INDEPTH Network

- Delivering Better Health Information
- Driving Better Health Policy

THE PAST, THE PRESENT AND THE FUTURE

PREFACE

The International Network for the continuous Demographic Evaluation of Population Health in developing countries (INDEPTH Network), was established in 1998 as a public good. Over the two decades the INDEPTH Network has coordinated the activities of its members to strengthen HDSS core capacities, harmonize various methodologies for data production, improved their ability to conduct large multi-site investigations that answer questions that cannot be addressed with single individual entities and widely shared both data and results that emanates from such activities.

The INDEPTH Network provides a robust large-scale health and demographic surveillance systems across developing countries that is available to address current global health challenges. The current global health threats such as emerging and re-emerging diseases, the quest to find cure for existing communicable and non-communicable diseases presents INDEPTH as a unique platform to conduct research and undertake intervention studies to find solutions to these challenges in the developing world.

The Network presents a universal approach to conducting large multi-center research based on its strength in surveillance, updated vital events-registration system, emphasis on mortality monitoring and tracking of migration. The Network's ability to offer a unique opportunity of innovative data capture mechanism, advance data analytics, and real-time data reporting systems, enhances data accuracy, efficiency, and timeliness in conducting research in the Sub- Saharan Africa region.

The INDEPTH Network remains pivotal in the continuing need for longitudinal health research that responds to urgent health issues in African and globally. Closely linked to this is the unprecedented opportunity to develop low cost, data-accessible, and user-friendly technology for longitudinal observation of populations. Software innovations, communication tools, AI capabilities, and inference tools expand opportunities for collaboration, exchanges, and capacity-building that are best addressed by a scientific network that builds regional links between scientists as well as collaborative links with research institutions in Europe, Asia, and North America.

This document provides the profile of 16 INDEPTH Sites in 10 countries, comprising a population of over 2.9 million people in East, West and Southern Africa. The document captures the following details of each site: institutional profile; geographic and administrative location; total population under surveillance; staff capacity and strength; community-based and hospital-based surveillance activities; clinical trial capabilities and clinical trial studies conducted. It also contains other health, population and intervention studies conducted by the sites and publications from these studies.

We are very grateful to all the experts, site leaders, site members and individuals who have contributed their knowledge and experience towards the development of this document. This document will serve as a guide to future health and population studies and large scale multi-country surveillance and clinical trial research in Sub-Saharan Africa.

Professor Philip B. Adongo
The Executive Director
INDEPTH Network Secretariat, Accra, Ghana
WWW.indepth-network.org
Email: info@indepth-network.org
Tel: +233 (0) 244806015

EXECUTIVE SUMMARY

The INDEPTH Network is a nonprofit International Organization established in 1998 as an initiative of the international Research Scientists and other stakeholders to create Health and Demographic Surveillance Systems (HDSS) across Africa to address the critical gaps in information on health and population in Low- and Middle- income countries (LMICs).

In 2018, the Network paused its operations for almost five years to address and streamline Legal and Governance issues of the Network. After resolutions and paper work of the Network, there was a wide stakeholder and Site Leaders meeting of the Network in January, 2024 to "Reboot" the Network and chart the way forward.

Although the Network will continue to build on its core mandate, to consolidate the gains of the Network's wealth of experience in clinical trials, epidemiology and demographic surveillance systems in over twenty research centers in sub-Saharan African countries, the current Phase of "rebooting" the Network will focus mainly on Clinical trials, from phase I to IV drug and vaccine trials, and diagnostics studies.

Currently, the Network has a population of approximately three million across sub-Saharan Africa (West, East, Central and South regions) with 16 Research Centers in 10 African countries who are longitudinally followed up in defined geographic regions and ready to participate in clinical trials.

These research clinical trial centers have conducted several Good Clinical Practice (GCP) compliant studies and are ready to get on board to conduct clinical trials in infectious and non-communicable diseases including oncology trials. The detailed profile of these centers are outlined in this brochure.

ACKNOWLEDGEMENTS

The INDEPTH Network acknowledges the listed sites and their leaders for their immense contribution to the INDEPTH brochure. The sites and their leaders are: GRAS HDSS (Prof. Sodiomon B. Sirima), Nanoro HDSS (Prof. Halidou Tinto), Dabat HDSS (Dr. Tesfahun Melese Yilma), Dodowa HDSS (Dr. Frank Atuguba), Kintampo HDSS (Dr. Kwaku Poku Asante), Agogo – IVI (Prof. Ellis Owusu-Dabo), Agogo – MRC (Prof. Tsiri Agbenyega), Kombewa HDSS (Mr. Peter Sifuna), Nyando HDSS (Dr. Bernhards Ogutu), Bandiagara HDSS (Dr. Mahamadou Ali Thera), Manhica HDSS (Dr. Francisco Saúte), Cross River HDSS (Dr. Martin Meremikwu), Keur Soce /UCAD (Prof. Oumar Gaye), Ifakara HDSS (Dr. Honorati Masanja) and Iganga Mayuge HDSS (Dr. Dan Kajungu).

The INDEPTH Network further acknowledges Professor Philip Adongo, Bernhards Ogutu, Margaret Williams, Professor Jim Phillips, Professor Don de-Savigny, Felicia Manu, Sixtus Apaliyah, Kwabena Owusu-Boateng, Rita Baiden, Fred Binka, for diverse support provided.

CONTENTS

ACRONYMS AND ABBREVIATIONS

AAS	African Academy of Sciences
AECID	Spanish Agency for International Development Cooperation
AWI-GEN	Africa Wits-INDEPTH Partnership for Genomic Research
BMGF	Bill & Melinda Gates Foundation
BMP	Bandiagara Malaria Program
CDC	Centre for Disease Control
CHAMPS	Child Health and Mortality Prevention Surveillance
CINAMR	Clinical Information Network-Antimicrobial Resistance
CISM	Centro de Investigacao em Saude de Manhica
CITI	Collaborative Institutional Training Initiative
CRHDSS	Cross River Health and Demographic Surveillance Site
CRUN	Clinical Research Unit of Nanoro
DANIDA	Danish International Development Agency
DGD	Directorate-General for Development
DHDSS	Dodowa Health and Demographic Surveillance Site
EDCTP	European and Developing Countries Clinical Trials Platform
EHES	Environmental Health and Ecological Sciences
GCP	Good Clinical Practice
GPS	Global Positioning System
GRAS	Groupe de Recherche Action en Santé
GSK	GlaxoSmithKline
GoG	Government of Ghana
HDSS	Health and Demographic Surveillance Site
HSIEP	Health Systems, Impact Evaluation and Policy
IDRC	International Development Research Centre
IHI	Ifakara Health Institute
ILO	International Labor Organisation
IMHDSS	Iganga Mayuge Health and Demographic Surveillance Site
IRSS	Institute de Recherche en Sciences de la Santé
IRESSEF	I'Institut de Recherche en Sante de Surveillance Epidemiologique et de Formation
IVI	International Vaccine Institute
JICA	Japan International Cooperation Agency
KATH	Komfo Anokye Teaching Hospital
KEMRI	Kenyan Medical Research Institute
KHDSS	Kintampo Health and Demographic Surveillance Site
KHRC	Kintampo Health Research Centre
KNUST	Kwame Nkrumah University of Science and Technology
LMICs	Low and Middle Income Countries
LSHTM	London School of Hygiene and Tropical Medicine
MHDSS	Manhica Health and Demographic Surveillance Site
MMV	Medicine for Malaria Venture
MRC	Malaria Research Centre
MRTC	Malaria Research and Training Center
MUCHAP	Makerere University Centre for Health and Population Research
NGO	Non-Governmental Organisation
NHDSS	Navrongo Health and Demographic Surveillance Site
NHMIS	National Health Management Information System
NIAID	National Institute of Allergy and Infectious Diseases
NIH	National Institute of Health
NISP	Navrongo Integrated Surveillance Project
NTDs	Neglected Tropical Diseases
PATH	Program for Appropriate Technology in Health
SIDA	Swedish International Development Agency

SMC	Seasonal Malaria Chemoprevention
SMD	School of Medicine and Dentistry
SwissTPH	Swiss Tropical and Public Health Institute
UCAD	University Cheikh Anto Diop
UHAS	University of Health and Allied Sciences
UNC	University of North Carolina
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USSEIN	University du Sine Saloum Ibrahima Niass
WALIMU	World Alliance for Lung and Intensive Care Medicine in Uganda

SUMMARY OF INDEPTH NETWORK CLINICAL TRIAL SITES IN AFRICA

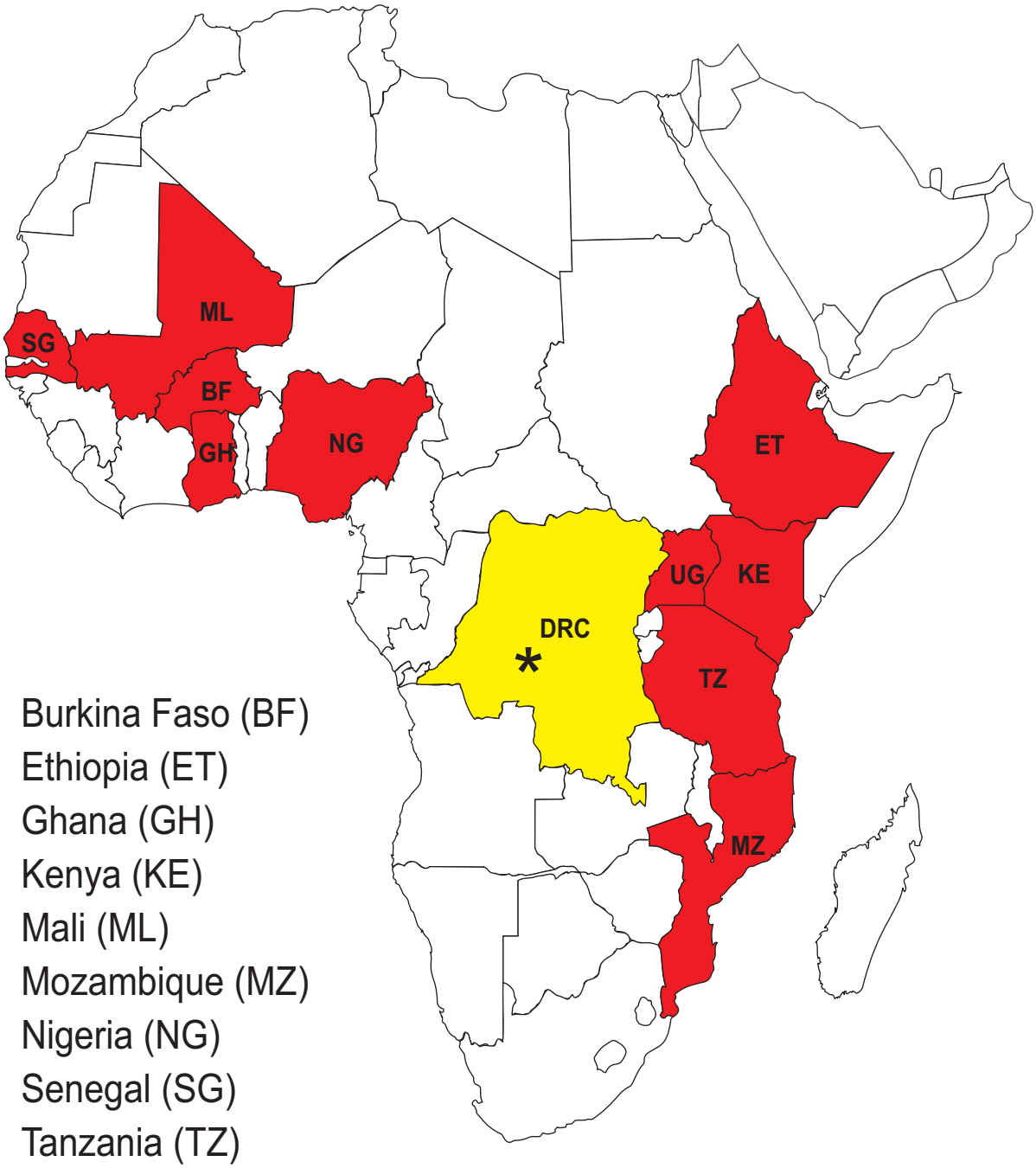
The INDEPTH Network has sixteen (16) member clinical trial sites in ten (10) countries in Africa. Specifically, there are five (5) countries in West Africa (Burkina Faso, Ghana, Nigeria, Mali, Senegal), four (4) countries in East Africa (Ethiopia, Kenya, Tanzania, Uganda), and one (1) country in Southern Africa (Mozambique). The site in the Democratic Republic of Congo (DRC) is under development.
The total DSS population of the 16 member sites is 2,983,092.

Total DSS population followed in INDEPTH sites	**2,983,092**
Number of countries:	**10**
Number of sites:	**16**

Regional and Country distribution of HDSS sites

Region /Country	City	HDSS Name	Pop. Size	Total
West Africa				**1,563,353**
Burkina Faso				
	Ouagadougou	Sabou	120,000	
	Nanoro	Nanoro	66,508	
Ghana				
	Agogo	Agogo KCCR	100,000	
	Agogo	Agogo MRC	184,993	
	Navrongo	Navrongo	266,000	
	Kintampo	Kintampo	553,566	
	Dodowa	Dodowa	150,000	
Nigeria				
	Cross River	Cross River	44,000	
Mali				
	Bamako	Bandiagara	38,000	
Senegal				
	Dakar	KeurSoce	40,286	
East Africa				**645,127**
Ethiopia				
	Gondar	Dabat	77,898	
Kenya				
	Kisumu	Kombewa	184,222	
	Kisumu	Ahero	161,508	
Tanzania				
	Ifakara	Ifakara	120,000	
Uganda				
	Iganga	Iganga /Mayuge	101,499	
Southern Africa				**129,485**
Mozambique				
	Manhiça	Manhica	129,485	
				2,983,092

INDEPTH Network Clinical trial sites in Africa



Burkina Faso (BF)
Ethiopia (ET)
Ghana (GH)
Kenya (KE)
Mali (ML)
Mozambique (MZ)
Nigeria (NG)
Senegal (SG)
Tanzania (TZ)
Uganda (UG)

*Expanding to Democratic Republic of Congo (DRC)

GROUPE DE RECHERCHE ACTION EN SANTÉ (GRAS), BURKINA FASO

LOCATION AND PROFILE Established in January 2008, the Groupe de Recherche Action en Santé (GRAS) is an internationally renowned private legal research institute situated in Ouagadougou, Burkina Faso, renowned internationally. The institute operates under an official license from the Ministry of Higher Education, Ministry of Scientific Research and Innovation of Burkina Faso. The surveillance site of the Institute which is located at Sabou district, is an hour's drive from Ouagadougou and covers a total population of 120,000.

Serving as a platform for collaboration, expertise exchange, and skill enhancement, the GRAS strives for excellence in advancing human health, conducting high-quality research aligned with international standards to inform policy decisions and promote ongoing improvements in population health and therefore is engaged in an ISO9001 accreditation process. Over the years, GRAS has fostered enduring partnerships with various health, academic, pharma and research entities, both nationally and internationally, solidifying its position as a key player in the field of health research. GRAS is highly committed to protecting the environment and therefore put emphasis in the use of Green Energy throughout its research activities.

SITE LEADER AND DIRECTOR: Prof. Sodiomon B. Sirima (MD, PhD).
Prof. Sirima is a distinguished medical epidemiologist, member of the African Academy of Sciences (AAS) with over three decades of professional experience, specializing in surveillance studies for 29 years. With an extensive background in clinical trials research spanning 26 years, Prof. Sirima has demonstrated expertise in implementing Good Clinical Practice (GCP) compliant studies for the past 26 years, some leading to policy recommendations. Throughout his illustrious career, Prof. Sirima has fostered strong community engagement, boasting 29 years of experience collaborating with diverse communities.

Map of Burkina Faso with the three main research stations of GRAS (in the middle the surveillance site of Sabou

Picture of Data Centre/Lab of Sabou

CAPACITY

Facilities: The GRAS has good clinical trial platform (from first in human Phase I to Phase 4 trials) and laboratory facilities, pharmacy, a state-of-the art Insectary (supporting trials involving membrane or skin feeding experiments) quality management systems and data management facilities to support clinical trials. Benefiting from a proficient team equipped in qualitative research, GRAS is committed to enhancing the private sector's involvement in health research alongside the public sector.

Human Resource: The GRAS is staffed with a multidisciplinary team, the majority of whom have extensive experience in health research including physicians, pharmacists, epidemiologists, biologists, clinical Trial specialists, sociologists, data managers, nurses. Strong administrative support (human resource manager, financial administrator, project manager, accountants, drivers and other supporting staff).

Projects: The GRAS has carried out a wide variety of projects / studies including:

- Infectious disease surveillance studies
- Clinical trials from phase l to IV studies
- Non-clinical studies
- Population and Health Studies among others

Clinical Trial Capacity

- A Phase 2, multi-centre, randomized, open-label interventional study of three age cohorts to assess the efficacy, safety and tolerability of KAF156- Lumefantrin SDF in the treatment of uncomplicated acute malaria with Plasmodium falciparum in a pediatric population (KALUMI)
- A Phase 1b, multicenter, randomized, placebo-controlled, observer-blinded, Dose-escalation study to evaluate the safety, tolerability, and immunogenicity of the Sm-p80 + GLA-SE (SchistoShield®) candidate vaccine in healthy adults in Burkina Faso and Madagascar (VASA)

- An adaptive, randomized, active-controlled, open-label, sequential cohort, multicenter study to evaluate the efficacy, safety, tolerability, and pharmacokinetics of intravenous cipargamin (KAE609) in adult and pediatric participants with severe Plasmodium falciparum malaria (KARISMA)
- Phase IIa Proof of Concept, Multicenter, Randomized, Open-label Study to Evaluate the Safety, Efficacy, and Pharmacokinetics of the Combination M5717 plus Pyronaridine Administered Once Daily for 1 or 2 Days to Adults and Adolescents with Acute Uncomplicated Plasmodium falciparum Malaria (CAPTURE1)
- Phase 2a Proof-of-Concept, Multicenter, Randomized, Open Label Study to Evaluate the Efficacy, Safety, and Pharmacokinetics of a Single
- Dose of the Combination M5717-pyronaridine as Chemoprevention in Asymptomatic Adults and Adolescents with Plasmodium falciparum Malaria Infection (CAPTURE2)

Surveillance capacity

- Shigellosis
- Echerichia Coli
- ETEC
- Salmonellosis
- Malaria

PARTNERS

PUBLICATIONS

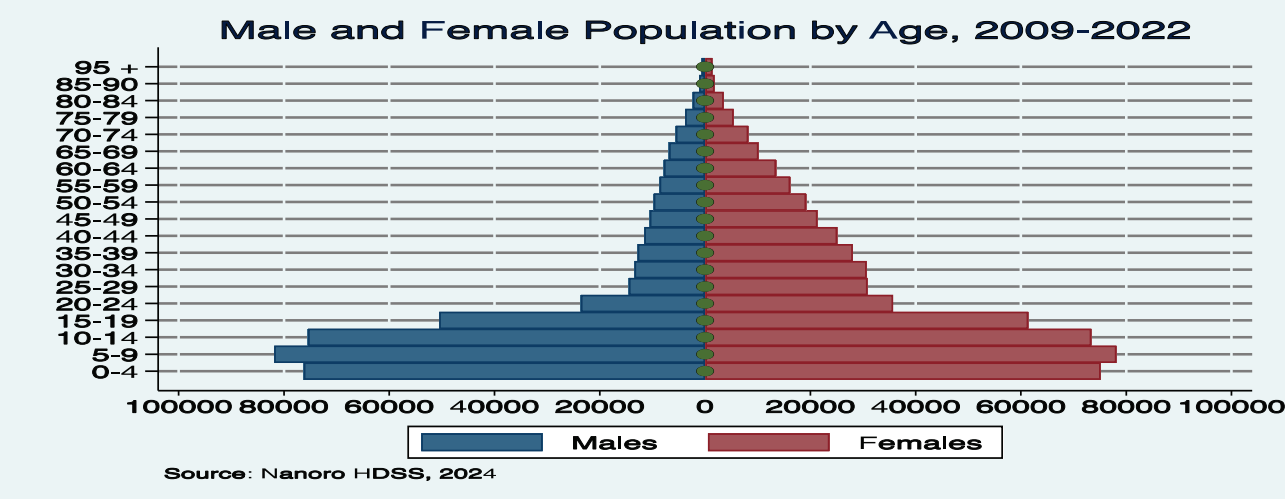
- Safety and immunogenicity of 2-dose heterologous Ad26.ZEBOV, MVA-BN-Filo Ebola vaccination in children and adolescents in Africa: A randomised, placebo-controlled, multicentre Phase II clinical trial
- Safety and immunogenicity of 2-dose heterologous Ad26.ZEBOV, MVA-BN-Filo Ebola vaccination in healthy and HIV-infected adults: A randomised, placebo-controlled Phase II clinical trial in Africa
- Safety and immunogenicity of Vi-typhoid conjugate vaccine co-administration with routine 9-month vaccination in Burkina Faso: A randomized controlled phase 2 trial
- A randomized, double-blind, phase 2b study to investigate the efficacy, safety, tolerability and pharmacokinetics of a single-dose regimen of ferroquine with artefenomel in adults and children with uncomplicated Plasmodium falciparum malaria.A Phase II, Randomized, Double-blind, Controlled Safety and Immunogenicity Trial of Typhoid Conjugate Vaccine in Children Under 2 Years of Age in Ouagadougou, Burkina Faso: A Methods Paper

NANORO HEALTH AND DEMOGRAPHIC SURVEILLANCE SITE (NANORO HDSS)
INSTITUTE DE RECHERCHE EN SCIENCE DE LA SANTÉ –CLINICAL RESEARCH UNIT OF NANORO (IRSS-CRUN)

DSS POPULATION AND DEMOGRAPHICS:

The Nanoro HDSS covers a total population of 66,508. Population profile of Nanoro HDSS is typical of rural low and middle-income countries with high birth rate (Total Fertility Rate around 5). The below population pyramid shows a high out-migration rates especially in adult men to urban areas.

Population demographics in the overall period 2009-2022



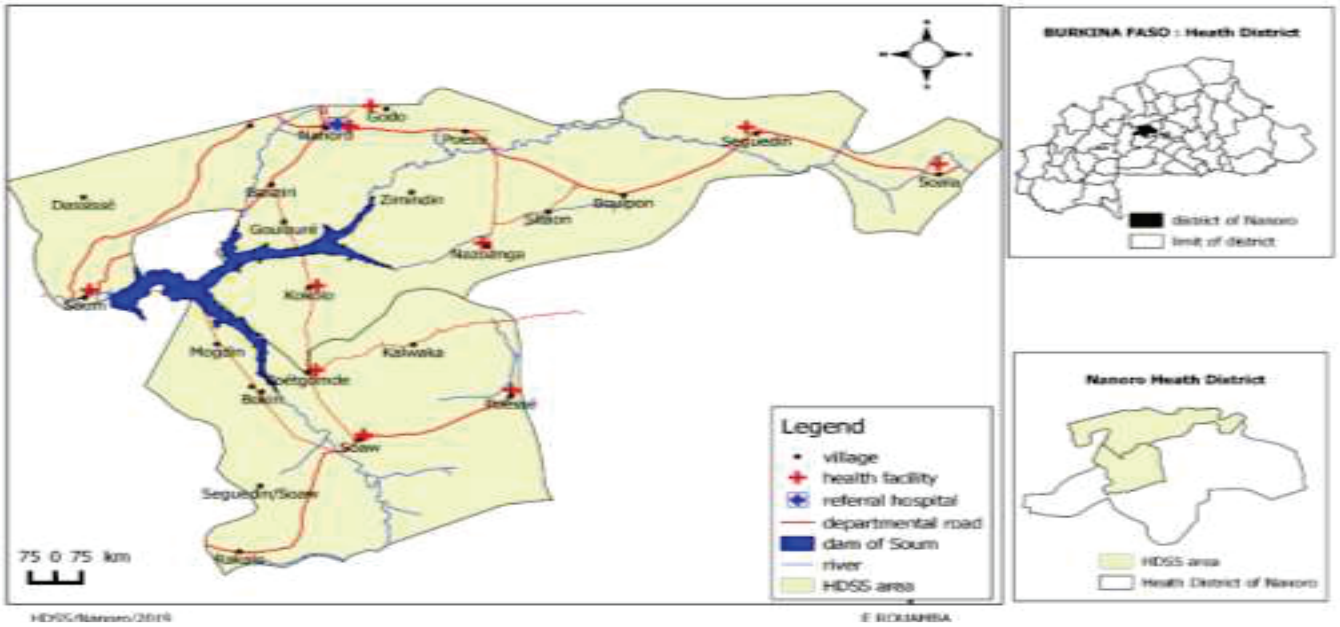
LOCATION AND PROFILE

Established in 2009 by the Clinical Research Unit of Nanoro - Institute de Recherche en Sciences de la Santé (IRSS-CRUN), the Nanoro Health and Demographic Surveillance System (HDSS) serves as a fundamental framework for clinical trials and aids Burkina Faso health authorities in generating epidemiological data vital for evaluating health interventions. Situated at approximately 85 kilometers from Ouagadougou the capital city, Nanoro, a rural area in the Centre-West of the country, hosts the Nanoro HDSS, covering 24 villages across 594.3 square kilometers, and providing a conducive environment for research on diseases of public health interest, particularly malaria, with ten peripheral health facilities and one referral hospital catering to healthcare needs.

Under the Sudano–Sahelian climate, characterized by a distinct rainy season from June to November and a dry season from December to May. The population under surveillance is approximately 66,508 residents, predominantly comprised of individuals engaged in subsistence farming, cattle-keeping, and other household activities. The main ethnic groups in the area include Mossi, Gourounsi, and Fulani. The CRUN clinical laboratory plays a crucial role in providing quality laboratory tests essential for addressing medical and public health requirements in the region.

SITE LEADER AND DIRECTOR: Prof. Halidou Tinto, PharmD, MSc, PhD

Prof. Tinto is a distinguished expert in medical sciences with 23 years of professional experience, including 22 years of expertise in surveillance studies and 20 years of hands-on clinical trials research and Good Clinical Practice (GCP) experience. With a remarkable 22-year history of community engagement, Prof. Tinto seamlessly integrates scientific rigor with community needs, making significant strides in advancing public health initiatives.



Clinical trial and laboratory facilities according to international standards (ICH/GCP)

CAPACITY

Facilities: The Nanoro HDSS is well equipped with a clinic, clinical and research laboratory facilities, pharmacy, quality management systems and data management facilities to support clinical trials. Moreover, the newly well-equipped clinical trial paltform established in 2021 at Siglé field station provides additional capacity to accommodate several trials in parallel.

Human Resources: The Clinical Research Unit of Nanoro (CRUN) boasts of a diverse team of seasoned professionals, comprising clinical researchers, health economists, data management specialists, social scientists, laboratory managers and technicians, and IT professionals. Most of the senior research scientists have training in Good Clinical Practice (GCP), highlighting the unit's commitment to excellence. The collective expertise and breadth of skills within the HDSS staff have been instrumental in the effective planning and execution of research projects, contributing significantly to its success.

Projects: The Nanoro HDSS has undertaken an extensive range of projects and studies including:

- Infectious disease surveillance studies
- Clinical trials spanning phases I to IV studies
- Non communicable Diseases
- Population and Health Studies
- Health Economics studies

Thanks to specialist research groups, research at CRUN focuses on structural biology, molecular cell biology and more. CRUN performs studies and teach in a variety of areas, including policy, epidemiology, behavioral science, diagnostics and pharmaceutical development, clinical trials, and bench science.

Clinical Trial Capacity: See below the clinical trials carried out within the last 3 years out of 40 trials conducted within the last 15 years.

- A Phase IIb randomised controlled trial of the safety, immunogenicity and efficacy of the blood-stage malaria vaccine candidates RH5.1 in Matrix-MTM and RH5.2-VLP in Matrix-MTM in infants aged 5-17 months in Burkina Faso; Funded by European and Developing Countries Clinical Trials Partnership (EDCTP)
- Boosting the impact of seasonal malaria chemoprevention (SMC) through simultaneous screening and treatment of SMC-Children's roommates in Burkina Faso ; Funded by Expertise France (Initiative 5%)
- Evaluation of molecular point-of-care Xpert® Xpress SARS-CoV-2 detection implementation in resource limited setting (EXPERT-CoV2); Funded by EDCTP
- A Phase III randomized controlled multi-centre trial to evaluate the efficacy of the R21/Matrix-M vaccine in African children against clinical malaria (VAC078); Funded by Serum Institute of India (SII)
- Efficacy and Safety of a newly regired Artemisinin-Based Combination (Pyronaridine-Artesunate - PYRAMAX®) for the treatment of uncomplicated malaria in African pregnant women (PYRAPREG); Funded by EDCTP.
- A Phase I/IIb randomised controlled trial of the safety, immunogenicity and efficacy of a candidate malaria vaccine, R21 adjuvanted with Matrix-M (R21/MM), in 5-17 month old children in Nanoro, Burkina Faso (VAC076) – The Extension study; Funded by Serum Institute of India (SII)
- Covid-19 epidemic in West Africa: infection dynamics and diagnostic approaches (COVADIS); Funded by EDCTP
- Seasonal R21 mass vaccination for malaria elimination; Funded by UKRI

Surveillance Capacity:

- Active One Health surveillance in LMICs to monitor and predict Antimicrobial Resistance Using Metagenomics (ALARUM); Funded by Swedish Cooperation Agency(SIDA)
- Improve research capacity in infectious diseases and surveillance to inform policy and practice and improve current control strategies in Burkina Faso; Funded by Belgian Cooperation (DGD).
- Health and Demographic Surveillance (HDSS)-based Mortality Surveillance in Africa and South Asia (Excess – Mortality); Funded by Bill & Melinda Gates Foundation (BMGF)
- Optimising community antibiotic use and infection control with behavioural interventions in rural Burkina Faso and DR Congo; Funded by Swedish Cooperation Agency(SIDA).
- A Pregnancy Registry to Assess the Safety of Antimalarial use in Pregnancy; Funded by Medicine Medicine for Malaria Venture (MMV)
- Mitigating climate changes on health in Burkina Faso (CLIMSA); Funded by Danish Cooperation (DANIDA)

PUBLICATIONS: 284 peer-review articles listed by following the link

https://pubmed.ncbi.nlm.nih.gov/?term=Halidou+Tinto&sort=date

DABAT RESEARCH CENTER, UNIVERSITY OF GONDAR, ETHIOPIA

LOCATION AND PROFILE

The combined population figures for the three sites is 122,295. The Dabat Research Center (DRC), which encompasses the Dabat, Gondar, and Gorgora HDSS sites, is situated in the Amhara Region of Ethiopia, approximately 821 km northwest of Addis Ababa and 75 km north of Gondar town. Also known as Dabat HDSS spans an area known for its rugged terrain, including mountains, valleys, and highlands, with altitudes ranging from 1,800 to 3,600 meters above sea level, covering three distinct geo-climatic zones: cold, temperate, and hot.

Established by the University of Gondar in 1996, the Dabat HDSS aimed to develop and evaluate a system for continuous registration of health, health-related, and socioeconomic indicators through population-level longitudinal research. In response to the need for a comprehensive understanding of health dynamics in the region, the Dabat HDSS expanded to include the Gondar and Gorgora HDSS sites in April 2021, considering factors such as urban population dynamics, ecological diversity, trans-boundary population movement, and water source-induced public health issues. Currently, the Dabat HDSS covers a population of 77,898, the Gondar HDSS covers 42,147, and the Gorgora HDSS has 2,250 individuals under surveillance.

SITE LEADER AND DIRECTOR PROFILE: Dr. Tesfahun Melese Yilma (PhD, MPH)

Dr. Tesfahun Melese Yilma brings 17 years of professional experience, specializing in Public Health Informatics, 13 years of dedicated work in surveillance studies and 17 years of extensive experience engaging with communities. Additionally, he has 5 years of involvement in clinical trials research, showcasing a well-rounded background in public health research and community engagement.

Map of Dabat HDSS

CAPACITY

Facilities:

The Dabat Research Center is equipped with the necessary infrastructure to support its research activities, including state-of-the-art data management systems and field offices for efficient data collection and analysis.

Human Resources:

The center boasts of a multidisciplinary team of professionals including nutritionists, epidemiologists, biostatisticians, public health experts, and data managers. Most staff members have completed Good Clinical Practice (GCP) training, emphasizing the center's dedication to research excellence.

Projects: The center has an extensive portfolio of projects/studies including:

- Infectious disease surveillance
- Phase I Clinical trials
- Non communicable disease
- Population and Health studies
- Maternal and Child Health
- Nutrition and Food Security
- Biomedical
- Environmental and Occupational Health
- Social and Behavioral
- Adolescent Reproductive Health
- Mental Health among others

Clinical Trial Capacity

- Enhanced community case management to increase access to pneumonia treatment: A cluster-randomized controlled trial
- Cervical Cancer Screening
- Pneumococcal Conjugate Vaccine Study (Ethiopian PCV-10 Study) project
- Effect of local handwashing agents on microbial contamination of the hands in a rural setting in northwest Ethiopia: Randomized Control Trial
- Effect of Health Extension Workers Led Home-based Intervention on Hypertension Management in Northwest Ethiopia: A Cluster Randomized Controlled Trial

Surveillance Capacity

- Community Drinking Water Quality in Bacteriological Analysis
- Environmental exposure analysis of Water, food, and soil quality in terms of bacteriological analysis

PARTNERS

University of Gondar

PUBLICATIONS

- Population Dynamics in Dabat Health and Demographic Surveillance System Sites, Dabat District, Northwest Ethiopia: A Four-year Surveillance Report (2009 To 2012)
- Tuberculosis and HIV are the leading causes of adult death in northwest Ethiopia: evidence from verbal autopsy data of Dabat health and demographic surveillance system, 2007–2013
- Injury related Gaining Momentum as External Causes of Deaths in Ethiopian Health and Demographic Surveillance Sites: Evidence from Verbal Autopsy study
- Knowledge, Attitude, and Practice of Mothers/Caregivers on Household Water Treatment Methods in Northwest Ethiopia: A community based cross sectional study
- Children who received PCV-10 vaccine from a two-dose vial without preservative are not more likely to develop injection site abscess compared with those who received pentavalent (DPT-HepB -Hib) vaccine: a longitudinal multi-site study

DODOWA HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM (DHDSS): DODOWA HEALTH RESEARCH CENTRE

LOCATION AND PROFILE

Dodowa HDSS Covers a total population of 150,000 individuals. The site operates within the Shai-Osudoku and Ningo-Prampram districts of the Greater Accra Region, situated in the south-eastern part of Ghana. Positioned between latitude 5° 45′ south and 6° 05′ north, and longitude 0° 05′ east and 0° 20′ west, the district covers a land area of 1528.9 sq km. It is located about 41 km from the national capital, Accra. The site hosts 150,000 registered populations living in 33,000 households, primarily in rural and coastal areas with scattered communities. The terrain is characterized by flat land at sea level, with isolated hills and vegetation primarily consisting of coastal savannah, alongside dense vegetation in the 'Dodowa Forest' sub-district. The main occupations include farming, fishing, and petty trading.

The center maintains strong working relationships with the two district health directorates and local government authorities. While initially focused on malaria research, the center has diversified its research areas to include maternal, neonatal, and child health, sanitation and health, tuberculosis, neglected tropical diseases (NTDs), and social protection. Recognized by the World Health Organization (WHO) since 2013 as a Center of Excellence in Implementation Research, the Dodowa HDSS continues to contribute significantly to health research and policy development in Ghana.

SITE LEADER AND DIRECTOR: Frank Atuguba (MBChB, DTM&H, MPH, MGCP, PhD)
Dr. Atuguba is a Public Health Physician Specialist with 23 years of professional experience in clinical and surveillance studies. He has 18 years of expertise in both clinical trials research and implementing Good Clinical Practice (GCP) standards. Dr. Atuguba has also dedicated 23 years to fostering meaningful community engagements, showing his commitment to holistic public health interventions.

Map showing the various health facilities in the DSA

DHRC-Clinical Trial/Vaccine Studies Ready Cold Room/Hospital addmission facility

CAPACITY

Facility: Dodowa HDSS is developing clinical trial and laboratory facilities, quality management systems and data management facilities to support clinical trials.

Human Resource: Dodowa HDSS has a team of experienced research scientists and administrative staff. These include Clinical researchers, Physicians, Laboratory Scientists, Data manager, social scientists, Biostatistician, and field staff. Most of the senior research scientists are GCP trained. The scope of staff of the HDSS have contributed to its success in the planning and implementation of research studies.

Project: Dodowa HDSS has conducted a wide variety of projects / studies. These include:

- Clinical trials (phases III and IV) studies/ Clinical studies
- Non-clinical studies
- Epidemiological and surveillance disease studies in communicable and non-communicable
- Population and health economics studies

The center specializes in clinical trials, biomedical science, social science, maternal and child health, neglected and tropical diseases, and health economy studies. It has actively participated in numerous multi-center clinical trials. Leveraging the DSS as its foundation, the center has seamlessly executed clinical trials and epidemiological studies, encountering minimal challenges along the way.

Clinical Trial/Studies Capacity

- A Phase 3 double-blind, randomized, active comparator-controlled, group-sequential, multi-national trial to assess the safety, immunogenicity and efficacy of a trivalent P2VP8 subunit rotavirus vaccine in prevention of severe rotavirus gastroenteritis in healthy infants
- Observational study to evaluate the clinical safety after introduction of the fixed dose artemisinin-based combination therapy eurartesim® (dihydroartemisinin/piperaquine [dha/pqp]) in public health districts in Burkina Faso, Mozambique, Ghana and Tanzania
- Assessment of COVID 19 infection burden and its impact on diagnosis among patients receiving healthcare in three hospitals in Ghana
- Epilepsy pathway innovation in Africa (EPINA) study

Surveillance Capacity

- Evaluating the implementation process of the Networks of Practice programme in Ghana: An implementation research project
- Assessment of COVID-19 infection burden and its impact on diagnosis among patients receiving healthcare in three hospitals in Ghana

PARTNERS

World Bank, Noguchi Memorial Institute for Medical Research (NMIMR), Bill and Melinda Gates Foundation, UNICEF, JICA, USAID, Wellcome Trust, ILO, INDEPTH Network, School of Public Health-University of Ghana, University of Health and Allied Sciences, Ho, Ghana

PUBLICATIONS IN CLINICAL STUDIES

- Correction to: Pharmacokinetic profile of amodiaquine and its active metabolite desethylamodiaquine in Ghanaian patients with uncomplicated falciparum malaria
- Pharmacokinetic profile of amodiaquine and its active metabolite desethylamodiaquine in Ghanaian patients with uncomplicated falciparum malaria
- Synthesis and Meta-analysis of 3 Randomized Trials Conducted in Burkina Faso, Ghana, and \Uganda Comparing the Effects of Point-of-Care Tests and Diagnostic Algorithms Versus Routine Care on Antibiotic Prescriptions and Clinical Outcomes in Ambulatory Patients <18 Years of Age With Acute Febrile Illness
- Advancing Access to Diagnostic Tools Essential for Universal Health Coverage and Antimicrobial Resistance Prevention: An Overview of Trials in Sub-Saharan Africa
- Impact of Point-of-Care Rapid Diagnostic Tests on Antibiotic Prescription Among Patients Aged <18 Years in Primary Healthcare Settings in 2 Peri-Urban Districts in Ghana: Randomized Controlled Trial Results

KINTAMPO HEALTH AND DEMOGRAPHIC SURVEILLANCE SITE (KHDSS)
KINTAMPO HEALTH RESEARCH CENTRE, GHANA

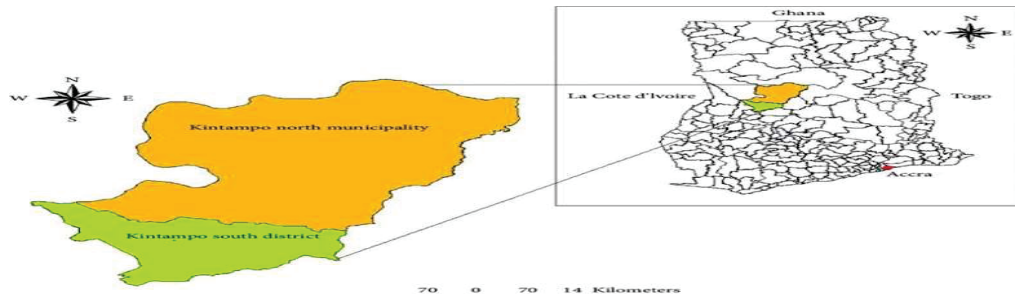
LOCATION AND PROFILE

KHRC is located in the middle belt of Ghana in the Bono East Region, covering an area of 22,952 km2. The region experiences distinct dry and wet seasons, with temperatures peaking during the dry season from December to April and encountering the hot Harmattan wind from December to early February. Annual rainfall averages between 750 to 1050 mm between July and November, contributing to predominantly forested landscapes and fertile soils. The Kintampo HDSS area (constituting of Kintampo North Municipality and Kintampo south district), has a surface area of 7,162 square kilometers.

Operated by the Kintampo Health Research Centre (KHRC), the KHDSS serves as a platform for basic health and demographic data such as migrations, fertility and mortality across the Kintampo Health Research Centre (KHRC) catchment areas made up of Six (6) districts in the Bono East Region of Ghana. With a current population under surveillance of 533,566, KHRC's research significantly influences health policies and practices not only in Ghana but also across Africa, championing contextually relevant interventions to address the continent's health concerns. Additionally, KHRC serves as the coordinating institution for the Malaria Vaccine Pilot Evaluation in Ghana.

SITE LEADER AND DIRECTOR: Kwaku Poku Asante (MD, MPH, PhD, FWACP) Dr. Kwaku Poku Asante is a distinguished Public Health Specialist and Epidemiologist with 22 years of professional experience, specializing in surveillance studies for 21 years, clinical trials research for 21 years, and GCP Clinical Trials experience for 21 years. With 21 years of dedicated involvement in working directly with communities, he has consistently demonstrated a commitment to advancing public health through comprehensive research and community engagement.

Map of Ghana highlighting the Kintampo Health and Demographic Surveillance area.



Facilities at the KHRC

CAPACITY

Facilities: KHRC has well-equipped clinical trial facilities, clinical laboratory with international quality-assurance systems, data management centre capable of processing and protecting large clinical datasets.

Human Resource: The Kintampo Health Research Centre (KHRC) is staffed with a multidisciplinary team, the majority of whom have extensive experience in health research including; Physicians, Pharmacists, Epidemiologists, Biologists, Clinical Trial Specialists, Social Scientists, Data Managers, Nurses and Health Economist. The clinical trial team is trained on local and international standards of conducting good clinical trials by the Ghana Food and Drugs Authority. Also, there is strong administrative support (Human resource Manager, Financial administrator, project Manager, accountants, drivers etc).

Projects: Kintampo Health Research Centre (KHRC) has carried out a wide variety of projects/studies including:

- Infectious disease surveillance studies
- Clinical trials and Non communicable Disease
- Population and Health Studies
- Health Economics Studies
- Environmental health and Climate change

The core areas of research, are Clinical Trials and Intervention, Environmental Health, Family Health, Malaria and Neglected Biomedical Science, Health Policy and Program Evaluation, and Operational and Implementation Research. The Centre has been involved in several multi-center clinical trials. With the DSS as the backbone, clinical trials and surveillance studies have been implemented successfully.

Clinical Trial Capacity:

- Study of Monovalent and Bivalent Recombinant Protein Vaccines Against COVID-19 in adults 18 Years of Age and Older (VAT00008)
- A Study of Etavopivat in Adults and Adolescents with Sickle Cell Disease (HIBISCUS)
- A Phase 1 Randomized, Blinded, Placebo Controlled, Dose-Escalation and Dosing Regimen Selection Study to Evaluate the Safety and Immunogenicity of rVSV-Vectored Lassa Virus Vaccine in Healthy Adults at Multiple Sites in West Africa
- The Impact of a combination of the RTS, S/AS01E Malaria Vaccine and Perennial Malaria Chemoprevention in Ghanaian Children
- A Phase 3, multicenter, randomized, double-blind, 24-week study of the clinical and antiviral effect of S-217622 compared with placebo in non- hospitalized participants with COVID-19

Surveillance Capacity:

- Meningitis surveillance
- Enteric fever surveillance
- Pregnancy surveillance
- Covid19

PARTNERS

University of Ghana, Kwame Nkrumah University of Science and Technology, Ghana, University of Health and Allied Sciences, London School of Hygiene and Tropical Medicine, UK, Columbia University, USA, INDEPTH Network, Ghana, George Washington University, USA, Georgetown University, USA, Aga Khan University, Pakistan, CMC Vellore, India, Kenya Medical Research Institute, Liverpool School of Tropical Medicine, Kamuzu University of Health Sciences, Malawi, UNC Global Womens Health, Zambia.

PUBLICATIONS:

- Malaria Transmission Intensity Likely Modifies RTS, S/AS01 Efficacy Due to a Rebound Effect in Ghana,Malawi, and Gabon
- Assessing the safety, impact and effectiveness of RTS,S/AS01E malaria vaccine following its introduction in three sub-Saharan African countries: methodological approaches and study set-up
- Antibiotic-Resistant Bacteria in Drinking Water from the Greater Accra Region, Ghana: A Cross-Sectional Study, December 2021–March 2022
- Strong off-target antibody reactivity to malarial antigens induced by RTS,S/AS01E vaccination is associated with protection
- Efficacy of Cipargamin (KAE609) in a Randomized, Phase II Dose-Escalation Study in Adults in Sub-Saharan Africa with Uncomplicated Plasmodium falciparum Malaria

KNUST-IVI COLLABORATING CENTRE AND DEMOGRAPHIC SURVEILLANCE SITE (RESEARCH CENTRE FOR GLOBAL HEALTH)

DSS POPULATION AND DEMOGRAPHICS: The KNUST-IVI Collaborative Centre (KICC) has a total population of about 100,000. About 60% of the population are in Agogo, the capital of the district. 70% are self-employed with 60% engaged in agriculture. One-third of the community above 11 years are illiterate with most schools centred at Agogo. About 75% are Christians divided into different sects with their set of rules with just below 20% being Muslim and about five per cent belonging to the traditional sect.

LOCATION AND PROFILE

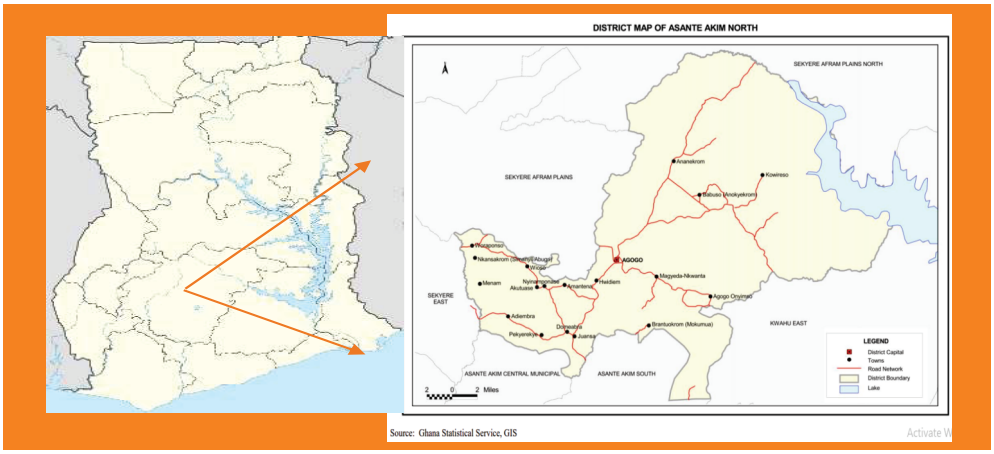
The International Vaccine Institute (IVI) and the Kwame Nkrumah University of Science and Technology (KNUST) opened KICC in 2021 where it began operations at KNUST/Agogo Presbyterian Hospital. The KICC is nested in the Asante Akim North District in the eastern section of the Ashanti Region of Ghana, a region renowned for its rich cultural heritage and vibrant community life.

The district's eastern boundaries serve as a barrier between the Ashanti Region and the Eastern Region of Ghana. It has borders with the following: The Sekyere Kumawu and Sekyere Afram Plains Districts are located to the north, while the Kwahu East District is situated to the east. The southern consists of two districts: Asante-Akim South and Asante-Akim Central. The district is positioned between the latitudes of 6°60'N and 7°30'N, as well as the longitudes of 0°15'W and 01°20'W. The land area it encompasses is 1,125 square km.

The KNUST-IVI Collaborating Centre (KICC) established to enable joint research, development, and capacity-building activities to achieve regional health objectives as well as the UN's global goals, the Centre addresses critical health challenges, advance scientific knowledge and stands as a beacon of research excellence in the region. With a commitment to improving health outcomes and fostering community well-being, KICC plays a vital role in driving impactful research initiatives and promoting evidence-based interventions with a shared vision of eliminating typhoid and other vaccine-preventable diseases in Ghana and beyond. Spanning across this district, the centre serves as a pivotal hub for collaborative research endeavors at the intersection of academia and public health.

SITE LEADER AND DIRECTOR: Prof. Ellis Owusu-Dabo BSc, MB ChB, MSc, PhD, FWACP, FGCP. Prof. Ellis Owusu-Dabo; a distinguished academic serves as the esteemed Director of the KICC. With a wealth of expertise spanning multiple disciplines, Prof. Owusu-Dabo leads groundbreaking research initiatives aimed at advancing public health, fostering collaborations, and driving innovation in disease control and prevention strategies. His visionary leadership and dedication to academic excellence have positioned the KICC as a global leader in research and education in the field of infectious diseases and epidemiology.

Asante Akim North District Area



Clinical Trial Capacity:

- Paediatric Phase I/II age de-escalation dose finding study of a vaccine against invasive non-typhoidal salmonellosis in sub-Saharan Africa PEDVAC iNTS
- A cluster-randomized controlled Phase IV trial assessing the impact of a Vi-Polysaccharide conjugate vaccine in preventing typhoid infection in Asante Akim, Ghana (TyVEGHA)

Surveillance Capacity:

- Surveillance to determine the burden of iNTS and Salmonella Typhi within the catchment area of the research site
- Multi-pathogen study with Ghana Health Service at Polio sentinel sites
- Typhoid sentinel surveillance site at Presbyterian Hospital, Agogo and Konongo
- Environmental Surveillance
- Typhoid Fever Sero-Surveillance in the Asante Akim District, Ghana

PARTNERS

International Vaccine Institute, South Korea, GoG, Malawi Liverpool Wellcome Trust Clinical Research Programme (MLW), Bill & Melinda Gates Foundation, European & Developing Countries Clinical Trials Partnership (EDCTP).

PUBLICATIONS

- Incidence of typhoid fever in Burkina Faso, Democratic Republic of the Congo, Ethiopia, Ghana, Madagascar, and Nigeria (the Severe Typhoid in Africa programme): a population-based study. 2024
- PA-261 Enhancing referral and participation in surveillance through facilitated participatory training in Asante Akim Agogo, Ghana: The TyVEGHA experience. 2023
- PA-401 Demographic surveillance in low-resource settings during COVID-19: lessons learnt from the typhoid cluster randomised trial in Ghana. 2023
- PA-500 Prevalence and genomic characterization of typhoidal and non-typhoidal Salmonellae in Ghana. 2023
- PA-259 Overcoming challenges in vaccination campaign during COVID-19: lessons learned from the TyVEGHA study. 2023

Agogo (Selected Cluster)- Identifying households using GIS maps

Facilities

CAPACITY

Facilities: KICC has good clinical trial and laboratory facilities, quality management systems and data management facilities to support clinical trials.

Human Resource: KICC has a plethora of experienced research scientists and administrative staff. These include Clinical researchers, health economists, data management specialists, consultant paediatrician, social scientists, laboratory managers and technicians, laboratory scientist, biochemists, pharmacists, medical officers, . Most of the senior research scientist are GCP trained. The caliber and scope of staff of the Centre have contributed to its success in the planning and implementation of research studies / projects.

Projects: KICC boasts of a robust capacity for conducting a diverse range of projects and studies aimed at addressing pressing health challenges including:

- Infectious disease surveillance studies
- Clinical trials (Phases II &IV)
- Health Economics studies
- Multi-Centre Clinical trial

With expertise spanning various disciplines, including epidemiology, infectious diseases, and public health, the center is well-equipped to undertake cutting-edge research initiatives. Also, the collaborative nature of the center facilitates partnerships with local communities, government agencies, and international organizations, enhancing its capacity to drive impactful research and contribute to advancing public health knowledge and practice.

Participants of an event convened in January to respond to the need for a new INDEPTH agenda, in Accra, Ghana, 9-10 January 2024. Seated (from left to right: Dr Mohamadou Thera, Prof David Ross, Prof Johnny Gyapong, Prof Fred Binka, Prof Halidou Tinto, Prof Lydia Aziator, Dr Md Khalequzzaman, Prof Phillip Adongo, Prof Jim Phillips,, Prof Don de Savigny, Prof Frank Baiden) and standing (from left to right: Dorcas Ayisana, Prof Peter Smith, Dr Bernhards Ogutu, Dr Francisco Saute, Dr Mohamadou Siribie, Prof Tsiri Agbenyega, Prof George Armah, Dr Michael Owusu Ansah Dr Patrick Ansah, Mrs Margaret Williams, Ms Felicia Manu, Mr Julius Williams, Mr Peter Sifuna, Dr Charity Binka, Prof Oumar Gaye, Dr Rita Baiden, Prof Daniel Ansong, Dr Abraham Oduro, Dr Robert Msiwa, Dr Honorati Masanja, Dr Hassan Mshinda, Prof Ayaga Bawah, Dr Dan Kajungu, Prof James Akazili).

MALARIA RESEARCH CENTER (MRC), AGOGO

LOCATION AND PROFILE

MRC, Agogo, is located in Agogo within the Asante Akim North District of Ghana, MRC extends its reach to cover the Asante Akim Central Municipal Area. Encompassing two municipalities, Asante Akim North and Asante Akim Central. The center operates in a forested region predominantly engaged in farming, with a catchment area spanning 1,386.5 sq km (Asante Akim North 1,089 sq km and Asante Akim Central 297.5 sq km). There is approximately 1400 mm of rain per year, with the main rainfall occurring between April to July and again between September and October. Established through a collaboration between the Agogo Presbyterian Hospital and the School of Medicine and Dentistry (SMD) at the Kwame Nkrumah University of Science and Technology (KNUST), the MRC has been conducting clinical research since 2006. Tasked with conducting clinical and public health research relevant to the local community and the Ghanaian government, the center plays a pivotal role in addressing malaria and other pressing health issues in the region. The current population under surveillance is 184,993.

SITE LEADER: Prof. Tsiri Agbenyega (BSc, MB ChB, PhD)
With 40 years of professional experience, Prof. Tsiri Agbenyega is a distinguished Physiologist specializing in Pediatric Studies, boasting 25 years of expertise in conducting clinical trials, including 14 years of surveillance studies. His extensive experience, particularly in GCP clinical trials spanning two and a half decades, underscores his commitment to advancing pediatric healthcare and fostering community well-being

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Map of Malaria Research Center Catchment Area

Clinical Trial and Laboratory facilities

CAPACITY

Facilities: MRC, Agogo boasts comprehensive facilities including clinical research laboratories and robust data management systems. With community advisory boards and strong research oversight, the center ensures ethical and efficient conduct of research activities while providing regulatory support to maintain compliance with relevant guidelines.

Human Resource: MRC, Agogo, boasts a skilled and diverse human resource capacity comprising specialist pediatricians, obstetricians, gynecologists, medical officers, physician assistants, project managers, clinical research coordinators, laboratory managers, field coordinators, pharmacists, and data managers, all of whom are trained in Good Clinical Practice (GCP). Additionally, the center benefits from a network of consultants and specialists from Komfo Anokye Teaching Hospital (KATH) who contribute their expertise during clinic visits, enhancing the center's ability to conduct comprehensive and high-quality research.

Projects: The Malaria Research Center, Agogo, exhibits a robust capacity for conducting a wide array of projects and studies including:

- Infectious Disease Surveillance
- Clinical Trials (Phase II to IV)
- Multicenter Clinical Trials

Conducts research aimed at addressing malaria and related public health challenges. With expertise spanning clinical research, epidemiology, and public health, the center is well-equipped to undertake various types of studies, including intervention trials, observational studies, and community-based surveys. Additionally, the center's strong collaboration with local healthcare facilities and academic institutions enhances its capacity to implement comprehensive research initiatives and generate evidence-based interventions for combating malaria and improving community health outcomes.

Clinical Trial Capacity:

- (CVIA 087) - A Phase 3 Randomized, Active-Comparator Controlled, Open-Label Trial to Evaluatethe Immunogenicity and Safety of Alternate Two-dose Regimens of a Bivalent Human Papillomavirus (HPV) Vaccine (Cecolin) Compared to a Licensed Quadrivalent HPV Vaccine (Gardasil) in Healthy 9-14 year – Old Girls in Low and Low-middle Income Countries
- Phase III Randomized, Open, Controlled Study to Evaluate the Immune Response to the Hepatitis B Antigen of the RTS, S/AS01E Candidate Vaccine, when Administered as Primary Vaccination Integrated into an EPI regimen to Infants Living in Sub-Saharan Africa (Malaria 063)
- A Phase 3, Double-Blind, Randomized, Efficacy and Safety Comparison of Prasugrel and Placebo in Pediatric Patients with Sickle Cell Disease April (Tado)
- Phase III, Double Blind (Observer-Blind), Randomized, Controlled Multi-Center Study to Evaluate, in Infants and Children, the Efficacy of the RTS,S/As01E Candidate Vaccine against Malaria Disease Caused By P. Falciparum Infection, Across Diverse Malaria Transmission Settings In Africa.

- Phase IIIb randomized, open, controlled, multi-center study to evaluate the immunogenicity and safety of the RTS,S/AS01E candidate malaria vaccine, when administered as primary vaccination at 6, 7.5 and 9 months of age with or without co-administration of measles, rubella and yellow fever vaccines followed by an RTS,S/AS01E booster vaccination 18 months post Dose 3, to children living in sub-Saharan Africa
- "An Evaluation of the Cluster – randomized pilot implementation of RTS,S/AS01 through health systems in Ghana" (MVPE)

Surveillance Capacity:

- (VAD00019) - A Multi-center, Multi-national, Prospective Surveillance Study of Respiratory Disease in Infants and Toddlers 6 to < 22 Months of Age
- An epidemiology study to assess Plasmodium falciparum parasite prevalence and serological conversion rates in catchment areas of a Phase III trial of the candidate malaria vaccine RTS,S/AS01E in sub-Saharan Africa

PARTNERS

Bill & Melinda Gates Foundation, Sanofi Aventis Research & Development, INDEPTH Network, PATH, World Health Organization (WHO), IQVIA, GlaxoSmithKline (GSK) Pharmaceuticals, PPD, part of Thermo Fisher Scientific, Eli Lilly and Company, The Presbyterian Church.

PUBLICATIONS

- Efficacy of RTS,S/AS01E malaria vaccine administered according to different full, fractional, and delayed third or early fourth dose regimens in children aged 5–17 months in Ghana and Kenya: an open-label, phase 2b, randomised controlled trial
- Feasibility, Safety, and Impact of the RTS,S/AS01 E Malaria Vaccine When Implemented Through National Immunisation Programmes: Evaluation of Cluster-Randomized Introduction of the Vaccine in Ghana, Kenya, and Malawi
- Immunogenicity and safety of the RTS,S/AS01 malaria vaccine co-administered with measles, rubella and yellow fever vaccines in Ghanaian children: A phase IIIb, multi-center, non-inferiority, randomized, open, controlled trial
- Long-term immunogenicity and immune memory response to the hepatitis B antigen in the RTS, S/AS01 E malaria vaccine in African children: a randomized trial

NAVRONGO HEALTH AND DEMOGRAPHIC SURVEILLANCE SITE (NHDSS)
NAVRONGO HEALTH RESEARCH CENTRE, GHANA

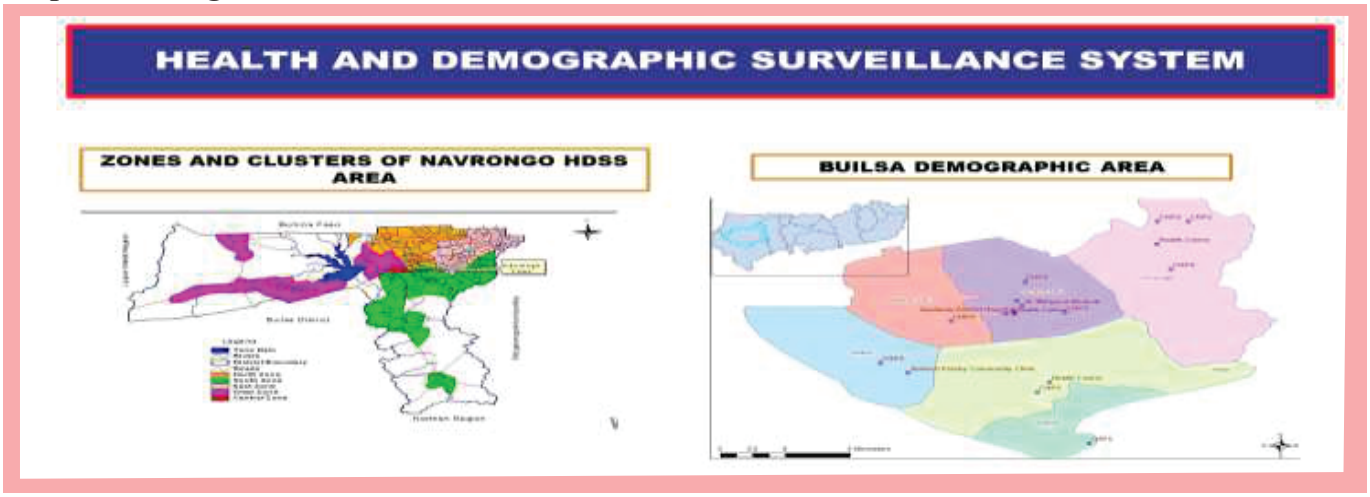
LOCATION AND PROFILE

The Navrongo HDSS site is located in the Kassena-Nankana District of the Upper East region of Ghana. The district covers an area of 1675 km^2 along the Ghana-Burkina Faso border. It measures roughly 55 km x 50 km and has an altitude of 200-400 m above sea level. The land is fairly flat, and passing through it from Burkina Faso is the White Volta River, which feeds Lake Volta (the world's largest artificial lake) in southern Ghana. Located in the Guinea savannah belt, the district is typically Sahelian (hot and dry).

Set up in 1993, the NHDSS was established to support research on the determinants of morbidity, mortality and fertility in Ghana's northern regions. One of the most important recent changes that the NHDSS has introduced in its data collection system, is to reconfigure the system from the compound as the unit of analysis to the household level as happens in many other HDSS sites and also to conform to demographic and health surveys worldwide. These changes became operational in early 2006. The current population under surveillance is 266,000.

SITE LEADER AND DIRECTOR: Dr. Patrick Odum Ansah (BSc, MBChB, MPH, MSc, MGCP). Dr.Patrick Odum Ansah is a seasoned public health specialist with 22 years of professional experience, specializing in surveillance studies for 21 years. He is a seasoned clinician and public health specialist with over two decades of professional experience. He is a specialist with 22 years of surveullance studies and 18 years of expertise in clinical trials. Dr. Ansah has also dedicated 21 years to fostering meaningful community collaborations, exemplifying his commitment to holistic public health interventions.

Map of Navrongo HDSS Area



Clinical trial and laboratory facilities

CAPACITY

Facilities: Navrongo HDSS has good clinical trial and laboratory facilities, quality management systems and data management facilities to support clinical trials.

Human Resource: Navrongo HDSS has a plethora of experienced research scientists and administrative staff. These include Clinical researchers, Health economists, Data management specialist, social scientists, Laboratory managers and technicians, and IT professionals. Most of the senior research scientist are GCP trained. The caliber and scope of staff of the HDSS have contributed to its success in the planning and implementation of research studies / projects.

Projects: Navrongo HDSS has carried out a wide variety of projects / studies. These include:

- Clinical trials from phase l to IV studies
- Epidemiological and surveillance disease studies in communicable and non-communicable
- Population and health economy studies among others

The core areas of expertise are Clinical trials, Biomedical Science, Social science and health economy studies. The Centre has been involved in several multi-center clinical trials. With the DSS as the backbone, clinical trials and epidemiological studies have been implemented without major challenges.

Clinical Trial Capacity:

- Platinum malaria drug trial
- Sanofi Covid 19 vaccine study
- EPIMAL 003 Malaria Study
- EPIMAL 005 Malaria Study
- Sickle cell Disease Study

Surveillance Capacity:

- Severe Infectious Disease: Surveillance, Detection, Risks, and Consequences in West Africa (vector-borne infections; zoonotic infections; viral hemorrhagic fevers; respiratory infections)
- Integrated community health engagement to investigate transmission sources in order to estimate the health risk of transmissible diseases
- Systematic and electronic entomologic sampling and molecular diagnostics toward real-time risk mapping of vector-borne diseases
- Enhanced Diagnostic Surveillance of Acute Febrile Illness in Ghana
- Seroprevalence Detection of SARS-CoV-2 Antibodies in Ghana
- Carriage Surveys Towards the Control of Vaccine-Preventable Meningitis in the African Meningitis Belt (PneuMenSurv) (Short Title: Pneumococcal and Meningococcal Carriage Surveys in Northern Ghana)
- Epidemiological Surveillance of Streptococcus pneumoniae Among Children Post Implementation of the 13 Valent Conjugate Vaccine in The Kassena Nankana Districts of Northern Ghana
- Navrongo Integrated Surveillance Project (NISP) Social Component - “Severe Infectious Disease: Surveillance, Detection, Risks and Consequences in West Africa” for Zoonotic and Vector Borne Public Health Survey
- National Entomological Surveillance Project

PARTNERS

Bill & Melinda Gates Foundation, European & Developing Countries Clinical Trials Partnership (EDCTP), London School of Hygiene and Tropical Medicine, University of Oxford, UK., International Medical Foundation, Sanofi Aventis Researche & Development, Malaria in Pregnancy Consortium, INDEPTH Network, Doris Duke Charitable Foundation, PATH, Merk & Co. Inc., West Africa Health Organization, Norvatis, NIH, Icahn School of Medicine at Mount Sinai/Arnhold Institute of Global Health, Kenyan Medical Research Institute, IQVIA, GlaxoSmithKline (GSK) Pharmaceuticals.

PUBLICATIONS:

- Effect of national immunisation campaigns with oral polio vaccine on all-cause mortality in children in rural northern Ghana: 20 years of demographic surveillance cohort data
- Drug resistance and vaccine target surveillance of Plasmodium falciparum using nanopore sequencing in Ghana
- Cardiovascular disease prevention: Community Based Asset Mapping within religious networks in a rural Sub-Saharan African neighbourhood
- Pf7: an open dataset of Plasmodium falciparum genome variation in 20,000 worldwide samples
- Genome-wide association study meta-analysis of blood pressure traits and hypertension in sub-Saharan African populations: an AWI-Gen study

KOMBEWA HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM (KHDSS) KOMBEWA CLINICAL RESEARCH CENTER:

LOCATION AND PROFILE

The Kombewa Health and Demographic Surveillance System (HDSS) originated from the Kombewa Clinical Research Centre in 2007 and has evolved into a prominent platform for conducting regulated clinical trials, nested studies, and local disease surveillance. Situated in a rural area of Kisumu County, Western Kenya, the HDSS spans approximately 369 km2 along the northeastern shores of Lake Victoria. Preparatory work, including Global Positioning System (GPS) mapping, was undertaken between setup and the baseline census conducted in 2011. With a total population comprising 184,222 individuals from 45,000 households under surveillance, the HDSS conducts routine biannual household surveys to monitor significant population changes. These surveys capture detailed information on residency, household relationships, births, deaths, migrations, and causes of morbidity and mortality through syndromic incidence, prevalence, and verbal autopsy.

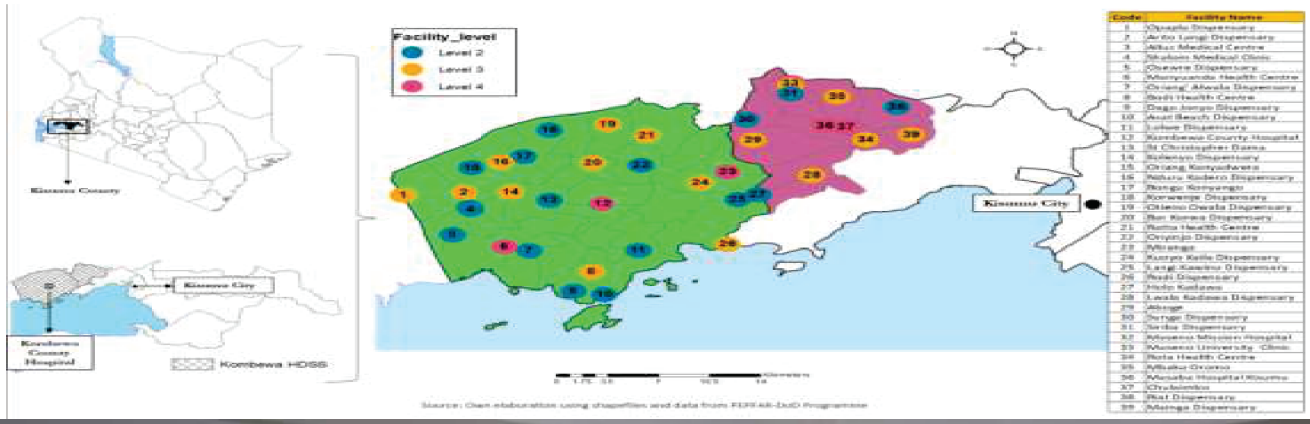
SITE LEADER AND DIRECTOR: Mr. Peter Sifuna, BSc., MPH

Mr. Peter Sifuna, is a senior research scientist with expertise in population health. He currently serves as the Principal Investigator and Program Lead for the health and demographic surveillance systems (HDSS) program. With more than 15 years of research experience, Mr. Sifuna has successfully managed the extensive longitudinal population-based surveillance study, contributed to various ICH-GCP compliant trials, and led a number of cross-sectional surveys.

Alternate Lead- Dr. Walter Otieno, (MBChB, M. Med (Paeds), PhD)

Dr. Walter Otieno, is a distinguished expert in Pediatrics, Molecular Medicine, and Clinical Trials, boasting over three decades of professional experience. With 20 years dedicated to surveillance studies, clinical trials research, and GCP Clinical Trials, along with extensive community engagement expertise spanning two decades, Dr. Otieno is committed to advancing pediatric healthcare through rigorous research and community-centered interventions.

HDSS LOCATION



CAPACITY

Facilities:

The Kombewa Clinical Research Center is equipped with state-of-the-art facilities to support its research activities. These facilities include modern laboratory infrastructure equipped with advanced equipment for molecular diagnostics, biochemistry, immunology, and microbiology. Additionally, the center houses clinical trial units equipped to conduct Phase I to Phase IV clinical trials, adhering to Good Clinical Practice (GCP) standards. Moreover, the center offers facilities for data management and analysis, ensuring the efficient collection, storage, and interpretation of research data.

Human Resources: Kombewa HDSS possesses a skilled and diverse workforce comprising research scientists, epidemiologists, data analysts, laboratory technicians, IT specialists, and field staff. With extensive experience in epidemiological research and data management, this dedicated team ensures the efficient operation of the HDSS, facilitating the collection, analysis, and interpretation of vital health data for research purposes. Many senior research scientists hold certifications in Good Clinical Practice (GCP), highlighting the unit's commitment to excellence. The collective expertise and breadth of skills within the HDSS staff have been instrumental in the effective planning and execution of research projects, contributing significantly to its success.

Projects: The Kombewa HDSS has undertaken an extensive range of projects and studies including:

- Infectious disease surveillance studies
- Clinical trials spanning phases II to IV studies
- Non-communicable Disease
- Population and Health Studies
- Health Economics studies
- Multi-center clinical trials

The Kombewa HDSS platform serves as a cornerstone for supporting various health research activities, including clinical trials and epidemiological studies focused on evaluating diseases of public health importance such as malaria, HIV, and emerging global infectious diseases like dengue fever.

Clinical Trial Capacity:

- Phase 3, randomized, double-blind, placebo-controlled study to evaluate the effect of Bi-26 (strain of Bifidobacterium longum, B. infantis) supplementation versus placebo on weight gain in underweight infants
- A Single Arm, Open Label, Phase 1/2 Study to Evaluate the Pharmacokinetics and Safety of Etavopivat in Pediatric Patients with Sickle Cell Disease
- Multi-Center, Randomized, Efficacy Study of COVID-19 mRNA Vaccine in Regions with SARS-CoV-2 Variants of Concern
- A prospective study to evaluate the safety, effectiveness and impact of the RTS,S/AS01E vaccine in young children in sub-Saharan Africa
- A phase IV, Longitudinal, cross-sectional, retrospective, ancillary epidemiology study of the EPI-MAL-005 study to evaluate the genetic diversity in the plasmodium falciparum parasite circumsporozoite sequences before and after the implementation of the RTS,S/AS01E vaccine in malaria-positive subjects ranging from 6 months to less than 5 years of age for review

Surveillance Capacity:

- Investigation of zoonotic and environmental reservoirs and transmission patterns of ESKAPE pathogens in Kenya
- Investigate Household Transmission of COVID-19 virus in Three Counties: Kisumu at KEMRI/Walter Reed Project (Kombewa HDSS), Nairobi at KEMRI/CDC (Kibera HDSS) and Kilifi
- Multi-Center, Randomized, Efficacy Study of COVID-19 mRNA Vaccine in Regions with SARS-CoV-2 Variants of Concern
- A parallel-group, Phase III, multi-stage, modified double-blind, multi-armed study to assess the efficacy, safety, and immunogenicity of two SARS-CoV-2 Adjuvanted Recombinant Protein Vaccines (monovalent and bivalent) for prevention against COVID-19 in adults 18 years of age and older
- Surveillance of Enteric Pathogens Causing Diarrheal Illness in Kenya)
- Multi-Center, Randomized, Efficacy Study of COVID-19 mRNA Vaccine in Regions with SARS-CoV-2 Variants of Concern
- HIV Incidence, Retention Rate, Willingness to Participate in Future HIV Vaccine Trials and Population Characteristics among Adults in Kisumu, Kenya: A Cohort and Site Development Study
- African Cohort Study
- The CINAMR (Clinical Information Network-Antimicrobial Resistance) Project: A pilot microbial surveillance using hospitals linked to regional laboratories in Kenya.
- Antimicrobial resistance surveillance in military and civilian populations in Kenya with emphasis on methicillin- and vancomycin- resistant S. aureus
- Acute Febrile Illness Surveillance in Kenya

PARTNERS

Walter Reed Army Institute of Research

PUBLICATIONS

- Deployment of Rotavirus Vaccine in Western Kenya Coincides with a Reduction in All-Cause Child Mortality: A Retrospective Cohort Study
- Safety profile of the RTS,S/AS01 malaria vaccine in infants and children: additional data from a phase III randomized controlled trial in sub-Saharan Africa
- Long-term incidence of severe malaria following RTS,S/AS01 vaccination in children and infants in Africa: an open-label 3-year extension study of a phase 3 randomised controlled trial
- Blood stage malaria vaccine eliciting high antigen-specific antibody concentrations confers no protection to young children in Western Kenya
- Pharmacokinetic evaluation of intravenous artesunate in adults with uncomplicated falciparum malaria in Kenya: a phase II study

NYANDO HEALTH AND DEMOGRAPHIC SURVEILLANCE SITE (NHDSS) AHERO CLINICAL TRIALS UNIT, KISUMU-KENYA

LOCATION AND PROFILE

The Nyando HDSS site is located in Nyando Sub- County, Kisumu County. The sub-county covers an area of 446.1 km² Area East of Kisumu City along the shores of Lake Victoria the African second largest fresh water lake in the world. It is situated along the Winam Gulf between longitudes 34.78º East and 35.75º East, and latitude 0.12º North and 0.33º South. The altitude ranges from 840m to 3200m

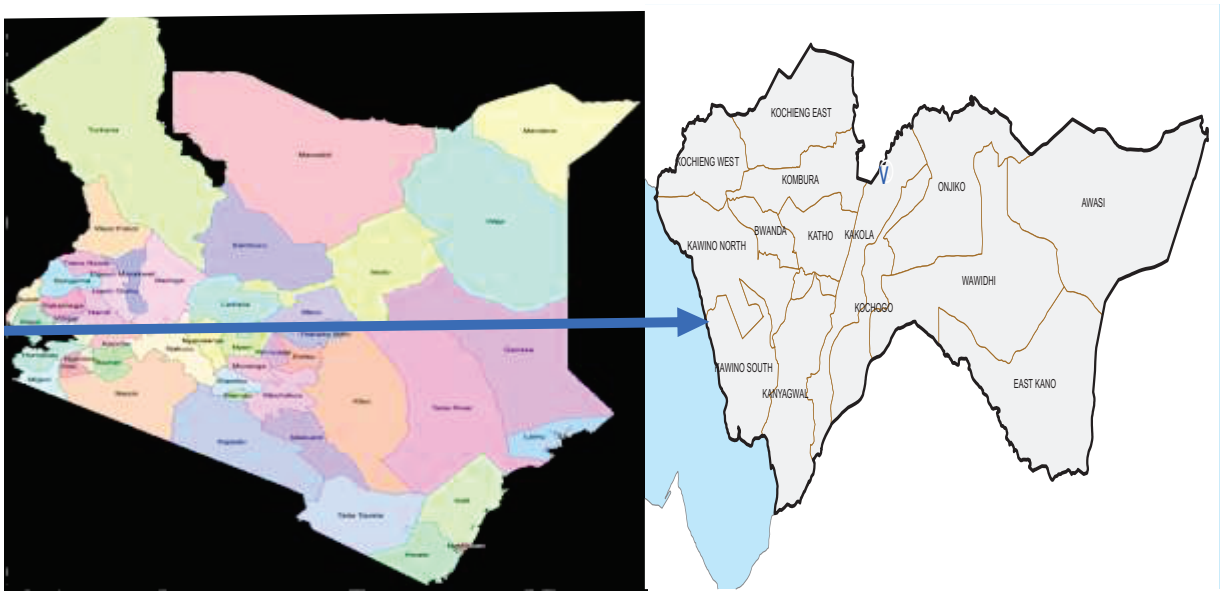
Set up in 2019, the NHDSS was established to support research on malaria prevalence and transmission pattern in the Eastern part of Kisumu County in Kenya. One of the most important recent changes that the NHDSS has introduced is the collection of malaria vaccine vaccination details for children below the age of 5 years, the change was initiated by the need to track all the EPI MAL 003 study participants who had received the vaccine. These changes became operational in early 2022. The current population under surveillance is 182,000.

Established under the Clinical Trial Division of the Kenya Medical Research Institute (KEMRI) to facilitate clinical trials and longitudinal research endeavors, the Ahero Clinical Trial Unit serves as a pivotal hub for conducting various phases of clinical trials, ranging from early-phase studies to late-stage trials. As such the Ahero Clinical Trial Unit's Surveillance system serves a crucial role in gathering comprehensive and demographic data. Equipped with state-of-the-art facilities and staffed by experienced medical professionals and researchers, the unit is dedicated to advancing medical knowledge and improving healthcare outcomes. Collaborating with local communities and international partners, the unit plays a vital role in addressing public health challenges and developing innovative healthcare solutions tailored to the needs of the region.

SITE LEADER AND DIRECTOR:

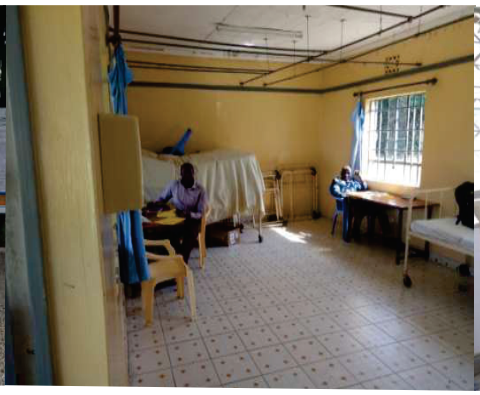
The site director is Dr. Bernhards Ogutu (MBChB, MMed, PhD)
Dr. Ogutu is a distinguished expert in clinical trials with 32 years of professional experience. He is a distinguished pediatrician with a doctorate in clinical pharmacology. He has 30 years of expertise in research, 30 years of hands-on clinical trials research and Good Clinical Practice (GCP) experience and a remarkable 30-years history of community engagement.

MAP OF NYANDO HDSS AREA

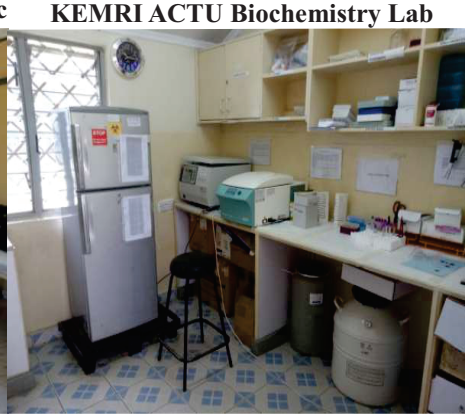


AHERO COUNTY HOSPITAL

KEMRI ACTU Research Ward/clinic



KEMRI ACTU Biochemistry Lab



CAPACITY

Facilities: The Ahero Clinical Trial Unit has good clinical trial and laboratory facilities, quality management systems and data management facilities to support clinical trials.

Human Resources: The Ahero Clinical Trial Unit has a team of experienced research scientists including clinical trial specialists, pediatricians, clinical pharmacologist, epidemiologists, biostatisticians, hematologists, pharmacists, immunologist, laboratory managers and technologists, study nurses, data clerks, and field workers. All the site staff have vast experience in clinical trial and they are also trained in Good Clinical Practice [GCP] by external training body known as Collaborative institutional training initiative, (CITI program) and have experience with Electronic Data Capture /e-Case Report Forms.

Projects: The Ahero Research Unit has undertaken an extensive range of projects and studies including:

- Infectious disease surveillance studies
- Clinical trials spanning phases I to IV studies
- Non communicable Disease
- Population and Health Studies

Clinical Trial Capacity:

- A prospective study to evaluate the safety, effectiveness and impact of the RTS, S/AS01vaccine in young children in sub-Saharan Africa
- (PLATINUM): A multi-part, multi-center PLATform study to assess the efficacy, safety, tolerability and pharmacokinetics of anti-malarial agents administered as monotherapy and/or combination therapy IN patients with Uncomplicated Malaria
- A Phase 2a, Multicenter, Open-label, Dose-finding, Dose escalation Study of Meplazumab in Adult Patients diagnosed with Uncomplicated Plasmodium Falciparum Malaria
- A Single Arm, Open Label, Phase 1/2 Study to Evaluate the Pharmacokinetics and Safety of Etavopivat in Pediatric Patients with Sickle Cell Disease
- FALCI STUDY: A Randomized, Double-blind, Phase IIb Study to Investigate the Efficacy, Safety, Tolerability and Pharmacokinetics of a Single Dose Regimen of Ferroquine (FQ) with Artefenomel (OZ439) in Adults and Children with Uncomplicated Plasmodium falciparum Malaria
- Safety and Immunogenicity Study of Full Schedule (3-Dose SHAN6™) or SHAN6™-SHAN 5® - SHAN6™ Versus the Licensed Vaccine SHAN 5® With bOPV and IPV When Administered Per National Immunization Schedule in Healthy Kenyan Infant

Surveillance Capacity:

- COVID 19 surveillance

PARTNERS

- Walter Reed Army Institute of Research (WRAIR)

PUBLICATIONS

- Controlled human malaria infection (CHMI) outcomes in Kenyan adults is associated with prior history of malaria exposure and anti-schizont antibody response
- Transcranial Doppler Screening of Children with Sickle Cell Disease for a Large, Multinational Interventional Study: Experience from the Phase 3 HOPE-Kids 2 Trial Investigating the Effect of Voxelotor Treatment on Transcranial Doppler Flow Velocity
- Ganaplacide (KAF156) plus lumefantrine solid dispersion formulation combination for Plasmodium falciparum malaria: an open-label, multicentre, parallel-group, randomised, controlled, phase 2 trial
- Efficacy, safety, and palatability of arpraziquantel (L-praziquantel) orodispersible tablets in children aged 3 months to 6 years infected with Schistosoma in Côte d'Ivoire and Kenya: an open-label, partly randomised, phase 3 trial
- Randomized, open-label, phase 2a study to evaluate the contribution of artefenomel to the clinical and parasiticidal activity of artefenomel plus ferroquine in African patients with uncomplicated Plasmodium falciparum malaria

BANDIAGARA SURVEILLANCE SITE (BSS), MALI
MALARIA RESEARCH AND TRAINING CENTER -PARASITOLOGY (MRTC-P)/BANDIAGARA MALARIA PROGRAM (BMP)

DSS POPULATION AND DEMOGRAPHICS:

The Bandiagara surveillance system covers an estimated total population of 38,000 inhabitants in Bandiagara city. The surveillance system is expandable to cover the 318,655 people living in the district of Bandiagara.

LOCATION AND PROFILE

The surveillance site is in the district of Bandiagara and operates within the Bandiagara Malaria Program (BMP) which was initiated as an NIH-supported collaboration between the Malaria Research and Training Center (MRTC) at University of Bamako and the University of Maryland's Center for Vaccine Development. The Bandiagara district covers an area of 7,365.4 km^2 in the region of Mopti, Mali, West Africa. Bandiagara is 65 km east-southeast of Mopti. A seasonal river, the Yamé, flows in a northeasterly direction through the town it encompasses diverse landscapes, including savannahs and plateaus, with the Dogon people being the predominant ethnic group. The area is Sahelian (hot and dry) with a short rainy season from July through September.

Set up in 1998, the BSS was established to generate data on population dynamics, health indicators, and disease prevalence, in support of conducting clinical trials of malaria vaccines under international standards. Collaborating with local communities and research institutions, the BMP/MRTC-P aims to contribute to the understanding and control of malaria and other prevalent diseases in the region, fostering advancements in health research and training initiatives.

SITE LEADER AND DIRECTOR: Dr. Mahamadou Ali Thera, (MD, MPH, PhD)
Dr. Mahamadou Ali Thera, brings over 36 years of professional expertise, particularly excelling in clinical trials, medical parasitology, and public health. With extensive experience spanning 24 years in both clinical trials research and GCP compliance, coupled with 5 years in surveillance studies and 34 years engaging with communities, Dr. Thera is a seasoned expert committed to advancing public health initiatives.

MAP OF BANDIAGARA HEALTH DISTRICT

CAPACITY

Facility: Bandiagara site has good clinical trial and laboratory facilities, quality management systems and data management facilities to support clinical trials.

Human Resource: The Bandiagara HDSS has a team of experienced research scientists including social scientist, clinical researchers, data manager, field staff among others who are GCP trained and have experience with electronic data capture. High-quality international standard administrative and managerial support is provided by the Mali Service Center based at the University of Science, Techniques and Technologies of Bamako, the actual institutional body of MRTC-P.

Projects: Bandiagara BMP has performed several projects / studies. These include:

- Clinical Trials (Phase I, II and IV)
- Infectious disease surveillance
- Epidemiological studies in communicable diseases
- Multicenter clinical trials

The core areas of expertise are clinical trials, biomedical science, social science and health economy studies. The centre has been involved in several multi-center clinical trials that have been implemented without major challenges.

Surveillance Capacity

- A surveillance survey of emerging and re-emerging viruses causes of fever in Mali.
- Sentinel sites for surveillance of malaria parasites resistance to antimalarial drugs (mainly CTA used by the Mali National Malaria Control Program)
- Malaria incidence surveillance studies after scaling up of malaria control strategies in Mali
- Spatio-temporal analysis of malaria incidence in Bandiagara

Clinical Trial Capacity

- Malaria vaccine candidate AMA1 (FMP1) phase 1 clinical trial in adults
- Malaria vaccine candidate AMA1 (FMP2.1/AS02A) phase 1 clinical trial, adults
- Malaria vaccine candidate AMA1 (FMP2.1/ AS02A) phase 1 and Phase 2b pediatric clinical trials
- Malaria vaccine candidate PfAMA1-FVO phase 1 clinical trial
- DMID-SANARIA PfSPZ-CVac malaria vaccine trial in adults (2017)
- Phase 1b/2b double blind, randomized, controlled study of the safety, immunogenicity, and efficacy of malaria vaccine candidate in young children in Mali.
- MSP3-CRM-Vac4All/ Alhydrogel® Phase 1a, Phase 1b and Phase 2b clinical trials
- Phase 1, Phase 2 and Phase 4 clinical trials of malaria drugs (Trimethoprim/sulfamethoxazole, Artesunate and Artesunate-based Combinations Therapies (ACTs))
- The age-specific impact of seasonal malaria chemoprevention on malaria incidence, antibody responses, and parasite reservoirs in Malian children

PARTNERS

Division of Microbiology and Infectious Diseases (DMID)/NIAID/NIH, University of Maryland School of Medicine Center for Vaccine Development and Global Health, Malaria Research Unit Glaxo-SmithKline Biologicals (GSK-Bio), Walter Reed Army Research Institute (WRAIR), European & Developing Countries Clinical Trials Partnership (EDCTP), Doris Duke Charitable Foundation, Institut de Recherche pour le Développement (IRD=French National Research Institute for Sustainable Development), University of Lyon, France, Wellcome Developing Excellence in Leadership, Training, and Science in Africa (DELTAS)/ Science For Africa Foundation (SFA), World Health Organization (WHO).

PUBLICATIONS

- Spatio-temporal analysis of malaria within a transmission season in Bandiagara, Mali
- Spatio-Temporal Dynamics of Asymptomatic Malaria: Bridging the Gap Between Annual Malaria Resurgences in a Sahelian Environment
- School-aged children based seasonal malaria chemoprevention using artesunate-amodiaquine in Mali
- A novel locus of resistance to severe malaria in a region of ancient balancing selection
- A field trial to assess a blood-stage malaria vaccine

MANHIÇA HEALTH AND DEMOGRAPHIC SURVEILLANCE SITE (MHDSS)
MANHIÇA HEALTH RESEARCH CENTRE / MANHIÇA FOUNDATION

DSS POPULATION AND DEMOGRAPHICS:

The total population of MHDSS is 129,485 inhabitants, predominantly rural and distributed across roughly 29,012 geo-positioned households.

LOCATION AND PROFILE

The Manhiça HDSS site is located in the Manhiça district, 80 km north of Mozambique's capital, Maputo City, at latitude 25°24' south and longitude 32°48' east, the HDSS area encompasses a plain bordered by the Incomati River, covering 2,373 km². The region experiences two distinct seasons, with a warm, rainy season from November to April followed by a cool, dry season.

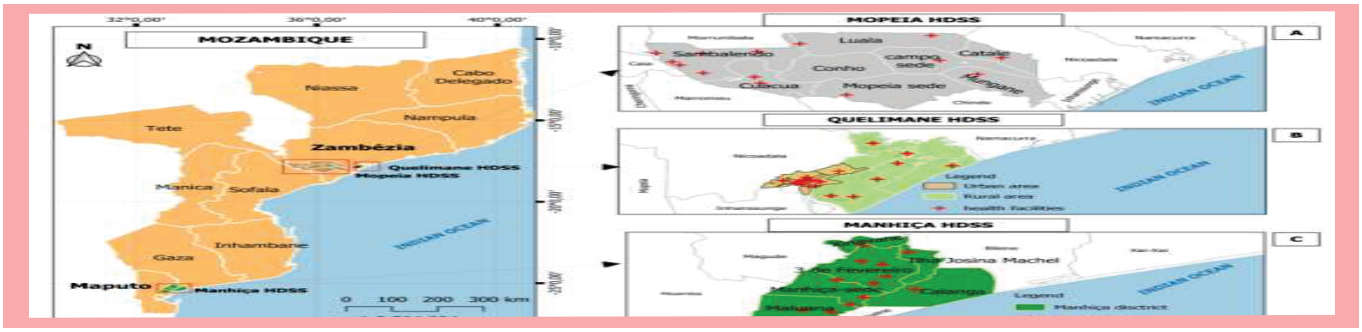
Established in 1996, MHDSS plays a crucial role in promoting biomedical research in communicable diseases highly prevalent in Mozambique. Manhiça's research portfolio puts a particular focus on the main causes of morbidity and mortality in the country. Focusing on Malaria, HIV/AIDS and TB, Reproductive, Maternal and Child Health, and Bacterial, Viral and other Neglected Tropical Diseases. The MHDSS serves as a cornerstone for clinical trials and epidemiological studies in Mozambique. Therefore, to do so, was established a series of well-functioning research platforms (geographical and demographic surveillance and morbidity surveillance), research support services (Laboratory, Information Technology, Data Management Centre and Analysis, Social and Behavioural Research Unit, the Regulatory.

Unit and the Research Training Unit in order to deliver the next generation of Mozambican researchers. One significant and recent milestone was the expansion of the HDSS from Manhiça to Mopeia District in 2020 and Quelimane District in 2022, in Zambezia Province, Centre of Mozambique, although the Mopeia site is not operational at the moment due to financial constraints.

SITE LEADER AND DIRECTOR: Dr. Francisco Saúte (MD, MSc, PhD)

Dr. Francisco Saúte, is a distinguished public health specialist, with expertise in epidemiology and a deep commitment in the improvement of public health outcomes. Dr. Saúte leads strategic initiatives aimed at advancing biomedical research, epidemiological surveillance, and healthcare interventions in Mozambique. His visionary leadership and dedication to community engagement have played a pivotal role in guiding the Manhiça HDSS toward its mission of promoting health equity and addressing priority health challenges in the region.

Clinical trials and laboratory facilities



Map of Manhiça and Quelimane HDSS area

CAPACITY

Facilities: The Manhiça HDSS boasts well-equipped research support services, featuring state-of-the-art facilities for laboratory work, information technology, data management and analysis. In addition, to conduct geographic and demographic surveillance, the HDSS excels in morbidity surveillance, ensuring comprehensive data collection for research purposes.

Human Resources: The Manhiça HDSS possesses a skilled and diverse workforce comprising research scientists, epidemiologists, data analysts, laboratory technicians, IT specialists, and field staff. With extensive experience in clinical trials, epidemiological research and data management, this dedicated team ensures the efficient operation of the research studies, facilitating the collection and processing of biological samples, analysis and interpretation of vital health data and mathematic modeling.

Projects: The Manhiça HDSS has carried out a wide variety of descriptive studies, intervention studies including clinical trials, monitoring and assessment studies and modeling. It covers key research areas including:

- Infectious disease surveillance studies
- Phases II to IV Clinical trials for drugs, vaccines and diagnostic devices
- Non-clinical studies
- Population, Health Economic and Environmental Studies
- Entomological and Genomic studies, among others.

The core areas of expertise are clinical trials, cause of death determination, malaria elimination research initiatives, research implementation, demography, social science and health economy studies. The centre has been involved in several multi-centre clinical trials. To implement the research activities, based on international standards, CISM created the regulatory unit with the main mandate of supporting and overseeing the research teams in research compliance throughout the research implementation processes.

Clinical Trial Capacity:

- Efficacy and Safety of a newly registered Artemisinin-Based Combination (Pyronaridine-Artesunate-
- PYRAMAX) for the treatment of uncomplicated malaria in African pregnant women - PYRAPREG
- Quantifiable stool-based TB PCR to Improve Diagnostics and Treatment Monitoring – STOOL4TB
- Empirical Treatment against cytomegalovirus and tuberculosis in severe pneumonia in HIV-infected infants: a randomized controlled clinical - EMPIRICAL
- Age descending, randomized placebo-controlled phase 2 trial in three sites in sub-Saharan Africa to assess the safety and immunogenicity of a parenteral trivalent - TSCV
- Severe malaria a research and trials consortium: a protocol for a prospective observational study - SMAART
- Invasive bacterial surveillance taking place at the District Hospital of Manhiça and the Provincial Hospital of Quelimane
- Diarrhea and viral infection surveillance in the Provincial Hospital of Quelimane
- Tuberculosis surveillance in the Manhiça district
- Mortality surveillance in children under 5 years old in Quelimane district
- Pregnancy surveillance occurring in Quelimane district
- Entomological Surveillance in Southern Mozambique

PUBLICATIONS

- A Global Tuberculosis Dictionary: unified terms and definitions for thefield of tuberculosis. doi:10.1016/S2214-109X(24)00083-4
- A. Sustained clinical benefit of malaria chemoprevention with sulfadoxine-pyrimethamine (SP) in pregnant women in a region with high SP resistance markers. doi: 10.1016/j.jinf.2024.106144
- Adjunctive rosiglitazone treatment for severe pediatric malaria: A randomized placebo-controlled trial in Mozambican children. Int J Infect Dis. doi:10.1016/j.ijid.2023.11.031
- Safety and efficacy of dihydroartemisinin-piperaquine for intermittent preventive treatment of malaria in pregnant women with HIV from Gabon and Mozambique: a randomized, double-blind,
- Evaluation of Laboratories Supporting Invasive Bacterial Vaccine- Preventable Disease (IB-VPD) Surveillance in the World Health Organization African Region, through the Performance of Coordinated External Quality Assessment. doi:10.3390/tropicalmed8080413 placebo- controlled trial. doi: 10.1016/S1473-3099(23)00738-7

CROSS RIVER HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM (CRHDSS) UNIVERSITY OF CALABAR, CALABAR

PROFILE AND LOCATION

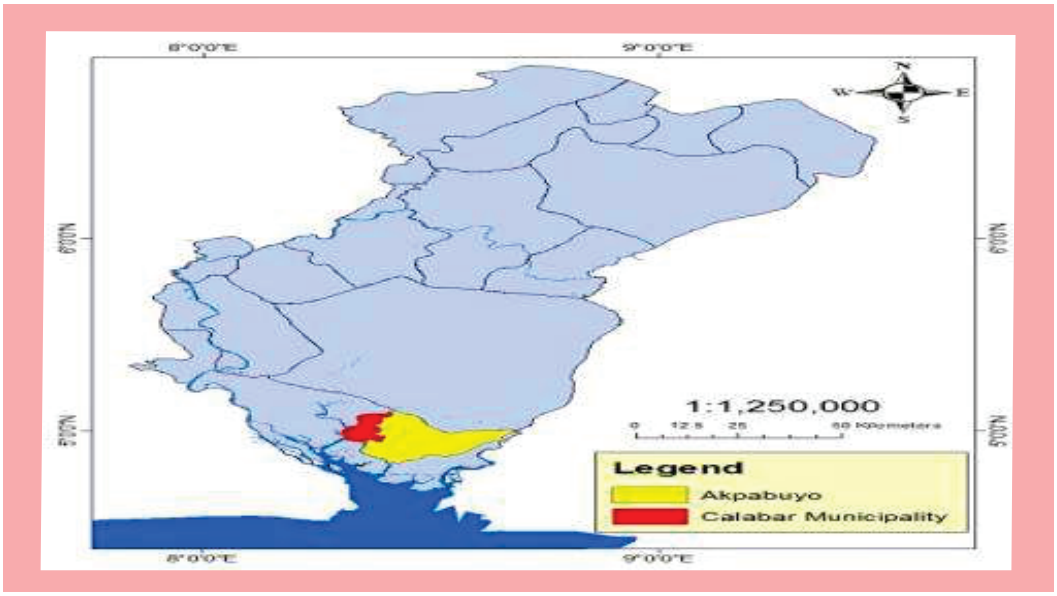
The Health and Demographic Surveillance System (HDSS) at the University of Calabar serves as a vital research platform enhancing the Nigerian National Health Management Information System (NHMIS), offering a streamlined approach to gathering and reporting crucial community-level data on health and socio-demographic trends. Through routine household visits, the HDSS ensures longitudinal tracking of key health and demographic indicators.

Initiated as a pilot project in September 2010 with support from the International Development Research Centre (IDRC) Canada, the Cross River HDSS began in the rural Idundu communities of Akpabuyo Local Government Area. The baseline census was conducted in November 2012, encompassing both urban and rural cohorts in Calabar Municipality and Akpabuyo, situated approximately 13 km apart. The population comprises predominantly farmers, fishermen, civil servants, traders, and artisans, with Efik, Ibibio, and English as the primary languages spoken.

Currently, the site monitors a total population of over 44,000 (expansion ongoing to include 80,000) individuals, covering both the urban cohort (Calabar Municipal) and the rural cohort (Akpabuyo LGA). The overall planned expansion, in the long run, targets a definitive size of 180,000 individuals spread across the three senatorial zones of Cross River State. The ultimate goal is to implement highly efficient mobile data tools supported by a secure network, enabling the HDSS database team at UNICAL to track cohorts across the entire country.

SITE LEADER AND DIRECTOR: Dr. Martin Meremikwu (MD, MSc)
With 30 years of professional experience, Dr. Martin Meremikwu is a distinguished expert in Paediatrics and Child Health and Clinical Epidemiology. He brings extensive expertise in clinical trials research, spanning 22 years, along with 11 years of experience in surveillance studies and a commendable track record of 18 years in Good Clinical Practice (GCP) standards. Dr. Meremikwu's rich background also includes 24 years of dedicated community engagement, reflecting his commitment to holistic healthcare solutions.

Map of Cross River State showing Akpabuyo and Calabar Municipality



CAPACITY

Facility: The CRHDSS, in collaboration with the Institute of Tropical Diseases Research & Prevention, the University of Calabar Teaching Hospital, boasts of well-equipped clinical trial and laboratory facilities, supported by robust quality management systems and advanced data management infrastructure, ensuring seamless support for clinical trials.

Human Resource: The HDSS is operated by a diverse team of academic researchers from various departments, including Computer Science, Sociology, Paediatrics, Obstetrics, Community Medicine, Public Health, and Education Social Science within the College of Medical Sciences and Faculties of Science, Social Sciences, and Education. All team members are proficient in electronic data capture and have undergone Good Clinical Practice (GCP) training, enhancing the efficiency and quality of research endeavours.

Projects: The CRHDSS has spearheaded a wide range of projects and studies, encompassing:

- Infectious disease surveillance studies
- Clinical trials spanning phases II to IV
- Non-communicable Diseases
- Population and Health Studies
- Health Economics studies

Leveraging expertise from diverse fields, such as Computer Science, Sociology, Pediatrics, Obstetrics, Community Medicine, Public Health, and Education Social Science, the HDSS has contributed significantly to multicenter clinical trials and implemented epidemiological studies seamlessly, supported by the robust backbone of the DSS infrastructure.

Clinical Trial Capacity:

- A Randomized, Double-blind, Placebo-controlled, Multicenter Study to Assess the Safety and Efficacy of Inclacumab in Participants with Sickle Cell Disease Experiencing Vaso- occlusive Crises".
- A Phase 3, Multicenter, Randomized, Double-Blind, Placebo-Controlled Trial to Evaluate the Efficacy of Voxelotor for the Treatment of Leg Ulcers in Patients with Sickle Cell Disease.
- An Open-Label Extension Study of Voxelotor Administered Orally to Participants with Sickle Cell Disease Who Have Participated in Voxelotor Clinical Trials.
- A Phase 2/3, Double-Blind, Randomized, Placebo-Controlled, Multicenter Study to Evaluate the Efficacy and Safety of Mitapivat in Subjects with Sickle Cell Disease.
- An Open-label Extension Study to Evaluate the Long-term Safety of Inclacumab Administered to Participants with Sickle Cell Disease Who Have Participated in an Inclacumab Clinical Trial.

Surveillance Capacity:

- Child health and mortality prevention surveillance (CHAMPS)
- Assessment of Reproductive, Maternal, Newborn, Child, Adolescent and Elderly Health Quality of Care data collection, management and use in Cross River and Rivers States, Nigeria
- Antimicrobial resistance management and stewardship programme partly supported with a grant from Fleming Fund UK
- Collaborating with the Pennsylvania State University on zoonotic virus surveillance (tracking wild viruses in "bush meat" at the Cross River Forest Reserve. Also, doing a joint work in Lassa fever)
- Ongoing antimicrobial stewardship programme at the University of Calabar Teaching Hospital.
- Elaborate clinical research in HIV. Concluded a WHO multi-centre research in COVID-19-induced severe respiratory disease

PARTNERS

The London School of Hygiene & Tropical Medicine (LSHTM), World Health Organization, INDEPTH Network, DFID via the Effective Healthcare Research Consortium, United States Naval Medical Research Unit 3, Egypt (NAMRU3 Unit Egypt), European Union, Society for Family Health (SFH), AfriCare, Cochrane and Cochrane South Africa, South African Medical Research Council, South Africa, European and Developing Countries Clinical Trials Partnership (EDCTP), Nigerian Institute of Medical Research (NIMR), Liverpool School of Tropical Medicine, Pennsylvania State University, Barcelona Institute for Global Health (ISGLOBAL), Medical Research Council (MRC), Gambia, University of Southern Maine USA, University of Oslo, Norway, University of Arizona, University College London (Lancet: Institute of Global Health, London), Swiss Tropical and Public Health Institute (Swiss TPH), Emory University, Atlanta USA, IDRC/CIDA, Nigeria government at various levels (Federal, State and Local) and Host communities.

PUBLICATIONS

- A comparison of all-cause and cause-specific mortality by household socioeconomic status across seven INDEPTH network health and demographic surveillance systems in sub-Saharan Africa
- Automating the data quality checks in health and demographic surveillance systems: Lessons from the Cross River HDSS, Nigeria
- Childbirth Practices in the Akpabuyo Rural Health and Demographic Surveillance System.
- Improving the recording and reporting of facility-based mortality using open source mobile technology: Lessons from Cross River HDSS, Nigeria
- Optimum hardware, software and personnel requirements for a paperless health and demographic surveillance system: a case study of Cross River HDSS, Nigeria
- Improving the Routine HMIS in Nigeria through Mobile Technology for Community Data

KEUR SOCE HDSS/ UNIVERSITY CHEIKH ANTA DIOP (UCAD)

LOCATION AND PROFILE

The Keur Soce HDSS covers 74 villages with an estimated total population of 40,286 inhabitants within 2759 households. The Site is located in a rural area in the region of Kaolack, in the Health District of Ndoffane. The area lies between longitudes 16°00'14.8"and 16°07'13"W and latitudes 13°51'53" and 14°00'00"N. It is located at 230 km from Dakar in the Sudano-Sahelian region of Senegal. The site's ecology is characterized by the alternation of a long and dry season from November to June and a short rainy season from July to October.

Established in 2013, the Keur Soce HDSS was set up to collect data on the population's structure, dynamics and geographical location. The Keur Soce Health and Demographic Surveillance System (HDSS) initiated its first census in 2013, followed by periodic rounds conducted to update the database. Recent rounds occurred in 2015, 2019, and 2021, with the integration of electronic data capture using REDCap software since 2015. This transition has facilitated better real-time data collection, streamlined control and utilization of previous data, and saved valuable time, contributing to the ongoing stabilization of field and management teams.

SITE LEADER AND DIRECTOR: Prof. Oumar Gaye, (MD, PhD)

Professor Oumar Gaye, brings over 40 years of extensive expertise in Parasitology, with a remarkable track record spanning clinical trials research, surveillance studies, and community engagement. With 30 years dedicated to each domain, Professor Gaye's profound experience underscores his commitment to advancing public health through rigorous research and community-centered interventions.

Map of Keur Soce HDSS

Facilities of the Keur Soce HDSS

CAPACITY

Facilities: The Keur Soce HDSS is equipped with modern facilities to support its research activities. These facilities include a well-equipped data management center with advanced infrastructure for storing, processing, and analyzing large volumes of demographic and health-related data. Additionally, the HDSS has established field offices equipped with electronic data capture tools, such as tablets using REDCap software, enabling efficient and real-time data collection during field surveys. Moreover, the HDSS has trained personnel proficient in data management and analysis, ensuring the quality and accuracy of research outputs.

Human Resources: The Keur Soce HDSS boasts of a diverse team of seasoned professionals, comprising experienced clinical researchers, medical entomologists, laboratory managers and technicians, field workers, data managers, research coordinators, and administrative staff, all of whom are adept at conducting household surveys, managing data collection processes, and ensuring the smooth operation of the HDSS. Many senior research scientists hold certifications in Good Clinical Practice (GCP), highlighting the unit's commitment to excellence. This multidisciplinary team collaborates closely to uphold the integrity of the surveillance system and contribute to the success of research endeavors aimed at improving public health outcomes in the community. With UCAD as the leading institution, this multidisciplinary team involved in running the Keur Soce site has also research and training activities at the University of Thies (UIDT) and University Gaston Berger (UGB), contributing to the potentization of the expansion of the HDSS.

Projects: The Keur Soce HDSS boasts of a robust capacity for conducting a wide range of projects and studies including;

- Infectious disease surveillance studies
- Clinical trials spanning phases II to IV studies
- Noncommunicable Disease
- Population and Health Studies
- Health Economics studies
- Multi-centre clinical trials

The Keur Soce Health and Demographic Surveillance System (HDSS) excels in malaria research and emerging tropical diseases. With a focus on intervention and evaluation studies, longitudinal research, and cohort follow-up, the HDSS plays a crucial role in advancing the understanding of disease dynamics and evaluating the effectiveness of interventions over time.

Clinical Trial Capacity:

- Efficacy and Safety of Artemisinin Combination Therapy in non-complicated malaria
- Efficacy and Safety of mass drug Administration (MDA) of Soil-Transmitted Helminthes (STH) & Schistosomasis in children.

Surveillance Capacity:

- Community-based surveillance studies on
    - Malaria, Schistosomiasis
    - Fungal infection
    - Helminths
- Surveillance of severe malaria
- Hospital-based surveillance of the hemorrhagic virus in collaboration with the Minister of Health; molecular diagnosis is performed for all suspected cases with clinical symptoms in the Pasteur Institute Reference Laboratory

PARTNERS

Malaria Research Capacity Development Consortium (MRTC in Mali, MRCG in Gambia, UoY1 in Cameroon, UHAS in Ghana, LSHTM, LSTM UK, IRESSEF Senegal, Drug for Neglected Diseases Initiatives (DNDi), University du Sine Saloum Ibrahima Niass (USSEIN) Senegal, Universté Gaston Berger Senegal.

PUBLICATIONS

- An epidemiological study to assess Plasmodium falciparum parasite prevalence and malaria control measures in Burkina Faso and Senegal
- Application of geographically-weighted regression analysis to assess risk factors for malaria hotspots in Keur Soce health and demographic surveillance site
- Dynamic malaria hotspots in an open cohort in western Kenya,National Institutes of Health (NIH) (.gov) https://www.ncbi.nlm.nih.gov › articles › PMC5766583
- Estimating Annual Fluctuations in Malaria Transmission ...ajtmh https://www.ajtmh.org › journals › tpmd › article-p1883
- Identifying malaria hotspots in Keur Soce health and demographic surveillance in the context of low transmission

IFAKARA HEALTH AND DEMOGRAPHIC SURVEILLANCE SYSTEM
IFAKARA HEALTH INSTITUTE

LOCATION AND PROFILE

Situated in the heart of the Kilombero Valley in southeastern Tanzania, the Ifakara Health Institute (IHI) stands as a beacon of research excellence, contributing significantly to the advancement of public health initiatives in the region. The Kilombero District is a district in Morogoro Region, south-western Tanzania. The district is situated in a vast flood plain, between the Kilombero River in the south-east and the Udzungwa-Mountains in the north-west. On the other side of the Kilombero River, in the south-east, the floodplain is part of Ulanga District. The area is predominantly rural with the semi-urban district headquarters Ifakara as major settlement. The majority of the villagers are subsistence farmers of maize and rice.

The IHI covers three distinct Health and Demographic Surveillance Sites (HDSS); the Ifakara Rural HDSS with a total population of 120,000 individuals, the Ifakara Urban HDSS with 45,000 individuals, and the Rufiji HDSS with a total of 100,000 individuals under surveillance. However, the total population covered by the clinical trial site is approximately 500,000 covering individuals residing within Bagamoyo and Ifakara Districts. Covering a diverse geographic area spanning the Kilombero and Ulanga districts, the IHI HDSS serves as a vital platform for collecting, analyzing, and disseminating health and demographic data. Founded by the esteemed Ifakara Health Institute, the HDSS plays a pivotal role in informing evidence-based interventions and policy decisions aimed at improving the health and well-being of local communities.

SITE LEADER AND DIRECTOR: Dr. Honorati Masanja (PhD)

Dr. Honorati Masanja is an esteemed epidemiologist with an illustrious 32-year career devoted to the field of epidemiology. With a remarkable track record encompassing 20 years of proficiency in surveillance studies, 30 years of clinical trials research experience, 28 years of expertise in GCP clinical trials, and 20 years of dedicated community engagement, Dr. Masanja brings invaluable insight and leadership to the design and execution of impactful health research endeavors.

Map of surveillance area

Facilities of the Ifakara Health Institute

CAPACITY

Facilities: The Ifakara Health Institute provides a comprehensive research environment with well-equipped clinical trial and laboratory facilities, alongside robust data management systems to ensure the quality and security of research findings.

Human Resource: The IHI is staffed with a multidisciplinary team, the majority of whom have extensive experience in health research including; Physicians, Pharmacists, Epidemiologists, Biologists, Clinical Trial Specialists, Social Scientists, Data Scientists, Statiscians, Nurses and strong administrative support (Human resource Manager, Financial administrator, project Manager, accountants, drivers etc).

Projects: Ifakara Health Institute (IHI) has carried out a wide variety of projects / studies including:

- Infectious disease surveillance studies
- Clinical trials
- Non communicable Disease
- Population and Health Studies
- Health Economics studies

The core areas of research are Environmental Health and Ecological Sciences (EHES), Interventions and Clinical Trials (ICT); and Health Systems, Impact Evaluation and Policy (HSIEP). The Institute has been involved in multi-center clinical trials. Driven by a multidisciplinary team of researchers and healthcare professionals, the IHI HDSS focuses on a wide range of research domains, including infectious disease epidemiology, maternal and child health, health systems strengthening, and social determinants of health. Through its robust surveillance and research activities, the HDSS continues to make significant strides in addressing the region's most pressing health challenges and shaping the future of public health in Tanzania and beyond.

Clinical Trial Capacity:

- A phase III randomized controlled multicenter trial to evaluate the efficacy of R21/Matrix-M vaccine in African children against clinical malaria
- Child health and infection with low Density (CHILD) malaria, a randomize controlled trial assess the long-term health and socioeconomic impact of interventions targeting low density malaria infection (LMI) among children in Tanzania
- A Phase 1b age de-escalation, dose escalation, partially randomized, open-label head-to-head study of the safety and immunogenicity of the candidate rabies vaccine ChAdOx2 RabG
- A Multicenter phase III double-blind; randomized; controlled study to evaluate the efficacy and safety of VPM1002 in comparison with BCG in HIV-exposed and HIV-unexposed
- Prospective study of Lopinavir based ART for HIV Infected children Globally

Surveillance capacity:

- Tuberculosis
- S. pneumoniae
- S. aureus
- Covid-1
- Rift valley
- Chikungunya
- H. influenza

PARTNERS

- Swiss TPH, University Hospital of Basel, University of California San Francisco

PUBLICATIONS

- https://www.researchgate.net/publication/378851558_Trends_of_Plasmodium_falciparum_molecular_markers_associated_with_resistance_to_artemisinins_and_reduced_susceptibility_to_lumefantrine_in_Mainland_Tanzania_from_2016_to_2021
- https://www.researchgate.net/publication/377975918_Safety_and_efficacy_of_malaria_vaccine_candidate_R21Matrix-M_in_African_children_a_multicentre_double-blind_randomised_phase_3 trial
- https://www.researchgate.net/publication/377532468_Dynamics_of_malaria_vector_composition_and_Plasmodium_falciparum_infection_in_mainland_Tanzania_2017-2021_data_from_the_national_malaria_vector_entomological_surveillance
- Child Health and Infection with Low Density (CHILD) malaria: a protocol for a randomised controlled trial to assess the long-term health and socioeconomic impacts of testing and treating low-density malaria infection among children in Tanzania
- The effects of prenatal and postnatal high-dose vitamin B-12 supplementation on human milk vitamin B-12: a randomized, double-blind, placebo-controlled trial in Tanzania

IGANGA - MAYUGE (IMHDSS)
MAKERERE UNIVERSITY CENTRE FOR HEALTH AND POPULATION RESEARCH (MUCHAP)

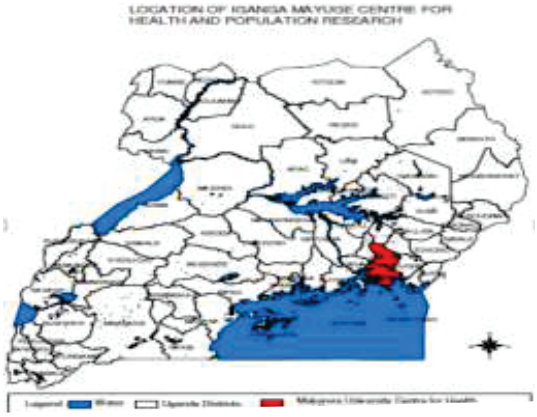
LOCATION AND PROFILE

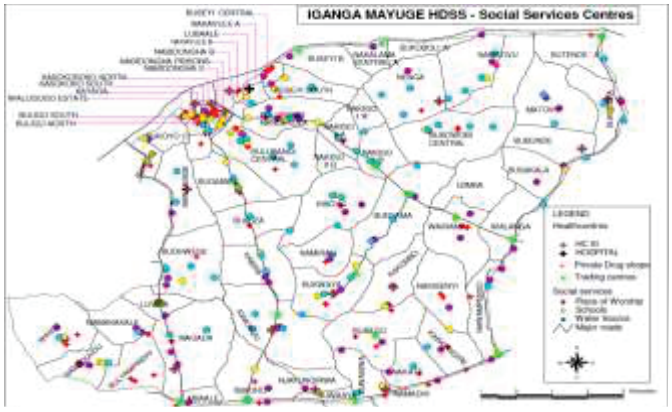
The Makerere Centre for Health and Population Research IMHDSS covers a total population of 101,499. The Iganga Mayuge Health and Demographic Surveillance Site (IMHDSS) which is run by Makerere University Centre for Health and Population Research (MUCHAP) was established by Makerere University in 2005. The purpose of the HDSS is to generate population-based information that is useful to guide policy and the decision-making process at district and national level.

IMHDSS/MUCHAP covers 65 villages distributed in Iganga and Mayuge districts in Eastern Uganda. It covers a population of approximately 101,499 individuals resident in about 17,000 households. It is located in Eastern Uganda; about 120 kilometers east of the capital city Kampala along the Uganda–Kenya highway. Since the inception of IMHDSS in 2005, bi-annual and sometimes, annual data-update rounds have been regularly conducted through routine home visits by trained Field Assistants (FAs) to register pregnancies, births, deaths, and migrations. Other population variables like education status, marital status, screening for injury and disability, vaccination coverage, and household socio-economic status are also periodically measured under this research platform.

SITE LEADER AND DIRECTOR: Dr. Dan Kajungu,(MSc, PhD)

Dr. Kajungu is a distinguished expert in medical sciences with 20 years of professional experience, including 20 years of expertise in surveillance studies and 15 years of hands-on clinical trials research and Good Clinical Practice (GCP) experience. With a notable 20-year history of community engagement, in advancing public health initiatives.





Research Assistants conducting interviews at household

CAPACITY

Facilities:

The Iganga-Mayuge Health and Demographic Surveillance Site (IMHDSS) is equipped with state-of-the-art facilities to support its research activities. These include well-equipped laboratories, advanced data management systems, and quality assurance protocols, ensuring the efficient collection and analysis of health and demographic data.

Human Resources: The Iganga-Mayuge Health and Demographic Surveillance Site (IMHDSS) is powered by a dedicated team of skilled professionals comprising researchers, statisticians, fieldworkers, data analysts, and administrative staff. Drawing expertise from various disciplines such as public health, demography, epidemiology, and social sciences, this multidisciplinary team ensures the effective implementation of research activities and the maintenance of comprehensive demographic and health data. With extensive experience in community engagement and data collection methodologies, the IMHDSS team plays a pivotal role in advancing research agendas and informing public health interventions in the region. Team members are proficient in electronic data capture and have undergone Good Clinical Practice (GCP) training, enhancing the efficiency and quality of research endeavors.

Projects: The Iganga-Mayuge Health and Demographic Surveillance Site (IMHDSS) serves as a dynamic platform for conducting diverse research projects and studies. With expertise in epidemiological research and population health, the IMHDSS facilitates investigations across various domains including:

- Infectious disease surveillance studies
- Clinical trials spanning phases II and IV studies
- Communicable
- Non-communicable Disease including injuries and disabilities, diabetes, hernia etc
- Population and Health Studies
- Health Economics studies
- Maternal and Child Health
- Multicenter Clinical trials

Clinical Trial Capacity:

- Minimally Invasive Tissue Sampling (MITS) study'
- BRANCH' Study- Infant feeding and identification of growth faltering

Surveillance Capacity:

- The institution conducts research in a specified geographical area and population.
- The institution conducts biomedical research in health facilities within the specified geographical area and catchment population

PARTNERS

MTIS Alliance- Research Triangle International, Bill and Melinda Gates, World Health Organization (WHO), World Alliance for Lung and Intensive Care Medicine in Uganda (WALIMU), African Population and Health Research Center

PUBLICATIONS

- https://www.researchgate.net/publication/309891188_Pneumococcal_Carriage_in_Children_under_Five_Years_in_Uganda-Will_Present_Pneumococcal_Conjugate_Vaccines_Be_Appropriate
- https://www.researchgate.net/publication/303769092_Objectively_Assessed_Physical_Activity_and_Associated_Factors_Among_Adults_in_Peri-Urban_and_Rural_Eastern_Uganda_A_Population-based Study
- https://www.researchgate.net/publication/281835319_Prevalence_and_risk_factors_of_latent_Tuberculosis_among_adolescents_in_rural_Eastern_Uganda
- Perceptions of diabetes in rural areas of Eastern Uganda.Rutebemberwa E, Katureebe SK, Gitta SN, Mwaka AD, Atuyambe L. Curationis 2013;36:E1-7.
- https://www.researchgate.net/publication/290432749_A_Randomized_Trial_of_Low-Cost_Mesh_in Groin_Hernia_Repair

THIS BROCHURE PRESENTS THE PROFILE OF INDEPTH NETWORK; A VIBRANT GLOBAL ORGANISATION WITH GCP COMPLIANT CLINICAL TRIAL SITES IN 10 AFRICAN COUNTRIES

BETTER HEALTH INFORMATION FOR BETTER HEALTH POLICY

INDEPTH Network Secretariat
Accra, Ghana
www.indepth-network.org
Email: info@indepth-network.org