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Our Science

A quarterly newsletter produced by the MRC Unit The Gambia at LSHTM focusing on our scientific research in health and highlighting our achievements in Africa.

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Our Science: Issue 8

There are two major areas touched by this current issue of *Our Science*. One is the increasing work The Unit carries out in West Africa and the other is the strengthening of our capacities in entomological research. The Unit is already a regional hub for research and training in health sciences. This is illustrated by our participation to WANETAM, a West African network, funded by the European Developing Countries Clinical Trial Partnership (EDCTP), whose main aim is to build regional capacities to carry out clinical trials at the highest possible standard. The Unit leads the malaria and the TB working packages and has already organised several short courses over the past 12 months, e.g. on medical entomology and on cluster randomized trials. Similarly, this issue reports the creation of a West African BioResource which will allow interrogating the human genome for a variety of studies on different diseases and health conditions such as obesity and hypertension. This will become more important as it is predicted that by 2030 the burden of non-communicable diseases in Africa will be higher than that of infectious diseases. In addition, The Unit is increasingly attracting young researchers from other West African countries. The most recent example is Harouna Soumare, an Entomologist from Mali, who is now managing our Entomology Laboratory, including our insectaries, and setting up membrane feeding experiments. The latter is extremely important in understanding malaria transmission from human to vector. It consists of feeding mosquitoes bred in our insectaries with blood collected from individuals infected with malaria, to understand their capacity of transmitting parasites to the vector. Our Entomological Department has been also strengthened by the building of a new insectary in Fajara. We decided to name this building in honour of Mrs Ida Secka, a retired staff, who contributed significantly to the success of our entomological research. Similarly, it is also meant to recognise that behind the success of our research projects, there is the hard work of our lab and field staff. West Africa bears the highest burden of maternal and neonatal mortality in the world and this is the reason why Maternal and Neonatal Health is one of our cross-cutting research areas. Such research includes Dr Okomo's pump priming grant that will investigate neonatal deaths and stillbirths, with the aim of defining the causes and identify potential control interventions. Finally, the training activity of The Unit is underlined by the three profiles of PhD students, namely Amat Bah, Abdoulie Bojang, and Fatoumatta Darboe, all of them Gambians. Amat Bah is also the Deputy Executive Director of the National Nutrition Agency, illustrating the excellent relationship between The Unit and The Gambian Government, and the Unit's role in building national capacity.

- Professor Umberto D'Alessandro

The West African Network for TB, Aids, Malaria (WANETAM)

The WANETAM network is being implemented in thirteen West African Institutions in nine countries with partnerships from four northern partners.



Dembo Kanteh, WAGHA Coordinator and Jean Pierre Nguessan, Project Manager for WANETAM at the EDCTP forum in Lisbon, Portugal held from 17th to 21st September 2018

The MRC Unit the Gambia at LSHTM is using its unique position in West Africa to support capacity building and development of researchers and research institutions in the region. In addition to the core funding that the MRC Unit The Gambia at LSHTM uses towards this objective, the Unit actively collaborates with other research groups in West Africa to seek external funding for capacity building. Dr Assan Jaye Head of Research Training and Career Development is the Deputy Coordinator of the European & Developing Countries

Clinical Trials Partnership (EDCTP) funded network of excellence on TB, AIDS and Malaria called WANETAM. These networks are flagship EDCTP initiatives for the development of core competencies in research institutions for the conduct of clinical trials.

The WANETAM network is being implemented in 13 West African institutions in nine countries with partnerships from four northern partners. A key feature of the WANETAM project is that the stronger research institutions in the Network provide support and

practical skill-based training to the weaker research institutions covering researcher development, scientific support as well as platform and infrastructure support. Currently, a significant part of the network activities are being led by the MRC Unit The Gambia at LSHTM. The malaria work package is led by Professor Umberto D'Alessandro with objectives to build capacities in the following areas,

- the evaluation of new community-based interventions aiming at interrupting malaria transmission in West Africa

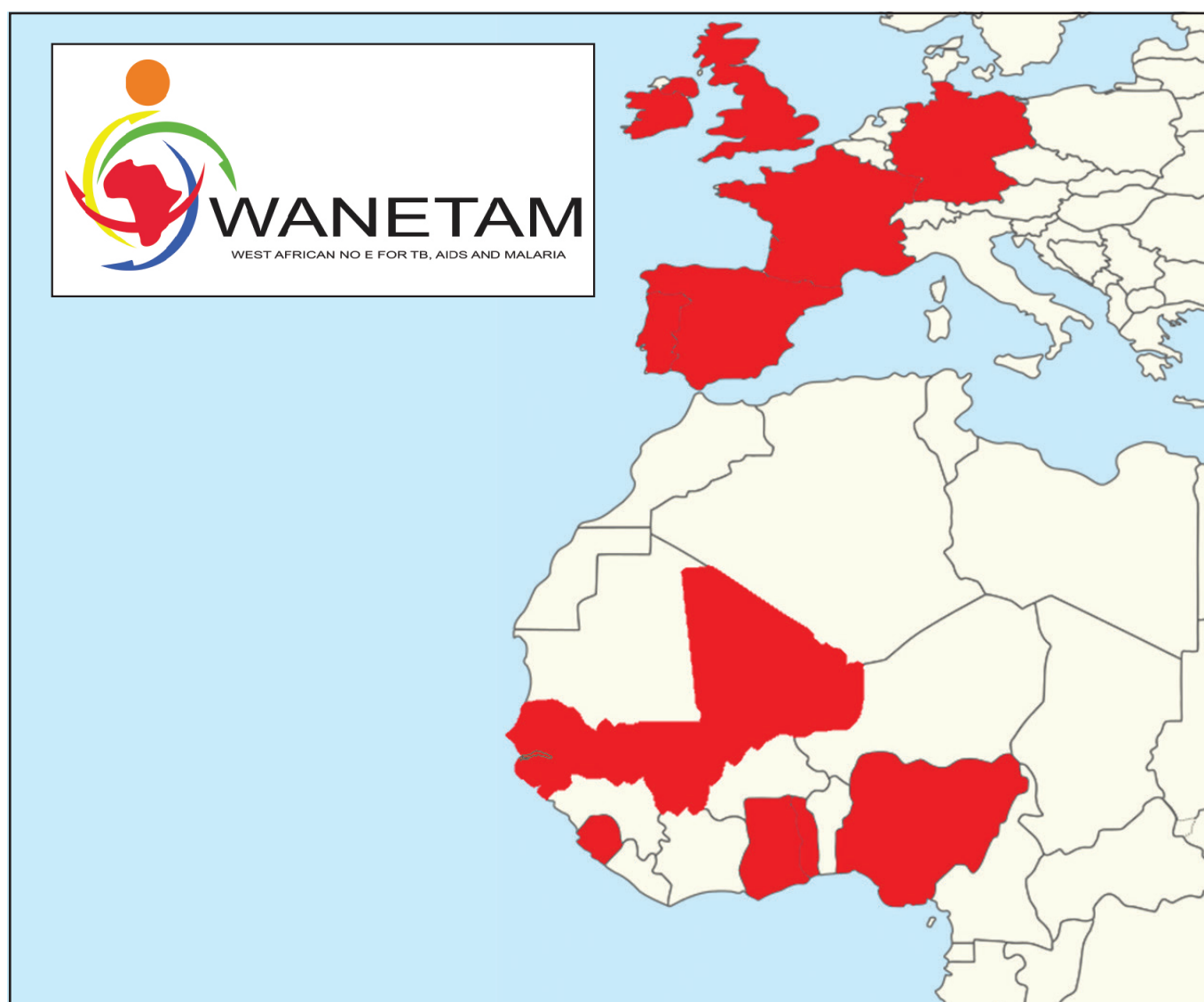
- the evaluation of the efficacy of new insecticides and the monitoring of insecticide resistance
- to determine safety and efficacy of new treatments and vaccines

The TB work package is being implemented by Professors Martin Antonio and Beate Kampmann with Martin continuing his work establishing a TB drug resistant surveillance platform across eight sites in seven West African countries. Professor Kampmann is expanding

her work on the diagnosis and management of childhood TB with West African partners in the TB group.

Dr Assan Jaye in addition to being the overall coordinator responsible for supervision of project activities, leads the delivery of the cross cutting trainings in researcher development and mentorship, financial management, clinical trial monitoring, data management and project management.

The overall objective of the WANETAM programme is aligned with the Unit's West Africa agenda to create an eco-system of complementary and supportive research institutions in the region in order to build competency to conduct collaborative research and clinical trials.



WANETAM project in nine countries with partnerships from four northern partners

The PRECISE (PREgnancy Care Integrating Transitional Science, Everywhere) Network

Annually, pregnancy hypertension, fetal growth restriction (FGR), and stillbirth unrelated to intrapartum events are associated with 46,000 maternal and 2.5 million fetal, neonatal and infant deaths.

Over 99% of these deaths occur in low- and middle-income countries and over half in sub-Saharan Africa. The PREgnancy Care Integrating Transitional Science, Everywhere (PRECISE) Network has been created to address this area of neglected global health research.

The PRECISE Network is an observation study. As part of the PRECISE Network, a prospective cohort of up to 10,000 pregnant women across three countries representative of sub-Saharan Africa: The Gambia (West Africa), Mozambique (Southern Africa), and Kenya (Eastern Africa) will be set up. The overall aim of the PRECISE Network is to develop a unique cohort of biologically and contextually characterized pregnant and non-pregnant women of reproductive

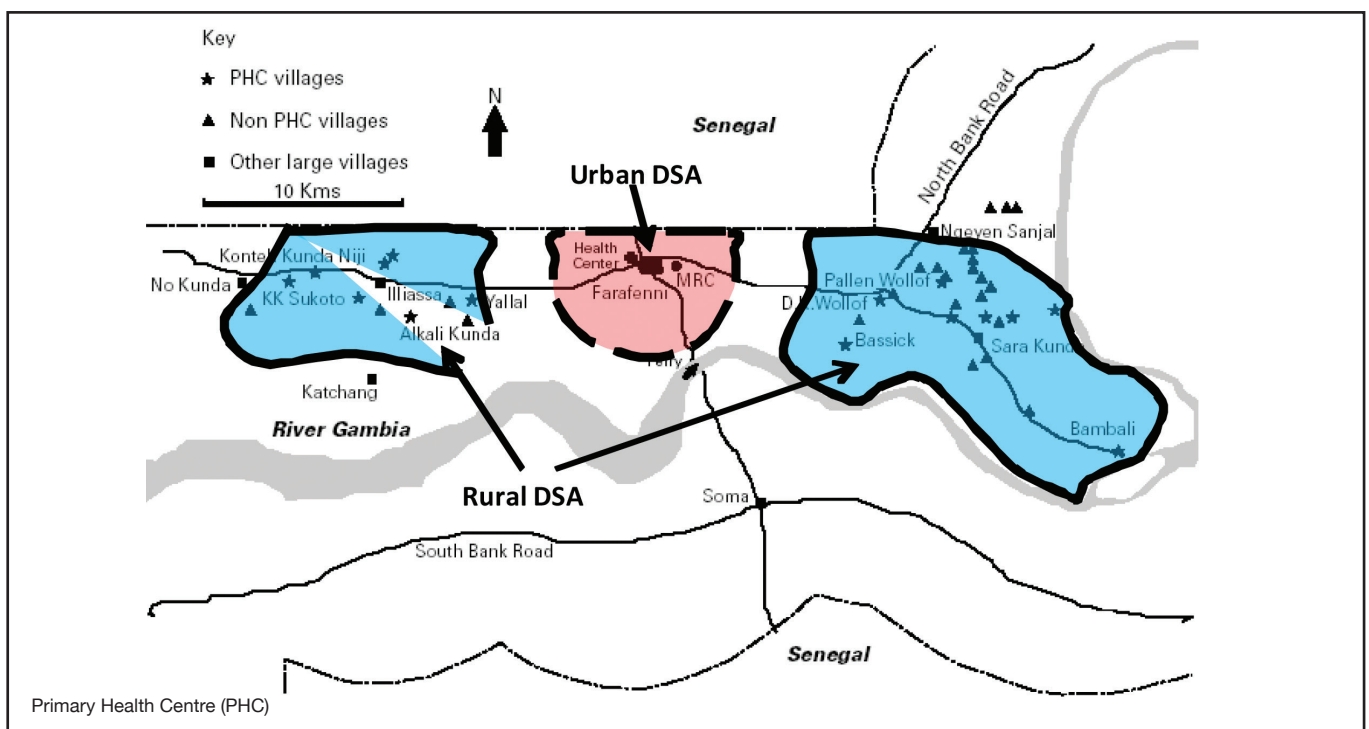
age to support research into placental disorders (namely hypertension, fetal growth restriction and stillbirth) in sub-Saharan Africa. The primary objective is to describe the extent of placental disorders in women attending antenatal care in centers representative of urban and rural African communities. Additional objectives include to investigate socio-cultural and health system barriers preventing access, effective management, care pathways and to investigate the potential for the introduction of novel methods to assist with diagnosis and management of placental disorders in sub-Saharan Africa.

MRC Unit The Gambia at LSHTM is one of the three recruiting sites of the PRECISE consortium. In The Gambia, 2,000 pregnant women

(1,000 in rural Farafenni and 1,000 in Farafenni town) will be recruited during their antenatal care (ANC) visits and followed-up until 6 weeks post-delivery.

Clinical, epidemiological and demographical information will be collected during antenatal visits, during labour and post-labour. Different biological samples will be collected at these time points to create a bio-repository.

Between 17th – 21st September 2018, a training for the PRECISE network was held at MRCG at LSHTM. The training focused on training the trainers and several key members of the different countries participating in the network. Professor Umberto D'Alsessandro and Dr. Anna Roca are the co-PIs of the study.



Farafenni area is represented in the figure above. Recruitment will take place at the Farafenni hospital and the antenatal care of three health facilities within the Farafenni HDSS area: (i) Ngeven Sanjal, (ii) Illiassa and (iii) Farafenni.

PRECISE

PREgnancy Care Integrating translational
Science, Everywhere



Participants at the PRECISE training

Dr Uduak Okomo awarded a Pump Priming Grant from the Wellcome Institutional Strategic Support Fund (ISSF)

Dr Uduak Okomo was awarded Pump Priming grant of £10,000 to carry out a facility-based evaluation of stillbirths and neonatal deaths in The Gambia, as part of her post-doctoral research activities. The funding for this award is provided by the Institutional Strategic Support Fund (ISSF), supported by Wellcome and the LSHTM.

Stillbirths and death of a newborns are tragic events for any family and continue to occur in large numbers in low- and middle-income countries (LMIC). Out of hundred babies born in The Gambia, three are likely to die within the first month of life, compared to four out of every thousand in the United Kingdom.

In The Gambia, stillbirth figures, particularly those occurring after the onset of labour but before birth, are not always accurately recorded. In addition to maternal infections, many other factors play a role in the origin of both stillbirths and neonatal deaths. Some stillbirth and neonatal deaths can be completely preventable with already proven measures such as having a skilled attendant at birth, neonatal resuscitation at birth to support the establishment of breathing, kangaroo mother care, and management of severe infections in newborns. However, in The Gambia, there is limited information about numbers and causes, there is no systematic recording system to facilitate the analysis of root causes, and hence intervention strategies are poorly informed.

Consistent information about the nature and cause of death is needed for planning health systems and

distributing resources, as well as for improving the quality of care at the point of service delivery.

The project will gather in-depth information about neonatal deaths and stillbirths at the major birth facilities in the western health region of The Gambia, facilitated by The Unit's close interactions with governmental partners and UNICEF. It will also collect data on the level of surface bacterial contamination in the delivery areas. This will lay the foundation to evaluate pathogens, routes of transmission and potential evolution of antimicrobial resistance among neonates, particularly within facility-based deliveries. This research will build on Dr Okomo's previous studies investigating the aetiology of serious infections among neonates admitted to the three main referral health facilities in The Gambia, and the role of mother-to-newborn transmission of potentially pathogenic bacteria from the maternal genital tract in the neonatal sepsis. The results of these studies suggest that most of neonatal infections in this setting may be acquired from the environment.

This study will be led by Dr Uduak Okomo and Professor Beate Kampmann, MRC Unit The Gambia at LSHTM. Other key collaborators include Professor Joy Lawn, (MARCH Centre LSHTM), Dr Melisa Martinez-Alvarez (MRCG at LSHTM), Mrs Mariama Janneh, (UNICEF The Gambia), Dr Mamady Cham (Directorate of Health Services), and Mr Ba Foday Jawara (Reproductive Maternal Newborn Child and Adolescent Health Unit, Ministry of Health and Social Welfare The Gambia).



Dr Uduak Okomo
Postdoctoral Research Fellow



Dr Uduak Okomo with a mother and child at the neonatal ward at Edward Francis Small Teaching Hospital, Banjul, The Gambia



Dr Uduak Okomo explaining her work to his Royal Highness Prince of Wales, Fajara Main Site, The Gambia

Creation of a West African BioResource (WABR)

Genome-Wide and Epigenome-Wide Association Studies (GWAS and EWAS) provide a powerful tool for exploring how genes and epigenes that are associated with disease outcomes exert their effects.

Modern science is increasingly relying on large collaborative ventures, and with good reason. The pooling of data, resources and brain power can create a whole that is much greater than the sum of its individual parts. Large studies generate much greater statistical power and certainty in outcomes. Genome-Wide Association Studies (GWAS) are leading the field and now frequently involve sample sizes of hundreds of thousands and even millions of subjects.

With coordinated inputs from the MRC and Wellcome Trust, the UK has invested in several large-scale initiatives such as the UK Biobank and 100,000 Genomes projects. Africa lags behind, but the Human Hereditary and Health in Africa (H3A) initiative, and its biobanking arm (B3A), will help to rectify this imbalance.

The Keneba Field Station hosts the smallest of MRC Unit The Gambia at LSHTM's three Demographic and Health Surveillance Surveys (DHSS), covering a population of about 15,000 people in 36 villages. The Keneba BioBank was created years ago as an active biobank for continuous monitoring with donated

blood, DNA and living samples. The biobank now contains samples and data from over 12,500 participants.

The Keneba BioBank has already been used in many studies, and had been awarded MRC Global Challenges Research Fund (GCRF) seed funding under a call branded 'Confidence in Nutrition'. We are using this funding to build a partnership with researchers in Bristol who run the world-renowned Avon Longitudinal Study of Parents and Children (ALSPAC).

ALSPAC is a remarkably productive longitudinal birth cohort study. Members of the ALSPAC team visited Keneba in May as part of a series of reciprocal working visits with the intention of 'cloning and adapting' ALSPAC best practices as we develop WABR.

In addition to supporting in-house research by MRC Unit The Gambia at LSHTM scientists, WABR is being created with the explicit goal of encouraging access by researchers across Africa and beyond. A dedicated website will be developed to promote the resource with the aim of emulating ALSPAC's phenomenal track record.

It will be a long time before personalised medical interventions become a reality in rural Africa but stratified approaches are a real possibility and can be informed by WABR.

Examples of on-going studies using the Keneba Biobank:

- PhD-student Momodou Wuri Jallow is examining how Transmembrane serine protease 6 (TMPRSS6) mutations affect hepcidin expression.
- PhD-student Fatou Joof is testing how ATPase plasma membrane Ca^{2+} transporting 4 (ATP2B4) variants affect plasmodium growth in red blood cells.
- Dr Modou Jobe is testing whether high-dose riboflavin reduces blood pressure and whether a common Methylene tetrahydrofolate reductase (MTHFR) variant affects response.

West African BioResource (WABR)

A 'living' biobank of 13,500 genotyped & epigenotyped rural Gambians

Available for secondary data analysis & open to future prospective studies using Recall-by-Genotype (RbG) and Recall-by-Epigenotype (RbE) designs

Examples of on-going recall studies

RbG

Ribo-BP
Hypertension

TMPRRS6
Anemia

RbE

POMC
Obesity

VTRNA2-1
Immunity

Deeply phenotyped embedded cohorts

LEGACY COHORTS

ENID

HERO-G

BRIGHT

PMMST

GAMBAS

FUTURE COHORTS

Active cohorts

New Entomology Laboratory at Fajara Main Site

The Entomology Laboratory puts the unit at a strategic position to attract new research funding and collaborations to conduct clinical trials of novel interventions against malaria and other vector-borne diseases.

The capacity for Entomology work was identified as a key resource for research on vector-borne diseases particularly malaria, during the implementation of the new MRC Unit The Gambia at LSHTM business model in 2009 and was retained within the MDEE (malaria

diagnostics entomology and epidemiology) platform. The facility will support laboratory work on controlled human malaria infection (CHMI) studies, and puts the Unit at a strategic position to attract new research collaborations and grants for clinical trials of novel

interventions particularly sporozoite vaccines for malaria control and eventual elimination. The laboratory also provides the Unit the capability to engage and collaborate on other vector-borne and emerging infectious diseases such as Zika.



Ida Secka Entomology Laboratory Building

The new laboratory is a secure facility divided into three sections, a room for conducting the direct membrane feeding assays (DFMA), another for holding uninfected adult mosquitoes and a third for rearing mosquitoes. The Insectary, a key component of the Entomology Laboratory was inaugurated in 2018 and named after a retired entomology staff, Ida Secka. Ida started working for MRC Unit The Gambia at LSHTM in 1974 as a field worker in Keneba within the Nutrition Theme. In 1975, she moved to Fajara

to start the first insectary breeding of mosquitoes and managed the insectary from 1975 to 1982 before joining the Rotavirus project team. Ida joined the malaria programme from 1986 to 2009 running the insectaries in Farafenni, Pakaliba and Walikunda before her retirement in 2013.

The clinical development of anti-malarial drugs and vaccines increasingly relies on controlled human malaria infection to provide reliable readout of efficacy. This requires

continuous production of mosquitoes in a thriving colony which the insectary at Fajara will provide. Coupled with the increasing expertise of staff employed in the Entomology Laboratory the Unit is poised to play a bigger role in this increasing area of research.



Dr. Davis Nwakanma, Head of Laboratory Services, Ida Secka, and Professor Umberto D'Alessandro Unit Director in front of the new Ida Secka Entomology Laboratory

Walikunda - A Field Site for Entomological Research

A Hub for Studying Mosquito Behaviour and Ecology.

The Walikunda Field Site was established in 1977 by a team of entomologists led by Professor M T Gillies from Sussex University Mosquito Behavioural Unit, along the South Bank of the River Gambia 100Km from Basse. Most of the entomological research projects conducted at the MRCG at LSHTM are hosted at the Walikunda site. The facilities at Walikunda were upgraded in 2012 with modern structures and amenities and the site continues to serve as a hub for studying mosquito behaviour and ecology.

The following operational research on improving rural housing in sub-Saharan Africa as a strategy to support malaria elimination studies and experiments were conducted at Walikunda from 2016 to 2018.

- To determine best methods for measuring airflow in rural African houses. This study looked at how air movement inside Gambian houses is best measured in an attempt to relate this to mosquito entry and comfort levels. The study was funded by the Sir Halley Stewart Trust.
- To measure the impact of different building designs on mosquito house entry. This study examined how five different typologies of houses affect mosquito house entry and indoor climate. The study was funded by the Sir Halley Stewart Trust.
- To determine the effect of applying different screening interventions on mosquito

house entry. Three experiments were carried out using five single-roomed experimental houses with gaps at the top and bottom of each door. Two individuals slept in each house to attract mosquitoes, which were collected indoors using sampling device called Centre for Disease Control (CDC) miniature light traps. Experiment 1 explored how badly-fitting doors alone affected mosquito house entry. Experiments 2 and 3 determined whether screened windows of different sizes affected mosquito house entry. The study was funded by the Sir Halley Stewart Trust.



Walikunda New Laboratory

- To look at the impact of screened self-closing doors on mosquito house entry. This study assessed the protective efficacy of four novel screened doors and two windows designs against mosquito house entry, their impact on indoor climate, as well as their use, durability and acceptability in the village. The study was funded by the Global Good Fund.
- To measure the effect of roof colour on indoor temperature. This study looked at the effect of roof colours on temperature and relative humidity inside the rooms. Two rooms had their roof painted white, red or plain metal sheets and a pair of data loggers placed inside the room to periodically measure relative humidity and temperature. The

results showed that rooms with white roofs had a lower temperature than red roof houses. The study was funded by the Sir Halley Steward Trust.

All the Walikunda based studies were supervised by Musa Jawara, Unit Entomologist MRC Unit The Gambia at LSHTM and Dr Margaret Pinder Epidemiologist Durham University, England. The studies were carried out in collaboration with Professor Steven Lindsay, Durham University, England and Professor Jakob Knudsen from the Danish Academy of Fine Arts School of Architecture Design and Conservation, Kunstakemiets Arkitektur Design Og Konservere (KADK), Denmark. However, the experiments and studies were conducted by Mahamed Abdi and Amalie Tilma from KADK and Ebrima Jatta, postgraduate trainee from The Gambia National Malaria Control Programme. The results have

been disseminated to the communities who participated in the studies. These two articles (1) New Prototype Screened Doors and Windows for Excluding Mosquitoes from Houses: a Pilot Study in Rural Gambia and (2) Metal-roofed houses may contribute to a decline in malaria transmission in sub-Saharan Africa, have been accepted in peer review journals, American Journal of Tropical Medicine and Hygiene and Lancet Planetary Health respectively for publication.

Two other articles, (1) Importance of screened windows for reducing malaria transmission in sub-Saharan Africa and (2) The effect of different typologies of rural houses on mosquito-house entry and indoor climate: an experimental study in rural Gambia have been submitted.



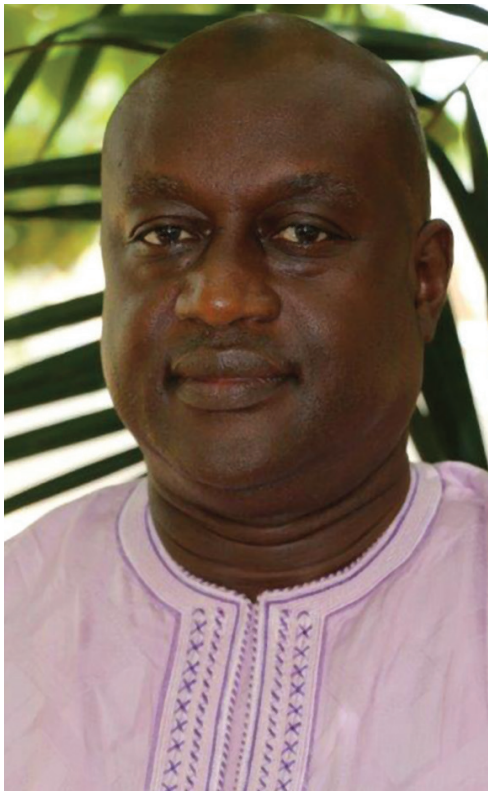
Visitors Sleeping Huts

FACT

The facilities at Walikunda were upgraded in 2012 with modern structures and amenities and the site continues to serve as a hub for studying mosquito behaviour and ecology.

Amat Bah a PhD student with the Nutrition Theme

Amat Bah is the Deputy Executive Director of the National Nutrition Agency (NaNA) in The Gambia. He is currently seconded to MRC Unit The Gambia at LSHTM to pursue a PhD under the supervision of Professor Andrew M. Prentice.



Amat Bah
Deputy Executive Director of the National
Nutrition Agency

Amat holds a BSc in Applied Human Nutrition from Queen Margaret University in Edinburgh and an MSc in Public Health Nutrition from London School of Hygiene and Tropical Medicine. In addition, he also holds a Diploma in Management Studies from the Management Development Institute, The Gambia and is a graduate of the African Nutrition Leadership Programme (ANLP) in South Africa. After his studies at The Gambia College he joined the then Nutrition Unit of the Ministry of Health as a Nutrition Assistant.

Amat has worked in various areas of nutrition over the past two decades including heading the micronutrient deficiency control programme in The Gambia. His area of special interest is anaemia control among pregnant women and children. He has successfully coordinated a holistic pilot community based integrated anaemia control programme that has been scaled-up to over 100 communities with the support of the World Bank.

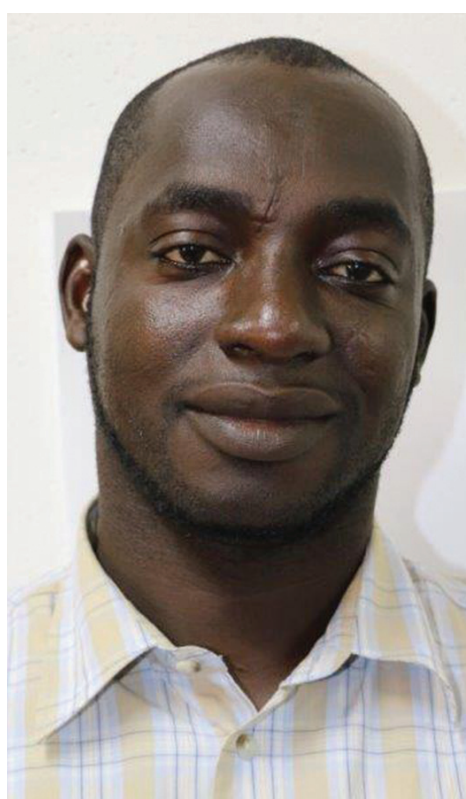
He has published two peer-reviewed papers in the BMC Pregnancy and Childbirth Journal and the Journal of Nutrition as part of his PhD. He is now working on the final paper of the PhD in which he conducted a double-blind randomised controlled trial comparing standard dose of iron supplementation for pregnant women with two screen-and-treat approaches using hepcidin as a biomarker for ready and safe administration of iron in rural Gambia.

Preliminary results indicate screen-and-treat approaches using hepcidin for screening are inferior to universal iron supplementation.

It is hoped that this research on hepcidin and iron will contribute to finding a solution for a simple test for assessing iron deficiency and also for the better management of anaemia in developing countries.

Abdoulie Bojang determined to understand how the use of prophylactic azithromycin may increase levels of antibiotic resistance in The Gambia

Abdoulie Bojang is a Microbiologist doing his PhD on understanding how public health interventions (i.e. prophylactic use of azithromycin) aimed at reducing mortality may establish antibiotic resistance in the community.



Abdoulie Bojang
Microbiologist

Abdoulie Bojang rejoined MRC Unit The Gambia at LSHTM in 2008 after completing his MSc in Biomedical Science. He worked as a scientific officer for 5 years primarily responsible for the management, training and supervision of laboratory technicians on a number epidemiological studies and clinical trials. In 2013, he was promoted to a Higher Scientific Officer in charge of the PregnAnZI-1 project. Abdoulie was responsible for the training and supervision of the scientific officer.

In 2016, Abdoulie won a scholarship to undertake a 4-year PhD study at the Open University entitled: *Staphylococcus aureus* long term prevalence, distribution of sequence types, genes associated with macrolide resistance and characteristics of *Staphylococci* species following one oral dose of azithromycin given to women during labour.

The study is ancillary to the PregnAnZI trials and aims at evaluating the risk of the use of azithromycin in establishing antibiotic resistance in the community. Dr Anna Roca is Abdoulie's director of studies and he has additional supervisors that cover a wide range of disciplines: Dr Ousman Secka (MRCG at LSHTM, The Gambia), Dr Christian Bottomley (LSHTM, UK) and Professor Benjamin Howden (Doherty Institute/ University Melbourne, Australia).

This year Abdoulie published the first output of his PhD in the prestigious *Clinical Infectious*

Diseases Journal. The results presented in the paper showed that the initial increase of azithromycin resistance observed after the exposure to azithromycin for *S. aureus* and *Streptococcus pneumoniae* wanes by 1 year post-treatment. In addition, Abdoulie has spent seven months in Professor Howden's lab investigating the distribution of *S. aureus* macrolide resistance genes and sequence types among children exposed and non-exposed to azithromycin at birth. He further received training in the identification of bacterial species using matrix assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOFF MS) and antibiotic susceptibility testing using the VITEK® 2 system.

Abdoulie is now finalizing the analysis of the sequences obtained during his time in Australia. He is also preparing a new manuscript and finalizing the lab work for the final component of his PhD which seeks to describe the impact of the intervention on susceptibility patterns of *Staphylococcal* species from different swabs obtained from the study participants.

Dr Anna Roca commented that "Abdoulie has been working hard for the first half of his PhD and has generated a lot of interesting and novel data. He now has time to ensure timely outputs to succeed on his effort".

Dr. Fatoumatta Darboe Post-Doctoral Researcher – TB Immunology Laboratory

Dr. Darboe recently completed her PhD in Clinical Sciences and Immunology at the University of Cape Town with top marks.



Dr. Fatoumatta Darboe
Post-Doctoral Researcher – TB Immunology Laboratory

Fatoumatta's PhD thesis looked at transcriptomic signatures in patients co-infected with TB and HIV. Her results showed that TB disease in HIV-infected persons could be diagnosed using a small gene signature which could be used as screening tools in basic health clinics. In addition, these signatures could be used to determine a person's risk of getting TB and allow for the provision of preventive therapy and is currently being tested in South Africa.

Fatoumatta completed her undergraduate studies in Biology and Chemistry at the University of The Gambia in 2009 and joined the MRC Unit The Gambia at LSHTM initially as an intern in the hepatitis group and then as a Lab Technician in the Infant Immunology Laboratory in 2010. She worked on several clinical trials including a HIV and malaria vaccine trial to eventually become a Scientific Officer. In 2014, Fatoumatta completed her MPhil through the Open University on non-specific effects of BCG vaccination on the immune response to other childhood vaccines in Gambian children (supervisors Associate Professor Jayne Sutherland and Professor Katie Flanagan). The results from this study have been published in 2017 in *Frontiers of Immunology*. Fatoumatta was subsequently accepted for a PhD at the South African Tuberculosis Vaccines Initiative (SATVI) at the University of Cape Town (UCT), supervised by Professor Tom Scriba.

Dr. Darboe's PhD work has resulted in one publication in the journal *Tuberculosis* (Darboe et al., 2018) with two more in preparation. Fatoumatta has also worked on several other projects resulting in five peer-reviewed publications including one in *Nature Communications* (Fletcher et al., 2016) and one in *Nature* (Chowdry et al. 2018). In 2017, she was a recipient of the prestigious Margaret McNamara Educational Grant from the World Bank for the importance and relevance of these studies to the health and well-being of HIV-infected persons. She has presented her work at several conferences and was one of the few African scientists invited for an oral presentation at the Keystone Symposia joint conference on TB and HIV held in Whistler, Canada in April 2018.

Since completing her PhD work, Fatoumatta has joined the TB Immunology Laboratory at MRCG at LSHTM as a postdoctoral researcher working on the TB Sequel project aiming to identify diagnostic and prognostic markers of TB disease and response to therapy.

Harouna Dit Massire Soumare – Manager Entomology Laboratory and Projects Entomologist

Focused on contributing to the development of the next generation of scientists and entomologist in the West African region to assist in combating infectious diseases.



Harouna Dit Massire Soumare
Manager Entomology Laboratory and
Projects Entomologist

Harouna Dit Massaire Soumare obtained the PharmD degree in Pharmacy from The University of Technical Sciences and Technologies of Bamako-Mali in 2010. He did his thesis on the monitoring and effectiveness of the indoor residual spraying in two districts at the Entomological Department at the Malaria Research and Training Centre (MRTC) in Mali. From 2010 to 2012 Harouna worked as a co-investigator of several entomological studies.

Harouna started working as an Entomologist in 2012 at MRTC where he rose through the ranks to become the Entomology Manager. He was responsible for the overall management of the insectary at MRTC in addition to overseeing a number of malaria entomology studies.

During the course of his study, Harouna gained experience in several techniques for the identification, sampling and io-ecology of malaria vectors, and on vector control methods. Processes carried out include breeding, sampling and field mosquito colony transport for biological effectiveness tests. These include PCR (Polymerase chain reaction) and ELISA (Enzyme-linked immunosorbent assay) techniques for malaria vectors species, human blood source identification and infection status.

Harouna is experienced in insecticide sensitivity testing in relation to IRS (indoor residual

spraying) according to WHO guidelines. He has participated in several national and international workshops on malaria control.

Harouna has over seven years of post-graduate experience in insectary management and, entomological investigation. From 2012 to 2018 he has conducted and lead a team conducting direct membrane feeding assay (DMFA), mosquito dissections, oocytes lectures, positive guts storage, strong data collection, sample conditioning and shipment. In 2014 he participated at the first international DMFA workshop in Yaoundé.

MRC Unit The Gambia at LSHTM Entomology Laboratory Department will benefit from Harouna's vast knowledge and experience. He will be providing support in areas of entomology for all our malaria projects.

Harouna would like to pursue his PhD in Entomology. He hopes to contribute to the development of the next generation of scientists and entomologist in the West African region to assist in combating infectious diseases.

Harouna believes that continuous training of young scientist to face and challenge entomological malaria control especially in Africa and in the world is needed.

Leading health research in West Africa to save lives and improve health across the world

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Our Science – the newsletter of MRC Unit The Gambia, at LSHTM is for everyone who is interested in our work and community.

We are keen to receive feedback and suggestions for new features from our readers, if you have any comment please let us know.

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