Health education class in The Gambia: maternal, adolescent, reproductive and child health is a growing focus of the School’s work in the region and worldwide. Photo courtesy Felicia Webb
Forewords from our partners

Over the past three decades, the London School of Hygiene & Tropical Medicine has had excellent and productive collaborations with academic and public health institutions in Ghana, through participation in national health system reforms and evaluation of several large scale public health interventions, ranging from Vitamin A supplementation, to insecticide treated bednets, vaccines and treatment of malaria in infants. As well as contributing to the international global health policies and research agenda, the School has many dozens of scientists in London and Ghana. I am privileged to be associated with one of the world’s leading global health institutions, involved in research, training, policy work and mentoring for scientists and students across Africa.

Our region is developing rapidly, and human capital is a key to our growth. We are investing in health, research and science infrastructure with the support of funders and partners globally. In Nigeria our focus in the “Saving One Million Lives” initiative is reviving the primary health care system to deliver life-saving interventions such as vaccines, essential commodities for malaria, diarrheal diseases, pneumonia and preventing maternal mortality.

The London School of Hygiene & Tropical Medicine is a key contributor in this work. It is helping national and local governments, universities and hospitals all over our region to strengthen their research and capacity, knowledge and expertise. I am personally grateful to my alma mater which has contributed immensely to the foundation of my career. I am also proud of the School’s world-leading researchers, students and alumni that are working all over the world, including sub-Saharan Africa, transforming lives and improving health for all.

Established in The Gambia for 65 years, the Medical Research Council Unit continues to produce innovative and ground-breaking science. Working closely with partners and particularly the London School of Hygiene & Tropical Medicine, we have conducted research which has impacts and brought about policy changes in many countries. The Unit and the School have a unique partnership, sharing data, joint research projects and academic appointments. With a shared commitment to research and capacity building, we recently received joint strategic funding from the UK Medical Research Council for a post-doctoral fellowship scheme to enable a new generation of African scientists to conduct world-class research.

Burkina Faso, once among the world’s poorest nations, has seen tremendous progress in recent years. Its government and universities have forged strong scientific and programme partnerships, and Centre MURAZ has become a hub for collaborative research throughout the region. Our long-standing links with the London School, among others, have been vital to this effort, and today, world-leading researchers are collaborating closely on many challenges, including laboratory investigations, surveillance, clinical and epidemiological studies, clinical and community trials, and designing, monitoring and evaluating major health programmes internationally. I am delighted to visit the School recently, and look forward to developing this work in future.

By Peter Piot

Dwen Hwe Kan - think ahead!

While in Accra for the first meeting of the Lancet commission on the future of health in Africa, we visited Mfantsipim School, which has educated so many leading Africans, including my former boss Kofi Annan. At the gate is the school crest with the motto Dwen Hwe Kan, which means Think Ahead! This is an important corrective to the short-termism prevalent today.

Thanks to painstaking medical research over the past few decades, millions of lives have been saved and health improved across the region, but millions more continue to suffer and die from preventable and treatable conditions: not only malaria, AIDS and tuberculosis, but malnutrition, diarrhoea, the complications of childbirth and, increasingly, hypertension, diabetes and cardiovascular diseases. We are also confronted by the emerging threats of new infections and pandemics.

We are engaged in collaborative research and teaching with many partners across the region. These links have been further enhanced by our participation in a growing number of international research consortia, which strengthen the capacity of African institutions to carry out world-class research. The next few years are critical. With economic growth and the spread of information technology, it is time to invest seriously in higher education, research and innovation that saves lives and transforms livelihoods. West Africa now has the people and skills to develop, implement and scale up solutions that can improve health for all. Together, by thinking ahead, we can meet this challenge.

Peter Piot is Professor of Global Health and Director of the London School of Hygiene & Tropical Medicine. He was previously Under Secretary-General of the United Nations and founding Executive Director of UNAIDS. He co-discovered the Ebola virus and has published over 500 scientific articles and 16 books on infectious diseases. In 2013, he was awarded the Hideyo Noguchi Africa Prize for Medical Research by the Prime Minister of Japan, for his pivotal research on diseases endemic in Africa.

Peter Piot

Director and Professor of Global Health
London School of Hygiene & Tropical Medicine

Contents:
Partnerships for research and innovation 2
Malaria prevention and control 4
Health on the map: selected projects and partnerships 6
Maternal, adolescent and child health 7
New approaches to infectious disease 8
Non-communicable diseases: stemming the tide 10
Think ahead - support our work 12
Partnerships for research and innovation

Infectious diseases have long been a focus for School research in the region, and since the 1970s, we have been working closely in partnership with universities, governments and non-governmental organisations to build strong, long-term collaborative programmes. These have developed African research and innovation, and many are now recognised as world-leading centres that not only address the complex challenges for health in the region, but also provide models for other countries.

Medical Research Council Gambia Unit

Established in The Gambia in 1947, the Unit is the UK’s single largest investment in medical research in a developing country. Since several decades, the Unit has worked closely in partnership with the University, directed by Brian Greenwood from 1980-1995 (see page 3) and currently under Tumani Corrah.

Eleanor Riley has worked in The Gambia since 1985, studying the human immune response to malaria and undertaking large-scale studies of the relationship between anti-malarial immunity and disease susceptibility. She has conducted pioneering immunological and epidemiological studies to identify and target antigens for malaria vaccines, understand protective and pathological immune responses to infection, and discover the molecular and cellular basis of increased susceptibility to systemic bacterial infections in children with malaria.

Hazard Dockrell and Jackie Cliff are partners with the MRC Gambia TB group led by Jayne Sutherland, in several major initiatives including the European funded AE-TEC Consortium led by Gerhard Waltz, University of Sheffield, working across seven African countries to evaluate host cytokine signatures and develop a sensitive, low-cost and effective field diagnostic test for tuberculosis.

The School’s MRC-funded International Nutrition Group, based at Keneba field station, throughout the years established globally important findings including the role of human milk in infant nutrition, a key factor underpinning WHO’s advice on exclusive breastfeeding to six months, and the impact of gastroenteropathy or persistent gut damage.

Andrew Prentice has worked at Keneba for over 35 years, with Sophie Moore and Brannen Hening, he is currently leading research on child growth and cognitive development, iron, infection and anaemia, bone health, and the effects of genetic variation on diet-related diseases.

Centre Muraz, a regional hub for research and capacity strengthening

Centre Muraz, founded in 1939, is the oldest national health research institute in Africa. In addition to high endemic diseases control in West Africa, its original mission, the scope of the Centre’s work has expanded to include research, training and technical support at national, regional and international levels.

Core competencies include clinical medicine and biology, pharmaceutical sciences, field and clinical epidemiology, biostatistics, medical informatics, policy and health systems, health geography and demography, health economics, human and social sciences. This enables Centre Muraz to provide professional training to researchers and health workers.


Directed by Professor Nicolas Meda since March 2013, Centre Muraz currently works with many School researchers including Simon Cousens, Hervé Rillos, Carine Romans, Philippe Mayaud, Ian Roberts, Haleema Shaukur and Mark Rowland. Together, they conduct laboratory investigations, surveillance, clinical and epidemiological trials, design, monitoring and evaluating major health programmes, as well as curriculum development for postgraduate level training across francophone Africa.

Malaria vaccine reduces severe malaria in infants

Malaria continues to cause high mortality and morbidity among children. Now, initial findings from the RTS, S malaria vaccine Phase III trial suggest that the vaccine may reduce the incidence of severe malaria in infants by up to one-third.

The trial is being conducted across seven African countries including Burkina Faso and Ghana, where it is led from Kintampo Health Research Centre by Seth Owusu-Agyei, with Daniel Chandramohan and Sir Brian Greenwood from the School.

Developed by a partnership of manufacturers sanofi Pasteurs and the PATH Malaria Vaccine Initiative, with support from the Bill & Melinda Gates Foundation, this is the largest such trial to date, reflecting the high expectations for the vaccine.

Brian Greenwood: a life in research

Sir Brian Greenwood, Manson Professor of Clinical Tropical Medicine at the School, has dedicated his long and distinguished career to tackling disease in Africa. After qualifying in medicine in 1962, he worked as a doctor in the UK and for 15 years in Nigeria, where he went on to develop research interests in malaria and meningococcal disease. In 1980, he moved to The Gambia to direct the UK Medical Research Council Laboratories, overseeing major pieces of work, including demonstration of the efficacy of insecticide-treated bednets in preventing death from malaria in African children and in developing ways of preventing pneumonia and meningitis in African children through vaccination.

Professor Greenwood joined the School in 1996, and is now director of the Malaria Capacity Development Consortium, which supports a post graduate malaria training programme in universities across Africa.

He continues to add to his 600-plus list of publications and is an advisor and collaborator in partnerships engaged in the development of drugs and vaccines for use in the developing world.

In 2008, he became the first laureate of the Hideyo Noguchi Africa Prize for Medical Research awarded by the Prime Minister of Japan. In 2012, he was knighted by the Queen and awarded the Gardner Medal by the government of Canada.
Malaria prevention and control

Great progress is being made in malaria control and elimination throughout sub-Saharan Africa, and while malaria still infects hundreds of millions, deaths have been reduced by one third in the last decade. Since its foundation, the School has had a leading role in malaria research, and today our Malaria Centre works with partners across the region to maintain the momentum towards understanding and eliminating it.

Mosquito and parasite population genomics

In a region of high geographical variability, the pattern of malaria transmission is very dynamic, depending on its seasonality and the breeding cycles of its mosquito vectors. Understanding the genetic and molecular epidemiology of the parasite is vital for better targeting of control programmes.

Anopheles gambiae and other related species are responsible for most cases of malaria in Africa, and understanding their genetics and molecular epidemiology is key to targeting control programmes.

Professor Conway’s group is now working with collaborators including Dr Gordon Awandare of the University of Ghana and Dr Alfred Amanabu-Ngwa of the MRC Gambia Unit to identify promising future vaccine candidate antigens of the malaria parasite Plasmodium falciparum in Africa.

They are conducting genome sequence analyses of population samples of the parasite, combined with studies of the receptors that parasites use to invade red blood cells, thereby identifying parasite molecules that appear most vulnerable to immune attack. The GENINVADE project, funded by the European Research Council, UK Medical Research Council, and Royal Society, now extends to six countries, Ghana, Mali, Senegal, Guinea, Gambia and Mauritania.

Targeting malaria drugs to those who need them

Artmisinin-based combination therapy (ACT) is the first line recommended treatment for malaria. Despite its efficacy, there are many issues around access, safety, targeting, and drug quality. In response, the ACT Consortium, with its secretariat based at the School, is a global research collaboration that addresses these issues through 25 studies in ten countries.

Virginia Wiseman and Lindsay Mangham-Jefferies from the School are collaborating with Obina Owolokan and Wilfred Mbacham on cluster randomised trials in public and mission health centres in Cameroon, and in health centres, pharmacies and drug shops in Nigeria, to evaluate different interventions to support the uptake of rapid diagnostic tests and adherence to their results.

Recently, efforts have been made to improve access to ACTs by expanding delivery systems to the community level as well as through the private sector. However, increasing access to effective drugs does not guarantee effectiveness, nor patient acceptability and adherence. A new study by Kristen Banek and colleagues is examining patient adherence to various ACT treatments in Sierra Leone. Hariparkash Kaur is leading a drug quality study that assesses the prevalence of falsified and substandard ACT drugs in various countries, including Nigeria, Ghana and Equatorial Guinea.

Protecting children through Seasonal Malaria Chemoprevention

About 25 million children under five live in areas of highly seasonal transmission in the Sahel, where malaria remains the leading cause of severe illness and death in children.

Over the past decade, research initiated in Senegal by Badara Cisse, then a PhD student at the School, and conducted by School researchers and partners in Senegal, Mali, Burkina Faso, Gambia and Ghana, has led to the introduction of a new malaria prevention strategy known as Seasonal Malaria Chemoprevention. Children without symptoms of malaria receive effective anti-malarial treatment once a month during the high malaria transmission season to prevent malaria illness.

In 2012, the World Health Organization recommended that all children under five living in areas of the Sahel with highly seasonal malaria transmission, should receive Seasonal Malaria Chemoprevention. An implementation guide for countries was published and the treatment is now being provided in Mali, Togo, Chad, Niger and Nigeria.

Seasonal Malaria Chemoprevention provides a very high degree of personal protection and, if widely deployed, could prevent a substantial proportion of the deaths and severe illnesses caused by malaria in children.
Health on the map: selected projects and partnerships

**Trachoma mapping and treatment**
Blinding trachoma affects more than 21 million people globally, with up to 180 million at risk in the world’s poorest countries. The Global Trachoma Mapping Project is funded by the UK Department for International Development. School researcher Anthony Solomon, chief scientist for the project, is training teams to use smart phones to collect data on water, sanitation and hygiene, and examining people for clinical evidence of trachoma in countries including Guinea Bissau, Cameroon and Nigeria.

**Resilient and Response Health Systems (RESYST)**
RESYST is an international research consortium funded by the UK Department for International Development, which aims to enhance the resilience and responsiveness of health systems to promote health equity and reduce poverty, in developing countries including Nigeria. The research focuses on health workforce, financing and governance.

**VISION 2020 LINKS for eye care**
The School’s International Centre for Eye Health is working with hospitals in the region through the VISION 2020 LINKS Programme, part of the global initiative to eliminate avoidable blindness worldwide. Five of the DS VISION 2020 LINKS established to date are in this region. An example is Accra, Ghana, where one of the LINKS is establishing a Surgical Training Centre for the region, developing sub-specialist modular courses through its link with Moorfields Eye Hospital.

**IDEAS in Nigeria**
North Eastern Nigeria has a high burden of maternal and newborn mortality, in part because of poor access to and quality of health care during pregnancy, childbirth and after. IDEAS is working on innovative projects which enhance community and family-based health provision.

**Reducing child mortality through mass media**
A pioneering project is underway in Burkina Faso to evaluate whether health messages on the radio can save children’s lives.

Researchers predict that a three-year health awareness campaign focused on mothers can reduce child mortality by 15-20% per year. 60-second health messages broadcast on local FM radio are designed to promote exclusive breastfeeding, which significantly reduces the risk of children under five dying from diarrhoea or respiratory infections.

Simon Cousens from the School is working in partnership with Development Media International, Centre Muraz and the Ministry of Health of Burkina Faso on a randomised controlled trial to evaluate the campaign, and assess how it changes the attitudes and behaviour of pregnant women and mothers, and whether it actually reduces child mortality.

**Protecting children through Seasonal Malaria Chemoprevention**
Brian Greenwood: a life in research

**Non-communicable diseases: stemming the tide**

**Intervention Research for Mental Health**

**Note:** The lines and points on the map indicate which countries these projects are working in. They are not meant to be geographically accurate within each country. Headings and numbers in blue circles indicate page references in this publication. The School is involved in many other projects in the region, and this publication represents only a selection. For an updated map of global projects and partnerships visit http://www.lshtm.ac.uk/aboutus/introducing/map.
New approaches to infectious disease

With partners across the region, School researchers are working to understand and control major tropical diseases including leishmaniasis, blinding trachoma, meningitis and tuberculosis, which together affect more than one billion people worldwide, mainly in sub-Saharan Africa. This work is vital in helping countries plan their intervention strategies and target treatment to areas of greatest need.

Effective vaccines for meningococcal meningitis

A new vaccine, MenAfriVac, has been found to protect against the epidemic strain of meningitis in Africa, according to the results of a study led by Brian Greenwood at the School and colleagues from the Centre de Support et Santé Internationale in Chad, published in The Lancet in September 2013.

Following the vaccination of almost two million people in Chad, there was a dramatic reduction in the incidence of all cases of meningitis by 94% and in carriage prevalence of the epidemic strain, serogroup A meningitis, by 98% while an epidemic persisted in unvaccinated parts of the country. Outbreaks in the African meningitis belt, from Senegal in the west to Ethiopia in the east, are regular and deadly. Infants, children and young adults are most at risk of meningitis, which can also cause disabilities such as deafness, paralysis and limb infection leading to amputation. The study findings give real prospects that the devastating effects of this infection in Africa can be prevented.

The African Meningococcal Carriage Consortium (MenAfriCar), led by Brian Greenwood and funded by the Wellcome Trust and Bill & Melinda Gates Foundation, is investigating the patterns of meningitis and trialing the introduction of the new vaccine across seven countries. Initial studies over six months show a low prevalence of serogroup A carriage in Senegal, Mali, Ghana, Niger and Nigeria. Sandra Mounier-Jack and Anne Mills have been working with the Centre for the Development of Best Practices in Health led by Dr Pierre Ongolo-Zogo in Cameroon, and Dr Mamadou Konate in Mali, to investigate the introduction of vaccination and its impact on wider health systems. The study found that the vaccination programme was successful overall, but in Mali led to an interruption of routine vaccination in many health centres during the campaign.

Cervical cancer, human papillomavirus and HIV

Every year, cervical cancer kills around a quarter of a million women in sub-Saharan Africa, and many of these lives could be saved by simple screening and vaccination against strains of the human papillomavirus. Women living with HIV are at particular risk of infection, and experience more rapid disease progression.

School researchers Frankie Liew and Philippe Mayaud are working with the University of Ouagadougou in Burkina Faso as part of the HPV in Africa Research Partnership to evaluate the effectiveness and cost-effectiveness of various screening strategies, leading to earlier detection and management of cervical cancer.
Non-communicable diseases: stemming the tide

Non-communicable diseases, known as NCDs, include cardiovascular disease, diabetes, cancers, chronic respiratory diseases and neurological diseases. Collectively, they represent the biggest cause of death and disability globally, and this is increasing. In sub-Saharan Africa, they now contribute a third of the disability-adjusted life year burden, the World Health Organization’s index of the impact of disease on populations. Deaths from non-communicable diseases occur at younger ages in Africa and in other low and middle income countries, and globally, we face the quadruple burdens of communicable diseases, non-communicable diseases, mental illness and injuries.

Meeting a growing challenge: focus on what works

As a result of economic and population growth, urbanisation and lifestyle changes, countries in west and central Africa face an increasing and devastating epidemic of non-communicable diseases. Today, major causes of death in many countries are stroke, hypertensive and ischemic heart disease, diabetes, chronic respiratory diseases, and cerebral, liver, breast and prostate cancers.

Integrated and multi-sectoral interventions that address this multiple burden of chronic disease are neither feasible nor affordable in the foreseeable future. Instead, we need a more practical approach that focuses on immediate, limited, high-priority actions. This means interventions which are proven to be effective, affordable, feasible, and innovative, using technologies that deliver value for money. They also need to be tailored to the needs and resources of individual countries.

Applying valuable and relevant lessons from communicable disease and in other regions is vital. For example, Rwanda now has nearly universal coverage of girls with human papillomavirus vaccine. Capacity strengthening of health systems to improve the management disease burdens is exemplified by the PH360 HIV/NCD integrated programs in Nigeria, Kenya, Zambia and Ghana. This demonstrates how prevention and treatment of non-communicable diseases can be incorporated into existing public sector health programmes.

We are also beginning to use innovative technologies such as smartphones, new diagnostic and management tools to improve individual self-management and community-based prevention of NCDs. As more resources become available, more comprehensive, integrated and multi-sectoral approaches can be incorporated to enhance the response.

Improving the evidence base on disability

The recent World Report on Disability highlighted the need to develop methods to generate reliable statistics on disability, Hannah Kupfer has been working in Cameroon on a project to assess the presence of visual, hearing and musculoskeletal impairment.

This work is helping plan programs and services, and to raise awareness of the importance of disability as a global issue. The project also aims to identify a tool to measure intellectual impairment, in collaboration with the School’s Centre for Global Mental Health (see facing page).

Intervention Research for Mental Health

Mental health is increasingly recognised as a global issue. Schizophrenia and other psychoses impose a huge burden of disease in low and middle income countries in Africa.

Vikram Patel, Mary De Silva, Sujit Rathod and colleagues from the Centre for Global Mental Health, a partnership between the School and King’s College London, are working with partners in west Africa on areas including psychosis, depression and mental health care services.

Vikram Patel is leading pilot studies on the phenomenology, onset, and outcomes of psychosis in Ibadan, Nigeria, funded by the Wellcome Trust, and scaling up services for people with psychosis, funded by the US National Institutes for Health. The overall aim is to design an evidence-based, feasible, acceptable, and locally appropriate community-based rehabilitation package of care in Nigeria.

Under the supervision of Betty Kirkwood, Ghanaian PhD student Benedict Weobong is researching the effects of antenatal and postnatal depression on maternal and infant mortality, and infant morbidity in the Kintampo Rural Health Research Centre in Ghana. He is studying the effects of integrated home visits care on reducing neonatal mortality among nearly 21,000 women in two large randomised controlled trials, one of the largest ever observational studies in the field.

PhD student Sara Cooper is looking critically at some of the epistemological assumptions underpinning contemporary thinking around mental health treatment in various post-colonial African settings, including Nigeria. She is investigating psychiatric research on the uptake of mental health care in sub-Saharan Africa, country-specific and pan-African mental health politics, and is conducting interviews with psychiatrists in public mental health care provision.
Support our work

The London School of Hygiene & Tropical Medicine’s work in west and central Africa is only possible thanks to the generous support of funders who share our commitment to improving health worldwide. Gifts from individuals and institutions make all the difference in making sure good ideas become good policy and practice. We hope you will join us in contributing to a healthy future for Africa.

For more information about supporting our work, please contact:

William Friar
Head of Development
London School of Hygiene & Tropical Medicine
Keppel Street
London WC1E 7HT
Tel. +44 (0)20 7927 2630
Email william.friar@lshtm.ac.uk