



# ANNUAL REPORT 2010/11

RESEARCHING AND EDUCATING TO SAVE LIVES

**LSTM**  
LIVERPOOL SCHOOL  
OF TROPICAL MEDICINE



# MISSION STATEMENT

As a centre of excellence, Liverpool School of Tropical Medicine, through the creation of effective links with governments, organisations and institutions and by responding to the health needs of communities, aims to promote improved health, particularly for people of the less developed countries in the tropics and sub-tropics by:

1. providing and promoting high quality education and training;
2. conducting first-class research and disseminating the result of that research;
3. developing systems and technologies for health care and assisting in their transfer and management;
4. providing appropriate consultancy services.

In fulfilling this mission LSTM also provides a clinical service of acknowledged excellence.



**Front cover:** On the shoreline of Lake Albert, a mother with young child collects domestic water. Although this young child is not directly exposed to the schistosome larvae, this photo typifies that the jerry-can water will be later used back at their homestead for bathing. In this lakeshore setting, over 50% of children under the age of 3 have patent intestinal schistosomiasis yet are presently overlooked within treatment campaigns. WHO treatment guidelines are now being revised to cater for this treatment gap within this paediatric setting.



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# CHAIRMAN'S FOREWORD

"LSTM continues to thrive despite the turbulent economic, financial and political times we are living through."

To be invited to add your name to the Fellowship books started by Sir Isaac Newton and President Abraham Lincoln may be a humbling experience; but that Professor Janet Hemingway was recognised as both a Fellow of the Royal Society and an overseas fellow of the US National Academy of Sciences in the same month is an extraordinary tribute to her personal contribution in her chosen field, as well as a rare acknowledgement of her leadership of LSTM.

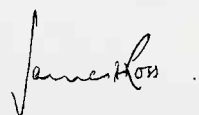
Under her guidance, LSTM continues to thrive despite the turbulent economic, financial and political times we are living through. LSTM is not immune from the

effects of such discontinuities: thus our activities in South Sudan and Syria are subject to considerable uncertainty and at home the shape and financing of higher education pose very real issues about precisely how LSTM will continue to make its unique contribution.

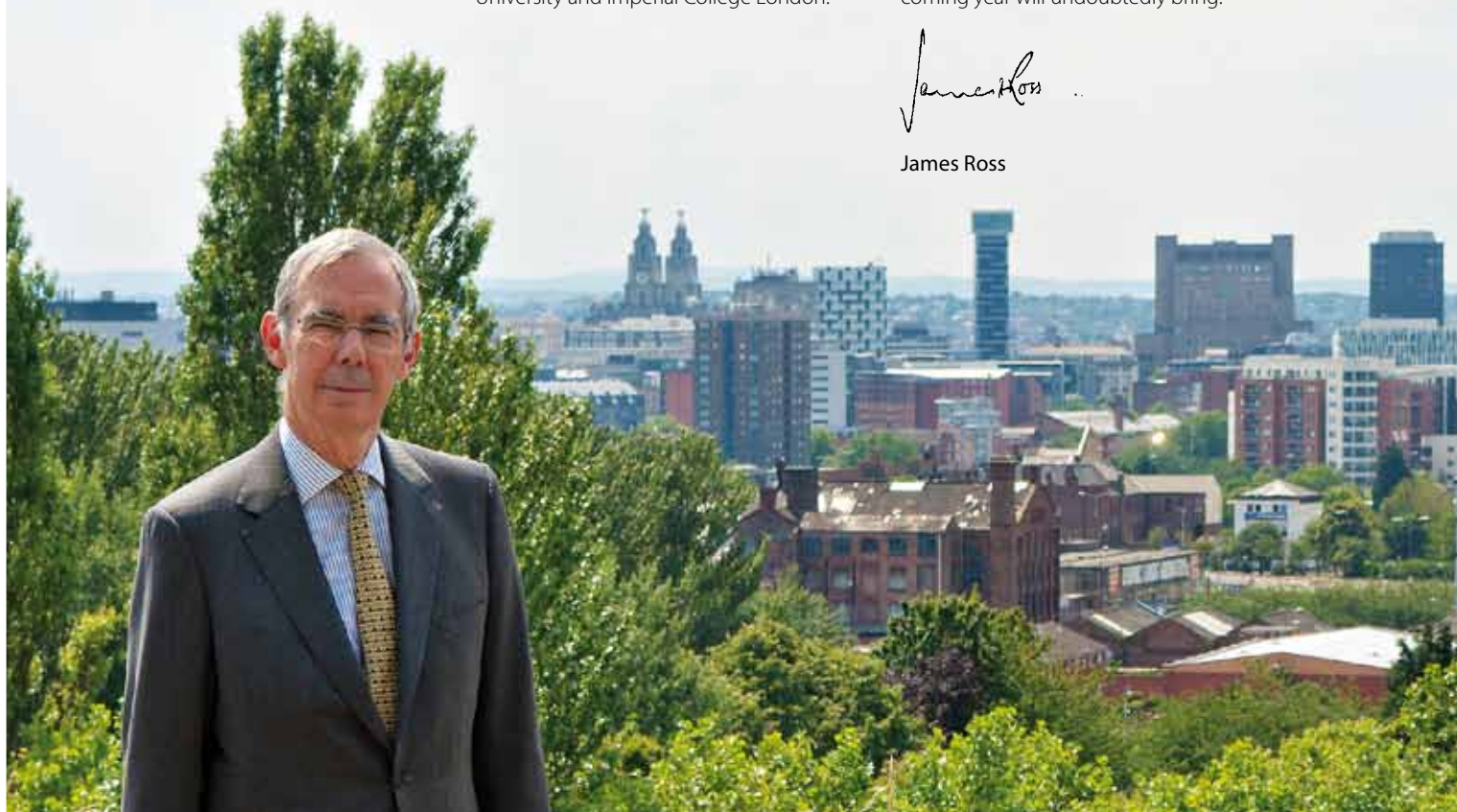
However, such challenges are a stimulus to innovative approaches and LSTM should benefit in the long term from the increased emphasis on the translation of research excellence into real impact on policy and practice out in the field. LSTM will make its growing impact by continuing to work in partnership with other strong players, by maintaining the special relationship with the University of Liverpool and by seeking multiple strategic alliances with such partners as Warwick University and Imperial College London.

Meanwhile LSTM continues to make demonstrable progress. Research funding in total and per full-time academic staff member stand at record highs. Our Patron, the Princess Royal, presided over an event at the Royal Society marking a joint venture with the Kingdom of Saudi Arabia to grow a regional centre in the Middle East. The physical fabric of the Liverpool base is being further improved with completion of the refurbishment of the 3rd floor and the opening of the Herpetarium; the freehold of the old building was acquired from Liverpool University.

With another successful year under our belts, thanks to the hard and effective work of all colleagues and stakeholders (including retiring trustee David Greensmith), we look forward to the challenges which the coming year will undoubtedly bring.



James Ross



# DIRECTOR'S REPORT

“We continue to expand our links with industry in developing new products for malaria, dengue, TB and pneumococcal disease.”

This year has seen the higher education sector gearing up to deal with the most radical changes to its funding in living memory. Direct government support for UK and EU undergraduate students will largely be replaced by increased student loans. The impact of this on post-graduate student numbers, and what, if any, government support will be retained for Masters students is currently unclear. It is, however, likely to accelerate the trend away from UK-based training as higher education institutions seek to establish robust partnerships with global brands. The School is currently looking carefully at how it positions itself in this rapidly changing landscape.

LSTM's research effort remains robust despite the economic downturn and increasing competition for funding. Our research grants and contracts currently stand at £210 million; an historic high and a testament to the relevance of the research undertaken by our staff. We continue to expand our links with industry in developing new products for malaria, dengue, TB and pneumococcal disease. A welcome expansion this year is the funding of a strategic award from the MRC for new TB drug development, extending work that was started under the NHS Biomedical Research Centre programme with the Royal Liverpool and Broadgreen University Hospital Trust. It is notable that the level of research activity per full-time academic staff member in LSTM stands at £760,000 per person per annum; this is higher than in any other UK institution.

Over the course of this year it is essential that we work with the Higher Education Funding Council for England and our other academic partners to ensure that this achievement is properly recognised in the new REF assessments that will be implemented in 2013.

I would personally like to take this opportunity to thank all our stakeholders for their continued support and look forward to working with you as we continue to develop our activities in operational and implementation research to ensure that the research undertaken by LSTM truly does impact on policy and practice to improve health in the tropics in line with our mission.



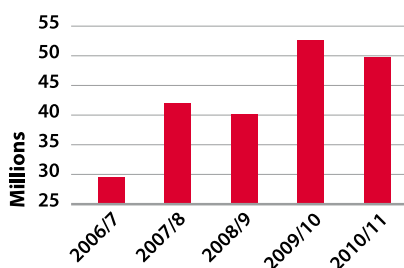
Janet Hemingway



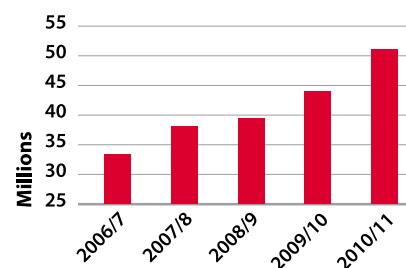
# TREASURER'S REPORT



## TOTAL INCOME



## NET ASSETS



The significant investment, in recent times, in people and facilities has given the School the platform to compete effectively on the world stage and is strongly contributing to a growing and satisfactory level of research grant funding. This is reflected in the financial results with a solid performance recorded in the year ended 31st July 2011, with Group income of £51.1m, leading to a surplus of £591k being added to the reserves.

Whilst income fell by £3m from the previous year (mainly due to timing differences on research programmes) expenditure, for the same reason, fell by a similar amount and the overall surplus was well ahead of the budgeted break-even scenario.

As mentioned elsewhere in this Report, LSTM intends to continue its expansion programme and it is worthwhile, therefore, to briefly reflect on the financial record of the last five years to show the effects of past investment and how far the organisation has come in a relatively short space of time:

- Income has almost doubled over the five year period and, having gone through a short period, when the grants from the Bill and Melinda Gates Foundation represented a particularly high percentage of the overall revenue, income is now well spread and, consequently, less vulnerable to the withdrawal of any one line of funding.
- The balance sheet has improved dramatically by virtue of retained surpluses and an inflow of capital and research grants.
- The Group is in the strong position of having no external borrowings and now owns all its property, having completed a freehold acquisition earlier this year. Net Assets have grown from £33m in 2007 to £51m.

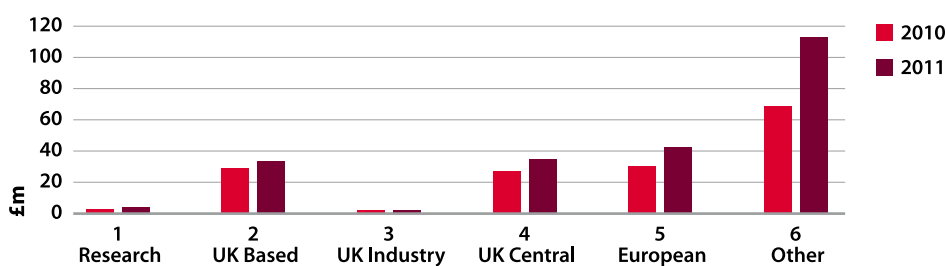
- In 2007, the total of active research grants stood at £103m but today that figure is more than doubled and exceeds £220m. Strong relationships with existing funders, coupled with the acquisition of new awards, have increased the grants portfolio by £61m in the past 12 months alone, an impressive 38% year on year uplift.
- The Innovative Vector Control Consortium is fully established, and this wholly owned subsidiary, which was initially established as a vehicle for Gates Foundation projects, is now receiving funding from a range of donors.

On the basis of this evidence, the decision to embark on the large investment has been fully vindicated and the School has achieved its objectives.

Notwithstanding this excellent progress, many challenges remain.

On the teaching front, the reduction in Higher Education Funding Council Grants has reduced income by £300k and in the very near future we will start to see the impact of the changing funding methodology for EU students. The drive to recruit quality overseas students continues apace and will hopefully soften any reduction in the numbers of home students.

## ACTIVE RESEARCH GRANTS



A subsidiary company, Liverpool Associates in Tropical Health, after many years of good performance, has suffered lately from erosion of margins and has struggled to win new contracts at economic levels of remuneration. Cost cutting exercises have been undertaken and the business is steadily being assimilated into the parent company.

Another subsidiary, Well Travelled Clinics, has also faced difficult times as the overseas travel market has come under pressure due to the general economic malaise. The plan to expand this business to achieve better margins is still being pursued but much depends on external factors and the forthcoming 12 months will be key to its future as a viable commercial enterprise.

The School's total investment in these two subsidiaries is less than £1.4m.

Another constant challenge is in respect of protecting and increasing the School's investment portfolio. With world financial markets in a turbulent state the value of the portfolio has fluctuated to a greater degree than we would like, despite a prudent approach to its management. We look forward to a day when reasonable stability returns.

Despite all of these issues, LSTM remains in a very healthy state and is well positioned for the future.

# VICE PRESIDENTS' PROFILES



## PROFESSOR SIR DAVID WEATHERALL

Sir David has had a close relationship with the School since 1965, and was delighted when he was asked to become a Vice President.

He became fascinated with tropical medicine and in particular, with common inherited blood diseases during the period of his national service in Malaya. This then led him to John Hopkins University in America, where he trained for another five years learning more about haematology, genetics and molecular biology. On his return to Liverpool in 1965 he established a haematology department at the Royal Infirmary while delivering lectures at the School for its course on tropical medicine.

In 1974, Sir David was appointed Nuffield Professor of Clinical Medicine at the University of Oxford where he established a number of overseas programmes in tropical medicine as well as a Tropical Medicine Day which has been running for over 30 years. He is currently Regius Professor of Medicine Emeritus at the University of Oxford and Chancellor of Keele University.

Sir David is especially impressed by the School's diverse areas of research. "I think the greatest strength of the School is the diversity of its expertise ranging from extremely strong parasitology, through good basic science to clinical application in the field."

"There is no doubt that the School has had an enormous influence on the development of global health, not in the least through its superb work in Africa over recent years. The School is clearly flourishing under its current leadership and it gives me enormous pleasure to be able to maintain my longstanding attachment to it."



## JANE NEWELL

Jane is immensely proud to have been associated with LSTM for nearly 30 years. Prior to this, Jane spent ten years working for the World Health Organization in Geneva, as an assistant to the Assistant Director General of China. After graduating with a First Class honours degree from Victoria University of Wellington, she and her husband returned to Liverpool where she worked at LSTM for eight years as the School's administrator and fundraiser. Later, Jane joined the School's Council, and was the Chair of Council from 1994-1996 and was then elected as a Vice President in 1997. She received an OBE for her work in connection with the Maxwell Pensioners' Trust in 1997 and an Honorary Doctor of Laws in 2008.

Jane is currently well known for being the independent Chair of the Royal Mail Pensions Plan and is one of the most experienced pension experts in the UK. She has many additional roles, including Trustee of Age UK, a Justice of the Peace and a Governor of the Pensions Policy Institute and is able to bring into play a wide range of skills to assist LSTM in fulfilling its mission.

"In the time I have worked here I have seen so many changes, however, what has remained constant throughout is the School's reputation for excellence in research and teaching in Tropical Medicine." In particular, Jane praises Professor Janet Hemingway's outstanding leadership in allowing the School to grow both physically and financially.

Looking into the future, she sees the challenges will be "to consolidate the expansion and to continue to recruit the health and development leaders of tomorrow".



## NICHOLAS BARING

Nicholas counts himself fortunate to have been able to pursue "so many diverse interests", both within his merchant banking career and outside of it. It was after his graduation from Cambridge with a Bachelor of Arts, that he spent a year in Kenya in 1957; an experience which made Nicholas acutely aware of the importance of medicine in the development of tropical countries. Upon returning to England he became involved in merchant banking, serving as a Managing Director and subsequently Deputy Chairman of Barings from 1963 to 1990.

It was his banking connections which first brought Nicholas knowledge of LSTM: through Barings' agency in Liverpool, which for more than 100 years was the bank's only office outside London, and through his professional and personal relationship with Philip Toosey, LSTM President and Baring associate in Merseyside. A joint venture was established with Barings in Nigeria, where Nicholas met Professor Herbert Gilles who arranged the opportunity for Nicholas and his wife to see LSTM staff at work in the field. This was to be "an inspiring experience", and led to his continued interest in the School, supported by a series of grants from the Baring Foundation. This mutual respect and collaboration culminated in Nicholas being invited to become a Vice President in 1992, and President from 1989 to 1996.

"The School has developed from its initial foundation to an institution with a worldwide reputation, much enhanced under the dynamic leadership of the present Director. I am proud to have been involved at the margin of this process, and look forward with confidence to the School's continued progress in a changing world."



# INSECTICIDE RESISTANCE

*From bench to policy*

In Africa there are a number of species that transmit malaria – the mosquitoes *Anopheles gambiae* and *Anopheles funestus* are the most devastating vectors.



To achieve its mission of improving health in the tropics, LSTM's research activities need to impact on its ability to prevent or treat major diseases.

The environment and associated ecological factors where prevention and treatment of insect-borne disease are undertaken is variable in space and time, and practitioners need to be equipped with appropriate and cost-effective tools for monitoring and evaluating interventions aimed at reducing disease. The insecticide resistance programme at LSTM is a good example of a multi-faceted cutting edge research programme that has had a demonstrable impact on operational malaria, filariasis and dengue control programme activities worldwide. The tools and technologies developed by the programme have contributed to the evidence base that is now driving a change in policy and practice. The impact of this work on malaria control in Africa is depicted in the diagram below.

#### CUTTING EDGE RESEARCH

In order to monitor and manage insecticide resistance a number of key questions need to be answered. These include:

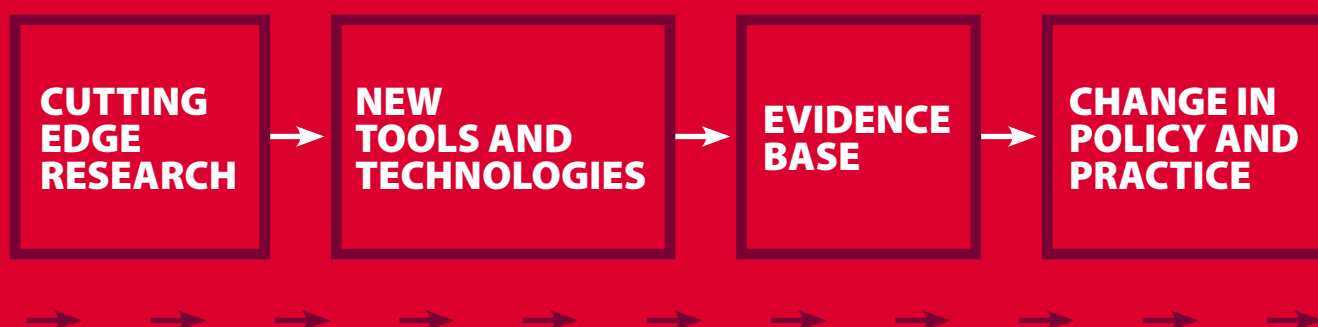
- What species is the resistance being selected in?

- What type of resistance is being selected?
- What is the frequency of the resistance?
- Does the resistance reduce the efficacy of the intervention being used?
- What steps can be put in place to reduce the rate at which resistance is selected or reduce the impact of the resistance that has already been selected?

In Africa there are a number of species that transmit malaria – the mosquitoes *Anopheles gambiae* and *Anopheles funestus* are the most devastating vectors, but until recently resistance was only monitored in *An. gambiae*, due to the lack of molecular tools for and inability to colonise *An. funestus*. With collaborators from Africa LSTM researchers have overcome both of these hurdles. This has allowed a whole genome based molecular approach to answer the question of what resistance has been selected in *An. gambiae* and *An. funestus* in numerous locations in Africa. Population genetic approaches have also been used to assess whether resistance has arisen at a single location and spread or has arisen multiple times in different locations.

#### NEW TOOLS AND TECHNOLOGIES

High tech genomic approaches, while appropriate for the laboratory, need to be simplified and made available for general screening of field populations of mosquitoes. Simple PCR based assays have been generated that allow field based workers to rapidly assess the resistance in populations of both species. Work is currently underway to try and simplify these platforms further to make them more readily accessible for use by national control programmes. A range of manuals have been published which will allow individuals to customise kits to monitor for species, infection rates and insecticide resistance in field collections of mosquitoes and the utility of these has been assessed in a number of locations.



# INSECTICIDE RESISTANCE

*From bench to policy*

## CREATING AN EVIDENCE BASE FOR POLICY CHANGE

A number of networks have been established to monitor the type and frequency of resistance that currently occurs in African vectors of disease. These include the Special Programme for Research and Training in Tropical Disease funded network, programmes sponsored by the Wellcome Trust and National Institute of Health, operational technical assistance work through United States Agency for International Development and Medical Care Development International/Marathon Oil. These activities have enabled large scale resistance monitoring in multiple locations in 24 countries throughout Africa. In addition to field based activities LSTM has also worked with other resistance networks, such as African Network on Vector Resistance to share data and technologies and VectorBase to develop an open access Insecticide Resistance Database of published insecticide resistance data. This recently culminated in a review of pyrethroid resistance in Africa, mapping the extent and type of resistance in both *An. gambiae* and *An. funestus*, commissioned by the World Health Organization which is now widely cited.

The next major step is to demonstrate what impact this resistance has on disease transmission and what actions can effectively be taken to mitigate the impact of resistance. The Liverpool based resistance group and its collaborators in Mexico already undertook the only large scale operational resistance management assessment of rotations or mosaics for indoor residual spraying. This work sponsored by the Industrial

Insecticide Resistance Action Committee under the auspices of the WHO, resulted in the publication of guidelines for resistance management. Currently large scale evaluations are underway to assess the effectiveness of new bednets and insecticide impregnated wall linings in locations with different insecticide resistance backgrounds.

## POLICY AND PRACTICE

Insecticides are widely used for malaria prevention. Pyrethroids are used in insecticide treated bednets, which are distributed in mass campaigns aimed at universal coverage or at least providing sufficient nets for pregnant women and children to sleep under. Indoor residual spraying of houses with insecticide, again dominated by pyrethroids is also widely used. Largely due to the growing evidence base that pyrethroid resistance has been selected and is rapidly spreading throughout Africa, insecticide resistance management is now high on the agenda of bodies such as Roll Back Malaria, the Presidential Malaria Initiative and the Global Fund for Aids, TB and Malaria. The Global Fund now requires countries applying for funding to describe the insecticide resistance management strategy that they will undertake as part of their application. At individual country level, changes in insecticide use for indoor residual spraying have occurred in several countries including Mozambique, South Africa, Malawi and Equatorial Guinea on the basis of the in country resistance monitoring activities that our research programme has directly facilitated.

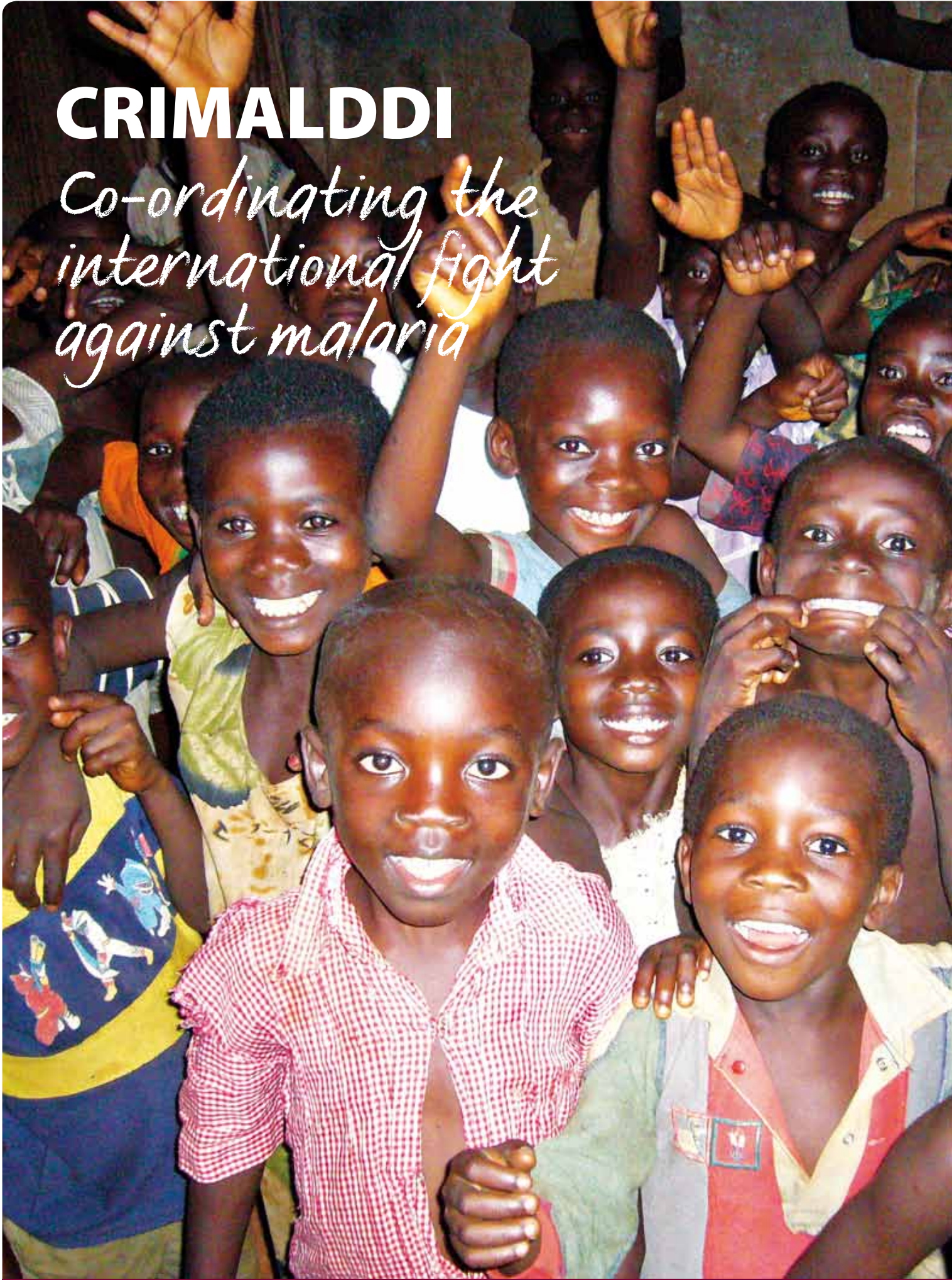




Insecticide resistance management is now high on the agenda, largely due to the growing evidence base that pyrethroid resistance has been selected and is rapidly spreading throughout Africa.

# CRIMALDDI

*Co-ordinating the international fight against malaria*





Today, half of the world's population is at risk of catching malaria. In 2008 the WHO estimated that there were about 250 million cases and 860,000 deaths due to malaria.

The world has taken up the challenge of malaria, not just to control this killer disease, but to eliminate it as a public health hazard in endemic countries and ultimately eradicate it. This will require a variety of tools and interventions, but new drugs will be a key part of the strategy to meet this ambitious goal, as drug resistance continues to be a major problem for treating the disease. Also, new drugs with different profiles to those used to control malaria will be needed to eliminate it.

CRIMALDDI (Co-ordination, Rationalisation and Integration of Antimalarial Drug Discovery and Development Initiatives) is a two year project funded by the European Commission to address the need for novel approaches to new drug discovery.

Professor Steve Ward, Deputy Director of the Liverpool School of Tropical Medicine and Scientific Co-ordinator of the CRIMALDDI project explained: "Novel drugs to prevent, treat and eventually eliminate malaria are desperately needed if we are to make an impact upon the millions needlessly dying from this disease each year. Antimalarial drug research and development programmes are

in operation across Europe and throughout the world, but too often these initiatives are not co-ordinated and time and money is spent going over old ground."

There is an urgent need, in light of the renewed global attention to malaria, to bring drug research and development into a co-ordinated and integrated plan to support the Global Malaria Action Plan. The CRIMALDDI Consortium has been set up to develop and publicise such an integrated and prioritised roadmap and an associated 5-year action plan for the discovery of new antimalarial drugs. It is planned that this will form the basis of the R&D agenda for antimalarial drugs in Europe.

Dr Timothy N C Wells, Chief Scientific Officer for the Medicines for Malaria Venture, said "CRIMALDDI is an important initiative. Its goal of bringing together researchers to optimise the ongoing projects makes sense. We believe that improved communication is key to sharing best practices and speeding the development of new medicines. The European Commission has led this with their AntiMal programme, and this is an important next step."

Antimalarial Drug Discovery  
**CRIMALDDI**  
 Coordination, Rationalisation, Integration

Left to right: Dr Ian Bathurst; Dr Andreas Holtel; Professor Michael Lanzer; Professor Donatella Taramelli; Dr Henri Vial; Professor Steve Ward; Mr Ian Boulton; Dr Cecilia Sanchez; Professor Christian Doerig; Dr Foluke Ayoyinka-Olusegun



## CRIMALDDI

*Co-ordinating the international fight against malaria*

Commenting on the project, Professor Ward said: “Co-ordinating research will mean that resources are better directed towards the faster discovery and development of new drugs to treat and eliminate malaria. We will look at the global status of antimalarial drug discovery and use that information to ensure that the research agenda for antimalarials in Europe over the next decade is properly aligned with what’s going on elsewhere.”

With this in mind, CRIMALDDI was set up to:

- Gather information on the current antimalarial drug development initiatives worldwide and on the current needs and future research and funding plans
- Identify research gaps, areas of duplication, funding opportunities and to present findings to the community and the funding bodies
- Produce a co-ordinated action plan for future research programmes and to present findings to the community and the funding bodies
- Propose the European antimalarial research agenda for the next decade by the implementation of aspects of the action plan

- Contribute to the debate on setting the global antimalarial research agenda for the next 10 years

The CRIMALDDI Consortium ran a series of meetings, conferences and workshops involving some 100 members of the international malaria community (from both academia and the private sector), where CRIMALDDI was able to identify a short-list of priorities that must be supported in order to deliver the next generation of antimalarial drugs, be they for control or eradication. These include funding priorities around:

- Attacking artemisinin resistance
- Delivering enabling technologies
- Identification of novel drug targets
- International communication and collaboration
- Rapid exploitation of high throughput screening hits

From this prioritised list, a roadmap and an associated 5-year action plan for the discovery of new antimalarial drugs has been developed ([www.crimalddi.eu](http://www.crimalddi.eu)). It is planned that this will form the

basis of the R&D agenda for antimalarial drugs worldwide.

LSTM’s mission of improving health in the tropics means its research activities need to impact on the ability to prevent or treat major diseases, and malaria is undoubtedly the biggest major tropical disease. LSTM’s association and co-operation with CRIMALDDI means that by utilising the vast wealth of international assistance and knowledge, as well as the experience and technologies of the private sector, LSTM can significantly contribute to the world-wide fight against malaria. At the same time, LSTM’s mission of improving health for people in the tropics is fulfilled. LSTM is a school with a burgeoning international reputation; a school which recognises that in order to fight malaria, a global effort is required. It is for this reason that CRIMALDDI is not the only consortium with which the School is affiliated.

CRIMALDDI is co-ordinated by LSTM’s Professor Steve Ward and managed by Susan Jones and Tracy Seddon. You can learn more about the Consortium and its work at [www.crimalddi.eu](http://www.crimalddi.eu).



Professor Steve Ward

## MEMBERS OF THE CRIMALDDI CONSORTIUM ARE:

- **Liverpool School of Tropical Medicine** – UK
- **WHO/TDR** – Switzerland
- **Medicines for Malaria Venture** – Switzerland
- **University of Heidelberg** – Germany
- **University of Milan** – Italy
- **Centre National de la Recherche Scientifique** – France
- **The Research Programme of INSERM** – Switzerland
- **University of Cape Town** – South Africa
- **University of Buea** – Cameroon

## OTHER LARGE SCALE CONSORTIA ASSOCIATED WITH LSTM:

### AvecNet

A collaborative project between African and European Researchers to develop and evaluate new tools for malaria control in Africa.

### ReBUILD

Tim Martineau, Sally Theobald and partners in the University of Edinburgh are developing ReBUILD – research for the building of pro-poor health systems during recovery from conflict – a successful grant application with DfID for £6 million over six years.

### Health Education and Community Integration

Dr Angela Obasi's EU funded programme, Health Education and Community Integration – evidence based strategies to increase equity, integration and effectiveness of reproductive health services for poor communities in sub-Saharan Africa.

### IVCC Programme

Established as a non-profit company and registered charity to overcome the barriers to innovation in the development of new insecticides for public health vector control and to develop information systems and tools which will enable new and existing pesticides to be used more effectively.

### A-WOL Programme

Funded by the Bill and Melinda Gates Foundation, the aim of the A-WOL programme is to develop new treatments against *Wolbachia*

– a bacterial endosymbiont of filarial nematodes responsible for onchocerciasis (river blindness) and lymphatic filariasis (elephantiasis).

### The Make It Happen Programme

The programme's overall goal is to contribute to a reduction in maternal and newborn mortality and morbidity in selected priority countries from which requests for assistance have been received (to date these are Sierra Leone, Kenya, Bangladesh, Zimbabwe and India).

### The Cochrane Reviews

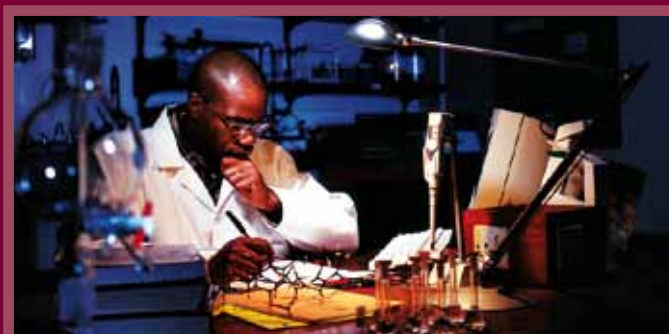
Systematic reviews of primary research in human health care and health policy. The reviews are internationally recognised as the highest standard in evidence-based health care. They investigate the effects of interventions for prevention, treatment and rehabilitation.

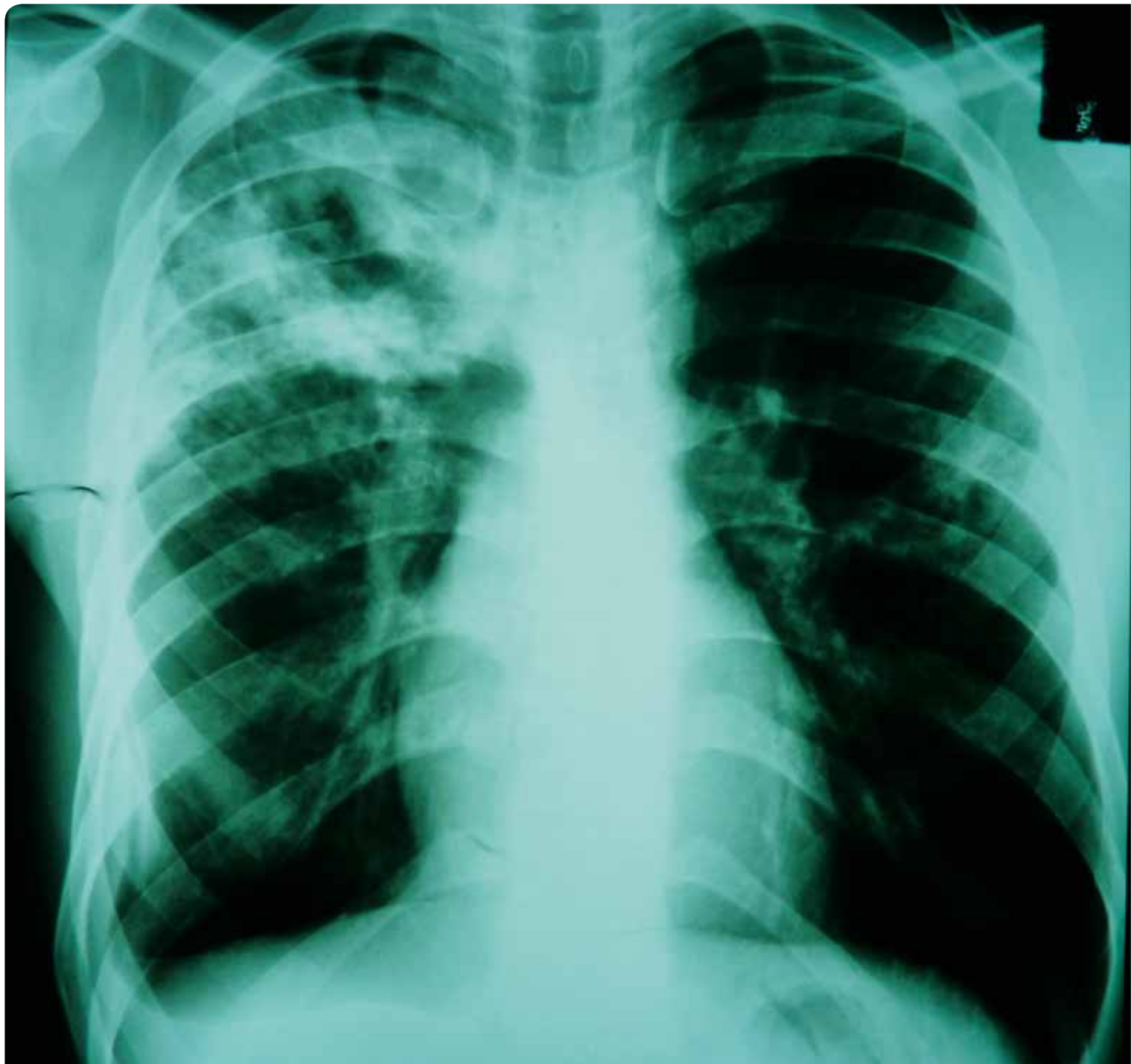
### AntiMal

An integrated project comprising leading groups of researchers with expertise in malaria biology, chemotherapy and drug development. The aim is to exploit new scientific opportunities to secure the development of a portfolio of viable novel antimalarial drugs.

### ARTEMIP

An EU funded collaborative project to investigate the safety pharmacology of artemisinin-based drugs in pregnancy.





# RESPIRATORY HEALTH

*Breathing life into  
new research*

Our current priorities in Respiratory Health are Tuberculosis, Pneumonia and Household Air Pollution.



## TUBERCULOSIS

Liverpool TB Research Group (LIV-TB) is a new research grouping between LSTM and the University of Liverpool which focuses on a wide range of TB research and brings a number of research disciplines together.

TB is a global disease, transmitted by aerosol droplets from patients with active disease, and we strongly believe that better TB control in the developing countries in the tropics worst affected by the disease will be critical to controlling TB cases globally. According to the most recent estimates, tuberculosis killed 1.7 million people in 2009, which is approximately one death every 20 seconds. There are many challenges for health systems in improving TB control, these fall into two broad categories: identifying sufficient numbers of people with TB early enough in the disease process, especially the most infectious cases and treating people with TB effectively and safely, including those with drug resistant diseases, and those with co-morbidities such as HIV and diabetes.

LIV-TB aims to cover all elements of the research pathway, from basic research to policy and practice as shown in the diagram below – with a focus on diagnosis and treatment.



## Drug Development

Treatment for TB relies on drugs developed some 40 years ago. Unfortunately these are only effective in long treatment regimens over a period of 6-9 months and often they do not work due to the ability of the TB bacillus to develop resistance. Using a novel strategy that targets an essential component of the respiratory chain, which is an enzyme known as menaquinone: oxidoreductase, Giancarlo Biagini (with team members including Professors Ward and O'Neill) is developing a new drug that will be able to kill all of the TB bacilli quickly, including those that are resistant. This enzyme is required by the bacilli irrespective of whether it is resting in its dormant state or actively replicating. To develop this drug Giancarlo has partnered with industry (GlaxoSmithKline pharmaceuticals) and will use industry-like development and management methods. Giancarlo has just secured MRC DPFS funding of £1 million to further develop this drug which they hope to be able to take into Phase I clinical trials in the next 3 years.

## Better Diagnosis Now

The diagnosis of TB has relied on a technique known as sputum smear microscopy for almost 100 years. This has also required patients to attend health facilities on a number of occasions over a period of several days in order to submit three sputum specimens.

Researchers have been working on two key studies to overcome this issue, led by Luis Cuevas of LSTM, these studies have important implications for the way in which screening for TB can be done in poor countries. One study suggests that fewer sputum tests are needed and the other suggests that a simple new laboratory

test can be used while maintaining the same level of accuracy for the diagnosis of tuberculosis. Both of these studies show how better tests are also more convenient for patients.

## Future Diagnosis Improvement

The World Health Organization endorsed the first automated molecular test for TB (Xpert MTB/RIF) in December 2010. LSTM's Collaboration for Research on Equity and Systems in TB and HIV-AIDS (CRESTHA) team have been engaged in high level, international debate about the kind of evidence needed to inform, if, how and when to adopt and scale up new TB diagnostics. This cutting edge thinking has been framed within LSTM's vital participation in a large international research consortium: Technology, Research, Education and Technical assistance for Tuberculosis (TREAT-TB), led by the International Union Against TB & Lung Disease and funded by the United States Agency for International Development.

Through an EU FP7 IML award, Biagini and the TB team will also be looking to develop a laboratory test that is better at predicting the clinical outcome of new drugs. This project will make use of a recently purchased High Content Imaging System, known as Operetta, that allows us to see the TB bacillus inside human cells called macrophages responding to drug challenge.

## Delivering the Message

CRESTHA is engaged in testing two community-based interventions aimed to promote early diagnosis of TB in poor communities. In Malawi and Sudan shop owners and youth groups, have been engaged through a simple health education tool to identify people with



National Tuberculosis Programme, Khartoum, Sudan



TB Culture Slopes, National TB Reference Laboratory, Malawi

# RESPIRATORY HEALTH

*Breathing life into new research*

chronic coughs and refer to diagnosis facilities. In both Malawi and Khartoum, the approach is being rolled out and routine data is being collected on numbers of patients starting TB therapy. Randomly assigned areas where the intervention is not yet being rolled out are acting as controls. This work is supported by the Norwegian Heart and Lung Patient Association and includes substantial components of capacity development within two local Research Non Governmental Organisations; Research for Equity and Community Health Trust in Malawi and The Epidemiological Laboratory in Sudan.

## PNEUMONIA

Pneumonia kills more children under five than any other disease globally and is most commonly caused by a bacterium known as the pneumococcus, which can cause invasive and non-invasive disease. Invasive pneumococcal disease (IPD) includes septicaemia, pneumonia and meningitis. IPD is a major cause of morbidity and mortality both globally and in the UK and the Pneumonia team at LSTM are concentrating on diagnosis, vaccine discovery and new treatments with the aim for the future, to construct a full discovery pathway similar to that for Tuberculosis.

## Vaccine Discovery

This year an Experimental Human Pneumococcal Carriage model was developed as a Gates Grand Challenge Exploration project. This experiment was set up for three major applications: as an immunological probe of mucosal immunity in the upper and lower airway; a mucosal vaccine model and a potential surrogate of protection for testing novel protein vaccines. This project was able to demonstrate in humans for the first time, that the nasal carriage is an immunizing event in the lung and confirmed the accuracy of nasal washing with PCR based methods of bacterial detection. The team is currently analyzing immunological data

and has already established important links with PATH and several vaccine development groups who lead in the development of protein vaccines against pneumococcus.

## New Treatment in Pneumonia

Pneumonia treatment needs new adjuvant (helping) therapy to add to current antibiotic strategy. The LSTM partnership with Centers for Disease Control and Prevention, Atlanta, has flourished and has now developed work on a short protein, the P4 peptide, to show an activating effect in human lung cells consistent with increased protection against pneumonia. The plan now is to study this effect in both lung cells and blood phagocytes from patients with sepsis and pneumonia. Further, patients with pneumonia in University Hospital Aintree and in Blantyre Malawi are being recruited to determine the effect of P4 on patient samples.

## Understanding the Causes of Pneumonia

Modern molecular techniques to determine the microbiota of acutely ill and convalescent patients are being utilised. This data will be correlated with clinical information and macrophage efferocytosis experiments to determine further new methods of increasing the speed of recovery with particular focus on new treatments that will augment the body's natural defence against pneumococcal infections.

## Engagement with the NHS, Patients and the Public

The Respiratory team work closely with the Royal Liverpool University Hospital (RLUH) in the National Institute for Health and Research (NIHR), Biomedical Research Centre. Part of this work has included public engagement and projects related to this work have formed the focus of artwork which has been on display in the World Museum, Liverpool. Further, the poster prize was again won by the team at the Clinical Research Facility in the RLUH.



TB referral posters on display at a youth centre in Sudan



Religious leader engaged in identifying and referring people with symptoms suggestive of TB, Khartoum, Sudan



Household air pollution from solid fuels



Professor S Gordon, Ward round, Malawi



Laboratory research, LSTM

### HOUSEHOLD AIR POLLUTION FROM SOLID FUELS

In the last year, attempts to address the global disease burden from the burning of biomass fuels (wood, charcoal, dung etc) gained momentum with the creation of the Global Alliance for Clean Cookstoves (GACC). GACC was launched in September 2010 by the US Secretary of State, Hilary Clinton, and members of the Respiratory Health Group at LSTM are contributing to the Health Working Group of GACC. This Group has the vision to achieve the global will and commitment necessary to transform clean cookstoves into a worldwide health priority in order to significantly reduce mortality and morbidity from household air pollution, especially among poor and vulnerable households.

Work by Duncan Fullerton and collaborators measured the smoke levels in rural and urban homes in Malawi and demonstrated that exposures in Malawi are dangerously high. Research at LSTM has also shown that lung function is impaired by different types of fuel, especially wood, and more recently in the laboratories of the Malawi-Liverpool-Wellcome Trust Research Programme in Blantyre, it has been demonstrated that lung cells from Malawian individuals that are exposed to biomass fuel smoke are less able to kill the organisms that cause pneumonia. Further, Jamie Rylance (Wellcome Trust Clinical PhD) has shown that alveolar macrophages exposed *in vivo* seem less able to mount an oxidative burst response.

Members of the Respiratory Health Group are studying the effect of biomass fuel smoke on alveolar macrophage function, by challenging these cells *in vitro* with smoke particles derived from biomass from Malawi and other countries. A way of mimicking alveolar macrophage exposure to smoke particulates in the laboratory has been established, by adding smoke

particles to macrophages in culture. Using these methods the Group are beginning to unravel the mechanisms by which biomass fuel smoke increases the susceptibility to respiratory infections. In the last year the Group has shown that phagocytosis of pneumococcal organisms is impaired by wood smoke but that tuberculosis does not seem to be affected in the same way.

Future work is needed. There is now a global momentum to begin clinical trials of clean cookstoves to assess the impact that these stoves have on different health outcomes especially the prevalence of pneumonia, low birth weight and mortality. This work is given additional urgency by the potential of low-energy stoves to effect climate change mitigation benefit. All work on household air pollution must be supported by developing suitable biomarkers of exposure and by laboratory studies on the mechanisms of disease, particularly on the susceptibility to infections such as tuberculosis, pneumonia and the interaction with HIV.

The Respiratory Health team at LSTM will continue to focus on research that benefits the health of the poorest people: by studies in the field, laboratory models of these field observations and finally clinical trials of the needed diagnostics, treatments and preventive measures.



Global communities understand the need to move research findings from academia into tangible products and practice that make a difference to enhancing the health status of relevant communities, and the School's history and standing make it uniquely placed to contribute to this global agenda.

# CENTRE FOR APPLIED HEALTH RESEARCH AND DELIVERY



### CRACKING THE CODE: TIME TO GEAR UP PUBLIC HEALTH

New technologies are revolutionising our world, particularly in middle and low income countries. New drugs and diagnostic tests, strategies for disease control, as well as information and communication systems complete with tele-medicine and remote-working, are revolutionising health care. The challenge for the future is implementing and using these technologies effectively on an international scale and especially for poor and vulnerable populations in developing countries. As LSTM moves forward in cutting edge laboratory science, the science and

expertise in the delivery of these products is undergoing a major strategic push in a new centre for innovative implementation research and practice. This new LSTM Centre, known as the Centre for Applied Health Research and Delivery, aims to put together unique expertise to valiantly crack some current and emerging public health issues, and to deliver what we know best.

### NEW EXPANSION

With the Centre for Tropical and Infectious Diseases being established in 2008, phase I of LSTM's expansion is behind us. In achieving the goal of world-wide recognition as the

premier European institution in tropical international health research, education and delivery, we plan a second development on applying tools and knowledge into existing systems, with an emphasis on programme implementation and support to better influence policy and transform practice. Global communities understand the need to move research findings from academia into tangible products and practice that make a difference to enhancing the health status of relevant communities, and the School's history and standing make it uniquely placed to contribute to this global agenda.

# CENTRE FOR APPLIED HEALTH RESEARCH AND DELIVERY



## STAFF ENGAGEMENT

To date, a series of meetings with key staff have highlighted key strategic strengths in the School. These meetings identified the operational scope of the initiative, building on existing strengths in health services research and informed local (as well as global) decision making. It was agreed that we should build the portfolio upon public policy and administration; with the backdrop of this contributing to the development of excellence in research and delivery capacity with our partners. Staff have analysed the gaps of where we need to get to and the strategic areas for development, helping generate clear direction for future senior staff recruitment in key areas. The emerging need to integrate technical assistance into the science and activities of senior staff is well recognised, and this provides the platform.

With research, the key backbone of this new Centre, this planned development brings together disciplinary working, blurring the margins between teaching, technical assistance and formal embedded training programmes, yet with each of these receiving equal representation. We hope this can contribute greatly to capacity development within countries.

## GLOBAL CHALLENGES

The world faces some substantial global challenges, and the health sector will need to respond. Indeed, the world needs new technologies as challenges emerge daily – whether it is drought, changing patterns of disease, or just increased demand from the public for better standards of living. Yet, despite rising expectations, the way we do things will have to change. Climate change is having a dramatic impact on food security: influencing disease patterns and causing often unpredictable health and security emergencies. The massive demands on raw materials including carbon fuels is having widespread consequences too, not least as fuel prices climb, so do transport and food costs, having massive implications in developing countries, particularly for the poor. On top of this, better health means disease patterns are changing as people live longer, which fundamentally challenges the resource base for financing care, and how it is organised.

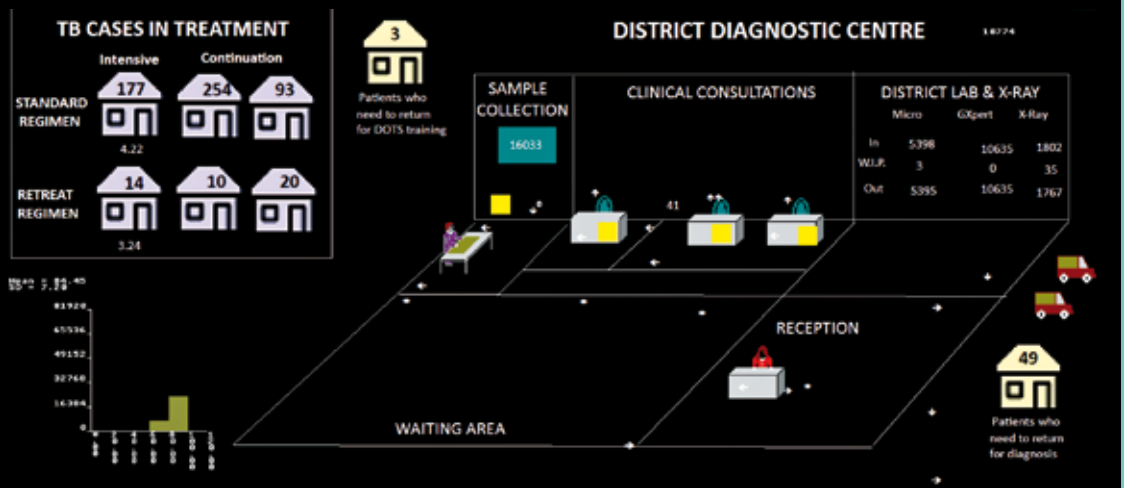
For many years, the health work force has concentrated on a few infectious diseases which don't last long – now there are whole populations in developing countries with emerging obesity, heart disease and diabetes.

How to organise care, train the work force, and finance the solution to these problems requires innovative thinking, good science, and a Centre embedded in global collaborative networks set to improve health outcomes.

Building on new technologies, looking at ways we can in partnership deliver what we know works, and tackling the new challenges is the starting point of the new Centre. Governments and donors need innovative approaches to address the health of the public in tropical and poor regions of the world. LSTM, with its strong track record in identifying key niche scientific areas, and tackling practical problems that make a difference on the ground, is moving this forward. The School's record in leadership and management of large consortia, as well as many years experience in programme management and technical assistance, put us in a unique position.

The bringing together of unique expertise in the strengthening and evaluation of health systems; setting standards through thorough evaluation of research evidence, human resource management and development of equitable health systems; combined with our strengths in tackling malaria, tuberculosis,

Modelling, as shown in this screen shot, is being used in the Treat-TB program to enable policy makers to evaluate alternative implementations of new and existing diagnostic technologies prior to and during scale-up. The models project the operational resource requirements, health and patient costs, patient outcomes, disease transmission impacts, and can be used for incremental cost-effectiveness analysis.





filariasis, HIV and other infectious diseases, provide us with a strong base. The history of postgraduate training and capacity development will be central to the Centre, which will include academics and staff with strong strategic management skills. Watch this space as we move forward over the next 3 years. The plans are in place, the collaborations being formed, and the development has started.

Professor Bertie Squire is leading the development of the new Centre for Applied Health Research and Delivery.



With research the key backbone of this new Centre, this planned development brings together disciplinary working, blurring the margins between teaching, technical assistance and formal embedded training programmes, yet with each of these receiving equal representation.

Professor Russell Stothard joins LSTM to continue his multi-disciplinary research and fieldwork on neglected tropical diseases, with his primary focus being on schistosomiasis. Alongside his molecular epidemiology team in Uganda and UK, they are working to improve the lives of children younger than school-age, by highlighting environmental management and better access to de-worming medications.



Schistosomiasis is a chronic parasitic disease and is particularly common throughout much of sub-Saharan Africa, as water hygiene and sanitation is poor. Detrimental effects of the disease are most keenly felt in school-aged children, but controlling infection in infants and pre-school children has unfortunately been overlooked. In intense disease transmission environments, children younger than school-age can sadly have overt schistosomiasis and are not presently targeted within control programmes. As Africa has sufficient funds, it is more straightforward for them to adopt school-based de-worming campaigns, treating tens of millions with praziquantel (an anthelmintic effective against flatworms).

#### NEW RESEARCH AND LONGITUDINAL SURVEYS

To address this oversight, up-to-date epidemiological information is required, using state-of-the-art field diagnostics and monitoring disease progression. The key questions include:

- What is the age of the first exposure and infection in pre-school children?

# SHEDDING NEW LIGHT ON SCHISTOSOMIASIS



- How effective is praziquantel in disease management?
- Does de-worming treatment(s) impact on other childhood diseases, such as malaria?
- What steps need to be taken to change WHO treatment guidelines?

With the extensive shoreline of the Great East African Lakes of Victoria and Albert in Uganda, the lakeside setting is one of the most conducive places in the world for transmission of intestinal schistosomiasis. As the disease can be particularly aggressive here, it causes chronic organ dysfunction, and abdominal bleeding, often precipitating the deaths of many adults and adolescents. To counter this, a national programme for control of schistosomiasis and intestinal worms, was put in place in 2003 and conducted regular mass drug administration of praziquantel to school-aged children.

Longitudinal surveys, as funded by the Wellcome Trust, were conducted for over three years and have targeted some 1,200 pre-school children living on these shorelines and reveal that up to 50% of children aged under 3 years can have clear signs and symptoms of intestinal schistosomiasis. Younger children tend to acquire their infections by being daily bathed in freshly drawn lake water, according to the practice of their mother or guardian.

### DETECTING AND FIGHTING SCHISTOSOMIASIS

It can be problematic to detect the infection in its early stages. Therefore, a combined diagnostic approach was

taken which brought together traditional methods of stool examination with more experimental methods. This included, antigen and antibody detection in urine and finger prick blood, respectively.

To assess what role these younger children play in general disease transmission, schistosome larval stages, obtained from either eggs from stool or cercariae from snails, are being examined by DNA barcoding methods. On the whole, news is good in that de-worming in this age-class was safe, brought some alleviation of symptoms and had no detrimental synergy with concurrent malaria.

However, children were re-infected much more quickly than originally envisaged highlighting the need for annual or biennial dosing. Efforts to quantify daily levels of water contact have been attempted with personal global positioning system (GPS) data loggers, recording the time and place of mother and child movements, showing that younger children have between 30-90 minutes of water contact each day.

### EVIDENCE FOR POLICY EXCHANGE

With the increasing interest in schistosomiasis in younger children, WHO commissioned a multi-country study further investigating the occurrence of this disease in younger children and the parasitological performance of liquid suspensions of praziquantel versus the use of crushed tablets. Praziquantel is presently not formally licensed for use in children younger than 4 years of age. The results from this study were reported at an informal meeting in Geneva in

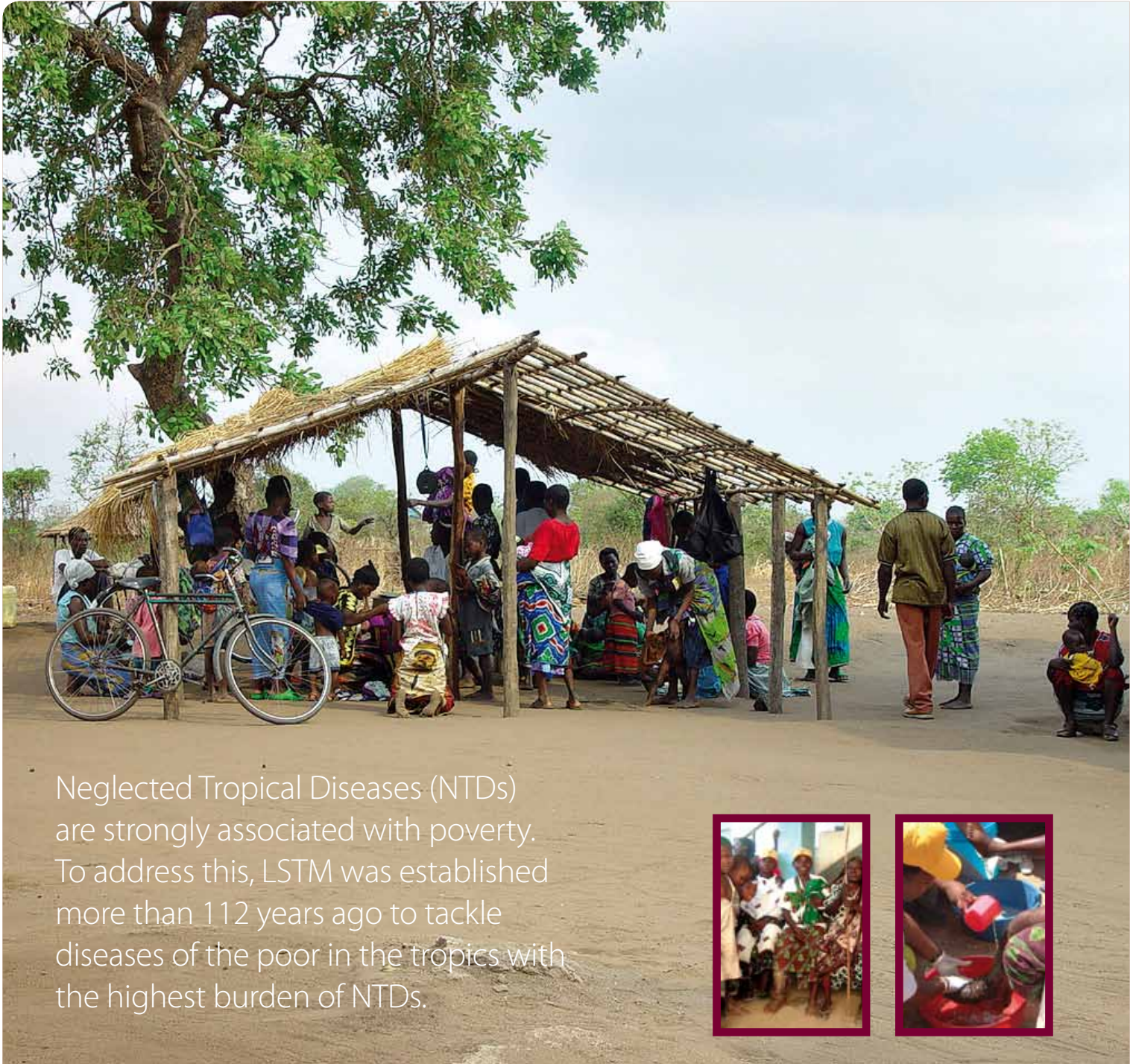
September 2010, where evidence from Mali, Niger, Sudan, Uganda and Zimbabwe was presented. Both urinary and intestinal schistosomiasis, inclusive of co-infections, could be commonly found in each of the countries. Of note were ultrasonographical studies in Mali which evidenced astonishing disease sequelae in bladder, ureters and kidneys in children aged between 2-3 years.

Whilst a more paediatric friendly formulation of praziquantel is needed, efficacy of praziquantel in liquid suspension was shown to perform no better than crushed tablets. As tablets are more easily procured than suspensions, this has major logistical advantages for mass drug administration. Nonetheless both effected good parasitological cures against urinary schistosomiasis although reduced performance against intestinal schistosomiasis was noted. Much of this information will be reported in a special issue of the journal *Parasitology* later this year entitled 'Progress in Paediatric Parasitology'.

It is clear that in high transmission environments, infants and pre-school children are in need of treatment and of formal inclusion in national control programmes; better health education is needed for their guardians as well as regular access to praziquantel. From this informal meeting and as parallel studies come to fruition, WHO will be revising its guidelines to highlight the plight of these younger children and include off-label use of praziquantel in this setting.

Up to 50% of children aged under 3 years can have clear signs and symptoms of intestinal schistosomiasis.





Neglected Tropical Diseases (NTDs) are strongly associated with poverty. To address this, LSTM was established more than 112 years ago to tackle diseases of the poor in the tropics with the highest burden of NTDs.



# CENTRE FOR NEGLECTED TROPICAL DISEASES

*Earning its place in the future*

## DISEASES OF POVERTY

The link between neglected tropical diseases and poverty is indisputable and unavoidable. LSTM was established more than 112 years ago with a clear mission: to tackle diseases of the poor in the tropics, which have the highest burden of NTDs. Acknowledging its NTD expertise, the School expanded the Lymphatic Filariasis Support Centre to become the Centre for Neglected Tropical Diseases (CNTD). The core staff has grown rapidly from four in 2008 (when the Centre was established) to nine at present. To complement the Centre's activities, LSTM recently added two professorial appointments in the area of NTDs. Professors Phillip Cooper and Russell Stothard are internationally renowned experts in soil transmitted helminths (STH) and schistosomiasis respectively (more information see pages 24-25). These new appointments, in addition to Professors Moses Bockarie (CNTD Director), Mark Taylor (NTD) and David Molyneux (Emeritus Professor) makes LSTM a world leader for NTD implementation, research and technical support. A further dimension to the Centre's NTD activities is Moses Bockarie's role as a member of the Executive Group of the Global Alliance to Eliminate LF and David Molyneux's role as a member of the International Commission for Guinea Worm Eradication.

## PRO-POOR INTERVENTION AT NATIONAL LEVELS

In the past year, collaborative and partnership initiatives have resulted in the growth of programme activity by 50%. With its ongoing £10m grant from the Department for International Development (DfID) and GlaxoSmithKline, the Centre directly supports mass drug administration (MDA) implementation activities in 10 of the 16 countries currently funded by USAID for integrated control of NTDs. This involves working directly with governments and national control programme managers to prepare budgets and plans for rolling out treatment. MDA implementation support for LF elimination is taking place in ten countries in Africa and two countries in Southeast Asia (Bangladesh and Nepal).

In addition, a new £25m programme, a partnership between CNTD, the Schistosomiasis Control Initiative (SCI) and the Liverpool Associates in Tropical Health (LATH), was awarded by DfID for the Integrated Control of Schistosomiasis and Intestinal Helminths in sub-Saharan Africa (ICOSA) using the WHO strategy of preventive chemotherapy and transmission control. This has added Niger, Uganda and Cote d'Ivoire to the list of countries receiving direct support. A successful bid for the first MRC/DfID African Research Leadership scheme for capacity development in research

awarded £1.9m to support Professor John Gyapong working with the CNTD to develop a centre of excellence in Ghana.

## MAKING THE CASE

In November Professor Bockarie was invited to speak in the House of Commons at the All Party Parliamentary Group Meeting on Malaria and Neglected Tropical Diseases, where he highlighted the value of capacity development for delivering health care in post conflict countries, using Sierra Leone and Liberia as prime examples. Inspired by the talk, Jeremy Lefroy MP, Chair of the Group, requested a visit to LSTM to hear further about the work of CNTD and LSTM on NTDs and malaria. Capacity development for monitoring and evaluation has been the flagship of the current DfID supported NTD projects. It is a model that USAID is now adopting because of the clear impact on technical assistance in the DfID-supported, resource poor countries. The Centre-funded NTD regional laboratories in Kenya, Ghana, Sierra Leone, Malawi and Sri Lanka are providing support for many countries and this is leading to a productive South-South technical assistance network for multiple NTDs. On another level of capacity development, the Centre has ten off-site PhD students working with national NTD programmes in nine countries.

Advocacy is another key activity of the Centre, recognised as important by DfID for maintaining the profile of NTD as a driver of poverty. This involves links with pharmaceutical donors, liaison work with WHO, NGOs and large foundations. Several keynote addresses by Professors Bockarie and Molyneux at prestigious international meetings provide a platform for promoting the Centre and advocating to different audiences the developmental importance of NTD control thereby promoting NTD supportive policy. Whilst high impact publications play a role in enhancing the Centre's reputation, the increased global interest highlighted by the Director General of WHO creates the opportunity for increased policy interest and higher prioritisation of these diseases. Further efforts in advocacy include contacts with the national student body, Medsin, which featured NTDs at their annual meeting in Cambridge, and Professor Molyneux's role with WHO/TDR as Chair of a Disease Reference Group on the Neglected Zoonotic Diseases resulting in a published policy report.

## NEW WORKLOAD, NEW TEAM

Expansion has necessitated some internal restructuring and additional support. Louise Kelly-Hope has added management of the CNTD supported in-country laboratories and PhD support to her responsibilities. To

complement the ICOSA and the LF project, Maria Rebollo recently joined as Scientific Manager responsible for monitoring and evaluation and Rinki Deb and Brent Thomas, as Research Assistants, provide support to Louise and Maria. Joan Fahy has taken up responsibility for in-country implementation activities. Lisa Nevitt and Sara Holmes continue their support in their respective and expanded IT/communication and programme administrator roles. Russ Glennon has been appointed as Centre Manager to provide co-ordination and support to all of the Centre's activities.

The outcome of the Centre's supported operational research is having a significant impact on NTD control policy. A review of the LF situation in countries that may not require MDA has already led to WHO revising the number of endemic countries down from 81 to 72. Initial findings on the role of vector control and importance of malaria vectors in transmitting LF in West Africa have also resulted in a WHO policy statement on the role of integrated vector management in LF control.

The biggest challenge to eliminating LF in Africa remains the interruption of transmission in countries where MDA may not be applicable because the filarial diseases amenable to MDA (LF and onchocerciasis) are co-endemic with *Loa loa*. To address this, high resolution mapping strategies to define *Loa loa* in affected communities are being utilised as well as investigating the value of controlling the vectors of *Loa loa* to reduce the transmission.

Accurate, high quality data will greatly enhance new opportunities to leverage support in the expanded funding environment available for NTDs.

CNTD is committed to further increasing the technical capacity in its 15 project countries. Its goal is to ensure that even more poor people have access to the effective NTD drugs. Strengthening local institutional capacity, undertaking monitoring, evaluation and developing surveillance capacity within the health system through improved data management and reporting skills will enhance the confidence of programme managers and other health professionals.



Professor  
Moses Bockarie,  
CNTD Director

# RESEARCH VENTURE WITH SAUDI ARABIA

The Liverpool School of Tropical Medicine along with IVCC has teamed up with The Ministry of Health of the Kingdom of Saudi Arabia in a new venture aiming to significantly increase efforts in the Middle East to control major infectious diseases such as malaria and dengue.



Liverpool School of Tropical Medicine



Kingdom of Saudi Arabia Ministry of Health



Innovative Vector Control Consortium



Signing Ceremony, Left to right: Dr Amir Hassan, LSTM; Professor Janet Hemingway, Director LSTM; Professor Ziad Memish, Assistant Deputy Minister of Health, Kingdom of Saudi Arabia; HRH Prince Mohammed bin Nawaf Al Saud, Ambassador of the Kingdom of Saudi Arabia; HE Dr Abdullah Bin Abdul Aziz Al Rabeeah, Minister of Health, Kingdom of Saudi Arabia; HRH The Princess Royal, LSTM Patron; Mr James Ross OBE, LSTM Chairman; Dr Tom McLean, Chief Operating Officer, IVCC; Sir Richard Evans, LSTM President.

On 5<sup>th</sup> of April 2011, the three organisations launched a new venture in which they established a Joint Research Centre, situated in Jizan, Saudi Arabia, with a mission to improve health through cutting edge research that will deliver innovative ways to control, monitor and evaluate insect-borne diseases that pose a major threat in the Gulf region and around the world.

The Centre will receive a US\$5.5 million seed funding from The Ministry of Health of the Kingdom of Saudi Arabia. The majority of the Centre's activity will focus on conducting high quality translational research in vector-borne disease control to generate new control tools; diagnostics

and IT systems relevant to the national and regional programmes. With a special focus on malaria and dengue, operational research that optimises prevention and treatment methods will also be a priority.

"Our vision is to develop the Joint Research Centre as a regional centre of excellence where we have a pool of world class scientists. Science, technology and education have always been considered as key for the growth and prosperity of our Kingdom" declared His Excellency, the Minister of Health, Dr Abdullah Bin Abdul Aziz Al Rabeeah.

Led by the Ministry of Health, the partners aim to raise an additional US\$21.5 million to fund education programmes and

further research activities. The partners view this four year agreement as the beginning of a long-term mutually beneficial collaboration and anticipate its continuation post-2015.

The first phase of the joint venture will start immediately with the recruitment and training of professional staff and development of a cutting-edge laboratory in Jizan. The first major joint project will be to develop an Arabic version of the Malaria Decision Support System. This platform will subsequently be extended to dengue and other vector-borne diseases. A new 70 million Riyals facility has been designed and commissioned for Jizan and should be operational by 2014.

# EDUCATION AND TRAINING

Our role is to meet the educational needs of a diverse group of students, ranging from those wanting to update their professional skills via a short period of intensive specialist study to those wishing to pursue a postgraduate Masters or PhD degree.



**DR SUE ASSINDER, BSc PhD**  
Director of Education and Training

Each year, highly-motivated students come to us from around 50 different countries and emerge with enhanced knowledge and skills with which to advance their careers. With a broad and flexible portfolio on offer, we maximize the impact of our courses and, as a result, LSTM graduates are found in senior positions in international health all over the world.

This year we concentrated on our suite of short professional courses. We launched a dedicated web page to highlight 30 courses ranging from 2 days to 4 weeks duration. This attracted over 17,000 visits and around 150 students attended short courses, 35 of them from overseas. This initiative has allowed relationships to be formed with delegates from international organisations and generated opportunities for future courses to be run in-country. Students who attended individual MSc modules as short courses gave excellent evaluations and several have expressed a wish to apply for the full MSc in the future. Our short course on TB and HIV was accredited externally by the Royal College of Physicians. To build on this solid foundation, we are in discussion with other external accreditation partners and professional bodies to provide additional benefits to students within specific career paths.

A major initiative was the introduction of the Diploma in Tropical Nursing (DTN), which aims to prepare nurses to work in low and middle-income resource settings. The DTN is accredited by the Royal College of Nursing and provides a benefit to the participants through their Continuing Professional Development scheme. This year we welcomed 39 students from 12 countries, the levels of post qualification experience ranged from 2-36 years. Around 70% of students had worked previously in a developing country, ranging from 3 week volunteer placements up to many years of mission experience.

DTN participants were extremely positive about the course. All of them aim to go overseas within the next 2 years, with a high proportion planning to work for non-governmental organisations and international aid agencies. One third of the students will be applying directly to Médecins Sans Frontières (MSF), who are strongly recommending the course through their various country-specific websites. A number of students expressed a wish to progress to management with organisations such as the World Health Organization and the United Nations and saw the DTN as a step in this direction. Encouragingly, several students indicated an interest in returning to LSTM to further

their knowledge of the humanitarian sector through MSc or Diploma level courses.

Education in LSTM now enters an exciting new phase as we move towards gaining our own degree awarding powers. This will extend our capacity to deliver courses overseas and allow us to build on our successful initiatives in the Middle East and Africa. Through developing courses that meet the needs of new international partners, we can extend the global reach of our educational activities. It is immensely rewarding to know that through the hard work of the teaching and administrative staff in LSTM, we can have a genuine impact on providing the knowledge and skills needed in developing countries.



*"The DTN course has really widened my experience in tropical nursing and tropical diseases as a whole"*



# CHILD & REPRODUCTIVE HEALTH GROUP

We are three units: the Child and Adolescent Health Unit (lead, Bernard Brabin); the Maternal and Newborn Health Unit (lead, Nynke van den Broek); and the Malaria Epidemiology Unit (lead, Feiko ter Kuile).



**PROFESSOR FEIKO TER KUILE, MD PhD MSc**

Head of Child and Reproductive Health Group, Professor of Tropical Epidemiology

## Child and Adolescent Health

In Child and Adolescent Health, we are focusing on nutritional research in maternal and child health. We started a NIH funded project in Burkina Faso with Dr Sabine Gies (Institute of Tropical Medicine, Antwerp) which looks at the effects of weekly long-term iron supplementation given to young women on malaria risk and pregnancy outcomes. Nested within this is a study funded by the MRC (UK), examining lactoferrin as a potential biomarker of vaginal infection. This research is innovative because it examines maternal health in early pregnancy, a period when women in developing countries mostly do not attend for care. The results will inform WHO recommendations on the use of iron supplements in women of child-bearing age. It also evaluates whether first trimester iron supplementation has specific effects on child health. Dr Ian Mackenzie leads studies to examine the efficacy of oral zinc supplementation on recovery from chronic otitis media in Kenyan children. The Merseyside child health studies, conducted with Dr Gibby Koshy focus on maternal cigarette smoking and its effects on child health and nutrition.

## Maternal and Newborn Health

In Maternal and Newborn Health, we offer unique expertise in using a rigorous research approach to inform teaching and technical assistance to improve the health of mothers and babies globally.

The Unit, which has attracted research grants of £6.6m, has grown significantly over the last year from 9 to 15 staff and is currently managing an annual grant budget of around £1.5m.

**Our midwives have been able to carry out assisted vaginal deliveries using the vacuum extractor with very good outcomes. This has prevented unnecessary caesarean sections and long delays before women get a caesarean section with the risk of further complications.**

One example of our work is the 'Making it Happen' project. This project works with a range of partners to build the capacity of health care providers to ensure availability and quality of essential obstetric care. Having developed a new monitoring and evaluation framework, this research programme measures the impact of a package of interventions on maternal and newborn health outcomes. Through the project we have shown a statistically significant increase in knowledge and skills, improved clinical practice, increased number of signal functions performed and fewer deaths and still births.

## Malaria Epidemiology

In Malaria Epidemiology, our focus is on research around controlling malaria in pregnant women and young children. We have long-term collaborations in Malawi, Kenya

and Indonesia, and we host the Secretariat of the Malaria in Pregnancy Consortium, a network of 42 Institutions in 29 countries. We published two key papers this year: one mapping the burden of malaria in pregnancy and another mapping the coverage of the use of insecticide treated nets and preventive drugs in pregnancy. Preliminary results of ongoing field studies addressing the impact of drug resistance on the effectiveness of prevention policies in pregnancy indicate an urgent need for new drugs and strategies for the control of malaria in pregnancy in east and southern Africa. The unit also initiated two large prospective Phase-IV studies addressing the benefits and safety of the artemisinin-combination therapy (first-line treatment for malaria) when used under real life conditions in populations repeatedly exposed to malaria in pregnancy (Kenya) or during the first 3 years of life (Malawi). A 4-year multi-centre trial looking at post-discharge management of young children with severe anaemia was also completed, showing that provision of intermittent presumptive antimalarial treatment given 1 and 2 months post-discharge markedly reduced re-hospitalisation.



# CLINICAL GROUP

LSTM's Clinical Group engages in a wide variety of activities incorporating research, education, training, technical assistance and clinical practice in tropical infectious disease and travel medicine.

We have had another highly successful year in all aspects of our wide ranging activities. These encompass research and teaching across the whole of the spectrum, from basic laboratory research to field based operational research, clinical service delivery and policy engagement.

The Diploma in Tropical Medicine and Hygiene (DTMH) continues to be extremely popular and oversubscribed. Two newly developed, standalone courses in HIV and TB run by the Group have also been highly successful. However, the main teaching success this year has been the change to a modular clinical Masters in Tropical Medicine course. Students enjoy this course, and it builds on the success of the Humanitarian MSc programmes run by Tim O'Dempsey which have now trained over 100 participants – many who now occupy senior roles within humanitarian organisations. The DfID funded International Health Links Centre, which promotes links between the UK and resource-poor areas, has expanded to over 1,000 members. In addition, the unique range of expertise in the Clinical Group provides specialist tropical clinical services nationally and supports one of the largest travel clinics in Europe.

**£20m**  
GRANT INCOME

Professor Stephen Gordon and Professor Bertie Squire lead major research areas in respiratory medicine and TB respectively (see pages 16-19). A new collaboration

with the Butantan Institute, Brazil offers exciting opportunities for research on the development of pneumonia vaccines and adjuvants, including studies funded through the NIHR Biomedical Research Centre, in which the Group plays a major role. The partnership with the Biomedical Research Centre has also facilitated development of an ongoing relationship with Novartis, who have funded studies that have helped to develop capacity in early phase clinical trials. A strengthening of the links with University Hospital Aintree has led to the first joint appointment between the two institutions and Dr Kevin Mortimer will work on non-communicable respiratory diseases in the tropics.

In addition to work in TB and equity, there have been exciting developments in the understanding of mechanisms behind the high mortality associated with TB in Africa, through Catriona Waitt's Wellcome Trust fellowship; co-supervised by Professor Bertie Squire of LSTM and Professor Munir Pirmohamed of University of Liverpool. This work took place at the MLW programme in Malawi (directed by Professor Rob Heyderman), one of the major sites of overseas clinical research for the Group and supported by the Wellcome Trust Tropical Centre in Liverpool (directed by Professor David Laloo). The recent site visit by the Wellcome Trust was highly successful, with recognition of the advances in high quality research: the programme now holds grant income of close to £20 million and two further major clinical trials have just been funded.



**PROFESSOR DAVID LALOO, MB BS MD FRCP FFM RCPS (GLASG)**

Head of Clinical Research Group and Clinical Director, Professor of Tropical Medicine, Director of Wellcome Trust Tropical Centre

Dr Miriam Taegtmeier and Dr Angela Obasi lead work in HIV and have continued to make a major impact. Extensive work on home based testing has led to changes in WHO policy and the IntHEC project on strengthening adolescent reproductive health services has already had considerable success in engaging with policy makers in the main focus countries. Two major clinical trials on HIV related conditions by Professor David Laloo have been published which will impact on the practical management and prevention of meningitis in these patients and are being taken up into WHO guidelines.

Senior members of the Group work on influential advisory and funding committees such as NICE; MRC; the UK Clinical Research Network; UK Advisory Committee on Malaria; the International Union Against TB & Lung Disease and the WHO Strategic & Technical Advisory Groups. In this way the full spectrum of the work of the Group continues to influence and shape the clinical, research, service delivery and policy arenas both nationally and internationally.



# DISEASE CONTROL STRATEGY GROUP

Members of the Disease Control Strategy Group draw upon their expertise, gained from a broad spectrum of fields including biomedical and public health research, which is applied to the Group's current research interests: blood transfusion, anaemia, malaria, capacity building and health systems. The Group also includes the Centre for Neglected Tropical Diseases (see pages 26-27).



**PROFESSOR IMELDA BATES,  
MD FRCPath**

Head of Disease Control Strategy Group, Professor of Tropical Haematology

## Haematology in the developing world

The Haematology Unit of the Group has had a very eventful year: we organised a workshop for the Royal College of Pathologists on 'Supporting Laboratory Medicine in Low-Income Countries'. The workshop was to develop a nationally co-ordinated approach for support to laboratory medicine in low income countries and brought together clinicians, scientists and health professionals. At the workshop, Dr Jen Duguid, a consultant haematologist and one of the unit's collaborators, showcased our successful British Council-funded link between Malawi, Ghana and the UK. The link provides postgraduate and in-service education to enhance the quality of laboratory services in the African countries and was reported in the Bulletin of the Royal College of Pathologists.

Professor Bates organised The British Society for Haematology's first ever session on the opportunities and challenges of haematology practice in developing countries at their annual meeting in Brighton. Presenters came from the EU, the USA and less wealthy countries such as Bangladesh, Ecuador, India, Kenya and Malawi, and included not only haematologists but paediatricians, transfusion specialists,

microbiologists and public health physicians. The sessions were interspersed with short film sequences from Queen Elizabeth Central Hospital in Malawi, using specially commissioned footage. Audiences were enthusiastic, with requests for developing world haematology to become a regular feature of the annual meeting.

**€1.7m**  
**NEW GRANT FROM  
THE EUROPEAN  
COMMISSION**

This year we obtained a new grant of 1.7m Euros from the European Commission to support research capacity in blood transfusion services in Ghana and Zimbabwe, in partnership with universities in Copenhagen and Groningen. The project T-REC was launched in Accra, Ghana in July 2011. The 4-year project evolved from a Wellcome Trust funded workshop held in Mombasa in 2008 that brought together blood services professionals, users of blood

transfusions such as anaesthetists and paediatricians, opinion leaders and policy makers from across Africa. The workshop concluded that we need much more research to improve blood transfusion in Africa and participants recognised that there was almost no capacity within the African transfusion services to generate this research.

## Research Capacity

The Disease Control Strategy Group has a longstanding interest in the challenging issue of how to demonstrate that efforts to develop research capacity have been effective. Our Group has produced several publications this year describing indicators and processes that can be used to monitor and evaluate the impact and sustainability of research capacity. A new grant from the Canadian Institutes for Health Research will enable us to consolidate our collaboration with the Dalla Lana School of Public Health in Toronto and to work together to synthesize evidence held by research funders about how they fund and evaluate the capacity development activities within their projects.

## INFORMATION ABOUT OTHER UNITS WITHIN THE DCSG CAN BE FOUND AT:

**CNTD:** <http://www.lstm.liverpool.ac.uk/research/research-environment/centre-for-neglected-tropical-diseases>

**TREC Project:** <http://www.t-rec.eu/>

**Middle East Projects:** <http://www.lstm.liverpool.ac.uk/research/academic-groups/staff-profiles/amir-hassan>





# INTERNATIONAL HEALTH GROUP

The mandate of this Group is research and evidence for shaping policy and influencing practice in the health sector. Our success this year can be seen in the innovative research and work done by our staff.

The research team around the Cochrane Infectious Diseases Group supplied relevant reviews for the WHO Essential Medicines Committee and the Global Malaria Programme. They also published two landmark reviews, one a highly technical document summarising the accuracy of different rapid diagnostic tests in malaria. The second review examined the quality of care provision in the private and public sector in developing countries. They both broke new ground applying synthesis methods. In addition, a Cochrane review that showed probiotics work in diarrhoea was featured in the Daily Express, in the Washington Post, and across 108 websites worldwide. We also won a DfID grant of £6 million to support our work for the next five years.

In Monitoring and Evaluation, which is linked to health systems decision making, Professor Joe Valadez and his team completed their work in Tripoli on HIV prevalence. The work was aimed at three hard-to-reach populations; intravenous drug users, homosexual men and female sex workers. In conjunction with local counterparts, the team also finished drafting Libya's first national HIV/AIDS strategy. They strengthened their capacity with the appointment of a statistician and epidemiologist, and also obtained substantive funding to carry out work in

India, Southern Sudan, Zimbabwe and Uganda, with other support from UNICEF to roll out Lot Quality Assurance Sampling throughout Africa and Asia.

**£12m**  
**GRANT AWARDS WITH DfID OVER SIX YEARS**

In health systems and human resource management, Mr Tim Martineau, Dr Sally Theobald and partners in the University of Edinburgh have been working on developing ReBUILD research for the building of pro-poor health systems, during recovery from conflict. This has been achieved from a successful grant application with DfID worth £6 million over six years. This, along with a further EU grant, will provide the substantive base to develop the capacity within the Group. With help from Tim Martineau, the human resource strategic plan for the government of Sudan will shortly be in use.

In areas of gender equity, Dr Sally Theobald organised the Sexual Health HIV Evidence into Practice Project which comprises a massive



**PROFESSOR PAUL GARNER,  
MBBS DRCOG MD FFPHM**

Head of International Health Group,  
Professor of International Health

28 organisations. This had accolades by being short-listed for the 2010 British Medical Journal 'Getting Research into Practice' Prize, and has now been published in a series of 15 papers. Rachel Tolhurst has been developing her work in maternal health, with successful components on EU grants in maternal health in both China and India.

Overall, the substantive progress this year demonstrates the strength of key academics with a consistency of vision in the strategic development of key niche areas. In all of our areas, we feel there is now a bigger demand from donors and countries, funding, and evidence of influence on policy and decision making.

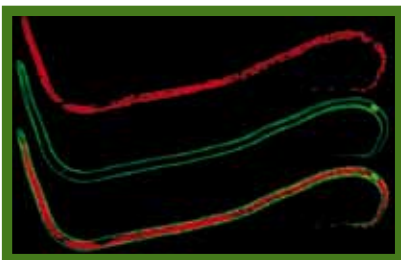


# MOLECULAR & BIOCHEMICAL PARASITOLOGY GROUP

New Awards. New Equipment. New Breakthroughs.

One of the outstanding highlights this year was Professor Alister Craig's success as one of the first recipients of the highly prestigious Senior Investigator Award from the Wellcome Trust. This award, shared among only twenty other outstanding scientists in the UK, will allow him to continue to examine how the malaria parasite sticks to the walls of blood vessels – a process which leads to 'cerebral' malaria. He hopes the knowledge gained with this award will help in the design of new drugs for severe malaria.

Another highlight was the success of Dr Alvaro Acosta-Serrano in obtaining a University Award from the Wellcome Trust, to establish his own independent research group studying the roles of sugars on the surface of the parasites that cause 'sleeping sickness' – the trypanosomes. He aims to further understand how these sugars are important bridges in the process of infection and transmission through tsetse fly vectors.



Confocal imaging of microfilariae (Dr F Landmann)

Our Group requires the most recent technology platforms to analyse key molecules and pathways important for parasite biology. We have excellent facilities for 'omics', partly funded through the Wellcome Trust Functional Genomics

Initiative but also supported by a range of other awards for malaria, filariasis, schistosomiasis, TB and snake venoms. This year we have acquired state-of-the-art equipment including, the LTQ Orbitrap Velos, the world's fastest and most sensitive ion trap mass spectrometer, the 'Operetta' high throughput cell-imaging platform and fluorescent imaging microscopy for Dr Joe Turner's work on elephantiasis.

These technology platforms not only generate exceptionally high quality data, but also in very large quantities, requiring powerful computer based approaches to process this data. To meet these needs MBP has established a new Bioinformatics Unit, headed by Dr Simon Wagstaff. The unit will provide access to computational resources and academic and technical bioinformatic expertise with the aim of providing leadership in the new area of Tropical Translational Systems Biology.

Our malaria, TB and A-WOL drug discovery and development activities continue to deliver new drugs and targets. Professor Steve Ward and Dr Giancarlo Biagini's work on malaria and TB has produced 11 peer-reviewed publications (including one in the highest ranking chemistry journal) on malaria pharmacology and biochemistry and one patent for novel antimalarials targeting the parasite's mitochondria. Our progress in TB research has also been boosted by a recent £1 million MRC DFPS award towards the development of a new drug against active and latent TB, and a €0.5 million award from the EU to develop imaging-based assays that predict the clinical outcome of drug efficacy. A-WOL, under the leadership of Professor Mark Taylor, is evaluating more than 300



**PROFESSOR MARK TAYLOR, BSc PhD**

Head of Molecular & Biochemical Parasitology Group, Professor of Parasitology, Director of A-WOL

potential drugs, which target the *Wolbachia* bacterial symbionts of filarial nematodes to deliver a safe and effective macrofilaricide for onchocerciasis and lymphatic filariasis.

MBP Group published more than 50 papers this year including Professor Pleass's study on the role of IgM antibodies in masking a malaria protein on the surface of blood cells from protective antibodies – the same protein (PfEMP1) that Professor Alister Craig and Dr Britta Urban have shown in another paper is linked with cytoadherence in cerebral malaria. Professor Phil Cooper, a Senior Wellcome Trust Fellow based in Ecuador, published a paper showing that treatment of gut worm infections leads to an increase in skin allergy reactions, raising a concern that de-worming programmes may lead to an increase in the prevalence of allergic diseases.

Our four new members of academic staff, Professors Phil Cooper and Russ Stothard and Drs Joe Turner and Alvaro Acosta-Serrano, mean that MBP now has a comprehensive portfolio of parasitologists covering all of the important groups of tropical helminth and protozoan parasites to work towards our aim of translating basic science into outputs with the potential to improve health in developing countries.



# VECTOR GROUP

From cutting edge fundamental research on genomics, behaviour and biology of the major insect vectors to implementing and evaluating vector control programmes, our work in the Vector Group continues to span the whole range.

We have been taking a leading role in applying the next generation sequencing technologies to vector-borne disease. Dr Jarek Krzywinski's Group has been identifying sex specific genes in mosquitoes – where disruption might lead to male sterility. Dr Martin Donnelly is examining the impact of insecticide resistance on mosquito genomic architecture. His pioneering work enables full genome wide association studies that detect epidemiologically important traits in malaria vectors. Major advances have also been made in functional characterisation of mosquito genes by the successful development of the Gal4/UAS system in *An. gambiae* by the Lycett Group. The Vector Group and the wider mosquito research community will use this system, which allows precise, conditional, spatial and temporal regulation of genetic modifications to answer fundamental questions related to parasite transmission and insect immunity.

The *Lutzomyia* sand fly genome sequencing is nearing completion with an online searchable version published at Baylor College of Medicine. Dr Rod Dillon has been largely driving the mining of this valuable dataset, and this has already led to important discoveries about the way in which the sand fly responds to the *Leishmania* parasite, including the identification of a gene that can prevent parasite transmission.

We remain strong in our research in insecticide resistance. We are working to improve the sustainability of insecticide based vector control programmes. Dr Charles Wondji has contributed to this, particularly by identifying the major insecticide resistance mechanisms in the important African malaria vectors, *Anopheles funestus*, while Professor Ranson has been focusing on resistance mechanisms in the *Anopheles Gambiae* complex. Dr Mark Paine has led a team that has identified the major routes of insecticide breakdown in the insect, paving the way for the development of novel resistance breaking insecticides.

In the field, new methods that allow on-the-spot measurements of insecticides being sprayed on walls are being trialled with malaria control programmes in Malawi and the South Pacific. The added value of combining two or more vector control tools, such as indoor residual spraying (IRSs) and insecticide treated nets (ITNs) in reducing malaria transmission is being explored in large scale field trials in Sudan and Gambia, and LSTM is involved in the evaluation of these interventions, particularly focusing on the impact of insecticide resistance.

Although IRSs and ITNs still continue to be very effective in many settings, the latest ecological studies by Dr Killeen's team in Tanzania have described how traits such as

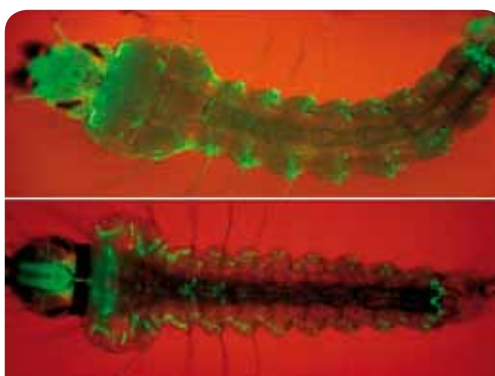


**PROFESSOR HILARY RANSON,**  
**BSc MSc PhD**

Head of Vector Group

outdoor feeding behaviour of mosquitoes and the repellent properties of commonly used insecticides define the limit of how much malaria control can be achieved with these indoor vector control measures. Work has commenced to develop new strategies for targeting mosquitoes outdoors.

Professor Mike Lehane is leading the Tsetse Group: an active field programme to develop cheaper and more effective means of control of the vectors of sleeping sickness. The targets developed are now being moved into the commercialisation phase with industrial partners. Further partnership with industry is ongoing through the Insecticide Testing Facility. The IVCC has helped support new insectaries and insecticide testing facilities to test new insecticides developed by our industrial partners against the range of insecticide resistant mosquito populations that are maintained by the Vector Group.



**Left** – The newly established Insecticide Testing Facility is helping the development of new insecticides for public health.

**Right** – Transgenic *Anopheles gambiae* mosquitoes modified to produce Green Fluorescent Protein from cuticle forming cells (top) and muscles (bottom). These tools are being used to study traits including insecticide resistance and parasite transmission.

# WELL TRAVELLED CLINICS LTD

We are a centre of excellence, providing a private pre-travel advice, vaccination and malaria prophylaxis service to the travelling public.



Well Travelled Clinics (WTC) has faced many challenges this year with the current financial climate and a drop in the international travel market. Despite this, WTC has continued to grow and expand its services and turnover continues to rise.

This year the company expanded to three branches with a new branch opening in Manchester in May 2011. The Clinic appointed a New Business Development Manager, Mr Samir Aga, in June 2011 and his primary objective for the year ahead is to build a new business client base at the Manchester branch.

During the year there has been a major emphasis on improving the quality, safety and governance within our clinics. All three Clinics have been registered and inspected by the Care Quality Commission (CQC). This has been a major achievement in bringing our policies, procedures and practices into line with the expected national standards.

WTC continues to carry out a number of educational and development activities. This year we ran our Travel Health and Expedition Medicine course, and an Expedition Medicine course in conjunction with the Expedition Care Programme. We have also had a number of clinical placements this year with both British and international students attending.

Dr Lisa Ford, WTC's Medical Advisor, attended the North European Conference of Travel Medicine in Hamburg on behalf of WTC where she presented an audit related to Acetazolamide provision for travellers to high altitudes. She has also had a paper related to rabies post-exposure prophylaxis in the *Journal of Travel Medicine* 2011.

During the year, nurses from WTC took part in a Phase 3 randomised controlled trial in conjunction with colleagues at the clinical research unit at the Royal Liverpool University Hospital. The trial, led by Professor Stephen Gordon from LSTM, was to evaluate the effect of Novartis vaccines meningococcal B recombinant and MenACWY conjugate

vaccines on pharyngeal carriage of *N. meningitidis* in young adults. The WTC team assisted with the planning of the trial, particularly in relation to the administration of vaccines. A number of WTC nurses had the opportunity to develop their research and development skills in their role as "unblinded" nurses. It is hoped that we can continue to take part in research activities in the future.

We are now working on an exciting new project with Chester Zoo looking at the specific occupational ill-health problems that can be encountered by zoo workers due to exposure to harmful substances and zoonoses. The work involves WTC working with veterinary staff at the zoo to identify risks and propose effective health screening procedures to protect both staff and animals. This piece of work will also involve the diagnostic laboratory at LSTM which will provide the screening for the zoo staff once the appropriate algorithms have been produced and agreed.

All these types of research and development, educational and audit activity are an important vehicle to gain increased visibility for our services and also to ensure that as a company, we remain at the forefront of travel medicine, delivering world class travel health services.

**Philippa Tubb,**  
Managing Director, WTC



# LATH

The Liverpool School of Tropical Medicine (LSTM) established Liverpool Associates in Tropical Health (LATH) in 1986, as an independent company to aid a more efficient response to an increasing demand for international development assistance.



As LSTM's consulting arm, LATH has been the gateway to the technical application and operationalisation of internationally recognised research, and has channelled its expertise into influencing policy and transforming practice. Over the years, LATH's cumulative turnover amounted to in excess of £30 million, and its gift aid contribution to LSTM has exceeded £5 million. This amount has underpinned much of the infrastructural growth in LSTM during that period. Both the brand name and critical mass of LSTM have been essential in achieving this success.

Over the last year, and in conjunction with the Government of Kenya, LATH has completed a successful multi-million DfID programme to improve delivery of Essential Health Services in Kenya. In addition to the development of a sector framework, this project also increased capacity for managing finances, human resources and transport. It also rehabilitated, equipped and trained staff for 25 health facilities to provide maternal and neonatal health services, which resulted in an increase in the percentage of births by skilled attendants by 6.5%. LATH has also assisted the new government of Southern Sudan to establish a National Health Management Information System and to develop a strategy and processes for managing

research. In Zimbabwe LATH has worked with DfID to introduce improvements in both the institutional and policy environment aimed at reducing maternal and neonatal mortality.

Internationally, the models of providing technical assistance are changing. Technical assistance clients are increasingly channelling funds through in-country offices and the consultancy business is becoming dominated by large scale providers. Nevertheless, demand for the type of specialised technical assistance offered by LSTM and LATH remains high. LSTM, therefore, needs to develop a new model for delivering technical assistance which builds upon LATH's existing and potential client base and exploits LSTM's unique relationship between research and development assistance.

LSTM is in the process of establishing a new Centre which will generate international quality operational research and will provide a vibrant environment for creating innovative synergies between research, capacity development and technical assistance. This Centre provides LSTM with a unique opportunity to re-organise the way it operates its technical assistance activities. LSTM and its funders recognise that its technical assistance

is most effective when it is closely linked to research activities and led by academics supported by a strong management team. Within the new Centre, technical assistance activities will be able to flourish and be more closely integrated into the day-to-day activities of LSTM's academics and technical experts.

During this transition phase, LATH has been re-organised to ensure that it delivers timely and high quality outputs on its existing contracts. Strategic delivery is overseen by Einion Holland, Director of Administration and Support Services, whilst operational delivery is managed by a restructured project delivery team headed by Susan Jones and identification of new business and bid development is supported by LSTM's newly restructured and expanded Research Management team, under Sian Roberts. The interface between technical assistance and research will be managed by a new Technical Assistance Committee. This committee will oversee the quality of technical assistance projects and will ensure harmonisation between LSTM's research and consultancy activities, thereby providing added value for researchers, research funders and consultancy clients. The committee will be equivalent to other key committees in LSTM (Research and Learning & Teaching).

LSTM is committed to safeguarding the delivery of all LATH projects, along with the creation of a vibrant environment of growth in which both LATH and LSTM unite in their desire to produce strategic technical assistance that is of international quality and competitiveness.



Mr Einion Holland,  
Acting Head of LATH

# GRANTS AND CONTRACTS

## Dr Alvaro Acosta Serrano

Wellcome Trust  
Understanding the molecular basis of how African trypanosomes cross the tsetse fly peritrophic matrix, **£294,190**

## Dr Susan Assinder

European Commission  
Creation of a multilingual continuing education programme by e-learning parasitology and medical mycology intended for professionals working in non-specialised clinical laboratories, **£7,506**

## Professor Imelda Bates

European Commission  
Building Research Capacity of blood transfusion services in Africa (T-REC), **£1,490,843**

British Council  
Improving the quality and effective use of diagnostic laboratory services in Malawi and Ghana, **£15,000**

Canadian Institutes of Health Research  
Health Research Capacity Development Evaluation: A Realist Review, **£27,738**

## Professor Moses Bockarie

Medical Research Council  
MRC/DfID African Research Leadership Award, J Gyapong, University of Ghana: 'Filariasis Elimination in Africa: Refining the Strategies through Research', **£1,852,560**

## Professor Bernard Brabin

National Institute of Health  
Long-term WIFS and malaria risk in early pregnancy: a randomised controlled trial (supplement), **£274,717**

## Dr Mike Coleman

Abt Associates Inc  
Zambia Integrated Systems Strengthening Program (ZISSP), **£182,828**

## Professor Phil Cooper

Wellcome Trust  
Impact of early infectious & microbial exposures on the development of immunity & allergic inflammatory disease in children in a tropical region of Ecuador, **£1,079,522**

## Dr Martin Donnelly

National Institute of Health  
Program for Resistance, Immunology, Surveillance & Modeling of Malaria in Uganda "PRISM" (led by University of California), **£346,852**  
*Shared with Dr M Paine*

World Health Organization  
Vector resistance to all insecticides in current use in Sudan, **£37,952**

Medical Research Council  
Can indoor residual spraying provide additional protection against clinical malaria over current best practice? A cluster-randomised controlled trial (Led by London School of Hygiene and Tropical Medicine), **£44,909**

Wellcome Trust  
Research Training Fellowship for Salako Djogbenou: "Study of carbamate and organophosphate resistance in *Anopheles gambiae*, the main malaria vector in West Africa, **£218,524**

## Professor Paul Garner

Department for International Development  
Evidence Building & Synthesis Research, **£5,998,991**

World Health Organization  
Consultancy Contracts (6 supplements), **£58,142**

## Dr Amir Hassan

Ministry of Health in Syria  
Technical Assistance to the Centre for Strategic Health Studies (supplement), **£150,020**

Ministry of Health Sudan  
Delivery of "Epidemiology in Action (EIA)" course, **£56,000**

## Dr Ian Hastings

Swiss Tropical Institute  
Simulation modelling of epidemiological impact and cost effectiveness of malaria intervention (Supplement), **£249,174**

Portuguese Science Foundation  
PhD – S. Barbosa (Supplement), **£8,546**

## Professor Janet Hemingway

Innovative Vector Control Consortium  
International research centre for infectious diseases: Ministry of Health Saudi Arabia – MDSS and other LSTM projects, **£3,140,669**  
*Shared with Dr A Hassan*

Innovative Vector Control Consortium  
Research support on eco-systems management for dengue and chagas vector control, **£93,565**

Bill and Melinda Gates Foundation  
IVCC Product Development Partnership, **£30,303,031**

Department for International Development  
Artemisinin Resistant Malaria Research Programme (Led by University of Oxford), **£1,079,357**

Syngenta  
Research collaboration agreement to determine the discriminating dose of pirimiphosmethyl to allow the monitoring of insecticide resistance in adult mosquitoes using World Health Organization test procedures, **£26,873**

## Professor Rob Heyderman

Wellcome Trust  
MSc fellowship for David Mzinza "Dynamics of host T-lymphocyte responses to Mycobacterium tuberculosis during treatment of pulmonary tuberculosis", **£114,348**  
*Shared with Dr H Mwandumba*

Novartis Asia Pacific Pharmaceuticals  
A Phase 2 Open-Label, Multi-Centre study of a Group B Streptococcus vaccine in HIV Positive and HIV Negative Women, **£242,123**

Gates Malaria Partnership/London School of Hygiene & Tropical Medicine  
*P. falciparum* genetic structure before and after the deployment of an artemisinin-based combination therapy in Malawi. Fellowship to Standwell Nkhoma, **£28,551**

Wellcome Trust  
Impact of HIV infection on naturally acquired mucosal immunity to Streptococcus pneumoniae (supplement), **£18,838**

## Dr Gerry Killeen

Bill and Melinda Gates Foundation  
Malaria Transmission Consortium – Tanzania (Supplement), **£297,091**

Bill and Melinda Gates Foundation  
Malaria Transmission Consortium – Zambia (Supplement), **£175,891**

Bill and Melinda Gates Foundation  
via Ifakara Health Institute  
Replacing DDT: Rigorous Evaluation of Spatial Repellents for the Control of Vector Borne Diseases, **£50,366**

## Professor David Lalloo

Bill and Melinda Gates Foundation  
ACTia- Value Added Study VA09- Antimalarial Drug Use (supplement), **£35,721**  
*Shared with Dr R Tolhurst and Dr M Sanjoaguin*

Wellcome Trust  
Wellcome Trust PhD Programme for Clinicians for Dr Emma Wall – Health Priorities in the Developing World: Project title: "Early goal directed therapy for adult meningitis in Malawi", **£369,244**  
*Shared with Professor R Heyderman*

Wellcome Trust  
Wellcome Trust PhD Programme for Clinicians for Dr James Scriven – Health Priorities in the Developing World: Project title: "Innate immunity in cryptococcal disease and immune reconstitution inflammatory syndrome", **£364,393**  
*Shared with Dr B Urban*

## Professor Mike Lehane

Bill and Melinda Gates Foundation  
Targeting Tsetse: use of targets to eliminate African Sleeping Sickness, **£2,630,322**  
*Shared with Dr H Smith*

# 2010/11

## **Dr Audrey Lenhart**

Royal Society  
The importance of non-household locations in dengue epidemiology, **£10,850**

The Norwegian University of Life Sciences  
Healthy Schools: Reducing dengue and diarrheal diseases in primary schools in Colombia (lead: University of Norwegian Life Sciences), **£12,138**

## **Dr Gillian Mann**

TB Alliance  
Assessment of Patient Costs and Patient Perspectives of TB Treatment, **£96,750**  
*Shared with Professor S B Squire*

## **Mr Tim Martineau**

Department for International Development  
Health Systems Financing, **£5,999,949**  
*Shared with Dr S Theobald*

## **Dr Philip McCall**

Syngenta  
Exploiting vector behaviour for dengue control by indoor residual spraying, **£48,323**

## **Professor Malcolm Molyneux**

Leverhulme Trust  
Emeritus Fellowship "Using eye changes to improve the monitoring of malaria", **£21,800**

## **Dr Henry Mwandumba**

National Institute of Health  
Restoration of alveolar macrophage function in HIV patients: A clinical study (led by Cornell University), **£429,609**

## **Dr Mark Paine**

Innovative Vector Control Consortium  
IQK Research Agreement: field study in Vanuatu and the Solomon Islands, **£28,965**

## **Professor Richard Pleass**

Royal Society  
Theo Murphy Blue Skies Award, **£13,766**

Wellcome Trust

Fully Human antibodies for understanding Fc-receptor mediated immunity to malaria, **£59,824**

European Commission

Towards the establishment of a permanent European Virtual Institute dedicated to Malaria Research (EVIMaR), **£15,553**

## **Professor Hilary Ranson**

European Commission  
African Vector Control: New Tools "AVECNET", **£10,382,409**

Innovative Vector Control Consortium

Study to determine activity of Etofenprox against susceptible & pyrethroid resistant mosquitoes (MITSUI), **£2,912**

Innovative Vector Control Consortium

Study to determine activity of Insecticidal Paint Samples against susceptible *Anopheles Gambiae*, **£55,714**

Innovative Vector Control Consortium

Insecticide Testing Facility, **£971,912**

Innovative Vector Control Consortium

Quality control of insecticide interventions and assessment of metabolic insecticide resistance on Bioko Island, Equatorial Guinea, **£180,871**

Innovative Vector Control Consortium

Artemisinin Resistant Malaria Research Programme (led by University of Oxford), **£1,079,357**

## **Dr Miguel Sanjoaguin**

Deutsche Gesellschaft für Technische Zusammenarbeit  
Strengthening a programme for multiple diseases surveillance and fast outbreak detection in Malawi in the context of the influenza pandemic, **£329,446**

## **Dr Helen Smith**

UNICEF New York  
Systematic review of qualitative studies from sub-Saharan Africa on household recognition and response to child malaria, pneumonia and diarrhoea, **£25,266**

## **Professor Bertie Squire**

USAID  
TREAT TB: Technology, Research, Education and Technical Assistance for TB (Year 3 of 5), **£253,900**

## **Professor Feiko ter Kuile**

UNICEF Indonesia  
Evaluation of screening regimes for control of Malaria in Pregnancy, **£136,518**

Centre for Disease Control (USA)

Institutional Collaboration between LSTM and CDC and Prevention on Malaria, **£465,210**

## **Dr Anja Terlouw**

MMV: Medicines for Malaria Venture Switzerland  
Malaria burden estimates in >5 year olds using a rolling MIS in Chikwawa district, Malawi, **£30,757**  
*Shared with Dr A Rocca-Feltrier*

Bill and Melinda Gates Foundation

ACTia Value Added Study VA10- Intervention coverage and malaria impact estimates in >5 year olds using a rolling MIS in Chikwawa district, Malawi, **£52,075**  
*Shared with Dr A Rocca-Feltrier and Professor D Lalloo*

## **Dr Sally Theobald**

World Health Organization-TB REACH  
Increased detection of children, women & elderly individuals with smear-positive TB in Yemen, **£186,259**  
*Shared with N Al-Sonboli and L Cuevas*

World Health Organization-TB REACH

Innovative community-based approaches for enhanced TB case finding & outcome in Southern Ethiopia, **£446,291**

*Shared with M Yassin and L Cuevas*

Medical Research Council/UNAIDS

Exploring the role of structural drivers of HIV on women and men over 50 in Uganda: A gender analysis, **£9,016**

*Shared with J Seeley*

## **Dr Rachel Tolhurst**

European Commission  
Large scale innovative pro-poor programs focused on reducing maternal mortality in India: a proposal impact evaluation "MATIND" (Led by Karolinska University), **£262,338**

UNICEF New York

A Narrative Review of Gender Influences on Child Survival and Guidance on Formative Research, **£22,533**

## **Professor Joe Valadez**

Benghazi International Fund (via Belgium Red Cross)  
Libya HIV Sero Prevalence Survey, Phase One, **£17,198**

## **Dr Nynke van den Broek**

Royal College of Obstetricians and Gynaecologists  
LSS-Essential Obstetric & Newborn Care-Nigeria, **£119,621**  
*Shared with Dr C Ameh*

World Health Organization

To conduct a Landscape review on the impact of training in emergency Obstetric care, **£12,000**

## **Professor Stephen Ward**

Wellcome Trust  
Seeding Drug Discovery Award: "Alternative complex I as a drug target in malaria" (supplement), **£47,000**

## **Dr David Weetman**

Wellcome Trust  
Masters training fellowship John Essandoh.  
Population genetics of resistance to alternative insecticides in southern Ghana vector in West Africa, **£92,867**

## **Dr Charles Wondji**

Wellcome Trust  
MSc fellowship for Charles Mulamba: 'Characterisation of Insecticide resistance in Ugandan populations of *Anopheles funestus* major malaria vector', **£100,343**

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# STAFF PROFILES



## EVE WORRAL, PROJECT MANAGER, VECTOR GROUP

From achieving a BA(Hons) in Economics and a PhD in the economics of malaria early warning systems to working at LATH for 5 years, Eve has had an exciting career already. She now works as a project manager on a large scale (€12 million) new EU FP7 funded project, AVECNet, with Professor Hilary Ranson as the project co-ordinator and LSTM being the leading institution with 14 partners from both Africa and Europe.

"I enjoy the job as it includes learning new skills and also being involved with exciting issues influencing global malaria control policy."

Eve is currently working on getting systems set up to manage the project, supporting partners to do the same and also employing new PhD students. "Field work is well underway so we have achieved a lot in a short space of time."

Making sure the partner systems are set up to meet reporting requirements is a big challenge, but LSTM has a strong set of collaborators and good working relationships. "I'm sure we can work through whatever comes our way!"



## RACHEL CLARE, RESEARCH ASSISTANT MOLECULAR AND BIOCHEMICAL PARASITOLOGY GROUP

Rachel, who previously worked in the pharmaceutical industry, joined LSTM in 2010 and is based in the A-WOL programme in the Molecular and Biochemical Parasitology Group. In the past year she has helped screen more than 10,000 drugs to find those with good anti-bacterial activity against *Wolbachia*. This screening has identified more than 300 new active drugs, which are being further tested to identify the lead candidates to develop into new treatments for filariasis.

"Working for LSTM has been a highlight of my career due to the fascinating and valuable work that is carried out in such impressive facilities: with highly motivated, knowledgeable and friendly staff."

She also feels that she has enjoyed demonstrating on the DTM&H course; "It was a great opportunity for me to widen my knowledge on tropical diseases and also meet LSTM students from all over the world."



## RALF WEIGEL, CLINICAL LECTURER, EDUCATION AND TRAINING

Ralf joined LSTM as a clinical lecturer and Director of Studies for the Masters programme in Tropical and Infectious Diseases. As a qualified paediatrician, he previously worked at the Charité University Hospital in Berlin and carries a MSc Degree in Infectious Diseases from LSHTM.

From 2002 he was a technical advisor to the Lighthouse HIV and AIDS clinic in Lilongwe under the Ministry of Health of Malawi, to assist in the roll out of HIV-related services including operations research, clinical mentoring and supervision. With the Education and Training Team at LSTM, he aims to promote high standards of teaching and learning, ensuring that students reach their learning objectives at LSTM.



## ABIGAIL HOWARTH, CHIEF OPERATING OFFICER, INTERNATIONAL HEALTH GROUP

Abigail joined LSTM in 2011 as Chief Operating Officer based in the International Health Group. With a PG Diploma in Public Leadership and Management, Abigail has experience of management, policy development and funding of European and International partnerships in Higher Education and local and regional authorities. Her role at LSTM comprises strategic management and development of the Effective Health Care Research Consortium working with two global networks including the Cochrane Infectious Diseases Group and three country networks in Africa, India and China. It is an important role, as it ensures that the Consortium meets their commitments to DfID and the World Health Organization, as well as building capacity to develop, understand and use evidence in policy and practice.

"Working at a respected organisation like LSTM has been a steep learning curve, but it is very satisfying being involved in something that is making such a significant difference to the lives of people in developing countries." Abigail has brought a fresh pair of eyes to LSTM and her new ideas will assist the Effective Health Care Research Consortium to stay effective.

# STUDENT PROFILES



## **OLUFUNMILAYO OLUMIDE, MSC INTERNATIONAL PUBLIC HEALTH (SEXUAL AND REPRODUCTIVE HEALTH STREAM)**

One of my most memorable experiences from LSTM was meeting the fantastic 2010/2011 MIPH class: it has been wonderful being a part of this great and amazing class. We have helped one another throughout the year and we ended up bonding like a family.

What impressed me the most was LSTM's ability to source for topics and co-ordinate overseas projects for students outside their home countries; co-ordinating these projects can be rather challenging but somehow students are all taken care of and are able to apply the knowledge acquired in the classroom even before they graduate from the institution. This is beneficial for the School because LSTM graduates can compete anywhere in the world.

After my studies, I hope to return to Nigeria putting into practice all I have learnt and acquired in the past year, mostly in areas of programme implementation and public health research as I also hope to start a PhD in the near future.



## **FUKUSHI MORISHITA, MSC INTERNATIONAL PUBLIC HEALTH**

At LSTM I was introduced to a variety of research methods. MIPH students focused on qualitative research skills in the first semester and many of us did qualitative studies in our dissertation projects as well. I have completed my field project in Ethiopia and now feel confident in my ability to carry out qualitative research. I really appreciate that LSTM gave me this precious opportunity not only to learn academic theories but also to gain practical research experience in the field.

LSTM students, especially in the MIPH course, come from different countries across the world and everyone has different cultural backgrounds and professional experience. Although this diversity sometimes made our group discussion difficult to move forward, on the whole it definitely had a positive impact as we were able to be inspired by a wide range of ideas and perceptions. I believe this is one of the greatest strengths at LSTM.

I met amazing friends from all over the world and experienced lecturers who inspired me in a very positive way here at LSTM. A wide variety of topics covered in each session gave me an additional interest in the field of public health, which has enabled me to have a clear picture of my future career options.



## **KAROLINA GRIFFITHS, MSC HUMANITARIAN STUDIES**

I was searching for a course I could do between my 4th and 5th year of medical school that would widen my horizons and teach me new skills in research and critical thinking. As soon as I read the syllabus on the Liverpool School of Tropical Medicine website I knew the course would be perfect: the topics were wide ranging, I had the choice to pick the modules that interested me most and I could cater it to my needs. What really sealed the deal was talking to alumni students – they said it was the best year of their life, and they're not wrong!

One of the greatest aspects of doing a Masters at LSTM is all the help and guidance you receive when arranging your research project for your dissertation abroad. My time in Nepal, evaluating the outbreak response to Dengue, was absolutely fascinating. It was through this experience of collecting my data where I really got to grips with different research methodologies and met so many fascinating people as well as doing a bit of trekking in the Himalayas!



## **MARYKE NIELSEN, MSC TROPICAL PAEDIATRICS**

As a native Liverpoolian, I did work experience at LSTM as a fifteen year old and fell in love with tropical medicine whilst reading the dissertations of previous students during my lunch breaks. I became interested in international child health after spending my medical school summer holidays volunteering in Kenya. It was during my elective in the Gambia, that my eyes were opened to the pivotal role of research in achieving long term health improvement both at home and abroad. After this I set my sights on studying for a Masters degree at LSTM.

I have learnt so much during my year at LSTM, both from my teachers and fellow students, particularly benefiting from the diverse backgrounds of my colleagues. Academically I feel I have acquired a solid understanding of research methodology and a confidence to use these new research skills in the future. The course has encouraged me to question the evidence behind decisions I make as a doctor on a daily basis, the policies I previously simply accepted and the best methods to improve clinical care. I have learnt to think about medical practice and health in a much broader context and to think in terms of translational medicine.

For me LSTM's greatest strength is its staff. I have felt privileged to have been taught by so many experienced, inspirational and gifted teachers, who are able to pass on their passion for their subject and always have time to help students.

# FUNDRAISING

Supporters of LSTM know all too well the challenges faced in meeting our mission to tackle the diseases of poverty. Many of them have themselves worked in the varying fields relating to health in the developing world, allowing them to bring with them, time donated in-kind, as well as financial support for the increasing range of projects we have undertaken during 2010-2011. All of the Vice Presidents, Trustees, staff, students and alumni that make up LSTM, would like to thank those supporters for their shared commitment.

## CAPITAL FUNDING

Plans are underway for a new translational centre which will be LSTM's first major capital build project since the Centre for Tropical and Infectious Diseases opened in 2008. Building work is planned to commence in 2015: in the meantime a fundraising appeal is being planned to contribute a public-private funding mix. The appeal will be launched in early 2012.

LSTM is supporting capital projects in Malawi to complete the new Adult Emergency Trauma Centre and a Learning and Teaching building to support the work of the Malawi-Liverpool-Wellcome-Clinical Research Programme (MLW) and the Queen Elizabeth Central Hospital. LSTM will continue to raise funds to support these projects during 2012.

Our work with MLW was highlighted in a case study for the Coutts Million Pound Donors Report, published in November 2010. The case study highlighted the

support from the Wellcome Trust and others funders, for the programme and the continued requirement for further support to provide improved facilities and resources.

## STUDENT FUNDING

Grants and donations for scholarships and hardship funding has been bolstered during 2010-2011 with a grant from an anonymous charitable trust supporting students from Nigeria and Ghana. Individuals including Mrs Margaret Hesketh and Dr Tom Fletcher have also made significant contributions to scholarships offered by LSTM. Continued support from The Oglesby Charitable Trust, The Farrington Hopkins Trust and several anonymous supporters is ensuring that our scholarship fund continues to grow. Demand as always is higher than the funds available and new supporters are required to improve levels of scholarship funding available to students from developing countries.

## LSTM ALUMNI

Many former staff and students have continued their relationship with LSTM beyond the time that they have spent with us. LSTM alumni offer their support through guest lecturing, hosting overseas student projects, becoming donors, acting as advocates to further shared aims. Increased communications with our alumni is presenting new opportunities for the future, allowing new partnerships and collaborations to flourish.

**FOR MORE  
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# AWARDS AND HONOURS



## PROFESSOR JANET HEMINGWAY

This year, Janet Hemingway became one of 44 new Fellows elected by The Royal Society and joins the ranks of the UK and Commonwealth's leading scientists, counting herself among early Fellows such as Sir Isaac Newton and Charles Darwin. This adds to her already extensive list of honours and accolades which helped her to become the Director of the School and CEO of the Bill and Melinda Gates Foundation-sponsored Innovative Vector Control Consortium.

The Royal Society is the UK's national academy of science and election to the Fellowship is the highest scientific honour in the UK. Founded in 1660, the Society is a major provider of independent scientific advice, a learned society and a funding agency. The School's Director has achieved a remarkable 'double' this year; as earlier this month, she was one of only 16 overseas Fellows inducted into the American National Academy of Sciences, the US equivalent of The Royal Society.

Professor Hemingway commented, "It is a great honour to be recognised by both the UK and American National Academies. These awards recognise not only my own contribution to the prevention of diseases such as malaria, but also the increasing importance placed on attempting to reduce the human health burden of these diseases through the design and implementation of better interventions. It is a humbling experience being asked to sign the Fellowship books started by Sir Isaac Newton and Abraham Lincoln in the UK and USA, respectively."



## HE DR ABDULLAH BIN ABDULAZIZ AL RABEEAH

His Excellency, Dr Abdullah Bin Abdulaziz Al Rabeeah, the Minister of Health in Saudi Arabia was presented with the Mary Kingsley Medal during his official visit to the School to mark the start of the new venture with IVCC and LSTM. The Mary Kingsley Medal is the highest award which LSTM can bestow. It was given in recognition of the Minister's outstanding contributions to medicine through his expertise in the separation of conjoined twins and in recognition of his vision in facilitating the establishment of the new Joint Centre.

The Mary Kingsley Medal was instituted in 1903 by Liverpool shipowner John Holt, one of the founders of the Liverpool School of Tropical Medicine in memory of the intrepid Victorian traveller, nurse and naturalist who was a 'new woman' of her time. She was a friend of John Holt with whom she campaigned for the setting up of the Liverpool School of Tropical Medicine at a time when hospital wards in Liverpool were seeing increasing numbers of seamen with tropical disease, due to increased trade between Liverpool and Africa.



## DR ALVARO ACOSTA-SERRANO

Another cause for celebration in LSTM this year is the work of Alvaro Acosta-Serrano. Alvaro's time at LSTM so far has been very

productive; after gaining his PhD in Molecular Parasitology in São Paulo, followed by post-doctoral work in Hopkins (Baltimore) and Dundee, and then as Wellcome Trust RCD Fellow in Glasgow, Alvaro joined LSTM in 2008. Since then he has obtained a prestigious Wellcome Trust project grant to carry the work he initiated in Mike Lehane's laboratory; this was in turn followed by the School granting Alvaro a Lecturer position within the MBP Group with a joint appointment to the Vector Group. Several things attracted Alvaro to LSTM, primarily the chance to join Mike Lehane, a world-leader in his chosen field. Alvaro remarks that the other things which attracted him to the School were "the School's good momentum in terms of funding, the quality of other research groups, the School's facilities, and the research environment of Liverpool University; specifically its Centre for Glycobiology."

Today Alvaro finds himself in an interesting position as the only glycobiologist at LSTM, and one of only two people (the other being Mike Lehane) studying the interaction of parasites and insect vectors using trypanosomes and tsetse flies as a model. In continuing his successful collaborations with Mike Lehane, Alvaro hopes that "these studies will help us to find ways to block the transmission of sleeping sickness and animal trypanosomiasis in Africa."



## MR JOHN HUGHES

After over 25 years of working in maintenance at LSTM, John Hughes retired at the beginning of September. Starting in April 1986 as a maintenance engineer, John has had an exciting time especially with the School going through so many diverse refurbishments.

With the School not being just lecture halls, but also laboratories, administration offices and all using high technology equipment, John's contribution has been of high importance in many sectors of the School. John says "I feel lucky to have been part of LSTM, every day has been different and I have enjoyed the working environment and all of my colleagues."



## PROFESSOR STEPHEN WARD

Professor Stephen Ward is also being recognised for his 25 years of service at LSTM, although his first encounter with the School was some 32 years ago, when he took up a Research Technician's position in the University of Liverpool's Tropical Pharmacology Group. "This experience triggered the refocusing of my research direction towards a much more product-oriented view of work." Steve has established the first and most successful academic antimalarial drug discovery programme (now extending into TB and beyond) in the world in collaboration with scientists in Liverpool, Europe and Africa. He was also awarded a Personal Chair from the University of Liverpool in 1998 and the Walter Myers Chair in Parasitology from LSTM in 2000. Since his return to the School, Steve was initially Head of the Molecular and Biochemical Parasitology Group before being promoted to Deputy Director of LSTM in 2002.

# OBITUARIES

## HAZEL HOWDEN-LEACH

LSTM wishes to celebrate the life of Hazel Howden-Leach. Joining the School in May 2004, Hazel initially worked with Professor Imelda Bates, before joining Dr Amir Hassan's team involved in capacity development of Higher Education institutions overseas as Academic Developer in 2008. She played a vital role in the development of learning and teaching, in an EU-funded technical assistance project based at the Centre for Strategic Health Studies in Damascus. This project involved relatively inexperienced national staff working closely with international staff experienced in the administration and delivery of Masters courses in the health field. Hazel organised and ran short courses in teacher training for national staff and was a constant source of advice, encouragement and guidance in this key area of their development. She was a crucial link between these two groups of staff, as well as between staff and students; involved in the introduction of national staff and students to approaches to learning and teaching techniques largely new to them. In addition, she worked closely with international staff in the area of quality assurance in which she contributed greatly to procedures used in student evaluation of teaching.



Hazel was a natural communicator and teacher. She took on the challenging task of implementing a new approach to skills training and personal development in the LSTM Masters programmes. Her bubbly personality, enthusiasm for teaching and down-to-earth approach gave her an instant rapport with the students; she took a personal interest in each of the students and was completely committed to delivering a high quality learning experience for them.

Hazel passed away peacefully on July 21 after a year-long battle with cancer of the pancreas. She was 56 years old. Hazel as a person was so full of life; someone who was very gregarious and had no problem working and socialising with people from different cultures and backgrounds. She was eminently likeable and contributed significantly to the School and its international reputation. She will be missed greatly.

## LIKEZO MUBILA

One of the most illustrious alumni of LSTM working with WHO in Africa passed away in August. Dr Mubila was a member of the CNTD technical advisory group for the LF project and worked tirelessly with us to promote our activities. Likezo was a remarkable person who worked as the WHO AFRO focal point for lymphatic filariasis, schistosomiasis and soil transmitted helminths in Africa. Her dedication was well recognised across the globe.

Likezo was particularly well known in Liverpool, where she studied for her PhD, and had worked closely with many here, including Professor David Molyneux who said, "Likezo was a student of mine in Salford in the 1980s and did her PhD in Liverpool in the 1990s. Her qualities of commitment and hard work combined with a sensitivity, quiet modesty and resilience to her personal problems were a shining example to us all. We will not easily replace her. We in Liverpool are greatly saddened by her passing and share the distress of her family and our colleagues in WHO."

Likezo graduated from the University of Zambia with a BSc in 1985, and was then awarded a British Council Scholarship to study in the Department of Biological Sciences at the University of Salford in 1986. It was here that she met Professor David Molyneux, who remarked that despite her arriving in Salford "during the worst possible time for a young African who had never experienced a northern European winter – a cold, dark and miserable environment," Likezo "rapidly adapted to all environments." She went on to produce two peer-reviewed papers from her Masters Dissertation before returning to Zambia to take up a post at the University of Zambia teaching Zoology as a Lecturer. These early achievements in the face of difficult circumstances reflected her steely determination to succeed and marked her out as an individual of rare qualities.

Likezo was awarded a WHO/TDR research studentship in 1992 to undertake a PhD at the Liverpool School of Tropical Medicine. Her thesis was on the epidemiology and transmission dynamics of schistosomiasis

on Lake Kariba under the supervision of Dr Ian Marshall. She successfully defended her thesis in 1995 and was promoted to Senior Lecturer on completion of her PhD. She was soon involved with WHO AFRO, initially in consultancy roles, then later assigned to a succession of contracts on parasitic diseases and their control.

Likezo was someone who was both admired and respected in equal measure, as an individual of both knowledge and humility. She was always warmly welcomed as a friend and colleague both at LSTM and at WHO Headquarters and will always be remembered with the greatest affection.



## IMAGE CREDITS

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PEMBROKE PLACE,  
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**Printed on revive 50:50 Silk**

A recycled paper containing 50% recycled waste and 50% virgin fibre and manufactured at a mill certified with ISO 14001 environmental management standard. The pulp used in this product is bleached using an Elemental Chlorine Free process (ECF).



Company registration number: 83405  
VAT registration number: 887125885  
Registered charity number: 222655