

LIVERPOOL SCHOOL *of* TROPICAL MEDICINE



ANNUAL REPORT
2005 - 2006

Mission Statement

As a centre of excellence, the 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:

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

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



LIVERPOOL
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TROPICAL
MEDICINE

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Chairman's Foreword



During the period of this report we have seen tremendous changes, mainly related to the physical expansion of the School. In keeping with the Strategic Plan, which the Director developed four years ago, there has been and continues to be an increase in the number of staff plus the building of the new Centre for Tropical and Infectious Diseases (CTID), which is growing apace alongside the original school.

More people and more space are a sign of great success, and we warmly welcomed all those joining this distinguished institution. It is sad to relate that the needs of the present century are just as great, and in some cases even more so, than they were a few decades ago. However, the School, with its extra resources of money, people and tools, now has the opportunity to make an even greater contribution than it has in the past. The School is clearly at the forefront of research capability and its application to the wider international community. An influx of large research grants from the Bill and Melinda Gates Foundation, the European Union and other funders, as well as the provision of locally and internationally sourced funding for the provision of the CTID has set the school on a firm programme of activities for the future, several of which are described in the following pages.

Teaching continues to be a strong thread which runs through all parts of the School, and new courses are being developed that will be run overseas. The way education is being delivered by the School is being reviewed this year in order to strengthen its position in the institution.

The School's Travel Clinic is extremely well used by the public, in fact it is so well used that serious consideration is being made to enlarging the facility. Some of the staff who provide service in the travel clinic also provide consultancy

services and run clinics in the Royal Liverpool and Broadgreen University Hospital.

Liverpool Associates in Tropical Health (LATH), the School's wholly-owned subsidiary company, which furthers the School's mission through consultancies marked its 20th birthday since it was founded by Professor Ken Newell in 1986. The celebrations which were held in Liverpool's magnificent Town Hall, took the form of an extremely interesting educational debate led by worldwide experts in tropical health, and a celebratory dinner with distinguished after dinner speakers. LATH is reviewing its position and planning for change and expansion to meet the growing opportunities and demand for its services. During the past year LATH and the Child and Reproductive Health Group of the School developed a collaborative link with the Royal College of Obstetricians and Gynaecologists who now have their international office based at the school. A recent award of £25,000 by the Liverpool based company, Medicash, is to be used for extra work in this area.

All these developments, and more, are covered in the pages of this Annual Report which cannot fail to inspire by conveying something of the dedication and the very special expertise of the staff that are devoted to making a difference to some of the most disadvantaged peoples of the world. It has been said that the School has contributed more to improving more lives across the world than any other organisation in Liverpool. I am told that along with the Beatles and football, the School is what Liverpool is known for worldwide. In 2007 we are certainly planning to play our part in marking the 800th anniversary of the granting of Liverpool's Charter by King John, and the 200 years since the abolition of the slave trade in Britain.

The School is in transition: building on its distinguished record, holding fast to its

purpose and values, but seizing the opportunity to improve and do more now it has greater resources, which its dynamic Director and her whole team of staff have attracted.

Thanks and appreciation are due to every single person who works with the School. We are also very grateful to our President, Sir Mark Moody-Stuart, for his wise and knowledgeable support, and to all the eminent Vice-Presidents who contribute their knowledge and experience. This year we warmly welcome Baroness Caroline Cox, James Smith of Shell, Michael Oglesby of Bruntwood, John Robertson of United Utilities and Professor Sir David Weatherall of the University of Oxford, as new Vice-Presidents and thank them for their interest and offers of help.

I am very grateful to all members of the Board of Trustees, for their hard work, wisdom and commitment to making the ideals of the School work in practice. In particular Rob Macfarlane, the Treasurer, has played a leading and invaluable role in not only overseeing the finances, which are strong and well managed by Einion Holland and his team, but also in the development of the new building. Three Trustees who have made a huge contribution are retiring. Simon Sherrard has supported the Board strongly as Vice-Chairman and also led the Audit Committee with invaluable experience and authority. Nick Earlam has been passionate in the development of LATH as a stronger business enterprise to fit into the opportunities ahead. Hilary Banner has been a great help as a lawyer on the Board and on the Audit Committee. All three are much appreciated, as are all the many supporters and benefactors who have generously given time and money to bring the School to its present very strong position.

Rosemary Hawley

Director's Report



Five years ago the Liverpool School of Tropical Medicine set itself the strategic goal of becoming the major international centre for tropical infectious diseases in Europe within a decade. The goal was set, recognising the immense wealth that the School possessed in talented staff, while not underestimating the challenge of revitalising a century old institution.

The last five years have been ones of major change in the School, with the restructuring of its management systems, re-evaluation and focusing of its research programmes and restructuring around areas of obvious strength and more recently, establishing a new modular structure for our MSc teaching programmes. The net result is an institution that is now able to invest in its own future. The annual deficits of more than £250k per annum, with a turnover of £7 million, have been replaced by a surplus of more than £500k on a turnover in excess of £23 million. Research grants and contracts on the School's books now exceed £100 million, a massive increase from the less than £10 million of five years ago. The School's teaching facilities have been renovated and £25 million of capital has been raised to develop the new building, which will house our expansion once it is completed in December 2007.

Much of this growth has been in malaria research, with major five-year projects, funded by the Bill and Melinda Gates Foundation and European Union starting in 2005/06. The same funders have allowed the School to reinvigorate its work on sleeping sickness in Africa. In 2007 we anticipate further success in large scale initiatives in filariasis as well as expansion of our malaria

programmes. The School's links to its more traditional funders, the Wellcome Trust and the Department for International Development (DFID), remain strong. This year we have made a proleptic appointment of a new Director for the Wellcome Trust Tropical Centre in Malawi. This Centre, a joint venture with the University of Liverpool and College of Medicine in Malawi, has developed into a major clinical research Centre under the able direction of Professor Malcolm Molyneux in Blantyre. Malcolm will be a difficult act to follow, but we are sure that Professor Robert Heyderman will continue to support the excellent work going on in malaria at the Centre with a new focus in his own area of medical microbiology.

Will the School achieve its goal of becoming the premier Centre for tropical infectious disease by 2011? The signs that it will are good. The increase in the breadth and depth of our funding base suggest that we are internationally competitive. The practical outputs of the School, in terms of new drugs, better policies and practices for prevention and treatment of disease and increasing overseas links, augur well for an increasingly beneficial impact of our work on those who live under constant threat of the major tropical diseases. Similarly we are also looking to improve the service we provide within the UK. In 2006 the School needed to remove its travel clinic details from the yellow pages. The need for our services, even from those who know of us by word of mouth, was sufficient to outstrip our capacity to meet the demand. In order to provide a better service to the region, plans are now being developed to expand the service we offer to the public, with better facilities in central Liverpool and the potential development of satellite clinics in neighbouring cities. We have also successfully partnered the Royal

Liverpool and Broadgreen University Hospital Trust (RLBUH) in its bid, along with the University of Liverpool, to become a national centre of research excellence in microbial disease. This bid was selected to go forward, as one of only three outside London, against stiff national competition. If successful in the final round, it will establish our credentials as the major national centre in infectious diseases.

Our technical assistance programme, run through the wholly-owned subsidiary company, Liverpool Associates in Tropical Health (LATH), celebrated its 20th Anniversary this year. Supporters from around the globe attended a dinner to celebrate with us this important part of the School's activities. They ensure that we fulfil our mission statement and continue to provide better tools and technologies to prevent and treat tropical infectious diseases. Our overseas collaborators also ensure better assessment of the evidence-base for good clinical practice and first rate technical advice to governments and other clients in the tropics to help them improve their health systems and services. LSTM and LATH together will form a formidable internationally recognised partnership for the foreseeable future that really will make a difference to the health and welfare of many of the poorest people worldwide.

Janet Hemingway

Treasurer's Report



The Liverpool School of Tropical Medicine's (LSTM) current year's results complement the preceding two years, and show the continued strength of the group with a surplus of £623,000.

The year has been dominated by major projects. Of these, the imposing structure of the Centre of Tropical Infectious Diseases (CTID) is possibly the most impressive as it dominates Pembroke Place. All funding support has been confirmed and £4,461,000 capital expenditure of the expected full cost of £25 million is reflected in the Financial Statements.

In November 2005 the Innovative Vector Control Consortium (IVCC), led by Professor Hemingway, was embedded within LSTM to manage the US\$50 million Bill and Melinda Gates Foundation research project. Within the financial year the administrative and management structures have been developed and the posts have been filled, creating an appropriate environment to nurture and control numerous prospective research projects.

Deputy Director Professor Steve Ward led the consortium "AntiMal", which obtained a €17 million award from the European Commission to develop a portfolio of viable novel antimalarial drugs. The infrastructure and administration of the consortium have been developed in the current year.

Potentially successful applications for major research projects and an enhanced spread of award-granting bodies have created a robust income portfolio, with £92million of research and teaching contracts spread over the next few years.

It is also appropriate to congratulate John McCullough, Managing Director of Liverpool Associates in Tropical Health Ltd (LATH), the School's wholly-owned subsidiary. In the year LATH has

generated a 33.2% growth in turnover, has transferred £791,000 to the School under gift aid and has retained surpluses in accordance with its reserves policy.

I reported that a milestone was reached in 2004, when the School generated a surplus from its own activities, excluding LATH. It is probably relevant to explain why this momentum has not been sustained, and LATH's continued success has continued to support the organisation in a difficult financial year.

Despite the major project successes, which will impact in the future, it has been a difficult year for LSTM:-

The Funding Council Grant (Higher Education Funding Council for England (HEFCE))

- Shown to have fallen by 1.8% in the year, a fall of 4.7% in real terms. Although Government policy specifically supports UK charity-funded research HEFCE changed its model in the year to penalise the activity. Subsequently the funding formula has been reinstated and is not seen as a problem in the forthcoming year.
- The settlement contains an amount of £137,000 for consultant clinician salaries, including backlog provision, where the costs are included as expenditure. If this additional grant is deducted the fall in the main grant is actually 10.6%.

- Core activities are funded from this source and a loss of this magnitude required a special readjustment in the year.

Tuition Fees and educational contracts

- Income has fallen by 23.9%, which includes a fall of £180,000 (9.2%) for project external short courses that came to an end. This is reflected in reduced expenditure in the year and little net effect.
- The number of full fee-paying overseas

students has fallen, reflecting a reduction of fees collected of £299,000 (a fall in real terms of 27.7%), whilst the costs of undertaking courses and maintaining the facilities has remained constant.

Salaries

- The figures include the full year cost effect of transferring staff to the higher education single spine pay structure. Assimilation costs amounted to 5% in addition to the natural annual pay awards and incremental increases. Other Universities fund their extra salary costs from their new undergraduate fees, but since LSTM has only postgraduate students, the additional funding is set against general sources.

Due to lack of space within its existing location, LSTM has moved 38 staff into leased overflow accommodation and will relocate a further 37 new staff off-site until the new research Centre is ready for occupation in December 2007. Although continuing to emphasise its streamlined management structure, a number of key middle management roles have been filled in the year including Health and Safety, Operational Management, Information Services, Research Management, Finance, Grants and Contracts and Student Registry.

Finally, the CODA Dream finance software package was implemented in January 2006. As noted last year this system will allow research workers to access and arrange their ordering and finance expenditure systems to suit their research contract requirements thus, enabling them to manage their grants more effectively.

With strengthened management and major projects, including CTID, coming onstream, I look forward to 2007 with confidence.

Rob Macfarlane

Fundraising



Founded in 1898 with an initial donation of £300 from Liverpool Shipowner Sir Alfred Lewis Jones, the School, a registered charity, continues to depend heavily upon donations given by charitable trusts, companies, individuals and public sector organisations.

During 2005/2006 the Fundraising Office has received donations totalling £1,340,815, with a further £1,161,000 pledged for 2006/2007. These donations support a range of projects and the overall development of a rapidly expanding organisation.

Centre for Tropical and Infectious Diseases (CTID)

The development of the new Centre is well underway thanks to further support during this period from The Wolfson Foundation, with a grant of £2 million over two years, and Business Liverpool, with a grant of £250,000 over two years, in addition to existing major funding from the EU and the North West Development Agency.

A fundraising appeal is now in progress in order to complete the fitting-out of the laboratories. Scheduled for completion at the end of 2007, the CTID will be at the forefront of major research into diseases such as malaria and dengue. More information on the CTID can be found on page 28-29.

Student Support

Donations totalling £103,827 were received from donors, including the Oglesby Charitable Trust, the Estate of the late Annie Elizabeth Evans and the Gunter Charitable Trust, providing more

and more students with scholarships and hardship grants. We have also seen a number of former students giving donations to allow other students to benefit from the School's world class training. The Thomas Mark Scholarship has been recently introduced and the Evans Memorial Scholarship will be available from 2007, strengthening the School's commitment to providing opportunities for tomorrow's medical profession.

Refurbishment

Despite the ongoing refurbishment of some teaching and laboratory spaces, there are still many areas that urgently require re-structuring and modernisation, a priority for the Fundraising Office and for the School over the next few years.

Donald Mason Library

The library is an invaluable resource for staff and students, holding thousands of medical journals and publications, complemented by computer and internet services which allow access to health databases, electronic journals and other e-resources.

Some of the library's services are supported by an anonymous charitable trust.

Alumni

Members of LSTM's alumni continue to maintain contact and offer their services as consultants and advisors, supporting the School with their time as well as donations.

If you are a former member of staff or student and would like to be kept informed of developments at LSTM

please contact the Fundraising Office with your contact details and we will send you the new LSTM newsletter "Tropical".

An appeal for foreign currency is continuing, with regular donations coming from the public, School students and staff. Thank you to everybody who has contributed to this appeal.

Donations are particularly encouraged to support the General Fund which is used by the School to fund projects that emerge without warning and require immediate attention.

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

If you would like more information on how to support LSTM please contact: Billy Dean, Fundraising Office, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool, L3 5QA. Alternatively, you can email:

william.dean@liverpool.ac.uk or phone 0151 705 3272

Thank you to all of our donors, your support is deeply appreciated.

Above - Construction of the Centre for Tropical and Infectious Diseases (CTID), July 2006

AntiMal: an initiative to discover and develop new drugs for malaria

It is readily accepted that malaria is one of the world's most important diseases with half the world's population at risk from the disease, more than 500 million new clinical cases each year and anywhere between 1 and 2 million deaths annually, depending on which statistics you choose to accept. One might expect with a disease of this importance, especially one which has its most devastating impact against children and pregnant women, that the "global pharmacy" would be full of efficacious remedies capable of treating malaria infection. After all, this is not a new infectious agent like HIV but one which has evolved alongside the evolution of man, making a significant impact in the shaping of the human genome. Unfortunately the reality is that the number of drug classes capable of treating malaria can be listed on the fingers of one hand. The implications of this are profound. If we consider Africa, where the greatest burden of disease is found, we are rapidly approaching a situation where there will be no effective, safe and affordable drug for mass treatment due to the spread of parasites resistant to the only truly affordable drugs chloroquine and Fansidar.

If we analyse the performance of the pharmaceutical industry over the past 50 years in addressing the drug needs of malaria endemic countries the picture is bleak, with only a handful of new drugs reaching the market place. This is in stark contrast to diseases of the West where we can expect 5-10 new cardiovascular drugs and 2-5 new anticancer agents to reach the market

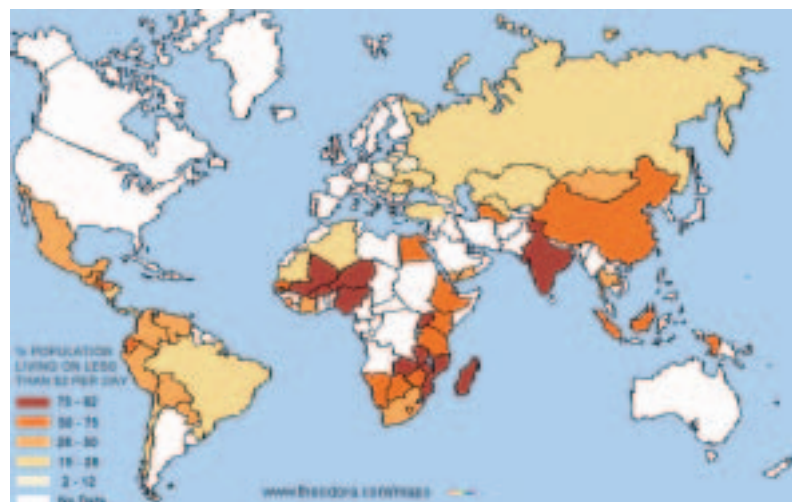
each year. There are a number of factors which contribute to this reluctance to invest in antimalarial drug development, but the lack of commercial viability has been the most important. The current development costs of a new drug are reported to exceed £500million, which has to be readily recouped with profit within the lifetime of a drug patent.

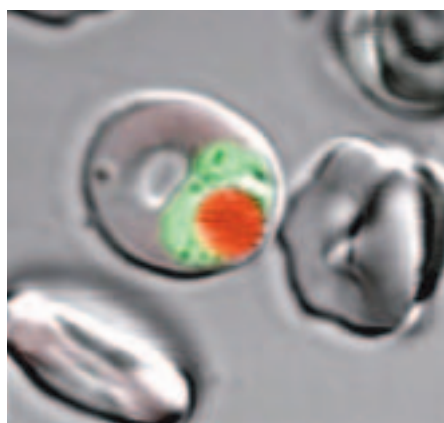
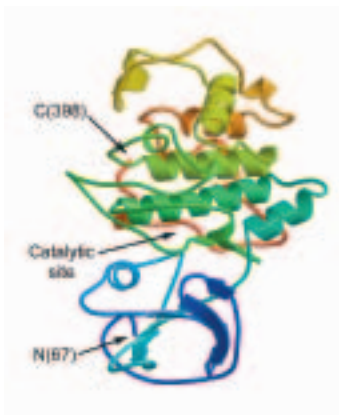
There is clearly a need for an alternative approach to antimalarial (antiparasitic) drug development. The academic sector and the Liverpool School in particular have a long-standing history in the development and evaluation of antiparasitic drugs. At the turn of the last century, scientists from the School were demonstrating the effectiveness of atoxyl for the treatment of African sleeping sickness and in the 1920's the usefulness of suramin against this disease was evaluated (this is a drug which still has clinical utility today). In the 1940's, as part of a commitment to chemotherapy research, the School evaluated the antimalarial potential of mepacrine and pamaquine and, in collaboration with ICI, participated in the development of proguanil, an antifolate antimalarial still extensively used today in drug combinations.



The School remains at the forefront of drug development programmes for tropical diseases and, to this end, has been a major driver in the development of Public Private Partnerships (PPPs). PPPs have the ability to bring together the technical expertise, managerial and financial support and political will in what can be represented as a "virtual pharmaceutical company". Using this model the School, in partnership with the University, GSK pharmaceuticals, DFID and the WHO, developed and registered the new antimalarial drug Lapdap in 2003. Furthermore the development process cost less than £10million and the end product is available at a cost which is really affordable and sustainable for African populations, less than \$0.5 per adult treatment.

As part of its commitment to neglected diseases the European Commission has secured funding to support antimalarial drug discovery and development. In early 2005 the Commission made a competitive call for applications from consortia of European scientists and scientists from disease endemic countries with an interest in malaria chemotherapy. One project was selected





for funding, with the School acting as the lead institution, reflecting the School's international status in this area of research.

AntiMal is an integrated project that is devoted to the development of new drugs for the treatment of malaria. The funding from the European Commission comes from its 6th Framework Programme. The project is coordinated by Professor Stephen Ward and comprises leading groups of malaria researchers from 31 independent institutions (10 from European and 2 from African countries). The goal is to establish a portfolio of new antimalarial drugs from within the European scientific community, and to manage this portfolio through an industry standard pre-clinical evaluation. Lead candidates from within the portfolio will be selected for progression to Phase I clinical trials. Ultimately this initiative will produce antimalarial drugs, registered to internationally recognised standards of excellence, which have potential utility in the affordable treatment of malaria within malaria-endemic countries and Europe. The current portfolio is managed as five Research and Development (R&D) clusters which focus on specific types of molecule such as quinolines and peroxides or specific targets such as lipid biosynthesis. The consortium has projects at the early proof of concept stage through to post candidate selection, and we anticipate processing at least one molecule into clinical trials within the duration of funding i.e. five years. This in itself will be a fantastic achievement and significantly faster than is generally achieved by big Pharma. A unique feature of the consortium, and a very alien concept for most academic partners, will be the 18 month review and portfolio rationalization. At this point external experts will advise the consortium on the potential of each project to actually generate a drug. Only

the very best projects will continue to be funded beyond this point.

The function of the consortium is to establish a virtual drug discovery and development capacity within the European community and with southern partners, in the area of infectious disease, with a focus on malaria. This capacity, and the expertise that will emerge from consortium activity, will have applications across a number of infectious diseases. The specific application of the outputs of this initiative will be through the development and registration of an antimalarial drug, followed by safe, affordable and effective treatment of uncomplicated malaria. There may also be potential applications for these products in malaria prophylaxis and in severe malaria.

The AntiMal project was initiated on 1st December 2005 and is funded for 5 years with an EC contribution of €17,500,000. In addition to its drug development remit, the consortium is also committed to training and capacity development. The main vehicle for training is the AntiMal international PhD programme which is run in collaboration with the European Molecular Biology Laboratory (EMBL). Each PhD project is a joint collaboration between at least two laboratories. Following a rigorous recruitment and selection process a total of eleven students have been selected to join the PhD programme. The successful students will start work by October 2006 and truly reflect the international nature of the programme, with representatives from 10 different countries. Later in 2007 AntiMal will also announce a £1,000,000 capacity development initiative for Africa.

Steve Ward

Oposite Top - Pharmacist in rural Mozambique health centre dispensing malaria tablets

Oposite Below- World Poverty Map 2000

Above Left - 3D model of PfGSK3 kinase

Above Right - Image of living trophozoite of *Plasmodium falciparum* in its host red blood cell, captured by confocal microscopy.

“ children are dying in Africa because they don't have access to cheap and effective drugs ”



DSS information system will be a vital tool in controlling malaria and dengue fever.



Mosquito-borne diseases, including malaria and dengue, cause extensive morbidity and mortality, and are a major economic burden within disease-endemic countries. Control of both these diseases, which are primarily transmitted in and around the home, is difficult. Malaria and dengue control are likely to combine vector control, drugs and the management of clinical illness to combat the disease. Although drug and vaccine development for malaria and dengue has received much attention since 2000, there has been little initiative on vector control.

Malaria is the most important parasitic disease of humans. It is estimated that over 3 billion people live in malarious areas and that this disease causes between 1 to 3 million deaths per year with morbidity reaching over 500 million cases. In recent years there has been a resurgence of this disease due to increased drug resistance of the parasite and increased insecticide resistance of the *Anopheles* mosquito vector. Malaria vector control relies on the use of an effective insecticide, most commonly for indoor residual spraying (IRS) and for impregnating bednets (ITN). There are numerous cases of insecticide resistance reported for *Anopheles* species.

Dengue is a deadly *Aedes* mosquito borne disease, with 2.5 billion people at risk of the disease, with 50 million new infections and 24,000 deaths reported annually. Most *Aedes* control relies on the application of larvicides and insecticide space sprays. *Aedes aegypti*, the main dengue vector, often breeds in water used for drinking. The World Health Organization (WHO) currently only

approves 5 insecticides for application to drinking water. Since the 1970's the organophosphate, temephos has been the most widely used insecticide, but increased resistance has reduced its efficacy.

Extensive exposure of insect vectors to insecticides eventually selects for insecticide resistance. Understanding this basis of insecticide resistance and how to manage it is essential if chemical control is to be used either in isolation or as part of an integrated pest management programme. Currently, there are only four insecticide groups available for public health control. The economics of developing, safety testing and marketing new insecticides means that novel compounds are not developed for the control of disease vectors. There is a need to monitor and manage the tools that are currently available.

The prompt availability of relevant data is vital to support public health surveillance, management, research and policy initiatives. Vector control and its monitoring and evaluation, in general, have spatial components which are ideally suited for a Geographical Information System (GIS) based Decision Support System (DSS). A DSS is an interactive, flexible computer-based information system especially developed for supporting decision making. It utilises data to support the planning, implementation, management and assessment of interventions, while enabling decision-making regarding the broader development and policy issues of a control programme.

The Innovative Vector Control Consortium (IVCC) is in the process of developing a malaria and dengue DSS. The dengue DSS development is being undertaken with partners at Colorado

State University, USA, (see article on page 10) while the malaria DSS is being developed at the Medical Research Council, Durban, South Africa.

The MRC, under the guidance of Brian Sharp, has developed various aspects of a DSS over the last 15 years and these have been implemented in South Africa, Equatorial Guinea, Malawi and Mozambique. A large platform of expertise has developed in the MRC due, in part, to the successful Lubombo Spatial Development Initiative, a tri-lateral agreement between Mozambique, South Africa and Swaziland, for the control of malaria. The IVCC malaria DSS will build on this experience and develop these tools further for the wider malaria community.

It is essential, at the start of this project, to have "buy in" of the malaria control programmes. In order to do this, the DSS will be developed in close collaboration with the malaria control programmes and the ministries of health in Mozambique, Malawi and Zambia. It is envisaged that the DSS will become a sustainable tool for improved vector control.

“Understanding the basis of insecticide resistance and how to manage it is essential if chemical control is to be used either in isolation or as part of an integrated pest management programme”



Left - Rural hospital from which malaria incidence data is collected.
Far left - Spraying insecticide on the wall for vector control.
Above - Traditional house in central Mozambique

The DSS is made up of several components that cover entomological, clinical and malaria control information and data. While each component of the DSS stands alone, allowing the user to look at certain areas of information, the more components that are incorporated the stronger the DSS becomes. Some of these components are described in more detail below.

Sentinel sites will be developed in-country for the continual monitoring of entomological and clinical information. These sentinel sites will provide information on an ongoing basis to the DSS, and ultimately the control programmes.

Perhaps key to any malaria control programme is a malaria information system that is capable of capturing health facility malaria case data. This system records all patients presenting with malaria at the health facility, the method of diagnosis and their treatment.

Annually, at each sentinel site, a parasite prevalence survey will be carried out. Parasite prevalence within the human population will be used as an impact indicator measuring the effect of the malaria control programme. As parasitaemia within the population falls, and it is no longer possible to measure a significant change, then the control programme will rely more on case incidence data obtained from the malaria information system. Currently the parasite prevalence in the study area ranges from 40% to 80%.

A range of entomology data will be collated. This includes species density

measured by attaching mosquito window traps to houses at sentinel sites which will be emptied on a daily basis, and the species identified. Those that are identified as *Anopheles* will be tested for malaria infections. Annual collections will also be undertaken to catch live mosquitoes for insecticide resistance testing. This is a time consuming and expensive process. Current methodologies of insecticide resistance testing are expensive and often give only crude measures of resistance. The Innovative Vector Control Consortium (IVCC) will develop new tools to quantify insecticide resistance in the field (see article on page 12). Previously, insecticide resistance in vectors has not been monitored directly, and is only detected once operational significant increases in disease transmission occur. However, the benefits of insecticide evidence-based vector control have been established in Sri Lanka, Mexico and Mozambique.

The unique data from these sentinel sites will be used to develop appropriate statistical, spatial and threshold models against which it will be possible to measure the impact of current interventions. This will become a powerful monitoring and evaluation tool for control programmes where the control is working.

In order to map and spatially analyse the data from the DSS, a spatial data repository of all the information required for GIS will be included. Simple GIS packages will be linked to the DSS to allow programme managers to undertake this work. Malaria control programmes will be able to see what the malaria

prevalence is, and how the interventions that they are using are distributed

Incorporated into the DSS are the mechanisms for the dissemination of data and information. This can be in the form of tables, graphs or maps. The aim is to provide the decision makers with the relevant data as and when required. The decision makers vary from managers, who are responsible for the daily running of control programmes, to a ministry of health that makes broader policy decisions.

The DSS will impact strongly on a malaria control programme through the powerful monitoring and evaluation tools that are incorporated within the system. This will allow for quality control of the control programme and at the same time provide relevant information for evidence based policy decisions.

Mike Coleman



Things learned during a sabbatical in Liverpool

“Insecticide resistance researchers here are worldwide leaders”

***Aedes aegypti* is a container breeding mosquito with a cosmopolitan distribution between 40°N and 40°S latitudes and is, on a global basis, the most common vector of yellow fever and dengue fever flaviviruses. Despite the widespread availability of an effective and safe vaccine, yellow fever remains an important public health problem in much of Africa, and South America. Since 1986, major epidemics have occurred annually in West Africa and mortality rates have ranged from 25-50%. Dengue fever is one of the most rapidly expanding diseases in the tropics with over 2 billion people at risk, about 100 million new cases annually, and hundreds of thousands of life threatening cases of dengue hemorrhagic fever-shock syndrome. All indications are that the situation will only get worse. Since the demise of mosquito control programmes beginning in the late 1960's, *Ae. aegypti* has re-established itself throughout tropical and subtropical areas of the Americas.**

The group at Colorado State University has been investigating the vectorial competence of *Ae. aegypti* for a number of years. The identification of the vector genes that affect natural variation in flavivirus infections in *Ae. aegypti* may indicate novel approaches to interrupt transmission. However, in the meanwhile, there are more immediate needs for regular and emergency suppression of vector populations, and the majority of this suppression is still accomplished with the use of pesticides such as pyrethroids and organophosphates. Unfortunately, resistance to these pesticides is becoming widespread in various arthropod vectors of disease. Currently, the list of insecticide-resistant vector species includes 56 anopheline and 39 culicine mosquitoes, body lice, bedbugs,

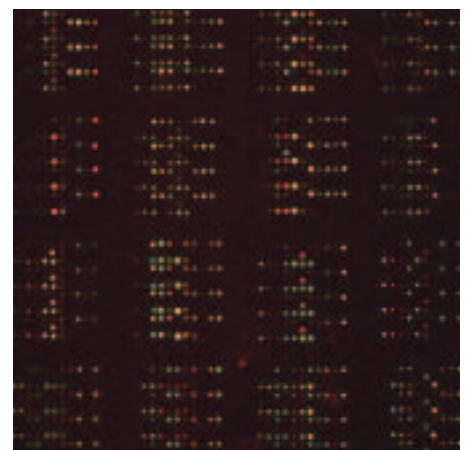
triatomids, eight species of fleas, and nine species of ticks. *Aedes aegypti* is one of those resistant culicine species and resistance in *Ae. aegypti* has and will continue to directly impact on the incidence of flavivirus transmission, re-emergence of previously controlled diseases, and the emergence of new diseases. Although alternatives to vector control with insecticides are available, drug resistance problems (e.g. malaria) or vaccine cost and availability (e.g. Japanese encephalitis) make vector control an important option.

The shrinking availability of effective insecticides, as a result of resistance, has been exacerbated by the removal of insecticides from the market, especially in the past decade. This is because the cost of keeping certain compounds on the market is higher than can be recouped from their limited use. In addition, insecticide use is also monitored and restricted by regulatory agencies. The concept of insecticide resistance management (IRM) treats insecticide susceptibility as a finite resource. As pesticides are applied, and the target population becomes resistant, the susceptibility resource is depleted. A key assumption of IRM is that resistance genes confer lower fitness in the absence of insecticides. Thus, when a specific insecticide is discontinued, resistance will decline, and susceptibility will be renewed. With sufficient time, during which alternative types of insecticides are used, the original insecticide can once again be applied.

Resistance surveillance is an essential step in IRM in providing baseline data for programme planning and pesticide selection; for continuously monitoring resistance, and for detecting resistance at an early stage so that alternatives can be implemented. After many decades of

research, the generalized mechanisms of insecticide resistance are now well understood and this knowledge has allowed for the development by Professor Janet Hemingway and others over the last 20 years of bioassays and biochemical tests for resistance surveillance. However, these assays do not identify genetic mechanisms of target site insensitivity, nor do they provide specific information on the numbers and types of genes involved in various forms of resistance. Molecular genetic information on resistance mechanisms are increasingly needed in resistance diagnostic procedures.

I chose to do a sabbatical at the Liverpool School of Tropical Medicine because the insecticide resistance researchers here are worldwide leaders in developing and testing molecular genetic tools for resistance surveillance. Furthermore, Drs. Hilary Ranson and Clare Strode had recently developed an *Ae. aegypti* detoxification microarray chip. This “chip” is a set of DNA probes printed as dots onto a glass slide. Each *Ae. aegypti* detoxification microarray is printed with probes from 234 different genes that are members of the cytochrome P450, glutathione transferase and carboxy/cholinesterase families. These are genes that code for



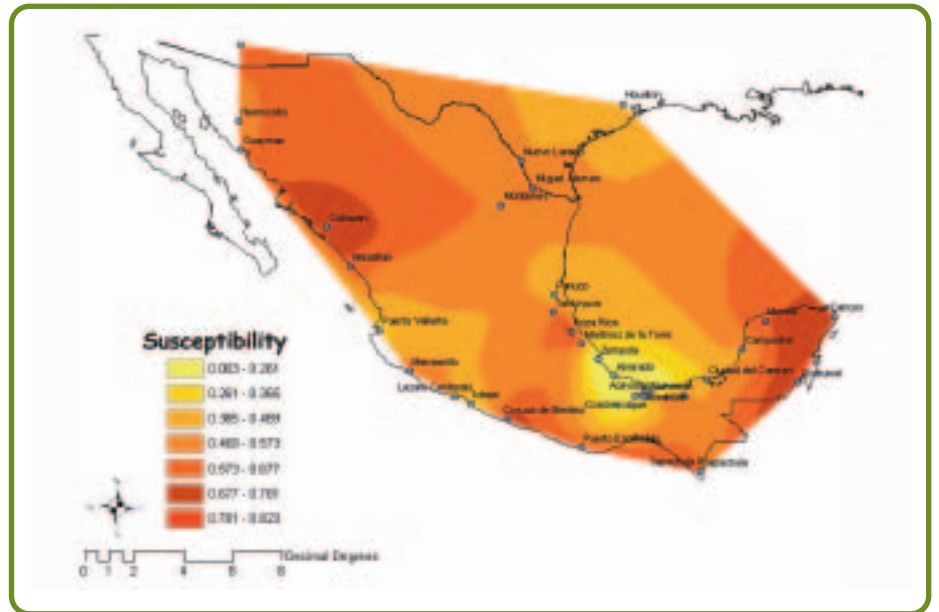
Right - Distribution of dengue virus susceptibility in *Aedes aegypti* from throughout Mexico.

Below Left - The *Aedes aegypti* detoxification microarray is printed with probes from 234 different genes that are members of the cytochrome P450, glutathione transferase and carboxy/cholinesterase families.

detoxification enzymes that metabolize a wide range of insecticides. Esterases hydrolyze ester linkages that occur in various insecticides, principally organophosphates. The *Ae. aegypti* detox chip contains 49 esterase genes, 158 different cytochrome P450 genes, and 27 glutathione transferase genes! So the big question is: "Of these 234 different genes, which ones are actually involved in insecticide resistance?"

In order to use the *Ae. aegypti* detox chip, we first isolate ribonucleic acid (RNA) from *Ae. aegypti* strains that are resistant to pesticides, this RNA is then amplified, labelled with fluorescent dyes and hybridized overnight to the detox chip. The next day the chip is washed, and read with a fluorescent laser scanner. Genes that are up regulated in resistant *Ae. aegypti* will hybridize strongly to their corresponding probe in the detox chip and will appear, depending on the way that the RNA was labelled, as bright red or bright green in the laser scan. In this way the specific cytochrome P450, glutathione transferase and carboxy/cholinesterase genes associated with resistance can be identified.

During my sabbatical at the School, Dr. Strode taught me how to use the *Ae. aegypti* detoxification microarray and Dr. Pie Mueller taught me the statistical techniques with which to interpret the microarray results. With these new tools and understanding, I have returned to Colorado to continue work in developing new and more specific molecular genetic tools for resistance surveillance in *Ae. aegypti*. This is an exciting time for *Ae. aegypti* genetics in general. The *Ae. aegypti* genome has been sequenced, and Dr. Dave Severson of the University of Notre Dame, USA, has printed a whole genome microarray. With the techniques



learned at the School, I plan to use whole genome microarray to identify those genes differentially regulated in flavivirus infected *Ae. aegypti*.

I have also come away from my sabbatical experience with a more realistic understanding that despite decades of international efforts, a detailed practical description of insecticide resistance that will allow control strategies to be adjusted to specific needs of different countries and communities remains the exception rather than the rule. Innumerable genetic, biological, and operational factors influence the development of insecticide resistance. Thus, while sufficient means exist to detect and manage resistance at a higher level and with greater effectiveness, the increasing diversity of vector control measures, the need for rapid emergency recommendations and the focal nature of resistance evolution will require continued development of simple and informative methods. Key questions that remain are: How can we use these newly developed sensitive and informative molecular genetic assays in concert with bioassay techniques? How can these genetic assays be simplified so that relatively untrained personnel can use them? While molecular genetic techniques are exciting to apply to field populations, the effort will be meaningless unless it also provides a deeper understanding of how resistance arises and maintains itself in natural populations.

A heartfelt thanks to the many people at the School who made my sabbatical a productive and educational experience! Cheers also to the kind and courteous citizens of Liverpool, I enjoyed our many conversations....especially the parts I understood!

Bill Black



New kit will give early warning of vectors' resistance to insecticides

Rationale

Bednets, treated with pyrethroid insecticides, are the primary method of malaria prevention in many countries. These baited traps not only provide excellent personal protection against mosquito bites, they also have a community effect, safe guarding neighbours without nets, presumably by reducing the total population of malaria vectors. The success of this cheap, technologically simple, intervention has provided a new hope for malaria control and a target of net coverage for 60% of individuals in African malaria endemic areas has been agreed by international funding agencies and heads of state. Pyrethroids are the only class of insecticide suitable and licensed for impregnating bednets. Therefore the development of resistance to pyrethroids in *Anopheles* mosquitoes is of great concern for malaria control programmes and nowhere is this problem more acute than in sub-Saharan Africa, which shoulders the burden of

malaria morbidity and mortality. To date often the first indication of resistance development is the failure of control programmes. This can have catastrophic results for the human population.

Conventional means of assessing resistance are costly, insensitive and inaccurate. Furthermore these techniques often require field collected mosquitoes to be raised in captivity. Despite their apparent resilience when one tries to dispatch them during their nightly predations, mosquitoes are delicate beasts and do not take well to captivity. Often they refuse all offers of artificial blood sources and insist upon fresh human hosts. We are fortunate that we have a dedicated team of staff who are prepared to nurture their charges.

Obviously these approaches are neither desirable nor sustainable. This led the IVCC to bring together teams to develop a simple molecular biology kit that will enable disease endemic country (DEC) scientists to determine if a population of mosquitoes have developed resistance. The kit will contain genetic markers that



will reliably identify the mosquito species, pathogen infection status (malaria positive) and the presence of insecticide resistance genes. At present, monitoring for each of these traits is performed using individual assays and, in the case of insecticide resistance, these assays require sophisticated equipment and expensive consumables. Furthermore, these insecticide resistance assays have only limited power to detect resistance at low frequencies. The new kit will allow programme managers to detect resistance when it is still at low levels before control failure has occurred. This will give these health professionals sufficient time to develop ameliorating strategies such as changing insecticides or altering treatment strategies.

By simplifying and combining DNA-based assays, whilst ensuring that they produce reliable results with dried or alcohol preserved specimens, we will be able to very rapidly screen the large numbers of mosquitoes that are collected during routine monitoring. We intend that within two years we will have integrated the kit into the routine activities of the Malaria and Dengue Decision Support Systems work within the IVCC (see preceding two articles). This synergy between the three





groups will provide the DSS groups with crucial information for their monitoring and evaluation programmes and will give us much needed feedback on end user requirements and allow us to tailor the kit for use in DEC control programmes.

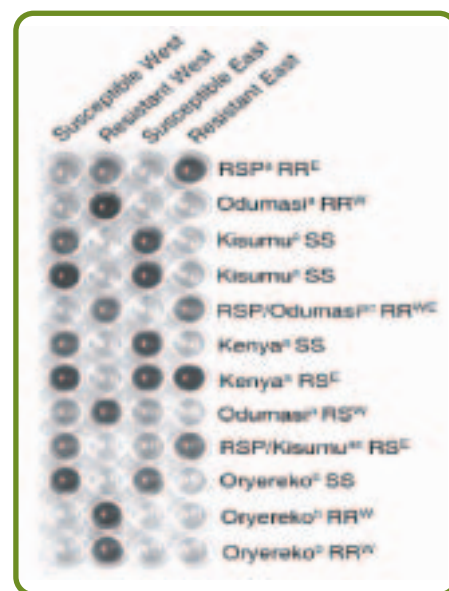
Team members have been drawn from Colorado State University, Athens University, Imperial College and Rothamsted Research together with DEC staff from Malawi, Mozambique and Zambia. Rothamsted Research is primarily an agricultural research institute and, as is usually the case, the profit motive has driven the development of allied technologies in the agricultural sector more rapidly than in the public health field. By teaming up with researchers from outside the health sector we can tap into a wealth of related experience, particularly for developing and commercialising the kit. The kit is being developed in full consultation with DEC scientist and programme staff. Market research conducted at the inception of the project showed that DEC scientists were supportive of the project and gave us the confidence that if we can develop a simple and cheap kit it will be widely used and will potentially revolutionise the monitoring and evaluation of vector-borne disease control programmes.

Although the programme only formally started in May 2006, progress has been rapid and we already have two prototype kits ready for field trials. These kits will allow us to detect a pyrethroid insecticide resistance mechanism known as 'knock-down resistance' mutation in both *Aedes aegypti*, the vector of dengue and yellow



fever, and *Anopheles gambiae*, the major malaria and lymphatic filariasis vector in Africa.

“ This will allow programme managers to detect resistance when it is still at low levels and give health professionals sufficient time to develop ameliorating strategies ”



Left/Top - Boy from Accra Ghana clutching his Insecticide treated bednet.

Left/Below - Exsanguinated human volunteer.

Above/Left - Dr.Craig Wilding rearing mosquitoes in a field laboratory in Cameroon.

Above/Center - Outline map of Africa detailing areas from where we received feedback stating support for the development of the VPMT.

Above/Right - The prototype field testing kit.

Martin Donnelly



Our new goals in influencing the world's response to HIV/AIDS

As we reported last year, our ability to understand the Social Context of HIV and AIDS represents the best hope for an effective response to HIV. “We can only assist countries to make a better response by understanding the social and cultural factors that embed HIV vulnerability and understand the context within which people utilise relevant services for coping with HIV” In pursuing this goal we have completed one Department for International Development (DFID)-funded Research Programme and were successful in bidding for a further DFID-funded Programme involving six partners joined together in this pursuit.

The HIV & STI Knowledge Programme 2001-2006

This programme provided a great deal of evidence, influencing government policy in both developed and developing countries, on how an effective response could be marshalled against HIV and AIDS.

In developing countries we had two aims. We wanted to influence the strategic goals that those countries had set for reducing HIV and STI transmission, and for the care and treatment of people with HIV. We also wished to influence how countries try to alleviate the burden of HIV and AIDS on individuals, families and communities in most need. A vast body of new knowledge in the shape of 190 publications was generated from the programme and we engaged in a great deal of lobbying (through policy briefs, meetings, personal contacts, conferences, etc.) with the policy makers and politicians in these countries to get them to hear the messages arising from this knowledge. A key message was that treatment contributes greatly to slowing the spread of HIV by increasing the willingness of people to be tested, and by reducing the infectiousness of those affected. However, the potential for treatment to influence prevention (by increasing the face-to-face opportunities for persuading people to change their risk

behaviour) remains open to question. We have also championed the view that “Quality of Life” is as important as survival in assessing the effectiveness of treatment and care, by providing cost effective evidence to support this outcome as a key goal for HIV policies. In the broader picture we established guidelines which can assist governments to generate a multi-sectoral approach to tackling HIV.

In developed countries we wished first to assist DFID to prioritise its goals, and thus its spending, on direct support for tackling HIV and secondly to engage other international agencies in working on common agendas that make more effective use of aid to the most affected countries. Our key message was to normalise the response to HIV and AIDS by basing priorities on evidence of what works, and to move away from the tendency to use support for HIV and AIDS control as a political and moral football. The key influences were brought about by Professor Charlie Gilks working with WHO on its “3 by 5” initiative, by Professor Alan Whiteside working with the UN on the “Commission for HIV/AIDS Governance in Africa”, Professor Adrian Renton working with the Governments of Former Soviet Republics on the spread of STI's and HIV in relation to injecting drug usage, and Dr Dave Haran working with policy makers and researchers in the South East Asia HIV Network to connect knowledge to policy in six south-east Asian countries. Through these pathways the evidence from the numerous programme studies were brought directly to the attention of those with the power to translate them into policy and practice.

The New Research Programme Consortium (RPC) on the Social Context of HIV and AIDS 2006-2011

This RPC is helping DFID to drive forward its strategy for assisting countries to tackle HIV and AIDS. The goal is to improve the effectiveness of efforts at poverty reduction and the achievement of the Millennium Development Goals by tackling and reducing the causes of vulnerability to HIV. We are assisting governments in Africa to use research



evidence about factors that influence the impact of HIV/AIDS on poor and vulnerable groups in order to provide greater benefits from programmes to tackle HIV in health, education and other sectors. One important body of evidence we will consider concerns the social, economic and institutional factors that place the livelihoods of vulnerable and neglected groups at increased threat from HIV and AIDS, and identify which institutions and programmes are best placed to alleviate those threats. Other important evidence concerns the way in which HIV affects the very institutions and programmes that tackle HIV and other health problems. This will help us understand how best to support them through joint action by NGOs, Donors and Governments.

The RPC agenda is to improve the use of this evidence by policy-makers, local programme implementers, representatives of vulnerable groups, and researchers so that better policies and programmes can be implemented for improving benefit to the poor and the vulnerable.

By giving centre stage to African partners, the RPC will be more sympathetic to African eyes and will have resonance across countries in and beyond Africa.

“ The G8 meeting re-emphasised the importance of the Millennium Development Goals and we hope to play a key role in shaping the strategic thinking on how HIV services contribute to Poverty Reduction ”

Our partnership has led to **key solutions** for improved TB care

“ New centre will help to improve the health of the poor and vulnerable through field-based research ”

The EQUI-TB Knowledge Programme was a five year research partnership with core funding from DFID. This funding ended in March 2006. EQUI-TB consisted of several organisations in countries with high TB incidence - primarily Malawi, Zambia and China - and two organisations in the UK - Liverpool School of Tropical Medicine (LSTM) and University College London (UCL). The programme's focus was to promote pro-poor strategies that improve the quality of, and access to, TB care, support and treatment services.

Key activities of the programme included:

1. A quality assurance approach to improve access to quality-assured TB care for poor people
2. Assessing mechanisms to reduce delays in TB diagnosis and case-finding.
3. Identifying missing cases and developing strategies to increase care
4. Disseminating new knowledge to key policy makers and opinion leaders
5. Strengthening research capacity of developing country partner organisations.

In both Malawi and China, a range of barriers in accessing care and completing treatment were documented including health system, financial, geographical and social barriers. Work in China highlighted the lack of attention provided by existing TB services to the large and increasing numbers of rural to urban migrants. In Malawi primary research in poor peri-urban settlements highlighted the potential role of informal providers, such as street-level grocery stores, in identifying TB cases and reducing barriers to diagnosis for the poor.

EQUI-TB has also investigated ways of reducing the time required to establish a laboratory diagnosis of TB. A series of studies on the optimal number of sputum smears required to enhance the number

of infectious patients starting treatment were completed. In addition, a series of studies examining the use of bleach in sputum processing to improve the detection of TB cases have been published.

Knowledge from the programme has been disseminated using a wide variety of delivery mechanisms. At national level dissemination meetings with key policy makers and opinion leaders were organised which have proved key in relationship building and subsequent influence on health policy. For example EQUI-TB in Zambia engaged policy makers from the Central Board of Health in overseeing and funding the ongoing work of TB control in prisons.

EQUI-TB staff participated in international conferences through discussion and delivering presentations on their work.

EQUI-TB hosted a meeting on “*TB and Poverty are we doing enough?*” held at the Rockefeller conference centre in Bellagio, December 2005. It brought together key individuals to move forward the international debate on the issue of TB and Poverty and was influential in clarifying future directions in the new Global Plan to Stop-TB (see www.stop-tb.org). Important related outputs of this meeting were a Lancet editorial and a Lancet commentary in TB and Poverty.

Research capacity building has been achieved in Malawi, China and Zambia by increasing both the number of individuals trained to Masters and PhD level through the conduct of EQUI-TB research, and the range of their disciplinary expertise. In addition, the research has led to the development and registration as a charity of a new Research Organisation, the REACH Trust, in Malawi.

The Future:

EQUI-TB built on its core funding from DFID by securing a number of additional, inter-related research projects from a variety of funding organisations to carry the work forward. In order to build on the

work of EQUI-TB, to maintain support for ongoing projects and to promote synergy with other related work on TB and HIV-AIDS at LSTM, the **Centre for Research on Equity and Systems for TB & HIV-AIDS (CRESTHA)** has been established. The purpose of CRESTHA is to improve the health of the poor and vulnerable through field-based research on the systems and interactions required for effective clinical and public health provision for TB and HIV. A key project in CRESTHA's portfolio is Mema Kwa Vijana (MKV). Under Dr Angela Obasi's scientific leadership, this work focuses on the development, evaluation and scale-up of a large scale (600 villages) youth Reproductive and Sexual Health intervention in Tanzania.

Key Outputs

1. Novel interventions for improving the delivery of care for poor and vulnerable people with TB and HIV-AIDS
2. Improved, practical methodologies and approaches for the “science of scale-up” including process evaluation, policy analysis, policy dialogue, impact assessment, and capacity development.

The administrative and managerial support hub of CRESTHA is housed within the Clinical Group at the School, but the intention is that academics from across the School in all other groups will engage in CRESTHA research, either as investigators or collaborators.



Adding Value to the Global Programme

Picture - Fijian welcome ceremony



The goal of the Global Alliance to Eliminate Lymphatic Filariasis (GAELF), of which the Centre is one of many partners, is “To eliminate Lymphatic Filariasis (LF) as a public health problem by 2020”. The purpose of the Centre, as described by DFID, is “To support the GAELF to add value at both international and national levels to the Global Programme”. The Centre’s activities are focused in four areas:

- As Secretariat of the GAELF
- To support in-country advocacy of the benefits of the elimination programme, particularly as it relates to the Millennium Development Goals
- To support operational research to assess the progress and success of the Programme
- To advocate for integration of LF as one of the packages of neglected tropical diseases

These activities and the goals of the Centre are in harmony with those of the Global Alliance and its diverse partners. The success of the Global Programme to date is testament to the collaboration between partners. 83 countries are filariasis endemic. 43 countries already have active programmes. In 2000, when the first mass drug administration (MDA) took place, 3 million people were treated and by 2005 400 million had been treated. No other global health programme has up-scaled so rapidly. This success is due, in large part, to the dedication of the Ministries of Health of the endemic countries, community volunteers, who distribute the drugs, and non-governmental organisations (NGOs), who support the programmes, and the commitment of the pharmaceutical companies.

Financial constraints limit activities and

expansion to further countries, particularly in Africa where only 10 of the 38 endemic countries have commenced programmes - representing the next challenge for the Global Alliance.

In March 2006 the fourth meeting of the Global Alliance was hosted by the Pacific region in the exotic location of Fiji. Working with the Local Organizing Committee the Centre, as Secretariat, was central to the organization of the meeting. Developing budgets, acquiring sponsorship, arranging participant attendance and agenda development were all essential components that ensured the success of the meeting. This success was confirmed by the attendance of over 200 people from 53 countries. One of the many outcomes of the meeting was that Professor David Molyneux, the Director of the Centre, was appointed as Executive Secretary of the Executive Group - the group which, with the endorsement of the Representative Contact Group, executes the Work Plan formulated to support the vision statement of the Global Alliance for the next two years.

Even prior to, but increasingly more so since becoming Executive Secretary, Professor Molyneux has been instrumental in his advocacy of the Global Alliance and Global Programme. Together with colleagues he has published several innovative papers addressing the package of “neglected tropical diseases” (NTD) in key journals. These papers have greatly raised the awareness of the low cost of treatment and benefits of integration of disease programmes such as lymphatic filariasis, schistosomiasis, onchocerciasis, trachoma and intestinal helminths. As well as disease elimination, the ancillary benefits of eliminating intestinal worms leading to improved growth and better nutrition in children and prevention of

anaemia in pregnant women are well received.

Earlier sponsored advocacy by the Executive Group led, this year, to the award by the US Congress of US\$15 million for the integration and treatment of NTDs. These funds were lodged with USAID and resulted in a call for proposals for funding related to NTDs of US\$100 million – the additional funds to be granted year-on-year subject to the success of activities. The US Research Triangle Institute with partners from the School’s consultancy company - LATH, the Schistosomiasis Control Initiative and the Trachoma Initiative has submitted a bid.

In-country, the Liverpool DFID funds continue to support the mass drug administration programmes in Bangladesh, Burkina Faso, Ghana and Tanzania. Some regions in Ghana and Tanzania have reached the critical evaluation time, and field studies are underway to assess the success of the elimination programme. Early signs are that, in most regions, prevalence rates have radically dropped.

And finally and most notably, two more of the Centre’s PhD students have this year successfully defended their theses. Mr Sammy Njenga’s thesis was based on results which showed that 2 rounds of MDA with DEC/albendazole resulted in a significant decrease in *W. bancrofti* infection in the Malindi District of Kenya. Dr. Bagrey Ngwira based his studies on the epidemiology and control of lymphatic filariasis and intestinal helminths in the Lower Shire Valley, Chikwawa District in Southern Malawi, and demonstrated the major impact that drug distribution had on the improved overall health (particularly anaemia) of the communities.

TALE: an example of institutional capacity building within the GMP supported training centres.



As part of its capacity development and 'knowledge into practice' mechanisms, the Gates Malaria Partnership (GMP) has established four training centres in association with its African partners. Located in Malawi, Tanzania, Ghana and The Gambia, the training centres aim to achieve best practice in malaria prevention, management and control and are developing innovative training activities in these areas. These diverse educational initiatives include a radio soap opera, media workshops, the training of district malaria focal personnel and seminars for members of parliament. An extensive information management system based on 'village registers' has been developed, as has a district level programme to empower mothers and other care providers to take a pro-active role in malaria management at home and in the community.

Each centre has a team of skilled professionals, including epidemiologists, social scientists and paediatricians striving to provide multidisciplinary training curricula that are responsive to district, country and sub-regional needs. While all are proven specialists in their own field, to date none of the training centre staff hold a qualification in teaching or training and the School has, over the last 2 years, played a major supportive role in the facilitation of in-country staff training to support the design, development and delivery of training centre activities.

To prepare the centres for becoming autonomous and sustainable Training Centres, when GMP comes to an official end in July 2008, the Teaching and

Learning Enhancement project (TALE), a programme of continual professional development in teaching and learning, is being funded by GMP and provided by the School. The course is validated by the University of Liverpool's Centre for Lifelong Learning and is adapted from the Certificate of Continual Professional Studies in Teaching and Learning. The 12-month course comprises 4 modules that cover: approaches to teaching and learning, planning and evaluating teaching and learning, assessment methods, and strategies to support and enhance learning.

The programme is delivered using a blended learning technique via a combination of two, five-day intensive workshops that bring all the participants together to share experiences and views through learner focused activities and discussion. These latter are supported through online discussion groups, e-mail and by in-country visits. Additional materials are posted at intervals onto a virtual learning environment. In-country visits comprise two strategically scheduled and structured support sessions for each training centre over the duration of the course.

Teaching and learning in sub-Saharan Africa is, in practice, mainly didactic with static learning materials and long periods of lectures. Therefore TALE workshops are delivered in a very learner-centred manner, focusing upon what the learner does and not what the tutor has to offer, in order to foster the understanding and subsequent use of these techniques within future training centre activities. To date, all participants have successfully completed the first two

assessments and have actively participated in both face-to-face workshop sessions. The final in-country support visits will be carried out before December 2006 and the expected completion date is February 2007. Although learner-centred techniques were new to most of the participants, both workshops have received excellent evaluations on the teaching methods used, and personal observation of the participants' teaching practices have already shown a marked change in teaching practice and a shift towards a more learner-centred approach.

“ In-country training workshops are supported through on-line discussion groups, e-mail and a virtual learning environment ”

Above - The Second TALE Workshop in Dar es Salaam, Tanzania. July 2006.

Below - After school in Kunduchi, Tanzania, July 2006.



Mothers and children are **top of our agenda** in tackling unacceptable mortality rates

Children form a substantial proportion (between 35 and 50%) of the population of most developing countries and, together with their mothers, they form the majority. For this reason child and maternal health are the best indicators of a community's well being, and in terms of the School's activities, this is also central to our teaching and research. It has been exciting to witness the growth of community child health in our work and within the Child and Reproductive Health Group over the last few years. The role of carers, especially mothers as effective health providers, is increasingly being recognised in developing countries, where the infants' survival depends primarily on the mothers' care. Evidence to support this concept is found in the exceptionally and unacceptably high perinatal and child mortality rates in developing countries. The role of the mother is important in relation to both her own reproductive health and in terms of the biological and social dyad between the mother and child. It is appropriate within the School to have a Group whose aim relates solely to these maternal and child health problems. The group focuses on four strategic themes headed by different staff: Malaria Epidemiology (Dr Feiko ter Kuile); Clinical Infectious Disease Epidemiology (Dr Luis Cuevas); Sexual and Reproductive Health (Dr Nynke van den Broek); and Child and Adolescent Health (Professor Bernard Brabin). Here we outline some details of the work of these groups.

Clinical Infectious Disease Epidemiology

The Clinical Infectious Disease Epidemiology research centres on tuberculosis, meningitis, respiratory infection and diarrhoea. Work on TB has focused on improving the diagnosis of TB in children, and optimising the use and timing of smear microscopy in resource limited settings. Assessing the child's immunological responses to tuberculosis are an important part of this, in order to distinguish current from latent infections. Attempts have been made with Dr. Brian Coulter and Professor van der Stuyff at the Prince Leopold Institute of Tropical Medicine in Antwerp to develop a revised gold standard for diagnosis of active TB in children and adults, in collaboration with overseas partners in Nigeria and Brazil and the World Health Organization. This includes approaches to completing all sputum smear microscopy tests in a single day in order to optimise the rapid diagnosis of TB. The research on epidemic meningitis has focussed on developing mathematical models to predict the location and occurrence of epidemics in Sub-Saharan Africa, in

close collaboration with Dr Madeleine Thomson. Models based on district level information and the pan-continental models were presented to the Meningitis Vaccine Project, and further maps are being developed with a view to guide vaccination activities in order to improve meningitis outbreak control. Work on rotavirus diarrhoea, including the description of the main genotypes affecting children with severe diarrhoea in Nepal and Brazil, will aid in developing rotavirus immunisation programmes. Further work on respiratory viruses has identified new pathogens causing respiratory infections in children in developing countries.

Malaria Epidemiology

The Malaria Epidemiology Unit of the CRH group was created in 2003 with the arrival of Dr Feiko ter Kuile, a senior clinical epidemiologist who previously worked with the Malaria Branch of the US-based Centers for Disease Control and Prevention (CDC). This unit has seen steady growth and currently consists of 2 clinical epidemiologists, a public health manager, a senior research



Right - Mother and baby in Somaliland.

Left - Midwives in rural hospital, Jigawa, Nigeria.



assistant, and 3 PhD students. In order to ensure that new ways of preventing and treating malaria are found and implemented as speedily and effectively as possible, international research efforts are increasingly focusing on larger multidisciplinary and multi-centre research and evaluation. This is reflected in the group's research agenda which is part of several productive international alliances that aim to improve the control of malaria in young children and pregnant women.

2005 saw the start of a five-year cooperative agreement with the CDC to facilitate cooperation between both institutes on malaria projects of mutual interest. This has resulted in several joint projects in Togo, Kenya, Mali, and India. In Togo, LSTM epidemiologists teamed up with CDC colleagues to design a GPS-PDA based survey method for community-based cluster surveys. This tool was subsequently used by teams of the Togo Ministry of Health to evaluate the national impact on Insecticide Treated Nets (ITN) coverage and malaria morbidity in the first national integrated measles vaccination campaign when over 700,000 free insecticide treated nets were distributed throughout the country. This Global Positioning System-Personal Digital Assistance (GPS-PDA) based survey technique has subsequently been used by CDC in various other national Insecticide Treated Nets (ITN) coverage assessments in sub-Saharan Africa.

Drs Anja Terlouw and Feiko ter Kuile are also collaborating with Colleagues from the World Health Organization (WHO) to develop a methodology to define age-based dosing regimens for the treatment

of malaria that aim to maximize efficacy and minimize toxicity, while taking ease-of-use into account using weight-for-age reference data from target populations in malaria endemic countries. In 2005 the method was successfully applied to determine the optimal tablet strength and corresponding age-based dose regimen of a new, user-friendly, blister-packaged fixed dose combination of artesunate and amodiaquine developed by Drugs for Neglected Diseases Initiative (DnDi, Geneva) and Sanofi-Aventis. Discussions are ongoing to expand this methodology to other antimalarials. It is expected that, with further funding, future application of this pharmaco-epidemiological tool could extend to a wide range of drugs used for neglected diseases in the tropics.

Dr ter Kuile, Dr Michael Boele van Hensbroek, and Kamija Phiri received a large 3-year grant to study the role of Intermittent Preventive Therapy in the post-discharge (IPTpd) management of young Malawian children with severe anaemia.

The past year has also been a productive year in generating support for research on Malaria in Pregnancy (MiP), a much neglected area of research. A start-up grant from the Bill and Melinda Gates Foundation enabled a small international group of experts to develop an integrated and focused research strategy for the next five years that will generate the next new treatment and prevention tools to control malaria infection during pregnancy. The secretariat of this international network is based at the School and is headed by Jenny Hill and Dr ter Kuile. Over the coming year efforts will shift towards the implementation of

the MiP research strategy through the creation of a global MiP Consortium of interested scientists, industrial partners, funding agents, and policy makers. To ensure an effective evidence-based approach for the anticipated future global activities, this group has also developed a database of all published and unpublished research of malaria in pregnancy; including a registry of ongoing and planned clinical trials. This database is managed by Sue Povall.

It is expected that the malaria epidemiology unit will continue its steady growth over the coming years with the recruitment of more senior and support staff.

Child and Adolescent Health

The School's core paediatric teaching is provided by staff in the group, and we convene two of the Masters degree programmes in Paediatrics and Tropical Medicine. There are several challenging research areas being addressed which involve field studies in Malawi and Tanzania. Dr Stephen Graham, who is based in the Malawi-Liverpool Wellcome Trust programme, has completed studies of bacteraemia in children with severe malaria and research on common infections in HIV-related and HIV uninfected children and how these can be prevented using the antibiotic cotrimoxazole. He is also co-investigator on studies on the causes of pneumonia. We continue to develop, with partners, our work on anaemia and malnutrition in children. A major study on the causes of severe anaemia in children has been completed by Dr Michael Boele van Hensbroek and will provide detailed information on why so many young



Left - Nurse on a field visit for the Severe Anaemia Study, near Blantyre, Malawi.

children develop these chronic anaemias which often lead to death. This work has led to the development of new field trials to test specific interventions to prevent these anaemias, in particular the role of iron supplements. Our Honorary Fellows, Dr James Bunn and Dr Stephen Owens are actively collaborating with staff in the Group to study undernutrition in children. Dr Owens, a paediatrician working with the UK Medical Research Council laboratories based in The Gambia, is completing the first trial of pre-natal multi-micronutrient supplementation in order to assess its impact on fetal growth. Other research on infant nutrition in Malawi has identified placental malaria as a major contributor to low birthweight and poor infant growth. Related work in Tanzania has documented the seasonal pattern of stillbirths associated with malaria. We host a WHO Collaborating Centre for Hearing Impairment, headed by Dr Ian Mackenzie, which is currently focusing on treatment strategies for chronic otitis media, a major cause of hearing disability in developing countries.

Professor Brabin acts as adviser and co-ordinating partner for community surveys on asthma and overweight children in Merseyside, in collaboration with Sefton Primary Health Care Trust. This work allows our knowledge and experience on child health research overseas to contribute to current health surveys in our own community in Merseyside.

The Sexual and Reproductive Health

This Unit within the CRH Group has been very busy in the last year. The number of staff working in the area of SRH now includes:

Dr Nynke van den Broek, Senior Clinical Lecturer
 Dr Jan Hofman, Clinical Lecturer
 Dr Eugene Kongnyuy, Clinical Lecturer

Dr Charles Ameh, SRH Technical Assistant and Dr Rasanjalee Hettiarachchi is a one year Honorary Research Assistant seconded by the University of Colombo.

Dr Angela Brown, based at LATH is very much a member of the team as TA Manager and Sue Cain, our Administrator and PA keeps us all on track.

Research activities this year have focused on pregnancy outcome: the results of the Wellcome Trust funded APPLe trial (Azithromycin for the prevention of pre-term labour) in Malawi are expected late 2006. Preterm delivery makes a large contribution to perinatal and infant mortality and disability. In developing countries perinatal mortality continues to be unacceptably high with estimates for sub-Saharan Africa ranging between 45 and 75 per 1000. One of the major causes of perinatal death worldwide is premature (pre-term) delivery (i.e.

“ Child and Maternal health are the best indicators of a community’s well being and is central to our teaching and research ”

at less than 37 weeks gestation). The incidence of premature delivery in most industrialised countries is reported to be around 7%, but our initial studies have shown the incidence in Malawi is around 20%. Recurrent pregnancy loss through prematurity may also produce significant risk to the mother in resource-poor areas where the risks of maternal mortality and morbidity are high, and increase cumulatively with repeated pregnancies.

Similarly, qualitative work on the perceptions of gynaecological morbidity in Bangladesh, and on the perceptions of preterm labour and pregnancy loss in Malawi, were analysed and have given lots of food for thought.

In Liverpool a project is looking at Somali women’s perceptions of maternity care needs. A literature review “The Fourth World” exploring why women of black and ethnic minority groups in the UK





have a significantly higher risk of dying as a result of pregnancy and childbirth has been completed.

We continue to work with a variety of international and national partners. In November 2005 the Royal College of Obstetricians and Gynaecologists (RCOG) International Office was commenced (partners RCOG, LSTM, LATH). In recognition of its wide international membership and conscious of the need to make an urgent contribution to achieving the Millennium Development Goals, the RCOG International Office wishes to provide effective and rapid action to:

- Increase awareness, making 'visible' to politicians, professionals and the public the need for more effective use of knowledge and tools to impact on maternal and neonatal health indicators.
- Strengthening health systems to facilitate the implementation and scale-up of good practice.
- Develop and apply new knowledge gathered through research, which meets local needs and directly informs policy.

In January 2006 The Health Foundation Consortium (THFC) started with The Institute for Health Care Improvement, Liverpool Associates in Tropical Health (LATH), Liverpool School of Tropical Medicine, Women and Children First and the Institute of Child Health, University College London.

The aim of THFC's Programme is to measurably reduce maternal and neonatal morbidity and mortality in Malawi over a period of five years. THFC plans to implement five core activities in three districts – Kasungu, Lilongwe and Salima. These include:

- Quality improvement in health facilities;
- Structured support of maternal and neonatal death audit, both at the facility and community level;
- Community mobilisation through women's groups;
- Improvement in data collection and utilisation to drive improvement both at local and national level;
- Population surveillance to measure maternal and neonatal mortality.

In addition, continued Technical Assistance is given to programmes of work in Nigeria, Pathways to Accessing Health Systems (PATHS), and Kenya Essential Health Services (EHS) through LATH.

A successful Diploma in Reproductive Health course was run from April to July

with 13 students from a variety of countries. The course continues to be well received and aims to give students practical teaching that is relevant to their own working situations. Work is being carried out on a new Masters in International Sexual and Reproductive Health, which it is hoped, will start in September 2007.

Above - Orphan children enjoying their evening meal in Malawi.

Below - Malawian mother and her multiple child responsibilities. In the HIV epidemic few adults are left to care for children.



LATH Celebrates its 20th birthday as it continues to grow

“ Lath will play a major role in a new ground-breaking programme funded by USAID ”

During the year, LATH has continued to grow and now has more than 20 staff in its Liverpool Offices and a workforce of more than 35 people in the developing world. Our client base has diversified to include the World Bank, The Global Alliance for Vaccines and Immunisation (GAVI), USAID, Europe Aid, The Health Foundation, Shell and many more. We have been successful in winning new programmes and establishing new partnerships over the past year. These include the DFID-funded Essential Health Services (EHS) Programme in Kenya, the USAID-funded programme focusing on neglected tropical diseases in some of the world's poorest countries as well as seeing the establishment of the Royal College of Obstetricians and Gynaecologists International Office in Liverpool. We are grateful for, and value the input from, Liverpool School of Tropical Medicine Staff who have made significant contributions in terms of securing these new programmes and partnerships. We have also continued to work successfully with Euro Health Group (EHG), based in Denmark and we were awarded a contract from GAVI for the 6th consecutive year to conduct data quality audits in 5 countries, looking at the accuracy and quality of country recording and reporting systems for immunisation.

One of the highlights of the year was our 20th Anniversary Celebration. To mark the occasion we hosted a dinner dance in Liverpool Town Hall, preceded by a lively round table discussion in the

Council Chambers on the role of international health consultancy over the next 20 years. Key speakers were Dr Paul Sikosana and Dr Richard Pendame, both LATH health systems consultants in Africa; Dr Stewart Tyson, Head of Health, DFID; LSTM colleagues Dr Imelda Bates and Tim Martineau and LATH consultant Monica Burns. After dinner speakers included Jane Newell, widow of Professor Ken Newell the *de facto* founder of LATH 20 years ago.

LATH continued its support to Ministries of Health in Kenya, Malawi and Mozambique in implementing the sector-wide approach (SWAp) to health services, and we are grateful both to hard-pressed Ministry staff in these countries for the opportunity of collaboration and for the hard work and commitment of our talented team of advisers in these countries. In Malawi we are supporting the implementation of the SWAp through providing 14 long-term technical assistants, supported by short-term technical assistance on a needs basis. The long-term technical assistants are all integrated within the Ministry of Health, providing technical support in the

areas of health planning, systems and financing, financial management, procurement, human resource management and development, monitoring and evaluation and scale-up of essential medical laboratory services. These technical assistants provide capacity where there are gaps, and work together with MoH colleagues to achieve the National Programme of Work.

LATH continues to work with Health and Life Science Partnership (HLSP), GRID Consulting, Health Partners International (HPI) and John Hopkins Bloomberg, School of Public Health Centre for Communications Programs (JHUCCP) in supporting health systems strengthening in Nigeria under DFID support to the Partnership for Transforming Health Systems (PATHS) Programme. This is a major programme, now in its 5th year, which has just received an extension that brings the total budget to over £50 million. Our key area of technical input is in ensuring that better quality preventive and curative services are established for the common health problems. The programme is currently operating in selected deprived states across the





Federation. These are Enugu, Ekitit, Jigawa, Kano and Kaduna States. One of the key initiatives that we have been supporting is to improve the quality and coverage of essential laboratory services. LATH's Russell Dacombe, and Drs Imelda Bates and Charles Chavasse from the School have been providing technical support to laboratory systems strengthening in Nigeria for the past 4 years and are now providing a harmonised laboratory training programme across all the PATHS funded States to build long term capacity, and improve laboratory effectiveness.

The DFID-funded Essential Health Services (EHS) Programme in Kenya started in July 2005. The purpose of this programme is "to support the Government of Kenya and the Ministry of Health to provide integrated, effective essential health services in Kenya, particularly for poor women and children". The key components of the programme include supporting the Ministry of Health to develop a SWAp to streamline support for the sector from donor partners and improve co-ordination of programmes; and supporting the Division of Reproductive Health to implement their reproductive health strategy, in particular strengthening maternal and neonatal health outcomes in Nyanza Province.

A base-line survey of all health facilities in the 4 programme Districts was conducted in April this year. The results from this are feeding into the development of a work plan for the target Districts in Nyanza Province.

In September 2005 a Memorandum of Understanding was signed by the Royal

College of Obstetricians and Gynaecologists, LATH and the School to build on existing collaboration in reducing maternal mortality in developing countries, and raise the standard of sexual and reproductive health care worldwide. As a result of this partnership the RCOG International office has been set up in Liverpool with staff based in both the School and LATH (see page 21). In March 2006, as a result of contact between the RCOG and Edna Adan, Minister of Foreign Affairs in Somaliland, the RCOG International Office was invited to undertake a needs assessment of maternal and neonatal health services at the Edna Adan Hospital and Government health facilities. We are hoping that this will lead to more substantial inputs in health systems strengthening in Somaliland.

The RCOG International Office is now providing key inputs into some of our major programmes in Kenya, Nigeria and Malawi which includes The Health Foundation funded Programme in Malawi. This new Programme has a primary focus on reducing maternal and neonatal morbidity and mortality in three districts, through implementing five core activities which include quality improvement in health facilities, maternal and neonatal death audit, community mobilisation, improvement in data collection and utilisation and population surveillance to measure maternal and neonatal mortality.

Finally LATH will play a major role in a new ground-breaking programme funded by USAID at a cost of \$100 million. It will be led by Research Triangle International (RTI), in partnership with LATH, the

Sabin Vaccine Institute, the Schistosomiasis Control Initiative at Imperial College London, and the International Trachoma Initiative. It will focus on the integrated control of seven of the most prevalent neglected tropical diseases which cause severe disability and death in some of the world's poorest countries including onchocerciasis (river blindness), schistosomiasis (snail fever) and lymphatic filariasis (elephantiasis). Drawing on the expertise and networks of the Liverpool School, LATH will provide key technical and managerial staff in Liverpool and Washington to support project implementation. Professor David Molyneux, Senior Project Adviser to LATH and Director of the School's Lymphatic Filariasis Support Centre in Liverpool said, "*It is gratifying that a major donor has at last recognised that for less than thirty pence per person treated annually we can control at least seven diseases in one go*". The programme aims to treat more than 40 million people annually for five years.

Far Left - Laboratory Staff in Kano State Nigeria.

Above - Angela Brown and Professor Jim Dornan, RCOG International Office on a scoping mission to Somaliland.

For **librarian** read Iodestar

“ Helping staff and students to navigate their way through the increasing tide of electronic information ”

The amount of information produced each year is expanding exponentially and by some estimates, electronic information available via the internet is doubling every 12 to 18 months. Library users increasingly rely on electronic resources, in some cases rarely leaving their desks to visit the physical library even in their own institutions. Libraries are, of course, still involved in the provision of these services even if the library user may not be aware of it. The Donald Mason Library, via its links with the University of Liverpool is able to provide access to a wide range of electronic resources such as: *Medline, Web of Knowledge* and many electronic journals such as *Elsevier's Science Direct*.

For Librarians one of the perennial concerns is helping users to navigate their way through this vast range of resources. Once upon a time a user would enter the Library and a librarian would be on hand to assist: perhaps advising the user on how to search a card or sheaf catalogue; which subject headings to choose or in the early days of On-line Public Access Catalogues (OPACs) helping them with Boolean or other techniques to help them broaden or narrow their searches. In the DML, the Library staff enjoy a great deal of contact with the many students who pass through on courses ranging from 3 to 12 months. More widely, librarians have been keen to encourage their patrons to use the internet in their search for information and, like the DML staff, note ways in which their internet search techniques can be improved. Common mistakes are misspelling search terms, entering terms which are too broad, or, in contrast too narrow. On average, it is said that a user

enters 2.3 search terms to a typical Search engine such as Google, which often results in thousands of hits in return. Given that most searchers only look at the top 10 to 20 hits and that they can be affected by the revenue generating practices of the Search engine such as “pay for view” or keyword spamming to give extra high rankings, there is much that information professionals can do to assist users in finding the resources best suited to their needs.

The internet has revolutionised access to information and has led to a greater people-use of resources, but there is still a role for information professionals. They can take a lead in pointing teaching staff and their students towards good quality web resources. One of these is <http://www.intute.ac.uk/>. The resources here are selected according to the key principles of “...quality, consistency, and interoperability.” They can be browsed under subject heading and accessed using standardised keywords. It is one way that information professionals working with subject specialists can help bring order to the chaos!

Computer Services Team

During 2005/06 the Computing Team recruited two new staff members. Since they started it has been a busy year with the establishment of a Help Desk system which has monitored a high number of incoming calls by telephone and e-mail. The number of new staff taken on at the School has definitely had an impact on the Team and it has been necessary to be flexible to adapt to the many demanding IT requirements that people have these days.

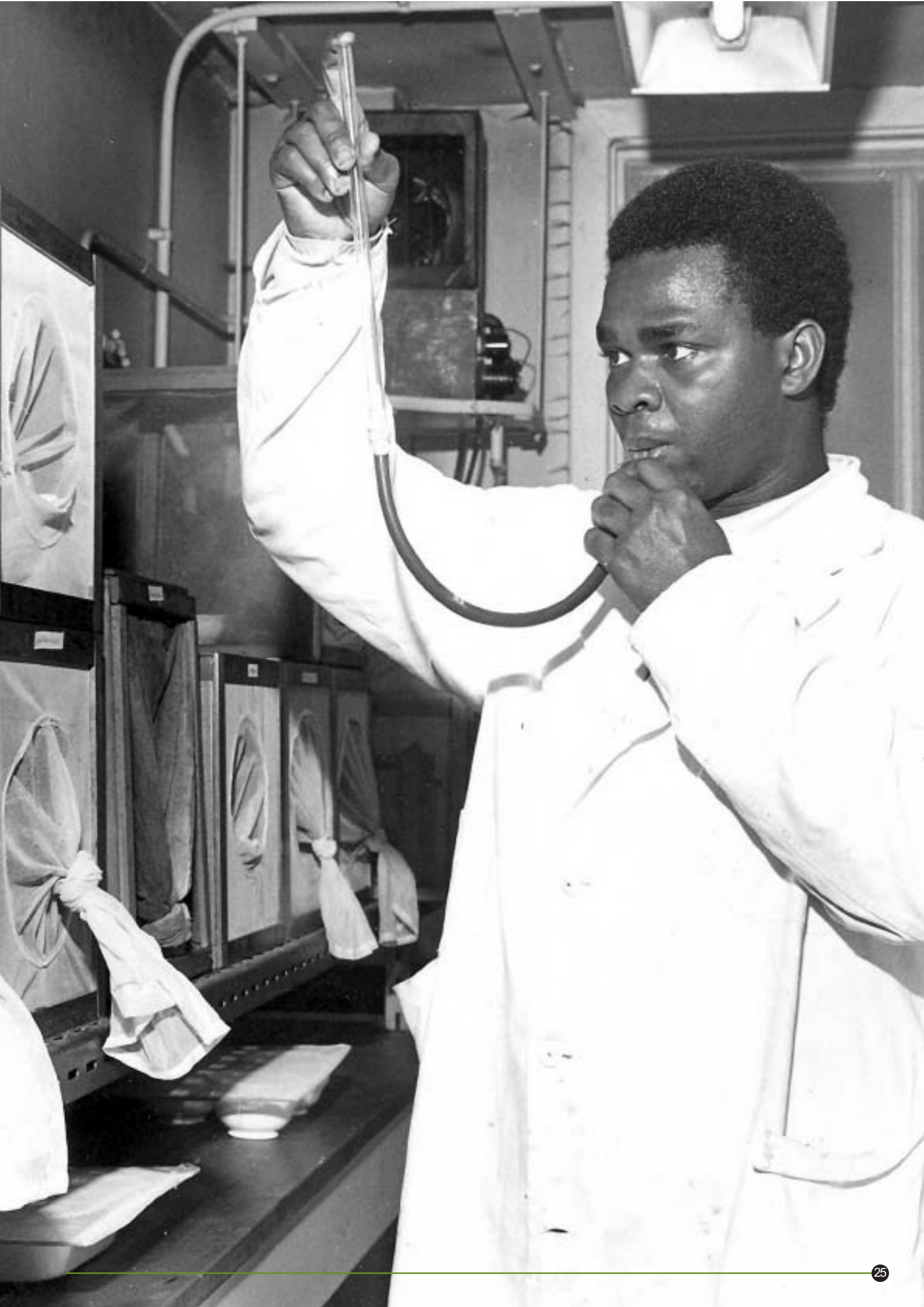
One of the main developments was the move of the Computer Teaching Centre from the Pilkington building and into

refurbished Great Newton Street offices. This was completed in summer 2006 as a temporary answer to the problem of providing facilities for students while the new building work is taking place. The Computer Services Team was relocated at the same time along with the other support services: Finance, Personnel etc. This meant a busy time, establishing the new offices and facing the demands of providing a service remote from most of the main users. The Team has responded in a positive fashion, maintaining its user-friendly service to the School while it is in this vital stage of its development.

Other important areas that the Team has taken the lead in are the redevelopment of the School's web pages and the creation of a staff intranet. In addition, they played an important part in the setting up of the technical aspects of CODA DREAM, the new finance package which has been adopted by the School.

There are no signs of the work-load lessening. With an ever-changing student population, an increase in staff and the probability of IT needs increasing, 2006/07 looks to be another very challenging year.

Right - Dr. B.A. Obiamiwe working in the insectary in 1981, prior to obtaining his Ph.D.



Consortium's Cochrane reviews challenge policy

Systematic reviews and evidence-informed policy and practice are the dhal and rice, the bread and butter, the tinned fish and sago, for the Effective Health Care Research Programme Consortium. Established some years ago, DFID extended their support even further with a three-year grant from April 2005. This means that the Cochrane Infectious Diseases Group, with ground-breaking reviews in a variety of areas, can further improve its technical support and editorial process for people internationally; partners in developing countries have the opportunity to develop their research and development work further; and the Consortium as a whole can build its dissemination capacity.

The Consortium has developed further, with partners at the Christian Medical College in Vellore, where Prathap Tharyan leads the South Asian Cochrane Network with vigour, enthusiasm and good science. Prathap's partners include 8 regional institutions, including the Aga Khan University in Karachi. Mary Ann Lansang, who has led a strong epidemiology group in the College of Medicine in the Philippines, has joined the Consortium. In China, the Consortium is now focusing its work through Chongqing University, which has established a country wide network to help institutions work together.

Systematic reviews are core to the work, and the review with the World Health Organization in treatments for SARS was completed - a massive effort, but produced rather limited evidence of any effects at all. In fact, some treatments appeared to do harm. The Cochrane Infectious Diseases Group manages 77 published reviews and 25 published



Above - Liu Qin, who coordinates the China Network from Chongqing University

protocols. Currently 25 reviews are being updated. A process of "closing" some reviews where little new research is anticipated has been initiated. Staff at the editorial base in Liverpool support 167 authors in 39 countries, and ensure the application of rigorous quality standards. This year saw, at long last, the introduction of a tracking system which allows the team to keep an eye on progress of reviews in an often quite complicated editorial process, and to be able to take action when things are delayed.

DFID has new policies in communicating research findings, and this has helped challenge us further in ensuring that we use formal and informal methods to get our message across. This is not always easy, particularly when Cochrane reviews go against what policy makers want to believe, but the debate is an essential part of the process of influence.

The long awaited WHO malaria treatment guidelines were published and to a large extent followed evidence-based processes and standards that are normal practice in the UK. This was partly helped by efforts from staff in the programme, as many technical staff at WHO are unfamiliar with evidence-based methods for guideline development.

“Cochrane reviews go against what policy makers want to believe”

The late Lord Chan of Oxtou

Michael Chan joined the School in the mid-1970s as a Senior Lecturer in Tropical Paediatrics. His appointment was part of the strategic development of teaching and research activities in tropical paediatrics and he was the first Senior Lecturer within what was then the Department of Tropical Paediatrics. His main areas of interest were neonatology and haematology, and he brought great experience to the teaching of these topics through his earlier research undertaken in Singapore and London. He held a joint appointment as honorary consultant paediatrician at Fazakerley Hospital in Liverpool, specialising in neonatal health.

Michael's activities were always broad-based. As well as acting as a core teacher on the Diploma in Tropical Child Health, he was responsible for developing a number of new paediatric teaching initiatives in India. The Department of Tropical Paediatrics was then engaged regularly in seconding senior staff for short periods to contribute

to and co-ordinate paediatric collaborative teaching with several overseas host institutions. He had particular responsibility for this strategy in Orissa, India where a large programme of both hospital and community child health teaching was developed. This work commenced during the 1980s when maternal and child health was the priority focus of many international organisations, and through Michael's expertise the School was well placed to play a pivotal role in this agenda. His experience in Asia enabled the Department subsequently, under his direction, to host an international course for Senior Indian child health specialists. This brought together a wide cadre of child health practitioners, from primary care doctors to government advisers and ran successfully for several years.

During the early 1990s his responsibilities focused on work in Nigeria, where he played an important role as adviser to the new DFID-funded Women's Health Programme. He was instrumental in facilitating its funding and staffing, and in maintaining its focus on the young adolescent girl who so often, in a developing country situation, is both a mother yet still a child.

His work with ethnic minority groups in Liverpool and elsewhere was recognised nationally with his appointment in 1993 as Director of the UK Government's Ethnic Health Unit in Leeds. At this time he resigned his appointment with the School, but maintained active teaching through an honorary appointment as Professor in Tropical Child Health. His legacy to the School is very considerable and internationally was important by highlighting the importance of integrated child health care, which in the new Millennium has helped foster the whole concept of Integrated Management of Childhood Illness.



New parasitology book for vets

Earlier this year, Dr John McGarry, Senior Experimental Officer in the Veterinary Parasitology Group at the School, and Maggie Fisher a consultant veterinary parasitologist, saw the production of their new book entitled "Focus on Small Animal Parasitology". The book, commissioned by Bayer HealthCare Animal Health of Germany is a unique encyclopaedia of small animal parasites. It covers their identification, epidemiology and zoonotic importance. It features commonly encountered helminths, protozoa and arthropods, and with an increase of the movement of dogs and cats around the world there is a very timely overview of exotic parasitic species that infect these animals. There is a section on the biology of disease vectors, notably the tick species that occurs globally and which are becoming increasingly important in animal and human health. The book contains many high-quality photographs,



pictures and maps to aid parasite identification and their distribution. The book is primarily aimed at veterinary

practices throughout the world, but would be equally helpful for parasitology students.

Above -Present at the book launch in Monheim, Germany, were (L to R): Roswitha Wolff, Publications, Bayer Animal Health; Maggie Fisher, co-author; Dr. Norbert Menke, Bayer HealthCare AG; Dr. John McGarry, co-author, and Anna Nowak, Communications, Bayer Animal Health.

New research centre will become world's premier research facility for translational science

The past year has seen the new Centre for Tropical and Infectious Diseases (CTID) emerge from the drawing board into a four-storey structure that will ultimately be a world class facility of laboratories and research space.

With its sparkling glass frontage, the building will reflect the School's status, not only as a centre of excellence in international tropical health - as it has been for more than a century - but also its current position at the cutting edge of the world's scientific effort to ease the burden of diseases such as malaria on some of the world's poorest people.

The School's vision is that the CTID will become the world's premier research facility for translational science for diseases of the developing world,

As Deputy Director, Professor Steve Ward, explains: "Many academic centres are capable of carrying out world class basic research. However, the translation of basic science into health benefit requires the sort of facilities usually found only in the big pharmaceutical companies. Furthermore, it is accepted that modern day product discovery and development is a technology intensive business, requiring expertise from many different scientific disciplines."

"The School has made significant contributions to health in the tropics from its existing facilities over many decades, but we have known for some time that the School has the potential to make an even greater impact with appropriate resources. The new CTID is the resource at the centre of the School's long-term plans to generate products that will directly improve health in the developing world.

“The CTID is the resource at the centre of the School's long-term plans to generate products that will directly improve health in the developing world.”

The new Centre will house state of the art facilities for post-genomic science, product discovery and product development. The facility will guarantee the retention of the School's best scientists and will attract world class scientists with an interest in translational science to Liverpool from around the globe. The CTID will bring together, under one roof, a multidisciplinary team of scientists with the capability of taking a scientific idea from the molecule to a final product capable of improving health."

Funding bodies in the North West of England have demonstrated their belief in the CTID's potential. Major funding has come from the North West Development Agency and the Government's Objective One office, each of which has given £9m.



CTID facts and figures

- 7,800 square metres over four floors containing laboratories, CAT 3 areas, office and write-up areas
- 1800 square metres of brownfield land brought back into productive use
- 270 temporary construction jobs
- Will support up to 640 new jobs throughout Merseyside
- on course for completion in December, 2007

What will happen in CTID?

- CTID will address global needs in the treatment of infectious and emerging diseases in the following ways:
- New drug design and development - portfolio of antimalarial and TB drugs
- Pesticides and vector control design and development
- Development of clinical trials for new drugs for malaria, TB, HIV
- State of the art cell and molecular biology research into pathogens from discovery to proof of concept
- Postgraduate training

There has been substantial support also from, among others, Liverpool City Council, the University of Liverpool and the Wolfson Foundation.

In addition, the Bill and Melinda Gates Foundation has given the School a grant of 50 million dollars for malaria research, much of which will be carried out in the new building. Research funded by a new £10 million EU grant for new malaria

drugs will also be carried out in the CTID, which will provide training for biotech graduates and establish links with the pharmaceutical industry. The Centre will make the School unique in being the only organisation capable of initiating, validating and trialling new drugs, vaccines and insecticides for diseases such as malaria, AIDS and tuberculosis. Clinical trials will be carried out prior to being transferred to local bio-

manufacturing specialists for commercial production and marketing.

As well as being a major boost for the School and its reputation, the new CTID will put the North West of England region, with its thriving bio-technical industry, at the forefront of research into current and emerging infectious diseases that are threatening world health.



New ventures in Education and Training

The School's Education and Training activities entered an exciting new phase of development in 2005/06. The most significant of these is a complete review and reorganisation of our Master programmes.

The objectives are:

- To develop a new uniform modular framework for LSTM's Master programmes.
- To ensure high quality and effective delivery of postgraduate programmes while maximising student's opportunities for flexible progression through certificate/diploma/master programmes.
- To ensure that programmes are designed within the national qualifications framework and that programme specifications, documentation, design and assessments are consistent across courses and modules.
- To help establish systems, within the School, for reviewing the quality of courses, for incorporating student feedback, for systematic refreshment of courses and for ensuring teaching and assessment is tailored to learning.

The new modular framework will be implemented in the academic year 2007/08 and will provide greater opportunities for linkages across programmes, the development of new programmes and a wider choice for students. Among the new programmes we plan to offer in 2007/08 are an MSc in Sexual and Reproductive Health directed by Dr Nynke van den Broek, and an MSc in Health Systems Management directed by Dr Amir Hassan. These, together with the successful implementation of the MSc in Humanitarian Studies and MSc in Humanitarian Programme Management in 2005/06, represent a significant

diversification in academic programmes offered by the School.

The School continues to support a variety of education and training activities in countries around the world. Over the past year, staff from the School have been actively involved in programmes in Ghana, Libya, Malawi, Nigeria, Sri Lanka, Sudan, Syria and Yemen. A new handbook 'Getting Education Right – First Steps in Quality Assurance for Tutors and Students' has been developed by a team led by Dr Imelda Bates in response to a request from colleagues in Kumasi, Ghana, for a simple guide to ensure that their professional development courses meet international educational standards. The book outlines the principles and practice of education quality assurance, providing practical, jargon-free advice about designing a course that meets international educational standards. The book is now freely available on-line at www.liv.ac.uk/lstm/student/documents/education_handbook.pdf

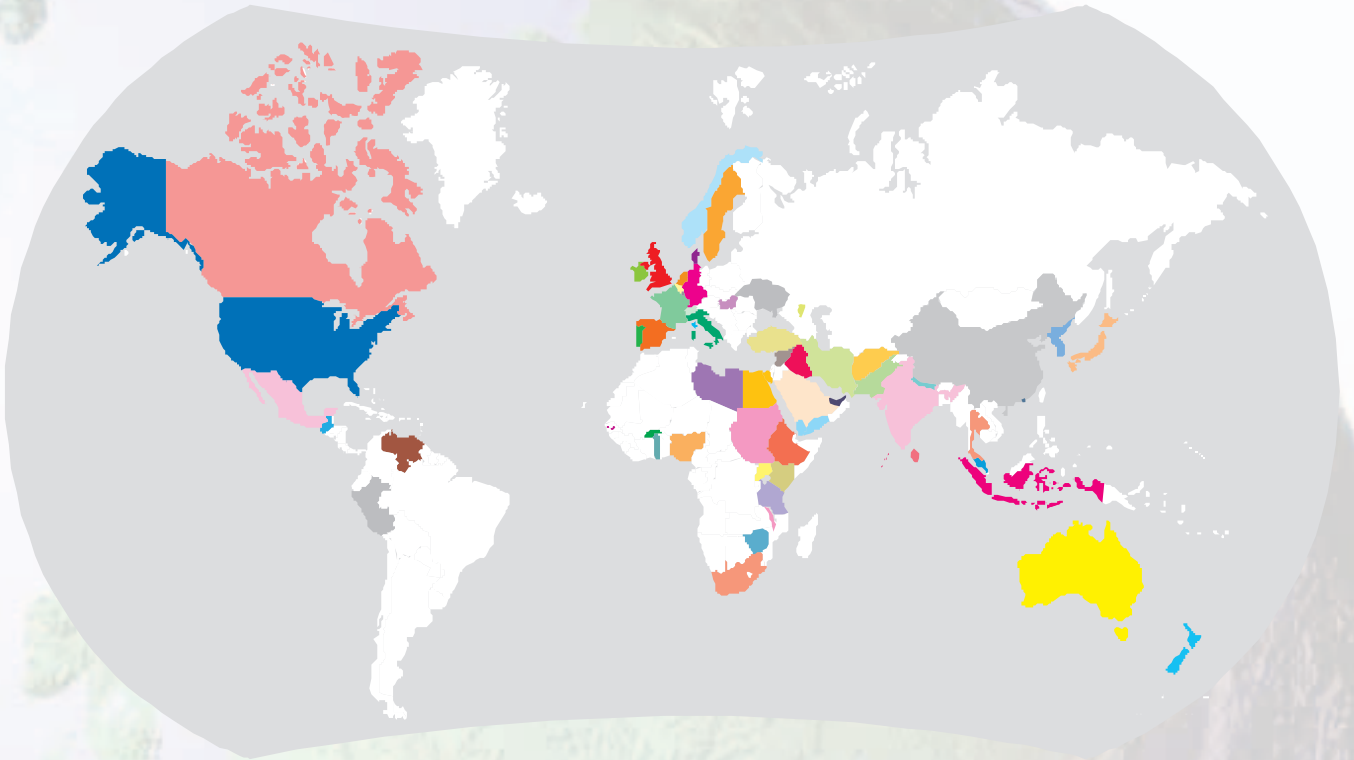
The School is embarking on two exciting new ventures in institutional capacity building in the coming year. Led by Dr Amir Hassan, we are collaborating with King Saud bin Abdulaziz University for Health Sciences, in the Kingdom of Saudi Arabia, to help establish and run a postgraduate School of Public Health. Three major programmes will be offered: Public Health, Health Systems Management and Epidemiology. The Liverpool School has also been contracted by the EU, to establish and run the Centre for Strategic Health Studies (CSHS), in Syria. The Centre includes four institutes: the Institute of Health Systems Management, the Institute of Public Health, the Institute of Demography and Population Studies and the Institute of Health Economics. The core areas of collaboration will be in programme development, curriculum development, staff training, education, research and technical assistance.

During the summer of 2006, the School hosted the European Course in Tropical Epidemiology (ECTE) which was organised by Dr Luis Cuevas, with the administrative support of Ms Pauline Anderson. ECTE is a collaborative venture of 9 European academic institutes. 32 participants attended and lecturers included staff from the London School of Hygiene and Tropical Medicine, the Prince Leopold Institute of Tropical Medicine (Antwerp), the Nordic School of Public Health, Goteborg, Sweden and the Swiss Tropical Institute, and was highly evaluated by participants and visiting lecturers. The course has been held in Liverpool on 2 previous occasions (1989 and 1999).

Dr Ian Marshall, Chair of the Learning and Teaching Committee and L&T Co-ordinator for many years, retired in 2006 (see page 39). With considerable patience and good humour, Ian has ensured that our education and training programmes meet with the highest standards and has helped us to create a fertile environment for the future growth and development of our education and training programmes.

“ the new modular framework will be implemented in the academic year 2007/08 and will provide greater opportunities for linkages across programmes, the development of new programmes and wider choice for students ”

Student Numbers



Afghanistan	2	Japan	2	Switzerland	1
Australia	7	Kenya	7	Syria	1
Belgium	1	Korea	2	Tanzania	6
Burkina Faso	1	Libya	4	Thailand	6
Canada	7	Malawi	14	Turkey	1
Chechnya	1	Malaysia	2	UAE	1
China	3	Maldives	1	Uganda	4
Denmark	2	Mexico	2	UK	122
Egypt	5	Nepal	1	UK/Belgium	1
Ethiopia	3	Netherlands	2	UK/Greece	1
France	3	New Zealand	7	Ukraine	1
Gambia	1	Nigeria	22	USA	17
Germany	35	Norway	17	Yemen	13
Ghana	7	Pakistan	2	Venezuela	1
Guatemala	1	Palastine	1	Zimbabwe	2
Hong Kong	1	Peru	1		
Hungary	1	Portugal	1		
India	1	Saudi Arabia	8		
Indonesia	1	South Africa	1		
Iran	6	Spain	4		
Iraq	2	Sri Lanka	3		
Ireland	5	Sudan	9		
Italy	4	Sweden	1		

Research Grants and Contracts

Dr I Bates

Knofo Anokye Teaching Hospital (KATH)
'Diploma in Project Design and Management Course at KATH' **£28,340**

Bill & Melinda Gates Foundation
'Professional Development Programme for GMP funded and successfully qualified PhD students (PDP)' **£61,500**

Wellcome Trust (supplement)
The safety and efficacy of umbilical cord blood transfusion in severe malarial anaemia in children' **£3,398**

Dr P A Bates

Wellcome Trust (supplement)
'Development & use of sandfly est microarrays to study gene expression in response to *Leishmania* infection' **£2,294**

Dr P A Bates & Dr R J Dillon

Wellcome Trust
'Mechanisms of *Leishmania* attachment in the sand fly vector' **£267,962**

Dr G Biagini

The Leverhulme Trust
'A new drug target against malaria' **£140,521**

Professor A G Craig

Wellcome Trust (supplement)
'Parasitic-host interactions in malaria pathogenesis & transmissions' **£5,296**

Professor P Garner & Dr K Jones

WHO (supplement)
'To carry out a technical update of the medicines library on:
<http://mednet3.who.int/EMlib/>' **£2,530**

Dr S Gordon

American Thoracic Society
'Promoting the development of Pan African Thoracic Society' **£5,395**

Dr R Harrison

Nigerian Government
'Preclinical assays of new anti-venoms for Africa' **£69,924**

Wellcome Trust (supplement)
'Bioinformatic and DNA immunisation strategies to generate neutralising antibodies specific to conserved haemostatis-disruptive toxins in African Viper Venoms' **£6,513**

Dr A A Hassan

The Sudan National Health Insurance Fund 'Postgraduate Diploma Course in Health Systems Management' **USD132,000**

Ministry of Health, Syria
'Postgraduate Diploma Course in Health Systems Management' **£100,000**

Ministry of Public Health & Population, Yemen
'Epidemiology in Action' course **£52,500**

King Saud bin Abdulaziz University for Health Sciences, National Guard Health Affairs, Riyadh, Saudi Arabia
'Institutional Development for the School of Public Health' **£1,100,000**

Dr A A Hassan, Dr I Bates and Dr C Chavasse

Ministry of Public Health & Population, Yemen
'Training Course - Quality Assurance of Laboratory Services for Malaria Diagnostics' **USD50,000**

Dr I Hastings

Swiss Tropical Institute
'Simulation modelling of the epidemiological impact and cost-effectiveness of malaria intervention' **£62,398**

Professor J Hemingway

Bill & Melinda Gates Foundation
'Innovative Vector Control Consortium (IVCC)' **£27,173,913**

Bayer Crop Science (Germany)
'Biological evaluation of K-O TAB 1-2-3' **£18,450**

London School of Hygiene & Tropical Medicine (supplement)
'Gates Malaria Project' **£5,598**

'Addendum: Teaching and Learning Enhancement Project' **£116,910**

Wellcome Trust
'Open Access Publishing for Research Papers' **£10,000**

Dr J Hodgkinson

The Home of Rest for Horses
'Preliminary Phenotypic and Genotypic Characterisation of Moxidectin resistance in the Cyathostominae' **£60,429**

Horserace Betting Levy Board (Supplement)
'The role of beta-tubulin gene mutations in benidazole resistance in cyathostomins' **£56,649**

Dr D Laloo & Dr K Ajdukiewicz

Meningitis Research Foundation
'Randomised controlled trial of Glycerol Adjuvant Therapy in adult bacterial meningitis in Malawi' **£90,390**

Professor M J Lehane

The Royal Society
'Tsetse trypanosome interactions' **£1,040**

Pfizer Animal Health (supplement)
'Field studies in trypanosomiasis vectors' **£10,000**

Wellcome Trust (supplement)
'Tsetse genome wide arrays' **£949**

Dr P McCall

Bill & Melinda Gates Foundation (with T. Mzilahowa)
'Determination of the sources of malaria vectors and effects on malaria risk' **£93,706**

Professor D H Molyneux

GlaxoSmithKline (supplement)
'Lymphatic Filaris Support Centre' **£60,000**

Professor M E Molyneux

Wellcome Trust
'Malawi-Liverpool-Wellcome Trust Clinical Research Programme (MLW): A Tropical Medicine Research Platform' **£2,722,012**

Wellcome Trust (supplement)
'Malarial disease in children' **£211,184**

Dr A Obasi

BMJ Publishing Group
To publish paper on 'Treatment of HIV in Resource-Poor Countries' **£24,941**

Dr T O'Dempsey

Concern Worldwide
'Health and Humanitarian Assistance' **£1,599**

Dr S B Squire

Norwegian Association of Heart & Lung Patients (supplement)
'Extending services to communities (Equi-TB Knowledge Programme)' **£29,808**

Dr S Theobald

Institute of Development Studies
'Research Programme Consortium on Realising Rights: improving sexual and reproductive health for poor and vulnerable populations' **£22,578**

Dr R Tolhurst

European Community
Co-ordination of 'Bringing basic health care to vulnerable – developing equitable and sustainable rural health insurance in China and Vietnam (RHINCAV)'
£1,079,397

Dr R Tolhurst & Dr J Critchley

International Development Research Centre 'Active and Passive Smoking, Chronic Diseases and Poverty in China'
£28,770

Dr F ter Kuile

UBS Optimus Foundation
'IPT post-discharge for children with severe anaemia'
£283,555

Bill & Melinda Gates Foundation (Dr K Phiri re-entry Grant)
'Iron deficiency in a population with high malaria and bacterial infection morbidity'
£88,949

Dr F ter Kuile & Ms J Hill

Bill & Melinda Gates Foundation
'Start-up Activities on Malaria in Pregnancy Working Group'
£180,916

European & Developing Countries Clinical Trials Partnership (EDCTP)
'A North-South working group to support the design integrated research proposals for malaria in pregnancy'
£14,286

Dr F ter Kuile, Ms J Hill & Dr M Boele van Hensbroek

The Netherland-African for Capacity Development & Clinical intervention against poverty related diseases (NACCAP) 'Intermittent Preventive Therapy post discharge (IPTpd) an innovative approach in the prevention of rebound severe malaria anaemia and mortality in young children – COMMAL Programme'
£279,404

Dr N Van den Broek

Royal College of Obstetricians and Gynaecologists (RCOG)
'Reducing maternal mortality in developing countries and to raise the standard of sexual and reproductive health care worldwide'
£462,128

Professor S A Ward

European Community
'Development of New Drugs for the Treatment of Malaria (ANTIMAL)'
£11,904,761

Bill & Melinda Gates Foundation (Dr Standwell Nkhoma re-entry grant)
'An evaluation of molecular markers for *Plasmodium falciparum* in-vitro resistance in anti-malarial drugs'
£90,243

Biotechnology and Biological Sciences Research Council (BBSRC)
'BBSRC Doctoral Training Grant (DTG)'
£216,888

Dr D J L Williams

Novartis Animal Health Inc, Switzerland
'Identifying and characterizing novel antigens of potential use for the development of vaccine against *Neospora caninum* in cattle'
£80,000

Wellcome Trust (supplement)
'Protective Type 1 helper T cell responses induced by *Neospora caninum* infection are detrimental to the maintenance of pregnancy in cattle'
£420

SHARED AWARDS**Mr T Martineau**

European Community
'Health Policy Making in Vietnam, India and China: key determinants and their inter-relationships (HEPVIC)'

Shared with Professor A Green, Nuffield International Health and Development Centre, University of Leeds
£165,673

Dr P McCall

European Community
'Towards successful dengue control'
Shared with Professor C R Bartram, Ruprecht-Karls Universitaet, Heidelberg
£331,001

Dr R Tolhurst

European Community
'Structural hindrances to and promoters of good maternal care in rural China (CHIMACA)'

Shared with Professor E Hemminiki, National Research & Development Centre for Welfare and Health, Finland
£125,665

Dr D J L Williams

European Community
'Design of Effective and sustainable control strategies for LIVER fluke in Europe (DELIVER)'

Shared with Dr J P Arévalo, Universidad de Córdoba, Spain
£316,453

Student Profiles



Charles Ameh was encouraged by his mother, who was a nurse, to become a doctor. He did his initial medical training in Zaria in Northern Nigeria. Like all graduates in his country, he

was then required to do a year of some kind of national service in a different part of the country. In his case, this meant travelling to South East Nigeria to work in a mission hospital in a rural area.

"This was quite challenging because the mission had been left with only one sister who was having a problem running the hospital. I did everything from surgery and paediatrics to obstetrics and gynaecology." Taking on another doctor, he was able to make significant improvements to the

organisation and operation of the medical services at the hospital, developing a special interest in obstetrics and gynaecology.

"I found it so rewarding - after seeing a woman in pain, at the end of the day she and her baby are alive and well. She is happy and her family are happy. As soon as I came back from national service I applied for a residency to do specialist training in obstetrics and gynaecology at a teaching hospital in Zaria."

Having decided to work in public health in the same speciality, Charles enrolled for the School's highly praised Diploma in Reproductive Medicine course, run in conjunction with the Royal College of Obstetricians and Gynaecologists. He was particularly pleased to be one of the students trialling the new Life Saving Skills Manual, launched by the school, RCOG and LATH.

Charles Ameh

"I really believe this manual will save lives where you have midwives and health care workers in rural areas with poor resources. It will teach them the skills to save women who are currently dying in pregnancy from conditions which could be treated or prevented. I have been there when women have been brought into hospital and died because someone has been trying to help them without the equipment or drugs to deal with their problem. Often they come in too late."

Charles feels that by working in public health he will be in a position to bring about change in policies in order to improve the situation and to help train health care workers in the developing world with these life saving skills. The course, he says, has reinforced his ambition. Exchanging experiences with fellow students has given him an insight into the challenges faced by health workers in other parts of Africa and Asia.

Ashok Raman

Ashok Raman grew up in Reading and studied medicine at University Kings College, London. He qualified in 1996 and did his medical training at Addenbrookes Hospital, Cambridge. It was while he was completing his training at Queens Medical Centre, Nottingham, as a specialist registrar in neurology that he decided on a career in that speciality. But always at the back of his mind was the idea that he would one day work abroad.

"While working as a registrar, I became interested in infectious diseases of the nervous system and in particular, the neurological complications of HIV/AIDS. I am also very interested in working and teaching in a developing country."

Although he has been appointed consultant neurologist at Hull Royal Infirmary, Ashok has delayed taking up his post in order to study for the Diploma in Tropical Medicine & Hygiene in preparation for future work in developing countries.

"I have always been drawn towards developing and under-resourced countries and this is the first step in achieving that goal. I would like to be able to teach and to pass on the skills I have been given. It is amazing how many tropical diseases attack the nervous system, causing severe brain dysfunction, for example in some cases of malaria."

During his studies in Liverpool, Ashok has been able to indulge his passion for walking and hill climbing in the easily reached Lake



District and North Wales. He has a twin brother, Vivek, who is also a doctor, working as a radiologist in London.

Kondwani Ngoma

Dr Kondwani Ng'oma of Malawi was encouraged by his father to consider becoming a doctor. "He was a teacher but one of his schoolfriends became a doctor, after studying in Manchester, and is now a prominent physician in Malawi."



Growing up in a rural area, 400 km from Lilongwe, he went from secondary school to the University of Malawi in Zomba to study for a BSc, a prerequisite of anyone wanting to study medicine in Malawi. He then went to the College of Medicine in Blantyre and qualified in 1999. An 18 month internship at Kamuzu Central Hospital, Lilongwe followed. To complete his training he was sent to head a rural district hospital and to be responsible for a number of health centres, combining public health with clinical work.

"Because you did not have the drugs, equipment and basic laboratory testing facilities that you had in the referral hospital you really had to use your brains and clinical acumen - and you had to learn to improvise.

You had to do everything including surgery. "The number one problem was malaria,

along with respiratory diseases and childhood malnutrition. There was also a lot of malaria in children who could have been saved but who were brought in too late to be helped."

Kondwani had decided by now that he wanted to specialise in paediatric medicine and embarked on paediatric training at Queen Elizabeth Hospital in Blantyre. Currently a paediatric registrar at Kamuzu Central Hospital, he has come to the School to study for a Master's in Tropical Paediatrics.

"I have had a lot of experience but this course is putting all that together. It is giving me an international perspective on tropical diseases and giving me the science behind them. I'm hoping that what I learn will help me a lot when I return to Malawi."

Kondwani's wife, Rose, and his two sisters are all nurses in Malawi. His brother is a vet.

Staff Profiles

Team ensures the School gets value for money

One thing that can be said about the purchasing department - it has a varied 'shopping' list, ranging from computers and centrifuges to paper clips and snakes. The office was established just over a year ago to provide a centralised, computerised purchasing service for the School. The team is led by Cathy Harrison, a staff member for 27 years. Cathy spent 24 of those years as a chief technician, firstly in tropical child health and then in parasitology. With experience in both science and purchasing, she became Purchasing Officer three years ago. She says her scientific background is definitely an asset when ordering complex laboratory equipment.

Working with her are purchasing clerks Lynn Abernethy and Steve Revill who joined the School in July, 2005. Lynn was previously involved in purchasing

within the NHS at Liverpool Women's Hospital while Steve gained experience of purchasing and finance at Greenbank College in Liverpool. The team's role is to carry out all purchasing functions for the School including ordering, determining requisitioners' needs, negotiating contracts, obtaining quotes and tenders with suppliers, developing links with purchasing consortia and providing advice and assistance on supplier suitability.

With so much expansion going on, this has been a hectic year, says Cathy. "Purchasing staff have been involved in introducing an interim computerised purchasing system called Sage as well as the CODA dream system which is now in place. Soon we will be involved in purchasing capital equipment for the communal scientific area in the new Centre for Tropical and Infectious Diseases so this is an exciting and busy time for the team, reflecting the growth of the School.

Purchasing Group



Purchasing Group -
l to r: Steve Revill, Cathy Harrison and Lynn Abernethy

"The purchasing system is much more streamlined now," adds Cathy. "Our main brief is to ensure that the School is getting value for money. We also save academic and scientific staff a lot of time by handling the process for them once they have put in their initial order to us via the computer."



IT Group - l to r: Lee Walton, Robbie Prendergast, Julia Martin, Jim Wright and Tom Cowling.

When a computer freezes or refuses to do what it should, technophobes can do only one thing - reach for the phone and speak to a member of the IT team. Calls to its Help Desk now amount to around 400 a month and as the School staff grows this number is like to increase accordingly.

Newly-appointed Information Services Co-ordinator Julia Martin heads the team which includes senior technician Jim Wright, who has been at the School for seven years. New recruits are technicians Robbie Prendergast joining the School from Stanley Casinos Help Desk, Lee Walton from

Carphone Warehouse and web editor Tom Cowling, who has recently graduated from the University of Central Lancashire in web and multi media studies. The library team, made up of Austin Johnson, Cath Coffey and Martin Chapman is also part of Information Services.

A librarian by professional training, Julia joined the School from the Proudman Oceanographic Laboratory at Bidston, where sea levels across the globe are monitored. She was head of information and communications there and worked previously for the University of Liverpool Harold Cohen library and what used to be Liverpool Institute of Higher Education. Her career path from library to IT clearly demonstrates the changing role of information services. From dealing with library users who relied on indexed catalogues and books, she has moved through the enormous transition to internet and electronic journals. She studied early on for an MSc in Technology and Society which helped as her "library" roles became increasingly scientific.

As Julia points out, the IT team has had to be very flexible to adapt to the

IT Group

many, demanding requirements that people have these days. Key roles are helping people throughout the School with computer or printing problems.

The team supports all research groups, the web and the intranet, teaches people how to use new equipment and looks after computer equipment in the laboratories and lecture rooms.

They reveal that some are still computer "illiterate" and that the most frequent call-out fault is caused when users turn off their computers while a floppy disc is still installed. This prevents the machine starting when they next switch it on. With such simple errors causing many of the problems, they are currently preparing a self-help package so that people can go through a check list process before calling them out.

The School's current growth with a flow of new installations, new staff and new equipment means that life is never dull. But team members are rising to the challenge in a flexible and good-natured way - perhaps because people are always so relieved to see them.

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Academic & Academic related Staff 2005 - 2006

Director Professor J Hemingway	Senior Fellows H Townson	Disease Control Strategy Group O Hassall H Howden-Leach A Medina-Lara	Annals of Tropical Paediatrics: International Child Health J B S Coulter V Coulter
Bursar R E Holland	Senior Lecturers G Barnish I Bates P Bates N J Beeching M Boele van Hensbroek M L Chance L Cuevas I G Edwards (joint Pharmacology & Therapeutics) E B Faragher G V Gill (joint Department of Medicine) S B Gordon D Haran I Mackenzie I Marshall T Martineau P J McCall A Obasi T O'Dempsey M J Paine H Ranson S B Squire S Tang F ter Kuile D J L Williams N Van den Broek	International Health Group A Danso-Appiah S Donegan G Gyte K Jones H MacLehose J Raven R Robb H J Smith	Lymphatic Filariasis Support Centre D H Molyneux L Bluett J Fahy H Frazer
Professors		Molecular & Biochemical Parasitology Group J B Alexander M Bates G Biagini S J Chakravorty R Dillon N Fisher J Garnvwa R Harrison R Hughes K L Johnston R S Langley G D Laing L Ochola J E Salcedo Sora M Sant' Anna P Stocks T Szestak J Turner S Wagstaff R Wilson Y Wu	Liverpool Associates in Tropical Health J McCullough G Afenyadu A Brown R Dacombe V Doyle D Freeman A Honor E Kelly L Silvester E Worrall
Professor of Molecular Entomology and Parasitology M J Lehane		Vector Group N Hawkes A Lenhart C Strode C Wondji	Innovative Vector Control Consortium J Hemingway L Byrne M Coleman A Dowd T McLean J Moore E Morou P Muller D Nikou M Paine P Pignatelli H Ranson R Sloss R Smith E L Warr D Weetman C Wilding
Professor of Tropical Paediatrics B J Brabin		Veterinary Parasitology Group C Guy S Lake C McCann J McGarry B Makepeace R Norton A Rosbottom J Y Sloane	Wellcome Trust Tropical Centre M E Molyneux S M Graham P Shephard
Professor of Molecular Parasitology A G Craig (joint Pharmacology & Therapeutics)	Lecturers K Abba K Bristow M Donnelly L Ford A A Hassan I Hastings J E Hodgkinson J Hofman X Liu R Sinfield S Theobald R Tolhurst Y Wang		
Professor of International Health P Garner	Research Staff		
Alfred Jones and Warrington Yorke Professor of Tropical Medicine <i>Vacant</i>	Clinical Group J W Bailey P Collini J Komrower R Parks A Ramsay N Swann R Thomson		
Middlemass Hunt Professor of International Community Health A Kroeger		Head, Information Services J Martin	
Professor of Tropical Health Sciences D H Molyneux		Head, Dagnall Teaching Laboratory C Chavasse	
Professor of Clinical Tropical Medicine M E Molyneux		Annals of Tropical Medicine & Parasitology K R Wallbanks	
Selwyn-Lloyd Professor of Medical Entomology <i>Vacant</i>	Child & Reproductive Health Group A Delpisheh J Hill S Povall E Savory D J Terlouw M A Yassin		
Professor of Veterinary Parasitology A J Trees			
Walter Myers Professor of Parasitology S A Ward			
Professor of Tropical Child Health <i>Vacant</i>			
Readers P G Bray D G Laloo			
Reader and Senior Wellcome Trust Research Fellow in Basic Biomedical Science M J Taylor			

Highlights

The 2006 Leverhulme Lecture

Peter Hotez, Professor and Chair of the Department of Microbiology and Tropical Medicine at The George Washington University, Washington, D.C., USA delivered the Leverhulme Lecture in May this year. His talk was entitled "The Neglected Tropical Diseases - New Tools and New Promise for Their Control"

The neglected tropical diseases, which include Leishmaniasis (Kala-azar), African Trypanosomiasis (Sleeping Sickness), Chagas Disease, Ascariasis, Trichuriasis, Hookworm infections, Lymphatic Filariasis (Elephantiasis), Onchocerciasis (River Blindness), Schistosomiasis, Dracunculiasis (Guinea Worm), Leprosy, Trachoma and Buruli Ulcer, are receiving more and more attention thanks to the efforts of Professor Hotez and his colleagues, of whom Professor David Molyneux is a close friend and collaborator. These 13 parasitic and bacterial diseases, of



mainly rural areas of low income countries, are disabling and deforming, and are associated with intense social stigma. They do not receive the global attention that "The Big 3" (HIV/AIDS, TB & Malaria) receive.

Professor Hotez is well qualified to present this subject, as his major research and academic interests are in the area of vaccine development for neglected tropical diseases, and the role of vaccines in international diplomacy.

In discussion before his Lecture Professor Peter Hotez (standing) with (l to r) Professors Janet Hemingway and Herbert Gilles and Dr. Lorenzo Savioli.

In 2000 he left Yale University, where he had been for 12 years, and relocated to The George Washington University to establish a new academic department devoted to infectious disease problems in developing countries.

The School's long-standing links with Thailand lead to Royal visit

A visit to the School by HRH Crown Princess Sirindhorn of Thailand proved a memorable day for staff and students, including some from her own country.

Her Royal Highness spoke of the special relationship between the School and Thailand, dating back to 1960 and, following an exchange of staff and students over several years, Professor Brian Maegraith, the School's Dean from 1946 to 1975, helped found the Faculty of Tropical Medicine in Mahidol University, Bangkok. Professor Chamlong Harinasuta, a former student at the School, was its first Dean. Professor Maegraith later received an honorary doctorate from the King of Thailand in recognition of his contribution to the study of tropical medicine in Thailand. He was also invested with the Order of the White Elephant by the King.

During a series of presentations to the Royal party, demonstrating the School's wide range of research and teaching activities, Director Professor Janet Hemingway, spoke of her own longstanding links with Thailand. She described the School's many research collaborations with Thailand in fields such as HIV, malaria, dengue fever and snakebite and added that having collaborated with colleagues in Thailand for the latter half of the 20th century, the School was considering how this collaboration could best continue for the next 100 years.

Current links between the School's Alistair Reid Venom Research Unit and Mahidol University include research into snakebite treatment, which mainly affects the rural poor, mostly children and agricultural workers. The Royal party met members of the Unit and heard how its collaboration with the Thai Red Cross had resulted in snake-bite treatments. The Unit is also working with Chulalongkorn University in Bangkok. The Royal tour of the School included a visit to the Hemingway Laboratory and

the Dagnall Teaching Laboratory for demonstrations on mosquitoes and information about diseases affecting South East Asia, including malaria, Japanese encephalitis and dengue fever.

Among those meeting the Crown Princess were two collaborators from Thailand who were working at the School, Ms Kobkan Kanjanopas of the Thailand Ministry of Health and Dr Yuwadee Trongtoki from Mahidol University.



Dr. Gavin Laing shows HRH Princess Sirindhorn of Thailand venomous snakes during her tour of the School

Highlights

It is not often that “non-medical” professionals are elected to the prestigious Royal College of Physicians. However, the School is proud to report that Professor David Molyneux was elected to an Honorary Fellowship of the College. Pictured front row, second from right, David was formerly Director of the School and, since 2000, has directed the School’s Lymphatic Filariasis Support Centre funded by the Department for International Development and GlaxoSmithKline (update on page 16).



The Centre is a key partner in the Global Alliance to Eliminate Lymphatic Filariasis (GAELF). Among its many diverse activities to support the Global Programme to Eliminate Lymphatic Filariasis the Centre works closely with the endemic countries and its many diverse partners. At the bi-annual GAELF meeting held in Fiji earlier this year David was elected Executive Secretary of the Executive Group which aims to raise the awareness of the disease, the profile of the programme and advocates for the support needed to achieve elimination. The Centre, on behalf of the School, also acts as the Secretariat of the Global Alliance.

David’s interest in working in the field of tropical medicine was established very early on in his career. He has worked on many different parasitic diseases and insect vectors, becoming a recognised expert in medical parasitology. He has, on many occasions, acted as an adviser/consultant to international organizations. Although David’s current position is focused on lymphatic filariasis he has a keen interest in raising the profile of the whole package of “neglected tropical diseases” which, in addition to lymphatic filariasis, includes onchocerciasis, schistosomiasis, soil transmitted helminths and trachoma.

This year he edited and contributed to a major 662 page book on the Control of Human Parasitic Diseases published by Academic Press which included chapters by School staff on malaria and bednets.

David was nominated for this award by Emeritus Professor Herbert Gilles, a former Dean of the School, who believed that his work and commitment over many years to tropical medicine has been outstanding and worthy of recognition. A belief that was recognised and endorsed by the award of the Honorary Fellowship.

Ian Marshall, who has retired as Education and Training Co-ordinator and Senior Lecturer, has clearly enjoyed his time at the School - he reckons that, during the past 31 years, he has driven the equivalent of 20 times round the world to get here from his Cheshire home.

He arrived at the School in September, 1975 from Cardiff University where he worked as a post-doctoral parasitologist with a small team investigating the reproductive biology of schistosomes. Having previously completed a PhD in Marine Parasitology, Ian’s time in Cardiff introduced him to parasites of medical importance, leading to a post in Liverpool. During his three decades at the School, he gradually moved away from research to specialise in education and training, playing a major role in development of postgraduate training in both the Faculty of Medicine and the School.

He stresses that he is very grateful to the School for the fantastic opportunity to visit and work with colleagues in many countries. “Even a glimpse at so many different cultures, lifestyles and attitudes has been a really interesting and fulfilling experience,” says Ian. “I have been to many parts of Africa and, more recently, Asia, developing friendships and academic links along the way. I would certainly like to continue extending that kind of collaboration.”

That last sentence indicates that Ian has no intention of retiring in the true sense of the word, rather looking for a change in direction and lifestyle. He hopes to continue to teach at the School and elsewhere, and will be happy to be able to put his extensive experience in the development and monitoring of training programmes to good use, both at home and overseas.

“It will be a wrench to leave the School as it has been a big part of my life and I

feel great loyalty to the institution and gratitude for the opportunities it has provided, but there are other things I need to do now,” says Ian. For example, he hopes to spend far more time with his Spanish wife Ana, and his son Ian Enrique, who now live in Spain and his beautiful Macclesfield garden is another aspect of his life that deserves far more attention than it has been getting of late.



Dr. Ian Marshall receiving colleagues’ good wishes from Professor Janet Hemingway

Highlights

Spreading the word about the School's work becomes an art form

Students from a Liverpool city centre college are drawing attention to the emerging CTID building with their colourful artwork for the site's hoardings, bringing a tropical touch to the downtown site.

Design and Build Contractor Shepherd Construction commissioned the artwork as part of its policy of involving local communities in major projects. Approaches were made to Liverpool Community College, where students took up the challenge of learning something about the School's many activities around the world, and the research that will be carried out in the new centre. They then produced artwork to illustrate it. They quickly picked up on the threat to health caused by the mosquito which features prominently in their work, along with other insects, microscopes, syringes and the students' interpretations of harmful bacteria and viruses. A large clock is included in one illustration, symbolising that saving lives in the tropics is often a race against time.

Art tutor Paul Gatenby said the students were delighted to be given a chance to experience working at a professional level, and had responded with great enthusiasm and creativity. "It's a terrific showcase for the college to work on a public display and in association with such a renowned institution as the Liverpool School of Tropical Medicine."

Director, Professor Janet Hemingway said that the project was a great way of getting people thinking about the

importance of the work that will be undertaken in the new building.

Gail Gillatt, Marketing Manager for Shepherd Construction said: "Working alongside the communities where we build is very important to us. This is the third project we have undertaken with students at Liverpool Community College. We hope that we have given them some valuable hands-on experience of working in industry."



Prestigious Fellowship Award

School Director, Professor Janet Hemingway was elected a Fellow of the prestigious Academy of Medical Sciences at a ceremony which took place at the Royal Society in June, 2006. The Academy's 800 fellows are considered to be the UK's leading medical scientists. They are drawn from laboratory science, clinical academic medicine, veterinary science, dentistry, medical and nursing care and other professions allied to medical science.

Fellows are selected primarily for their exceptional contribution to the advancement of science either in the

form of original discovery or of sustained contribution to scholarship, or for the application of existing scientific knowledge or understanding in an innovative way, so as to bring about advances in human health and welfare. The Academy aims to promote advances in medical science so that progress translates as quickly as possible into healthcare policy.



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