
ANNUAL REPORT

2008/09

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.

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."



Last year I wrote in the middle of the global financial crisis about the contrast between the developed world, caught in a spiral of greed and fear, with the challenges facing those who are exposed to tropical diseases. One year later it is hard to be entirely optimistic. Certainly we are beginning to climb out of the hole which we dug for ourselves – but at the cost of millions of unemployed and a reduction in the value of funds underpinning such things as research into combating tropical diseases.

The work of Liverpool School of Tropical Medicine (LSTM) remains as vital and urgent as ever. It is not threatened financially in the short term, as new funding streams continue to be attracted by the talented individuals led by the Director, Professor Janet Hemingway. We have tested LSTM's financial resilience into the longer term and are confident that the organisation continues to be prudently managed. The modest but encouraging surplus this year should be seen in the context of a continued strengthening of the balance sheet and a healthy cash flow. Moreover the relationship with Liverpool University is being clarified and reinforced. At the same time funding from the Higher Education Funding Council for England (HEFCE) has seen a substantial increase, as a result of a successful Research Assessment Exercise and mirrors growth from third party donors. We therefore face the future with continuing confidence.

This year marks the retirement of our President, Sir Mark Moody-Stuart, after a tenure of some six years. Fortunately his invaluable support will not be lost to us, as he remains Chairman of the Board of the Innovative Vector Control Consortium (IVCC). This successful Product Development Partnership, hosted by LSTM, is in the process of seeking re-financing from various donors, principally The Bill & Melinda Gates Foundation. We are delighted that Sir Richard Evans, a strong advocate of LSTM for many years, has agreed to succeed Sir Mark as President.

With the new Centre for Tropical and Infectious Diseases (CTID) in Liverpool now complete, and refurbishment of our existing facilities proceeding, 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. Two things stand out to me from last year's story of success: firstly, LSTM practically never undertakes activity on its own: it is virtually always working in partnership with donors, host governments, other research establishments and delivery agents on the ground. This requires a particularly co-operative type of working which is not always easy to practise. Secondly, our geographic field of activity is rapidly expanding. While Africa remains in aggregate the main focus, new ventures are being

addressed in Saudi Arabia, Syria, China, India and indeed Libya. Sadly in one sense, there seems no limit to demand on our resources.

In addition to IVCC, two other subsidiaries are making their contribution to the work of LSTM. The consultancy arm, Liverpool Associates in Tropical Health (LATH), is undergoing considerable reshaping as it faces changing market conditions and increased competition. Its adoption of a new identity and logo is symbolic of its decision to work even more closely with LSTM, to share expertise and to bring to market many of the unique skills of our researchers. Our travel clinic business, Well Travelled Clinics, have opened new premises in Chester and relocated to expanded premises opposite CTID.

This report can barely do justice to the remarkable work of all who are associated with the Liverpool School of Tropical Medicine – its staff, donors, collaborators, officers and friends. But I hope you will find within it something of the character of this vibrant institution.

A handwritten signature in dark ink, reading 'James Ross'.

James Ross

DIRECTOR'S REPORT



"With your continued support we will ensure that we really do make a difference"

This year has been one of financial turmoil in the world's markets with severe knock-on effects for the economies of both developed and developing countries. The current recession is likely to have longer term effects on the flow of government funding into the higher education sector. Whilst LSTM cannot assume immunity to these financial pressures, we have continued to expand during the year, increasing our research grant and contract income from all our major funders, gradually increasing academic and support staff levels, and opening a second branch of our Well Travelled Clinic in Chester. With reduced holiday traffic, the timing of the Clinic opening was not ideal, but numbers attending the clinic are continuing to grow and we will continue to monitor the situation closely over the next 12 months.

LSTM's academic outputs were well recognised in the recent UK higher education sector Research Assessment Exercise. Much of our work was graded as 'Internationally Excellent'. Entomological research, drug development, our overseas clinical programme in Malawi and the UK based Biomedical Research Centre (the latter both joint activities with the University of Liverpool) were singled out for special mention, alongside the step change improvement in facilities provided by the opening of our new £26m research facility.

Activities in maternal and neonatal health, monitoring and evaluation of HIV programmes, malaria drug development, ecological entomology, filariasis control and public health pesticide development have all attracted major funding over the last year. The Filariasis Control Programme, formerly led by Professor David

Molyneux, has a new head, Professor Moses Bockarie. The Programme's remit is to expand to cover neglected tropical diseases (NTDs) more broadly with a £10m award from DfID underpinning the Centre's support to multiple country programmes over the next 5 years. Professor Molyneux, meanwhile, continues his advocacy role for NTDs and filariasis in a part-time capacity through LSTM.

Teaching remains a central part of LSTM's activities and the coming year will see us pursuing a range of new initiatives to expand, rationalise and improve our teaching programmes at PhD, Masters, Diploma and short course level. New Liverpool-based teaching facilities have come on-stream this year, as we have occupied our new building and turned our attention to much needed renovation of our old premises, incorporating new lecture theatres and computing laboratories. Completion of these renovations in 2010 will allow us to plan for future expansion, building up a small portfolio of properties opposite our current facilities to form a 'land bank' for future expansion.

We are also improving facilities in Malawi with funding from the Wellcome Trust allowing us to expand the research facility in Blantyre and build a much needed adult accident and emergency centre for the Queen Elizabeth Hospital site on which our research facility is situated.

A major new initiative next year should be the establishment of a Joint Centre for Infectious Diseases Research and Teaching between LSTM and the King Saud bin Abdulaziz University

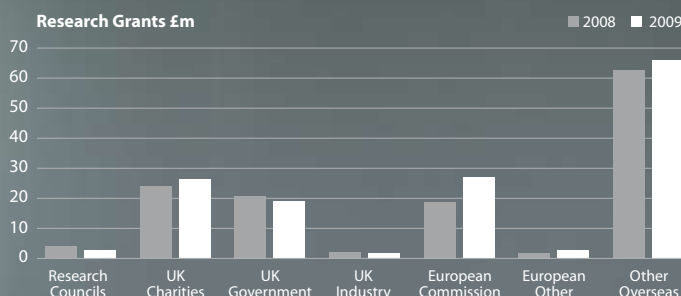
for Health Sciences in Jeddah, Saudi Arabia. This new venture significantly expands a very successful postgraduate teaching link between the two institutions which has been in place for several years.

A small number of senior staff also retired or moved on to new posts this year. Dr Mike Chance, a Senior Lecturer in Parasitology retired, but will continue to maintain a teaching role within LSTM; Dr Paul Bates moved to a Chair at Lancaster University and Dr Luis Cuevas has been seconded to WHO TDR for 2 years. The Director of HR, Mrs Eileen Tedford also retired after 20 years service. We wish them well for the future.

Despite the difficult trading environment we continue to operate in, LSTM is confident that it will continue to expand, fulfilling its role as one of the market leaders in translational infectious diseases research, with the generous support of its numerous donors, institutional and industrial collaborators and other benefactors. With your continued support we will ensure that we really do make a difference to the health and welfare of our stakeholders in the disease endemic countries afflicted with malaria, TB, HIV and a raft of other tropical infectious diseases.

Janet Hemingway

TREASURER'S REPORT



During the last few years, LSTM has invested heavily in people and property, and 2008/09 saw a continuation of this strategy. The main expenditure programme has now been largely completed and has created a platform which is beginning to deliver strong dividends.

The investment in property has provided a first class working environment, which is helping both research and teaching staff to achieve very solid results and to further enhance the existing strong worldwide reputation of LSTM. There is no doubt that the excellent facilities are a big plus factor in enabling LSTM to compete effectively in attracting new research grants and students.

The much improved facilities, coupled with funding set aside to establish new professorships, have helped LSTM attract high quality academic staff and this will, no doubt, deliver strong benefits to the institution over the years to come.

Under normal circumstances, it is LSTM's aim, as a non-profit making organisation, to balance its income with expenditure but, to facilitate the continuing investment programme, the current five year Strategic Plan factored in a modest projected loss for 2008/09. It is pleasing to report, therefore, that LSTM has been able to outperform its budget to achieve a surplus for the year of £450k. This is a Group surplus after deducting losses from its subsidiaries and also an unrealised loss on the value of the investment portfolio.

The deferred timing of some research programmes has led to a reduction in research grant income to £20.2m compared with £24.5m

the previous year, but the relative expenditure is also deferred and the net result is satisfactory.

The total portfolio of research grants now stands at £145.5m which is an increase of £11.4m (5%) on the previous year.

On the teaching front, an objective has been to increase the number of overseas students and this has been achieved as the number of overseas Masters students grew by 35% although there was no growth in numbers for LSTM's Diploma courses.

During the year, the Innovative Vector Control Consortium (IVCC) completed its transition to a Product Development Partnership constituted as an independent not-for-profit company. It is a registered charity and a subsidiary of LSTM.

LSTM's consultancy subsidiary, Liverpool Associates in Tropical Health Ltd, has historically earned significant profits, which have been passed to the parent company, but 2008/09 saw a downturn in the fortunes of this company as lucrative contracts came to an end and were partly replaced by lower value business. The company is adapting to an increasingly difficult and competitive environment and is being supported by the parent company throughout the process.

An investment has also been made into the wholly owned subsidiary, Well Travelled Clinics Ltd, a commercial venture which provides facilities to overseas travellers. The long-established Liverpool business has been relocated into high quality premises and the company has also opened a satellite outlet in Chester. This expansion has taken place in

a difficult economic climate, which has seen sharp reductions in overseas travel, but it is hoped that the business will benefit from any upturn in global conditions.

Turning to LSTM's consolidated balance sheet, it is pleasing to report that total net assets have grown to £39.8m (previous year: £38m). This increase has been achieved notwithstanding a reduction of £374k in the value of its investment portfolio. LSTM's liquidity remains strong with a healthy cash balance available and the business is well placed financially to move forward from a strong base.

Ian Jones

Audit Committee Report to the Board of Trustees

Internal and external auditors reports continue to show significant improvements and indicate how increased control has been achieved during the year. Management is addressing all matters raised by the auditors and the Audit Committee is assured, from the information received, that LSTM is under sound governance and is in control of financial matters.

The Chairman would like to thank the members of the Committee, auditors, management and staff for their work during the year, in achieving such progress.

MEET THE TRUSTEES

01. Dr Imelda Bates, BSc, MBBS, DTMH, FRCP, MD, FRCPath, MA. Imelda is Head of LSTM's Disease Control Strategy Group.

02. Mr Jonathan Brown, LLB. Jonathan is Chairman of LSTM's Audit Committee and a partner at law firm Halliwell's LLP.

03. Dr Trevor Francis, BSc, PhD. Trevor is a member of LSTM's Audit Committee and he runs a consultancy firm helping companies improve their innovation capability and leadership.

04. Mr David Greensmith, MA. David is Chairman of LSTM consultancy arm Liverpool Associates in Tropical Health (LATH) and Managing Director of Fujifilm Imaging Colorants (FFIC) based in Manchester.

05. Professor Janet Hemingway, BSc, PhD, DSc, FMedSci, Hon FRCP. Janet is Director of LSTM and Chief Executive of the Innovative Vector Control Consortium (IVCC).

06. Dr Ann Hoskins, MB, BAO, BCH, MCommH, FFPH. Ann is Deputy Director of Public Health/ Medical Director for NHS Northwest and a member of the Public Health Advisory Committee for the National Institute for Health and Clinical Excellence.

07. Mr Ian Jones, ACIB. Ian is an Elected Council Member, Treasurer, Member of the Finance & Investment Committee for LSTM and Finance Director of Liverpool-based property group Maghull Developments.



08. Miss Catherine Jones, BA, ACIS. Catherine is Academic Secretary at the University of Liverpool.

09. Mr Stephen O'Brien, MP. Stephen is a Parliamentary Advisor to the Institute of Chartered Secretaries and Administrators and runs an international business consultancy.

10. Mr James Ross, BA. James is Chairman of the Board of Trustees, Director of Prudential, of McGraw Hill in the US and of Schneider Electric in France and a trustee of the Council for Industry and Higher Education.

11. Professor Jon Saunders, BSc, PhD. Jon is Pro-Vice Chancellor for Research and Professor of Microbiology in the School of Biological Sciences at the University of Liverpool.

12. Mr Jonathan Schofield, BA, ACA. Jonathan is a member of LSTM's Finance & Investment Committee and a Chartered Accountant and a founding partner of Dow Schofield Watts LLP.

13. Professor Sir Brian Smith, PhD, DSc, FRSC. Sir Brian is a member of the Higher Education Funding Council for Wales and a Governor of the University of Glamorgan.

14. Mr André Winter, MA. André is a Non Executive Director of Liverpool Associates in Tropical Health (LATH) and Senior Investment Director with Rensburg Sheppards plc.



CHILD AND REPRODUCTIVE HEALTH GROUP

MATERNAL AND NEWBORN HEALTH UNIT

LSTM's Maternal and Newborn Health Unit (MNHU) consists of six academic and three support staff, Nynke van den Broek (Head), Jan Hofman, Charles Ameh, Adetoro Adegoke, Emma Hulme, Joanna Raven, Gillian Blackman, Sue Cain and Kristian Godfrey. This active and rapidly expanding unit is concerned with three key strategic areas in the area of 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, MNHU conducts research, teaching and provides technical assistance.

Malaysian Successes for MNHU

The Royal College of Obstetricians and Gynaecologists (RCOG), MNHU and the Department of Making Pregnancy Safer at WHO, have developed a training programme to improve health care provider capacity in developing countries. Just a year after the first 'Life Saving Skills Training – Essential Obstetric and Newborn Care & Training of Trainers' in Malaysia, the course already has a life of its own and is well on the way to raising the standard of maternal and newborn health in the country.



Having been successfully introduced to seven sub-Saharan African countries the course is now being adapted and scaled up nationally in the Republic of South Africa. Following an invitation

from the Obstetrical and Gynaecological Society of Malaysia, the MNHU together with the RCOG and supported by the Ministry of Health, Government of Malaysia, ran the first Life Saving Skills – Emergency Obstetric Care and Newborn Care (LSS-EOC & NC) course in Kuala Lumpur.

Three more courses were held and attended by 106 participants of whom 37 participated in 'Training of Trainers'. During that time the participation of the RCOG International Office – a partnership between RCOG, LSTM and LATH – has focused mainly on monitoring and evaluation. Whilst the first teaching team was made up of RCOG International Office staff, the course is now delivered by the 'trained trainers' from hospitals and institutions around the country and is mainly self run.

The LSS-EOC & NC course in Malaysia has been recognised as an important capacity tool and is the start of a long term plan to effectively train all levels of medical staff (nurse midwives, doctors, clinical officers and specialists) in safe deliveries. The success of the course in Malaysia is also mirrored in ambitious future plans. In 2010, six doctor courses are planned as well as the start of mixed training for medical officers and midwives. With continued monitoring and evaluation from the RCOG team, the LSS-EOC & NC package has been successfully introduced in Malaysia and in the coming years will be able to further increase the number of skilled health professionals providing high quality maternal and neonatal care in south east Asia.

Training Iraqi health care providers

The MNHU, in collaboration with the UK-based Human Relief Foundation, conducted LSS-EOC & NC training for 32 participants from 19 public hospitals in Iraq in October 2008. The training was conducted in Istanbul in Turkey because of security concerns in Iraq at the time. Due to the collapse of the health care system, the quality and quantity of post graduate and in-service medical training has declined very significantly. This was an opportunity to update health care professionals providing emergency



obstetric and new born care in major public health care institutions with the necessary skills and knowledge required to manage related complications they encounter. Immediate evaluation of the training showed that participants enjoyed the training and indicated that they will find the knowledge and skills useful. The participants also showed significant improvement in knowledge and skills after the training.

Gender Based Violence

In Somaliland, gender based violence is common among the IDP (Internally Displaced Persons) and there is a high prevalence of female genital cutting in Somalia. In addition a low contraceptive prevalence rate is a significant contributor to high maternal and newborn mortality. As part of the support to an EU funded programme aimed at improving the sexual and reproductive health of IDPs in Maroodi Jeex, Somaliland, the MNHU conducted interactive training workshops for mixed groups of medical officers, nurses and midwives who provide related services for the residents of five IDP settlements. The workshops, held in June 2009 in Hargeisa, Somaliland, covered the provision of family planning services, psychological support and counselling for victims of gender based violence and the management of complications from female genital cutting.

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. He holds a personal Chair in Tropical Paediatrics at the University of Liverpool and the Foundation Chair in International Child Health at the Academic Medical Centre, University of Amsterdam. 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.



DEVELOPMENT OF APPROPRIATE AGE-BASED DOSING REGIMENS

Many febrile episodes in malaria endemic areas are treated with over-the-counter antimalarial drugs or by first-line health care providers in settings where patient weights are not known. In these situations drug doses are determined by a patient's age as a proxy of their weight, but because of the considerable natural variation in weight this means that some patients may receive too much or too little drug. This is a particular concern with drugs that have a narrow therapeutic margin and with dosing in early childhood and adolescence, times of rapid growth and large variations in bodyweight by age. Sub-optimal dosing is a major cause of treatment failure, particularly in young children who may have insufficient immunity to clear any persistent parasitaemia, and may drive the development of drug resistance in populations. Overdosing on the other hand may have potentially fatal consequences for the individual and may negatively affect the reputation of an otherwise highly efficacious antimalarial.

There are no standardised procedures to devise age-based proxies for bodyweight as part of the normal regulatory drug developmental process, yet malaria control programs need dose recommendations that are based on both weight and age. The lack of clear guidance on the design of age-based dosing regimens has resulted in considerable variation in the available dose recommendations, some resulting in poor, but widely-used, regimens.



To address this, LSTM Child and Reproductive Health group scientists developed a method in collaboration with WHO TDR and Drugs for Neglected

Diseases initiative (DNDi) to determine practical age-based dose regimens for both children and adolescents that would result in the smallest number of patients receiving doses above or below the effective dose range. A weight-for-age reference data set was compiled specifically for this purpose using data from over 35 malaria endemic countries, to develop a model that reflects the variation in weight by age of populations in malaria endemic regions of Africa, Asia-Pacific and Latin America and can therefore provide the optimal translation of weight-based to age-based dosing regimens.

It has become increasingly clear that there are similar needs for age-based dosing regimens with other drugs. To address this, the team from LSTM has started work with DNDi and others this year to explore practical opportunities for work on drugs for other neglected diseases, and improve the availability of evidence-based, safe, effective age-based dosing regimens for populations with limited access to health care.

WHO COLLABORATING CENTRE AT LSTM REDESIGNATED FOR ANOTHER 4 YEARS

The World Health Organization Collaborating Centre for the Prevention of Deafness, directed by LSTM's Dr Ian Mackenzie, is based in the Child and Reproductive Health Group. Deafness is often a hidden disability, leading to poor education and social skills in children and the severe restriction of occupational prospects for adults. It is estimated that up to 4% of the world's population have disabling hearing loss, a situation which is becoming worse worldwide as the average population age increases.

Over the last few years the Centre has conducted hearing prevalence studies in Myanmar, Sri Lanka, India and West Java, for use by WHO's global burden of disease database. The Centre has long standing experience with studies related to the management of chronic suppurative otitis media (runny ear), a common preventable cause of deafness in low resource countries. Our initial research indicated that WHO guidelines and policy

required revision. This research in Kenya was funded by The Wellcome Trust and showed the cost-effectiveness of antibiotic eardrops. We are now extending this work through a grant from the US Thrasher Foundation to include studies on how the nutritional status of children influences their risk for ear infection. We are particularly interested in the effects of zinc supplementation on recovery rates from ear infection. We have also examined the relationship of deafness to HIV/AIDS in children in western Kenya and work last year in Peshawar, Pakistan confirmed the high rate of deafness in children in this area which paralleled a similar pattern in the Pakistani community in Oldham, England.

Globally the management of deafness is expensive and hearing aids and the recurring costs of batteries are beyond the means of most in poorer communities. By representing WHO at international hearing and disability meetings in China, Philippines, Thailand, USA, India, France, Holland and Australia over the last 2 years, we have highlighted the need to translate these high standards in hearing initiatives in a more equitable way.



Dr K Phiri recording from a child their auditory brainstem responses and otoacoustic emissions in a Malawian village.

The Centre at LSTM provides technical support to WHO in Geneva as well as supporting several teaching initiatives on deafness both overseas and in the UK. The efforts of Dr Mackenzie have been recognised through the re-designation of the Centre by WHO for a further four years.

MALARIA IN PREGNANCY (MIP) CONSORTIUM

Malaria in pregnancy is a major cause of severe maternal anaemia and preventable low birth weight in infants, which greatly increases the risk of infant death. In Africa, where malaria is endemic in most countries, its complications are responsible for as many as 100,000 infants and up to 25,000 mothers dying needlessly every year.

The Malaria in Pregnancy (MiP) Consortium is a global research initiative led by the Liverpool School of Tropical Medicine, which aims to find new drugs for the treatment and prevention of malaria in pregnancy and is co-funded by the Bill and Melinda Gates Foundation, the European Union FP7 framework and the European and Developing Countries Clinical Trials Partnership.

One of the Consortium's key objectives is to identify new antimalarial drug combinations that are safe, effective and practical to use for the treatment of uncomplicated malaria in pregnancy in Africa, Asia and Latin America. Of the new generation of drugs available today, Artemisinin based combination therapies (ACTs) are the fastest acting and most effective antimalarials. There is increasing evidence that ACTs are safe and effective, but there have been few formal studies in pregnant women in Africa. Although these drugs are now increasingly used by pregnant women, it is not yet known what the optimal dose should be and which of the available combinations is most effective, best tolerated, and most practical for pregnant women in Africa. It is also critically important to carefully

document their use in pregnancy to obtain further reassurance about their safety at the population level.

Over the next five years, the Malaria in Pregnancy Consortium is undertaking seven multicentre trials in Africa, Asia and Latin America to identify new drugs for the treatment and prevention of malaria in pregnancy, including three multicentre trials comparing different ACTs.

One essential first step is to establish whether the standard dose used in adults is adequate for use in pregnant women. This is particularly important since several previous studies indicated that pregnancy significantly changes the disposition of many drugs, which can lead to clinically significant lower blood concentrations than expected. This is a consequence of the physiological changes associated with pregnancy, particularly in the more advanced stages. Inadequate concentrations of a drug in blood may translate into treatment failures and persistence of malaria in the placenta that will continue to affect the mother and foetus adversely. Low drug levels also encourage drug resistance by failing to eliminate all parasites.

In its first year of activity, the MiP Consortium has conducted a number of Pharmacokinetic studies in order to determine whether the optimal adult antimalarial treatment doses for a range of drugs required adjustment for use during pregnancy.

A recently concluded study in Burkina Faso, aimed to establish the pharmacokinetics

of one of the drug candidates for the case management of malaria in pregnancy – Mefloquine/Artesunate (MQ/AS).

The study was conducted by Dr Halidou Tinto from the Centre Muraz in Bobo-Dioulasso, Burkina Faso, in collaboration with the Institute of Tropical Medicine in Antwerp, Belgium, the Wellcome Trust research laboratories in Bangkok, Thailand, and LSTM. A group of 24 pregnant women and a control group of 24 non-pregnant women, all suffering from malaria, were enrolled in the study. They were administered with a treatment of MQ/AS and followed closely for 42 days to determine the treatment response and the drug profile in the blood. The field work was completed in March 2009 and the Mefloquine drug levels in blood sera samples were analysed in the laboratory of Professor Steve Ward at LSTM. The Artesunate assays are being conducted in Bangkok. Preliminary analyses are encouraging, suggesting that no dose adjustment is necessary in pregnancy for MQ/AS.

A similar study on MQ/AS is also just about to start in five sites in Brazil (led by the Centers for Disease Control, US), a country which exhibits a very different pattern of malaria transmission and levels of drug resistance to parts of Africa. Over the next six months similar studies on the remaining drugs to be tested in the MiP Consortium multicentre trials will be completed. This data will then be used to define the dosing strategies to be used in each of the three multicentre clinical treatment trials that are scheduled during the later part of 2009.

MALARIA IN PREGNANCY (MiP) CONSORTIUM

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mip
malaria in
pregnancy
consortium



CLINICAL GROUP

FINDING SOLUTIONS FOR THE PROBLEM OF POVERTY IN TB CONTROL

The Collaboration for Research on Equity and Systems for TB and HIV/AIDS (CRESTHA) at LSTM, has this year continued to support pragmatic trials of health system interventions aimed at improving access by the poor to TB services. The Triage-Plus work with informal providers (featured in the 2006/07 Annual Report) has continued in Sudan and Malawi with valuable support from the Norwegian Heart & Lung Patient Organisation. A new trial is also now underway in Hunan Province in China. This is testing the effect on TB case notifications of removing up-front, out-of-pocket payments for health services from patients with chronic cough symptoms. Instead of patients having to pay up-front and then be reimbursed later by China's New Co-operative Medical Scheme (NCMS), the NCMS is directly covering costs incurred by TB dispensaries in two counties (Lingxiang and Miluo). A third, similar county (Huarong) is acting as a control.

LSTM operates the Secretariat of the TB & Poverty Subgroup and this facilitates our ability to reach a global audience for the policy and practice implications of our work.

This year the Secretariat has been championing a call for consultations and tests for patients with chronic cough symptoms to be free of charge at the point of access. The Secretariat hosted a debate within the Global Stop-TB Partnership Forum in Rio De Janeiro entitled 'A TB-Free World requires Free TB diagnosis' and the resulting recommendation was included in the Rio Declaration on TB control. Another achievement this year has been the contribution of a chapter on Access and Impact Assessment in the Scientific Blueprint for Development of New Diagnostics.

CRESTHA was amongst a team of partners led by The International Union Against Tuberculosis and Lung Disease in a successful bid to the United States Agency for International Development (USAID) for a multi-million dollar, five-year collaborative research grant named TREAT-TB (Technology, Research, Education And Technical Assistance for Tuberculosis). CRESTHA will be responsible for the impact evaluation of this work – principally on the extent to which the new interventions serve the needs of the poor and facilitate progress towards the Millennium Development Goals. The first years of research are focusing on field evaluations of new diagnostic tests for TB.



PROFESSOR DAVID LALLOO MB BS MD FRCP FFM RCPS (Glasg)
HEAD OF CLINICAL RESEARCH GROUP
CLINICAL DIRECTOR AND PROFESSOR IN CLINICAL TROPICAL MEDICINE
DIRECTOR OF WELLCOME TRUST LIVERPOOL TROPICAL CENTRE

David's main research interests are in clinical trials and epidemiological studies in resource poor settings, particularly in HIV related infections, malaria and envenoming. He has collaborations and studies in a number of countries including Uganda, Malawi, Sri Lanka and Vietnam. He holds an appointment as Honorary Consultant at the Royal Liverpool University Hospital.



The team from Shanghai Academy for Social Sciences visits a Township Hospital in Hunan Province which has been approved as a provider by the New Cooperative Medical Scheme.



- The principle of a 'free, quality-assured diagnosis' (meaning any consultations and tests to ascertain the cause of a chronic cough and any other tests associated with a TB diagnosis, should be provided with no charge to patients) should be formally endorsed by the STOP-TB Co-ordinating Board at its next meeting in late 2009
- The Co-ordinating Board should then ensure that by 2011 this principle is enshrined in:
 - Any revisions to the current Global Plan to Stop TB
 - The subsequent Global Plan to Stop TB
 - Any revisions of the WHO Stop TB Strategy
- All Country Programmes should be recommended to make TB Diagnosis free, at a minimum through the public health system, through:
 - Technical Assistance recommendations to TB Programmes (by TB Team, KNCV and Union Consultants) during TA visits to countries in 2010 and 2011
 - The Revised International Standards for TB Care

BRINGING HIV RAPID TESTING TO LIVERPOOL

LSTM is leading a study that will bring community outreach programmes for HIV point of care testing to the local community in Liverpool. LSTM is already a recognised leader in giving support and technical assistance to the scale up of rapid HIV testing in resource-poor countries and is now adapting a model developed by a Kenya-based organisation, Liverpool VCT, Care and Treatment (LVCT), for use in the UK. LVCT started in 1998 as a collaboration between LSTM, the Kenya National AIDS Control Programme and the Kenya Medical Research Institute and is now the largest non-government provider of VCT services in Kenya. Trained counsellors undertake pre- and post-test counselling and perform two parallel rapid HIV tests within a one hour

session, ensuring that 99% of clients leave knowing their HIV status. It is this model that is being brought to a community outreach setting in Liverpool, in partnership with the Primary Care Trust, the Health Protection Agency, Royal Liverpool University Hospital, Liverpool John Moores University, UC24, GP practices and others. Services that allow people to have an HIV result in 20 minutes are now underway in a number of settings throughout the City. Testing events are being organised for the week of World AIDS day and will provide additional drop in services. For further information please contact: enquiries@liverpoolgettested.org



RESPIRATORY INFECTIONS GROUP 2009

The Respiratory Infections group has developed three major themes this year, attracting significant new funding and providing an exciting platform for new discoveries. The group has recruited new members and plans to increase activity in translational research in collaboration with the Respiratory Medicine units in the Royal Liverpool University Hospital and University Hospital Aintree.

Defence against pneumonia and pneumococcal disease

Our team has been working in both Liverpool and Malawi. In Liverpool in May 2009, we co-hosted the Mucosal Perspectives on Pneumococcal Diseases workshop with the Infectious Disease Research Network.

In Malawi, Kondwani Jambo working with the MLW Mucosal Defence group has been awarded the Tony Hart PhD prize for his work on antigen specific T cell responses in the lung. Kondwani has shown for the first time that lung defence against pneumococcus is highly specific in both cell type and function, as well as being regulated differently than the defence measured in circulating blood.

The group has been successful in winning a Gates Grand Challenge Exploration grant (featured in The Times) and is now unique in the world in exploring the immunising effect of nasopharyngeal carriage of bacteria.

Effect of indoor air pollution on lung health

Our team in Malawi have measured the association of reported smoke exposure, measured household smoke and lung function in urban and rural Malawians. Results show very



high levels of indoor air pollution, particularly in rural households burning wood. We have collaborated with the University of Aberdeen to show that endotoxin levels in smoke are very high, and are now testing the inflammatory effect of smoke on human cells.

H1N1 influenza

The Respiratory Infections group is part of the Wellcome Trust-funded MOSAIC consortium which will recruit patients in Liverpool and London to examine mechanisms of severe inflammation. These studies may be of benefit to the Malawi group who will also carry out H1N1 surveillance.

Translational Medicine in Respiratory Infection in Liverpool

The acute medical units in Liverpool have developed within the NIHR Biomedical Research Centre to being able to link with LSTM and provide support for studies of pneumococcal infection, H1N1 influenza, tuberculosis and other respiratory infections. This cluster has now linked with the Manchester Royal Infirmary and plans to study acute pneumonia are well advanced.

DISEASE CONTROL STRATEGY GROUP

CENTRE FOR NEGLECTED TROPICAL DISEASES

With the focus shifting to integrated strategies and intersectoral approaches to disease control, CNTD now promotes an integrated approach to the control of neglected tropical diseases (NTDs). Integration of disease-specific intervention strategies into health care delivery systems is a challenge for many resource constrained countries affected by multiple parasitic and bacterial infections. Over 1 billion people living on less than US\$2 per day suffer from two or more NTDs that can be effectively controlled for as little as 10 cents per person. New low-cost tools and effective control strategies are now available for many NTDs and there has been a seismic shift in terms of resources devoted to tackling these diseases.

Following the announcement of a £50m investment in September 2008 by the UK International Development Secretary, Douglas Alexander, to “wipe out deadly tropical diseases”, the Department for International Development (DFID) approached the Centre to present a proposal for additional support for scaling up mass drug administration (MDA) implementation to eliminate lymphatic filariasis

and other NTDs. This resulted in a Project Memorandum for increased support for MDA implementation in the four countries currently receiving support (Burkina Faso, Ghana, Tanzania and Bangladesh) and eight additional countries (Democratic Republic of Congo (DRC), Ethiopia, Guinea, Liberia, Malawi, Mozambique and Zambia in Africa, and Nepal in Asia). Also included in the Project Memorandum is PhD training and support for laboratory capacity strengthening in Ghana, Egypt, Kenya, Malawi, Sierra Leone and Sri Lanka.

Relocation in February 2009 into the main LSTM buildings, closer to central administration and research laboratories significantly improved the Centre’s intellectual and research capabilities, which enabled the Centre’s new Director, Professor Moses Bockarie, to start work immediately, developing collaborative partnerships with colleagues in LSTM working on different NTDs. In April 2009, Professor Bockarie and Dr Phillip McCall from the Vector Group led an NTD expedition to Sierra Leone accompanying four Biology and Control of Parasites & Disease Vectors Masters students – Simon Jackson, James Pritchard, Anna Wamsley and Nsa Dada – to undertake their projects.



MSc student Simon Jackson (left)

Their mission was to identify the mosquitoes responsible for transmission of the parasites that cause LF and to determine the prevalence of certain other NTDs.

Two of the students, Nsa Dada (The prevalence and intensity of soil transmitted helminths in Sierra Leone) and Anna Wamsley (*Schistosoma mansoni* infection prevalence and intensity among school children in Sierra Leone) passed with distinction. A further academic success was recorded when Khalfan Mohamed, the Zanzibar Programme Manager, supervised by Professor

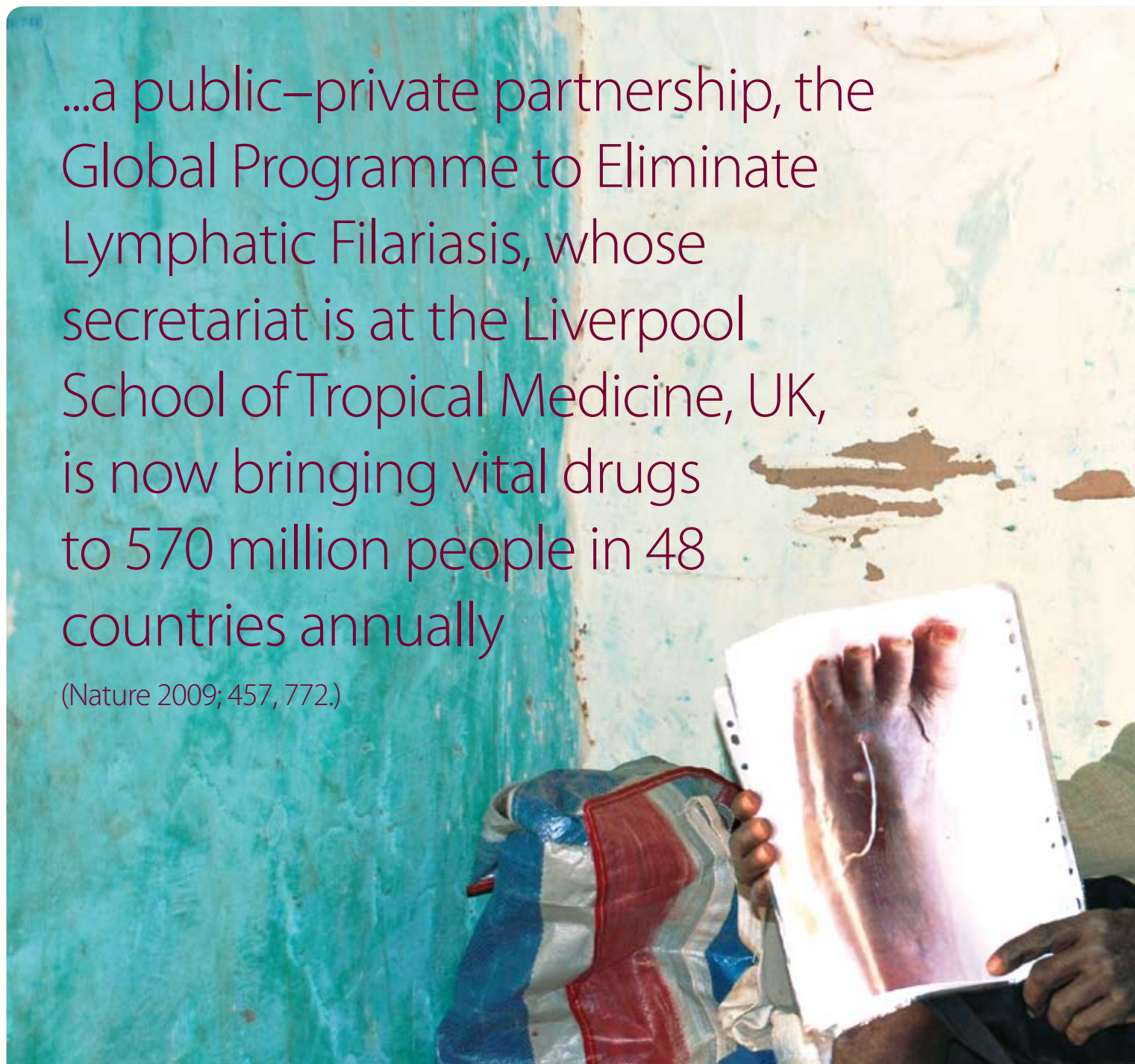
DR IMELDA BATES MBBS MD MA FRCP FRCPath HEAD OF DISEASE CONTROL STRATEGY GROUP READER IN TROPICAL HAEMATOLOGY

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, capacity building and the relationship between infections, such as malaria, and lymphomas.



...a public–private partnership, the Global Programme to Eliminate Lymphatic Filariasis, whose secretariat is at the Liverpool School of Tropical Medicine, UK, is now bringing vital drugs to 570 million people in 48 countries annually

(Nature 2009; 457, 772.)



Professor David Molyneux

David Molyneux, successfully defended his PhD thesis on 'Lymphatic filariasis in Zanzibar: Epidemiology, elimination and impact'.

Professor David Molyneux as a member of the International Commission for the Certification for the Eradication of Guinea Worm led a team of WHO staff and consultants to Mauritania in January to investigate if transmission of Guinea Worm had ceased in this vast desert country. The results demonstrated that Mauritania appears to be free of the disease and represents another country on the increasing list of countries certified free of this debilitating condition.

Two collaborative grant proposals were funded during the academic year, including

a US\$34m award to the Global Network for Neglected Tropical Diseases (GNNTD) from the Bill & Melinda Gates Foundation to mobilise US\$200m in support of the NTD elimination/control programmes. Since the award late last year GNNTD has been working diligently with CNTD and other global partners to develop a strategic plan on how this can be developed and the goal achieved.

DFID and GlaxoSmithKline (GSK) continued their support to CNTD for co-ordinating the activities of the Global Alliance to Eliminate Lymphatic Filariasis (GAELF). GAELF supports the Global Programme to Eliminate Lymphatic Filariasis (GPELF). Along with the 30 plus NTD partners in the alliance, it has added value at



both international and national levels to the elimination programme based on the strategy of mass drug administration (MDA) as part of an integrated package against the major NTDs. During 2008 alone, 496 million people around the world were treated to prevent transmission of LF, making it the largest public health programme using MDA to control diseases in the tropics. Since 2000, more than 1 billion treatments have been delivered, significantly reducing the prevalence and intensity of LF and preventing infection in millions of children. The focus is now on co-ordinated efforts in the simultaneous treatment of other NTDs such as soil-transmitted helminthiasis, schistosomiasis and trachoma.

The Centre launched its new website and logo in 2009. The website will continue to provide visitors with an overview of advocacy efforts and support for programme implementation, operational research and monitoring and evaluation activities. The new logo is a globe tilted by the burden of NTDs among the bottom billion that constitute the world's poorest. The panoramic design, supported by a big 'C' fades around the NTD acronym implying a trend towards eliminating the chains of poverty that are concentrated at the bottom of the globe.

The main challenge in the fight against NTDs is organisational rather than conceptual. There is a need to provide strong direction to ensure

that the increasing investment is well targeted and co-ordinated. As a Centre of Excellence for research on NTDs, LSTM presents a perfect environment for the new Centre.

INTERNATIONAL HEALTH GROUP

USING RESEARCH FOR CHANGE IN SEXUAL AND REPRODUCTIVE HEALTH AND HIV

The critical test of health and development research is whether people use it – for reference, for influence and, most importantly, for change. Development actors have been paying increasing attention to the question of how research can fulfil its potential to improve policy and practice, despite the many barriers that exist to research uptake. Researchers and communications experts are increasingly using innovative approaches to communicate their research, but their experiences and achievements are not often identified and shared.

A two day international meeting on the strategies researchers and communication specialists use to try and influence policy and practice in research on Sexual and Reproductive Health (SRH) and HIV and AIDS was held at LSTM in May 2009. The meeting was led by Sally Theobald (LSTM) and Jo Crichton from the

African Population and Health Research Center in Kenya and brought together 40 researchers, communications experts and activists working on research programme consortia on SRH and HIV that are funded by the Department for International Development, UK. The two day meeting which is part of a larger research project involved clustered presentations, plenary discussions and group work to develop an agenda of further work in this area.

A key challenge in understanding research policy links is the multiplicity of variables. The meeting focused on the research-policy interface in one arena – that of SRH, HIV and AIDS, enabling detailed discussion of the issues at stake in policy engagement in one sector, albeit a fast moving, fluid area of the health sector that involves multiple stakeholders working at different levels.

The issues can be highly politicised, sensitive and challenging and the messages and processes through which to engage with

diverse stakeholders in different contexts need careful consideration. In many contexts, SRH issues are conceptualised by policy makers and practitioners as low priority, low profile, controversial and unpopular. HIV and AIDS on the other hand, following long and sustained advocacy and campaigning has climbed national and international policy agendas. The meeting discussions moved forward understanding of how researchers and communication specialists working on different SRH and HIV health issues and with different research methodologies critically and strategically respond to changing policy climates to create windows of opportunity for influence.

For meeting presentations, report and policy brief see https://vocal-external.liv.ac.uk/sites/cross_rpc/default.aspx

The papers and discussions from the meeting will be the focus of a special issue of the international journal Health Policy and Planning which will come out in 2010.



Research programme consortia members meeting at LSTM

PROFESSOR PAUL GARNER MBBS DRCOG MD FFFPM
HEAD OF THE INTERNATIONAL HEALTH GROUP;
CO-COORDINATING 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 15 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, and using this research to promote evidence-based health policy and practice.



EFFECTIVE HEALTH CARE RESEARCH CONSORTIUM

Based at LSTM, the Effective Health Care Research Consortium (EHCRC) is focused on two main areas:

- Reliable, up-to-date, scientifically defensible and relevant evidence in malaria and tuberculosis, child health, maternal health and health systems
- Effective dialogue and influence between research, policy and practice communities in public and private sector.

It's been a great year! The Cochrane Centre in India opened; South Africa partners set up a Nutrition Unit in Stellenbosch University; partners in Calabar ran a malaria treatment trial; and the World Health Organization commissioned the Cochrane Infectious Diseases Group to prepare reviews for a major revision of the Malaria Treatment Guidelines. On top of this, the Director of the Consortium, Paul Garner, was requested to present to the DFID Permanent Secretary on the role of systematic reviews in health. Big Cochrane reviews were published: one of zinc in diarrhoea completed by ex-DTMH student and consultant paediatrician Marzia Lazzerini from Trieste, with 27 media hits worldwide; and massive reviews of iron supplementation in children in malaria areas and in malaria treatments were also widely publicised. No wonder the international team is being kept busy!



effective health care
RESEARCH CONSORTIUM



Jimmy Volmink is responsible for the Africa Cochrane Network, part of the DFID Effective Health Care Research Consortium (EHCRC). Here he reflects on his relationship with LSTM over the last 14 years...

NEW EVIDENCE FOR POLICY DEVELOPMENT ON RURAL HEALTH INSURANCE IN CHINA

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 the International Health Group, led by Rachel Tolhurst and Shenglan Tang, are leading a study funded by the European Commission Framework VI Programme, aiming to provide evidence to improve health insurance schemes in China and Vietnam. The project, known as RHINCAV, includes seven other partners from China, Vietnam, Sweden and Germany. In collaboration with Chinese partner universities, the project has assessed the impact of rapid and substantial changes aimed to extend and improve the rural health insurance scheme in two provinces in China between 2006 and 2008.

Initial results show that membership of the scheme increased between 2006 and 2008 to 95% of the population, which is extremely high for a voluntary health insurance scheme in comparison to other low and middle-income countries. Strong political will and increased government subsidies to the scheme contributed to this. Increasing government subsidies have achieved one aim of helping rural people to afford to use health services when they need them, since the proportion of people who saw a health provider when

they were sick doubled over the period, whilst hospital admissions increased by a quarter. This was particularly the case for the poorest rural people, who find it most difficult to afford to use healthcare; hospital admissions amongst the poorest increased by 40%. However, the amount of money that rural people paid for healthcare also increased and was very high in relation to incomes, especially for the poorest half of the population. The poorest 40% of the rural population had to pay on average more than their total annual income for hospital care. This was partly because the costs of health care increased faster than incomes, and partly because the contributions to the scheme were too low to enable a high enough proportion of costs to be covered.

These results have important implications for Chinese policy makers: government subsidies are effective and should be increased, but unless rising health care costs can be effectively controlled, current subsidies and even additional funds will not achieve their goal of preventing rural people from falling into poverty as a result of having to pay high medical bills. The findings should also be helpful for health insurance planners in other low and middle-income countries, including those in Vietnam, where this project also assessed progress in rural health insurance. The findings and policy implications will be presented to and discussed with policy makers in both countries later in the year.

"Mutual interest, equality, respect and open communication characterise our long-standing collaboration with IHG at LSTM. My relationship goes back to 1995 when I worked on my first Cochrane review with Paul Garner, evaluating the effects of strategies to promote adherence to tuberculosis treatment. The review highlighted the absence of rigorous evidence for Directly Observed Therapy, a finding which attracted a lot of attention. Over the years the collaboration has become increasingly productive. We have expanded from supporting Cochrane review authors in South Africa and Nigeria to include a variety of research synthesis capacity building programmes for people in various sub-Saharan African countries. Recently the DFID-funded EHCRC has extended the network to partners in Asia and South America, furthering its aim of bridging the gap between evidence synthesis and the use of research by practitioners and policy makers."

A NATIONAL HIV/AIDS STRATEGY FOR LIBYA



Co-leader of the El Amal organization for Intravenous Drug Users with HIV, Abdullah Aljad (left), Team Leader, Dr. Lusine Mirzoyan (centre) and Social Mapper, Amal el Karouaoui (right)

LSTM is leading an eighteen month project to provide technical assistance to the Government of Libya to finalise the development of a national HIV strategy and programme of support, backed by a €1 m grant from the Delegation of the European Commission to Libya.

In partnership with Libyan institutions and Harvard University's Biostatistics Department, LSTM will produce updated and comprehensive information on the current epidemiology of HIV infection in the country.

HIV is still the object of stigma and fear and there is little known about the drivers of the epidemic among most at risk persons or the perception of risk and knowledge of HIV among other sectors of the community.

A skilled team of researchers will formulate a national HIV strategy that addresses Libya's priorities in HIV prevention and care, using biological, social and behavioural estimates to guide and assess the strategy, developing policies and procedures to effectively promote best practice, evidence-based harm minimisation activities amongst key high-risk groups.

The studies of Knowledge, Attitudes and Practices (KAP) will be designed to learn about knowledge and misconceptions about HIV transmission and prevention, attitudes associated with stigma and discrimination and high risk behaviours. Survey instruments will be based on ones already field tested but adapted to the Libyan context. LSTM's

Professor Valadez, nominated Key Expert, is one of the pioneers of rapid KAP methods. The results will be used to determine how to improve training and capacity building among health facility workers, religious leaders and young people.

Professor Valadez will be in charge of Monitoring and Evaluation (M&E) as well as provision of epidemiological expertise to the field team. He said: "This project will establish an overall HIV strategy for Libya and provide it with a framework for making important decisions about how to control HIV. It will also allow Libya to join the other countries of north Africa which have HIV strategies and participate in the international UNAIDS community. We hope this project will also allow us all to better understand how HIV is progressing in north Africa and hopefully provide us with information about how to better control it."



HEALTH BEHAVIOUR AND MALARIA CONTROL – WHAT CAN WE LEARN FROM QUALITATIVE RESEARCH?

Because a pregnant woman owns an insecticide treated net does not necessarily mean she will sleep under it, or indeed encourage any of her family members to do so. Despite proven efficacy of insecticide treated nets and intermittent presumptive treatment in pregnancy under controlled conditions, these interventions do not fare well at community level and coverage remains modest or low. Known as the efficacy-effectiveness gap, this is well recognised and over the last 10 years or so it has been the role of social science research to help bridge that gap.

So how can the social sciences, and qualitative research in particular, help understand pregnant women's uptake of malaria preventive interventions? This is one of the questions Helen Smith and colleagues in Uganda are hoping to answer with a new grant from the MRC. The project involves synthesising (systematically reviewing) existing qualitative research on factors that influence pregnant women's uptake of interventions to prevent malaria. As with other health care interventions, successful implementation depends on introducing and sustaining behaviour change. Fortunately there is a growing body of social science research in malaria in pregnancy that documents social, cultural and behavioural factors that must be overcome for effective uptake of IPT, and factors that determine use of ITNs in pregnancy.

What is the contribution of this research? First consider the prevention policy that ITNs should be provided to women as early in pregnancy as possible and their use throughout pregnancy encouraged. In many countries nets are distributed through antenatal clinics, immunisation programmes and other public and private outlets. This should reach most women who routinely use these services, but many logistical challenges exist. Not least the

availability, accessibility and cost associated with reaching antenatal care and acquiring a net; women's perceptions about the benefits of antenatal care and satisfaction with the service are also important determinants of use. But where qualitative research plays a vital role is in exploring cultural beliefs surrounding the use of ITNs in pregnancy, community perceptions of nets and acceptability of their use during pregnancy. For example, qualitative research indicates that communities fear the insecticide used to treat nets; it is perceived as strong (since it kills mosquitoes) and therefore harmful to the pregnant women and the foetus.

For the other component of WHO's strategy for prevention of malaria in pregnancy, IPT, current evidence suggests women should receive at least two doses of sulfadoxine-pyrimethamine (SP) during the second and third trimester of pregnancy. As with ITNs, implementation is dependent on functioning health systems with good quality care, timely and regular antenatal care attendance by pregnant women, and their positive perception of the drugs and the service. The other important aspect here is adherence to the regimen, and pregnant women may be reluctant to take malaria prophylaxis based on their beliefs and perception of the drugs. Qualitative research conducted in Uganda indicates that drugs commonly known to treat malaria, such as SP, are perceived by communities as too strong, weakening pregnant women and causing abortions. Ethnographic research suggests pregnant women associate IPT with chloroquine and on the basis of its bitterness, with abortifacients, therefore women fear that adherence to IPT carries the risk of miscarriage. Research elsewhere in East Africa suggests pregnant women associate the side effects of SP with HIV infection, and this fear leads some women to dispose of SP tablets.

Lastly, prompt treatment for malaria in pregnancy depends on illness recognition. It is important to understand how communities perceive malaria, its severity, and their ability to identify malaria in pregnancy as life threatening. A complicating factor here is that malaria-related symptoms are similar to pregnancy-related symptoms. Qualitative research has helped to understand treatment seeking behaviour for malaria and reasons for

delay, and more research is needed to understand the perceived severity of malaria for pregnant women, the foetus and the newborn.

Important findings from qualitative research rarely reach health policy makers and programme managers; often this is because the key messages are hidden and researchers fail to communicate the findings in a way that is appealing to practitioners. By bringing the totality of qualitative evidence together in a systematic review, we aim to draw out useful lessons on the social, cultural and behavioural aspects of women's uptake of malaria in pregnancy interventions, and highlight where there are gaps in knowledge. Working alongside the Malaria in Pregnancy Consortium and the Partnership for Social Sciences in Malaria Control we will carefully interpret the synthesised primary studies, disseminate the results to stakeholders in malaria control in Africa, and ensure the findings enter debates about intervention delivery at the highest possible level.



FINDINGS FROM QUALITATIVE RESEARCH RARELY REACH HEALTH POLICY MAKERS

MOLECULAR & BIOCHEMICAL PARASITOLOGY GROUP

MBP have enjoyed a busy and productive year settling in to their new state-of-the-art laboratories in the CTID building. At the end of the 2008/09 academic year we say farewell to Paul Bates and Michael Chance, with a combined score of more than 50 years service to LSTM. Their work on *Leishmania* and Trypanosome parasites have made valuable contributions to the MBP group output and they have been key figures in the delivery and management of research and teaching at LSTM.



FILARIASIS GROUP PROF M TAYLOR, DR L FORD, DR K JOHNSTON AND DR D VORONIN

The Anti-Wolbachia Consortium (A-WOL) is a large consortium of academic and industrial partners funded by the Bill & Melinda Gates Foundation to discover and develop new treatments for filariasis through targeting the *Wolbachia* bacterial endosymbionts. We have developed a screening assay based on insect cells infected with *Wolbachia*, which we have used to screen 2,600 registered human drugs together with our A-WOL partners CombinatoRx and FORMA Therapeutics. This has delivered 69 new drugs, which are active against *Wolbachia* and show increased potency compared to the current antibiotic of choice, doxycycline.

We also have completed the screening of a library of 1,084 novel tetracycline derivatives, which showed 254 of these compounds had improved efficacy compared to doxycycline. These compounds have now progressed into further screens against nematodes in culture and *in vivo* screening by our A-WOL partners. We have also made progress in identifying important *Wolbachia* biochemical pathways and enzymes and have discovered a new



class of antibiotic, Globomycin, which targets the lipoprotein biosynthesis pathway and is effective at killing the bacteria.

The Consortium have recruited a new post-doc, Dr Denis Voronin to characterise the structural and biochemical features of the *Wolbachia* lipoproteins to further understand the contribution of these molecules to bacterial growth and survival. One of these lipoproteins, Peptidoglycan Associated Lipoprotein (wPAL or WoLP), has been shown to stimulate innate and adaptive inflammatory immunity associated with the disease pathogenesis of filariasis.

We are currently expanding our screening activities to include larger diversity based libraries using computational chemistry analysis and high throughput screening technologies.

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

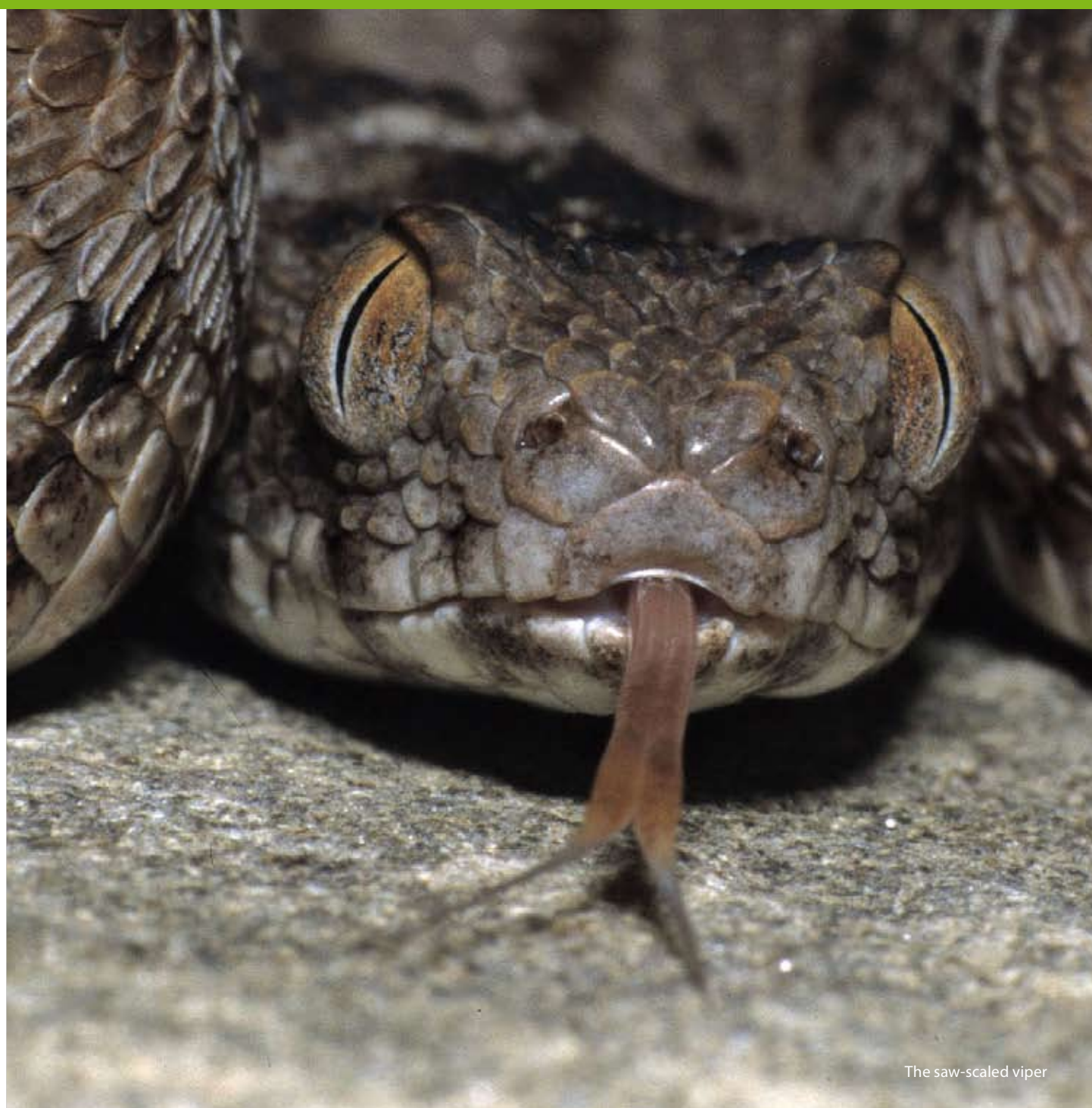
Mark's area of interest is the filarial nematode diseases of humans. These include elephantiasis (lymphatic filariasis) and river blindness (onchocerciasis): two of the leading causes of global disability. His research team performs laboratory and field-based studies on the bacterial endosymbionts *Wolbachia* as drivers of inflammatory disease pathogenesis and 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-wolbachial therapy into a public health tool for filariasis control.



ALISTAIR REID VENOM RESEARCH UNIT – SAVING LIVES IN WEST AFRICA

DR R HARRISON AND DR S WAGSTAFF

This unit, hosts the **largest collection of venomous snakes in the UK** and uses this unique resource for clinical studies and scientific studies to improve the efficacy, safety and affordability of antivenom to treat victims of snakebite, with a focus on the rural poor of Africa.



The saw-scaled viper



Rural farming increases risk of snakebite



Bleeding typical of saw-scaled viper envenoming



Disability: a common consequence of snakebite

“Over 25,000 vials of these antivenoms have been delivered free to snakebite victims in Nigeria in the past 4 years – representing 12,500 treatments against snakebite which, if untreated, kills 20% of victims.”

Being bitten by a snake is a daily hazard for many people living in rural, subsistence agricultural communities in West Africa. Tilling the soil by hand exposes farmers to venomous snakes, particularly in the rainy season when snakes are driven above ground. Footwear that might offer protection from snakebite is either unaffordable or too uncomfortable and in the dry season, storage of seed and crops attracts rodents, which in turn attract snakes. The typical location of homes near to farms and grain stores consequently increases domestic exposure to snakebite, especially in children. It is estimated that 18,500 West Africans are killed by the haemorrhagic or neurotoxic effects of snake envenoming each year.

Farmers, typically young adults and children, are most often bitten on the feet, lower legs and hands, critical to a subsistence farmer. Those surviving the bite will often suffer from secondary infections and other severe complications that too often can only be resolved by amputation. As well as the obvious personal consequences, it is not uncommon for snakebite victims to occupy the majority of hospital beds, placing a significant and largely unrecognised financial burden on local health centres.

Antivenom is the only effective therapy and is prepared from antibodies generated in horses or sheep which have been immunised with venom. Africa is reliant exclusively upon commercially-produced antivenom and the expense of manufacture and cost to the patient (currently \$300 per treatment) reduced

governmental demand to the point where, in the late 1990s, antivenom ceased to be supplied to West Africa, with a consequent dramatic rise in snakebite-induced death and morbidity.

A collaboration to address this crisis, the EchiTab Study Group, Chaired by Professor Theakston, was formed between the Nigerian Federal Ministry of Health and LSTM. Funded by the Nigerian Ministry of Health and co-ordinated by the Venom Research Unit, the scheme was established with the importation of some of Nigeria's most medically important snake species into the LSTM herpetarium. Venoms extracted from the snakes by Mr Rowley were sent to antivenom manufacturers in Wales and Costa Rica. Utilising newly developed cost-efficient techniques, monospecific **EchiTab** (effective against saw-scaled viper envenoming) and polyspecific **EchiTabPlus-ICP** (effective against saw-scaled viper, puff adder and spitting cobra bites) antivenoms have been manufactured and demonstrated to be safe and effective in double-blind clinical trials supervised by Professor Warrell, Oxford University.

The EchiTab Study Group is now focused upon expanding the delivery of these vital medical supplies and devising systems to ensure a secure supply of safe, effective and affordable antivenoms to reduce this high death toll amongst some of West Africa's most disadvantaged communities. An important lesson learned while resolving this West African antivenom crisis was that a stable supply of antivenom for Africa is unlikely until there is

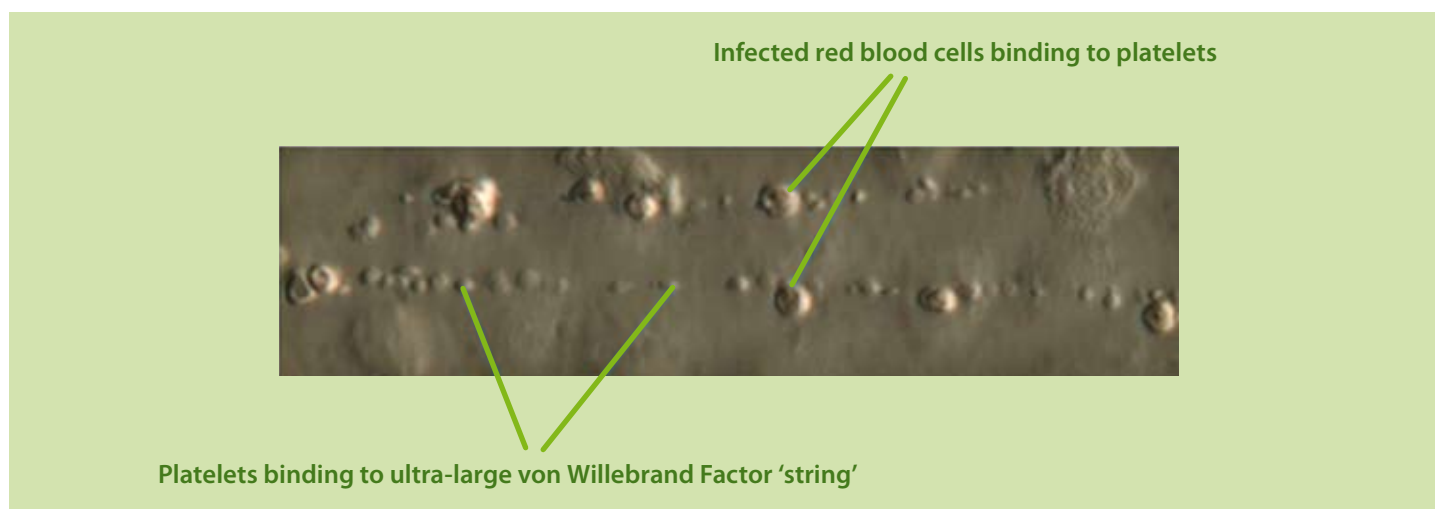
sufficient governmental demand to re-stimulate commercial production and when antivenoms are affordable to the patient. The objectives of the Venom Research Unit research activities are consequently to develop novel antivenoms that are effective, safe and cheap.

Drs Harrison and Wagstaff are conducting venom gland gene surveys of all the medically important snakes in West Africa and analysing this data, using complex bioinformatic techniques, to construct synthetic proteins. These synthetic proteins are carefully designed to generate antibodies that will neutralise all the toxins in venoms of all the medically important snakes of West Africa. Such a universally-effective antivenom should improve demand, thereby increasing commercial manufacturing incentives and ultimately driving down the cost to the patient.

Since camel antibodies are less immunogenic than those currently used to make antivenom, Dr Harrison and Mr Cook are investigating whether they are less likely to induce the serum sickness and anaphylactic adverse effects associated with many conventionally-prepared antivenoms.

As camel antibodies are also more thermostable, the Venom Research Unit is testing whether camel antivenoms can be stored at room temperature, potentially greatly improving antivenom delivery to many African regions without electricity.

MALARIA PATHOGENESIS GROUP



Cytoadherence in *P. falciparum* malaria is thought to play a major role in the pathophysiology of severe disease. Research in Professor Craig's laboratory into this important feature of malaria uses static and dynamic ex vivo models of parasite binding, functional genomics and cell biology. His group uses this information to identify possible therapies for severe malaria, for example small molecules capable of reversing or blocking cytoadhesion. They also look at the host response to parasite sequestration and its potential impact on disease outcome as well as novel mechanisms of cytoadherence.

PROF A CRAIG, DR Y WU, DR J MONTGOMERY, DR S WASSMER AND DR D BRIDGES

Research overseas is a critical component of Professor Craig's group. Projects are mainly based in Malawi and Kenya, looking at variant adhesive parasite types in patient populations, as well as an analysis of the tissue distribution of parasite populations during sequestration and variation in the host response to infection.

Some of their recent work has identified a new method by which malaria parasites within infected red blood cells can attach to host cells lining the blood vessels. This novel pathway does not rely on long-term activation of the host, but uses quick-acting chemicals to release long strings of a sticky protein (ultra-large von Willebrand Factor (uLVWF)) into the lumen of the vessel to which platelets can bind,

acting as a bridge for adhesion of parasitized erythrocytes.

DR B URBAN AND DR E GITAU

Clinical immunity to malaria is dependent on repeated exposure to *Plasmodium falciparum*-infected erythrocytes, which adhere to endothelial cells and sequester in capillaries. Our group, currently based at the KEMRI-Wellcome Trust research programme in Kilifi, Kenya, is researching whether and how the cytoadhesive properties of infected erythrocytes shape the immune response to a given isolate. We have developed a system to identify and express a small region of the variant cytoadhesion protein identified in parasite isolates from children admitted to the local hospital. We use the recombinant proteins for the activation of antigen-specific T cells from the same child and measure the type

and duration of cytokine responses. Together with the cytoadhesion profile of the infecting parasite isolate, we are now able to establish whether there is a relationship between cytoadhesion and immune responses to a particular parasite variant.

We are also investigating B cell responses in children with acute malaria. We have shown that children with acute malaria maintain B cell memory cells after the acute attack, indicating that they are induced although a considerable number are IgM positive. We are now investigating the role of IgM memory B cells in acute malaria.

TROPICAL DRUG DISCOVERY GROUP

PROF S WARD, DR A SHONE, DR P STOCKS, DR G LAING, DR S MAUNGNOICHAROEN AND DR G DONEGAN

Professor Ward's unit continues to focus on both basic and applied aspects of antinfective chemotherapy with an emphasis on malaria, TB and more recently, in collaboration with Professor Taylor, filariasis. Product oriented research projects are investigating new antimalarial peroxides, quinolines and mitochondrial targeted drugs with renewed funding from the Antimal EU drug discovery initiative, the Wellcome Trust and the Biomedical Research Centre Liverpool. There is only a rudimentary understanding of how antimalarial drugs work, compounded by a lack of knowledge of parasite physiology. Understanding the basic physiology and pharmacology of the malaria parasite therefore underpins much of our work. We are currently involved in characterising parasite transporters, second messenger signaling and aspects of energy metabolism. This has led to significant advances in our understanding of the mode of action of antiparasitics and is helping us to understand the toxicological limitations of drugs such as the endoperoxides.

In the past twelve months we have made significant advances in a number of other areas including the identification of potential resistance breaking pyrethroid insecticides, the identification of biomarkers of severe malaria and TB and the pharmacokinetics of antimalarials in pregnancy. In collaboration with Professor O'Neill (Liverpool University) we have used the knowledge gained from our basic science research to form a platform for the rational design of new drugs, insecticides and eventual diagnostics.

DR P BRAY AND DR E SALCEDO

Parasite transporters have particular biological significance in the asexual blood stages of malaria. Various transport processes must adapt to the intracellular milieu of the host erythrocyte and the extracellular environment that is encountered during reinvasion, potentially making them suitable for chemotherapeutic targeting.

The group is focused on the molecular characterisation of malaria parasite transporters, as they can serve as specific access routes for drug delivery into the intracellular parasite and be important mediators of drug resistance, as well as drug targets in their own right.

Current projects encompass folate transport, organic cation transport, amino acid transport and drug transport in *Plasmodium falciparum*. Some of these studies have provided new insights into the mechanisms of folate salvage in *Plasmodium falciparum*. The parasite is able to salvage pre-formed folates and folate precursors such as para-aminobenzoic acid (pABA) using two plasma membrane transporters characterised by our group and termed PfFT1 and PfFT2.

Other work has examined the drug transport mechanism and the endogenous role of the *P. falciparum* chloroquine resistance protein PfCRT. Some of this work, conducted in collaboration with Professor Sylke Muller at Glasgow University, has revealed a previously unsuspected role in the parasite glutathione pathway. We have provided the first demonstration of peptide transport by PfCRT and have focused on the transport of the tripeptide glutathione. We have shown that mutant forms of PfCRT are also able to transport glutathione into the digestive vacuole. Once inside, glutathione destroys some of the heme target, making a significant contribution to chloroquine resistance.

DR G BIAGINI, DR N FISHER AND DR A WARMAN

Resistance to antimalarials is an increasing problem, requiring new drugs with novel targets. Key to this is a better understanding of the malaria parasite biochemistry and physiology in order to exploit differences for future chemotherapies and to circumvent resistance mechanisms.

Current projects have focused on two main parasitic organelles, the digestive food vacuole (DV) and the mitochondrion. The DV is the site of haemoglobin digestion and the by-product of this process – heme (or ferriprotoporphyrin IX) – is the target of a number of quinoline-based drugs. The DV is also the site of two key transporters, Pgh1 and PfCRT, responsible for resistance to quinoline-based drugs. Our studies have focused on understanding the physiology of the DV such as pH and Ca²⁺ homeostasis, in an effort to elucidate resistance mechanisms. We have discovered that the acidic DV contains elevated (relative to cytosol) free Ca²⁺ which is regulated by

a H⁺-dependent transporter(s) and have characterised a transporter found on the DV membrane that is responsible for Ca²⁺ transport.

The electron transport chain (ETC) of the parasite mitochondrion is also being analysed as a possible chemotherapeutic target. Unlike the human host, the parasite ETC does not contain Complex I but instead possess a type II NADH:quinone-oxidoreductase otherwise known as "alternative complex I". This enzyme has recently been genetically and chemically validated as a potential chemotherapeutic target. Grants from the Leverhulme Trust and the Wellcome Trust are funding studies to deconvolute the structure and function of this enzyme and to develop drug candidates from medicinal chemistry QSAR (with Professor Paul O'Neill at the University of Liverpool) and high throughput screening activities. This essential enzyme is also found in *Mycobacterium tuberculosis* (Mtb), and through funding from the Biomedical Research Centre we have embarked on a 5 year programme to develop anti Mtb inhibitory molecules. In addition we have recently discovered potent antimalarial compounds selective against the plasmodium mitochondrial bc1, and efforts are underway to secure a drug discovery programme for this new class of antimalarials.

DR I M HASTINGS

Dr Hastings works on identifying and quantifying the forces driving drug resistance and how drug deployment could minimise resistance. Recent research has focused on how best to analyse surveillance data on mutations known to encode drug resistance and how to translate these data into policy recommendations. Collaboration with the Swiss Tropical Institute and renewal of BMGF funding to model malaria epidemiology has funded a PhD studentship, Katherine Winter, to start integrating drug pharmacology into the genetic understanding of how drug resistance arises and spreads. Susana Barbosa has joined from Portugal and will work on the related problem of how insecticide resistance spreads through populations of mosquitoes.





VECTOR GROUP

BREAKTHROUGH SHOWS GENETIC BASIS FOR RESISTANCE TO INSECTICIDES

Research led by the Vector Group at LSTM has identified the genetic basis for resistance to commonly-used insecticides in one of the major malaria-carrying mosquitoes in Africa.

Malaria remains one of the biggest killers of children and pregnant women in the developing world and much of the effort to combat malaria is focused on controlling mosquitoes through the use of insecticides in bednets and indoor residual spraying. Mosquitoes can evolve to overcome the way in which insecticides work and the emergence of insecticide-resistant strains of mosquitoes is an increasing problem, therefore understanding more about its genetic and biological basis is critically important.

The team, led by Dr Charles Wondji, studied strains of the *Anopheles funestus* mosquito and identified a family of genes coding for enzymes known as cytochrome P450s, detecting two genes which were associated with resistance to pyrethroid insecticide.

Dr Hilary Ranson, also of the Vector Group and an author of the study, explained that these same genes were also recently identified with pyrethroid resistance in the other major malaria-carrying mosquito in Africa, *Anopheles gambiae*: “We expected to find that different species and populations would have different groups of genes responsible but they are very similar. This is encouraging news because it means that work to overcome resistance in one species is likely to be effective against the other.”

Furthermore, provided these genetic markers identified in laboratory populations of mosquitoes are equally predictive in the field – something currently being tested by Dr Wondji – this will overcome a

major blocking point in the evaluation of wild mosquito populations. Routine use of these molecular markers for resistance will provide early warning of future control problems due to insecticide resistance and should greatly enhance the ability to mitigate the potentially devastating effects of resistance on malaria control.



250 million
THE NUMBER OF MALARIA CASES
THAT EMERGE EACH YEAR



PROFESSOR MIKE LEHANE BSc PhD
HEAD OF THE VECTOR GROUP
PROFESSOR OF MOLECULAR ENTOMOLOGY AND PARASITOLOGY

The laboratory based studies of Mike's research group are centred primarily on investigations of vector parasite interactions with a large scale gene discovery programme. This work is done in collaboration with the University of Yale, US and the University of Victoria, Canada. Mike's team are also undertaking studies on sandfly interactions.

DEVELOPMENT OF RESISTANCE-DETECTING FIELD KIT

LSTM is leading a five year project to develop a Field Applicable Screening Tool (FAST) kit to detect resistance to public health insecticides in mosquitoes.

The two principal methods for control of malaria in sub-Saharan Africa are the use of insecticide-treated bednets (ITNs) and indoor residual spraying (IRS) of insecticides. Scientists at LSTM, the Centers for Disease Control and Prevention in the US, Ghana's Biotechnology and Nuclear Agricultural Research Institute and Uganda's National Livestock Resources Research Institute will be working in partnership to identify genes that render malaria-carrying mosquitoes resistant to a range of insecticides that are used for IRS and ITNs. At present information on underlying resistance mechanisms of the two most important mosquito species is very limited.

Based upon this knowledge, a rapid and cost-effective DNA-based screening kit will be designed, tested and rolled out for use by control programme staff in the regions of sub-Saharan Africa where malaria and filariasis are endemic. The new screening tools will provide information vital for predicting the success of IRS and ITN programmes.

Speaking at the launch of the project in May 2009, project leader Dr Martin Donnelly, Senior Lecturer in Vector Biology at LSTM said: "Malaria control in Africa is reliant upon the use of insecticides against mosquitoes. Therefore if the mosquitoes develop high levels of resistance to these insecticides the public health impact could be devastating. We are developing DNA-based tests which are sensitive enough to detect resistance when it is at a low level and thereby enable control programme staff to take action to reduce the build up of resistance."

The rollout of FAST kits will be facilitated in collaboration with existing programmes run by IVCC, TDR (a World Health Organization programme for research and training in tropical diseases) and PMI (US President's Malaria Initiative). The project is funded by the US National Institutes of Health.



TURNING DEADLY MOSQUITOES AGAINST THEIR OWN OFFSPRING



A new field demonstration from Peru suggests that we might be able to co-opt adult mosquitoes into applying insecticides for us, and that they are far more efficient at doing this than humans are. LSTM's Dr Gerry Killeen, seconded to the Ifakara Health Institute in Tanzania, created a simple model that helps interpret the technique and suggests that it might have applications for the control of malaria vectors.

Working with researchers from Rothamsted Research, an institute of the Biotechnology and Biological Sciences Research Council in the UK and the health authority in the Peruvian Amazon, the team have pioneered a new way of controlling the mosquito that carries the potentially deadly dengue virus. They forced adult *Aedes aegypti* mosquitoes to transfer insecticides to their own breeding sites, thereby killing any larvae developing there.

Juvenile stages of all mosquitoes develop in aquatic habitats. Emerging adults have to return there to lay their eggs and continue the life cycle. These habitats are key targets for mosquito and disease control campaigns but, because of the cryptic and myriad nature of

potential breeding sites, their treatment with insecticides is usually difficult, time consuming, and expensive.

The team were able to achieve almost total coverage of the aquatic larval habitat by treating a small proportion of the area where adult mosquitoes rest with a safe, potent and persistent insecticide. This insecticide can be carried by adult mosquitoes but only kills juvenile stages. Amplification of the effect occurs because every adult mosquito completes several resting and egg-laying cycles during its lifetime. This results in multiple opportunities for the transference of the insecticide.

The use of the adult mosquito as the transfer vehicle ensures that the larvicides are very accurately targeted: the more popular the breeding site, the greater the transfer of insecticide and the more effective the control.

The technique is truly novel, and could be implemented immediately. One of the researchers at the Ifakara Health Institute in Tanzania has developed a mathematical model of the process to explore how the Peruvian team might apply their technique to the mosquito species which carry malaria and filariasis.

EDUCATION & TRAINING

LSTM's education and training activities are diverse and wide-ranging. As the following pages show, 2008/09 has seen us embarking on a variety of exciting new projects as well as continuing to grow and develop our established programmes. A suite of MSc programmes continues to attract highly-motivated graduates from around the world. A distinctive feature of our MSc programmes is the opportunity to carry out a dissertation project overseas. This year we sent students to over 30 countries worldwide, including some in very challenging social and political contexts, as shown by the account below of dissertations conducted by students studying on the MSc in International Public Health.

LSTM also runs professional Diploma and short courses varying in length from 1 day to 3 months, which provide participants with the opportunity for intensive study within a specialist field related to health care in the tropics. This year saw the successful introduction of a new Diploma in International Community Health Care, which is targeted at health professionals who are working or planning to work in community health settings in resource-poor countries. The programme is

distinguished by a move away from teacher-led didactic lecturing towards a focus on student-centred, interactive learning, a philosophy that we intend to embed in all LSTM programmes over the coming years.

We have not just been busy in Liverpool but have also extended our activities overseas, including a pilot project in Ghana aimed at building capacity in educational skills of local tutors; provision of MSc teaching in the Syria and the Kingdom of Saudi Arabia; and the first 'in-country' delivery of our successful Diploma in Humanitarian Assistance, which ran in South Africa. All of these activities, both in Liverpool and overseas, are underpinned by the sterling work of our Student Registry, which supports our students from application to graduation and helps academic staff to deliver an education and training experience of the high quality.

SELECTED DISSERTATIONS FROM THE MSC IN INTERNATIONAL PUBLIC HEALTH (MIPH)

Key to our MIPH and MHS programmes are approaches that encourage the transfer of theory into practice through experiential learning, reflection and action. These



Research meeting – Dr Olusegun and colleagues in the conference hall of the Jigawa state ministry of health.

approaches develop students' skills in critical thinking and enable exchange of ideas and experiences between students from different professional backgrounds and diverse country contexts. Our unique client-led dissertation option is an example of this approach. A client identifies a research topic or problem for further research, rather than the student pursuing a research area based on their, or their supervisor's, interests and contacts. Most of our clients are based in resource-poor settings and include ministries of health, international or national Non Governmental Organisations (NGOs) providing services, and research and

DR SUE ASSINDER BSc PhD DIRECTOR OF EDUCATION

Sue is LSTM's first Director of Education. She 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.



academic institutions. In this way the process and outcome of the research benefit the client, LSTM and especially the student in regards to their future career and employability.

In our 2008/09 MIPH cohort, Dr Adeyemi Olusegun from Nigeria, conducted his dissertation research in Jigawa state, Nigeria and used shop surveys and qualitative research methods to assess the availability of effective antimalarial drugs in medicine stores. Dr Olusegun was awarded a Kenneth Newell Bursary from LSTM to write up his dissertation findings as an academic paper. Petro Chirambo from Malawi travelled to Sudan to work with Epi-lab in Khartoum to explore the important and often undervalued role of community volunteers in the provision of care for TB patients and people living with HIV and AIDS. Dr Sarian Kamara from Sierra Leone worked with an Indian NGO, SEWA Rural, to explore the challenges new mothers and health providers faced in using the 'kangaroo bag' – a low technology method for supporting low birthweight babies. All the students found the experience of doing research in a new context exciting and challenging. In the words of Dr Chika Obi who travelled to Awassa in Ethiopia to look at access barriers to tuberculosis care, the dissertation experience "opened my mind to doing further research... it was an enjoyable time."

DIPLOMA IN INTERNATIONAL COMMUNITY HEALTH CARE (DICHC)

The DICHC is a new Diploma programme at LSTM and successfully ran for the first time from April to July 2009, building upon and expanding the very popular Certificate in Tropical Community Medicine and Health (CTCM&H) which had been running concurrently with

the Diploma in Tropical Medicine and Health (DTM&H) since 1973. The development of the DICHC was informed by the expansion in the roles and expectations of health workers in community health settings in resource-poor countries and the difficulty in providing enough graduates to fulfil the needs of many NGOs, research institutions and Ministries of Health who now employ graduates of this programme.

Although the DICHC builds on CTCM&H, the learning, teaching and assessment strategies are very different. The Learning and Teaching strategy adopted by DICHC helped to enable candidates become proficient in comprehending, analysing, synthesizing and evaluating issues in international community health and in acting upon those issues. This strategy moved away from teacher-led didactic lecturing to a more student-centred, interactive learning approach. This consisted of classroom discussion of key issues, analysis and interpretation of resource material and practice in applying concepts and solving problems; working in small groups to develop the ability to work co-operatively, taking responsibility for own learning and learning from each other; independent learning through guided study and the use of online learning packages; and lecture overviews which provided students with a core knowledge base. The timetable included self study time before, during and after sessions. This gave students opportunities to prepare for sessions through resource materials available online.

Fourteen students attended the DICHC programme this year and they all successfully completed the programme in July 2009. The student-centred teaching approach received a lot of positive feedback from the students.

Six students obtained distinction marks and the David Haddock Prize for overall best performance was awarded to Sarah Moxon.

For more information about the DICHC kindly contact:

Dr Adetoro Adegoke, Director of Studies DICHC, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool, L3 5QA.
Email: a.a.adegoke@liverpool.ac.uk
Tel: +44 (0)151 705 3710

STUDENT REGISTRY

LSTM's Student Registry is made up of nine members of staff, who between them look after the needs of the students from before they arrive through to graduation.



The admissions staff – Eleanor, Katie and Laura – process all applications and deal with anything prospective students want to know about LSTM programmes and studying in Liverpool. They

are the first point of contact for students and often have to deal with a wide range of queries – not always related to academic matters. The admissions process can be complex, particularly for international students, and it is reassuring for a prospective student to have someone on hand to answer their queries. By making sure everything is in place pre-arrival, the registration process can run smoothly when the student



actually arrives and the admissions team can finally put faces to names.

The student support staff – Viv, Jenny, June and Jane – look after the students while they are studying at LSTM. The Registry office is very busy, particularly at the start of term while students settle in and get used to finding their way around the buildings and the City. The students are given a ‘welcome pack’ on arrival, which contains information about their programme and more general tourist information to make sure that they can make the most of their time in Liverpool. As the term progresses, students use the Registry office as a drop-in centre for queries, as well as handing in their assignments. The Accommodation and Welfare Officer, Rebecca, advises on practical matters that affect students, from immigration matters and finding a place to live through to English language classes, childcare and schooling, council tax, registering with doctors/dentists and opening a bank account. Students are offered a drop-in service throughout the academic year and can also pick up a wide range of informative leaflets.

Overseeing all of this activity is Ruth, the Postgraduate Programmes Manager, who ensures that LSTM policies and procedures are followed, that academic staff are supported in the delivery of programmes and that students are given up to date and accurate information.

Through this ‘cradle to grave’ service, the Registry team make sure that students coming to Liverpool get a warm welcome and that their experience of studying in LSTM is fulfilling and rewarding.

LEARNING AND TEACHING DEVELOPMENTS IN THE MIDDLE EAST

LSTM continues to strengthen its role in capacity building and institutional development in the Middle East through two projects in Syria and the Kingdom of Saudi Arabia. Dr Amir Hassan and colleagues have been involved over many years in the development of health systems in the region which have recently helped in the establishment of two schools of public health.



In Syria, LSTM’s involvement with the Syrian Ministry of Health and EU’s Health Sector Modernisation Programme has led to the creation of the Centre of Strategic Health Studies (CSHS), promoting capacity building of faculty and staff, education and training in both long and short courses and research and technical assistance in line with the requirements of the Syrian Ministry of Health. CSHS staff have been supported with the engagement of experts in Libraries, Marketing and Management of Information Systems that have sought to bolster the strength of non-academic support.

The second cohort of 41 students began their second year of Master Awards this year as the first cohort of 21 students graduated. The reputation of CSHS for training has begun to establish itself in Syria and in early 2009 over 1,400 prospective students applied to study. The short courses on offer also fulfill a role of continuing professional education and 15 such courses have been provided this year, funded by the EU and other sponsors such as the World Health Organization.

This year also sees the finalisation of a major joint research initiative between the LSTM and CSHS on Health Systems Management. Both the staff and the students at the CSHS have been involved over the last year in generating research along the priorities of the Syrian Ministry of Health and its comprehensive health sector modernisation programme supported by the EU. The research will help the CSHS cement its position as the number one establishment for evidence-based research in Syria.

The future of this long standing co-operation with the health sector in Syria is also progressing with expansion in scope and is moving towards closer institutional links that should further enhance the pace and scale of LSTM engagement with CSHS, led by Dr Reem Akhras, under the chairmanship of His Excellency the Minister of Health, Dr Rida Said.

In Saudi Arabia, LSTM has collaborated with the establishment of the College of Public Health and Health Informatics at the King Saud bin Abdulaziz University for Health Sciences, by providing technical assistance for training in three Masters awards. In 2007, LSTM began supporting the Masters degree in Health Systems and Quality Management. In 2009 this commitment increased to include the new Master of Epidemiology and Statistics. The next stage of this fruitful collaboration will take place in 2010 when LSTM will provide technical resources to implement the new Master of Public Health.

Collaboration with the College of Health and Health Informatics is expanding to include a significant research component and an additional postgraduate education programme. This has been discussed and agreed during a recent visit by Dr Majid Al Tuwaijri, Dean College of Health and Health Informatics. One example is the plan to establish a joint centre of infectious disease control under the umbrella of the IVCC led by Professor Janet Hemingway. The IVCC Consortium Agreement has now been signed by Dr Banadr Al Kenawy, President of King Saud bin Abdulaziz University for Health Sciences and CEO National Guard Health Affairs.

1,400

THE NUMBER OF PROSPECTIVE STUDENTS
THAT APPLIED TO STUDY ON SYRIAN CSHS
PROGRAMMES IN EARLY 2009

STAFF AND EDUCATIONAL DEVELOPMENT ASSOCIATION RECOGNITION

In July 2009, LSTM achieved institutional recognition by the Staff and Educational Development Association (SEDA) for our ability to provide courses in educational development. SEDA is an internationally recognised, professional association which promotes innovation and good practice in higher education. The expert team from SEDA who visited LSTM were particularly impressed by the close co-operation between HR staff and those involved in developing teaching, and with the way in which the Staff Development Advisory Group facilitated the embedding of teaching development processes within the institution.

PROFESSIONAL DIPLOMA IN LEARNING, TEACHING AND ASSESSING

This year we have developed our first formal educational development programme – a Professional Diploma in Learning, Teaching and Assessing (LTA) – which has been officially recognised by SEDA. The LTA programme has been developed in Ghana, predominantly but not exclusively for tutors teaching the LSTM off-site Diploma in Project Design and Management. The programme has been designed to meet the needs of the Ghanaian tutors for formal recognition of their teaching experience and to enhance their educational skills. SEDA commended the programme for being genuinely student-led, for using sound principles of adult learning, and for the organic development of the programme in harmony with the Ghanaian context. To complete the programme, participants collect evidence of their personal teaching experiences and justify how this evidence demonstrates they have met the programme outcomes. In response to the demands of our own tutors in Liverpool, we are planning to adapt the programme in 2009/10 for Liverpool, an excellent but unusual example of an initiative transferred from South to North.





DIPLOMA IN HUMANITARIAN ASSISTANCE IN AFRICA

Sustainable solutions to the problems of disasters and development can only be achieved when people have local access to training in regions that are most affected by humanitarian emergencies. LSTM is pioneering 'Fair Training' in Africa by providing the DHA in collaboration with local partners with a view to long-term sustainability. Just as Fair Trade promotes equitable trading standards that offer poor people direct access to markets and the means to develop sustainable livelihoods, Fair Training aims to promote justice and empowerment by offering direct access to quality assured education and training. This is delivered through partnerships targeting local priorities and facilitates sustainable human resource development in countries that are affected by poverty and vulnerable to humanitarian disasters.

Located at Wits Rural Facility in South Africa, DHA Africa attracted over 130 applications, resulting in enrolment of 43 participants from 16 different countries. Of these, 79% were

African nationals, including participants from South Africa, Zimbabwe, Mozambique, Malawi, Kenya, Uganda, Cameroon, Nigeria, Sierra Leone and Senegal, with others from the US, Australia, Italy, France, Sweden and the UK. The intensive, multidisciplinary, residential programme was delivered by faculty from LSTM, MSF, Wits P&DM and experts from leading humanitarian organisations within the region. The experience of participants enabled a high level of critical discussion and analysis covering a wide range of humanitarian challenges.

On the basis of this success, we are exploring a five year project in which we will work with local counterparts and train approximately 250 professionals. Initially, the DHA will be awarded by LSTM and quality assured through our QA framework. In the medium term, we intend to offer the award jointly with P&DM, Wits. It is anticipated that, over the 5-year period as local capacity increases, LSTM's input will diminish and P&DM will become the principal local academic provider for the Diploma. In the fifth year P&DM also plans to launch a Masters in the Management of Humanitarian Programmes.



DIPLOMA IN HUMANITARIAN ASSISTANCE IN AFRICA

LSTM, in association with The Graduate School of Public & Development Management (P&DM) at The University of the Witwatersrand, Johannesburg, and Médecins Sans Frontières has provided a six-week intensive training programme in humanitarian assistance leading to the award of a Diploma in Humanitarian Assistance (DHA).



STUDENT NUMBERS

2008/09

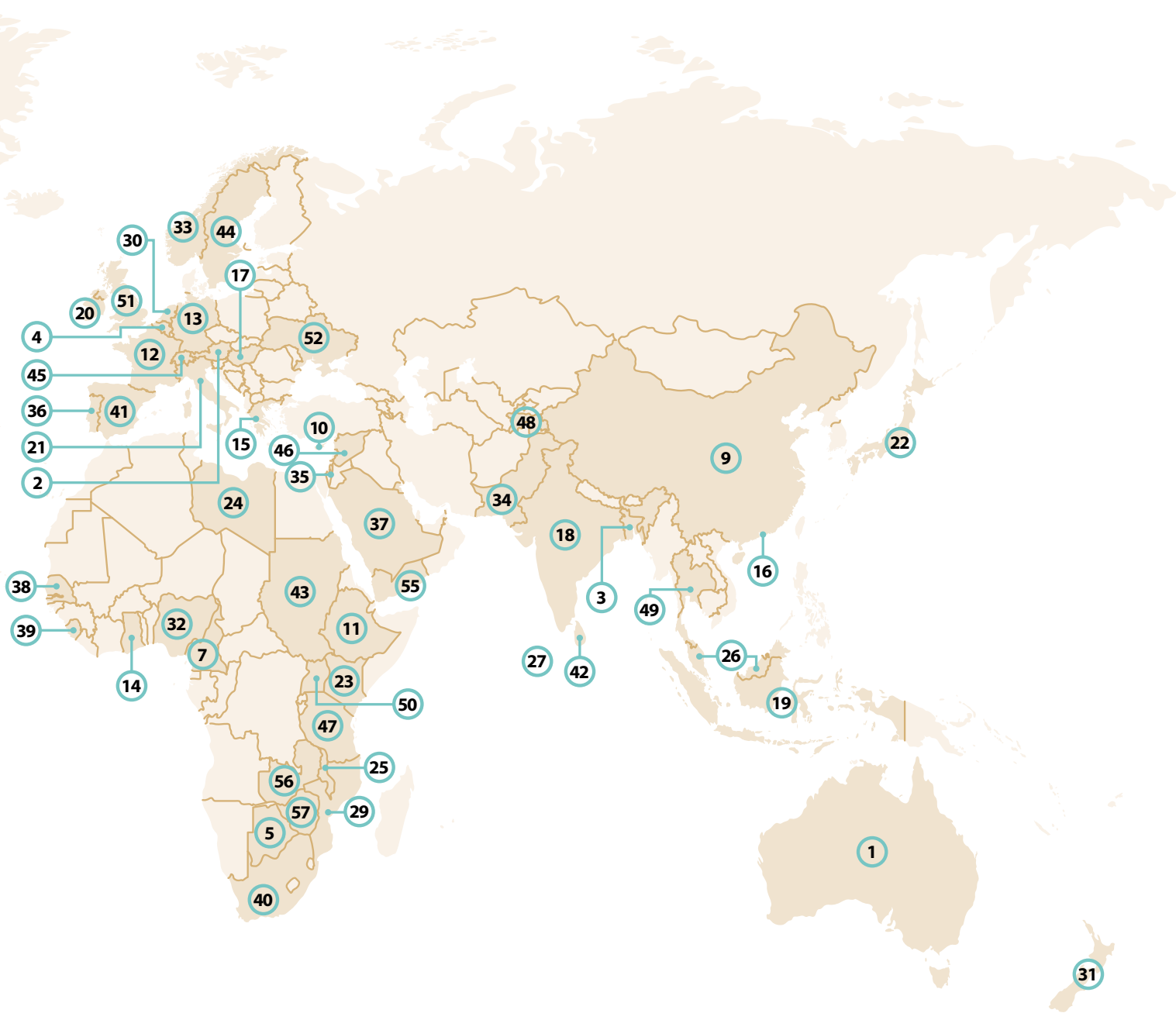
During 2008/09 LSTM has attracted **496 students from 58 countries** to undertake short courses, diploma programmes, masters programmes and PhDs in Liverpool and across developing countries to improve health and alleviate suffering.

COUNTRY: STUDENTS:

1	Australia	7
2	Austria	1
3	Bangladesh	1
4	Belgium	1
5	Botswana	3
6	Brazil	1
7	Cameroon	1
8	Canada	7
9	China	5
10	Cyprus	1
11	Ethiopia	1
12	France	3
13	Germany	12
14	Ghana	29
15	Greece	1
16	Hong Kong	1
17	Hungary	1
18	India	7
19	Indonesia	1
20	Ireland	6
21	Italy	7
22	Japan	4
23	Kenya	4
24	Libya	3
25	Malawi	11
26	Malaysia	6
27	Maldives	1
28	Mexico	3
29	Mozambique	1
30	Netherlands	2
31	New Zealand	1
32	Nigeria	24
33	Norway	13
34	Pakistan	2

35	Palestine	1
36	Portugal	4
37	Saudi Arabia	39
38	Senegal	1
39	Sierra Leone	1
40	South Africa	1
41	Spain	7
42	Sri Lanka	1
43	Sudan	5
44	Sweden	2
45	Switzerland	4
46	Syria	34
47	Tanzania	3
48	Tajikistan	1
49	Thailand	4
50	Uganda	3
51	UK	116
52	Ukraine	1
53	USA	9
54	Venezuela	1
55	Yemen	7
56	Zambia	2
57	Zimbabwe	1





DEVELOPMENT OFFICE



In keeping with an expanding organisation, the role of the Development Office has continued to grow. Utilising new methods to provide communications services to core activities, research projects and new initiatives, LSTM is increasingly visible to global audiences. Fundraising efforts have focused on support for students but have also reflected the international downturn in charitable giving.

The internet is now the preferred means of communication of many, and LSTM's website is regularly reviewed to ensure it is in step with peer organisations. The homepage has been redesigned to feature an image-led latest news lead item which is actively managed and refreshed regularly. This has driven more traffic to the website and allowed us to visibly support e-communication initiatives of allied organisations, such as World Malaria Day. Social media has been adopted as another method of keeping a range of stakeholders informed, with a LSTM presence now established on the facebook and twitter social networking sites allowing anybody with an interest in our work to be instantly informed of daily developments. LSTM was featured in a wide range of media over the year, from BBC Radio 4 Woman's Hour to the Financial Times, The Times Higher Education Supplement and Nature.

A photographic competition with the theme of 'overseas projects' which ran from April to June 2009 generated over 100 entries from staff, students and project partners, with the entries augmenting a developing image library. The competition is set to continue in 2010 with new themes. Another new initiative this year was the production of a showreel demonstrating LSTM at work in research, education, training and technical assistance across the world, now on display to staff, students and visitors in the foyer of the Centre for Tropical and Infectious Diseases.

The LSTM brand has been further rolled out and embedded both in Liverpool and overseas, reinforcing the qualities and values that are associated with LSTM.

Funded by the Wellcome Trust, LSTM Artist in Residence Gina Czarnecki has been busy researching and developing digital media projects based upon LSTM projects and activities. Over the past twelve months Gina has developed plans for a sensory tropical garden in the grounds of a new hospital in the Garston area of Liverpool and has worked with Professor Toh to explore LSTM links with the Biomedical Research Centre in Liverpool. Further installations and exhibitions are planned over the next two years.

Donations totalling £127,904 were received during the 2008/09 financial period. A large proportion of these donations, including a £25,000 legacy from the estate of the late Sir David Orr, were for the general purposes of LSTM, allowing us to invest in infrastructure.

Meetings with new supporters are expected to result in the formation of a new scholarship fund and an agreement with a charity to fund Nigerian students on LSTM education programmes.

A grant from the Heritage Lottery Fund of £48,200 is allowing Professor Geoff Gill to continue his work with ex-Far Eastern Prisoners of War.

A full list of donors during this period can be found in the LSTM Financial Statements.

Looking forward to the coming year, the Development Office will lead a comprehensive review of the website and aim to further increase the global reach of our communications through further integrating our e-communications and placing a greater emphasis on directly promoting the work we do to the national and international media. Liverpool will have a major presence at the Shanghai World Expo 2010 and discussions are underway with organisers to optimise LSTM's representation.

LSTM BUSINESS OFFICE

LSTM is increasingly securing its funding and progressing its major R&D programmes through a series of consortia involving industry, academia and governmental groups of scientists.

With the R&D base of LSTM growing substantially, it has been a busy year for the Business Office developing collaboration and partnership agreements that meet the needs of the funder to ensure global access to our work, but also developing and securing the intellectual property base to ensure commercial return to the various partners where this is possible.

One of our large R&D consortia, involving a series of global partners, is the anti-Wolbachia consortium, AWOL. During the year we were delighted to welcome Forma Therapeutics Singapore as a new party to the AWOL consortium, where they will assist LSTM in high throughput screening of new drug candidates against filariasis and onchocerciasis.



As an extension of this, we recently completed an agreement with Inventa Technologies Singapore to allow access to their unique chemistry library, and with Anacor Pharmaceuticals Inc, to allow access to their anti-

infectives chemical library to support our drug discovery efforts.

We also have a number of projects in the discovery of new drugs to treat or prevent malaria. During the year we started a new programme, based around electron transport targets, supported by Wellcome Trust in their Seeding Drug Discovery initiative. The Business Office supported the project by negotiating a drug discovery partnership agreement with BioFocus (part of Galapagos Group) for high throughput screening, access to their chemical library and bioinformatics support. This project has progressed well and we expect the first patent to be filed from this work early in 2010. To extend our chemistry search further we recently developed an agreement with Alfama Inc for access to their chemical library for use in the programme.

During the year we were also pleased to collaborate with Iota Technologies Ltd, to evaluate new nanotechnology forms of the anti-malarial treatment artemisinin. In other collaborations, we completed research agreements with Bayer, Novartis and Pfizer. As the School's drug discovery programmes move forward we will progress more of these service and scientific partnering agreements, to gain both scope and reach in our ability to bring forward new drugs (and diagnostics) to treat neglected diseases.

As part of our growing role in working in communicable infectious disease in the UK, we now have formal research programmes and IP agreements with the Liverpool BioMedical Research Centre in Microbial Disease, funded by the NHS's research arm, the Department

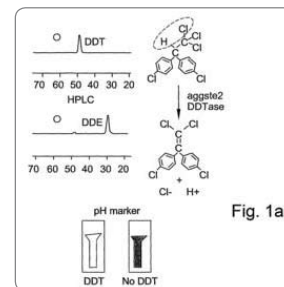
of Health's National Institute of Health Research, to support the LSTM led projects in pneumococcal respiratory disease and TB diagnostics and drug discovery.

During the year LSTM also increased its patent estate in developmental malaria drugs with assignments of certain patents

from the University of Liverpool – particularly the tetroxane class – and also filed new patents on the monoxane class developed under its EU funded Antimal drug discovery programme. I am delighted to report that LSTM has begun to file patents in its own right and the first related to LSTM's vector control R&D was recently published as WO2009/103985. These patents will now be assigned to LSTM's subsidiary IP Company.

LSTM has been busy this year with a number of new commercial collaborations and in the year we undertook commercial work for United Utilities plc and Vestergaard Fransen in the areas of vector control and through our travel health business, Well Travelled Clinics Ltd, contract work for a number of shipping companies and major football clubs in the Liverpool and Manchester areas.

Finally, a number of 'open days' have been established to provide opportunities for local companies involved in biotechnology product development, insect control and corporate travel health to work with LSTM following the opening of the new CTID building.



"I am delighted to report that LSTM has begun to file patents in its own right"

LSTM Chief Business Officer, Phil Gould PhD FRSC MIOD



LIVERPOOL ASSOCIATES IN TROPICAL HEALTH (LATH)



The past year has been one of transition for LATH with the arrival of a new Chief Executive Officer, Dr Stewart Tyson, in September 2008, the restructuring of the organisation and the relocation of the main office in July 2009. Stewart joined LATH from the UK Department for International Development (DFID) where he was the Head of Profession for Health.



Launch of mass drug distribution campaign (12 May 2009) in the region of Segou in Mali for the Neglected Tropical Disease Programme.

In September 2008 LATH was organised around a number of dedicated teams focused on new business development, the delivery of long term programme management services, and to better access opportunities in the short term consultancy market through creation of the Technical Resource Centre (TRC) with the new teams backed by a central finance and administrative unit and supported by LSTM's Human Resource Department.

LATH's main client has continued to be DFID, followed by USAID. The Kenya Essential Health Services Programme remains our largest programme and following a positive review, DFID requested LATH to extend operations to additional districts. The programme works at two levels; centrally in providing senior level policy advice to the two Kenyan Ministries of Health and in Nyanza province to strengthen the provision of maternal health services. LATH is supporting the refurbishment of a number of district health facilities and working to strengthen quality and management systems within the province and districts.

Five new programmes started operations this year: in Zimbabwe (Maternal and Newborn Health Monitoring); in Nigeria (Northern States Maternal, Newborn and Child Health); in Uganda (Monitoring and Evaluation of HIV/TB); and in Malawi (the Health Research Capacity Strengthening Initiative – a joint initiative of DFID/Wellcome Trust/International Development Research Centre (Canada). The long delayed South Sudan Health System Strengthening Programme commenced with technical support to the development of a range of policy priorities.

Dr Carmen Camino supported the South Sudan programme through the planning and quality assurance of the health systems assessment completed the plan for the community healthcare workers revitalization in Mozambique and conducted evaluation of EU-funded immunisation projects in Nigeria. Russell Dacombe, LATH's laboratory systems expert, began a secondment to the Malawi TB control programme to supervise the refurbishment of the central reference laboratory and provide support to systems to improve TB diagnostics. LATH provision of technical assistance to the BSc programme in Medical Laboratory Technology in Malawi came to an end as the degree programme is now deliverable without international assistance.

LATH staff supported a number of successful LSTM-led bids including a HIV/AIDS programme in Libya and the establishment of the first UK NHS International Health Links Centre.

LATH has continued to provide support to the USAID funded Malaria Indoor Residual Spraying (IRS) and Neglected Tropical Diseases (NTD) Programmes. Dr Achille Kabore has provided extensive support to integration of the treatment of NTD's within the health systems being rebuilt in states emerging from conflict including Sierra Leone and South Sudan. Substantial work was generated through the USA Capacity Project, with Tim Martineau, Margaret Caffrey and Paul Marsden providing support to the development of health workforce strategies in a number of countries. LATH has bid as a subcontractor on the next generation of five year programmes funded by USAID for Malaria IRS, Tuberculosis and Human Resources for Health.

The establishment of the TRC in late 2008 led to a substantial increase in short-term work with contracts from new donors including the World Bank, the Finnish Aid Agency and Comic Relief and work in new countries including Lesotho and Afghanistan. The increase in the capacity of the unit by the end of the year bodes well for 2009/10. LATH has continued to focus on four technical niche areas: Malaria, Laboratory Systems, HRH and Maternal and Neonatal Health (MNH) and has added two new areas in NTDs and decentralised approaches to Monitoring and Evaluation with the latter, led by Professor Joe Valadez, generating substantial new work in 2009.

At the end of July 2009 the LATH HQ office moved into Anson House, located opposite LSTM. The new open-plan office spread over two floors allows a much improved environment for team-working and enables closer day to day links with our colleagues in LSTM.

We can be confident looking to the year ahead. LATH has achieved a high degree of success on bids for new contracts and has tested a number of new alliances with academic groups and consultancy companies. The pipeline of new bids is healthy, a substantial amount of short term technical assistance work is available and the TRC is better positioned to win and deliver more in 2009/10.

Finally this year, long term staff members Dr Vicki Doyle, Linda Phythian and Lorelei Silvester left the organisation for new opportunities and we wish them well.

THE INNOVATIVE VECTOR CONTROL CONSORTIUM (IVCC)

During this year the IVCC has evolved from a consortium led by LSTM to a Product Development Partnership constituted as an independent, not for profit company and registered charity. This legal structure gives IVCC the clarity of independent governance with which to tackle the many challenges inherent in restarting the development of new pesticides for public health after a hiatus of nearly 30 years.

Insecticide impregnated bednets and indoor residual spraying remain the cornerstones of vector control programmes and the scale-up of such activity has resulted in a major increase in the market for insecticides for public health use. Increased insecticide pressure is likely to result in resistance to these insecticides, indeed high levels of resistance have already been detected in some mosquito vectors in west and southern Africa. New insecticides are therefore urgently needed if control and elimination programmes are to be sustainable. The

new projects established to discover novel active ingredients have unearthed a wealth of opportunities amongst IVCC's industrial partners, focusing on data-mining and screening of their chemical libraries to find development candidates. All of the major agrochemical companies now have one or more projects with the IVCC. Additionally, many of the insecticide formulation projects have now progressed from lab development and evaluation to field trials which show great promise for reducing the cost and increasing the residuality of applications. IVCC's institutional partners are also bringing forward molecular design proposals based on their increasing understanding of the insecticide target sites. As a result, the public health pesticides development pipeline is now healthier than at any time in the last thirty years.

The IVCC has funded the development of a suite of information systems and tools which, if broadly deployed, will transform the cost-effectiveness and efficiency of vector control activities. Decision Support Systems for malaria and dengue are at an advanced stage of development and trialling and will allow data on key attributes including disease incidence, the spread and density of insect populations and insecticide resistance to be presented



IVCC
COMBATING INSECT
BORNE DISEASE

together in a unique geographically based format, allowing programme managers previously unattainable insights into the scale and dynamics of the disease they are fighting. Modelling software that will use a range of parameters to forecast the spread and growth of insect vector populations and the likely rates of dengue infection is also in the final stages of development and field verification. The Vector Population Monitoring Tool (VPMT) project is developing simple field test kits to quickly gather data on the status of local mosquito vector populations, determining species, infection status and the presence of resistance mutations. Provisional field testing of kits has taken place in Malawi and South Africa, where VPMT protocols are now being used routinely to support the testing of the Malaria Decision Support System. The Insecticide Quantification Kit project is developing kits which can quickly and cheaply determine whether an insecticide treated surface or material needs re-treatment or replacement, thus reducing the risk of control failure due to poor interventions going undetected or through an undetected drop in concentration over time. The kits are currently in the final stages of field testing in Africa and will be available in 2010.



WELL TRAVELLED CLINICS LTD (WTC)

This has been an exciting second year for LSTM's travel health trading subsidiary, Well Travelled Clinics Ltd (WTC). Sales have grown substantially (31%) through a major period of investment by LSTM to grow the extent and reach of the business.



We are delighted to report that the first part of this investment has been in the relocation and redevelopment of the existing Liverpool clinic which moved to new premises, directly opposite LSTM, in June 2009. The new clinic offers an expanded number of consultation rooms with dramatically improved and modernised facilities for clients, with a better waiting area and the opportunity to display retail products.

WTC has now also begun to grow its services across the North West with the opening of its first satellite clinic in the city of Chester in April 2009. The clinic, which is based in the heart of the shopping area in Watergate Street, offers pre-travel advice and vaccination to the

holiday and business traveller, and stocks a full range of retail items. Six staff are now based at the Chester branch, and business at the new clinic is growing steadily, with the majority of patients coming from the City and North Wales.

These new clinics allows WTC the opportunity to grow and extend the services that it offers, building on the 17% growth in our client numbers in the last year, despite the economic downturn. Clinic opening times now better reflect the needs of our clients with late night and Saturday opening at both our locations and a full 'walk in' service in Liverpool.

The number of services we offer our clients has increased, particularly for our corporate and business clients, where we have introduced flu vaccination, pre-travel medical checks and post travel screening. Now that we have the space to display a full range of retail items, we have also significantly increased the range of products we offer and our retail sales have doubled in the last year. These items can also be found at our 'e-Trop Shop' at <http://shop.welltravelledclinics.co.uk> and we continue to extend the range of

products. In addition, we have begun to take our services out to local schools to support their overseas cultural exchange programmes, and to students to prepare them fully for their gap year in increasingly exotic locations.

WTC, through its links to LSTM, is now seen as an important leader in travel health medicine and runs an annual Travel Health and Expedition Medicine course. Aimed at GPs, practice nurses and pharmacists, the course provides an introduction to travel health and expedition medicine and is an important vehicle to increase visibility of the depth and extent of our clinic services. The 2009 course was a resounding success and plans are in place to continue with this annual event and to add a series of short one day update courses throughout the year.

Using our two new flagship branches, we look forward to continued growth as we extend the services and client base for the business and gain profitability through the quality, extent and reach of our service.



**WTC Managing Director,
Philippa Tubb**

17%

**GROWTH IN OUR CLIENT
NUMBERS IN THE LAST YEAR**



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GRANTS AND CONTRACTS 2008/09

Dr I Bates

The Wellcome Trust, Baseline needs assessment for a study entitled Capacity development in malaria research in Africa, **£75,130**

Dr G Biagini

National Institute for Health Research, Biomedical Research Centre – Respiratory Infectious Diseases Theme, Proof of Principle: type II NADH: QOR (including a supplement), **£171,200**

Dr P Bray

Medical Research Council, Characteristics of chloroquine translocation by PfCRT – Award to University of Oxford, **£8,307**

Professor A Craig

Medical Research Council, An analysis of ICAM-1 adhesion in *P. falciparum* malaria (supplement), **£25,884**

Dr L Cuevas

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

World Health Organization, A Multi-centre trial of front-loaded smear microscopy in the diagnosis of Tuberculosis (supplement), **£68,162**

Dr R Dillon

The Leverhulme Trust, The contribution of microbes to the life of Phlebotomine sand flies, **£168,862**

Dr M Donnelly

World Health Organization, Integrated tsetse fly ecology and genetics for improved HAT control, **£6,840**

Professor P Garner

World Health Organization, Review of evidence revision of guidelines treatment for malaria (2nd) – WHO Agreement for the performance of work on 2008/15560 M50-APW-038, **£6,503**

Professor G Gill

Thackray Research Trust, Medical Innovation and Invention of the Burma Railway 1943-45 (supplement), **£9,950**

Dr S Gordon

The Bill & Melinda Gates Foundation, Experimental Human Carriage of Pneumococci – Gates Grand Challenges Explorations Initiative, **£67,592**

Dr I Hastings

Portuguese Science Foundation, PHD – S Barbosa, **£8,267**

Swiss Tropical Institute, Simulation modelling of epidemiological impact and cost-effectiveness of malaria intervention (supplement), **£58,394**

Professor J Hemingway

The Wellcome Trust, Open Access Publishing (supplement to M71), **£20,000**

World Health Organization, Systematic Co-ordination of commissioned Reviews for TropiKA.net (3 supplements), **£110,457**

Vestergaard Frandsen SA, Efficacy of unwashed and washer 20 x long lasting insecticide nets in experimental huts of Yaokoffikro, centre Cote d'Ivoire, **£26,794**

Professor R Heyderman

The Wellcome Trust, Adult Emergency & Trauma Centre at Queen Elizabeth Central Teaching Hospital in Blantyre, Malawi, **£650,000**

Meningitis Research Foundation, Prevalence and prognostic significance of viral co-infection of the brain HIV-infected adults with bacterial meningitis in Malawi, **£19,744**

Dr L Kelly-Hope

The Royal Society, Ghana/Tanzania – UK Science Networks (supplement), **£1,787**

Dr G Killeen

The Bill & Melinda Gates Foundation, Malaria Transmission Consortium (MTC), **£307,505**

The Bill & Melinda Gates Foundation, Malaria Transmission Consortium – Zambia, **£294, 585**

The Bill & Melinda Gates Foundation, Proof of concept study of larviciding as a malaria intervention and verification of the larviciding module within the IVCC malaria decision support system, **£102,354**

The Wellcome Trust, MSc Course in Biology and Control of Parasites and Disease Vectors – Mr Dennis Massue, **£86,248**

Professor D Laloo (transferred from N French)

Wellcome Trust, Investigation of the humoral immune response to pneumococcal polysaccharides and the role of a conjugate pneumococcal vaccine in secondary prevention of invasive pneumococcal disease in HIV-infected African adults (supplement only), **£18,700**

Dr G Lycett

European Commission, Malaria Transmission Blocking by Vaccines, Drugs and Immune Mosquitoes: Efficacy Assessment and Targets (TransMalariaBloc), **£253,497**

Dr I Mackenzie

World Health Organization, Randomised trial of treatment of chronic suppurative otitis media (CSOM) in Kenyan children, **£243,949**

Dr P McCall

The Wellcome Trust, Can insecticide treated curtains prevent transmission of dengue? **£454,571**

Dr H Ranson

Bayer AG Germany, Pilot study into the relationship between mosquito age and resistance to insecticide, **£41,760**

The Wellcome Trust, MSc course for Mr Deodatus F V Maliti: Population genetics of malaria vectors in the Islands of Zanzibar and mainland Tanzania

and the implications for the spread of insecticide resistance, **£78,908**

World Health Organization, Insecticide resistance in African Malaria Vectors (supplement), **£112,581**

Dr H Smith

Medical Research Council, Understanding pregnant women's uptake of malaria prevention interventions, **£179,636**

World Health Organization, HPSP management training workshops in Shanghai – WHO Agreement to support 2009/19700-0, **£4,881**

Dr B Squire

World Health Organization, To develop equity & poverty impact assessment documentation for the New Diagnostics working group, **£25,276**

USAID, TREAT TB: Technology, Research, Education and Technical Assistance for TB project, **£88,636**

World Health Organization, TB Poverty Secretariat (2 supplements), **£151,275**

Norwegian Heart and Lung Association, Triage Plus for TB-HIV: improving community-based provision for TB and HIV in Africa (3 supplements), **£26,066**

World Health Organization, Technical Support for policy development and design of pro-poor interventions in TB control and collection and analysis of data (2 supplements), **£20,801**

Dr C Strode

Vestergaard Frandsen SA, The genes putatively conferring metabolic resistance in *Aedes aegypti* from Vietnam, **£8,092**

Dr M 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, **£12,572**

Gilead Sciences Limited, Undiagnosed HIV in primary care and marginalized communities in Liverpool: Pilot of a model to deliver point of care HIV screening, **£32,000**

Professor M Taylor

Biotechnology and Biological Sciences Research Council, Industrial CASE Studentship Leishmania vaccines, **£72,540**

Professor F ter Kuile

European & Developing Countries Clinical Trials Partnership, Optimization of the existing dose and regimen of intermittent preventive treatment with sulfadoxine-pyrimethamine for the prevention of malaria in pregnancy in the context of high coverage of insecticide treated nets and highly seasonal malaria transmission, **£3,218,214**

AMC Medical Research BV, College of Medicine, Malawi-Amsterdam-Liverpool Partnership Research Capacity Development through the establishment of a Research Support Centre in the College of Medicine, HIV-Iron Study NACCAP Project 2, **£241,803**

European & Developing Countries Clinical Trials Partnership, to develop a clinical trial management and support infrastructure at the College of Medicine, Blantyre, Malawi, **£25,982**

Dr A Terlouw

Drugs for Neglected Diseases Initiative, Determination of a safe, effective, user-friendly age-based regimens for the new fixed dose combination of As-MQ for use in South America based on Brazil data and data from South East Asia, **£10,808**

Dr S Theobald

Institute of Development Studies, Research Programme Consortium on Realising Rights: improving sexual and reproductive health for poor and vulnerable populations (supplement), **£20,968**

Professor J Valadez

EuropeAid, Preventing a major health and social crisis in Libya by supporting the development and implementation of National HIV-AIDS Strategy, **£824,158**

Dr N van den Broek

EuropeAid, Improving reproductive & sexual health of internally displaced people in Maroodi Jeex-Somaliland, **£142,341**

Royal College of Obstetricians and Gynaecologists, Essential obstetric & newborn care in Sierra Leone, **£41,000**

Royal College of Obstetricians and Gynaecologists, LSTM/RCOG International Partnership, **£50,000**

Department for International Development, Support for Capacity Development of Human Resources for Maternal & Newborn Health, **£2,830,000**

Obstetrical & Gynaecological Society of Malaysia, LSS-EOC Skills in Kuala Lumpur, Malaysia (supplement), **£4,588**

Professor S Ward

National Institute for Health Research, Biomedical Research Centre, Respiratory Infectious Diseases Theme: Biomarkers for TB, **£88,250**

European Commission, Potential of methotrexate in the treatment of Malaria, **£171,046**

European Commission, The coordination, rationalisation and integration of antimalarial drug discovery and development initiatives (CRIMALDDI), **£427,837**

SHARED AWARDS

Dr I 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, **£476, 979**

Shared with Dr S Khoo (University of Liverpool) and Professor R Heyderman (LSTM)

Professor A Craig

Wellcome Trust, Capacity development in malaria research in Africa – COM WTMLW studentships – Lead Institution LSHTM, **£397,184**

Shared with Dr M Sanjoaquin (LSHTM)

The Wellcome Trust, Fellowship for Dr Christopher Moxon to undertake his PhD studies through the Wellcome Trust PhD Programme for Clinicians entitled: 'Health Priorities in the Developing world' **£300,083**

Shared with Dr S Wassmer and Professor C Toh (University of Liverpool)

Dr M Donnelly

Development of a Field Applicable Screening Tool (FAST) kit for detecting resistance to public health insecticides, **£1,093,159**

Shared with Dr H Ranson and Dr D Weetman (LSTM)

Dr S Gordon

The Wellcome Trust, Fellowship for Dr Jamie Rylance to undertake his PhD studies through the Wellcome Trust PhD Programme for Clinicians entitled: 'Health Priorities in the Developing World' **£319,463**

Shared with Professor R Heyderman (LSTM), Professor M Jackson (University of Liverpool) and Dr F McArdle (University of Liverpool)

Dr D Lalloo

The Bill & Melinda Gates Foundation, Programmatic implementation of ACTs in Malawi: Safety and effectiveness of combination therapies with repeated treatments for uncomplicated *P.falciparum* malaria over a three-year period, **£1,695,381**

Shared with Dr D Terlouw (LSTM), Dr M Sanjoaquin (LSHTM), Dr S Theobald (LSTM) and Dr B Faragher (LSTM)

The Bill and Melinda Gates Foundation, Establishment of a drug safety register for the ACT consortium, **£553,278**

Shared with Dr M Pirmohamed (University of Liverpool) and Dr E Davies (LSTM)

Wellcome Trust, Research Capacity Strengthening in Africa Institutions Initiative, **£104,535**

Shared with Dr S Gordon (LSTM) and Professor P Winstanley (University of Liverpool)

Dr T O'Dempsey

Department for International Development, UK Health Links International: Links Centre, **£559,242**

Shared with Dr I Bates (LSTM)

Dr H Ranson

Intermediate Fellowship in Public Health and Tropical medicine for Dr Antonio Nkondjio Christophe – "Impact of urbanisation on malaria vectors population dynamic in two major cities of Cameroon", **£363,588**

Shared with Dr C Wondji (LSTM)

Dr A 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, Dr B Faragher (LSTM) and Dr S Khoo (University of Liverpool)

Dr S Theobald

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

Shared with Dr M Taegtmeier and Dr O Tulloch (LSTM)

Professor S Ward

The Wellcome Trust, Seeding Drug Discovery Strategic Award – Alternative complex I as a drug target in malaria, **£1,400,000**

Shared with Dr G Biagini (LSTM) and Professor P O'Neill (University of Liverpool)

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S B Gordon
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S Tang
N van den Broek

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S Glennie
M Mallewa
D J Miles
J Montgomery
M Moore
A Rocha-Feltrer
M Sanjoaquin
S C Wassmer
S A White

Annals of Tropical Medicine & Parasitology

K R Wallbanks

Annals of Tropical Paediatrics: International Child Health

J B S Coulter
V Coulter

Centre for Tropical Neglected Diseases

J Fahy

Innovative Vector Control Consortium

L Byrne
D Malone
T McLean
R Sloss
A Spencer

Liverpool Associates in Tropical Health

S Tyson
S Cooper
V Doyle
D Freeman
S Collens
E Kelly
L Silvester

Well Travelled Clinics Ltd

P Tubb

STUDENT PROFILES



PAMELA GODIA



RACHEL PENFOLD



SHAVANTHI RAJATILEKA

PAMELA GODIA, PHD STUDENT

Pamela comes from a family of teachers so she has no romantic notions about careers. She believes the educational system is based around exams and you choose your profession on the basis of how good you can perform. Pamela chose dentistry as her area of study before taking a Masters in Public Health at the University of Nairobi in Kenya. Upon completion, she worked in the Kenyan Ministry of Health in the Reproductive Health Department where she managed an adolescent reproductive program for 5 years.

"LATH, supported by DFID, was running some maternal health programs in Kenya so I worked closely with some of the consultants. One of them became my PhD supervisor here at LSTM."

Pamela's PhD is in Adolescent Reproductive Health. She researches views of adolescents, health workers, community members and grassroots community leaders on the reproductive health of young people. Her interest developed whilst running the adolescent reproductive program.

After perfecting her presentation skills, knowledge of statistics and qualitative research in the first year at LSTM, she spent a year

collecting data in the field in Kenya. She is now collating and analysing her research before writing up her PhD.

"After my PhD I will return to the Ministry. I am not sure what department yet but I would like to be responsible for the co-ordination of the unit's research. Two things have been somewhat neglected in Kenya's health system and those are research and ethics. I want to contribute to the activation of those areas. My goal is to help make the decision making inside the Ministry more research and evidence based."

Pamela enjoys Liverpool but spends most of her time concentrated on work. To keep herself fit she loves walking around and exploring the City.

RACHEL PENFOLD, MASTERS IN HUMANITARIAN STUDIES STUDENT

Rachel originally came to Liverpool University to study medicine and having a fondness for Liverpool when the opportunity presented itself to do a Masters at LSTM, she had no hesitation. "I heard about humanitarian studies at LSTM from a previous student and decided to spend a year doing it. It's been great, a real eye opener."

She spent time in Ghana and travelled around Asia and South America. "All those experiences influenced me to do the Masters and I also wanted a bit of a break from science to learn about the social side of health care, politics and development. I've found it really fascinating."

Rachel did field research in Liberia with Médecins du Monde on the perceptions of family planning and family size.

"As it happens I am supposed to be writing my conclusion today. What I can say is just common sense confirmed by research. To put it simply I've learned that we need to educate men and women about family planning and the fact is we are not doing it enough."

Rachel has been enjoying her studies at LSTM. "There's a massive difference between studying medicine in a big University and doing the Masters at the LSTM. Here staff really support you and are very keen for you to do well. They help you as much as possible. It's just a great learning environment. Also my course mates are amazing, they come from all over the world and have had all kinds of experiences. I have met some really interesting people."

After working as a junior doctor, Pamela hopes to return to LSTM and take a diploma in tropical medicine. "What I would really like is to work in reproductive health abroad, especially on advocacy of family planning, reproductive health, empowerment and gender equality.

There's only so much you can do on a ground level. Hopefully I'll find a job where I can treat the patients and work on a strategic level too.

While still in Liverpool she enjoys the City's numerous museums, parks, cafes and restaurants. "The people here have pride in their community which you do not find in many cities. If you want to do something you can be sure there's a group aiming for that goal."

She is also planning to get into sports again, enjoy good films and maybe do some sewing and beading, remembering her Mum's choice of career for her. "She wanted me to be an interior designer."

SHAVANTHI RAJATILEKA, PHD STUDENT

Shavanthi grew up with a 'medical' background coming from a family of doctors and scientists and having lived in a tropical country for part of her life she has always had a keen interest in tropical diseases and their control.

"I obtained a BSc Honours in Medical Sciences from the University of Leeds and in my final year did a research project on Schistosomiasis and its treatment. I was accepted onto the MSc course here in Human Parasitology and Medical Entomology in 2004 and on completion was offered a PhD position in the Vector Group at LSTM to conduct research on the insecticide resistance mechanisms in the dengue vector *Aedes aegypti* in Thailand and Mexico. This research is vital as at present there is no vaccine or prophylaxis licensed to be used for the prevention of dengue infections."

Shavanthi has acted as the student representative for PhD students at LSTM and represented LSTM at Liverpool University's Faculty of Medicine postgraduate research group.

"Studying at LSTM has been a great experience. The staff and students alike are very friendly and very supportive and you meet people from all over the world. I have made some great friends. I got to travel a fair bit during my PhD for work purposes including my first ever visit to Africa, when I presented my work at the International Congress of Entomology in Durban last year. During my PhD I also spent time teaching in the practical classes for the very same MSc course I took a few years previously."

In August 2008 Shavanthi became a research scientist in the LSTM Vector Group looking at the effect of age on insecticide resistance in the malaria vector *Anopheles gambiae*. And when she is not glued to her lab bench Shavanthi enjoys travelling (a great advantage during her PhD), photography and the outdoors.

STAFF PROFILES



CHARLES AMEH



KATHLEEN CARROLL



ANNE-MARIE STEPHANIE

CHARLES AMEH, CLINICAL LECTURER

When he was growing up Charles wanted to be an architect, but in the end decided to train to become a doctor. He finished his undergraduate medical training and post-graduate studies in Obstetrics and Gynaecology in Zaria, Nigeria and received his post-graduate Diploma in Reproductive Health for Developing Countries at LSTM in 2006.

‘I was a student here for three months and after the course it was clear to me what I wanted to do – to contribute to maternal and newborn health.’ So when the opportunity presented itself Charles came to LSTM to work with Dr Nynke van den Broek and her Maternal and Newborn Health Unit. Although his academic work occupies him with teaching and tutoring students for exams, for the majority of the time he provides technical assistance to the Unit’s programmes, mainly through LATH. For a week or two each month he works in the field, mainly in east and west Africa.

In his teaching, Charles relies heavily on his experiences as a former LSTM student. ‘Knowing exactly what knowledge you most craved when you were a student makes you want to improve on it as a teacher. I was always most interested in the transformation of theory into practice.’

‘Anything I do here at LSTM, every skill I learn, every opportunity that presents itself to me, I hope to use to improve the situation for mothers and children especially in developing countries. I have seen it all, from the bottom up, from ground to strategic level. That gives me better understanding of the situation and I hope that I can contribute to solutions.’

Charles loves living in Liverpool. ‘It’s small enough to be friendly and big enough to never be boring. There are always places to go and things to do.’ He spends his free time with his children, taking them to one of the many parks and playgrounds – and of course playing and watching football!

KATHLEEN CARROLL, PA TO THE DIRECTOR

In many ways, Kathleen is a woman of contrasts. She is Scottish but her interesting career choices and adventurous life have taken her all around the world. She enjoyed the excitement of working in the commercial sector but she is now relishing a different challenge looking after LSTM’s director, in the knowledge that she is helping to fulfil LSTM’s mission.

Beginning her career 18 years ago in retail management, a move to the north west led to an approach from Littlewoods and a job as marketing manager. Swept off her feet by the honesty, warmth and humour of Liverpoolians she quickly settled in. But the world is a fascinating place and after reaching one of life’s many crossroads, Kathleen decided that it was time to explore, selling her house and car and travelling around the world for three years: climbing Kilimanjaro, swimming with sharks, sky diving, learning Spanish and diving in the great barrier reef whilst on her travels.

When she returned to Liverpool she took her time deciding on her next role. ‘I temped for six months and during that time only seriously applied for two jobs. I wanted something challenging and interesting and this job as PA to the Director of LSTM fits the bill. I am very proud to work here. I am not a scientist but the little bit that I do to aide Janet in her job helps LSTM to help people around the world and

that’s a great feeling. These last few months have been fantastic. It’s been a baptism of fire but interesting jobs always are. I’m really enjoying it, it’s a stimulating place to work in and that suits me. I don’t want to be in a boring job and this certainly isn’t!’

ANNE-MARIE STEPHANIE, MANAGING EDITOR, COCHRANE INFECTIOUS DISEASES GROUP

Anne-Marie grew up in Gateshead, England, obsessed with animals, dreaming of horses, ponies and riding. She was good at science and a logical ambition to be a vet followed. However, a summer job at an equine practice in Newmarket when she was 18 put paid to that notion. ‘At the end of it I didn’t want to be a vet anymore. All my romantic notions were destroyed – it was more people management than looking after animals and I realised it wasn’t for me.’ But science and animals were still her two favourite things, so she decided to study Biosciences at the University of Sunderland and ended up working on veterinary viruses.

Living in Alabama, US, for three years she worked on bluetongue virus in sheep, then came back to the UK and lived in Cambridge before doing a Masters in science communication leading to a career as a medical writer. After working in the commercial sector for a long time and seeing how profit driven it can be, she decided it was a time for a change.

As a Managing Editor of the Cochrane Infectious Diseases Group, based at LSTM, Anne-Marie is doing less writing and more managing the vast amounts of material. She has used Cochrane reviews in her work as a medical writer but nothing could really prepare her for the enormity of it all and she is just getting introduced to the vast body of work. ‘The Cochrane reviews look at all the available data on a subject. We do massive searches across all the literature, then we analyse it and report. Our group works closely with the World Health Organization and our findings help guide them in their decisions.’

RETIREMENTS



DAVE HARAN

He is also very proud of the HIV projects he has worked on at LSTM over the last ten years, including a collaborative research project in six countries looking at the social context of HIV. "We also did an interesting piece of work on quality assurance in Honduras, Costa Rica and Panama, putting in place tools to ensure the quality of basic services delivered," said Dave.

After originally planning to stay at LSTM for five years and ending up retiring after more than 20, David is going to fully dedicate himself to fishing, painting, renovating his apartment in the Mull of Kintyre and generally enjoying life. Just one thing is bugging him at the moment: "I find it difficult to understand how I ever found the time to come to work," he says.

DAVID WARRELL

Professor David Warrell became Honorary Clinical Director of the Alistair Reid Venom Research Unit upon the death of Dr Alistair Reid in 1983. During this time he has made a major contribution to the research carried out in the Unit, initially providing the necessary medico-clinical support which was vital in order for the Unit to continue to have direct contact with victims of snake bite.

The Unit's collaboration with David has been mutually beneficial. Although calling himself a 'simple clinician', he provided vital clinical input and the Unit was able to provide him with technical expertise. Although retiring from this post, David's close association with the problem of snake bite in Nigeria will continue, its amelioration being something which remains very close to his heart and with which he has been deeply involved with since the early 1970s. His help and advice has been given generously over the years and his close official relationship will be sorely missed. The Unit would like to thank him very sincerely for all his efforts.

EILEEN TEDFORD

Arriving 20 years ago for an interview, Eileen Tedford watched everyone set up the offices for the Christmas party and realised it was somewhere she wanted to be part of. As she approached her last few weeks as Human Resources Director, Eileen recalled some very fond memories of life at LSTM.

In January 1989, she successfully applied for a part time position at LSTM, although it was quite a culture shock at first. "It was a small, academic institution and all the HR issues had previously been handled by the Dean's secretary," she recalls.

Her proudest moment was gaining the Investors in People Award in 2006. "It was a tremendous achievement and a personal highlight for me," she says, although her most memorable experience was the chance to see LSTM's work in Malawi for herself in 2008: "It was good to see first hand the work we do. I was shocked by the poverty, but they were wonderful, cheerful people despite having so little. It really puts everything in perspective."

Eileen and her husband have begun making plans for her retirement. Following a holiday in a motor home in January, Eileen and her husband, Bob, have bought their own. They plan to go to Scotland first where Bob can indulge in some fishing before they take off for France later in the year.

As Eileen puts it, "When I walk away in January it's going to be hard. LSTM has been part of my life – and my family's life – for the past 20 years. Both the HR and academic staff have been a pleasure to work with."

Photo: Eileen Tedford (centre) with colleagues Paul Garner and Sandra Duff.

IRENE REECE

Arriving at LSTM in August 1984, Irene worked as Personal Assistant to the Director of Finance, Development and Administration, before moving to become Personal Assistant to the Director.

In addition to organising the Director's schedule, travel and meetings, Irene supported LSTM's fundraising activity, securing donations and much needed hardship funding for students. She also served as Editorial Assistant for the Annual Report, a true multi-tasker who has served the organisation admirably for more than 25 years.

On her last day, Irene was clearly overwhelmed by the crowd that had turned out to wish her well. In a tearful farewell, she said: "Your generosity overwhelmed me somewhat and what I had wanted to say – but couldn't get out coherently – was that you are all wonderful people doing amazing work and it has been an absolute privilege to be part of LSTM. Janet has a terrific team behind her and I know LSTM will go from strength to strength. I'll miss you all very much."

Photo: Irene Reece (second from the left) and co-workers on their way to celebrate Irene's retirement.

DAVE HARAN

Dave Haran, Senior Lecturer in Health Systems Development & RPC Director, retired after a distinguished career spanning 40 years, even though he did not originally intend to be an academic. "I went to university to do a degree in maths, because that was what my maths teacher and headmaster said I should do," he recalls. In 1988 he successfully applied for what he calls "a rather strange position" at LSTM and never looked back. In 1993, he became head of the DFID Principles and Practices in Primary Health Care project, the first of many such projects, including one of the first to investigate a relationship between Human Papilloma Virus and cervical cancer.

OBITUARIES



DR PATRICIA NICKSON OBE

One of the mission giants of her generation, Pat worked in Northern Australia, Bangladesh, Afghanistan and The Congo and became a world authority in her field, working closely with the World Health Organization, the World Council of Churches and LSTM.

Pat was adopted by the vicar of St John's, Polegate, where she was introduced to many of the missionaries who came to visit. Listening to their stories she realised that this was the life for her. Following her training in nursing and midwifery Pat went to Angurugu, a tiny, Aboriginal community in the Northern Territory of Australia. It was the early 1970's and the Church Mission Society (CMS) receives a report of an incident in the area: 'Two boys are searching for firewood. One climbs a tree and, using an axe, tries to chop off some branches. His brother waits below, ready to collect the wood for the fire. Suddenly, there's a scream and blood everywhere. The boy has dropped the axe. By horrific chance it has sliced into his brother's skull. Amid 'great pantomime' the injured boy is brought into the local hospital. On duty is a young English nurse/midwife, who's in the Northern Territory to test her call to be a missionary with CMS. Pat Nickson sprang into action. She recalls, "I did exactly what I had been taught in nursing school. He had a bad cut to his head. I had the child under observation. I sutured his wound. I observed him very carefully as a neurosurgical case, put him in a darkened room and so on. Because I didn't have skilled workers around me I spent the night with him, making half-hourly observations. I wouldn't let anyone else go in except the mother just to look at him but not to talk to him."

After moving to Bangladesh in 1975, she ran a rural health programme and developed her expertise. She even acquired surgical skills, from emergency caesarean sections to rewiring fractured jaws. "I learnt there that I had to understand the culture before I could ever

begin to practice health care," she said. In 1982, she was posted to the Democratic Republic of Congo, where she worked until 2004. She was a leading trainer of indigenous healthcare workers and became an authority on utilising the healing properties of local herbs.

In 1992, she founded the Institut Panafricain de Santé Communautaire et Medecine Tropicale (IPASC – the Pan-African Institute of Community Health) with academic support from LSTM.

Despite some terrifying episodes as the war raged in The Congo, a second centre was opened in 1998 and IPASC remains strong. Pat herself was abducted and held at gunpoint with nine others in the Mission Aviation Fellowship hangar at Nyankunde. On another occasion she was interrogated by security forces for two days – during which time she was so terrified she could neither eat nor drink. The biggest tragedy of all happened in 2002 when the whole complex was destroyed in inter-tribal conflict and many students and staff were killed. Pat was Dean of IPASC at the time and was away from Nyankunde attending to duties at a hospital in England. Despite the security risk she wanted to go to Oicha to join the refugees. "If I am killed, there are lots of other people to carry on, but while I'm here I'm responsible for the Institute" was her comment.

Louis Paluka Sabuni, Director, Institut Supérieur Panafricain de Santé Communautaire de Bunia, said "Pat Nickson changed the lives of many that she touched in the Congo with her commitment and courage. One of our most vivid memories of her was at the time of the violent civil war, when staff had to leave Nyankunde. We all evacuated, leaving at night on foot through the tropical forest to Beni, 150km away. Pat rushed to Beni to join staff – she was coming into the country from the UK, when other foreigners were leaving because they feared for their lives."

Pat's commitment and dedication provided an example for others to follow, at IPASC, at LSTM and in every other part of the world that she visited. In 2004 she was ordained into the Anglican ministry. Then in 2005 she was awarded the OBE for her services to Africa, which she accepted with characteristic humility. All who knew her agree that she was a person of exceptional energy and strength and it was a privilege to enjoy her company for as long as we did. She is survived by two sisters and a brother. Dr Patricia Nickson OBE, Health Adviser to the Christian Medical Commission (Geneva), renowned community health pioneer and

Lecturer at LSTM died on 26 April, 2009.

GEORGE NELSON

Professor George Nelson FRCP FRCPath, will be remembered as one of the world's most distinguished medical parasitologists. He was a District Medical Officer in Uganda from 1950 to 1955 and a Senior Specialist in Parasitology in the Kenyan Medical Service's Division of Vector-borne Diseases from 1955 to 1963. He came to the London School of Hygiene and Tropical Medicine in 1963 as a Reader in Medical Parasitology and was later Professor of Medical Helminthology. From 1980 until his retirement in 1988 he was the Walter Myers Professor of Parasitology at LSTM, later becoming Emeritus Professor.

George revolutionised research in helminthology, setting up internationally important and pioneering research programmes on many of the infections on which his own distinguished research in Africa had concentrated, principally tricinellosis, taeniasis, filariasis and schistosomiasis. He wrote: "We needed a great deal of effort to persuade Bayer that the veterinary anticestode product should be released for use against human schistosomiasis. But together with the World Health Organization we were successful and it has been used for the control of schistosomiasis throughout the world, including China and South America."

In 1980, he surprised many by moving to LSTM. George was famous for his remarkable lectures that captivated audiences of all generations, disciplines and cultures. The lucky ones that attended his lectures agree that he was one of the most effective and engaging communicators of his generation, even capable of eliciting spontaneous applause from undergraduates. As a professor both in London and Liverpool he enhanced the understanding of tropical parasites through his experience.

His business and even private life were always influenced by his love of the outdoors. He enjoyed gardening and ornithology and was a highly competitive golfer even in his eighties when he won a competition organised in his honour. George was happily married to Sheila and raised two daughters and two sons. Professor George Nelson died on 31 March 2009 aged 85.



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