tropical

LSTM
LIVERPOOL SCHOOL
OF TROPICAL MEDICINE

IVCC begins phase two

2011-2012 issue

Diploma in Humanitarian Assistance

February - April 2012

Further information and application forms are available from the Programme Administrator

Tel: + 44 (0)151 705 3321 **Email: LSTMRegistry@liv.ac.uk**

Contents

Evidence Aid, helping people make health decisions in crisis situations

Evidence Aid is an online collection of research summaries set up by The Cochrane Collaboration as a free resource for people and organisations who plan for and respond to natural disasters and major health care emergencies.

The collections of evidence-based research are tailored specifically to individual disasters; the first one was created in response to the devastating tsunami in the Indian Ocean in December 2004. More recently, collections have been produced for this year's Japanese earthquake and tsunami, the Haiti earthquake in January 2010 and the floods in Pakistan later that year. The Effective Health Care Research Consortium, funded by the Department for International Development (DFID) and co-ordinated from the International Health Group at LSTM contributes to the project by providing Systematic Reviews produced by the Cochrane Infectious Diseases Group and Evidence Update summaries across a range of health topics.

Evidence Aid seeks to highlight which interventions work, which don't work, which need more research, and which, no matter how well meaning, might be harmful; and to provide this information to agencies and people planning for, or responding to, disasters. Up to now, it has focused on health care but it is expanding to provide evidence across a wider range of challenges such as shelter, communication, construction, education, security and support for displaced people.

Evidence Aid has three main elements. The first provides an urgent response to the potential requirements for research summaries in the short-term just after the event, by bundling together very brief summaries of the findings of systematic reviews relevant to, for example, managing injuries. The second provides a context specific resource for the evidence needs that arise during the subsequent weeks and months particular to the circumstances of the disaster - such as the cholera outbreak in Haiti. These collections aim to help planning for disaster risk reduction and alleviating the impact of a disaster. Finally, the third element is a process to gather information about the need for evidence and to seek to ensure that this need is met through up-to-date systematic reviews of the relevant research.

Mike Clarke, Director of All-Ireland Hub for Trials Methodology Research and, until March 2011, Director of the UK Cochrane Centre says, 'The Cochrane Collaboration has been around now for more than 15 years, trying to help people make better decisions about health care through the production of systematic reviews. Evidence Aid provides a way to target this type of information at the enormous challenges raised by natural disasters such as tsunamis, earthquakes and floods. It's about giving people the evidence they need so that the response to those disasters can be as effective, efficient and beneficial as possible'.

To find out more about Evidence Aid, go to **www.EvidenceAid.org**

Expeditions and a research outpost

In 1905 LSTM sent two doctors, Wolferstan Thomas and Anton Breinl on an expedition (LSTM's 15th) to the Amazon basin to conduct research into yellow fever. Before long Dr Breinl contracted the disease and returned home. Dr Thomas stayed to continue the research and established LSTM's Yellow Fever Research Laboratory in Manaos (now called Manaus). The outpost gave LSTM a foothold in an important region of the world for research into tropical diseases.

Thanks to a £750 grant from the Booth Steamship Company in 1919, LSTM was able to recruit three research assistants, Dr Burnie, Dr C J Young and Dr Gordon, to work alongside Dr Thomas at the laboratory. Writing to his sister in 1921, Dr Rupert Montgomery Gordon said: 'one's only hope is to keep on piling together little scraps of information and then sit juggling them round in the hope that someday they may suddenly slide into position and present as clean a picture as a jigsaw puzzle.' By 1922 the funding from the Steamship Company had ended and the laboratory was dependent upon locally appointed research assistants. This arrangement continued until Dr Thomas's death in 1931, when LSTM handed control of the laboratory over to municipal authorities in Manaus.

In addition to his work at the laboratory Dr Thomas acted as Pathologist to the Santa Casa Hospital in Manaus, carrying out pathological work for federal, state and municipal authorities. Dr Thomas's commitment to helping local people and his role as researcher, doctor, pathologist and humanitarian was acknowledged by the people of Manaus, who dedicated a memorial hospital 'Asil Doutour Thomas' in his honour.

In 1970 following a visit to LSTM by Professor Lobato Paranese, Director of Biological Sciences, University of Brazil, stronger contacts were made with Brazilian scientific organisations. Strengthened further by Professor Peter's tour of important medical centres including the Wellcome Leishmaniasis Field Unit. Throughout the 1970s an exchange of staff bolstered research and teaching both at LSTM and the University of Brazil.

Re-emergence leishmaniasis

Today, leishmaniasis, a disease caused by a protozoan parasite that is spread by the female phlebotomine sand fly, continues to threaten 350 million people in some 88 countries. Visceral leishmaniasis (also known as kala-azar) is the most dangerous of the three manifestations of disease caused by the Leishmania parasite because the parasite migrates into the vital organs.

Over the past twenty years in Brazil visceral leishmaniasis has been re-emerging in some districts, encouraged by expanding populations, with some living in overcrowded conditions with inadequate housing and sanitary facilities.

The urbanization of visceral leishmaniasis in Brazil has been related to environmental changes, migration, interaction and spread of sylvatic reservoirs and infected dogs to areas with no transmission, and adaptation of the vector *Lutzomyia longipalpis* to the peridomiciliary environment. From 1980 to 2005, Brazil recorded 59,129 cases of visceral leishmaniasis, 82.5% of which in the Northeast region. Visceral leishmaniasis gradually spread to other regions of the country: in 1998 these other regions reported 15% of all cases, but by 2005 this proportion had

Focus on: Braz

of visceral

increased to 44%. From 1998 to 2005, indigenous cases were reported in 1,904 different municipalities of the country (34.2%). Reservoir and vector control pose major challenges for disease control, since there is a need for better knowledge of vector behavior in urban areas, and control activities involve high operational costs. In recent years the Brazilian Ministry of Health has supported research on the laboratory diagnosis of infection and disease in humans and dogs, treatment of patients, evaluation of the effectiveness of control strategies, and development of new technologies that could contribute to the surveillance and control of visceral leishmaniasis in the country.

Keeping domestic animals such as dogs, chickens, and horses in the back yard provides an abundance of blood meals for sand fly vectors and raises vector population densities dramatically. LSTM is working with the University of Piauí in Teresina, North East Brazil.

LSTM's collaboration with Fundação Oswaldo Cruz, a scientific institution for research and development in biomedical sciences located in Rio de Janeiro, Brazil, is examining Sand fly-*Leishmania* interactions with the intention of developing new vector control strategies.

Control of Malaria in Pregnancy in Latin America

Based on available knowledge of malaria in pregnancy (MiP) in areas with high and stable malaria transmission in sub-Saharan Africa, WHO developed guidelines for safe, effective interventions for pregnant women for this region. These include a combination of intermittent preventive treatment (IPTp), insecticide-treated mosquito nets, and prompt case management of febrile illness. No such recommendations are available for areas with much lower stable and unstable malaria transmission levels and/or higher risk of *P. vivax* infection such as the Latin American region, as there is little or no specific data on the burden of malaria during pregnancy or the impact and applicability of preventive interventions. This severely limits the development of optimal evidence-based policies and programmatic recommendations for this region.

Led by LSTM, the MiP Consortium is conducting a facility-based cohort observational study in pregnant women in three malaria endemic countries in Latin America: Guatemala, Colombia and Brazil. The study aims to describe the epidemiological and clinical features of vivax and falciparum malaria in pregnancy in areas of low malaria endemicity and/or predominantly *P. vivax* endemic areas. In addition, studies will determine if there are pregnancy-specific *P. vivax* and *P. falciparum* immune responses and characterize the genotypes and phenotypes of the parasites in the placenta.

Data collected by the MiP Consortium on the prevalence and incidence of malaria infection during pregnancy will be essential to guide future control policies. If the incidence and prevalence of malaria infection in Latin America is low, current preventive strategies could be replaced with more cost-effective approaches such as intermittent screening and treatment in pregnancy (ISTp). In ISTp, pregnant women are screened for malaria parasitemia at each antenatal visit with either rapid diagnostic tests (RDTs) or blood smears. Treatment for malaria would be provided only if the test is positive. This would limit unnecessary exposure of pregnant women (and their foetuses) to antimalarial drugs, and thus avoid potential risks. Therefore, the findings from the current study assessing the burden of disease will help to inform strategic approaches to prevention of MiP, as well as document the clinical impact of these infections in the region.

www.mip-consortium.org

LSTM Alumni – A relationship that keeps on growing

As many of our Alumni will know, we are communicating much more with them through the Alumni E-newsletter, which we hope you are all enjoying. We have had great feedback and we are thrilled at the way our Alumni are engaging with us.

Last year we asked our Alumni if they could help us with international projects for our current MSc students. We greatly appreciated receiving some fantastic projects and our students took the opportunity to complete some of these. We shall continue this activity and ask our Alumni to submit possible projects for the 2011/12 students.

Whilst communicating and keeping in touch is great, we really want our students and Alumni to know that coming to LSTM is about starting a relationship which we hope will continue long after you have left our doors.

Following on from this, we engaged in a short survey to see how our Alumni feel about us now they are working around the world and we received the following results:

- 74% feel that studying at LSTM provides opportunities that they wouldn't have got elsewhere.
- 82% feel that LSTM encouraged them to continue studying or beginning work in their respective fields.
- 67% feel that studying at LSTM improved their chances of securing a job or research programme.
- 84% of our Alumni feel a sense of pride in belonging to LSTM.
- 88% rate our teaching as Very Good or Excellent

Thank you to all our Alumni who took the time to complete the questionnaire.

Quotes

"*The collection of specialists cannot be found anywhere else, and the experience and enthusiasm these people have for their subject is what makes LSTM unique.*"

"*The no-nonsense hands on approach, combined with excellent teaching from people with both knowledge and experience. They're looking for real answers to real questions, I think LSTM offers something that you don't find in many academic schools.*"

"The broad overview of clinical tropical medicine and wider perspective of public health and epidemiology was invaluable in my later work."

Diploma in Tropical Nursing

Back by popular demand! What do you do when potential students keep requesting a course which was cancelled some time ago..... you bring it back! The Diploma in Tropical Nursing has been rebooted for 2011.

This course is designed by nurses who are lecturers at LSTM and hold extensive international experience of working in developing countries. It is the ideal culmination of what you really need to know before working overseas. It also utilises the fantastic wealth of expert knowledge here at LSTM to give the nurses real insight into disease, treatment and care of patients in challenging conditions.

The course provides a wide knowledge base, incorporating laboratory work, clinical aspects of infectious diseases (something of a speciality here!), child health, sexual health, neglected tropical diseases, non-communicable diseases as well as professional topics.

We hope this course will prove successful and develop into a mainstay of the teaching portfolio here at LSTM. For further details, please see the Diploma Tropical Nursing webpage within the Learning & Teaching area of the website –

www.lstmliverpool.ac.uk

Gender, Equity and Health

How a person's gender affects their healthcare has been the subject of a number of studies at LSTM and a continual factor in the delivery and management of healthcare in some developing countries. To mark International Women's Day 2011, three women from LSTM highlight work involving gender, equity and health.

Eleanor MacPherson
PhD student

Over the past 20 years, HIV/AIDS has had a devastating impact on the lives of millions of people around the world. In Southern Africa women have borne the brunt of the epidemic. They are now more likely to become HIV positive than men and the most likely to care for family members when they get sick with HIV.

Socioeconomic factors such as poverty and inequality continue to shape who gets sick and why some people are more susceptible to becoming sick than others. Power relations also shape who is able to access health care with women in developing countries having less power in the decision making around accessing health care for themselves and their children.

The fishing industry in Malawi is highly gendered. Men almost exclusively carry out fishing, whereas women tend to process, dry and sell the fish. Recent research has shown that people working in the fishing industry in developing counties are particularly vulnerable to HIV. They often live in geographically isolated areas with little access to health care. My PhD research is concerned with understanding why men and women living in fishing communities in Southern Malawi are so vulnerable to HIV. In particular it is investigating how women's social and economic position in this context can make them vulnerable to HIV.

Growing up in a feminist household I have always been interested in issues of social justice and particularly women's rights. I believe access to health care is a basic human right which nobody male or female should be denied.

Dr Rachel Tolhurst
Lecturer in Social Science and International Health

In international health programming we need to understand and address the way that women's and men's roles and relations affect their health and healthcare needs. In my work I draw on my social science background, and my long-standing commitment to women's rights. I work closely with Dr Sally Theobald and other staff in the International Health Group and across LSTM, through the Gender and Health Group, to provide research evidence for governments and organisations to promote greater gender equality in health, a process often known as gender mainstreaming.

Our approach involves promoting women's and girls' rights and access to services, but also working with men to achieve this and meet their own needs. Examples include our recent organisation of a seminar series that brought together practitioners, advocates and researchers from 15 countries to discuss the achievements and challenges facing us in gender mainstreaming. Disseminating our conclusions should help others in this work.

We are also developing a body of research with international partners aimed at better understanding how to help women and men change the way they negotiate sexual relationships to prevent HIV/AIDS. A project funded by UNIAIDS in Uganda will look at the specific challenges for older women and men in preventing HIV/AIDS and how these can be addressed. Another current piece of work involves conducting a review of the current evidence about how aspects of gender, such as women's autonomy, decision making power and access to resources, and men's roles, affect young children's health and survival. This review will be used to develop advice for UNICEF country officers about how to understand and address these issues in their programming.

Dr Nynke van den Broek
Head of LSTM's Maternal and Newborn Health Unit

Each year an estimated 360,000 women die from complications of pregnancy and childbirth. Many more survive but will suffer ill health and disability as a result of these complications. In addition an estimated 4 million neonatal deaths and a similar number of stillbirths occur each year accounting for almost 40% of all deaths under 5 years. More than 95% of all these deaths in mothers and babies occur in Asia and sub-Saharan Africa.

I am an Obstetrician Gynaecologist with over 25 years experience of working in developing countries and Head of the Maternal and Newborn Health Unit at the LSTM where I lead a team of 15 committed and enthusiastic staff who come from a variety of countries and back grounds. Our work focuses on women and their new born babies, trying to ensure that all women have skilled birth care.

Often the type of care women receive is of a very poor quality and we have developed a set of tools to improve quality of care and training packages to ensure the care that health care providers give is effective, timely and is more women and baby friendly.

Working closely with governments and organisations like the World Health Organization, UNICEF, the UK Department for International Development (UKAid) and the Royal College of Obstetricians & Gynaecologists, we help identify which interventions are most effective and how these can be provided. Our current work focuses on research which evaluates the effect of implementation of the identified individual interventions or 'packages of interventions' to see if these really make a difference and save lives. This is an exciting area of new research.

Building capacity to utilise the increasing funding for NTD control in post conflict countries

Acknowledgement by donors of the value of addressing a group of neglected tropical diseases (NTD) has been unparalleled and this recognition has been matched by substantial financial support and donated drugs.

This funding has come from several sources: The UK Department for International Development (DFID), a long term funder of onchocerciasis and lymphatic filariasis programmes, agreed a further £50m in 2008. USAID initial commitment of $100m was increased in 2010 to $450m over the next five years, and the Gates Foundation had already approved more than $100m. This funding has been supplemented by drug donations from Merck & Co. Inc., GlaxoSmithKline, and Pfizer.

In 2000, the WHO Global Programme to Eliminate Lymphatic Filariasis (GPELF) launched programmes in 3 countries. Today 53 of the 81 lymphatic filariasis (LF) endemic countries have implementation programmes, a number of which are now reporting no transmission and are entering a surveillance phase prior to elimination certification. Although recognised as the fastest growing elimination programme, of those countries remaining to launch programmes, 60% of them are in Africa and are mostly post-conflict countries. These countries present a greater challenge to launch and sustain, not just an LF programme, but an integrated NTD programme.

Post-conflict countries have many challenges including poor infrastructure, limited health facilities, human resource capacity and financial resources. In the earlier years of LF and expanded NTD programmes support has been focused on the "low-hanging-fruit" countries, those which are considered able to accommodate elimination/control programmes into Ministry of Health and its health systems

To address the need for support in post-conflict countries the LSTM's Centre for Neglected Tropical Diseases, supported by DFID, since 2000, has recently expanded its activities to include the launch of LF elimination programmes and laboratory support in five post-conflict countries: Democratic Republic of Congo (DRC), Ethiopia, Guinea, Liberia and Sierra Leone.

The Centre is working to launch programmes in these countries with NGDO partners, Ministries of Health and donors. In DRC, the LF programme will be launched in collaboration with Research Triangle International (USAID funded), who are also supporting other NTD programmes. The Ethiopia LF programme is being extended to additional districts, supported by CBM, an international NGDO, and will build on existing Carter Center onchocerciasis and LF implementation activity. In Guinea, efforts to launch a national NTD programme have already begun, working in collaboration with Helen Keller International. As well as launching a Liberian LF programme, the Centre is also a key part of a DFID funded consortium (along with Imperial College's Schistosomiasis Control Initiative and Liverpool Associates in Tropical Health) tackling schistosomiasis and soil transmitted helminths in school age children. Operational research is also exploring whether LF implementation is required in Monrovia and what impact current vector control is having on transmission.

As well as direct country programmes, the Centre also supports a number of PhD students, three of whom are from post-conflict countries – two from Sierra Leone, and one from Liberia who is also one of the Centre's PhD sponsored fellows.

Professor Moses Bockarie during the filming of a stage debate on Other Diseases of the Millennium Development Goals

Supporting Research Leaders in sub-Saharan Africa.

Professor Moses Bockarie, the Director of the Centre for Neglected Tropical Diseases has won a prestigious Medical Research Council/Department for International Development African Research Leadership Award. Through this collaborative award Professor Bockarie will work jointly with Professor John Gyapong of the University of Ghana and other Ghanaian colleagues to refine strategies through research and provide mentoring to emerging key scientists to develop their full potential.

John Gyapong is Professor of Epidemiology in the Ghana School of Public Health, a position which offers the opportunity to build a team of motivated multi-disciplinary scientists by providing them with the leadership to reach their career goals. He established the Lymphatic Filariasis Support Centre for Africa (LFSCA) at the University of Ghana which has become a training hub for programme managers and scientists in the African region. Collaboration to achieve the goals of the award with the LFSCA will create opportunities for additional capacity building and linkages with other African scientists and enhance the utility of any research findings.

The five-year award has a goal to develop novel approaches to the community-directed treatment strategy for lymphatic filariasis and the criteria and interventions that facilitate interruption of LF transmission. The ultimate goal of the award will be to lead the capacity building drive for health research in Africa and guide the next generation of research scientists in the area of neglected diseases control.

The collaboration between Professor Bockarie and Professor Gyapong will build on their records of successful and productive research projects in an area of high relevance for the control of infectious diseases.

Dr Wendi Bailey goes ape!

Collecting and examining faecal specimens belonging to gorillas, chimpanzees, orangutan and their keepers may not be everyone's idea of a holiday, however LSTM Parasitologist Dr Wendi Bailey does things differently. For the past few years, Wendi has been travelling to primate conservation centres to help with training staff in parasite diagnosis.

Wendi's expertise in helping to set up laboratories and train staff in diagnosing parasitic infections has brought her into close contact with these primates and the parasites they often carry. Often when an animal that was a pet is given to a wildlife sanctuary, it is carrying parasites that can be passed on to other animals or to the keepers. Likewise the keepers may unintentionally pass on parasites to the animals. When it is time to release them into the wild, animals must be free of parasites to avoid spreading them to a wider population.

"Whilst working at LSTM I have travelled to many countries, helping to set up laboratories and train staff in the diagnosis of parasitic infections. I enjoy trying to improve the diagnosis of parasites in areas where there may be few facilities and often little equipment and a poor or non-existent electricity supply," she explained.

"The Pan African Sanctuary Alliance (PASA) hosts annual veterinary workshops in different African counties where sanctuary vets and associated staff discuss issues, present case histories and participate in practical laboratory sessions. Since 2007, I have attended these workshops as an advisor on parasite recognition and I run the parasitology laboratory sessions. From a scientific perspective, the work has expanded my diagnostic skills; we have published a paper on what we believe is the first recorded case of *Dientamoeba fragilis* in a sick, symptomatic gorilla and I have helped update the diagnostic parasitology chapters in PASA's on-line Veterinary Manual for sanctuary vets."

The orangutan connection came in 2008 following a request by the Sumatran Orangutan Conservancy Veterinary Programme (SOCVP) to Steve Unwin, vet at the UK's Chester Zoo and PASA advisor, to organise a PASA-style workshop series for national veterinary staff at orangutan rehabilitation centres in Indonesia & Malaysia. The first workshop staged by SOCVP was held in 2009 at Samboja Lestari, East Kalimantan, Indonesia, part of the Borneo Orangutan Survival Foundation. It was designed and facilitated by Steve in partnership with Dr Rafaella Commitante of SOCVP. Wendi was invited to organise the parasitology part of the programme.

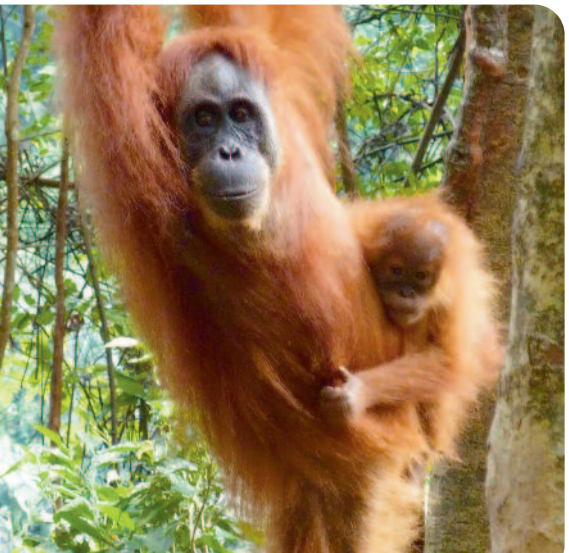
Orangutans are placed in rehabilitation centres due to loss of habitat caused by deforestation, often to make way for palm oil plantations, and the confiscation of illegally held pet orangutans. The aim of the conservation programmes is to rescue, quarantine and reintroduce orangutan back into the wild.

In Samboja, newly arrived orangutans are placed in the quarantine area with other areas housing those awaiting reintroduction. Staff have constructed small islands where orangutans that cannot be reintroduced are kept in as near natural conditions as possible with minimal human contact. Vets from Borneo, Sumatra and Indonesia attended the workshop, which was designed to promote training, teamwork and a better understanding of the management of orangutans, with everything from TB screening to nutrition, habitat protection and reintroduction issues on the agenda.

The second SOCVP veterinary workshop was held in August 2010 in Sumatra, which focussed on TB testing - the ultimate aim is to test all 1,500 captive orangutans in the centres. Other sessions included advances in field diagnostics for parasites, environmental enrichment, data collection and reporting. The practical sessions were held at the SOCVP orangutan quarantine centre at Batu Mbelin near Medan.

"We are now planning for the 2011 workshop which is to be held in Java. It is extremely rewarding to be involved with this field of animal conservation and to have the opportunity to meet and work with such dedicated people, some of whom work in extremely difficult conditions," said Wendi.

Further information on the organisations mentioned can be seen at **www.pasaprimates.org** and **www.orangutan.com**



IVCC, malaria and the fight against insecticide resistance

Malaria kills more people than any other parasitic infection and claims nearly one million lives a year, mostly children under five in Africa. The Innovative Vector Control Consortium (IVCC) was established five years ago with an award of $50.7 million from the Bill & Melinda Gates Foundation to develop new products and tools to increase the effectiveness of control campaigns against the insect vectors of malaria and other diseases such as dengue. The Foundation awarded a second grant of $50 million in late 2010, allowing IVCC to continue the development of entirely new insecticides and to complete the development of a range of products based on reformulating or repurposing existing insecticides.

Mosquito vector control is capable of spectacular results, indeed the eradication campaigns of the mid twentieth century eliminated malaria in much of the world. Even in the endemic regions of sub Saharan Africa, the disease burden was reduced significantly, only to increase again once the campaigns ceased. In recent years the much more insidious threat of insecticide resistance has emerged, creating the risk that the limited range of insecticides currently approved for indoor residual spraying (IRS) and insecticide treated nets (ITN), which are the mainstay of malaria control campaigns, may become ineffective. Currently only pyrethroids are recommended for ITN use, putting what is often the only widely available control measure at risk of failure in areas where resistance to pyrethroids has developed. Insecticide resistance is now widespread throughout West and Southern Africa and the earlier low level of resistance in species in East Africa has started to increase as further resistance mechanisms enter the population.

The impact of insecticide resistance is illustrated in the well-studied case of Bioko Island where pyrethroid resistant mosquitoes were largely unaffected by a spray campaign using a pyrethroid, but which showed a dramatic response to a spray campaign with a carbamate insecticide the year after. The problem of insecticide resistance is more pronounced in the public health arena as insecticides for this purpose are already in short supply and a move away from contact toxicity and persistence in the 1980s means that many modern agricultural insecticides cannot simply be repurposed for public health use. High development costs and relatively small markets make the development of new public health insecticides unattractive, further stagnating the supply of suitable alternatives. Hence, no new active ingredients for mainstream public health insecticides have been registered since the mid 1980s.

The role of the IVCC is to identify opportunities for the development of new products that will enable improved vector control, facilitate the establishment of projects and develop partnerships that will provide the resources to bring these projects to fruition. Transferring legal status to the Product Development Partnership in 2008 has given the IVCC further clarity of independent governance and the freedom to fully pursue innovative funding mechanisms to deliver the objectives in its strategic plan.

The first of these objectives is to facilitate the creation and delivery by 2020 of three new Active Ingredients (AIs) for insecticides which will be unaffected by current resistance mechanisms. IVCC's industrial partners have large molecular libraries built up over decades of agrochemical research and are confident that development candidates will be found within these libraries. To this end, two substantial data mining and rescreening programmes are underway with a further two in preparation. The first two projects have already identified several promising classes of chemistry which are active against mosquitoes and which are being taken forward for optimisation. Another project has successfully demonstrated proof of principle that a molecule from a modified insecticide backbone can improve activity against resistant mosquitoes.

Chief Executive Officer Professor Janet Hemingway explained: "Insecticide resistance is increasing in disease endemic areas and is being discovered in new areas previously free from resistance. In order to maintain the impetus in vector control that has been gained in recent years, we need to be able to deliver new products into the marketplace which can effectively beat resistance and ensure that campaigns remain effective.

As well as entirely new insecticides, IVCC has a number of formulation and repurposing projects in various stages of development which seek to use existing approved insecticides in new ways to increase the effectiveness and longevity

of insecticide treatments whilst reducing the cost. Two reformulation projects have already successfully completed their development phase, displaying improved residuality in IRS treatments and are being taken through the WHOPES process by Bayer and Syngenta, IVCC's industrial partners in the respective projects. A portfolio of proof of concept projects has given rise to a smaller number of repurposing projects which will begin later this year with the aim of yielding products in 2016, bringing alternative agricultural insecticides into the public health arena.

Dr Tom McLean, IVCC's Chief Operating Officer, said: "The development programmes for new insecticides are necessarily rigorous but it is very encouraging to see the first of the new products enter the licensing stage. The second award from the Foundation allows us to complete the existing portfolio of formulation and repurposing projects, which will bring alternative agricultural insecticides into the market.

"We will continue working closely with our industrial partners on a range of new AI development projects. Their support and commitment to our mission has been fantastic and we have already seen some exciting initial results, especially from the data mining and rescreening programmes which have indicated large numbers of hits for candidate development. We are now taking these forward along with several other screening and molecular design projects currently in preparation."

Alongside the insecticide projects IVCC also has five programmes developing new systems and diagnostics for monitoring and evaluation of the effectiveness of operational disease control programmes. These will allow programme managers to assess the impact of resistance on control, the quality of the treatment and integrate and query combined entomological, clinical and logistical data. These products are now being implemented in a range of operational settings with support from IVCC and other donors.

www.ivcc.com

CRIMALDDI

Coordination, Rationalisation, Integration

It is a poor reflection on 21st century society that a child is allowed to die every thirty seconds from a simple parasitic infection because of a lack of an affordable, safe, and effective drug treatment. This is the situation today with malaria. This is a disease that the World Health Organisation estimates in 2009 threatened almost half the world's population, resulted in some 225 million clinical malaria cases per year and was accountable for some 781,000 deaths year on year. Even these statistics fail to convey the actual misery and devastation this disease causes by targeting the very young in those populations living in resource poor settings.

Malaria is caused by a single cell parasite that is transmitted by the bite of the female mosquito. We know a great deal about the life cycle of the malaria parasite and how it is transmitted. We have the entire genome sequences of representative parasites and mosquitoes and the world has invested heavily understanding the details of the underlying biology both of the parasite and the disease.

In theory, we have all the information and technologies at hand needed to crush this disease. Yet despite the investment we still have relatively few effective antimalarial drugs and resistance casts a constant shadow over the therapies that we do have available. Until recently artemisinin-based combination therapy was considered to be the unifying solution to multi-drug resistance in malaria. Artemisinin is based on a traditional Chinese herbal remedy for fevers used for thousands of years. However, there have been disturbing reports from South East Asia that parasites are becoming less sensitive to the action of artemisinins. If this confirmed loss of sensitivity continues to develop and spreads geographically it would be a disaster for all current malaria control and eradication initiatives.

It is a sobering fact that over the past century the world has generated less than a dozen new antimalarials (in only four drug classes). In contrast this number of drugs is registered annually for cardiovascular disease, cancer and many other diseases that impact on Western society.

The EU funded AntiMal project coordinated by LSTM has demonstrated that it is possible to deliver industry quality drug discovery programmes on a European level through engagement of the academic sector with SMEs and "big Pharma". However much more needs to be done. It was this realisation that has led us to establish the CRIMALDDI initiative "Co-ordination, Rationalisation, and Integration of Antimalarial Drug Discovery Initiatives".

While CRIMALDDI was being set up, Bill and Melinda Gates challenged the World malaria community to be considerably more ambitious and think beyond disease control to disease eradication. In response, the global community has accepted the challenge to eradicate malaria within the next 50 years. The actions needed to achieve this ambitious objective have been summarised in the Roll Back Malaria (RBM) Global Malaria Action Plan (GMAP). The plan makes clear that this objective cannot be met with the current tools, notably drugs, that are available or in late stage development. In short it will be necessary to develop new tools to meet the unmet and newly emergent needs of the Control, Pre-Elimination, and Elimination phases of GMAP. In line with the challenge, CRIMALDDI, funded under FP7, broadened its remit to include the eradication agenda.

CRIMALDDI is set up to:

- Gather information on the current antimalarial drug development initiatives worldwide and on the current needs and future research and funding plans.
- Identify research gaps, areas of duplication, and funding opportunities and to present findings to the community and the funding bodies.
- Produce a co-ordinated action plan for future research programmes and funding opportunities.
- Propose the European antimalarial research agenda for the next decade by implementation of aspects of the action plan.
- Contribute to the debate on setting the Global antimalarial research agenda for the next 10 years.

Through a logical series of meetings, conferences, workshops involving some 100 members of the international malaria community from both academia and the private sector, we have been able to identify a shortlist of priorities that must be supported if we are to deliver the next generation of drugs for malaria control and malaria eradication. These include funding priorities around:

- Attacking artemisinin resistance
- Delivering enabling technologies
- Identification of novel drug targets
- International Communication and collaboration
- Rapid exploitation of High Throughput Screening hits

There is always a risk that the current window of opportunity of large scale resourcing for antimalarial drug R&D will not last and that resources will become much more constrained over the next decade. It is hoped that the disseminated outputs from CRIMALDDI will help inform funding agencies worldwide and provide clear and logical guidance on the priorities for such R&D as seen by the international malaria community.

CRIMALDDI is coordinated by LSTM's Professor Steve Ward and managed by Susan Jones and Tracy Seddon. Members of the CRIMALDDI consortium are: Liverpool School of Tropical Medicine – UK, WHO / TDR – Switzerland, Medicines for Malaria Venture – Switzerland, University of Heidelberg – Germany, University of Milan – Italy, Centre National de la Recherche Scientifique – Switzerland, The Research Programme of INSERM – France, University of Cape Town – South Africa, University of Buea- Cameroon.

Further details are available on

www.crimalddi.eu

SEVENTH FRAMEWORK PROGRAMME

A Health Human Resource Master Plan for Bhutan

Since September 2010, Liverpool Associates in Tropical Health (LATH), LSTM's dedicated technical assistance (TA) company, has been providing short term TA to the Ministry of Health (MoH) in Bhutan. The Bhutanese government commissioned LATH to assist in reviewing and recommending strategic human resource deployment and to assist with the revision of the Health Human Resource Master Plan (HHRMP). This work is being funded by the Danish Ministry of Foreign Affairs (DANIDA) through the Social Sector Programme Support (SSPS), 2008 – 2013.

Like many other developing countries, Bhutan is facing the problem of a shortage of health professionals, particularly doctors and nurses. Changing morbidity patterns, rapid advancement of technologies in the medical field and limited knowledge and skills of existing health professionals present major challenges for the MoH in the provision of quality health care services. The shortage is compounded by the deployment system which results in an inequitable distribution of available health professionals. The shortage can be partially mitigated by improving these systems and reforming the deployment policies, skills mix and through multitasking. Therefore a well managed and effective human resource development and management system is required.

The first HHRMP for Bhutan was developed in 1999 and revised in 2003. The MoH commissioned LATH to assist with further revision during 2010 and 2011. The aim of the plan is to set clear criteria and direction for the recruitment and deployment of human resources in the short term and to propose a realistic investment plan for the recruitment, professional development and deployment of health human resources at all health facilities in the longer term.

The LATH team was led by Human Resource Management and Development Specialist, Margaret Caffrey, and included health systems development consultant Lynne Elliot (pictured here with MoH staff) amongst others. The team has undertaken visits to the Bhutanese capital, Thimpu, in order to review existing recruitment, professional development and deployment, multi-tasking and ongoing professional development. The consultants used the HHR Action Framework to develop a rapid assessment tool which was used to collect and analyse data to provide a broad overview of the HHR situation and to enable the team to identify, analyse and target specific gaps.

The final HHRMP has been submitted to the MoH. This considers the critical factors, provides an analysis of the current HHR situation and presents options and recommendations for addressing current and future HHR issues and challenges.

Chhimi Rinzin, Yangchen Choden with Lynne Elliot of LATH

Severe anaemia and blood transfusions in Africa

Anaemia is one of the world's most important causes of disability and is a serious public health burden in three-quarters of the world's countries. In areas where malaria is common, anaemia is responsible for 25-40% of death in children and pregnant women; even mild anaemia causes stunting, intellectual impairment and reduced productivity.

Two of our doctoral students, Steve McKew and Alex Owusu-Ofori, from the haematology research team of the Disease Control Strategy Group at LSTM, are undertaking research to improve our knowledge of the causes of anaemia in Africa and to understand how it can be treated more effectively.

Steve is a Liverpool-trained haematology consultant who is based in Malawi and funded through a Wellcome Trust Fellowship. Local clinicians in Malawi were puzzled about why over 40% of their adult in-patients with HIV/AIDS were dying of severe anaemia. Steve's project was set up in response to their concerns and involves testing HIV/AIDS patients with severe anaemia for a wide range of possible causes of anaemia. Although Steve's project is still in progress he has made some interesting new observations which are already influencing the way that these patients are managed. Steve found that many of these patients die soon after admission to hospital and a large proportion have tuberculosis which, in some cases, only shows up on a bone marrow examination. As a result of Steve's research a new protocol for the early treatment of these seriously ill patients on admission to hospital, including better rapid access to blood for transfusion, is being developed.

Improving the safety of blood transfusions in Africa is the topic of Alex's research. Alex is an African-trained consultant microbiologist based in Kumasi, Ghana and he has been funded through a Commonwealth Scholarship to investigate the clinical impact of malaria and syphilis transmitted through blood transfusions. Although it has long been assumed that these infections are a significant transfusion-related problem in Africa there is almost no evidence to support the current recommendations which require all blood to be screened for these infections prior to transfusion. Interestingly Alex's preliminary results seem to indicate that transfusion-transmitted malaria may be less of a problem than previously thought. If confirmed, this finding could lead to a saving in the cost of screening blood and, more importantly, if less blood needs to be discarded then this will help to alleviate the severe shortages of blood which are common in Africa.

AvecNet: £10 million project to develop new tools for malaria control

LSTM has launched a collaborative project to develop and evaluate new tools to control the spread of malaria in Africa. AvecNet is a five year (2011-2016), £10 million project involving sixteen partners in Africa and Europe.

Because malaria is transmitted by mosquitoes, their effective control is essential to combating the disease. Wide scale use of insecticides on bednets and in interior spraying programmes has dramatically reduced transmission but continued success is dependent on a very limited range of insecticides and other tools.

AvecNet, funded by the European Union's Seventh Framework programme, aims to secure the continued effectiveness of these methods into the future by developing and evaluating new insecticides and techniques that will overcome the growing threat of insecticide resistance, as well as designing new tools and interventions to target the mosquitoes that currently evade these control methods. The project also aims to increase existing knowledge about the biology and behaviour of mosquitoes to enable more effective control as urbanisation and other environmental factors alter the balance in this continuing fight against an evolving and formidable opponent.

Dr Hilary Ranson, Head of the Vector Group at LSTM and leader of AvecNet, said: "We need to secure the viability of existing malaria control programmes and expand their scope and reach by developing new methods and tools based upon a vastly increased understanding of how mosquitoes behave and react in different environments.

"We will also rigorously field test existing and prototype tools and techniques to both inform their further development and refinement and to add to the knowledge base from which we can develop further tools and interventions.

"By increasing research capacity in Africa and Europe and uniting people with skills in lots of different fields we are going to generate the momentum to achieve what we hope will be a number of significant breakthroughs in malaria control."

Liverpool BioCampus

Liverpool's growing reputation for excellence in bioscience looks set to increase with the founding of a BioCampus involving LSTM, The Royal Liverpool & Broadgreen University Hospitals Trust (RLBUHT), Liverpool Science Park, MerseyBIO, the University of Liverpool, Liverpool John Moores University and a host of industrial players.

The demolition of the existing Royal Liverpool University Hospital when the new hospital opens will create a brownfield site in the heart of Liverpool's Knowledge Quarter and it is here that the BioCampus will be created to concentrate and co-locate research, industry and health provision to enable Liverpool to become a centre of global excellence in biomedical sciences.

The BioInnovation Centre (BIC), due to open in 2013, is the first step in expanding the scale of the existing model for development of commercial opportunities from the research and clinical base, and is the first phase in developing Liverpool's BioCampus. It will comprise of laboratory facilities for new and growing SMEs to develop new drugs, a business support and commercialisation centre and meeting and networking facilities. These businesses can then work in collaboration with the clinical and research departments in the Hospital, University and LSTM.

Liverpool is already a hub for bioscience, playing host to the largest grouping of pharmaceutical industries in Europe and the UK's National Biomanufacturing Centre. The BioCampus is expected to build on that reputation, attracting talented professionals from all over the world, keeping top quality graduates in the City and adding hundreds of millions of pounds to the regional economy.

The opening of LSTM's Centre for Tropical and Infectious Diseases in 2007 and the establishment of Liverpool's Biomedical Research Centre (BRC) by LSTM, RLBUHT and the University of Liverpool in 2009, are considered key assets which have contributed to making the BioCampus possible.

www.liverpoolbiocampus.com

"There is potential to research and develop drugs that could save countless lives globally."

The Royal LiverpoolBioCampus University Hospitals

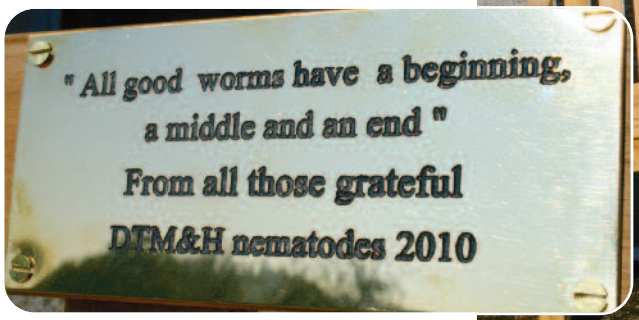
Tribute to retired DTM&H legend

LSTM's Diploma in Tropical Medicine & Hygiene (DTM&H) is world renowned, due in part to the enormous contribution made by Dr Guy Barnish, LSTM Senior Lecturer and Senior Fellow in Parasitology, as a lecturer on the course.

As a former LSTM student himself, Guy brought his love of Africa to his research and to his teaching. Indeed, teaching has played a large part in his life, as Guy recalls "My first encounter with the DTMH was in late 1982 when I was asked by Professor George Nelson to describe The Rockefeller Foundation's St Lucia schistosomiasis project. As time passed I was asked to provide more lectures, and over the last ten years I replaced more and more of the retired lecturers until I covered a large proportion of the parasitology syllabus.

My last lecture to the DTM&H, in March 2010, was on schistosomiasis with Dr Bertie Squire and was a rather emotional affair!"

Officially retiring in 2007, Guy returned to lecture part time due to popular demand from the students, who have displayed their gratitude with a special gift of a retirement bench, for which Guy is extremely grateful:
"I would like to thank the whole of the class for providing the retirement bench and Dr Katie Walter in particular for organising it and ensuring its delivery to my house in France."



LSTM launches FEPOW website

A new website has been launched as an education tool for the public, students and educators to learn more about the experiences of ex-Far Eastern Prisoners of War (FEPOW).

Thousands of FEPOW received medical treatment from staff at LSTM following the end of World War II, leading LSTM's Professor Geoff Gill and researcher Meg Parkes to conduct a study into the diseases treated, recording over 50 oral histories from surviving ex FEPOWs.

A website which tells their fascinating story has been launched thanks to a grant from the Heritage Lottery Fund. The site, captivememories.org.uk, houses a range of multimedia learning resources including artwork, audio files and lesson plans that will help schools to learn more about these experiences within the context of the history, science and art curriculums.

A case study of the project's first collaboration with a school is featured on the site. Pensby High School for Girls has been working with ex-FEPOW since 2009 and students have contributed a great deal to the development of the website. Another featured project is a bamboo garden inspired by the FEPOW experience which has a permanent home at Ness Botanical Gardens.

This unique relationship has led to world class research into tropical diseases and the effects of captivity which has helped to inform the way in which military personnel are treated and cared for today.

Education and Training Programmes
2010 – 2011

Masters Programmes

Masters in Tropical & Infectious Diseases
9 students attended from 8 countries: Brazil (1), UK (2), Netherlands (1), Germany (1), Indonesia (1), Kenya (1), Tanzania (1), Nigeria (1).

Masters in Biology & Control of Parasites & Disease Vectors
9 students attended from 4 countries: UK (6), China (1), Libya (1), Italy (1).

Masters in Molecular Biology of Parasites & Disease Vectors
8 students attended from 4 countries: UK (5), China (1), Colombia (1), Saudi Arabia (1).

Masters in International Public Health
27 students attended from 15 countries: Afghanistan (1), Cameroon (1), Canada (1), China (1), Ghana (1), Indonesia (1), Japan (1), Kenya (3), Malawi (1), Myanmar (2), Netherlands (1), Nigeria (6), Sierra Leone (2), Sudan (1), UK (4)

Masters in Humanitarian Studies
13 students attended from four countries: France (1), UK (10), Spain (1), Ireland (1).

Masters in Humanitarian Health Programme Management
5 students attended from five countries: Nigeria (1), France (1), Pakistan (1), Switzerland (1), UK (1), Belgium (1).

Masters in Tropical Paediatrics
10 students attended from 8 countries: UK (2), Spain (2), Sudan (1), Netherlands (1), Zambia (1), Yemen (1), Nigeria (1), Japan (1).

Diploma Programmes

Diploma in Tropical Medicine & Hygiene (DTM&H)
86 students attended the September 2010 DTM&H from 13 countries: Australia (1), Austria (1), Finland (2), Germany (5), Hong Kong (1), Italy (1), Netherlands (1), New Zealand (1), Norway (3), Spain (1), Sudan (1), UK (67), USA (1).

85 students attended the February 2011 DTM&H from 17 countries: Australia (5),Austria (2), Canada (1), Germany (5), Hong Kong (1), Ireland (3), Japan (2), Malaysia (1), Norway (2), New Zealand (1), Pakistan (1), Saudi Arabia (1), Spain (4), Sudan (2), UK (50) and USA (3), Zimbabwe (1).

Diploma in Humanitarian Assistance
15 students attended this course which ran from February - April 2011. Students came from 6 different countries: Bangladesh (1), Ireland (2), Germany (1), Nigeria (4), South Africa (1), UK (6).

Diploma of Health Systems Management
9 students attended this programme which began in December 2010. Overseas programme based in Damascus, Syria

Diploma in Health Systems Management (Hospital Management)
6 students attended the programme based in Damascus, Syria

Diploma in Public Health
9 students attended the programme based in Damascus, Syria

Diploma in Health Economics, Finance & Policy
4 students attended the programme based in Damascus, Syria.

Diploma of Epidemiology & Biostatistics
15 Students attended the programme based in the Kingdom of Saudi Arabia.

Diploma of Health Systems and Quality Management
13 Students attended the programme based in the Kingdom of Saudi Arabia.

Diploma in Public Health
10 students attended the programme based in the Kingdom of Saudi Arabia.

Diploma in Reproductive Health
15 students attended from 10 countries: Japan (2), Kenya (2), Libya (1), Malawi (1), Nigeria (2), Norway (2), Rwanda (1), Sierra Leone (2), Uganda (1), UK (1).

Research students

97 students from 33 countries were registered as research students in May 10: Bangladesh (1), Belgium (1), Canada (1), Colombia (1), Egypt (1), France (1), Germany (2), Ghana (2), Italy (1), Kenya (1),Kuwait (1), Liberia (1), Malawi (5), Malaysia (8), Maldives (1), Mali (2), Mexico (1), Netherlands (1), Nigeria (1), Papua New Guinea (1), Portugal (3), Saudi Arabia (7), Sierra Leone (2), Sudan (2), Switzerland (1), Syria (6), Tanzania (3), Thailand (2), Turkey (1), Uganda (2), United Kingdom (27), USA (3), Zambia (4).

Short Courses

86 students from 22 countries: Canada (1), China (1), Ethiopia (2), Ghana (1), India (1), Kenya (1), Myanmar (1), Niger (1), Ireland (2), Nigeria (9), Norway (2), Pakistan (4), Sri Lanka (1), South Africa (3), Singapore (1), South Korea (1), Somalia (2), Sudan (1), Switzerland (1), Turkey (1), UK (48), USA (1).

Prizes

From the DTM&H September 2010 Prizes were awarded as follows:
Milne Prize in Tropical Medicine – Willoughby Morgan
Blacklock Prize in Parasitology and Medical Entomology – Hannah McLeod
Warrington Yorke Prize in International Community Health – James Pauling

From the DTM&H February 2010 Prizes were awarded to the following students:-
Milne Prize in Tropical Medicine – Catherine Kirby
Blacklock Prize in Parasitology and Medical Entomology – Kelvin Kong
Warrington Yorke Prize in International Community Health – Bethan Walsh

Fundraising Appeals

As a registered charity the Liverpool School of Tropical Medicine relies heavily upon donations of all sizes in order to undertake existing work and to react to new developments. The support of individuals, charitable trusts, governments and companies underpins every aspect of our work.

LSTM Capital Appeal

Current facilities are operating at capacity and further expansion is required. A new building project will begin soon, to house new teams able to translate LSTMs research into practice. Support from the public and private sectors will be required to build upon our existing successes.

Support for scholarships

Although the quality of students wanting to come to LSTM is always exceptional, their resources can often be far scarcer. LSTM's Scholarship Fund endeavours to bridge that gap. By supporting the scholarship fund you can help to develop a career that will be dedicated to preventing disease and suffering.

Neglected Tropical Diseases

There are 17 neglected tropical diseases that blight the lives of 1 billion people worldwide and threaten the health of millions more. LSTM's Centre for Neglected Tropical Diseases is at the centre of this struggle and needs further support to help prevent and control these diseases of poverty.

Malawi Liverpool Wellcome Clinical Research Programme

This programme is based at the College of Medicine in Malawi and conducts biomedical research on tropical health problems, to build the capacity of medical personnel through training. Funding is urgently needed for equipment to train local scientists and doctors.

Details of how to make a donation and information on other ways of supporting LSTM can be found on our website.

www.lstmliverpool.ac.uk








MALÁRIA




researching and educating to save lives

INVESTORS IN PEOPLE

LSTM
LIVERPOOL SCHOOL OF TROPICAL MEDICINE

LSTM 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:

1. providing and promoting high quality education and training;

2. conducting first-class research and disseminating the result of that research;

3. developing systems and technologies for health care and assisting in their transfer and management;

4. providing appropriate consultancy services; in fulfilling this mission the Liverpool School of Tropical Medicine also provides a clinical service of acknowledged excellence.

Edited by Billy Dean
Published by Liverpool School of Tropical Medicine

Designed by: **onefiveonecreative.com**
Printed by: **Printfine Ltd**, Liverpool