

ANNUAL REPORT 2009/10

RESEARCHING AND EDUCATING TO SAVE LIVES





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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.

2009/10 HIGHLIGHTS

LSTM's multi-disciplinary expertise in combating disease and improving health systems continues to grow, with new partnerships and advances expanding LSTM's existing international reach. This year, LSTM:

RECORDED A TURNOVER OF

£53m

WAS DESIGNATED A WHO
COLLABORATING CENTRE
FOR EVIDENCE SYNTHESIS
FOR INFECTIOUS AND
TROPICAL DISEASES

INTRODUCED RAPID HIV
TESTING TO LIVERPOOL
COMMUNITIES

LED 15
INTERNATIONAL
HEALTH CONSORTIA

APPOINTED THREE
NEW PROFESSORS,
BRINGING THE TOTAL
TO 19 AMONGST A
STAFF OF NEARLY

TAUGHT **562** STUDENTS
FROM
53 COUNTRIES

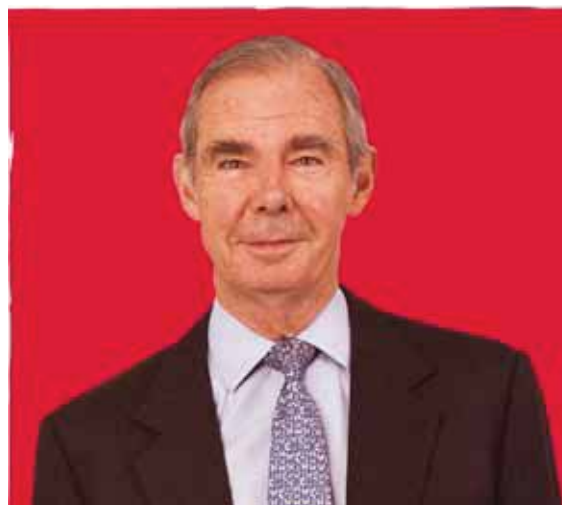
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WORKED ON MORE
THAN 50 PROJECTS TO
FIGHT MALARIA AND
ITS EFFECTS, WORKING
IN PARTNERSHIP WITH
OVER 30 COUNTRIES
WORLDWIDE

HELD A RESEARCH
PORTFOLIO WORTH

£159m

CHAIRMAN'S FOREWORD



"LSTM is at the hub of an expanding portfolio of activities to bring the benefits of innovative research to those who are grappling with the ravages of tropical diseases around the world."

Earlier this year, the Director Janet Hemingway was elected to the National Academy of Sciences – one of the highest scientific honours, particularly for a non-US citizen. This is a significant recognition of Janet's contribution to the world of science in general and to research and teaching in the field of tropical diseases in particular. She of course argues that the honour is in recognition of the work of the institution as a whole. This simply underlines the fact that the success of the Liverpool School of Tropical Medicine is the success of the talented individuals who work in the LSTM family and who translate their knowledge from 'bench to bedside'.

LSTM's talent pool has been strengthened this year by the appointment of three new Professors, Roy Carr-Hill, Phil Cooper and Richard Pleass, and a new Director of HR, Christine Greenway, who joined LSTM in January 2010. We welcome each one of them and look forward to their contribution to the work of LSTM.

As a result of his appointment as Parliamentary Under Secretary of State at the Department for International Development, Stephen O'Brien has resigned from LSTM's Board of Trustees. We would like to thank him for his support over the years and wish him well in his important new role.

At the same time we welcome Dr Nicholas Banatvala to the Board. He brings with him a wide range of international experience in global health, government and the work of NGOs, which will be invaluable to LSTM. Two new members of LSTM have been appointed, Mr Oliver Isama and Mr Malcolm Jones; their advocacy of LSTM in the wider community will be important to us.

With the strength of the 'human capital' of LSTM reinforced, we continue to look forward to further growth in the scale of activities of the institution. This is dependent on our financial strength, which has been underpinned this year by the achievement of a very satisfactory surplus.

Key members of staff are to be congratulated on securing a flow of new research grants, which are the lifeblood of the institution. But there are warning signs out there of increasing competition, of falling returns on endowment funds leading to pressure on the quantum of awards and of great uncertainty about the impact of cuts in government expenditure in the UK.

Although an increasing emphasis on 'impact' in determining who receives funding should play to the strengths of LSTM, we cannot be complacent about our ability to finance future growth, so prudent financial management will continue.

In the pages of this report you will see something of the rich tapestry that is the work of LSTM in all the parts of the world where it operates. And more vividly, you can keep up to date with our revamped website at our new domain of www.lstmliverpool.ac.uk.

If I had to pick out just one event of last year, which encapsulates the importance of our work, I would choose the day in April 2010 (pictured on the cover) when one hundred staff and students joined hands outside the new building to mark World Malaria Day, each one symbolising ten thousand of the lives lost each year to malaria.

A handwritten signature in black ink, reading "James Ross". The signature is written in a cursive style.

James Ross

DIRECTOR'S REPORT

"The planned Institute of Translational Medicine pulls together numerous elements within LSTM that support taking cutting edge evidence-based research and translating this into policy and practice."



Many institutions claim to work in global health or translational research, but few do this as innovatively or as successfully as LSTM.

Our large scale programmes, all aimed at improving health in the tropics, continue to attract financial support from major donors and help us attract and retain high calibre staff.

The continued financial stability of the organisation has underpinned our ability to grow, with increased staff numbers and turnover and further strengthening of our balance sheet with local land acquisitions.

The latter will provide the opportunity over the next few years to expand our estate to house the planned Institute of Translational Medicine, pulling together the numerous elements within LSTM that support taking cutting edge evidence-based research and translating this into policy and practice through research, teaching, training and technical assistance.

This new initiative complements our laboratory based translational research activity which is already highly visible internationally in drug and insecticide definition, development and delivery, and the basic research that underpins these programmes.

Only two years after its completion, and in line with our initial business plan, the Centre for Tropical and Infectious Diseases (CTID) is now fully occupied. We welcome two new major research Professors, Richard Pleass and Phil Cooper who will strengthen our immunology expertise and open up new collaborations in South America.

These will be augmented further with a new senior appointment in Schistosomiasis research, a timely addition to LSTM with the expansion of the Centre for Neglected Tropical Diseases with new contracts from DFID and USAID.

Malaria continues to be a major focus and the renewal of current initiatives, such as the IVCC programme, with a further US\$50 million from the Bill & Melinda Gates Foundation, and funding of new initiatives such as the €12 million AvecNet programme, have cemented the role of staff as leaders of large scale partnerships that push forward the frontiers of science, in order to improve our abilities to sustainably control, or dream of eradication of, this major cause of morbidity and mortality in the tropics.

We are also expanding our links within the UK, with renewal of the Biomedical Research Centre in infectious diseases with the Royal Liverpool and Broadgreen University Hospital Trust and the University of Liverpool, a high priority for 2011.

This successful close collaboration at the patient interface was highlighted in 2010 with an ITV1 fly on the wall documentary that was well received.

We hope the publicity from this will convince more people to visit our travel clinic before they travel rather than needing our in or out-patient services when they return.

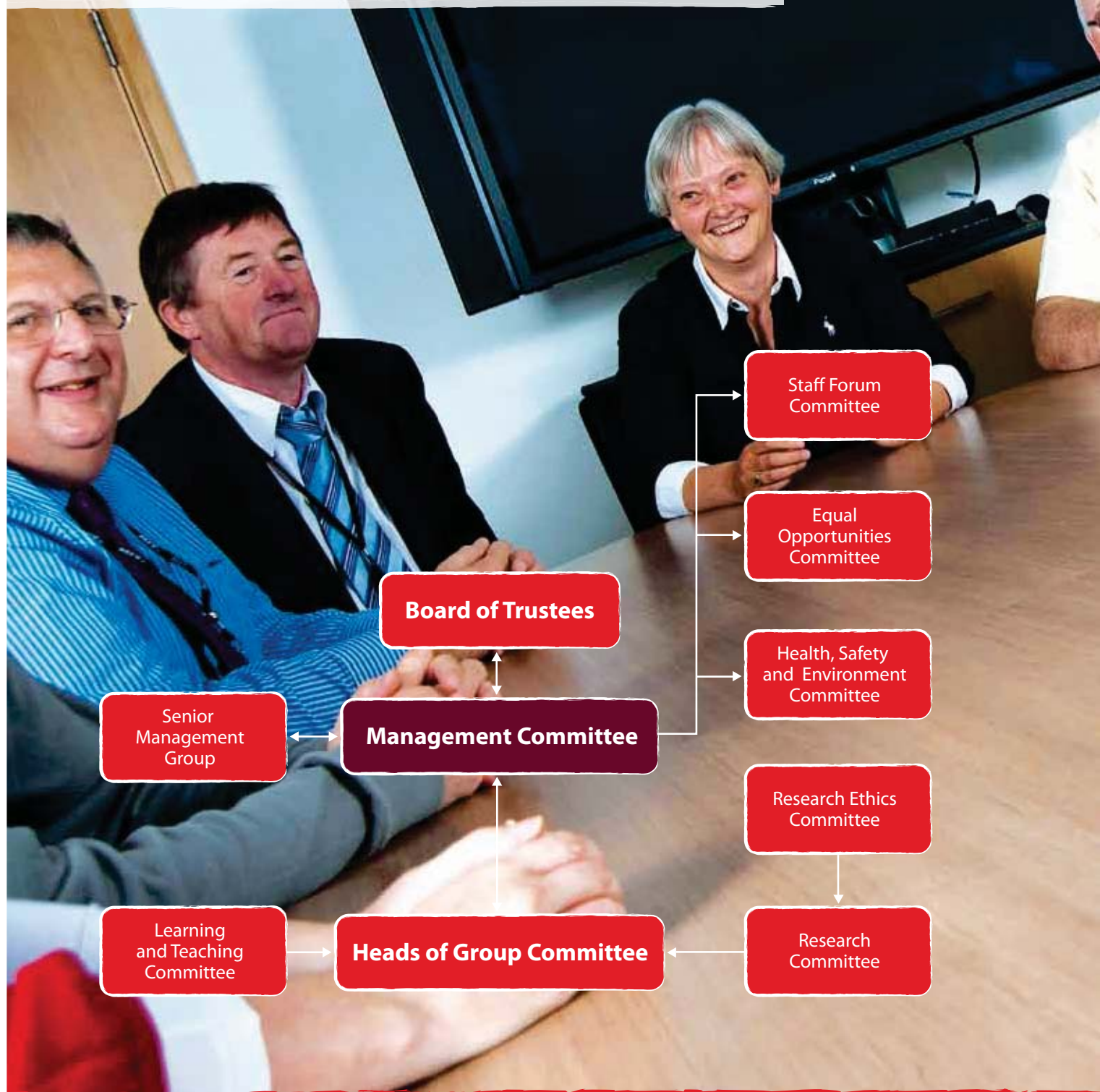
As ever, we would like to thank our numerous stakeholders and donors for their continued support. Without this we would be unable to deliver the innovations in translational medicine that are still so desperately needed if we are to effectively reduce the burden of disease in the tropics.

A handwritten signature in black ink, reading 'Janet Hemingway'.

Janet Hemingway

LSTM DECISION MAKING PROCESS

LSTM's structure allows decisions to be made in a professional, responsible and informed manner, leading to a results-driven environment.





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Management Committee is responsible for developing the high level strategy of the organisation, approving the strategic plan and recommending it to the Board of Trustees, annual revenue, capital budgets and cash flow. It considers, develops and facilitates the implementation of the research, teaching, human resources, finances and estates strategies.

Management Committee receives, ratifies and where appropriate adopts those employment recommendations from the Senior Management Group (SMG) which have financial implications. It is comprised of the Director, Deputy Director and a mixture of senior divisional heads whose individual expertise in their area contributes to the development and implementation of organisation-wide strategies.

LSTM's **Board of Trustees** is responsible for the sound governance of LSTM. The Board establishes strategies, policies and plans to achieve LSTM objectives, having regard to advice from the Director and Management Committee. The fifteen board members are selected for their mix of skills and experience in international health, business management and financial affairs. They are responsible for ensuring a sound financial and budgetary framework, assessing and managing risk and monitoring performance in relation to the strategies, policies and plans.

Senior Management Group (SMG) is composed of the Director (Chair), Deputy Director, Director of Administration and Support Services and the Director of Human Resources and acts as a first screen for financial and HR matters. It considers requirements for staff alongside associated issues and monitors the integrity of the research database, reporting detailed operational issues to Management Committee.

The **Heads of Group Committee** ensures that LSTM's academic groups contribute to the strategic plan by facilitating cross-group collaboration and coordinating LSTM's research, teaching and technical assistance activities. This committee receives information from the Research and the Learning and Teaching Committees, the TA Coordinator, the Global Health Development Working Group, the Staff Development Advisory Group and the Space Advisory Group and reviews progress against targets.

The **Research Committee** is responsible for developing the detailed strategic plans for research development linked to LSTM's overall strategic plan and comprises the Director, Deputy Director, Research Coordinator, nominated group representatives and the Head of Research Management. It recommends deployment of resources to enhance LSTM's research portfolio, through the Heads of Group Committee, to Management Committee.

The **Learning and Teaching Committee (L&T)** is responsible for developing and maintaining LSTM's strategic teaching policy

and making recommendations on this to Management Committee, through the Heads of Group Committee. It provides a robust organisational framework for the pursuit of new learning and teaching opportunities.

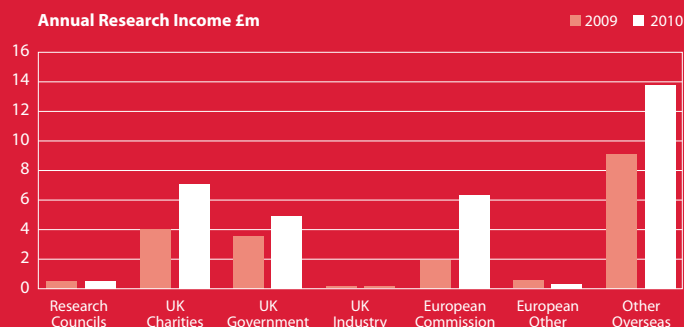
The **Research Ethics Committee (REC)** reviews all research proposed by members of staff, students or researchers involving participants and undertakes to ensure that all research associated with LSTM takes every possible measure to protect the participants from harm or danger, to preserve their rights and to reassure the community and sponsoring organisations. The REC is made up of staff members from a range of scientific and medical backgrounds and lay members.

The **Equal Opportunities Committee (EOC)** ensures there is no discrimination at LSTM. The Committee monitors and recommends EOC policy and strategy, monitors and reports on their continued effectiveness and presents reports to Management Committee and the Board of Trustees.

LSTM's **Staff Forum Committee** is comprised of 12 members of staff, two of whom also sit on Management Committee as staff representatives. The Committee organises a monthly open forum meeting and is responsible for ensuring that members of staff can freely discuss matters.

The **Health, Safety and Environment Committee** is responsible for monitoring and reviewing all health and safety arrangements at LSTM and is a consultative and advisory body for all health and safety matters potentially affecting staff, students and visitors.

TREASURER'S REPORT



Against the backdrop of financial turbulence that has created so many problems across the globe, it is pleasing to report that LSTM has delivered a very solid performance in the financial year to 31 July 2010 and that the institution remains very well placed for the future.

The extensive capital investment programme of the past few years has provided state of the art facilities which, coupled with the recruitment of senior academics, has helped LSTM win competitive tenders for grant funding and fulfil major research programmes. The resultant momentum has positively benefited the income and expenditure account and added to the strength of the balance sheet, which is in a very healthy state.

LSTM's income during 2009/10 amounted to £40.5 million, up by 27% on the previous year. After adding in the subsidiary undertakings, LSTM Group income totalled £52.5 million, an increase in excess of 30%.

£6.3 million of Group turnover came from the IVCC Product Development Partnership, a not-for-profit charitable enterprise which has successfully completed its first full year of operation.

It is pleasing to report that after a difficult period, LSTM's consultancy subsidiary, Liverpool Associates in Tropical Health (LATH) Ltd returned to profitability with a surplus of £300,000.

This is testimony to much hard work within the company to improve financial control systems and margins. It is true to say that LATH operates in a highly competitive environment and is likely to face continued turbulent trading circumstances.

Another subsidiary, Well Travelled Clinics Ltd, registered a loss for the year of £108,000 and is suffering from the reduced levels of holiday and business travel traffic. LSTM's commitment to this company is regarded as a medium term investment, unlikely to show any dividends for some time. Vigorous steps are being taken to promote the business and increase sales. Much will depend on the very difficult trading conditions easing.

The consolidated result for the LSTM Group shows a surplus of £1.36 million for the year, to which can be added £374,000 from the revaluation of investments. This is a highly satisfactory outcome and well ahead of expectations.

This surplus, coupled with a £2 million increase in capital grants, has strengthened the Group balance sheet, to the extent that total net assets now stand at almost £44 million. The Group has good liquidity and cashflow and is debt free.

Looking to the future, LSTM remains well placed for the short to medium term. Nevertheless there are challenges ahead, particularly in respect of teaching with uncertainty as to the funding levels available via block grants from the Higher Education Funding Council for England. A reduction of £500,000 will be incurred in the current year and it remains to be seen what levels of support will be available in future years.

On the other hand, research grants remain at a high level with the current portfolio of grants standing at £159 million. The relationship with longstanding donors remains strong; for example, the Bill & Melinda Gates Foundation has just committed to another five year grant of US \$50 million. In addition, £18 million of other applications have been approved awaiting signed contracts.

Ian Jones

VICE PRESIDENTS' PROFILES

LSTM Vice-Presidents are drawn from the fields of academia, business and politics and are committed to assisting LSTM in fulfilling its mission. Three of the current twenty one Vice Presidents are profiled below.



MICHAEL OGLESBY

Just a half day tour of LSTM was enough to persuade Michael Oglesby that its work was well worth supporting.

His involvement began through the Oglesby Charitable Trust which now provides an annual scholarship to three students from developing countries to study the Diploma in Reproductive Health programme at LSTM.

Following his sponsorship, Michael was invited to become a Vice President to provide advice and support to LSTM in his own specialist field of property development. He founded the Bruntwood commercial property group in 1978 and remains Chairman. His extensive knowledge of the industry has been very helpful to LSTM's expansion.

Michael has a number of other roles in the North West including Chair of Manchester's Investment & Development Agency and the Board of Governors of the Royal Northern College of Music, and positions on the board of the Manchester Cancer Research Centre and the North West Business Leadership Team.

His passion for LSTM's work is obvious. He explains "There is still an enormous amount to do in developing countries battling diseases and we in the UK have a real role to play in supporting them. LSTM is completely out of the political arena and for this reason has established itself as a place of reputation that can make good partnerships. People in Merseyside are aware of LSTM, but possibly not of its importance and I would like more people to know about the work that is done."



JENNY BORDEN

Jenny has spent much of her working life in organisations supporting the countries which LSTM operates in, so when she was invited to become a Vice President in 2007 she was very happy to accept.

Her first encounter with LSTM dates back to the 1960s when she taught in Malawi at a rural mission that incorporated a school, a hospital and a leprosarium. She now works as an independent consultant carrying out interim management, organisational reviews and project work in the international development field. She received an OBE in 1999 for her work with Christian Aid.

She admires LSTM's geographical reach and its effectiveness: "LSTM's work really gets it to the grassroots in the remotest of villages as well as doing high level cutting-edge research. Keeping the connections between these two ends of the continuum of work is something that LSTM does very well."

Looking to the future, she sees new challenges and opportunities for LSTM: "The growing constraints entailed in bringing students from developing countries where LSTM's training is most vitally needed has resulted in a recognition that LSTM will have to provide more training overseas and this poses exciting challenges.

"LSTM has huge, continuing potential. I'm particularly interested in its work in maternal and child health and its continuing work with malaria. Progress in these two areas is crucial to meeting the MDGs and high on the international agenda. They are much more of a priority now and this puts LSTM in a strong position."



EMERITUS PROFESSOR
HERBERT GILLES

LSTM's longest serving Vice-President and former Dean, Professor Herbert Gilles is an exceptional figure in the world of tropical medicine.

In 1949, Professor Gilles was House Physician on the Tropical Ward of the Liverpool Royal Infirmary, while studying for the Diploma in Tropical Medicine at LSTM. During this time he struck up a friendship that would influence LSTM and the course of tropical medicine as well as his own career. As he explains, "I was approached by the Dean of LSTM, Professor Maegraith, to take up the position of Lecturer at Large, which I readily accepted and which lasted from 1960 to 1965."

The role took him to Nigeria, where he formed a department of preventative medicine at Ibadan University. Returning to LSTM in 1965, he was offered a Senior Lecturer position by Maegraith, before taking the Alfred Lewis Jones and Warrington Yorke Professorships. His commitment to carry on the work of Maegraith was evident: "I worked very closely with him and when he retired I took over his work in Thailand."

He retired in 1986, having spent the previous five years as Dean of LSTM. Since retirement, Professor Gilles has continued to teach in Ireland and Italy and helps postgraduates who are seeking further training overseas.

He was awarded the CMG for his outstanding work overseas in 2005 and in 2008 he was appointed Companion of the Most Exalted Order of the White Elephant by the King of Thailand for his involvement with the faculty of tropical medicine at Mahidol University for more than 30 years.

MOLECULAR & BIOCHEMICAL PARASITOLOGY GROUP

This year in MBP Group we aimed to expand and strengthen our core of parasitologists. Our recruitment drive was intended to both replace colleagues who have retired or moved on and to create a new and strong critical mass in helminth parasitology to exploit key global health funding initiatives in the Neglected Tropical Diseases.

We also wished to create more balance in our parasite portfolio and develop and strengthen our links with LSTM's Centre for Neglected Tropical Diseases. We are delighted to report that the outcome of our search has delivered four new parasitology appointments to LSTM:



Professor Richard Pleass joins us from the Institute of Genetics at the University of Nottingham. Richard's research is concerned with understanding the immunological basis behind the control of parasitic infections,

which would enable the design of novel therapeutics to treat malaria and other parasitic diseases. Whilst at Nottingham he played a key role in developing the first fully human antibodies against the malaria parasite. He is particularly interested in how parasites evade immune responses and is now investigating if antibodies can be incorporated into vaccines. Richard said: *"I was attracted to LSTM by the possibility of applying my expertise to develop exciting new avenues of research with colleagues who have close ties with Africa, where I grew up as a child. I'm interested in helping my new colleagues here by making monoclonal antibodies to their target proteins. I'm already working with Professor Alister Craig and Dr Stephen Gordon to understand how antibodies protect people from malaria and pneumococcal pneumonia."*



Professor Phil Cooper moves to Liverpool from St. George's University of London. Having trained in medicine at St George's, he completed a PhD in parasite immunology at the University of

Cambridge and worked in the US as a post-doctoral researcher at the National Institutes of Health, continuing his research on human immune responses to helminth infections with field work based in Ecuador.

He returned to the UK and to St George's as a Wellcome Trust Advanced Training Fellow. His Senior Wellcome Research Fellowship has been renewed to continue his work on the interactions between helminth and other infections on allergy. His broader interests include helminth immunology, epidemiology, treatment, and control. Talking about his appointment, Phil said: *"I am excited about the prospect of coming to Liverpool. LSTM has put a major effort into recruiting people with expertise in Neglected Tropical Diseases and I believe that there is now enough critical mass accumulated to propel LSTM forward as a major player in this area in terms of setting the research agenda and public health policy."*



Dr Joe Turner returns to LSTM from the University of York's Schistosomiasis Research Group, to establish his own group in helminth immunopathology. After graduating in Medical Microbiology

from Newcastle University and deciding to specialise in parasitology, he attained an MSc in Molecular Parasitology and Vector Biology from Manchester University before gaining a PhD in Parasite Immunology from Nottingham University.

He was a member of The Filariasis Research Group at LSTM that demonstrated the curative treatment for onchocerciasis and lymphatic filariasis using doxycycline.

He moved to The Schistosomiasis Research Group at York University to work on an EU funded project defining immune regulation in schistosomiasis and also gained a Wellcome Trust Departmental Fellowship to investigate host-parasite interactions of experimental schistosome transmission. Commenting on his appointment, Joe said: *"I am very much looking forward to rejoining LSTM as part of the recently expanded Neglected Tropical Disease research focus. My aspiration is to determine how filarial pathogens induce the disease manifestations of onchocerciasis and lymphatic filariasis at the molecular and cellular level. Such understanding will lead to a targeted development of novel therapeutics both to cure infection and alleviate symptoms."*



The final parasitological appointment is Professor Russell Stothard who joins the Centre for Neglected Tropical Diseases in our Disease Control Strategy group from the Natural History Museum next spring

in order to expand our NTD helminth interests to include schistosomiasis. Russell is foremost a field parasitologist and epidemiologist and has applied molecular DNA tools to provide new insights into disease burdens, transmission and evolution, paving a way for optimising control of schistosomiasis, soil-transmitted helminthiasis, trypanosomiasis and malaria.

His key interests include the spatial epidemiology of NTDs and uncovering cryptic zoonotic cycles.

PROFESSOR MARK TAYLOR BSc PhD
HEAD OF THE MOLECULAR & BIOCHEMICAL PARASITOLOGY
GROUP, PROFESSOR OF PARASITOLOGY, DIRECTOR OF A-WOL

Mark's area of interest is the filarial nematode diseases of humans. These include elephantiasis (lymphatic filariasis) and river blindness (onchocerciasis): two of the leading causes of global disability. His research team has also performed laboratory and field-based studies to exploit *Wolbachia* as a target for antibiotic therapy, providing a novel and effective treatment for filarial infection and disease. He is Director of the A-WOL consortium which aims to translate anti-Wolbachia therapy into a public health tool for filariasis control.



LSTM is the headquarters of A-WOL – The Anti-Wolbachia Consortium, which runs a five-year programme with a \$23 million grant from the Bill & Melinda Gates Foundation, to discover and develop new and improved treatments for onchocerciasis and lymphatic filariasis through targeting the *Wolbachia* bacterial symbionts of filarial nematodes. The consortium is under the direction of Professor Mark Taylor, the head of the MBP Group.

Current field trials carried out with colleagues from Bonn University and Kumasi Centre for Collaborative Research (KCCR), Ghana using doxycycline and rifampicin to determine the optimum regimen for onchocerciasis and lymphatic filariasis are reaching their final phase. The results will define the shortest course and dosage of existing anti-wolbachial antibiotics effective at killing the adult parasites.

A-WOL has completed the screening of registered drug libraries and novel libraries of tetracycline-based drugs delivering a total of more than 300 'hits'.

These are progressing through a screening process to identify the drugs with improved potency and those that are effective over a shorter timeframe.

The screening activity has expanded to include larger diversity-based libraries and focused anti-bacterial libraries in collaboration with industrial partners including; Inventa Technologies (S) Pte Ltd, Anacor Pharmaceuticals Inc, Abbott, Pfizer Inc, Bio-focus DPI Ltd and SIMM (Shanghai Institute of Materia Medica) in collaboration with the Pasteur Institute, Shanghai.

A-WOL has teamed up with Professor Bill Sullivan's lab in University of California, Santa Cruz to develop high-throughput screening assays to increase the screening capacity and throughput of A-WOL library screening activities. The Sullivan lab is also investigating critical interactions between *Wolbachia* and its nematode host at both the cellular and molecular level to determine additional *Wolbachia*-specific drug targets together with Dr Barton Slatko's lab in New England Biolabs.



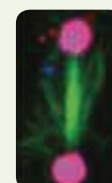
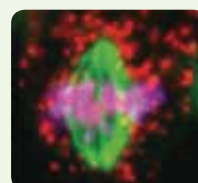
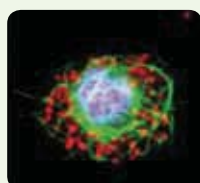
Other target discovery activities between New England Biolabs and Dr Ken Pfarr's lab in Bonn University have identified aptamers and small molecules, which bind specifically to *Wolbachia* target molecules in the glycolysis and haem biosynthesis pathways, which are among the genes identified as essential for the symbiont's survival.

A-WOL is on track to meet its goal of delivering new anti-Wolbachia drugs and compounds, which can enter hit-to-lead optimisation to produce the next generation of treatments for onchocerciasis and lymphatic filariasis. Additional large-scale trials are planned to evaluate these drugs at the community level to work-out how best to deploy anti-wolbachial treatments in conjunction with ongoing elimination programmes aimed at eradicating one of the most debilitating of the neglected tropical diseases.



A typical request for help from a relative of someone suffering from lymphatic filariasis:

"Sir you are the only hope for me because my 16 year old younger brother is suffering with this disease. He lives in a small village in India where there are lots of mosquitoes in their place. There are so many people in his village suffering with the same problem. But I don't want to see my brother with elephantiasis. I want him to play cricket like everybody he is very fond of it. I love my brother a lot. He is a kid sir he came to know that he has this disease on his birthday. Instead of celebrating we all were very sad and cried because of his position. Many people are saying that there is no cure for this but when I saw this article on the web I got the hope that my brother can again be normal like everybody. it is in the starting stage. Sir Please help us telling what to do and how I can solve my brother's problem. Please sir give me a chance and give him life again."



TROPICAL DRUG DISCOVERY GROUP

PROFESSOR STEVE WARD BSc PhD DEPUTY DIRECTOR LSTM, WALTER MYERS PROFESSOR OF PARASITOLOGY, SCIENTIFIC DIRECTOR ANTIMAL

Steve Ward graduated with a first class honours degree in Pharmacology and Physiology from Aston University in 1979 and went on to gain a PhD in Biochemical Pharmacology from Liverpool University in 1984. Steve spent the next two years as a Senior Research Fellow at Vanderbilt University in Tennessee USA, prior to taking up the role of Wolfson Lecturer in Tropical Pharmacology at Liverpool School of Tropical Medicine until 1990.



Over the following ten years Steve held Lectureship and Senior Lectureship posts in the Department of Pharmacology and Therapeutics (Liverpool University), before promotion to Reader and subsequently Professor of Pharmacology in 2000. Returning to LSTM in 2000 as Walter Myers Professor and Head of Molecular and Biochemical Parasitology, Steve was promoted to his current role of LSTM's Deputy Director in 2004.

Malaria is a disease, which causes approximately 1 million deaths per year. Most of the people that die are children living in resource-poor countries in sub-Saharan Africa. The disease is caused by a small parasite, known as *Plasmodium*, entering the human body through the bite of a female mosquito. There is no vaccine and the only way to treat people that have been infected with the parasite is through the use of drugs. Currently we are faced with a crisis, as many of the drugs which have been used for years to treat malaria are failing to cure infections because of parasite resistance to the drugs. As a result deaths from malaria are globally on the increase.

In fact, more people die of malaria now than they did 20 years ago. Initiatives have been introduced to stem the number of drug-resistance mediated clinical failures, such as the introduction of artemisinin derivative-based combination therapy (ACT). However it is clear that a better understanding of resistance mechanisms to currently used drugs is required to support the development of such strategies and help prevent the development of resistance to new therapies.

Chemotherapy has been and will remain the central strategy for malaria treatment. As a result there is an urgent need for the development of new antimalarial drugs. The ultimate goal is to register drugs with a suitable product profile for uncomplicated malaria. This includes efficacy against drug-resistant strains, cure within three days (using single daily doses), low toxicity especially in children and in pregnant women, low risk of emergence of resistance, adeptness in formulation and packaging, good product stability and a low cost of goods. As a consequence of the need to adhere to these strict criteria, it is estimated that only 1-2% of drug discovery projects will make it to the later stages of clinical development.

In an effort to improve the success rate of drug development, several approaches are being investigated. These include the redesign of existing drugs, the novel use of older drugs, the development of drugs from natural products and rational targeting of novel parasite-specific targets as identified by an improved understanding of parasite biology. All four strategies have the potential to produce therapeutically relevant drugs

and it is hoped that in the near future a new arsenal of drugs will be available to stem the tide of antimalarial drug resistance.

Over the past decade, Steve has contributed towards the development of a molecule-to-man initiative in Liverpool aimed at translating basic scientific knowledge into products. He was involved in all stages of the development and registration of the antimalarial Lapdap in partnership with GlaxoSmithKline (GSK), UK Department for International Development (DFID) and the World Health Organization Research and Training in Tropical Diseases programme (TDR), with a principal role in the preclinical pharmacology and human disposition studies as well as being a member of the product development team (PDT).

He has held equivalent roles in two further PDTs funded by Medicines for Malaria Venture and GlaxoSmithKline. To date Professor Ward's team has taken three antimalarial products into human trials and a further three molecules into preclinical development. More recently, studies have focused to exploit targets in the pathways of the parasite's energy metabolism. In order to treat not only non-severe malaria but also to effect radical cure (by blocking the liver stages of the parasite) and to block transmission of the parasite to the mosquito vector (by targeting the sexual stages of the parasites). Outside the field of antimalarials the team is now looking at novel ways of treating dormant TB in collaboration with Dr Giancarlo Biagini and novel routes to new insecticides with Professor Paul O'Neill. These studies are multi-disciplinary efforts that involve chemists, biochemists and clinicians within Liverpool and overseas.



1 million
DEATHS PER YEAR CAUSED BY MALARIA

MALARIA PATHOGENESIS GROUP

PROFESSOR ALISTER CRAIG BSc PhD PROFESSOR OF MOLECULAR PARASITOLOGY, CHAIR OF RESEARCH COMMITTEE

Alister Craig graduated with an honours degree in Genetics from Edinburgh University in 1981 and gained his PhD in Molecular Biology at Leicester University in 1984. Work as a Post Doctoral Research Fellow with Professor Hans Lehrach on Genome Analysis followed, firstly as an EMBO Fellow at the European Molecular Biology Laboratory (Heidelberg) and then at the Imperial Cancer Research Fund Laboratory (London). Alister spent the following 10 years as a Senior Postdoctoral Researcher at the Institute of Molecular Medicine (Oxford) before moving to LSTM in 1999 as a Senior Lecturer.



Alister was promoted to Reader before taking up his current position as Chair of Molecular Parasitology in 2006. In addition to running his own Research Group and his role as Principal Investigator, Alister has significant supervisory experience on the Wellcome Trust Clinical Training, Advanced Training and Career Development Fellowships. He is also Chair of LSTM's Research Committee, which is responsible for the development of the detailed strategic plans and the deployment of key resources to enhance research development.

He is a member of the Immunology and Infectious Disease Funding Panel of the Wellcome Trust and the Scientific Advisory Committee of the European Vaccine Initiative as well as being Reviews Editor for the Molecular and Biochemical Parasitology journal.

Malaria continues to exact a huge toll across large parts of the globe. While control measures continue to yield rewards, our basic understanding of how infection leads to a clinical spectrum of mild through to severe disease remains incomplete. Progression to severe illness in malaria has been linked with the ability of red blood cells (RBC) infected with the human malaria parasite *Plasmodium falciparum* to bind to a number of host proteins on the endothelial cells lining the small blood vessels. For example, one syndrome of severe malaria, cerebral malaria, is thought to result, at least in part, from parasitised RBC (pRBC) adhesion in the brain.

The binding of pRBC to human endothelium is mediated on the host side by a large number of receptors but two have come under particular scrutiny due to their use by a large proportion of clinical parasite isolates. These two proteins, CD36 and ICAM-1, are variably distributed through the body and the level on host cells of the latter is known to be increased during malaria infection.

The parasite side of this binding interaction is mediated by a protein called *Plasmodium falciparum* erythrocyte membrane protein 1 (or PfEMP1). This is an interesting molecule as it undergoes a process known as antigenic variation, during which different pRBC in a population are able to switch the type of PfEMP1 being displayed on their surface.

The basis of this behaviour is to enable the parasite to evade the host immune defence systems, and in doing so, the parasite generates different variants that have variable binding repertoires. This has led to the suggestion that severe disease may result from the 'wrong parasite, wrong place' whereby a parasite variant displaying a PfEMP1 protein able to bind to a host endothelial receptor such as ICAM-1 that can be induced during infection could be preferentially recruited to the blood vessels in the brain, resulting in cerebral malaria.

Answering this question is complicated by the lack of an appropriate animal model that has the same parasite binding seen in human disease. Therefore our studies have focused on developing *in vitro* models in the laboratory that mimic as closely as possible the interactions taking place in a blood vessel in order to develop hypotheses and then testing these in clinical studies.

An example of this is our attempts to link adhesion to specific host receptors with different disease classifications. Using a variety of techniques in the laboratory, including adhesion assays under flow conditions and capturing data via video microscopy, we are able to examine the ability of infected RBC to bind to a variety of targets, such as the receptor ICAM-1.

This work has led us to suggest that adhesion to this receptor varies between different PfEMP1 variants and therefore might be related to particular types of disease such as cerebral malaria.



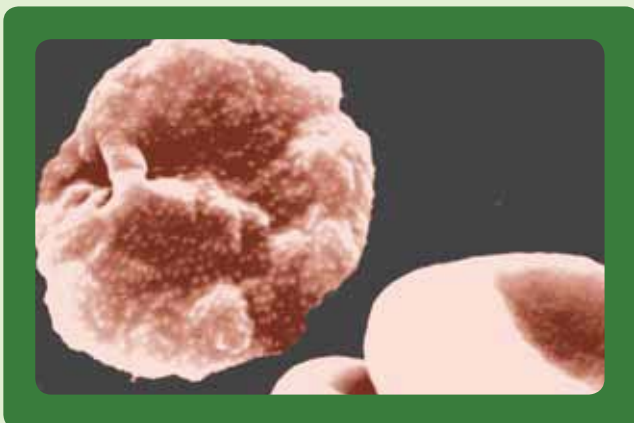
We have established these technologies at research programmes in Kenya and Malawi and by examining parasite isolates have demonstrated that the ability to bind at high levels to ICAM-1 under flow conditions is associated with parasites from children with cerebral malaria.

By understanding the molecular mechanisms underpinning severe disease we hope to be able to develop new therapies aimed at supporting the sick child while more standard anti-parasite drug regimens have a chance to work.

Not all of our workflow runs from the laboratory to the field. Recently we benefited from a clinical observation made in Ghana about increased levels of a protein (von Willebrand Factor (VWF)) found at increased levels in the blood of children with severe malaria.

This interested us as we had previously seen that platelets could be involved in parasite adhesion but did not fully understand how this happened. Knowing that high levels of VWF were seen in children with malaria and

that this protein can also bind to platelets led us to develop a completely new mechanism for parasite binding to endothelium based on the release of 'strings' of VWF by endothelial cells that capture platelets, that in turn provide proteins, including CD36, to which pRBC can bind. This raises several new avenues of research linking the ability of parasites to bind to endothelial cells and the host inflammatory response to infection with the pathology of severe malaria.



The malaria parasite *Plasmodium falciparum* remodels the host red blood cell (RBC) membrane to facilitate the development of the parasite and to avoid clearance by the host. This electron micrograph shows two uninfected RBC as smooth biconcave disks and an infected cell, which is highly irregular in shape.



Infected RBC are shown binding to a human endothelial cell grown in culture. By using these laboratory models we have been able to characterise the binding abilities of different parasite variants and suggest how they might bind to vessels in different organs such as the brain.

VENOM UNIT

The Alistair Reid Venom Research Unit plays an integral part in the production of antivenom to treat West African snakebite victims. As part of the EchiTab Study Group, which includes the Nigerian Federal Ministry of Health and antivenom manufacturers in UK (MicroPharm Ltd) and Costa Rica (Instituto Clodomiro Picado), the Unit collects venom and conducts preclinical testing of antivenom, which saves countless lives in Nigeria and other West African countries.



The Unit was fully refurbished this year, improving the laboratory and office facilities and rebuilding the herpetarium to nearly double the previous size. This four month project was completed in early 2010 and involved rehousing the snakes in temporary accommodation in adjacent laboratories.

The Unit currently houses more venomous snake species than any other research establishment in Europe, mainly spitting cobras, puff adders and carpet and saw-scaled vipers because of their significance in envenoming.

One of the main benefits of the refurbishment is the new air handling system that can be easily adjusted to provide an environment at constant temperature and humidity to the snake rooms, irrespective of ambient conditions, providing an improved atmosphere for the snakes and also for the staff caring for and working with the snakes.

The other major change is the provision of a viewing window and sound system between the reception room and the procedure room which allows visitors to watch venom extractions and snake handling procedures in complete safety. In the first quarter since the refurbishment, nearly 200 visitors have been accommodated, from TV crews and students to herpetologists and Home Office inspectors.

The new viewing facility will allow us to accommodate more visitors to raise awareness of the importance of the facility to saving lives without interrupting the work of the staff.

The refurbishment also included a much improved snake handling area, the provision of new snake cages and wheeled racks to hold the cages, which makes venom extractions, handling and cage cleaning much safer and more efficient. We gratefully acknowledge funds from the Wellcome Trust that supported this refurbishment.

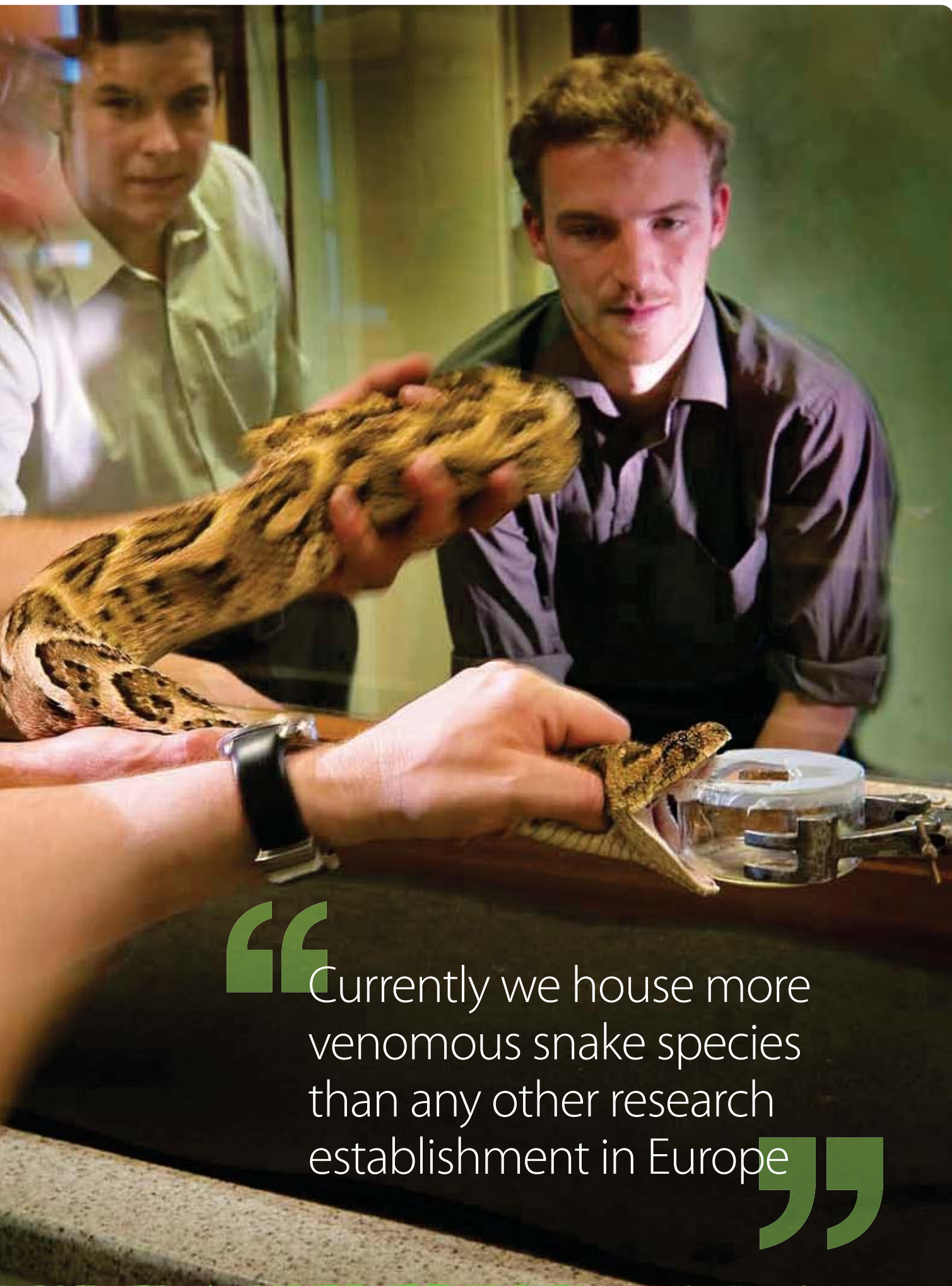
Antivenom is produced by immunising horses with a small amount of venom but maintaining the horses in arid regions can be problematic. Camels are however much better acclimatised to these conditions and the first phase of a project led by recently graduated PhD student Darren Cook has demonstrated that effective antivenoms can be prepared from camels immunised with snake venom.

Another graduating PhD student, Nicholas Casewell, successfully characterised all the genes encoding venom proteins from four species representing the phylogenetic diversity of the *Echis* genus of saw-scaled vipers.

His research culminated with the demonstration that antivenom developed against the West African species, *Echis ocellatus*, is pre-clinically effective against venoms from other African *Echis* species. This is important because antivenom supply to Africa has been deficient for the last decade.

Finally, we welcome Camila Renjifo and Maimonah Al Ghanmi, who have joined our research team this year on PhD projects to improve our understanding of venom protein biology as a means to improve the therapy of victims of snake envenoming.





“Currently we house more venomous snake species than any other research establishment in Europe”

VECTOR GROUP

TACKLING VECTOR-BORNE DISEASE

Effective control of many disease vectors requires the deployment of an insecticide as a residue in locations where the vector will contact it and where the insecticide will persist. This must be done without any risk to humans or animals and without damaging the environment.

Today, indoor residual spraying (IRS) and insecticide-treated bednets (ITNs) are among the best methods for doing this for most vectors and a substantial proportion of the work undertaken by members of the Vector Group at LSTM is directed towards both improving these strategies and ensuring they remain effective for as long as possible. However, these methods are not suitable for every type of disease vector, nor every situation worldwide where mosquitoes and other vectors transmit human disease: for

example, many diseases are transmitted by day-biting mosquitoes, or by species that rest or bite outdoors. These situations present unique challenges to preventing disease transmission that are being met by a wide range of approaches in the Vector Group, some of which are highlighted here.

DENGUE

Dengue is the most important and fastest-spreading arthropod-borne viral disease of public health significance. It is transmitted by day-biting mosquitoes, mainly *Aedes aegypti*. Only nine countries had dengue in the 1950s, compared with more than 100 countries worldwide today, and the World Health Organization (WHO) estimates that more than 2.5 billion people are at risk.

THE WORLD HEALTH
ORGANIZATION ESTIMATE THAT

2.5

BILLION ARE AT RISK
FROM DENGUE.



MIKE LEHANE BSc PhD

**HEAD OF THE VECTOR GROUP, PROFESSOR OF
MOLECULAR ENTOMOLOGY AND PARASITOLOGY**

Mike's field research group are developing more cost-effective control technology for tsetse flies. This technology would be used alongside case detection and treatment in the fight against African sleeping sickness. Mike's laboratory-based research group are concentrating on molecular investigations of tsetse trypanosome interactions.



VECTOR GROUP

Following earlier studies in Latin America, which demonstrated that insecticide-treated materials could reduce *Aedes aegypti* in treated communities, a major new study led by LSTM's Dr Philip McCall began in the city of Iquitos in Peru.

Funded by the Wellcome Trust, and collaborating with institutions from Peru, UK and the USA, Dr McCall and LSTM's Dr Audrey Lenhart are investigating whether insecticide-treated curtains hung in doorways and other locations inside houses can reduce transmission of dengue to the human population. Early reports indicate the communities under study have enthusiastically accepted the curtains but it will be some time before their effect on dengue is known.

Coincidentally, another very different but equally exciting approach to controlling this vector was also first attempted in the city of Iquitos.

Dr Greg Devine who joined the Vector Group in the past year, previously showed that female *Aedes aegypti* could easily pick up and transfer lethal amounts of the insecticide pyriproxyfen to their own breeding habitats. The potential of such 'autodissemination' has been recognised and a major new study has now begun, to evaluate whether the African malaria vectors will do the same. If successful, it could permit substantial reductions in the costs of larval control of malaria vectors and be a useful complement to adult mosquito control, especially in areas where mosquitoes rest and bite out of doors or are resistant to pyrethroid insecticides.

Dr Devine is undertaking this study at the Ifakara Health Institute (IHI), a non-governmental institute located in Tanzania, with a world-renowned record in many areas of research, particularly malaria prevention.

The Biomedical & Environmental Thematic Group at IHI is the current home to many other members of the LSTM Vector Group, including Drs Gerry Killeen (Thematic Group leader), Silas Majambere and Stefan Dongus. Focusing primarily but not exclusively on malaria transmission and the biology of its vectors, the entomology team includes over 20 postgraduate students from Tanzania and Kenya and a multi-million pound research programme supported by a variety of funders such as the Bill & Melinda Gates Foundation, the Wellcome Trust and the United States Agency for International Development (USAID). In published work over the past year, this thematic group, including young Kenyan and Tanzanian scientists, has highlighted the importance of vector ecology as a prerequisite for malaria elimination and revealed new trapping technologies and implementation strategies for mosquito control and malaria reduction.



SIMPLE TESTS FOR MEASURING INSECTICIDES IN TREATED/SPRAYED SURFACES

Dr Mark J I Paine and the Insecticide Quantification Kit (IQK) team

Accurate determination of the actual quantities of insecticide residues on treated surfaces is fundamental to understanding the efficacy of any of these interventions, and for both the management and prevention of insecticide resistance, yet there is no easy way to quantify insecticides in the field. With support from the Innovative Vector Control Consortium (IVCC), Dr Mark Paine and the IQK team are developing user-friendly tests for measuring insecticides under field conditions.

Basically, kits comprise a simple extraction to remove insecticide from a small section of treated surface, and a vial or strip test with a sensor unit and a 'traffic light' type indicator which allows visual assessment of the amount of insecticide in the sample.

This project, involving close collaboration with Dr John Vontas of the University of Crete and the London School of Hygiene and Tropical Medicine, has produced a pyrethroid kit that is in the final phase of development having undergone rigorous laboratory and preliminary field validation.

In all cases, the new simple kits are easier to use, faster and more cost-effective than current methods and are eagerly awaited by vector control operations worldwide. They will enable standardised, routine testing and quality control of intervention tools, providing an evidence base for policy decisions on their use and an early warning system for challenges or potential operation failures.



INSECTICIDE RESISTANCE IN AFRICAN MALARIA VECTORS

One example of such a programme is the World Health Organisation/Tropical Disease Research (TDR) network on insecticide resistance in African malaria vectors. Led by Dr Hilary Ranson and involving partners in six African and two European countries, this group continues to make good progress in unravelling the extent and causes of insecticide resistance, which represents a very real threat to programmes scaling up in many countries.

Now in its third year, data on resistance to all the major classes of insecticide in four sites in four different countries, paints a worrying picture with very high frequencies of resistance to many insecticides currently used in malaria control. Students from Burkina Faso and Sudan have spent time in the Vector Group at LSTM over the last year receiving training in dissecting the molecular basis of this resistance and the network is now following up on this work to develop improved diagnostics for insecticide resistance.

Development of additional field applicable screening tools to monitor insecticide resistance in the malaria vector *Anopheles gambiae* is being led by Dr Martin Donnelly in studies funded by the US National Institutes of Health and the IVCC.

The tools will be first tested as part of a UK Medical Research Council funded randomised controlled trial in Gambia (with Professor Steve Lindsay of the London School of Hygiene and Tropical Medicine). Related work from this group has yielded the publication of the first association mapping studies for insecticide resistance (Drs David Weetman and Craig Wilding) and the first long range haplotype study (Dr Amy Lynd) in *A. gambiae*. These studies, conducted on LSTM-designed SNP arrays, were a major advance toward the development and application of Whole Genome Association studies in wild populations of *A. gambiae* which, using next-generation sequencing technologies, are now being pursued through collaborations with the Broad and Sanger Institutes.

Until recently, insecticide resistance was not thought to be a cause for concern in another of the major African malaria vectors, *Anopheles funestus*. However, results in several African countries from a Wellcome Trust-funded project led by LSTM's Dr Charles Wondji, are rapidly changing this view with findings that resistance to different types of insecticide is widespread. Efforts are ongoing to better characterise the underlying mechanisms and to design diagnostic tools that will allow early detection and monitoring of resistance in this malaria vector too.

SINGLE INTERVENTION SOLUTIONS

Although all of the different vector control approaches are intended, at least initially, to target the vectors of one disease, one simple household intervention often has the potential to impact equally well on vectors of other diseases. In some parts of Peru for example, it is possible to find vectors of malaria, dengue, leishmaniasis, chagas disease and plague within a single community.

The benefits of being able to prevent multiple infections by single interventions are obvious. In Iquitos in Peru, Dr Audrey Lenhart has been collaborating with colleagues from the University of the Balearic Islands, Mallorca, Spain and the Universidad Nacional Mayor de San Marcos in Lima in a study to determine if indoor residual spraying can control domestic populations of the mosquito vectors of dengue and malaria, as well as other potential vectors.

In Tanzania, Dr Philip McCall and colleagues at NIMRI showed that insecticide treated nets, exactly as deployed for malaria prevention, can also have a dramatic impact on the often large populations of floor-dwelling soft ticks that transmit the serious and often fatal human disease, tick-borne relapsing fever or TBRF, in rural areas across Africa and Asia.

INTERNATIONAL HEALTH GROUP



The Effective Health Care Research Consortium (EHCRC) is making solid progress with good visibility. It includes the Cochrane Infectious Diseases Group (CIDG) and research teams in China, India, South Africa, Nigeria and the Philippines. The remit of the Consortium is to produce high quality systematic reviews in topics relevant to low and middle income countries and to improve health care in those countries.

Highlights for the year include the Consortium carrying out a large Cochrane Systematic Review on malaria treatments for the World Health Organization (WHO) which was used to inform the 2nd edition of the WHO Malaria Guidelines. The Consortium and LSTM gained the coveted status of WHO Collaborating Centre for Evidence Synthesis for Infectious Tropical Diseases in 2010. This means a closer working relationship with WHO and increased opportunity to influence the global agenda in combating infectious tropical diseases.

The Consortium was also involved in a highly successful campaign to stop the sale of electronic mosquito repellents on major airlines in partnership with advocacy website Malaria World. British Airways, KLM and Finnair all withdrew the products after seeing the evidence provided by a CIDG review that these devices do not work. During the last five years, 65 new systematic reviews and 28 updates of existing reviews have been completed by the Consortium and this year has seen special collections of CIDG's work in malaria, TB and Neglected Tropical Diseases featured on *The Cochrane Library*.

INDIA: THREE MORE YEARS OF FREE ACCESS TO THE COCHRANE LIBRARY

Wiley-Blackwell provides free access to reliable up-to-date medical literature through *The Cochrane Library* in all low-income countries. However, middle-income countries such as India do not qualify. In 2007, after many months of lobbying by Consortium partners – the South Asian Cochrane Network & Centre – the Indian Council of Medical Research (ICMR) agreed to pay for a three-year national subscription to the library.

Three years on, the success of this initiative is evident with downloads of articles rising from a pre-subscription figure of 500 per month to 4,500 per month in 2009. Earlier this year, this phenomenal success convinced the ICMR to purchase a further three years of access. Nearly 60 million residents now have free access to this unique resource.

Prathap Tharyan, Director of the South Asian Cochrane Network & Centre said:

"This is a meeting of minds over the need to invest in reliable evidence in order to inform efforts to improve health outcomes, and an example of responsible leadership in health that governments of countries without a national provision might wish to emulate. We have seen an increasing number of Indian researchers contributing to Cochrane reviews, and an increasing number of people from all walks of life in India using *The Cochrane Library*. We hope that this trend will help raise the quality of research and health outcomes in India."

The EHCRC is funded by the UK's Department for International Development.



PROFESSOR PAUL GARNER MBBS DRCOG MD FFPHM
HEAD OF THE INTERNATIONAL HEALTH GROUP,
CO-ORDINATING EDITOR OF THE COCHRANE INFECTIOUS
DISEASES GROUP, DIRECTOR OF THE EFFECTIVE HEALTH
CARE RESEARCH CONSORTIUM

Paul is a specialist in research synthesis and for the last 16 years has been instrumental in bringing research synthesis to tropical diseases, mainly through the Cochrane Infectious Diseases Group. Currently Director of a large consortium committed to preparing and updating systematic reviews relevant to middle and low income countries, he is using this research to promote evidence-based health policy and practice.



NEW EVIDENCE FOR POLICY
DEVELOPMENT IN RURAL HEALTH
INSURANCE IN CHINA AND VIETNAM

Health insurance schemes are being developed in China and Vietnam, as in many other countries, to help reduce the costs to rural people of using health services. Researchers in the Health Systems Development Team in LSTM's International Health Group, led by Rachel Tolhurst and Shenglan Tang, have concluded a study funded by the European Commission Framework VI Programme, aiming to provide evidence to improve health insurance (HI) schemes in China and Vietnam.

The project, known as RHINCAV, included seven other partners from China, Vietnam, Sweden and Germany.

The project assessed the impact of rapid and substantial changes aimed at extending and improving the rural HI schemes in two provinces in China and Vietnam, between 2006 and 2008.

The study found that whilst coverage of HI had increased to very high levels in China, increasing membership of voluntary schemes remained a major challenge in Vietnam.

Both countries had made some progress towards the aim of improving access to services, since the utilisation of services increased.

However, there were some exceptions suggesting that not all geographic areas and population groups benefited equally.

In Vietnam, higher use of services among people with insurance may be partly because people with chronic health problems are more likely to join the voluntary HI scheme, which is a threat to its financial sustainability because it does not adequately share the financial risks of ill-health across the population.

In both countries, the costs of both outpatient and inpatient health services had substantially escalated, with the effect that having insurance provided only partial protection against poverty due to health care costs.

This was a major concern expressed by rural people about the schemes, particularly in China. The costs of health care relative to income remained higher for poorer people in both countries. Interventions developed by the project provided useful examples of how to improve the management and promotion of HI schemes at local levels, including simplifying HI packages and procedures, and improving collaboration and coordination between local agencies.

An international dissemination workshop was held in Beijing in December 2009 to communicate the project findings to policy makers and other experts in the field from China, Vietnam and international agencies.

The key messages communicated were the need to improve cost control in the health system; to consider how to adjust the scheme designs so that they provide greater financial protection for the poorest; and to further improve HI management to maintain or improve coverage, improve financial protection for members (particularly in China), and achieve sustainability.

HUMAN RESOURCE PLANNING AND MANAGEMENT STRATEGIES

IMPROVING COMMUNITY HEALTH WORKERS' SERVICE DELIVERY

In addressing both the challenges of scaling up programmes to meet Millennium Development Goal targets and the shortage of professional health workers, health service and programme managers are increasingly using what are commonly known as Community Health Workers (CHWs). They may be paid or volunteers and their tasks may range from distribution of a single drug such as ivermectin for treatment of onchocerciasis to providing a whole range of services. They may be employed and managed by a village committee, formal health service managers, or both. Though CHWs have been mainly limited to specific programmes within the health service, a number of countries are now using them nationwide. Major challenges include attracting sufficient numbers of CHWs and minimising the turnover – especially for volunteers; and enabling them to perform effectively within the health service. Though extremely important, these issues are not usually addressed by human resource departments in ministries of health.

LSTM and LATH have been applying their expertise in human resource (HR) planning and management, normally used for health professionals, to these challenges. Paul Marsden led a team in Mozambique to develop a strategy for scaling up the use of *Agentes Polivalentes Elementares de Saude* and develop a training curriculum, with USAID funding through the Capacity Project. Shortly after this Margaret Caffrey of LATH worked with Hans Beks to carry out a review of existing CHWs in Zambia and to develop a strategy for a rapid expansion of them; training has now started.

We were able to share some of the lessons from Mozambique with colleagues in Zambia who also visited Ethiopia to see how their new programme of nearly 34,000 health extension workers had been established and was being managed.

However, there has been little systematic sharing of experiences across countries using CHWs at a national level.

The Global Health Workforce Alliance addressed this lack of information by commissioning a study on the global experience of community health workers for delivery of health related Millennium Development Goals.

LSTM's Tim Martineau, who had already been involved in the LATH work in Mozambique and Zambia, was invited to be on a steering group to oversee the commissioning of this global study. He was subsequently invited by the Alliance to design and facilitate a consultation workshop to review the findings of the study. The workshop, which was held in Montreux, Switzerland, in April 2010 and was attended by over 50 international experts, produced a set of key messages on planning and production, attraction and retention and performance management of CHWs (<http://www.who.int/workforcealliance/media/events/2010/chwconsultation/en/index.html>).

Tim Martineau is about to start a study on incentives for CHWs in Africa commissioned by WHO's TDR programme which will provide more detailed information on how managers can attract, retain and manage the performance of CHWs. LATH's Paul Marsden is now leading an initiative for the new CapacityPlus Project (www.capacityplus.org), to examine the interface between CHWs, management in the formal health system and the communities in which they work – a challenge identified earlier in the Mozambique assignment.

So over the last couple of years LSTM and LATH have had the opportunity to inject some solid HR thinking into the policy and planning for the use of CHWs at both global and country level, thereby increasing the chances of meeting MDG targets.



“a new programme of nearly 34,000 health extension workers has been established”

HIV RISK IN MALAWI FISHING COMMUNITIES

Worldwide there are now 33.4 million people living with HIV and countries in southern Africa have been hardest hit by the pandemic. Recent research has highlighted that people living and working in fishing communities face an increased risk of HIV infection. However, these communities have been largely overlooked in HIV prevention and treatment programmes.

The MAFESSTA study is an innovative research project based in fishing communities on the shore of Lake Malawi. The project is led by Dr Victor Mwapaswa of the College of Medicine, Malawi and is working in collaboration with LSTM (Professor David Lalloo and Dr Sally Theobald) and the WorldFish Centre, Malawi. The project combines social science and epidemiological methods to understand the dynamics of HIV transmission in these communities.

Early data from the project has shown that, like many other countries, the fishing industry in Malawi is highly gendered. Lake fishing is almost exclusively carried out by men whereas women tend to process, dry and sell the fish. To gain access to fish, women often enter ‘fish-for-sex’ exchanges with fishermen to access more favourable fish prices.

Given that women’s livelihoods depend on these ‘fish-for-sex’ exchanges it can be difficult for them to negotiate safe sex and minimise their risk of HIV infection.

LSTM student, Eleanor MacPherson’s PhD will study these gender dynamics further. Dr MacPherson’s PhD is nested within the MAFESSTA study and will undertake qualitative and participatory research to investigate the gendered dynamics of ‘fish-for-sex’ exchanges, and develop a contextually appropriate HIV prevention programme for women in fishing communities.

Dr MacPherson has previously run a HIV prevention project in South Africa that combined gender training and microfinance delivery to reduce women’s risk of HIV. In July 2010, Eleanor traveled to Malawi to deliver specialist training to the MAFESSTA research staff on gender and gender-based violence. The training was an opportunity for staff to reflect on how gender is shaping the HIV epidemic.

In summary, the MAFESSTA Project offers a unique opportunity to combine epidemiological and social science research to give great depth of understanding to the dynamics of HIV transmission in fishing communities. Eleanor’s research into the gendered nature of ‘fish-for-sex’ exchanges will allow the development of an HIV prevention programme that is grounded in the reality of people’s lives.



MONITORING AND EVALUATION

LIBYAN HIV STRATEGY

LSTM is working with the Libyan National Center for Diseases Control (NCDC) and the National HIV Program (NAP) on a project entitled *Supporting Development and Implementation of National HIV Strategy in Libya*. Funded by the European Commission, it is implemented by LSTM in close partnership with NCDC and NAP. The success of the project is due to the close partnership and support of Professor Abdulhafid A Abudher, the Director of NCDC, Dr Hussein bin Othman, the Manager of NAP, Dr Mohammad Elhenshiri, the focal point of the project, and the whole NAP team as well as the substantial goodwill and motivation of local stakeholders.

The LSTM team is directed by Professor Joseph Valadez, led by Dr Lusine Mirzoyan in Tripoli and supported by the team based at LSTM including Dr Sima Berendes (Research Associate), Steven Williams (Programme Administrator) and Dr Caroline Jeffery (Biostatistician). The project has carried out an in-depth situation analysis of the HIV epidemic and the national response. Specifically, the following aspects of the strategy have been investigated and reports with findings and recommendations produced:

- Treatment, care and support for PLHIV (People Living with HIV), existing laboratory system
- Opportunities for establishment of VCT (Voluntary Counseling and Testing) and PMTCT (Prevention from Mother-to-Child Transmission)
- The need for introduction of harm reduction programmes
- Ways to address stigma and discrimination of PLHIV and the most vulnerable population groups
- Existing HIV policy and related legal issues.

In addition to these tasks, the project mapped the most vulnerable population groups in Libya's three main cities in preparation for a Bio-Behavioural Surveillance Survey (BBSS) now under way.

The project, together with NAP and NCDC, also carried out strategic planning workshops with PLHIV, NGOs, private sector representatives and international organisations, during which findings and recommendations of the LSTM team were presented. Priority populations, areas, goals and objectives of the national strategy were discussed.

The BBSS among most vulnerable population groups has been prepared and started in Tripoli.

In the fourth quarter of 2010 it will be extended to at least two additional cities, a task which could not be accomplished without an excellent local team working in close coordination and diligently implementing the project on a daily basis.

SUPPORTING INSTITUTIONALISATION OF MONITORING AND EVALUATION IN UGANDA

HIV prevalence has stalled in Uganda for the past five years despite a reduction up to 2006. Tuberculosis (TB) is the leading co-infection with HIV positive cases, at an estimated prevalence of 65%. During 2009-2010, USAID and the Ugandan government awarded three contracts to support the strengthening of HIV/AIDS and TB prevention, treatment, care and support services. The overall goal of the five year USAID-funded district-based project is to increase access to coverage and utilisation of quality comprehensive HIV/TB prevention, care and treatment services within district health facilities and communities.

As part of this project, LSTM through LATH is supporting the government of Uganda in establishing the sustainable capacity to monitor and evaluate programmes at the district and sub-district level. Professor Joseph Valadez is the Technical Director. The monitoring and evaluation component of the project is devoted to advancing the practice of the Lot Quality Assurance Sampling (LQAS) in the health sector (and possibly other sectors) for monitoring services and their impact and using the data to support improvement.

The project is moving forward with technical support from LATH and Management Sciences for Health (MSH). The LQAS component has been progressing the development and implementation of three important processes related to district level health and service monitoring: Community level LQAS surveys, a health facility assessment and a data use for Service Performance Assessment and Improvement.

It aims to empower communities in Uganda to effectively respond to the challenges of fighting the HIV/AIDS epidemic by focusing their efforts on key relevant interventions for preventing the spread of HIV and TB; treating, caring for and supporting those infected and affected; and mitigating the health and social impacts of both diseases.

Mrs Primanjali Patel (Malaria Technical Supervisor) interviewing ASHA (Accredited Social Health Activist) trained for new diagnostic test and treatment of malaria during LQAS Survey.



MONITORING AND EVALUATION OF MALARIA IN INDIAN STATES

The Government of India has made the control and elimination of malaria a national goal and India's National Vector Borne Diseases Control Programme (NVBDCP) now receives support from the UK Department for International Development and The World Bank. The latest generation of malaria prevention techniques including better use of insecticides for vector control and artemisinin-based combination therapies can radically reduce malaria cases and deaths.

Although progress has been made, 1.5 million malaria cases and more than one thousand deaths were recorded in 2008, with actual figures likely to be 10-15% higher.

In the states of Orissa and Madhya Pradesh, LSTM has helped federal and state governments to control malaria through community epidemiological research to improve health systems. The LSTM team is establishing a real time monitoring and evaluation system using the LQAS method to enable local managers to identify the areas with the weakest malaria control programmes and strengthen them.

LQAS is a rapid and easy to use survey technique using a small sample to determine whether an area is reaching its targets for key programme indicators, with underperforming areas targeted for further investigation.

The overall objective is to achieve decentralised measurement of outcomes to support local decision making and provide objective monitoring at state, district and sub-district levels. Led by Professor Joseph Valadez, a leader in this field, with a dedicated in-country project manager, Baburam Devkota, LSTM is building local capacity to use the LQAS method for the future and investigating the impact that LQAS has on improving programmes. Implementation is under way in Orissa and planned for Madhya Pradesh.



CHILD AND REPRODUCTIVE HEALTH GROUP

MERSEYSIDE COMMUNITY CHILD HEALTH SURVEYS

Sefton and Wallasey Primary Schools, Sefton Primary Care Trust, Sefton Metropolitan Borough Council and the Liverpool Children's Fund have supported a series of sequential cross-sectional child health surveys amongst 4,000 primary school children in Merseyside over the last 20 years. This work has facilitated collaboration of LSTM's Child and Reproductive Health Group staff with local health authorities in order to address key research questions related to child health in Merseyside.

Self-completed parental questionnaires have been distributed recurrently through 15 primary schools situated in lower socio-economic areas and requested information on current and past child health, asthma, ADHD, allergies, hospital admissions and environmental exposures including parental cigarette smoking. The research, which is coordinated by Professor Bernard Brabin, has supported several PhD students, and is currently funding Dr Gibby

Koshy, who manages the large child health database which has been established to support this work.

Key findings include evidence that cigarette smoking in pregnancy has profound effects on child health which are much greater than previously thought. These include effects on fetal growth which later translates into an increased risk of childhood obesity and short stature.

Boys were more affected than girls and if a mother smoked during pregnancy she was more likely to deliver a baby girl. There are pregnancy interactions which increase a child's predisposition to asthma and allergic disease, indicating the importance of exposures in pregnancy for the long-term health of children.

The findings highlight the importance of continued health surveillance in these children, as well as the substantial contribution which LSTM staff have been able to make to this collaborative research with the local community.



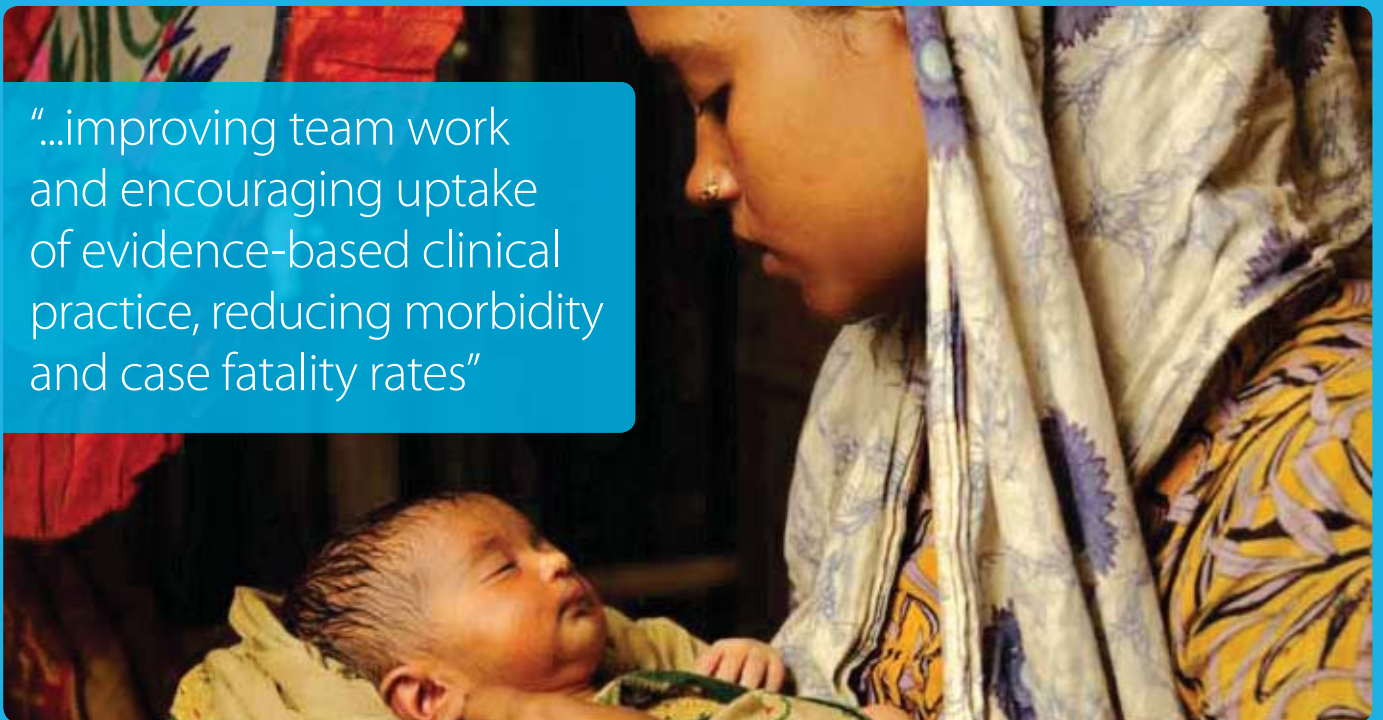
This is part of a wider research programme within the Child and Reproductive Health Group addressing maternal-child health interactions, and which bridges the Group's research studies on this theme in both developing countries and the UK.

PROFESSOR BERNARD BRABIN MB ChB MSc PhD FRCPCH HEAD OF THE CHILD AND REPRODUCTIVE HEALTH GROUP PROFESSOR IN TROPICAL PAEDIATRICS

Bernard is Head of the Child and Reproductive Health Group. His research focuses on maternal and child health in low resource settings with particular emphasis on malaria, and nutrition and infection interactions. He also undertakes research in Merseyside on the effects of maternal smoking on child health.



MATERNAL AND NEWBORN HEALTH UNIT (MNHU)



"...improving team work and encouraging uptake of evidence-based clinical practice, reducing morbidity and case fatality rates"

The Unit consists of six academic and four support staff, Nynke van den Broek (Head), Jan Hofman, Charles Ameh, Adetoro Adegoke, Joanna Raven, Ahmad Makuwani, Gillian Blackman, Sue Cain, Kristian Godfrey and Joe Yates. This active and rapidly expanding unit is concerned with three key strategic areas in Maternal and Newborn Health – Skilled Birth Attendance, Essential Obstetric Care and Quality of Care. Contributing to the global movement to reduce the burden of disease from pregnancy and childbirth, the MNH Unit conducts research, teaching and provides technical assistance.

SKILLED BIRTH ATTENDANCE

Provision of Skilled Birth Attendance (SBA) is one of the key international strategies to reduce maternal and newborn mortality and morbidity. The Unit has conducted research to map out the training, roles and responsibilities of a variety of cadres of staff all of whom are said to provide SBA. A selection of countries in sub-Saharan Africa (eight) and Asia (two) are included in this study representing countries with medium and high maternal and perinatal mortality and morbidity. In addition, a new framework for monitoring and evaluating

progress towards attaining SBA for all pregnant women, the indicator for Millennium Development Goal 5, was developed.

ESSENTIAL OBSTETRIC CARE

The availability and functioning of MNH services was assessed across countries using the Rapid Assessment Tool (previously developed by the MNH Unit). This tool was used in 2009 to measure availability and functionality of facilities providing MNH services for population groups (district, state or provincial) in Kenya, northern Nigeria, Sierra Leone, Malawi, Bangladesh and India. Analysis of data has shown that in general there are facilities in place for MNH but that functioning of such facilities is sub-optimal. Minimum UN coverage for Essential Obstetric Care, especially for Basic Essential Obstetric Care, is not achieved and in many districts no facility is able to provide all nine signal functions of Comprehensive Essential Obstetric Care.

The Life Saving Skills – Essential Obstetric Care and Newborn Care Package has been delivered in 16 countries with over 2,000 health care providers and over 350 in-country facilitators. A new monitoring and evaluation framework for

evaluation of such training has been designed and is being applied in all countries with particular focus on the five countries included in the 'Making it Happen' programme funded by DFID and UNICEF (Sierra Leone, Kenya, Zimbabwe, Bangladesh, India). The initial results indicate that this is resulting in improved health facility functioning and reduced maternal case fatality rates and stillbirths.

QUALITY OF CARE

Quality of care (or lack of) is believed to be one of the main determinants of uptake of maternal and newborn health care. What constitutes good quality care and how this can be implemented have been a focus area for research in China (with International Health Group) and Malawi.

The specific quality improvement tools used in Malawi include standards- based audit and maternal and perinatal death audit. A new classification for cause of maternal deaths has been developed by the Technical Working Group at WHO and this classification is being piloted using data from Malawi, Zimbabwe, Kenya and Nigeria.

TECHNICAL ASSISTANCE

The team actively supports a number of larger in-country programmes which are managed by LATH. The Unit provides operational research as well as design and monitoring and evaluation of implementation. Current programmes include the Kenya Essential Health Services (EHS) Programme, the Somaliland Health Systems Strengthening Programme, the Nigeria Northern States Maternal, Newborn and Child Health Programme and a programme in Zimbabwe to set up a research and policy unit for MNH.

TEACHING

In 2010 the Diploma in Reproductive Health for Developing Countries (DRH) was redesigned and a new Masters in International Sexual and Reproductive Health (MSc ISRH) was piloted. The resulting feedback was used to finalise the design of specialised Sexual and Reproductive Health Masters running alongside the Masters in International Public Health and the Diploma in International Community Health Care (DICHC) was successfully run. The Unit currently hosts four PhD students.



MALARIA EPIDEMIOLOGY UNIT



Women being enrolled at ANC, MiP study, Sumba district, Indonesia

This malaria epidemiology unit consists of six academic and three support staff members: Professor Feiko ter Kuile (Head), Dr Dianne (Anja) Terlouw (Clinical epidemiologist), Jenny Hill (Programme Manager), Stephanie Dellicour (Pharmaco-epidemiologist), Annemieke van Eijk (Clinical epidemiologist), Carole Khairallah (Epidemiologist), Cheryl Pace (Pharmaco-epidemiologist, shared with the Clinical Group) and Alison Reynolds and Helen Wong (Programme Administrators) and several PhD students: Dr Rukhsana Ahmed (MD, India/Liverpool), Kassoum Kayentao (MD, based in Mali), and Dr Daniel Hayes (MD, based in Liverpool), and three new PhD students who will join this year from Malawi. The section has a large network of international collaborations and provides the global secretariat for the Malaria in Pregnancy (MiP) Consortium. It also works in close partnership with the Malaria Branch of the US-based Centers for Disease Control and Prevention (CDC) as part of a five-year cooperative agreement and with the Malawi-Liverpool-Wellcome Trust Clinical Research Programme and College of Medicine, University of Malawi in Blantyre. The research focus is on the epidemiology, treatment and prevention of malaria in children and pregnant women.

Over the past year, the Unit has collaborated on a range of malaria in pregnancy-related research. Here are some recent highlights:

SP ANTIMALARIAL DRUG RESISTANCE AND INTERMITTENT TREATMENT EFFECTIVENESS IN PREGNANCY

Parasite resistance has compromised the efficacy of sulphadoxine-pyrimethamine (SP) and is no longer recommended for the case management of symptomatic children.

Intermittent Preventive Treatment in pregnancy with SP (IPTp-SP) remains relatively effective in many parts of Africa, probably because pregnant women possess greater immunity than young children, and is still recommended by the World Health Organization for sub-Saharan Africa. Yet this may soon change because, in areas with very high levels of SP-resistance, such as northern Tanzania, IPTp-SP no longer provides protection and has even been associated with the presentation of increased parasite densities. It is unclear at what level of resistance alternative strategies should be considered. It is therefore important to monitor the impact of SP resistance on the effectiveness of IPTp across sub-Saharan Africa. To date there are no standardised methods to do this.

In response, Professor Feiko ter Kuile and colleagues from LSTM are coordinating a multi-country, multi-centre study in Malawi, Mali and Burkina Faso where IPTp-SP is implemented as part of the control of malaria in pregnancy.

In each site investigators are monitoring the effectiveness of IPTp by determining the relationship between the level of SP resistance in the population as assessed by molecular markers of SP resistance, the efficacy of SP in clearing existing malaria infections in asymptomatic parasitaemic women attending antenatal clinic (ANC), and the ability of IPTp-SP to reduce placental malaria and the adverse effects of malaria at birth (e.g. low birth weight) in both primi and secundi-gravidae, as well as multi-gravidae.

The study is a collaborative effort involving partners from the Malaria In Pregnancy Consortium, including the Malaria Research and Training Centre in Mali, the Université de Ouagadougou in Burkina Faso, and the College of Medicine in Malawi in conjunction with the Centre for Health Research and Development, the University of Copenhagen, Denmark, and the London School of Hygiene and Tropical Medicine, UK.

The partners from the MiP Consortium also work in close collaboration with a further three sites in Malawi, Zambia and Mali that are conducting similar studies sponsored by CDC, Atlanta, USA and the USAID President's Malaria Initiative. LSTM is providing centralised support for the overall study coordination and data management between the six sites and the University of North Carolina (UNC). CDC provide support for the molecular assays and drug assays.

MiP Consortium partners in Mali in west Africa, led by Dr Kassoum Kayentao, have completed the field work recently and found that IPTp with SP remains highly effective in this part of Africa which has relatively low levels of SP resistance.

By contrast, in southern Africa, Dr Linda Kalilani from the College of Medicine in Blantyre is finding that SP is clearly failing; preliminary results suggest high rates of recrudescence and re-infection in primi – and secundi-gravidae receiving IPTp-SP, and lack of impact at delivery in southern Malawi. This raises concern about the longevity of IPTp-SP in Malawi and stresses the need to explore alternative drugs to replace SP or alternative strategies to replace IPTp.

MALARIA IN PREGNANCY BURDEN STUDIES IN INDONESIA

Malaria in Indonesia is a substantial public health problem with 30 million clinical cases (caused by both *P. falciparum* and *P. vivax*) reported annually. As is common in malaria endemic countries of the south east Asia region, data on the burden of malaria in pregnancy in Indonesia is scarce, which limits the development of evidence-based control policies.

Since 2006, Professor Feiko ter Kuile, Dr Anja Terlouw and Dr Rukhsana Ahmed from the Malaria Epidemiology Unit at LSTM have been providing technical assistance to the Eijkman Institute to conduct MiP burden surveys in Indonesia.

The surveys were conducted in two districts in Eastern Indonesia as a collaborative project between the Eijkman Institute and its partners UNICEF Indonesia, CDC and LSTM. The burden of *P. falciparum* and *P. vivax* malaria on maternal anaemia, preterm birth and low birth weight was determined to assist the development of appropriate control interventions. Support was provided to the Indonesian team in planning and training staff to conduct MiP burden surveys, and capacity building for data management and analysis.

Between June 2008 and June 2009, 2,598 women attending for antenatal care and 1,632 women delivering at two hospitals and 11 Puskesmas (community health centres) in south west Sumba and Jayapura district, Papua participated in the burden surveys.

The observed malaria parasitaemia prevalence was moderately low in this population with predominance of *P. falciparum*, while *P. vivax* mono and mixed infections were also common. In the antenatal clinics the overall peripheral parasitaemia was 7%; at delivery a similar proportion were found to be infected. Both *P. falciparum* and *P. vivax* infections were strongly associated with maternal moderate to severe anaemia and low birth weight, even among women who were asymptomatic and had very low parasite densities that were not detectable by microscopy but could be detected by Polymerase Chain Reaction (PCR), which is known to be much more sensitive. The findings suggest that asymptomatic infections may provide an important contribution to the burden of malaria in pregnancy in these settings, and that previous surveys using microscopy only may have underestimated the true burden. It also suggests that primary prevention by insecticide treated nets, or screening for asymptomatic malaria, may have the potential to significantly improve maternal and infant health.

Following the successful completion of her PhD, Dr Ahmed will move to Jakarta as part of a recently approved five-year cooperative agreement between CDC and LSTM, to continue supporting the Eijkman Institute with their operational research agenda for malaria in pregnancy in Indonesia. The first project will evaluate the use of malaria rapid diagnostic tests for the screening of pregnant women.

2010 ANNUAL MALARIA IN PREGNANCY CONSORTIUM MEETING

The third annual meeting of the Malaria in Pregnancy (MiP) Consortium took place in Dar es Salaam, Tanzania, in June 2010. The meeting was attended by 63 partners representing the 47 global member institutions based in 32 countries in Africa, Latin America, Asia Pacific, Europe and the USA. The meeting was hosted by Dr Salim Abdulla, Director of the Ifakara Health Research and Development Centre (IHRDC) and was officially opened by the Director of Preventive Services, Ministry of Health, United Republic of Tanzania. The 63 participants included project leaders and site PIs for the 14 major research activities as well as stakeholders from a wide range of international malaria and health agencies and NGOs. The objectives of the meeting were to discuss the progress of the multicentre clinical trials to find new drugs for the prevention and treatment of malaria in pregnancy over the next five years, and to plan the cross cutting activities, such as immunology, drug safety, public health impact and capacity development.

The agenda also included defining a research and funding strategy for the next five years of the MiP Consortium (2012-2017). Discussions centred on the development and evaluation of new candidate antimalarial combinations for treatment and IPTp for the control of malaria in pregnancy in collaboration with MMV; strategies to control malaria in pregnancy in the context of reducing malaria transmission; and research to determine how to use the integration of malaria in pregnancy control into broader reproductive health services in order to strengthen health systems. The annual meeting afforded the opportunity for the investigators of the multicentre trials to hold project-specific meetings and to plan data collection with the relevant teams for the cross cutting themes, such as anthropology and economics.

Women at Thyolo District Hospital ANC, Malawi



CLINICAL GROUP



LSTM's Clinical Group has a wide activity profile covering research, education, training, technical assistance and clinical practice in tropical infectious disease and travel medicine. Some 45 members of staff support the Group's activities in areas from TB, HIV and sexual & reproductive health to clinical trials, travel medicine and diagnostic parasitology. Three projects from this diverse portfolio have been highlighted this year.

IHLC – TOWARDS EFFECTIVE HEALTH PARTNERSHIPS

The International Health Links Centre (IHLC) was established in July 2009 with funding from DFID. This three year project aims to establish a 'gold standard' resource centre for effective international health partnerships as well as conducting operational research and evaluations in this specialised field.

The Centre launched a database of international health links and a dedicated member's area in April 2010. The database is fully searchable by specialty, type of organisation and link status.

Individuals and institutions are able to make contact with any of the organisations identified on the database, thus making partnerships between individuals and institutions much easier to effect.

Currently there are more than 400 institutions and individuals registered on the database from over 30 countries around the world. IHLC members also have access to an online discussion forum, information on funding

opportunities relevant to health links, resources and toolkits to aid in proposal and grant applications, best practice guidance on establishing and sustaining successful links, and a collection of health plans and strategies from low and middle income countries.

The Centre is also creating a humanitarian emergency register to enable humanitarian organisations to rapidly identify skilled individuals who are available to assist in responding to emergencies. By using the technology already in place for the database, the register will quickly contribute to the resource capacity available for international humanitarian responses.

The Centre will carry out operational research and evaluations on health links, including understanding how the United Kingdom benefits in participating in these partnerships, comparative analysis of health links and best practice. The research is being designed to contribute to the growing body of evidence on the effectiveness of health links as a development intervention.

Having expanded its remit over the past year, the Centre is striving to encourage placements of individuals in member institutions. The IHLC has identified numerous institutions in low income countries that can benefit from the vast expertise that is available among members, ranging from translating documents to assisting in project design. Some of these requirements can be met by remote assistance which is convenient for both parties.

Bob Marley Achura of the Global Health Network in Uganda explained the significance of the Centre's involvement in their work:

"The projects we are establishing now have a significant training component, especially in the areas of community-based reproductive health and family planning, growth monitoring and nutrition, water, sanitation and hygiene education, HIV/AIDS prevention and control, and community-based malaria prevention and management.

"The initiative will also advocate changes in the national policy agenda on health, specifically with regards to primary health care, as well as to champion a human rights-based approach to health. The institutions and individuals interested in these initiatives will play a vital role in providing technical support in the areas of behavioural change, reproductive health and family planning, nutrition and community-based programming.

"The International Health Links Centre has made it easier for us. Important information on collaborations, networks and funding opportunities has become much easier to access and the initiative to provide placements within our organisation will be of tremendous help to us. It is indeed a one-stop shopping market for health links."

The Centre aims to continue to innovate, create opportunities in health links, and use research to demonstrate how health links can also make a positive impact on developed as well as low income countries.

**DAVID LALLOO, MB BS MD FRCP FFFM RCPS (GLASG)
PROFESSOR OF TROPICAL MEDICINE, HEAD OF CLINICAL
RESEARCH GROUP AND CLINICAL DIRECTOR
DIRECTOR OF WELLCOME TRUST TROPICAL CENTRE**

David has focused on clinical trials in the tropics, particularly in HIV-related infections, malaria and envenoming. He has collaborations and studies in countries including Uganda, Malawi, Sri Lanka and Vietnam. David holds an appointment as Honorary Consultant at the Royal Liverpool University Hospital and is Clinical Director of the Tropical Medicine Directorate.



The IHLC team (Dr Tim O'Dempsey (Director), Dr Kwalombota Kwalombota (Project Manager) and Beth Sheridan (Project Administrator)) warmly invite readers to contact them for further information and details on membership via the Centre's website at www.ihlc.org.uk

**COLLABORATION FOR RESEARCH
ON EQUITY AND HEALTH SYSTEMS
FOR TB AND HIV/AIDS (CRESTHA)**

CRESTHA has this year focused on raising awareness and supporting the adoption of its 'Impact Assessment Framework' (IAF). The IAF provides a structure for collecting and synthesising a comprehensive evidence base to support decision making for adoption of innovations in health policy and practice. Currently its focus is on evidence related to the implementation of new and improved diagnostic tools and approaches for tuberculosis within health systems (as opposed to laboratory based evaluations). The IAF comprises five interconnected layers: effectiveness analysis; equity analysis; health systems analysis; scale up analysis; and policy analysis. A full description of the IAF has been accepted for publication in the International Journal of Tuberculosis and Lung Disease (IJTLD) (Mann GH, Squire, SB et al).

It can be used by a wide range of stakeholders, from new diagnostics developers and researchers to support research design, to international and national policy makers to support adoption, implementation and scale-up decisions. The IAF has already been adopted by a number of international bodies. It is incorporated in the Stop-TB Partnership's New Diagnostics Working Group's recent publication, 'Pathways to Better Diagnostics for Tuberculosis: A blueprint for the development of TB diagnostics' (http://www.stoptb.org/wg/new_diagnostics/assets/documents/BluePrintTB_annex_web.pdf). It is informing debates on diagnostics packages in the subgroup for Introducing New Approaches and Tools (INAT) (http://www.stoptb.org/wg/dots_expansion/inat) of the Stop TB Partnership and is the overarching framework for operational research and field evaluations (national and multinational) of new tools and approaches for TB diagnosis and treatment undertaken

through the USAID-funded TREAT TB grant (Technology, Research, Education and Technical Assistance) initiative (<http://www.treattb.org/>).

Currently we are supporting research on the implementation of line probe assays for detection of multi-drug resistant TB through TREAT TB in South Africa, Brazil and Russia. The IAF relies on multi-disciplinary research and specifically advocates that patient perspectives and equity analyses form a core part of an evidence base. The broad skill base present in CRESTHA is well placed to support this, since our team includes an infectious disease/public health specialist (Dr Bertie Squire), a health economist (Dr Gillian Mann), a laboratory systems specialist (Russell Dacombe), a new technology developer (Dr Kerry Millington), a policy analyst (Rachael Thomson) and a mathematical modeller

(Ivor Langley). Ivor is the most recent member to join the team and is bringing decision modelling lessons and tools from the corporate sector to apply to the health needs of poor populations.

His work on health systems modelling will link with work on transmission modelling which is being undertaken by partners at Harvard School of Public Health.

In addition to this, CRESTHA is the lead in the *IntHEC* project, highlighted elsewhere in this report. We have also sustained our research on developing and evaluating pro-poor approaches to TB service delivery in Malawi (through MLW and the REACH Trust), Sudan and China as highlighted in last year's report. We continue to use our research activities to build research capacity in all of our skills among developing country partners.





INTHEC: IMPROVING REPRODUCTIVE HEALTH IN TANZANIA AND NIGER

IntHEC is a four-year, €2.75 million Adolescent Reproductive Health (ARH) research project being implemented in Tanzania and Niger by a consortium of eight institutions led by LSTM. Poor ARH continues to be a major cause of morbidity and worsening poverty for the poorest people in sub-Saharan Africa.



The effectiveness of the ARH programmes that are being taken forward within the health, education and community sectors is seriously hampered by prevailing cultural and institutional factors within these sectors and in the wider community.

The project will aim to improve delivery of reproductive health services by generating new evidence to identify these adverse factors. Interventions specifically designed to address these barriers will then be implemented and their effectiveness evaluated based on the quality, uptake and equity of ARH services in both countries.

The *IntHEC* project is based around a cluster randomised trial, with intervention and comparison communities in Tanzania and Niger. A situational analysis is currently being carried out which includes a household survey and in-depth qualitative research within health and education facilities. Interventions will be developed and implemented in light of the results of the situation analysis; ongoing process evaluation will enable more in-depth interpretation of the final impact evaluation to be conducted in the fourth year of the project.

In May 2010, a launch workshop involving all consortium members was held at LSTM, enabling the eight partner institutions to get together and plan the near-term work programme in detail. A team from LSTM travelled to project sites in Niger and Tanzania in July to develop and trial the research tools before information and data gathering begins in earnest later this year. The team conducted exploratory visits to health facilities and education institutions in Maradi and Tillabéri in Niger and Mwanza and Iringa in Tanzania. The team also took the opportunity to meet with the community-based organisations which are partnering with the project in advance of the forthcoming national and regional

launches. During these visits, local leaders and implementers in communities welcomed *IntHEC* and expressed their support for the project and the associated research.

Dr Angela Obasi, Senior Clinical Lecturer at LSTM, is the co-coordinator of *IntHEC*. Other members of the team at LSTM are John Dusabe, Gillian Mann, Kerry Millington and Helen Rigby. The project is based within the CRESTHA office.

Dr Obasi said: "This research will tackle some of the key structural drivers which limit access to effective reproductive health services by assessing the weaknesses of current programmes and directly developing specific actions to tackle them.

"The government ministries responsible for ARH in Tanzania and Niger are partners in the programme, meaning that the outcome of the research will be genuinely owned by the key policy makers, so ensuring the impact of this research beyond the life of the project."

The other seven consortium members are the Université Catholique de Louvain in Belgium; the National Institute of Medical Research in Tanzania; the Ministry of Health and Social Welfare and the Ministry of Education and Vocational Training in Tanzania; the Laboratoire d'Etudes et de Recherches sur les Dynamiques Sociales et le Développement in Niger; the Ministry of Public Health in Niger; and the United Nations Population Fund, also in Niger. The project is funded by the European Union's Seventh Framework Programme.

DISEASE CONTROL STRATEGY GROUP

The expertise of the members of the Disease Control Strategy Group is broad, ranging from biomedical and public health research to capacity building and teaching. Our research interests include blood transfusion, anaemia, malaria, capacity building and health systems.

Our Group includes the Centre for Neglected Tropical Diseases which has a strong global advocacy role for NTDs in addition to conducting operational research, scaling up implementation, improving monitoring and building capacity.

Our Group also includes several members who are dedicated to teaching and are at the forefront of reorganising our courses to improve their flexibility and accessibility to students from all over the world.

SYRIA CENTRE FOR STRATEGIC HEALTH STUDIES (CSHS)

In 2009 the first cohort of students graduated from the CSHS. Now in its third year, the Centre is delivering Masters degree programmes in Public Health, Health Services Management, Hospital Management and Health Economics, Finance and Policy. For the first time this year these programmes will be available on a one-year basis. LSTM's Dr Amir Hassan and colleagues have been at the heart of establishing CSHS and continue to contribute to teaching and to the Centre's development.

CSHS through the creation of effective links with user sectors, institutions, organisations and groups, and by responding to the health needs of communities, aims to promote improved health and support health sector modernisation by:



1. Providing and promoting high quality education and training;
2. Conducting high quality studies and applied research and disseminating the results of that research;
3. Developing systems and technologies for health care and assisting in their transfer and management.

In 2007 CSHS began teaching Masters programmes and short courses.

DR IMELDA BATES, MBBS MD MA FRCP FRCPath HEAD OF DISEASE CONTROL STRATEGY GROUP, READER IN CLINICAL TROPICAL HAEMATOLOGY

Imelda is a Reader in Tropical Haematology and a Consultant Haematologist. She is a Fellow of both the Royal College of Physicians and the Royal College of Pathologists. Imelda's research interests include public health aspects of anaemia and blood transfusion systems and capacity building for research.



BUILDING CAPACITY FOR NTD CONTROL AND ELIMINATION IN RESOURCE POOR SETTINGS

Support for pro-poor strategies for the control and elimination of Neglected Tropical Diseases (NTDs) has reached its 'tipping point'. In 2009, over £300m was committed to efforts to control or eliminate NTDs including lymphatic filariasis, schistosomiasis, onchocerciasis, soil transmitted helminths and Guinea worm. NTDs are associated with poverty and are more common in remote rural settings, particularly areas with a history of conflict. Amongst the 2.7 billion people living on less than US\$2 per day, over one billion people suffer from one or more NTDs.

In October 2009, the Centre for Neglected Tropical Diseases (CNTD) was awarded £10 million by the UK Department for International Development (DFID) to support endemic countries in tackling lymphatic filariasis (LF) – a crippling disease more commonly known as elephantiasis.

The funding builds on earlier successful collaborations and will continue support programmes to reduce the prevalence of LF and other related NTDs and make progress towards the eventual elimination of LF.

The goal of the DFID-funded LF project is to support the Global Programme to Eliminate Lymphatic Filariasis (GPELF) to eliminate LF as a public health problem by 2020 (a World Health Assembly resolution 50.29 passed in 1997). Through capacity building, institutional strengthening and funding for drug distribution, CNTD with other donor partners, is enabling endemic countries to reduce the prevalence of LF and other NTDs that can be targeted through a Mass Drug Administration (MDA) strategy and make progress towards LF elimination.

The grant, alongside ongoing joint financial support from GlaxoSmithKline (GSK), will also support the activities of the Global Alliance to Eliminate Lymphatic Filariasis (GAELF), a partnership of public and private sectors working towards LF elimination, and whose Secretariat has been hosted at CNTD since 2004. GAELF coordinates efforts with the World Health Organization (WHO) and other disease control programmes and NTD partnerships. A highlight of the year was the sixth meeting of GAELF held in Seoul, Korea, where 150 delegates from 38 countries met to hear and discuss the successes at 'half-time' towards elimination and the challenges remaining to 'full-time' in 2020.

Twelve countries are the focus to support LF drug distribution. Bangladesh, Burkina Faso, Ghana and Tanzania receive continuing support; DRC, Ethiopia and Zambia where support programmes will be launched; Malawi, Guinea and Liberia, which are in proximity to highly endemic countries; and Nepal which recently launched a programme.





To develop this focus CNTD staff travelled extensively to provide technical assistance to national programme managers for mapping and development of strategic plans for integrated control. In the short time since October 2009 much has been achieved with mapping completed in Liberia, Malawi, Mozambique and Zambia and strategic plans either developed or in the process of development.

Capacity building activities coordinated by Dr John Haskew included the award of six part-time PhD fellowships to pursue PhD research at LSTM. The fellows, from Bangladesh, Liberia, Mali, Malawi, Papua New Guinea and Zambia, will be based in their home countries and visit LSTM intermittently for supervision and training.

Five laboratories in Ghana, Kenya, Malawi, Sierra Leone and Sri Lanka have been structurally strengthened and equipped to provide support for research and monitoring and evaluation activities in west, east and southern Africa and the Asia-Pacific region respectively.

Building on the existing research base is also a key activity to facilitate the design, development and management of operational research proposals in endemic countries.

Operational research activities coordinated by LSTM's Dr Louise Kelly-Hope will support the evidence base for the elimination strategy and

apply tools for assessing progress, as well as for providing evidence for the interruption of LF transmission in countries not undertaking MDA. To develop this, leading experts and endemic country partners were invited to a workshop to consider the pending challenges and the research questions to be addressed. Based on the outcome of the workshop, CNTD's Technical Advisory Group developed the research agenda and a call for proposals was made with five operational research projects totaling £600,000 approved.

Future additional activities include training workshops in collaboration with the Noguchi Memorial Institute for Medical Research, University of Ghana, Accra and the Kenya Medical Research Institute in Nairobi. Participants from Africa, Asia and the Pacific will be sponsored to learn and develop skills based on WHO guidelines.

To ensure good coordination in its activities, the Centre recognises the immense value and importance of working closely with its many partners particularly in-country and in the areas of communication and advocacy. In-country activities are undertaken in close partnership with national programmes and other donors. CNTD's Director, Moses Bockarie, has spoken at several international meetings and other staff have attended regional, partner and stakeholder meetings.

David Molyneux edited a prestigious series on NTDs in the Lancet, with contributions from Professor Moses Bockarie and other LSTM partners. CNTD has worked closely with other groups at LSTM including organising and hosting MSc students for in-country projects and working with Liverpool Associates in Tropical Health (LATH) on funding applications.

CNTD is particularly proud of its leading role in launching programmes in countries not considered to be 'low hanging fruit'. A good example of this is Liberia where with commitment by the Ministry of Health, a strong link has been developed and an excellent Programme Manager identified (now registered as a CNTD PhD student).

In a very short time a strategic plan has been developed and launched and capacity building addressed. A further positive outcome is the attraction of further funding in recognition of its commitment and rapidly established capabilities from the Bill & Melinda Gates Foundation for laboratory support and DFID's commitment to address schistosomiasis.

On a final note CNTD is delighted to congratulate David Molyneux on two awards: an Honorary Degree from Georgetown University and an Honorary Fellowship from Liverpool John Moores University both for his services to tropical medicine.

EDUCATION AND TRAINING

Over the past year we have diversified the range of education and training opportunities that we offer in LSTM. Whilst our prestigious Masters programmes continue to attract students from around the world, we have appointed a dedicated Education Business Development Officer to help grow our portfolio of short courses. These courses give participants seeking continuing professional development an opportunity for intensive study within a specialist field. This year also saw a major re-organisation of our Masters programmes to enhance their relevance and attractiveness for students.

Most of our Masters students have the opportunity to undertake an overseas dissertation project in the final semester of their programme.

Disruptions to flights caused by the volcanic eruptions in Iceland and industrial action meant that organising travel was particularly difficult this year. Plans were constantly changed, visas re-applied for and flights re-booked. Despite the difficulties in obtaining visas for some countries, all students who wanted to go overseas managed to depart for their chosen destinations, albeit some a little later than planned.

LSTM students choose locations far from the usual tourist destinations in their quest to come back with an interesting study, but their safety is of prime importance. In order to ensure that they are properly looked after, they work under the supervision of hosts who are experienced in operating in what can often be challenging conditions.

This year student projects took place in locations including Afghanistan, Haiti, Chad, South Africa and Guatemala. A particularly interesting study by a student on one of the Humanitarian Masters programmes involved the effects of climate change on the islands of the South Pacific, involving travel to Tuvalu, a tiny, low lying island with a population of just 11,000 people which is threatened by rising sea levels. The overseas project is one of the unique selling points of LSTM's taught courses and, despite the challenges faced by both students and staff, it is always a rewarding experience for all concerned.

The introduction of the points-based immigration system into UK education has also had repercussions for our admissions.



SUE ASSINDER BSc PhD **DIRECTOR OF EDUCATION**

Sue has extensive experience of quality assurance, quality enhancement, curriculum development and programme validation. Outside of conventional teaching and learning, she has pursued an interest in promoting public engagement with science. Sue has research interests in the pedagogy of learning and teaching, in particular the development of effective student-led approaches to learning.



This major change to the UK's immigration rules required us to obtain a sponsor licence in order to continue to recruit employees and students from overseas.

We have now gained our sponsor licence and are classified as an 'A' rated sponsor. A new classification level of 'Highly Trusted Sponsor' was introduced by the UK Border Agency in 2010 which gives a greater level of freedom to sponsors of students and staff. LSTM's application for this stage is currently being processed.

ENHANCEMENT OF MASTERS PROVISION

Our MSc programmes are offered within a dynamic research-led environment and their content is informed by the cutting-edge research activities of the academic staff. In order to keep our programmes in their leading market position, we have this year undertaken an extensive review of their content and delivery.

One of the major changes has been to our MSc International Public Health (MIPH). Responding to feedback from students that they would like the opportunity to concentrate on particular aspects of the discipline, we now offer specialist pathways in 'Sexual & Reproductive Health', 'Planning & Management' and 'Humanitarian Assistance' alongside the broad MIPH programme.

In all of our programmes, we have made a general move away from teacher-led didactic lecturing towards more student-centred, interactive learning. This involves classroom discussion of key issues, working in small groups to practise applying concepts and solving problems and independent learning through guided study and the use of online packages. Our aim is for our students to not only acquire a strong knowledge base but to also become proficient in analysing, synthesising and evaluating issues related to health care in the tropics and to be able to act upon those issues.



In this way we are producing graduates who are capable of taking substantial and leading professional roles to promote improved health and wellbeing in middle and low income countries.

EXPANSION OF SHORT COURSE PORTFOLIO

We have significantly expanded our provision of professional short courses, particularly by opening up our MSc modules for external candidates. We have a selection of modules run intensively for two weeks, which is an attractive model for external candidates wishing to undertake a period of concentrated study within a specialist field. We currently have 32 short courses with more in the planning stage.

Our aim is to become a 'first port of call' for training needs by providing a full learning experience in subjects that are attractive to the professional market.

One example of our efforts came about by listening to our alumni from the Diploma in Tropical Medicine & Hygiene (DTM&H), who had said that they wanted refresher courses to provide valuable updates on their DTM&H knowledge. Two elements of the DTM&H are now offered consecutively as short courses to external candidates, 'Essentials of TB Epidemiology, Clinical Management and Control' (two days) and 'HIV Epidemiology, Clinical Case Management & Strategies in Resource Poor Settings' (three days).

ONCE A STUDENT, ALWAYS A STUDENT – DEVELOPING ALUMNI RELATIONS

One of the core strengths of educational institutions lies with their alumni, often providing a free ambassador and recommendation service.



We are positively addressing communications with our alumni association with the development of full database-centred communications. In 2010, we launched the Alumni e-newsletter which goes out to nearly 3,000 alumni.

It's not just about keeping in touch, we aim to provide real benefits in our e-news such as changes that are happening at LSTM, jobs at LSTM as well as establishing a job forum for external opportunities.

Our research shows us that the jobs market is an extremely important benefit to provide to alumni and gives us a way of offering continued support after graduation. There is also now a 'LSTM Alumni' group on LinkedIn, which all alumni are welcome to join.

One way of keeping in touch with our students has been inviting their 'postcards from the field'. This has been a very popular feature, both in terms of alumni providing information on their current employment and projects as well as visits on our website. It's a great way of finding out how fellow ex-students are progressing and may even provide real networking opportunities for future joint projects.

LSTM POSTGRADUATE RESEARCH DAY

The Annual LSTM Postgraduate Research Day has been a long standing feature of the academic year, the aim of which is to equip postgraduate students with the necessary skills and experience of presenting their work in a conference-style setting.

The experience provides students with a professional setting akin to an international conference and this year's event was supported by approximately 130 staff and students.

Those PhD students who were off site or submission pending were exempt from presenting their work unless they so wished. In total 18 students presented seminars whilst 14 presented their work in a poster format. The standard of the seminars and poster presentations was outstanding.

Two first prize awards of £100 were awarded to Urvashi Ramphul and Francesca Tamarozzi for their seminar and poster presentations respectively and two £50 runner up prizes for each category were awarded to Rachel Currier and Lignet Chepuka. Feedback from both students and staff was overwhelmingly positive and very much in support of the format of holding the event off site.



OVERSEAS TEACHING PARTNERSHIPS



DR AMIR HASSAN,
LECTURER, LSTM
PROJECT DIRECTOR,
CSHS SYRIA

LSTM IN THE MIDDLE EAST: MAKING PATHWAYS FOR FUTURE DEVELOPMENT

The project at the Centre for Strategic Health Studies (CSHS) in Syria continues into its third year. The second cohort of 42 students admitted in 2009 are presently completing their research studies based around the priorities set by the Ministry of Health. Their graduation is now set for November 2010.

The students will graduate with degrees in Public Health, Health Services Management, Hospital Management and Health Economics, Finance and Policy.

Following a change in planning, the Centre now accepts Masters students on one year Masters degrees reflective of the practice in the United Kingdom. The third cohort, consisting of 49, will be expected to complete this cycle by the end of 2010. In keeping with the previous cohort, these students also went through an intensive foundation course to bring their knowledge and skills up to a level required for entry in Masters studies.

LSTM is currently negotiating with the University of Liverpool (UoL) to introduce a dual degree and accreditation leading to the issue of UoL-based Masters awards.

This will lead to an internationally recognised award being generated from within Syria, boosting the standards of the Syrian education system and cementing the role of Liverpool in the region.

During the last year, training began in a collaborative course involving LSTM, The Nursing Directorate, Faculty of Nursing, Tishreen University and the CSHS on a Diploma in Nursing Management. The Centre received accolades from the Ministry of Health and regional health authorities to an extent that LSTM has been invited to run the Diploma again next year. The Nursing Management Diploma program began in August 2009 and was finalised by April 2010.

The collaboration in Syria also saw the beginning of a new course in innovation in health care which will aim to train key stakeholders in change management in Syria.

A joint research study on the Syrian Health System, conducted by CSHS staff under the guidance and mentoring of LSTM, has also continued in Syria over the last year. This study not only provides a valuable academic resource to the region but has led to the research capacity development of local staff in many areas including skills, systems, culture and approach to research.

www.cshs.moh.gov.sy



DIPLOMA IN HUMANITARIAN ASSISTANCE SOUTH AFRICA

Over the past year LSTM, in partnership with the Graduate School of Public and Development Management (P&DM) at the University of the Witwatersrand and MSF South Africa, has established the intensive six week Diploma in Humanitarian Assistance (DHA) in South Africa. DHA Africa was set up to improve access to quality training and critical analysis that addresses Africa's humanitarian priorities.

The programme has brought together development and humanitarian practitioners from government, UN, NGOs, donors, media, civil society and the African Union to debate, share experiences and apply their learning through case studies and scenarios. DHA Africa goes beyond traditional notions of 'training', enhancing the insight, knowledge and skills of those already on the front lines of humanitarian crises and enabling them to better prevent, prepare for and manage humanitarian crises in the region.

DHA Africa attracted 43 participants in 2009 and 40 in 2010, approximately 80% of whom were African nationals.

Sharon Ekambaram, Head of the Programmes Unit, MSF South Africa said: "The professional humanitarian activists that have come out of this course are an organic product of a unique partnership between LSTM, P&DM and MSF. This Diploma is critical to ensure that at the end of the day, individual acts of humanitarianism contribute to building solidarity for change."

STUDENT PROFILES



CARMEN CASTILLO
COLOMBO

The information obtained during this study is expected to contribute to a better understanding of the dengue situation in Trujillo, and the whole of Venezuela, demonstrating the necessary link between health authorities and university researchers to design, implement and evaluate a sustainable *Ae. aegypti* control programme.

The knowledge, training and expertise obtained during my PhD will be crucial in contributing to dengue vector control in Venezuela.

In addition, returning to my country, I will continue coordinating the Phytopathology and Biological Control laboratory at The University of the Andes campus in Trujillo, Venezuela, where I am Associate Professor in the Department of Biology and Chemistry.

Research interests include entomopathogenic bacteria and fungi and the main subject: epidemiology and control of dengue fever.

As LSTM is an international and well recognised postgraduate centre dedicated to education, training and research of tropical diseases, I felt here was an excellent opportunity to take a postgraduate programme leading to my PhD. Former colleagues from my home university conducted important research in my country under support and supervision of professors from LSTM. It was a valuable experience to participate in a multi-country dengue study, focused primarily on dengue control. I am working to strengthen relationships with LSTM to further the support and advice necessary for planning the best strategies for control of dengue in Venezuela.

ADNAN AL-HINDI PhD STUDENT

I joined LSTM as a PhD student back in November 1999. I chose Liverpool because of its outstanding reputation in my specialist field of parasitology. I am an Assistant Professor in Medical Parasitology at the Islamic University of Gaza and LSTM was a natural choice for supervising my PhD entitled "Some Health and Parasitological Problems in the Gaza Strip".

My experience of LSTM is very positive, the staff are extremely helpful and my supervisors provided full support, both remotely and during my eight visits to Liverpool throughout my PhD.

I found the support staff really friendly and I always brought them cakes from Gaza, which is probably why they asked me to be included in the Annual Report!

The remote support became vitally important during the challenges I faced living in Gaza and trying to visit Liverpool, including the war in Gaza in 2008/9, with closed borders and ongoing visa difficulties.

LSTM were sensitive to my needs, which included two extensions and additional hardship funding to help me achieve my goals.

My future goals are primarily about helping with the problems of parasites in Gaza.

I particularly enjoyed the city of Liverpool and its surrounding countryside. Liverpool feels more intimate than other larger cities, and not too busy. I found my way around easily and the nearby shopping ensured much anticipated presents for my family. I hope very much to visit Liverpool with my family in the future.

LUCIA PANTELLA MSc HUMANITARIAN PROGRAMME MANAGEMENT 2009/10

Having worked for some years in the humanitarian sector, I decided to start the Humanitarian Programme Management Masters at Liverpool School of Tropical Medicine in order to have the time and the opportunity to broaden my knowledge on humanitarian issues, not only from the management point of view but also to critically analyse and evaluate humanitarian contexts and responses.

Moreover this year represented a unique opportunity for me to gain detailed knowledge on health and nutrition programmes, especially in emergency situations, although I do not have a medical background.

From my previous experience, I understood that the humanitarian sector requires more and more skilled people and I strongly believe this Masters programme can support the development of the sector.

The possibility to learn and work during this year with people from different countries and different backgrounds was also important for my personal growth and to build with my colleagues a trust that will last beyond this Masters.

I took up a post with Save the Children after the course and am working in Gaza on a project involving child protection, health, nutrition and education.

CARMEN CASTILLO COLOMBO PhD STUDENT

I am a graduate of the University of the Andes in Venezuela and have recently completed a PhD programme at LSTM.

My study involved the evaluation of the impact of insecticide-treated materials on dengue vector populations in Venezuela: a cluster-randomised control trial. In this study I examined the susceptibility of *Aedes aegypti* natural populations to deltamethrin at baseline and throughout the study I evaluated the vector population determined. This research was part of a multi-country EU funded dengue project.

ADMINISTRATION PROFILE: RESEARCH MANAGEMENT OFFICE

The academic research environment has undergone many changes in recent years, not least in the areas of governance, ethics and regulation. Legislation relating to clinical trials and the use and storage of human tissue has been introduced which has necessitated a more formal, structured approach to managing research.

In response to these changes, LSTM established the Research Management Office in 2006, with the appointment of Sian Roberts as Head of Research Management. Sian's team has grown since that time to include Vicky Cowley as Research Administrator, Natalie Strickland as Project Officer and most recently Greg Dow as Research Manager.

The Research Office provides support to academic staff by providing information on funding opportunities and advice and guidance on how to approach and liaise with funding bodies. Staff also assist with drafting research funding proposals, applications for ethical approval and negotiations with funding agencies and other bodies such as ministries of health. In addition, they provide resources associated with research management such as patient consent form templates, standard operating procedures and guidance on good practice.

Drafting and coordinating research agreements and contracts is another important element in the work of the Research Office. With the advent of large scale consortia-based programmes and projects, the need for formal agreements and contracts has become a basic requirement of nearly all research activity. With responsibility for ensuring that LSTM's intellectual property is protected and that relevant partner contributions and inputs are clearly established, the Research Office prepares agreements for researchers that are appropriate to the academic setting. In certain projects, Research Office staff have a more direct input and work as part of the project team, the coordination of clinical trial monitoring activities for the MiP Consortium by Natalie Strickland being one example.

Regulatory compliance is another business critical area which is coordinated and supervised by the Research Office. LSTM applied for a licence for storage of human tissue for the purpose of research last year and was awarded a full licence after an inspection by the Human Tissue Authority. The Research Office now coordinates all activities relating to human tissue to ensure that regulatory compliant documentation is available and that LSTM's processes and procedures are in compliance with the requirements of the legislation. Similarly in relation to clinical trial activities, the Research Office provides information and support to research staff on the requirements

for indemnity for participants, trial monitoring and quality assurance to ensure compliance with relevant legislation.

The Research Office also manages the operations of all research-related committees. LSTM's Research Ethics Committee and ethical approval process is managed and administered by the Research Office and is at present undergoing full review to update processes and procedures. The Governance Oversight Committee oversees LSTM's responsibilities as a sponsor of research, both non-clinical and clinical as well as issues relating to human tissue and is managed and administered by the Research Office as is LSTM's Research Committee, which is responsible for the development and implementation of LSTM's overall Research Strategy.

The work of the Research Office continues to grow and develop in line with the research environment that LSTM operates within, helping staff to take full advantage of emerging opportunities whilst protecting them and the institution from potential threats by providing a proactive service at all stages of a project. Major undertakings in the forthcoming year include the development and roll-out of a research database, a review of ethics procedures, the introduction of an integrated 'light touch' review process for ethical approval and the roll-out of a clinical trial management resource pack.



LSTM BUSINESS OFFICE



DR PHIL GOULD
CHIEF BUSINESS OFFICER

The focus of the Business Office this year has been to support the extension of our collaborations with major research partners. These will support our new drug discovery and therapeutic developments to help treat a number of parasitic and infectious tropical diseases. Through these partnerships we have taken the opportunity to extend our research model, establishing collaborations to improve the scope of discovering new medicines and using emerging international centres to support our drug screening activities.

LSTM now has a growing intellectual property base focused around potential drugs to treat tropical and parasitic infections. During the year we took the opportunity of filing intellectual property worldwide on a new class of potent antimalarial drugs – the dispiro-tetroxanes – a second generation of drugs similar to the leading treatments based on artemisinin. We are now at an important stage with another programme, supported by the Wellcome Trust Seeding Drug Discovery Initiative, to file some significant intellectual property on a new class of antimalarial agent.

We are also now approaching a similar point with our new TB drug discovery programme being funded by the EU.

Another aspect of LSTM's business activities is contract-based research or support services. During the year several companies have taken the opportunity to access LSTM's expertise on a commercial basis. We have supported insect control projects with our Vector Group and vaccine immunology projects with our research teams as well as supporting occupational health programmes for corporate clients within our Well Travelled Clinics Ltd subsidiary.

PHARMA COMPANIES AND LSTM JOIN FORCES IN THE FIGHT AGAINST PARASITIC DISEASES

To increase the diversity of our search for new medicines to treat human parasitic diseases, LSTM has reached agreement with a number of large pharmaceutical companies and major biotech companies to screen their chemical libraries (proprietary compounds they have made themselves during their own research studies) and collaborate in LSTM's search to discover new drugs to treat human parasitic diseases. In the past year, LSTM's research teams have established drug discovery collaborations with major pharmaceutical companies including Pfizer Inc, Abbott and leading biotech companies such as Anacor Inc to support our efforts to identify new drugs to treat and eliminate lymphatic filariasis and onchocerciasis with our A-WOL programme.

Within our antimalarial drug discovery programme we were pleased to receive support from Syngenta plc, Biofocus plc and Peakdale Molecular Ltd who allowed LSTM to access their chemical library to search for leads for new antimalarial drugs.

LSTM LOOKS EAST TO SEARCH FOR NEW DRUGS FOR PARASITIC DISEASES

Following initial discussions in the autumn of 2009, LSTM's A-WOL project has just completed agreements with the Chinese Academy of Sciences, located at the Shanghai Institute of Materia Medica, to search their diverse chemical library for new clinical leads in helminth diseases.

As an extension of this agreement, the high throughput screening of the library to support our Chinese partner has been established via an additional collaboration with the Institut Pasteur of Shanghai. IPS will optimise our screening methodology in the clinical lead identification process, increasing our assay throughput allowing us to screen more compounds. Our Chinese partners will then deliver the screening 'hits' to our Liverpool-based research teams to develop into clinical candidates.

These new research agreements represent a first for LSTM's drug discovery efforts in extending our research reach, as well as creating opportunities for working with the rapidly expanding hub of new medicines development in the Far East.

www.lstmliverpool.ac.uk/working-with-us/business-office/

WELL TRAVELLED CLINICS LTD (WTC)

The business environment has been challenging in 2009/10, with both domestic and business travel being reduced in the current financial climate. Despite this, in the third year of trading, Well Travelled Clinics, (WTC), has continued to grow and income is up 14% on the previous financial year.



WTC continues to extend its range of services, and this year we have added HIV Point of Care testing; blood grouping and cervical cancer vaccination to our services.

This year, the clinic has taken part in a television documentary commissioned by ITV1. The documentary focused on the clinical work of the Liverpool School of Tropical Medicine and has involved collaboration across various departments within LSTM, The Royal Liverpool University Hospital and WTC. The programme aired in September 2010 and gave recognition and publicity to the work of LSTM as a whole and the work of the Clinical Group and WTC.

WTC continues to run the annual Travel Health and Expedition Medicine course, which is aimed at General Practitioners, Practice Nurses and Pharmacists. The course provides an introduction to travel health and expedition medicine and is an important vehicle to gain increased visibility for our services.

This year was the most successful course to date with 45 students attending the one week accredited course.

As part of our business strategy, a new Business Development Manager started with the company in August 2010 in order to bring in new business clients and maintain a strong relationship with our existing customers. This post will be pivotal in meeting our key objectives to increase our income and our corporate client base.

In 2011, WTC plans to open a third branch in the Greater Manchester area, to increase our sphere of influence in north west England and further our brand as a market leader in travel health.

Need a vaccination?

WELL RESEARCHED

Our profits go back into the research and development work of the Liverpool School of Tropical Medicine.

WELL DONE !

Visit our travel clinics at:

10 Watergate Row
Chester

T: 0844 939 5600

welltravelledclinics.co.uk

Philippa Tubb
Managing Director, WTC

LIVERPOOL ASSOCIATES IN TROPICAL HEALTH (LATH)



LATH has continued to deliver international health programmes for the UK's Department for International Development (DFID) and the United States Agency for International Development (USAID) in sub-Saharan Africa. In 2010 we have also been successful in winning new contracts for work in India and Nepal.

HUMAN RESOURCES FOR HEALTH

LATH has continued to build on our collective experience in Human Resources for Health (HRH). HRH Technical Advisor, Margaret Caffrey, has provided support to policy development, planning and capacity building in four states of northern Nigeria as part of a DFID funded project.

Capacity, the USAID flagship health workforce programme which addressed the global shortage of over four million health workers, finished this year and has been succeeded by *CapacityPlus*. LATH HR Management and Development Advisor, Paul Marsden, has been seconded to the project in Washington DC as a Policy and Planning Specialist.

As part of a new DFID Health Systems Strengthening programme, LATH will be providing support to the Ministry of Health in Nepal on health workforce issues.

Southern Sudan faces enormous challenges in rebuilding its health system following many years of conflict. Dr Simon Gould, an alumnus of the LATH/LSTM course in International Health Consultancy, was appointed as Manager for the Technical Assistance to Health Priorities Programme in late 2009. LATH is providing extensive support to the Ministry of Health including needs analysis, strategic planning and improving health services.

LATH's Senior Public Health Specialist, Dr Carmen Camino, has been instrumental in providing support to these activities and with other consultants has helped with the establishment of a Planning and Budgeting Unit and in the assessment of health workforce planning, management and training capacity. LATH consultants have supported the community midwifery programme, the strengthening of hospital management, improvement of monitoring and evaluation systems and the finalisation of the Southern Sudan Household Health Survey.

MALARIA CONTROL

LATH's subcontract for the USAID PMI indoor residual spraying (IRS) programme finished in February 2010, due to the scale down of activities in anticipation of the new IRS 2 programme.

LATH provided technical assistance (TA) in monitoring and management of pesticide resistance, strategic advice to national governments on the rational choice of pesticides and undertook cost-effectiveness analyses of different types of pesticide usage. LATH has partnered with US contractor, Chemonics, to compete for contracts under IRS 2 and the partnership has won a first contract in Malawi. Dr Eve Worrall, Lead Technical Specialist at LATH, returned from maternity leave in May 2010 and is providing TA to support the malaria grantmaking work of Comic Relief.

NEWBORN AND MATERNAL HEALTH

LATH supports a number of countries to reduce deaths of women in pregnancy. This is central to the Kenya Essential Health Services Programme which is now entering its final year. Since 2005, LATH has supported a comprehensive programme to upgrade maternity services in six districts in Nyanza province including investment in infrastructure and equipment in 13 health facilities. An extensive programme to train staff from the community to health facility level has increased life saving skills and improved the quality of essential obstetric care. The numbers of women attended by a skilled health worker during labour has doubled in some districts and quadrupled in others since the start of the project.

Similar support to develop skills and improve Maternal Newborn Child Health (MNCH) services is being provided under the leadership of LSTM's Dr Nynke van den Broek in Nigeria on the UK-Norway Northern States MNCH Initiative. In Zimbabwe, the Maternal and Newborn Health Programme has helped to focus maternal and newborn health initiatives through analysis of need, mapping of services, the introduction of new monitoring approaches including maternal death audits and advocacy. In both Kenya and Zimbabwe, LATH has piloted the use of motorcycle ambulances to improve referral to health care.

NEGLECTED TROPICAL DISEASES (NTDs)

Substantial donor resources are now targeting NTDs. LATH's Dr Achille Kabore relocated from Liverpool to Washington DC as West Africa Regional Manager on the USAID funded NTD programme and he has continued to provide support to country programmes. After four years of implementation, the programme has delivered more than 255 million treatments in more than ten countries with 55 million people treated in the third year alone.

HEALTH RESEARCH CAPACITY STRENGTHENING

The Malawi Health Research Capacity Strengthening Initiative seeks to strengthen national research capacity and improve evidence-based policy and practice.

The programme delivers technical support along the research continuum from mentoring at the research concept stage through to the awarding of grants and provides technical backup to the National Commission for Science & Technology. Stuart Miller took over as Programme Manager in country, in January 2010. The programme has helped build the foundation of increased capacity to absorb donor research grants and has awarded a number of research grants, training awards and fellowships to training institutions and successfully activated the National Research Council of Malawi (NRCM) database.

LABORATORY SYSTEMS STRENGTHENING

LATH's Russell Dacombe, working with LSTM's Dr Bertie Squire and Dr Brian Faragher, has provided TA to the Malawi Multi Drug Resistance TB survey since 2008. This includes the refurbishment of the Central Reference Laboratory to international Bio-Safety Level 3 which was completed in September 2009.

This support has contributed to the improvement of laboratory quality systems and the training of survey teams. LATH has also supported the successful application to the Green Light Committee to access second line TB drugs from the Global Drug Facility.

TRAINING THROUGH SHORT COURSES

LATH and LSTM successfully delivered the *Short Course in International Health Consultancy* in September 2009 and May 2010. Demand for places was high and the programme received excellent feedback from both students and the external examiner. The course has attracted interest from a number of institutions to deliver the programme overseas.

In addition to the delivery of long term programmes, LATH has provided a wide range of short term TA including work in new countries such as Benin, Sudan, Syria, Tajikistan and Vietnam; and for a wider range of donors; Danida, Irish Aid and Action Against Hunger.

Over the year LATH has developed new alliances with academic groups and consultancy companies in the UK, Europe and USA. Despite the economic downturn, the new UK government has ringfenced aid and prioritised future investment in malaria and maternal health, which are areas of strength for LSTM and LATH.

In 2010 LATH adopted a new logo based on the LSTM group brand, emphasising the unique link to LSTM which is fundamental to our work.

This year LATH said goodbye to Stephen Cooper and Hannah Brooks and celebrated Executive Secretary Pat Reid's 25 years of service to LSTM and LATH.



GRANTS AND CONTRACTS 2009/10

Professor Bernard Brabin

National Institutes of Health
Long-term WIFS and malaria risk in early pregnancy: a randomised controlled trial
£488,720

Professor Moses Bockarie

Department for International Development
Support for the elimination of Lymphatic Filariasis
£9,500,000

GlaxoSmithKline
Contribution to the core support for the elimination of Lymphatic Filariasis £100,000

Professor Alister Craig

Wellcome Trust
Structural and functional analysis of the interaction of ICAM-1 with DBL domains in cerebral malaria (led by University of Cambridge)
£145,377

Dr Luis Cuevas

Thrasher Research Foundation
Towards new diagnostic approaches for active & latent TB infections using IFN (Supplement), £9,451

British Council
Developing Institutional capacity to address the diagnostic needs of excluded patients with pulmonary TB in Nigeria and Ethiopia (Supplement), £30,000

Dr Gregor Devine

Sumitomo Chemical Co Ltd
Sub-Contract for field study in Iquitos, Peru, £9,750

Bill & Melinda Gates Foundation
Control of Malaria vectors by the auto-dissemination of insecticides, £2,294,148

Dr Martin Donnelly

World Health Organization
Integrated tsetse fly ecology and genetics for improved HAT control (Supplement), £6,676

Professor Geoff Gill

Wellcome Trust
Captured Memories – Far East prisoner of war experiences over 60 years, £5,950

Heritage Lottery Fund
LSTM Far Eastern POW oral history Project: Reaching a Worldwide Audience, £48,200

Dr Stephen Gordon

Wellcome Trust
Mechanisms of severe acute influenza consortium "MOSAIC" (led by Imperial College London)
£246,050

National Institute for Health Research
Pneumonia Aetiology and Severity Study (PASS) & FsF 2009-2010, £79,458

Intercell AG
P4 Immuno-modulation or respiratory defence against infection (matched to NIHR funding)
£190,000

National Institute for Health Research
P4 Immuno-modulation or respiratory defence against infection (matched to Intercell funding)
£190,000

Dr Ian Hastings

Portugese Science Foundation Tiago Antao – PhD bench fees (supplement), £10,583

Portugese Science Foundation
PhD- S Barbosa (Supplement), £7,870

Professor Janet Hemingway

Innovative Vector Control Consortium
Protocol for village scale testing of PermaNet2 & PermaNet3 to establish insecticide resistance breaking efficacy, £221,098

Innovative Vector Control Consortium
Malaria Decision Support System (MDSS) project management, £684,570

World Health Organization
Systematic Coordination of commissioned Reviews for TropiKA.net (3 supplements), £84,999

Wellcome Trust
Open Access Publishing (Supplement), £30,000

Vestergaard Frandsen S A
Efficacy of washed & unwashed insecticide nets in experimental huts in Yaokoffoko, central Côte d'Ivoire (Supplement), £5,057

Professor Rob Heyderman

Wellcome Trust
Research Training Fellowship for Dr Jeremiah Chikovre: "Kuteerera muviri? Engaging men in TB control interventions", £140,790

Wellcome Trust
Unlocking the Mysteries of Medical Research in Malawi through a Participative Exhibition at MLW
£30,000

Wellcome Trust
Career Development Fellowship, Dr Henry Mwandumba: "Defects in alveolar macrophage innate immune function and increased susceptibility to pulmonary infections in HIV-infected adults", £874,805

Dignitas International
"What is the prevalence of tuberculosis and other serious opportunistic infections in patients with weight loss and fever in patients accessing antiretroviral therapy in Zomba and Thyolo Districts in Malawi", £37,513

European & Developing Countries Clinical Trials Partnership
The Eastern and Southern Africa Research Network for Evaluation of Second Line Therapy in HIV Infection: "The EARNEST TRIAL", £296,234

Dr Gerry Killeen

Wellcome Trust
Research Career Development award for Dr Gerry Killeen: Evaluating community based delivery of mosquito abatement for malaria control by the municipal councils of Dares Salaam. (Transfer from University of Durham), £100,429

Bill & Melinda Gates Foundation
Malaria Transmission Consortium – Tanzania (Supplement), £310,744

Bill & Melinda Gates Foundation
Malaria Transmission Consortium – Zambia (Supplement), £266,822

Dr Audrey Lenhart

Wellcome Trust
Masters Training Fellowship Nelson Grisales – Colombia Project entitled "Improving dengue control in Colombia by optimising the selection of insecticides", £78,610

Professor Mike Lehane

World Health Organization
A user-friendly decision support system to improve vector control operations against trypanosomiasis (2 Supplements), £8,867

Mr Tim Martineau

Australian Government
Health worker performance improvement: Evidence from an intervention in Papua New Guinea, Australia, £5,129

Dr Phillip McCall

Sir Halley Stewart Trust
Is East African tick-borne relapsing fever a Zoonosis?, £43,070

Dr Angela Obasi

European Commission
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 (IntHEC), £2,391,305

Dr Mark Paine

Royal Society
Developing new tools to control insecticide resistance, £11,900

Dr Hilary Ranson

European Commission
Research capacity for the implementation of genetic control of mosquitoes – "INFRAVEC" (Led by Imperial College London), £132,478

World Health Organization
Insecticide resistance in African Malaria Vectors (Supplement), **£121,200**

Dr Bertie Squire

World Health Organization
Promotion and Rationalization of Operational Research Activities in TB control: Development of Research Study Outlines for inclusion in the Workshop Report, **£4,971**

World Health Organization
Technical Support for policy development and design of pro-poor interventions in TB control and collection and analysis of data (Supplement) **£30,665**

World Health Organization
To develop equity & poverty impact assessment documentation for the New Diagnostics working group (2 Supplements), **£20,325**

World Health Organization
TB Poverty Secretariat (Supplement), **£78,169**

USAID
TREAT TB: Technology, Research, Education and Technical Assistance for TB project (2 Supplements), **£182,945**

Dr Clare Strode

Vestergaard Frandsen S.A
The genes putatively conferring metabolic resistance in *Aedes aegypti* from Vietnam (Supplement), **£6,242**

Dr Miriam Taegtmeier

World Health Organization
To provide expert guidance on scientific issues, program planning, and related norms and standards relevant to HIV testing and counselling and develop training manual (Supplement) **£6,070**

Dr Sally Theobald

Department for International Development
Special Issue of Health Research Policy and Systems: Strengthening the Research to Policy & Practice Interface, **£19,260**

BUPA Foundation Medical Research Charity
BUPA Foundation-Travel award to develop Thailand grant, **£4,920**

Economic and Social Research Council
Identifying barriers to TB diagnosis & treatment under a new rapid diagnostic scheme (Supplement), **£8,340**

Professor Joseph Valadez

Department for International Development
Introducing Lot Quality Assurance Sampling (LQAS) in Orissa and Madhya Pradesh, India, **£499,248**

Dr Nynke van den Broek

Royal College of Obstetricians and Gynaecologists
Evaluation of LSS-EOC & NC training in Pakistan, **£20,000**

Royal College of Obstetricians and Gynaecologists
LSS-Essential Obstetric Care & Newborn Care – India, **£69,000**

World Health Organization
Contribution to British Journal of Obstetricians and Gynaecologists supplement, **£2,500**

World Islamic Call Society
Evaluation of LSS-EOC & NC Training in Libya, **£121,143**

Unicef
Making it Happen: Capacity Development of Human Resources for Maternal and Newborn Health in Sierra Leone, **£457,274**

Department for International Development
Health system strengthening in the Somali Republic through phased interventions with an initial focus on Somaliland (Supplement), **£227,733**

Dr Lalith Wijedoru

European Society Of Paediatric Infectious Diseases
Paediatric Febrile Illnesses, Sri Lanka, **£5,068**

Dr Charles Wondji

Wellcome Trust
Masters Training Fellowship in Public Health and Tropical Medicine for Charles Mulamba: "Characterisation of Insecticide resistance in Ugandan populations of *Anopheles funestus* major malaria vector", **£100,343**

SHARED AWARDS

Dr Imelda Bates

Wellcome Trust Training Fellowship Stephen McKew– The aetiology of anaemia in HIV positive adults in Blantyre, Malawi: The contribution of anaemia of chronic disease and lymphoma (Supplement), **£42,225**

Shared with Professor R Heyderman and Professor S Khoo, University of Liverpool

Professor Alister Craig

European Commission, Towards the establishment of a permanent European Virtual Institute dedicated to Malaria Research "EVIMalaR" (led by University of Glasgow), **£146,160**

Shared with Dr B Urban

Professor Rob Heyderman

Meningitis Research Foundation, Health Seeking behaviour for acute bacterial meningitis in childhood and adult populations in Blantyre, Malawi, **£68,946**

Shared with Professor D Lalloo

Wellcome Trust, Surveillance for influenza in the context of pandemic H1N1 in an African population with a high burden of HIV, Malaria & malnutrition, **£373,143**

Shared with Professor D Lalloo and Dr M Sanjoaquinn

Dr Gerry Killeen

Wellcome Trust, MsC Course in Biology and Control of Parasites and Disease Vectors-Mr Dennis Massue, **£86,248**

Shared with Dr H Ranson

Dr Jaroslaw Krzywinski

Wellcome Trust, Functional genetic and transcriptomic analysis of male fertility *Anopheles gambiae*, **£267,710**

Shared with Dr G Lycett

Professor David Lalloo

Wellcome Trust, Wellcome Trust PhD Programme for Clinicians for Dr Peter MacPherson – Health Priorities in the Developing World: Project title: "The IDEA Study: Intervention to Address Delays in Equitable Access to ART", **£352,524**

Shared with Professor R Heyderman

Wellcome Trust, Research Capacity Strengthening in Africa Institutions Initiative: Southern Africa Consortium for Research Excellence (institutional support as part of SACORE), **£104,535**

Shared with Dr S Gordon

Dr Anja Terlouw

European & Developing Countries Clinical Trials Partnership, Special populations and label expansion studies with the fixed dose combinations artemether-lumefantrine, amodiaquine-artesunate, and dihydroartemisinin-piperaquine in Zambia, Malawi and Mozambique **£3,280,482**

Shared with Professor D Lalloo, Professor S Ward, Professor S Khoo and Dr B Faragher

Dr MacPherson Mallewa

Meningitis Research Foundation, An open randomized trial of ceftriaxone v penicillin and gentamicin in infant bacterial meningitis in Malawi, **£77,049**

Shared with Professor E Molyneux

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STAFF PROFILES



CHRISTINE GREENWAY
DIRECTOR OF HUMAN
RESOURCES

LSTM's new Director of HR, Christine Greenway, started in January 2010 and is enjoying the challenge of transforming her department. "LSTM is much more than an academic institution, it's very different and exciting and is much more grant and revenue-led."

Christine started working life in the Police, then took a career break to have her children. On returning to work she was appointed to a HR position at the University of Brighton, later moving to a senior HR position with East Sussex Fire and Rescue.

After 20 years away from Liverpool, Anfield-born Christine decided it was time to move back to the North West, taking a senior role in HR at GMPTE. Until then her knowledge of LSTM was limited to childhood memories of the church missionaries talking about the tropical diseases they had encountered while working overseas.

She's now looking forward to tackling the challenges ahead: "As an HR department, we're about balancing people strategies with financial strategies. With my team, I'm looking at ways to turn HR into a more business-focused operation, supporting the organisation and partnering with individual projects to deliver a service that helps them to achieve their aims. We're introducing a management information system to help with this and looking at more effective, innovative and cost-effective ways of recruiting the best talent to work here. We're also looking at management development and how we need to align training and support to help managers and staff more effectively in their roles.

"It's been a pleasure after 20 years to return to Liverpool and see how it's all changed. I really love the job and the environment and believe the experience I have will provide a good basis to carry out the changes required to help LSTM grow in the future."



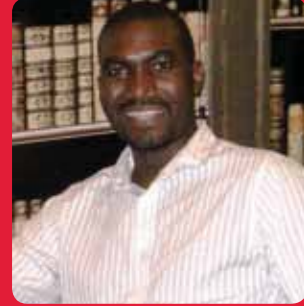
JAMES LACOURSE
LECTURER IN
PARASITOLOGY

James studied Biochemistry at University of Wales, Aberystwyth to PhD level before joining the University of Liverpool in 2006 to research globally distributed zoonotic liver fluke. After lecturing in Veterinary Parasitology at LSTM and the University of Liverpool, James returned to LSTM at the end of June 2010 as Lecturer in Parasitology.

James said: "The students who enrol for the course are often medics, vets and biologists, whilst others are just finishing undergraduate degrees. This year we have students from the Tropics, Europe, the Middle East and South America. This mix of backgrounds is a real advantage in terms of what experiences they can bring to the group."

At the start of term he took the newly registered MSc students on a 'parasitology and disease vector' field trip to Shropshire, England. "It's an intensive few days but the outcome is that students have a basic understanding of key parasitological practical methods and concepts that will underpin much of what they will learn on the course. It's also a great ice-breaker that helps students form good working relationships with each other and staff that can be essential to effective teaching and learning as the year progresses. The students come from a variety of backgrounds and disciplines and everyone was feeling quite shy. It was great to see after a couple of days everyone becoming part of the team."

In terms of his decision to return to LSTM, he says "I'm thrilled to join an organisation held in high regard across the world for ground-breaking research and educational excellence. I look forward to contributing to the ongoing education and development of LSTM graduates that will leave here to play such a crucial role in the improvement of health, economy and communities of some of the world's most resource-poor countries."



KWALOMBOTA
PROJECT MANAGER,
CLINICAL GROUP

Kwalombota is originally from Zambia, where he gained a degree in medicine and worked as a government doctor and District Medical Officer in remote areas of the country. Kwalombota has found his background useful, as he explains: "I was born and raised in Zambia and understand all about lower income and the problems associated with this."

The International Health Links Centre was established in 2009, attracting Kwalombota to LSTM as Project Manager in March 2010. The Centre promotes health partnerships between UK health institutions and organisations across the world and is funded by the UK's Department for International Development.

Kwalombota believes LSTM was chosen to run the scheme because of its reputation and facilities which really support the work. He said: "The research support at LSTM is brilliant and we can tap into people with such varied experience."

The database is open to all countries and currently has institutions and members from more than 30 countries involved. Through the partnerships, institutions can arrange exchange visits, technical assistance and develop mutual benefits such as higher professional relationships and academic mentoring.

The project is still in the early stages and Kwalombota plans to expand the remit during 2010 and 2011. He explains, "We want to create a larger footprint in Europe and North America. The more institutions we can have from higher income countries, the larger the difference we can make."

Even at this early phase Kwalombota is beginning to gather feedback on the usefulness of the project and is pleased with the response from the members. He says: "The UK institutions have already discovered that being involved can help them become more clinically attuned and for the developing countries it is a valuable opportunity to discover new ways of doing things which can make a positive impact on their health systems."

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OBITUARIES

EMERITUS PROFESSOR RALPH GEORGE HENDRICKSE MD DSc FRCP FRCPCH



Professor Bernard Brabin, Head of the Child and Reproductive Health Group and Professor in Tropical Paediatrics, pays tribute to Emeritus Professor Ralph Hendrickse, who died peacefully at home in Cheshire on 6 May 2010:

Ralph was born in South Africa on 5 November 1926. He was recognised early in childhood as an outstanding scholar and matriculated from Livingstone High School aged 15 with a first class pass. He passed the entrance examination to medical school at the University of Cape Town (UCT) and was the youngest to graduate in his class in 1948. He was also recognised as one of the top two students, although he later discovered that he had actually achieved first place but could not be acknowledged as such because of his colour.

On 17 December 1948 Ralph married Begum Abdurahman and the couple moved to McCord Zulu Hospital in Durban, where Begum worked as a nurse and Ralph as a Medical Officer. After becoming a member of the Royal College of Physicians of Edinburgh, he was appointed Senior Registrar in Paediatrics at the University College Hospital in Ibadan, Nigeria, in 1956.

He returned to UCT in 1957 to write and submit his research thesis on sickle cell anaemia, which laid the foundation of modern understanding of the disease's presentation in African children and for which he was awarded MD in December 1957, the first graduate of UCT to earn this honour in Paediatrics.

After his return to Nigeria in January 1958 he was promoted to senior lecturer, then Professor in 1962, subsequently becoming Director of the Institute of Child Health at the University of Ibadan.

In 1969, Ralph moved to LSTM to head up a new Department of Tropical Paediatrics where he also established the Diploma in Tropical Paediatrics and Child Health. He was appointed by the University of Liverpool as Emeritus Professor of Tropical Paediatrics and International Child Health and in 1988 he was appointed to the Deanship of LSTM. He held and administered both posts up to his retirement in 1991.

In June 1998, he was greatly honoured and deeply moved when he was invited back to UCT to be awarded the degree Doctor of Science *honoris causa*, the first in Paediatrics awarded by the University.

Ralph was the founder and editor-in-chief of the journal 'Annals of Tropical Paediatrics'. Among his numerous publications are two books, chapters in a number of others and over 100 journal articles.

A man of many parts, he loved both his immediate and extended family. His wife Begum started a shop in Ibadan selling local arts and crafts, an interest Ralph shared. Together they travelled the length and breadth of Nigeria collecting and promoting the works of indigenous significant artists and craftspeople. He loved photography, was an accomplished amateur artist and a natural musician, being able to sit at the piano and play by ear with great vigour and enthusiasm. A great story teller who illustrated his talks and anecdotes with off-the-cuff poems, he was also an excellent lecturer and public speaker with a prodigious memory, his talks well timed and filled with amusing details to keep his audience engaged.

At the end, he was constantly supported by his five children, his eleven grandchildren, three great grandchildren and many friends who all made sure his days were filled with peace, love and comfort.

ANNE GRIFFITHS (NEE BROCKBANK)

Dr Wendi Bailey, clinical scientist and manager of LSTM's diagnostic parasitology lab, pays tribute to the life and career of Anne Griffiths, who worked at LSTM for 29 years:

Anne started work at LSTM in 1967 as a junior technician in the Department of Tropical Medicine, becoming Chief Technician in the Electron Microscope/Histology Unit in 1984. During this time she enrolled with the Open University and received a degree in Biological & Environmental Sciences. Following departmental restructuring, Anne moved to the Dagnall teaching laboratory in 1992 and worked there until 1996 when her post became redundant.

She decided she would like to try something different so attended various courses after leaving LSTM, attaining NVQ certificates in Catering, Food Hygiene and Nutrition followed by a Certificate in Massage Therapy and Reflexology and a Diploma in Chiropractic Medicine.

Anne liked to be busy and had many interests. She had a long association with her local Guide's group as a Girl Guides leader for many years. She was a member of the choir at her local church and a keen member of the local branch of the Lancashire Wildlife Trust, for which she was Group Treasurer.

In 1998, Anne started her business as a mobile chiropodist. To supplement her income whilst building up a client base, she applied for a part time histology technician post at the Department of Veterinary Pathology at the University of Liverpool. After a few years this became a full time job again and Anne remained in-post until 2004 when her breast cancer was diagnosed.

Anne fought cancer for almost six years but lost her battle with the disease in March 2010. Throughout her illness she was very positive, joking about wearing a wig following post-treatment hair loss and enjoying visiting friends and going out up until a few months before her death. She leaves a daughter, Catherine and her partner of nearly 15 years, Geoff, and will be sadly missed by all her family and many friends.

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Fax: 0151 705 3743
Email: william.dean@liv.ac.uk
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