTH from 2004 to 2013 and Consultant in Operations Research with PRRINN-MNCH, a UK DFID and Norwegian Government funded project in Yobe State. His career track records include over 15-year working experience both as a Physician and Lecturer in Nigeria with Government as well as International NGOs.

He is experienced in clinical and epidemiologic research, undergraduate and postgraduate teaching in General Internal Medicine, Infectious Diseases, Immunology and Tropical Medicine. He is also conversant with Health System Strengthening interventions in Nigeria with emphasis on Operation Research, Capacity Building, Integrated Supportive Supervision, Human Resource for Health and Monitoring and Evaluation.

NAME: DR BABA WARU GONI
DATE/PLACE OF BIRTH: 1972 /YUSUFARI
SEX: Male
LANGAUGE SPOKEN: ENGLISH, KANURI, ARABIC AND HAUSA
NATIONALITY: NIGERIAN
STATE OF ORIGIN: YOBE
LOCAL GOVERNMENT AREA OF ORIGIN: YUSUFARI
CONTACT ADDRESS: House number C91, Red Bricks Housing Estate, Maiduguri Road, Damaturu, Yobe State.
POSTAL ADDRESS: Office of the Chief Medical Director,
Yobe State University Teaching Hospital,
PMB 1072, Damaturu, Yobe State, Nigeria.

E-Mail: bgoni2000@yahoo.com, babawaru@gmail.com, bgwaru72@hotmail.com
Telephone: +234(0)8039282285, +234(0)7085079346 (Mobile),
MARITAL STATUS: MARRIED WITH CHILDREN

Working Experience with Dates:

- Pre-registration House officer, University of Maiduguri Teaching Hospital (November 1998 to December 1999)
- Senior House Officer (Locum) University of Maiduguri Teaching Hospital (January 2000 to June 2000)

- Medical Officer NYSC, Taikai NYSC Community Based Clinic, Takai LGA Kano State (July 2000 to August 2001)
- Medical officer/acting Principal Medical Officer Dr. (Mrs) Maryam Abacha Maternal and Children Hospital, Damaturu Yobe State (September 2001 to September 2002)
- Medical Registrar, Department of Medicine, University of Maiduguri Teaching Hospital, Borno State (September 2002 to April 2005)
- Senior Registrar I, Department of Medicine, University of Maiduguri Teaching Hospital, Borno State (April 2005 to May 2006)
- Senior Registar II, Department of Medicine University of Maiduguri Teaching, Borno State (May 2006 to August 2008)
- Consultant Physician (Infectious Diseases and Immunology) University of Maiduguri Teaching Hospital (August 2008 to October 2010)
- Honorary Consultant Physician (Infectious Diseases and Immunology), University of Maiduguri Teaching Hospital, Borno State (October 2010 to date)
- Lecturer I, Department of Medicine, University of Maiduguri, Borno State (October 2010 to October 2013
- Senior Lecturer, Department of Medicine, University of Maiduguri, Borno State (October 2013 to October 2016)
- Associate Professor (Reader) Infectious Diseases and Immunology University of Maiduguri, Borno State (October 2016 to Date)
- Executive Secretary Yobe State Hospitals Management Board, Damaturu (June 2015 to November 2016)
- Pioneer Chief Medical Director, Yobe State University Teaching Hospital, Damaturu (November 2016 to date)
- Principal Investigator Dementia Research Project in North Eastern Nigeria, BioRTc Centre YSU Damaturu Nigeria and University of Sussex UK (2023 to date)
- Principal Investigator Infectious Diseases (Malaria) BioRTc Centre YSU Damaturu Nigeria (2023 to Date)

SCHOOLS ATTENDED WITH DATES:

PRIMARY: State Low Cost Primary School, Maiduguri, 1979-1985

POST-PRIMARY: Fika Government Secondary School, Potiskum, Yobe State.
1985-1991. Passed with Distinctions.

TERTIARY:

- University of Maiduguri. 1991-1998.
- West African College of Physicians, 2002-2008.
- National Posgraduate Medical College of Nigeria 2002-2009.
- University of Maiduguri 2006-2007.
- University of London, UK (London School of Hygiene and tropical Medicine)-2011/2012
- Royal College of Physicians of London, UK (2012)
- Nigerian Arabic Language Village Ngala, Maiduguri Campus 2014-2015

POSTGRADUATE:

- Fellow, West African College of Physicians (Infectious Diseases/Immunology) -April, 2008.
- Fellow, National Post Graduate Medical College of Nigeria (Infectious Diseases/Immunology)-Dec, 2009.
- Masters in Health Planning and Management (University of Maiduguri 2007)
- MSc Tropical Medicine and International Health (University of London 2012)
- Post Graduate Diploma in Tropical Medicine and International Health, London School of Hygiene and Tropical Medicine, UK (2012)
- Diploma in Tropical Medicine and Hygiene (Royal College of Physicians of London, April 2012)
- Advanced Certificate in Arabic Proficiency (Nigerian Arabic Language Village 2014)
- ACADEMIC QUALIFICATIONS/CERTIFICATES OBTAINED WITH DATES
- Primary School Leaving Certificate-1985
- Senior Secondary School Certificate of Education (SSCE)-1991
- Bachelor of Medicine, Bachelor of Surgery (MBBS)-1998
- Masters in Health Planning and Management (MHPM)-2007
- Member West African College of Physician (MWACP)-2005
- Fellow West African College of Physician (FWACP)-April, 2008
- Fellow National Postgraduate Medical College of Nigeria-Dec.2009
- Certificate in Computer Appreciation and Application (UNIMAID)-2007
- Masters in Tropical Medicine and International Health (London School of Hygiene and Tropical Medicine/University of London UK) -2012

- Post-graduate Diploma in Tropical Medicine and International Health (London School of Hygiene and Tropical Medicne, London UK)-2012
- Diploma in Tropical Medicine and Hygiene (Royal College of Physicians of London UK)-2012

Advanced Certificate in Arabic Proficiency Course, Nigerian Arabic Language Village (NALV) Ngala, Maiduguri Annex (2013/2014)

AWARDS/PRIZES

- Best graduating student, Fika Government Secondary School Potiskum, Yobe State, Nigeria-1991.
- Borno State Representative National JETS Competition at Yola, Adamawa State, Nigeria, 1990.
- Takai Local Government Chairman's Merit Award, National Youth Service Corps, Kano State, Nigeria-2001.
- Best Part 1 Candidate National Postgraduate Medical College of Nigeria May 2005.
- POSTS HELD:
- Library Prefect- Fika Government Secondary School Potiskum, Yobe State, Nigeria- 1990-1991.
- Treasurer, Yobe State Medical Student Association, Nigeria-1997/98
- Chairman, Organising Committee Inter-Class Academic Presentations, Univ. of Maiduguri Medical Students Association-1997/98.
- Secretary of the Special Committee set up by Yobe State chapter of the NMA to Investigate and proffer solutions to the problem bedeviling the health sector in the state, 2001-2002.
- Treasurer Association of Resident Doctors (ARD), UMTH, Nigeria, 2002-2004.
- Member Editorial Board UMTH News, University of Maiduguri Teaching Hospital 2006-2010
- Member Yobe State Task Force on Prevention and Control of COVID-19 March 2020 to Date.
- EMPLOYMENTS WITH DATES:
- House officer, University of Maiduguri Teaching Hospital, Maiduguri. -1998/2000.
- Responsibilities in this capacity included:
- Completing patient admission according to established guidelines.
- Clerking all new patients and keeping updated information on each for presentation on ward rounds.
- Taking blood samples for investigations and ensure that all other investigations are carried out.
- Observing symptoms of changes in patient status and respond appropriately by informing senior colleagues on some occasions.
- Recognizing emergency situations and functioning effectively, according to emergency protocols.
- Collaborating with other health professionals in the care of patients.
- Pioneer Medical Officer in Charge (Youth Corper), Primary Health Care Centre, Kachako, Takai LGA, as well as Medical Officer, Takai NYSC Community Based Clinic, Takai LGA, Kano state-2000/2001.

Responsibilities in this capacity included:

As the only Medical Officer I was responsible for the administrative, technical and Medical day to day running of the clinic.

- Organizing health talks and awareness campaigns on topical issues.
- Determining drug requirement of the Clinic and making recommendations to the Head of PHC Dept. Takai LGA, Kano State.
- Purchasing drugs for use by the clinic.
- Responsible for the welfare of staff of the clinic.
- Organizing health talks for the host community.
- Medical Officer, State Specialist Hospital, Damaturu, Yobe State, Nigeria, 2001/2002
- Acting PMO Maryam Sani Abacha Maternal and Child Health Clinic, Damaturu, Yobe State, Nigeria,-2001-2002
- Medical Registrar (September 2002- April 2005), Department of Medicine, University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria
- Responsibilities in this capacity included:
- Initiate and complete patient admission from the casualty to the wards.
- Observe symptoms of changes in patient status and respond appropriately.
- Recognize emergency situations and function effectively, according to emergency protocols.
- Collaborate with other health professionals in the care of patients.
- Supervise formulation and implementation of medical care plan based on identified problems and needs. Set priorities and deliver or direct care to meet patient needs.
- Evaluate patient responses and make appropriate revisions on the medical care plan.
- Make patient care assignments based on acuity of illness and staff skill level required to meet patient needs.
- Maintaining professional competence through participation in continuing education and other appropriate learning experiences like departmental and unit seminars etc.

- Performing other professional medical services as delegated by the leader of the team.
- Teaching subordinates, patients and their relations.
- Senior Registrar, Department of Medicine, University of Maiduguri Teaching Hospital, 2005-April, 2008.
- Responsibilities in this capacity included:
- Initiate and complete patient admission according to established guidelines.
- Observe symptoms of changes in patient status and respond appropriately.
- Recognize emergency situations and function effectively, according to emergency protocols.
- Collaborate with other health professionals in the care of patients.
- Supervise formulation and implementation of medical care plan based on identified problems and needs. Set priorities and deliver or direct care to meet patient needs.
- Evaluate patient responses and make appropriate revisions on the medical care plan.
- Make patient care assignments based on acuity of illness and staff skill level required to meet patient needs.
- Maintaining professional competence through participation in continuing education and other appropriate learning experiences.
- Performing other professional medical services as delegated by the leader of the team, Professor Idris Mohammed.
- Organize the infectious diseases/immunology outpatient clinic.
- Plan of duty schedule of all unit staff.
- Teaching subordinates, patients and their relations.

Member Yobe State Medical Team, Hajj 2005

- Responsibilities in this capacity included:
- Recognize emergency situations and function effectively, according to emergency protocols at strategic pilgrims' site before departure to the holy land e.g. pilgrims camp, Airport depature terminals etc.
- Collaborate with other health professionals in the care of patients both at home and in the Holy land.
- Supervise formulation and implementation of medical care plan based on identified problems and needs. Set priorities and deliver or direct care to meet patient needs.
- Evaluate patient responses and make appropriate revisions on the medical care plan.
- Make patient care assignments based on acuity of illness and staff skill level required to meet patient needs and make appropriate referrals for further care at strategic sites in the holy land.
- Attend to all Medical emergencies of pilgrims at strategic sites in the holy land i.e. at Makka, Minna, Muzdalifa, Madina and Jeddah.
- Work as a team with other members/staff of the Hajj Committee as well as the Nigerian Medical Mission in the KSA for a successful hajj operation.

Physician and HIV-care specialist of the Havard School of Public Health's US Presidents Emergency Plan for AIDS Relieve (PEPFAR/APIN) UMTH Site:

Responsibilities in this capacity included:

- Evaluate and Diagnose new cases of suspected HIV patients and commence them on their appropriate treatment
- Diagnosed and properly treat all opportunistic infections in the setting of HIV/AIDS
- Offer pre-test and post-test counseling services for suspected cases of HIV/AIDS as well as voluntary test and counseling services including follow up counseling.
- Carry out collaborative efforts with the National TB programme as well as other NGOs in the management of HIV/AIDS, TB, Malaria and other prevailing infections.
- Training of health personnel both at regional and national level on HIV/AIDS.
- To conduct Health research on HIV/AIDS and other opportunistic infections.

Hospital Consultant UMTH August 2008 to October 2010

Responsibilities:

- Clinical responsibilities
- Organizing and conducting medical outpatients clinical in general internal medicine, infectious diseases, immunology and Rheumatology
- Organizing and conducting clinical ward rounds and patients' review in general internal medicine, infectious diseases, immunology and rheumatology
- Organizing and attending to medical emergencies in the accident and emergency Department

- Attending to medical emergencies during call hours at the A&E department, medical wards, ICU or any other department within the hospital

Attending and review of medical cases in any part of the hospital following medical consults/request

Postgraduate teachings:

- Organizing and conducting bedside teaching for postgraduate resident doctors in internal medicine
- Organizing and conducting tutorials in general internal medicine, infectious diseases, immunology and rheumatology for postgraduate residents doctors
- Organizing and conducting journal club reviews for postgraduate resident doctors in internal medicine
- Organizing and conducting morning clinical meetings and patients review for postgraduate residents doctors in internal medicine
- Supervising and guiding postgraduate resident doctors on their part 2 dissertations
- Organizing and conducting grand rounds for postgraduate resident doctors
- Organizing and conducting postgraduate teachings and presentations for postgraduate resident doctors
- Organizing and liaising with other departments (e.g. pathology, radiology etc.) to conduct postgraduate clinic-pathological/clinic-radiological reviews for resident doctors.
- Teaching and mentoring of postgraduate resident doctors
- Lecturer 1 Department of Medicine University of Maiduguri September 2010 to October 2013
- Responsibilities under this capacity:
- Organizing and conducting lectures to Medical Students in Infectious Diseases, Tropical Medicine, Immunology and Rheumatology (MBBS IV, V and VI and BDS IV and V)
- Bedside teaching to medical students during introductory, intermediate and final postings in clinic medicine for MBBS III, IV, VI and BDS IV and V respectively.
- Bedside and clinical teaching in the Medical outpatient clinic to medical students during introductory, intermediate and final clinical postings for MBBS IV, V, VI and BDS IV and V respectively
- Organizing and conducting tutorials in clinical infectious diseases, tropical medicine, immunology and Rheumatology for MBBS IV, V, VI and BDS IV and V students during introductory, intermediate and final clinical postings
- Organizing and conducting continuous assessment exams and end of postings clinical tests for medical and dental students after introductory, intermediate and final clinical postings
- Organizing and conducting MBBS and BDS final examinations (i.e.MCQs, long essays, data interpretations, long and short cases clinical exams, oral exams etc.)
- Mentoring and tutoring medical students in their final year projects, clinical postings, classroom lectures etc.
- Organizing and teaching medical students on side laboratory investigations especially in tropical parasitology/bacteriology and immunology/serology.
- Organizing and conducting clinical and epidemiologic research in infectious diseases, tropical medicine and immunology as well as public health

Honorary consultant physician UMTH September 2010 to date:

Responsibilities under this:

- Clinical responsibilities
- Organizing and conducting medical outpatients clinical in general internal medicine, infectious diseases, immunology and Rheumatology
- Organizing and conducting clinical ward rounds and patients' review in general internal medicine, infectious diseases, immunology and rheumatology
- Organizing and attending to medical emergencies in the accident and emergency Department
- Attending to medical emergencies during call hours at the A&E department, medical wards, ICU or any other department within the hospital
- Attending and review of medical cases in any part of the hospital following medical consults/request
- Postgraduate teachings:
- Organizing and conducting bedside teaching for postgraduate resident doctors in internal medicine
- Organizing and conducting tutorials in general internal medicine, infectious diseases, immunology and rheumatology for postgraduate residents doctors
- Organizing and conducting journal club reviews for postgraduate resident doctors in internal medicine
- Organizing and conducting morning clinical meetings and patients review for postgraduate residents doctors in internal medicine
- Supervising and guiding postgraduate resident doctors on their part 2 dissertations
- Organizing and conducting grand rounds for postgraduate resident doctors
- Organizing and conducting postgraduate teachings and presentations for postgraduate resident doctors

- Organizing and liaising with other departments (e.g. pathology, radiology etc.) to conduct postgraduate clinic-pathological/clinic-radiological reviews for resident doctors.
- Teaching and mentoring of postgraduate resident doctors
- Organizing and conducting teaching and mentoring in clinical and epidemiologic research methods, study designs as well as statistical analysis including usage of statistical software e.g. STATA and SPSS as well as reference manager software e.g. Endnote etc.

Associate Professor, Department of Medicine, University of Maiduguri October 2016 to date.

Responsibilities under this capacity:

- Organizing and conducting lectures to Medical Students in Infectious Diseases, Tropical Medicine, Immunology and Rheumatology (MBBS IV, V and VI and BDS IV and V)
- Bedside teaching to medical students during introductory, intermediate and final postings in clinic medicine for MBBS III, IV, VI and BDS IV and V respectively.
- Bedside and clinical teaching in the Medical outpatient clinic to medical students during introductory, intermediate and final clinical postings for MBBS IV, V, VI and BDS IV and V respectively
- Organizing and conducting tutorials in clinical infectious diseases, tropical medicine, immunology and Rheumatology for MBBS IV, V, VI and BDS IV and V students during introductory, intermediate and final clinical postings
- Organizing and conducting continuous assessment exams and end of postings clinical tests for medical and dental students after introductory, intermediate and final clinical postings
- Organizing and conducting MBBS and BDS final examinations (i.e.MCQs, long essays, data interpretations, long and short cases clinical exams, oral exams etc.)
- Mentoring and tutoring medical students in their final year projects, clinical postings, classroom lectures etc.
- Organizing and teaching medical students on side laboratory investigations especially in tropical parasitology/bacteriology and immunology/serology.
- Organizing and conducting clinical and epidemiologic research in infectious diseases, tropical medicine and immunology as well as public health
- Marking of Examination Scripts for undergraduate medical and Dental Students

Reader in Infectious Diseases and Immunology October 2016 to Date

External Examiner Department of Community Medicine University of Maiduguri August 2015 to date

Examiner Part 1 Exams in Internal Medicine National Postgraduate Medical College of Nigeria March 2019 to Date

Executive positions held with dates

Executive Secretary Yobe State Hospitals Management Board Damaturu 8th June 2015 to 2nd November 2016.

Responsibilities:

- Supervising and overseeing 12 secondary and 1 tertiary health facilities across Yobe State
- Supervising all the 7 directorates in the board heading by their respective directors i.e. directorates of Human Resources/Personnel, Medical Services, Nursing Services, Laboratory Services, Finance and Supply, Planning, Research and Statistics and Pharmaceutical Services.
- Supervision and monitoring of provision of health commodities across all the 12 secondary and 1 tertiary health facilities across the state
- Responsible for renovation, reconstruction as well as maintenance of infrastructure in all the facilities mentioned above
- Responsible for employment, promotion and discipline of all categories of health care workers e.g. doctors, nurses, physiotherapists, radiographers, laboratory scientist, hospital assistants, hospital administrators and other support staff in the state
- Development of annual budget estimates as well as planning, monitoring, evaluation and implementation of budgetary provisions for secondary and tertiary health care in the state.
- Writing request memoranda to the honorable commissioner for health and the state executive council for ratification

Chair and member for medical ethics/health research committee in the state

Chief Medical Director Yobe State University Teaching Hospita, Damaturu (YSUTH)

2nd November 2016 to Date.

Head of Department of Medicine, College of Medical Sciences, Yobe State University Damaturu, Nigeria (2022 to date)

ADHOC DUTIES

Member Editorial Board UMTH News 2006 to Date

Member Drug and Therapeutics Committee, University of Maiduguri Teaching Hospital, 2013- Date

Member Borno State HIV/AIDS Anti-retroviral therapy Implementation Team- September 2003 to Date

Member Expert Committee Borno State Tuberculosis, HIV/AIDS and Malaria Control Programme

Chairman University of Maiduguri Teaching Hospital Committee on monitoring and Disposal of Expired drugs and therapeutics April 2013 to Date

Member University of Maiduguri Teaching Hospital Public and Environmental Health Committee 2009 to Date.

Member Nigerian Medical Association Borno State Chapter Continuing Medical Education Committee.

Member, University of Maiduguri Teaching Hospital Environmental Sanitation committee, February 2010-date.

Member Ebola Virus Disease Prevention and Control Committee Unimaid 2014 to Date

Member Ebola Virus Disease Committee Borno and Yobe States 2014 to Date

Visiting consultant physician at General Sani Abacha Specialist Hospital Damaturu, Yobe State. Services rendered here include; outpatient review of all medical cases, clinical medical ward rounds, emergency medical services as well as teaching of medical officers.

Visiting consultant physician at Federal Medical Center Nguru, Yobe State. Services rendered here include; outpatient review of all medical cases, clinical medical ward rounds, emergency medical services as well as teaching of medical resident doctors and medical officers.

Visiting consultant physician at State Specialist Hospital Maiduguri, Borno State. Services rendered here include; outpatient review of all medical cases, clinical medical ward rounds, emergency medical services as well as teaching of medical officers.

Rendering consultancy services to UK Department of International Development (DFID) under the PRRINN-MNCH PROGRAMME in Yobe State. Services here include routine training of all cadres of health workers on routine immunization, maternal and newborn health and general community health. Other services are conduction of periodic community surveys across the state in order to assess the impact of health interventions.

Community health education and enlightenment on diseases of public health significance over the media in English, Hausa and Kanuri Languages. Media outfit involved include BBC Hausa service, VOA Hausa Service, Radio France International Hausa Service, Radio Nigeria Peace FM Maiduguri, BRTV Maiduguri, NTA Maiduguri, YTV and YBC Damaturu, Yobe State.

PROFESSIONAL TRAINING/CONFERENCES ATTENDED:

Revision Course, West African College of Physicians, University College Hospital, Ibadan, Nigeria. (Aug. 2004).

Workshop on the Use of Antiretroviral Drugs organized by AIDS Prevention Initiative in Nigeria (APIN) at UMTH, Maiduguri. 26th - 28th June 2006. Presented papers on:
1.Antiretroviral Drug Classes and Mechanism of Action
2.Defining Treatment Success and Failure

Delivered a paper on: HIV/AIDS trend in Nigeria and Basic Prevention Concepts. University College Hospital (UCH) Ibadan, Nigeria, 14th September 2006.

Workshop on management of HIV/AIDS, Tuberculosis and Malaria organized by Global Fund, and APIN Plus in collaboration with the Federal Ministry of Health, at NIMR, Yaba, Lagos (May, 2005).

19th Annual Scientific Conference of the Nigeria Association of Nephrology. Maiduguri, Nigeria (Feb.2007).

Workshop on Abacavir Hypersensitivity Training at the University College Hospital, Ibadan (Nov. 2007).

Revision Course on Research Methodology Organised by the West African College of Physician at UCH, Ibadan (Aug. 2007)

Workshop on creating awareness about HIV/AIDS organized by the Konduga Local Government Islamic Centre, Konduga, Borno state (Nov. 2007).

Leadership workshop on HIV/AIDS care organized by the Harvard School of Public Health's PEPFAR programme Maiduguri, Borno State (Dec. 2007).

Revision course on Management, Research Methodology and Update organized by the National Postgraduate Medical college of Nigeria (Feb. 2008).

Workshop on injection safety and hospital waste disposal organized by John Snow Inc. in collaboration with the Federal Ministry of Health, Nigeria, at UMTH (July, 2008).

Seminar on Islamic Medical Ethics by Professor Omar Hassan Kasule; professor of Epidemiology and Islamic Medicine University of Brunei and Malaya (June, 2008)

Workshop on Sensitization of Principals, Headmasters and PTA Chairmen on HIV/AIDS organized by the Borno State Ministry of Health in collaboration with Borno State Action Committee on AIDS, Maiduguri August 2008.

HIV/Hepatitis seminar by Prof. Marion Peters, lead researcher in Hepatology, University of California San Francisco, USA, Organized by the Harvard School of Public Health's PEPFAR Programme, Sheraton Hotels and Towers, Abuja, Nigeria (Oct. 2008).

Advanced Antiretroviral Seminar by Prof. Rob Murphy, North Western University, Chicago, USA, Organized by the Harvard School of Public Health's PEPFAR Programme, Sheraton Hotels and Towers, Abuja, Nigeria (Oct. 2009).

Research Design and Methodology Workshop organized by Medical Education Partnership in Nigeria (MEPIN) University of Maiduguri 5th July 2013

Grant Writing Workshop organized by Medical Education Partnership in Nigeria (MEPIN) University of Maiduguri 18th June 2013

Responsible Conduct of Research Workshop organized by Medical Education Partnership in Nigeria (MEPIN) University of Maiduguri 21st June 2013.

Manuscript Writing Workshop organized by Medical Education Partnership in Nigeria (MEPIN) University of Maiduguri 2nd July, 2013.

Facilitator Nigerian Infectious Diseases Annual General Meeting and Scientific Conference 25th – 26th September 2013, Abuja Nigeria.

Facilitator Improved Health Information Management/Appointment Systems In Electronic Health Records Management in Nigeria, Organized by Harvard School of Public Health/APIN limited, University of Maiduguri Teaching Hospital, 18th-19th October 2013.

Facilitator Improved HIV/AIDS Records Management Step-down Training organized by APIN PLUS/Harvard PEPFAR, 26th to 29th November 2008.

West African College of Physician AGM 2015 Abuja, November 2015.

Workshop on Task Shifting in the Health Sector in Dutse Jigawa State, oraganized by MNCH-2, W4H and DFID, December 2015.

Workshop on Financial Crimes and Corruption organized by EFCC at Tahir Guest Palace Kano, December 2015

Workshop on SunMap End of Programme Assessment and Implementation Organized by Malaria Consortium and DFID in Abuja February 2016.

Workshop on Annual Evaluation Plan of Budgets in the Health Sector organized by DFID/W4H/MNCH-2 in Kaduna December 2015

58th National Council on Health Annual Meeting in Sokoto February 2016.

Workshop on Annual Evaluation Plan of Budgets in the Health Sector organized by DFID/W4H/MNCH-2 in Kano October 2016.

59th National Council on Health Meeting in Umuahia, Abia State January 2017.

Membership of Committees

Member Yobe State Technical Committee on Routine Immunization

Member Yobe State Technical Committee on 'Task Shifting and Task Sharing Policy'.

Member Yobe State Technical Committee on Control of HIV/AIDS, Malaria and Tuberculosis

Member Yobe State University Committee for the establishment of College of Medical Sciences

Member Yobe State Technical Committee on Human Resource for Health (HRH) policy

Member Yobe State Technical Committee on Revitalization of the Health Sector

Member Yobe State Technical Committee on Medical Ethics and Health Research

Member Yobe State Technical Committee for the establishment of Community Midwifery programme and College of Health Sciences and Technology Nguru, Yobe State.

Member Yobe State Technical Committee for the prevention and control of Non-communicable Diseases

Chairman Clinical Management Committee on COVID-19 Yobe State

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS/SOCIETIES/COMMITTEES:

Member, Nigeria Medical Association (NMA).

Member University of Maiduguri Teaching Hospital Harvard School of Public Health President's Emergency Plan for AIDS Relief (PEPFAR) Programme

Coordinator, Antiretroviral treatments switch committee, University of Maiduguri Teaching Hospital.

Member, Harvard School of Public Health AIDS Prevention Initiative in Nigeria (HARVARD/APIN) Team, University of Maiduguri Teaching Hospital.

Member, State TB Advocacy Committee, Borno State.

Member, Clinical Immunology Society (USA). January 2007-Date

Member Islamic Medical Association (ISMA)

Member Medical and Dental Consultant Association of Nigeria (MDCN)

Resource person Desert Initiative Support Group for care of People Living With HIV/AIDS (PLWA) Yobe State, Nigeria.

Member Nigerian Infectious Diseases Society (NIDS).

Member Academic Staff Union of Universities (ASUU), Nigeria.

Member Royal Society of Tropical Medicine and Hygiene, UK.

Member American Society of Troipical Medicine and Hygiene

Member International Institute of Islamic Thought (IIIT)

List of Academic publications

Goni BW, Alkali YH, Sani H, Biu SA, Simon A, Issa B, Warshu SH. Prevalance of Abortion among women in their reproductive age in Konduga LGA, Borno State. Final Year MBBS Community Medicine Project (Unimaid 1998)

Goni BW. Attitudes of People in Maiduguri Metropolis towards voluntary blood donation. MHPM project (School of Postgraduate studies, Unimaid 2007).

Goni BW. Prevalence of Hepatitis B virus surface antigeneamia among HIV-infected adults in Maiduguri, Nigeria. Part 2 Dissertation West African College of Physicians; Faculty of Internal Medicine (April 2008)

Goni BW. Prevalence of Toxoplasma gondii IgG antibody among HIV-infected adults in Maiduguri, Nigeria. Part 2 Dissertation Faculty of Internal Medicine (Infectious Diseases) National Postgraduate Medical College of Nigeria (November 2009)

Goni BW. Cryptococcal Antigenaemia among HIV-infected adults in Maiduguri, Nigeria. Msc Project (TMIH) London School of Hygiene and Tropical Medicine, University of London (2012)

Emue EB, Ogedengbe JO, Goni BW. Normal morphological variations of the superficial cubital veins in adults Nigerians. Journal of Research in Biosciences, vol 7, number 1, 2011. (ISSN:2141-0089).

Talle MA, Enyikwola O, Adelaiye A, Yusuph H, Bakki B, Baba MM, Goni BW. Disorders of lipids among newly diagnosed hypertensive patients in Maiduguri, North Eastern Nigeria. Borno Medical Journal Vol 1, No 1; Jan.-June 2009. (ISSN: 0189-9422).

Mustapha SK, Pindiga UH, Yusuph H, Goni BW. *Helicobacter pylori* infection among dyspectic patients at a tertiary hospital in North Eastern Nigeria. Internet Journal of Infectious Diseases 2011, ISSN:1528-8366.

Tahir A, Yusuph H, Bakki B, Zailani SB, Goni BW. Smear positive tuberculosis among pulmonary TB patients at the University of Maiduguri Teaching Hospital. A retrospective study. Kanem Journal of Medical sciences 2010; 4:4(2):28-31.

Mustapha SK, Bolori MT, Goni BW. Prevalence of Helicobacter pylori among Diabetics in Maiduguri, North Eastern Nigeria. Borno Medical Journal Vol 1, No 1, Jan-June 2005; 8-10.

Talle MA, Okheahialam BN, Bakki B, Buba F, Baba MM, Abdul H, Goni BW. Prevalence of microalbuminuria in untreated Nigerian hypertensive patients. Kanem Journal of Medical Sciences 2010;4(1): 1-7.

Talle MA, Okeahialam BN, Bakki B, Anjorin CO, Baba MM, Goni BW, Yusuph H. Left ventricular geometry in untreated hypertensive patients presenting to tertiaru hospital in North Eastern Nigeria. Borno Medical Journal 2011;8(1):20-25.

Goni BW, Yusuph H, Mustapha SK, Sahabi MA, Bakki B, Tahir A, Talle MA. Comparison of hepatic transaminases and alkaline phosphatase enzymes levels between HIV-HBV co-infected and HIV monoinfected patients in Maiduguri, Nigeria. NJCP oct-Dec.2013;16(4):530-534.

Salawu FK, Bwala SA, Wakil MA, Kida I, Rabbebe I, Waru BG, Bukbuk DN. Cognitive deficit and their relationship to other neurological complications in Nigerian chronic alcoholic subjects. Nigerian Medical Practioner 2007; 52(1): 3-7.

Goni BW, Yusuph H, Gofama MM, Gana ML, Bakki B, Kida MI. Diptheria in a 7-year-old child in northeastern Nigeria-management in a resource poor setting- A case report. Tropical Doctor 2013 (in press).

Goni BW, Bakki B, Yusuph H, Galadima GA, Mayun A, Kida IM, Talle MA, Sahabi MA, Tela UA, Denuae BA. Tuberculosis of Breast-a case report. Borno Medical Journal 2013.(in Press)

Knowledge Attitudes and Practice of People in Maiduguri towards voluntary blood donation. Borno Medical Journal 2013;19(3). 34-39.

Goni BW et al. Tuberculosis of the Breast- A case report. Borno Medical Journal 2013; 19 (4). 40-41.

Goni et al. SEREROPREVALENCE OF HEPATITIS B SURFACE ANTIGENAEMIA AND ITS RELATIONSHIP TO CD4+ CELL COUNT AMONG HIV-INFECTED PATIENTS IN MAIDUGURI, NORTH EASTERN NIGERIA. Kanem Journal of Medical Sciences, 2011;5(2):1-6.

Goni et al. SEROPREVALENCE OF IgG ANTI- *T. GONDII* ANTIBODY AMONG HIV-INFECTED PATIENTS IN MAIDUGURI, NORTH EASTERN NIGERIA.

Goni BW, Yusuph H, Suleiman MM, Ummate I, Bakki B, Kidah IM, Talle MA, Alhaji MA. ACUTE RENAL INJURY FOLLOWING *ECHIS CARINATUS* SNAKEBITE IN NORTHERN NIGERIA: 2 CASE SERIES. Arid Medical Journal 2014;1(1);35-38.

Maina MB, Ahmad U, Ibrahim HA, Hamidu SK, Gon BW et al. Two decades of neuroscience publication trends in Africa. Nature Communications 2020.

HOBBIES

Reading Nature watch. Travelling

REFEREES

Prof Haruna Yusuph MB;BS, FMCP, Professor of Infectious Diseases and Immunology, College of Medical Sciences, University of Maiduguri, PMB 1069, Maiduguri,, Borno State, Nigeria. Mobile: +234(0)8036829898 Email: harunyusuph@yahoo.com

Prof Baba Gana Muhammad Ahmad Provost College of Medical Sciences, Yobe State University Damaturu, Nigeria: Mobile: +2348023638638

Dr. Muhammad Lawan Gana MB;BS, FWACP, Honorable Commissioner for Health Yobe State, Yobe State Ministry of Health, Damaturu, Yobe State. Email: muhammadlawangana@gmail.com Mobile: +234(0)8069555209

NURU SULEIMAN MUHAMMAD
+2347036323713, +2348052384242
nurusulemuhammad@gmail.com, muhammadnuruddin18@yahoo.com

Current employer	Yobe State Healthcare and Health-related Facilities Inspection and Monitoring Agency (YOHFIMA)
Current position	Director of Operations and Consultant Public Health Physician

Qualifications

Year achieved	Degree and institution
2017	Masters of Public Health, Ahamdu Bello University Zaria
2015	Master of Health Economics, Bayero University, Kano
2011	Bachelor of Medicine, Bachelor of Surgery (MBBS), Ahamdu Bello University Zaria

Year achieved	Professional qualifications
Sept, 2021	Economic Evaluation in Global Health, University of Washington
Dec, 2020	Policy Development and Advocacy for Global Health
June,2020	Certificate Course in Fundamental of Global Health Research offered by University of Washington
Sept, 2020	Certificate in Leadership and Management in Health offered by University of Washington
March,2020	Certificate Course in Programme Management in Global Health offered by University of Washington
March, 2020	Certificate Course in Monitoring and Evaluation of Public Health Programmes offered by Ahmadu Bello University Zaria, Nigeria
Dec, 2019	Certificate Course in Fundamentals of Implementation Science offered by University of Washington
August, 218	Two-day Certificate Course in Medical Ethics. West African College of Physicians
Feb, 2018	Revision Course in Public Health organised by the Faculty of Public Health and Community Medicine, National Postgraduate Medical College of Nigeria
Dec, 2017	From Research to Practice: Certificate Course in Sexual and Reproductive Health Research, offered by Geneva Foundation for Medical Education and Research/ Department of Reproductive Health and Research, WHO
2017	Certificate Course in Adolescent Sexual and Reproductive Health, Geneva Foundation for Medical Education and Research

June 2017	Certificate Course in Evidence-Based Management of Postpartum Haemorrhage online course offered by The Geneva Foundation for Medical Education and Research/Oxford Maternal and Perinatal Health Institute,
June 2017	Certificate Course in Obstetric Fistula, e-learning course offered by The Global Health Network
July 2017	Certificate Course in Maternal Infections, e-learning course offered by The Global Health Network
Sept 2017	Training of Trainers on Essential New-born Care Course (ENCC) organised by Paediatric Association of Nigeria/ Federal Ministry of Health, Nigeria
Nov 2017	Training Course on Inpatient Management of Severe Acute Malnutrition organised by WHO/UNICEF/UKAID
July 2016	Certificate Course in STATA software, Kaduna, Nigeria, funded by DFID facilitated by ORIE
Nov 2016	Four-week short course on HIV AID Care and Management, organised by Centre for Integrated Health Programme (CIHP) / Department of Community Medicine, Ahmadu Bello University Zaria
2016	Training for research on Use of Social Actors in Addressing Contextual Barriers to Use of Immunization among Care-giver of Under-five in Urban Slums of Yobe State, Funded by Alliance for Health Policy and Systems Research
March 2015	Certificate Course in Minimum Initial Service Package for Victims of Rape in humanitarian setting, in Kaduna Nigeria, organised by UNFPA
April 2015	Certificate Course in the use of NVIVO software for qualitative data analysis, Kaduna, Nigeria organised by ORIE with funding from UKAID
May 2015	Future Learn three-week Certificate Course on Ebola in Context: Understanding Transmission, Response and Control offered by London School of Hygiene and Tropical Medicine (LSHTM)

Employment history

Dates	Employer	Country base	Position
2019- Date	Yobe State Hospitals Management Board	Nigeria	Senior Registrar
2019- Date	Ahmadu Bello University Teaching Hospital Zaria	Nigeria	Supernumerary Senior Resident Doctor in Community Medicine
2017- Date	Community Health Officers' Training Program **(CHOTP)**, Department of Community Medicine, ABUTH Shika	Nigeria	Resource Person
2017- Date	School of Health Information and Management, Ahmadu Bello University Teaching Hospital, Zaria	Nigeria	Resource Person
2015-2017	General Hospital Gashua	Nigeria	Senior Medical Officer
2013-2014	General Hospital Danbatta	Nigeria	Medical Officer/ Youth Corp Member

2012-2013	Federal Medical Centre (FMC), Birnin Kudu, Jigawa State	Nigeria	Senior House Officer
2011-2012	Federal Medical Centre (FMC), Birnin Kudu, Jigawa State	Nigeria	House Officer

Selected Projects

Conducted Key Informant Interviews, and Focus Group Discussions among Survivors of GBV, Police

Dates	08/2021 – 09/2021	Employer/ Sponsor	UNFPA
Project Name	Gender-Based Violence and Harmful Traditional Practices Landscape Survey in Nigeria		
Location	Adamawa, Nigeria		
Position	Data Collector		

Gender Desk Officer, Community Opinion Leaders, Representatives of NGOs, Gender Focal Person in Ministry of Women Affairs Adamawa, Adolescent males and female, Adult males and females to assess Gender Based Violence and Harmful Traditional Practices in Nigeria

Dates	01/2020 – 02/2020	Employer/ Sponsor	ABU Zaria/ Mc Arthur Foundation
Project Name	Socio-cultural and behavioural factors affecting HIV spread among underserved communities in Kaduna State		
Location	Kaduna, Nigeria		
Position	Co-Consultant		

Conducted Key Informant Interviews among households in underserved (Rural, border, scattered and nomadic and security compromised) communities in Kaduna state to assess the Socio-cultural and behavioural factors affecting HIV spread among them

Dates	2015	Employer/ Sponsor	DFID/ORIE/ Yobe State Ministry of Health
Project Name	Contextual Barriers to Uptake of Nutritional Services in Northern Nigeria,2015		
Location	Yobe, Nigeria		
Position	Data Collector		

Conducted Key Informant Interviews, In-Dept Interviews and Focus Group Discussions among mothers of under-five, their husbands, Mothers-in-law, Heads of Primary Health Facilities and Community opinion leaders

Dates	2016	Employer/ Sponsor	Yobe State Government
Project Name	Activation of new PMTCT/ HCT sites in Zone B of Yobe State, 2016		
Location	Yobe, Nigeria		
Position	Lead Coordinator		

Toured round primary healthcare facilities in Yusufari, Nguru and Bade LGAs of Yobe State to supply HIV test Kids and tool and educate healthcare providers for the provision of PMTCT/HCT services.

Dates	2022	Employer/ Sponsor	National Agency for the Control of AIDS
Project Name	Skills appraisal of PHC workers in Jigawa State, under the Health WorkersGlobal Fund RSSH Supported Operationalization of the Task Shifting Task Sharing Policy of the FMOH		
Location	Jigawa, Nigeria		
Position	Co- Consultant		

Jointly trained and supervised data collectors, analysed the data and participated in the presentation of the findings to NACA

Dates	2023	Employer/ Sponsor	National Agency for the Control of AIDS
Project Name	Skills appraisal of PHC workers in Kaduna State, under the Health WorkersGlobal Fund RSSH Supported Operationalization of the Task Shifting Task Sharing Policy of the FMOH		
Location	Kaduna, Nigeria		
Position	Co- Consultant		

Jointly trained and supervised data collectors, analysed the data and participated in the presentation of the findings to NACA

Dates	2023	Employer/ Sponsor	NCDC/ Yobe State Government
Project Name	Training of Surveillance Officers in all the 17 LGAs of Yobe State under the Integrated Training for Surveillance Officers in Nigeria (ITSON) Programme		
Location	Kaduna, Nigeria		
Position	Mentor and Trainer		

Together with other trainers and mentors trained, mentor and supervised the field activities of surveillance officers and deputy surveillance officers across Yobe State

Dates	2022 to 2023	Employer	National Agency for the Control of AID
Project Name	Training of Trainers under Community Health Influencers Promoters and Services Programme (CHIPS),		
Location	Kaduna, Nigeria		
Position	National CHIPS Trainer		

Together with other trainers trained CHIPS agents across Nigeria

PUBLICATIONS
Journal articles

1. K.N. Fountoulakis…. **N.S. Muhammad**…. D. Smirnova. Results of the COVID-19 mental health international for the general population (COMET-G) study. European Neuropsychopharmacology 2021 Oct 15; 54:21-40. Doi: 10.1016/j.euroneuro.2021.10.004.
2. **Suleiman MN**, Dahiru T, Bashir S.S, Self-Reported Prevalence and Factors Associated with Intimate Partner Violence Among Attendees of Antenatal Care in Primary Healthcare Centres of Sabon Gari Local Government Area, Kaduna State, Nigeria. Nigerian Journal of Scientific Research. 2018; 17 (2): njsr.abu.edu.ng.
3. Gobir AA, Aliyu AA, Abubakar AA, **Nuru SM**, Nmadu AG, Esekhaigbe C, et al. Knowledge of obstetric danger signs and its determinants among household heads of a rural community in North-Western Nigeria. Sahel Med J 2021; 10.4103/smj.smj_143_20
4. Dahiru T, Khadija H.L, Suleiman SB, **Suleiman NM**, Zara Z, Mairo M,Igboanusi JC, Oguntunde R, Garba MB,Umar MU. Determinants of Vitamin A Uptake in Nigeria: The Role of Contextual Factors. Journal of Advances in Medicine and Medical Research.2018;25(7)
5. Gobir AA, Aliyu AA, Abubakar AA, Esekhaigbe C, Joshua IA, Adagba KO, **Muhammad NS**, Omole VN3, Ibrahim JM, Nmadu AG. Climate Change Awareness and related Tree Planting Practices in a Rural Community in North-Western Nigeria. Journal of Community Medicine and Primary Health Care. 2021; 33 (1) 41-49. https://dx.doi.org/10.4314/jcmphc.v33i1.4
6. Muhammed Sani Ibrahim, Kabir Sabitu1, Abdulhakeem Abayomi Olorukooba, **Nuru Suleiman Muhammad**, Aisha A. Abubakar, and Sunday Asuke. Pattern and Predictors of Tobacco Use Among Undergraduates in Three Tertiary Institutions in North-Western Nigeria. International Quarterly of Community Health Education. March 2021. doi:10.1177/0272684X211004949
7. M.B. Sufiyan, S.O Lawal, **S.M Nuru**. Client Satisfaction with Quality of Antenatal Care Services Among Attendees of University Health Services Medical Center Ahmadu Bello University Zaria, Kaduna State Nigeria. Journal of medical and Basic Scientific Research. College of Medical Science Ahmadu Bello University, Zaria). 2021

Refereed conference papers

1. **Suleiman Nuru M**. Comparative Study of Birth Preparedness and Complication Readiness among Internally Displaced and Host Communities Women in Bade Local Government Area of Yobe State-Nigeria. Consultative Meeting of The Network on Behavioural Research for Child Survival in Nigeria (NETBRECSIN) On U-Report Enlistment Campaign and Supportive Supervision in Health Service Delivery. 1st -5th July 2021. Bafara Hotel, Kaduna State, Nigeria.
2. **Suleiman Nuru M**, Lawal A, Khadeejah L, Suleiman U, Dahiru T, Knowledge, attitude and help seeking behaviour of intimate partner violence among attendees of antenatal care in Primary Health Care centres, Sabon Gari Local Government Area, Kaduna State, 36th Annual General Meeting and Scientific Conference of the Association of Public Health of Nigeria (APHPN) Jos 2020, March 16th -19th, 2020
3. **Suleiman Nuru M**, Muhammad KM, Usman S, Hamza KL, Ahmadu L, Adherence to treatment of Diabetes Mellitus among Children attending Endocrinology Clinic of a Tertiary Health Facility in Zaria, Nigeria, 36th Annual General Meeting and Scientific Conference of the Association of Public Health of Nigeria (APHPN) Jos 2020, March 16th -19th, 2020
4. Usman S, **Muhammad N** Hamza KL, Ahmadu L, Awareness and Practice of Hand Hygiene among Children in selected Primary Schools in Zaria, Kaduna State, 36th Annual General Meeting and Scientific Conference of the Association of Public Health of Nigeria (APHPN) Jos 2020, March 16th -19th, 2020

REFEREES: Dr Lawan Gana The Honourable Commissioner of Health, Yobe State.

Dr Cécile Cazes, BNurs, MPH, PHD

Post-doctoral researcher in public health – Maternal and child health in global health
cecile.cazes@u-bordeaux.fr or cecile.cazes@coral.alima.ngo
www.linkedin.com/in/cécile-cazes-5a765612b

PROFESSIONAL EXPERIENCE IN GLOBAL HEALTH RESEARCH

Since 2018. **Senior scientific project leader**, Child and maternal health department - CORAL (Clinical & Operational Alliance) platform. ALIMA (The alliance for International Medical Action), University of Bordeaux, National Institute for Health and Medical Research (INSERM) UMR 1219, Research Institute for Sustainable Development (IRD) EMR 271, Bordeaux Population Health Research Centre, Bordeaux, France

NutriVax-Measles- Nigeria

Increasing measles vaccination coverage and reducing malnutrition through twelve months of supplementation with SQ-LNS incentive in children aged 6-23 months

https://eleanorcrookfoundation.org/resources/why-ecf-and-gavi-are-joining-forces-to-explore-pairing-nutritional-supplement-and-vaccine-delivery-to-save-more-lives

- **Wakobo-ti-kodro-Central African Republic**

Improving the identification and follow-up of pregnant women at risk of obstetric complications in the community through traditional birth attendants: a quasi-experimental study combined with a prospective cohort study in the Central African Republic.

https://www.elrha.org/project/nassamba/

- **OptiMA-DRC** trial leading to WHO guideline revision.
  Simplifying and optimising the management of uncomplicated acute malnutrition in children aged 6–59 months in the Democratic Republic of the Congo (OptiMA-DRC): a non-inferiority, randomised controlled trial https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(22)00041-9/fulltext
  Optimising the Dosage of Ready-to-Use Therapeutic Food in Children with Uncomplicated Severe Acute Malnutrition: A Non-Inferiority Randomised Controlled Trial in the Democratic Republic of Congo https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(23)00055-X/fulltext

- **Other research on subjects of interest to be developed**:
  Proper use of antibiotics in simplified programs for the management of child malnutrition and antibacterial resistance.
  Sickle cell disease in malnourished children.

Since 2018. **Independent consultant**

- 2023-2024. Emergency Nutrition Network, United Kingdom
  Pooled secondary analysis to explore non-response to malnutrition treatment and the appropriateness of existing definitions.
  Publication in progress
- 2018. Vienna Evaluation Unit – Doctors Without Borders (MSF)
  Capitalization of MSF-OCG projects in South Irumu, Ituri, DRC - Successes and difficulties according to different strategic approaches https://evaluation.msf.org/evaluation-report/capitalisation-des-projets-msf-ocg-dans-le-sud-irumu-ituri-rdc-reussites-et

2017. **Research officer** - Reproductive health and HIV (internship), INSERM U1219 - University of

Bordeaux

2014-2016. **Country medical coordinator**, MSF, Mali

- *Follow-up of research projects conducted by Epicentre-MSF Research department (antibiotic resistance, SMC coverage survey, study of a complete preventive and curative paediatric care package)*

2013. **Country medical coordinator**, Première Urgence International, Niger

- *In charge of a Knowledge, Attitudes and Practices survey in Niamey of mothers facing acute malnutrition*.

2010. **Nutritional assessment coordinator**, MSF, Chad

OTHER PROFESSIONAL EXPERIENCE IN GLOBAL HEALTH

2014 – 2016. **Country medical coordinator**. MSF, Mali

- Support of the Regional Hospital of Tombouctou activities (72 beds, 2 operating theatres, 1 blood bank)
- Support of 300-bed paediatric hospitalization centre, a general laboratory, a bacteriology laboratory and a blood bank, as well as 10 community health centres in the District of Koutiala
- Support for the national program to combat malaria, malnutrition, TB/HIV, EPI, mass campaigns for chemoprophylaxis of seasonal malaria (200,000 children)
- Strengthening the capacity of health facilities to respond to the Ebola epidemic (training, equipment, surveillance system, awareness-raising, support for the management of suspected and confirmed cases).

2012 – 2013. **Country medical coordinator**. Première Urgence Internationale, Niger

- Strengthening the capacity of a regional hospital in Niamey and 3 health areas to detect and treat severe acute malnutrition (rehabilitation of structures, equipment, staff training, construction of a 10-bed intensive care unit).

2010 – 2011. **Field project coordinator**. MSF, West and central Africa

- Operational research project to combat cholera and participation in the finalization of the intervention strategy, Katanga, Democratic republic of Congo (DRC)
- Measles outbreak response, DRC
- Malaria Epidemic Response, Burundi

2010. **Volunteer nursing consultant** (3 months). Southern Health Improvement Sanity, Calcutta, India

2008-2009. **Nutritional and medical paediatric activities manager**, MSF, Burkina-Faso

2007. **Hospital Supervisor**, MSF, Gore, Chad

OTHERS PROFESSIONAL EXPERIENCE

January 2000 - 2010 - **General care nurse**. Public and private sectors, French Guiana (4 years), Paris, Basque Country, France.

TEACHING EXPERIENCE

Since 2023. **Lecturer** on child malnutrition Global Health in the South - University of Sorbonne, France

Since 2019. **Lecturer** on child malnutrition Master 2 Global Health in the South - University of Bordeaux, France

PHD SUPERVISION in Epidemiology – Bordeaux university, France

- Since 2023. Jérémie HIEN SAN-SAN, MD, MPH (co-supervision with Dr Renaud BECQUET)

  Improving the identification and follow-up of pregnant women at risk of obstetric complications in the community through traditional birth attendants: a quasi-experimental study combined with a prospective cohort study in the Central African Republic.

MPH SUPERVISION in Global Health – Bordeaux university, France

- 2023. Carla MERTEENS, MPH

  Sickle cell disease and undernutrition in children under 5 years of age in sub-Saharan Africa: a systematic review of the literature.
- 2023. Justine SILVESTRI, PharmD, MPH (co-supervision)

  Acceptability and feasibility of using mobile ultrasound for pregnancy monitoring in rural guinea: baseline survey in six health centers in the Télimélé prefecture.

- 2021. Rodrigue ALITANOU, MD
  Nutritional recovery for children 6-59 months affected by acute malnutrition associated with delayed growth: a secondary comparative analysis of the OptiMA randomized clinical trial.
- 2021. Marie Nicolas, MPH (co-supervision)
  Acceptability in Africa and the Middle East of the Antibiogo smartphone application: a tool to assist antibiogram reading.
  https://fondation.msf.fr/en/projects/antibiogo
- 2021 Federico SIRNA, BA
  Review of the literature on acute kwashiorkor malnutrition in children aged 6-59 months and analysis of their recovery using the OptiMA simplified strategy compared with the standard OptiMA-RDC clinical trial.
- 2020. Carine GRENIER, BNurs, MPH (co-supervision)
  Setting up an outpatient therapeutic trial in the context of the SARS-COV epidemic sars-cov-2, coverage trial, March-July 2020, Bordeaux, France: Operational issues, feasibility and acceptability.
- 2019. Mégane GERMAIN, MPH (co-direction).
  Management of severe acute malnutrition in children aged 0 to 59 months in Louga region, Senegal 2021.

EDUCATION

2022. **PhD in Public Health and Epidemiology**. *Bordeaux University, France*

2017 **Master of Public Health, International Public Health** *Institute of Public Health & Epidemiology, Bordeaux University, France*

2006 **Post-graduate diploma in Tropical Disease and international Health**, *Sorbonne University, Paris, France*

2000 **Bachelor degree in Nursing**, *Nursing Care Institute, University Hospitals of Strasbourg, France*

PUBLICATIONS SCIENTIFIQUES

Cécile Cazes, Kevin Phelan, Victoire Hubert, Harouna Boubacar, Liévin Izie Bozama, Gilbert Tshibangu Sakubu, Bruno Bindamba Senge, Norbert Baya, Rodrigue Alitanou, Antoine Kouamé, Cyrille Yao, Dephine Gabillard, Maguy Daures, Augustin Augier, Xavier Anglaret, Moumouni Kinda, Susan Shepherd and Renaud Becquet. Optimising the dosage of ready-to-use therapeutic food in

children with uncomplicated severe acute malnutrition in the Democratic Republic of the Congo: a non-inferiority, randomised controlled trial. *eClinicalMedicine* 2023;58: 101878, https://doi.org/10.1016/j.eclinm.2023.101878

Phelan K, Seri B, Daures M, Yao C, Alitanou R, Aly AAM, Maidadji O, Sanoussi A, Mahamadou A**, Cazes C**, Moh R, Becquet R, Shepherd S. Treatment outcomes and associated factors for hospitalization of children treated for acute malnutrition under the OptiMA simplified protocol: a prospective observational cohort in rural Niger. Front Public Health. 2023 Jul 5;11:1199036. doi: 10.3389/fpubh.2023.1199036. PMID: 37475774; PMCID: PMC10354363.

Cazes C, Phelan k, Hubert V, Boubacar H, Bozama LI, Tshibangu Sakubu G, Kalenga Tshiala B, Tusuku T, Alitanou R, Kouamé A, Yao C, Gabillard D, Kinda, Daures M, Augier A, Anglaret X, Shepherd S, Becquet R. Simplifying and optimising the management of uncomplicated acute malnutrition in children aged 6 to 59 months: a non-inferiority randomised controlled trial in the Democratic Republic of Congo. *The Lancet Global Health* 2022;10: e508–18, DOI:https://doi.org/10.1016/S2214-109X(22)00041-9

Renaud Becquet, **Cécile Cazes**, Kevin Phelan, Béatrice Kalenga Tshiala, Susan Shepherd,The OptiMA protocol in children with wasting and stunting – Authors' reply, The Lancet Global Health, Volume 10, Issue 7, 2022, Page e958, ISSN 2214-109X, https://doi.org/10.1016/S2214-109X(22)00245-5

Maguy Daures, Jérémie Hien, Kevin Phelan, Harouna Boubacar, Sanoussi Atté, Mahamadou Aboubacar, Ahmad A. G. M. Aly, Baweye Mayoum, Jean-Claude Azani, Jean-Jacques Koffi, Benjamin Séri, Aurélie Beuscart, Delphine Gabillard, Victoire Hubert, **Cécile Cazes**, Moumouni Kinda, Xavier Anglaret, Suvi Kangas, Susan Shepherd and Renaud Becquet. Simplifying and optimising management of acute malnutrition in children aged 6 to 59 months: study protocol for a 3 arms community-based individually randomised controlled trial in decentralised Niger. Trials 23, 89 (2022). https://doi.org/10.1186/s13063-021-05955-6

Cazes C, Phelan k, Hubert V, Alitanou R, Boubacar H, Bozama LI, Tshibangu Sakubu G, Beuscart A, Yao C, Gabillard D, Kinda M, Augier A, Anglaret X, Shepherd S, Becquet R. Simplifying and optimising management of acute malnutrition in children aged 6 to 59 months: study protocol for a community-based individually randomised controlled trial in Kasaï, Democratic Republic of Congo. *BMJ Open* 2020;10:e041213. https://bmjopen-bmj-com.proxy.insermbiblio.inist.fr/content/10/12/e041213

Daures, M., Phelan, K., Issoufou, M., Kouanda, S., Sawadogo, O., Issaley, K., **Cazes C.,** Séri B., Ouar B., Becquet, R. (2020). New approach to simplifying and optimising acute malnutrition treatment in children aged 6–59 months: The OptiMA single-arm proof-of-concept trial in Burkina Faso. *British Journal of Nutrition, 123*(7), 756-767. https://doi:10.1017/S0007114519003258

ORAL OR POSTER PRESENTATIONS AT INTERNATIONAL CONFERENCES

C. Cazes, R. Alitanou, K. Phelan, V. Hubert, B. Kalenga Tshiala, A. Briend, S. Shepherd, R. Becquet. Optimising the dosage of ready-to-use therapeutic food in children with severe acute malnutrition and severe underweight: a secondary analysis of the OptiMA-DRC trial. MSF Scientific Days, Jun 2023, London.

C. Cazes, F. Sirna, K. Phelan, V. Hubert, B. Kalenga Tshiala, G. Tshibangu Sakubu, D. Gabillard, S. Shepherd, R. Becquet. Optimising the dosage of ready-to-use therapeutic food in children with uncomplicated kwashiorkor: a secondary analysis of the OptiMA-DRC trial. MSF Scientific Days, Jun 2022, London.

C. Cazes, K. Phelan, V. Hubert, H. Boubacar, L.I. Bozama, B. Kalenga Tshiala, G. Tshibangu Sakubu, R. Alitanou, A. Antoine Kouamé, C. Yao, D. Gabillard, M. Kinda, A. Augier, X. Anglaret, S. Shepherd, R. Becquet. Optimising malnutrition treatment in children 6-59 months: primary outcome of a randomised control trial in Democratic Republic of Congo. MSF Scientific Days, Jun 2021, London.

C. CAZES, K. Phelan, V. HUBERT, H. Boubacar, G. Tshibangu, L.I. Bozama, N. Baya, T. TUSUKU, C. Yao, A. Kouamé, D. Gabillard, R. Alitanou, M. Kinda, A. Augier, X. Anglaret, S. Shepherd, R. Becquet. Optimising malnutrition treatment: recovery of severely wasted children 6-59 months in a randomised control trial in Democratic Republic of Congo. MSF Scientific Days, Jun 2021, London.

Cécile Cazes, Kevin Phelan, Victoire Hubert, Harouna Boubacar, Liévin Izie Bozama, Rodrigue Alitanou, Beatrice Kalenga Tshiala, Gilbert Tshibangu Sakubu, Cyrille Yao, Antoine Kouame, Gabillard Delphine, Moumouni Kinda, Augustin Augier, Xavier Anglaret, Susan Shepherd, Renaud Becquet. Optimising Malnutrition Treatment in Children 6–59 Months-OptiMA-DRC: Primary Outcome of a Randomised Control Trial in Democratic Republic of Congo. *Current Developments in Nutrition*, Volume 5, Issue Supplement_2, June 2021, Page 111, https://doi-org.proxy.insermbiblio.inist.fr/10.1093/cdn/nzab035_019

Cécile Cazes, Kevin Phelan, Victoire Hubert, Harouna Boubacar, Gilbert Tshibangu Sakubu, Liévin Izie Bozama, Norbert Baya, Toussaint Tusuku, Cyrille Yao, Antoine Kouame, Gabillard Delphine, Rodrigue Alitanou, Moumouni Kinda, Augustin Augier, Xavier Anglaret, Susan Shepherd, Renaud Becquet. Optimising Malnutrition Treatment – OptiMA-DRC: Recovery of Severely Wasted Children 6–59 Months in a Randomised Control Trial in Democratic Republic of Congo. *Current Developments in Nutrition*, Volume 5, Issue Supplement_2, June 2021, Page 110, https://doi-org.proxy.insermbiblio.inist.fr/10.1093/cdn/nzab035_018

OTHERS

Languages

- French: mother tongue;
- English: C1 level;
- Spanish, Portuguese - basic level

Information & Communication Technology

Pack Office (Excel, Word, Power Point, Outlook) et de la Suite Google, R software, Zotero