The London School of Hygiene & Tropical Medicine
Gates Malaria Programme will play a key role, together with other initiatives and organisations, in meeting the international target of halving child mortality from malaria by 2010.

London School of Hygiene & Tropical Medicine in partnership with

- Centre for Medical Parasitology, University of Copenhagen, Denmark
- College of Medicine, University of Malawi, Malawi
- Danish Bilharziasis Laboratory, Copenhagen, Denmark
- Kilimanjaro Christian Medical College, Tanzania
- Liverpool School of Tropical Medicine, UK
- MRC Laboratories, The Gambia
- National Institute for Medical Research, Tanzania
- Pharmaceutical & Therapeutics Department, University of Liverpool, UK
- School of Public Health, University of Ghana, Ghana

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Cover photograph: Dan Salaman, LSHTM
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Summary

The most important task during the first nine months of the Gates Malaria Programme has been to recruit a strong team that, during the next few years, will be able to accomplish the ambitious research and training objectives of the programme. The award from the Foundation contained provision for the appointment of a manager, assistant manager and five senior scientific appointments in areas where the London School of Hygiene & Tropical Medicine (LSHTM) malaria programme needed strengthening. Both a manager and assistant manager have been appointed and senior appointments have been made at LSHTM in clinical science, pharmacology, maternal and child health (part-time position), entomology, anthropology and vaccinology (part-time position). Post-doctoral positions have been advertised; two appointments have been made and further candidates have been short-listed.

The Gates award included a sum of $10.5 million to support specific research proposals on epidemic prediction and on the evaluation of new anti-malarials, insecticides and vaccines. $1.5 million has been allocated to the WHO LapDap Taskforce to facilitate the evaluation and introduction into use of this potentially valuable new anti-malarial drug. $300,000 has been earmarked for a collaborative programme with the Liverpool School of Tropical Medicine and Hygiene (LSTM) on the use of geographical information systems in the control of malaria and discussions have started on how this programme should develop. Staff of the LSHTM Malaria Centre and their collaborators have been invited to compete for the remaining research funds. To ensure that only high quality science is supported, a research committee has been established to rigorously review all proposals. Three proposals have so far been approved by the research committee.

The training component of the Gates Malaria Programme is a collaborative one between LSHTM, LSTM, the Danish Bilharziasis Laboratory (DBL), the Centre for Medical Parasitology, University of Copenhagen (CMP) and partners in four African countries - Ghana (School of Public Health, University of Ghana), Malawi (College of Medicine, University of Malawi), Tanzania (National Institute for Medical Research) and The Gambia (MRC Laboratories) where malaria training centres will be established. An advert for the doctoral training positions has been disseminated widely and a number of applications from candidates in malaria-endemic countries have been received. A director of training has been appointed in Malawi and trainers for Ghana and Tanzania will be appointed shortly. The African partners will be supported by three trainers based in Europe, who were appointed in May and will take up their posts in the next few months. Visits have been made to each of the African partners and sites for the construction of new training centres have been identified in Ghana, Malawi and Tanzania. In addition, sites have been selected for two research laboratory buildings to be located at Moshi and Tanga in Tanzania.

Negotiation of the financial agreements with partners in the Gates Malaria Programme has raised more contractual problems than had been anticipated originally but these are close to resolution and should be signed within the next few weeks. Once this has been done, it will be possible to transfer funds to the African partners so that work on the new buildings and training programmes can begin. Following confirmation of the detail of the financial agreements, a Memorandum of Understanding will be drafted. This will be signed by all Gates Malaria Programme partners.
Introduction

The London School of Hygiene & Tropical Medicine (LSHTM) has a long and distinguished record of research on malaria and this is being sustained. Approximately 50 LSHTM scientists work on some aspect of malaria; their skills cover a wide range of topics that extend from molecular biology to economics. A multidisciplinary approach is particularly appropriate to the study of diseases such as malaria, tuberculosis and HIV, which affect developing societies in numerous complex and interacting ways. At LSHTM, research is conducted within disciplined-based units placed in three large departments. However, to facilitate inter-disciplinary activities in malaria, a cross-departmental Malaria Centre was established in 1998 and this now receives support for some of its activities from a Medical Research Council Co-operative Programme grant.

In 1999, LSHTM celebrated its centenary. As part of the activities of the centenary year an appeal fund was established by the Dean, Professor Harrison Spencer, and financial support for the fund was solicited from a wide range of donors. As part of the appeal an outline proposal was submitted to the Bill & Melinda Gates Foundation in November 1999 for funds to expand the malaria activities of the School. In April 2000, a request was received from the Foundation for a full proposal. Production within a few weeks of an ambitious programme of research which involved many different groups within LSHTM was facilitated by the lines of communication established through the Malaria Centre. The desperate need in Africa for more trained staff at every level if malaria is to be controlled effectively in that continent was recognised early in the course of these discussions. It was considered that the contribution that LSHTM might make in this area would be enhanced if training activities were conducted in collaboration with other European partners with major expertise in training and malaria research in endemic areas. Thus, the Liverpool School of Tropical Medicine (LSTM), Danish Bilharziases Laboratory (DBL) and the Centre for Medical Parasitology, University of Copenhagen (CMP) were invited to join as partners in the training component of the programme. Developing country partners were identified in Ghana (School of Public Health, University of Ghana), Malawi (College of Medicine, University of Malawi), Tanzania (National Institute for Medical Research and the Kilimanjaro Christian Medical College) and The Gambia (MRC Laboratories), countries with which the northern partners already had strong links. In July 2000, the partnership was delighted to hear that it had been awarded $40 million by the Bill & Melinda Gates Foundation over a period of five years to support the objectives of the proposal.
The Gates Malaria Programme has both research and training objectives.

The main *research* objectives of the programme are:

- The evaluation of new forms of malaria chemotherapy, in particular combination therapy;
- The evaluation of insecticides that could be used to replace pyrethroids on netting material;
- The evaluation of malaria vaccines;
- The use of geographical information techniques in predicting malaria epidemics.

It is proposed that all intervention studies will have a strong economic and social component utilising the strengths of LSHTM and its Gates partners in these areas. It was also recognised that innovative approaches will be needed to ensure that any new, effective interventions are adopted rapidly.

The *training* component of the Gates Malaria Programme consists of:

- A doctoral training programme directed particularly at students from malaria-endemic countries;
- The establishment of training centres across Africa (Ghana, Malawi, Tanzania and The Gambia) that will offer a variety of training programmes that are relevant to local needs. These will be supported by distance learning, and other new techniques.
Recruitment

London School of Hygiene & Tropical Medicine

Professor Brian Greenwood, who was a key contributor to the initial proposal to the Bill & Melinda Foundation is the Gates Malaria Programme’s Director. Professor Geoffrey Targett is the programme’s Deputy Director.

During the first year, the Gates Malaria Programme recruited six high calibre staff to lead the research across a range of disciplines and to contribute to training initiatives. Details of these appointments are shown in Table 1 below. All of these staff are based in London, but they will develop research programmes based in malaria endemic countries. Their biographies are in Annex 1.

Table 1: LSHTM Research staff funded by the Gates Malaria Programme

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor Mike Hollingdale</td>
<td>Senior research fellow, vaccinology</td>
<td>January 2001</td>
</tr>
<tr>
<td>Dr Harparkash Kaur</td>
<td>Lecturer, pharmacology</td>
<td>July 2001</td>
</tr>
<tr>
<td>Dr Robert Pool</td>
<td>Senior lecturer, anthropology</td>
<td>March 2001</td>
</tr>
<tr>
<td>Dr Mark Rowland</td>
<td>Senior lecturer, entomology</td>
<td>March 2001</td>
</tr>
<tr>
<td>Dr Caroline Shulman</td>
<td>Clinical senior lecturer, maternal and child health</td>
<td>January 2001</td>
</tr>
<tr>
<td>Dr Chris Whitty</td>
<td>Clinical senior lecturer, clinical science</td>
<td>March 2001</td>
</tr>
</tbody>
</table>

A statistician will be appointed towards the end of the year to assist staff in setting up new research programmes and provide expertise in data analysis. In addition, a Computing Officer will be recruited to support Gates Malaria Programme staff based at LSHTM, to advise our Programme partners on their hardware and software needs, and to assist with the development of Distance Learning modules.

Funding is available for two posts to facilitate interactions between the Gates Malaria Programme and WHO Geneva and WHO AFRO. Members of the Advisory Committee will be asked for their advice on how these resources could best be employed.

To date, two post doctoral fellowships have been awarded. Details of these appointments are shown in Table 2 on page 8. A further two applicants have been shortlisted and are currently being considered for post doctoral fellowships, a further round of recruitment will take place in late 2001/early 2002.
Table 2: LSHTM Post Doctoral Fellows funded by the Gates Malaria Programme

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr T K Mutabingwa</td>
<td>Clinical research fellow, clinical science (based in Muheza, Tanzania)</td>
<td>April 2001</td>
</tr>
<tr>
<td>Ms Virginia Wiseman</td>
<td>Lecturer, health economist (based in London)</td>
<td>March 2001</td>
</tr>
</tbody>
</table>

An advertisement for two entomology technician posts resulted in over 60 applications, from which nine were interviewed in May, and two appointed. They will support research programmes concerned with testing of new insecticide combinations and with assessment of the impact of drugs on transmission of *Plasmodium falciparum* malaria.

In addition staff have been recruited during 2001 to support the Director and Deputy Director in the management and administration of the Gates Malaria Programme. These are shown in Table 3 below.

Table 3: LSHTM Management and Administration Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs Cathy Bowler</td>
<td>Manager</td>
<td>January 2001</td>
</tr>
<tr>
<td>Dr Tracey Henshaw</td>
<td>Assistant Manager</td>
<td>May 2001</td>
</tr>
<tr>
<td>Mrs Julia Mitchell</td>
<td>PA to Professor Greenwood</td>
<td>April 2001</td>
</tr>
<tr>
<td>Mrs Viviene Dean</td>
<td>Secretarial Assistant</td>
<td>June 2001</td>
</tr>
</tbody>
</table>

The Head of Training position was advertised in November 2000, but no suitable candidate was identified. The original assumption had been that the following his/her appointment, the Head of Training would recruit a team of three trainers to be located at the LSHTM, LSTM and DBL. Subsequently it has been decided that the training component of the Programme will be co-ordinated through the Gates Training Committee (see Training Activities in Europe). Further advertising took place in 2001 to recruit the trainers and in May 2001 three trainers were recruited as Lecturers or Advisers in Postgraduate Education.

Dr Rana Asghar has been appointed as a Lecturer in Postgraduate Education based in London. Dr Asghar is currently a Research Associate within the Division of Infectious Diseases at Stanford University. He also engages in consultations for the World Health Organization Eastern Mediterranean Region. Dr Asghar previously worked as a family physician in Lahore, Pakistan and as a Teaching Assistant and Research Associate at the University of Washington.

Liverpool School of Tropical Medicine

Angela Dawson has accepted the position of Lecturer in Postgraduate Education based at LSTM. She is currently a Lecturer in Australia at the Yooroong Garang School of Indigenous Health Studies at the University of Sydney, and is involved with co-ordinating postgraduate coursework programmes, teaching and co-ordinating distance and flexible units of study, preparing material for distance learning, and the design, development and implementation of web based learning material.
Danish Bilharziasis Laboratory, Copenhagen

Paul Bloch has been appointed as an Advisor in Postgraduate Education, to lead the training contribution to the Programme from DBL. He is a senior health adviser and scientist with experience in capacity building, control and research related to tropical infectious disease. Paul has served as manager of two disease control projects in Africa both of which emphasised multilevel capacity building and operational research as an integrated part of programme implementation. Furthermore, he has carried out numerous research studies on infectious diseases in Ghana, Tanzania and Malawi in the process of acquiring his academic degrees.

The School of Public Health, University of Ghana, Ghana

At the School of Public Health, University of Ghana (UoG), the Training Director’s position has been advertised, and a shortlist has been drawn up. Further staff will be recruited once the Training Director has been identified.

College of Medicine, University of Malawi, Malawi

The College of Medicine, University of Malawi (CoM) has recruited Dr Grace Malenga as Director of the Gates Malaria Training Centre in Malawi. Dr Malenga is a paediatrician, working at the Queen Elizabeth Central Hospital in Blantyre. She has been closely involved in the Roll Back Malaria initiative within Malawi. Dr Malenga is now recruiting support staff.

National Institute for Medical Research, Tanzania

The Director of the Training Centre will be Dr Andrew Kitua, who will assume this responsibility as part of his overall role as Director General of the National Institute for Medical Research (NIMR). A job and person description for the Deputy Director, who will take the lead on training, has been drawn up and the position has been advertised. Interviews have taken place and the post will be offered shortly, following the take up of references.

An administrator, Mr Geoffrey Lyamba has also been appointed. He has administrative responsibility for initiatives in Tanzania funded from the Gates Malaria Programme, the Medical Research Council and DANIDA’S ENRECA programme, under the Joint Malaria Programme (JMP) umbrella. JMP has been set up as an agreement of co-ordination between major institutions engaging in research, training and control of malaria within north-east Tanzania.

MRC Laboratories, The Gambia

A trainer with special responsibility for the Gates training programme at the MRC Laboratories (MRC) in The Gambia has been requested to work under the MRC Director of Training.
Linkages with other Gates Malaria Programmes and other Malaria Research and Training Groups

An important consideration in the development of the LSHTM Gates Malaria Programme has been the intention that it should compliment rather than compete with other new initiatives in malaria control. Thus, during the first year of the programme, discussions have been held with several organisations with an interest in applied malaria research and control to identify areas for collaboration.

Other Gates supported malaria programmes
Several meetings have been held with the executive staff of the Malaria Vaccine Initiative (MVI). Professor Greenwood is a member of the technical advisory group for this programme and has been involved in a number of discussions on the clinical aspects of malaria vaccine trials. Discussions have been held in London on how the LSHTM team could contribute to studies on the social and economic aspects of malaria vaccines.

LSHTM (Dr. Croft) was a recipient of one of the first awards from the Medicines for Malaria Venture (MMV) as a partner in a collaborative programme with the University of Bristol and Glaxo SmithKline on the development of a new anti-malarial. Thus, a route for further collaboration with MMV has been established.

The Shoklo Malaria Research Centre in Thailand has been awarded a grant from the Bill & Melinda Gates Foundation to support its work on the control of malaria on the Thai/Burmese border. This programme will have a strong training component and it has been agreed that the partnership will support training activities in Thailand in any way that will be helpful.

WHO
There are already strong links between LSHTM, LSTM and the RBM through the joint LSHTM/LSTM Malaria Consortium. Ways are being explored of how these links might be strengthened in both research and training. Meetings have been held with RBM to discuss research on malaria in pregnancy, an area of common interest. More discussions are needed on how the Gates Malaria Programme could contribute to the capacity development activities of RBM. A possible way of supporting the Tropical Diseases Research Programme (TDR) that is being explored is the establishment of joint-funded PhD programmes.

A number of valuable training initiatives on various aspects of malaria control have been undertaken by WHO AFRO and it is essential that the training activities of the new training centres in Africa are co-ordinated with those of AFRO. Preliminary discussions have been held in Harare as to how this might best be accomplished.

The LSHTM component of the Gates award contains provision for the appointment of two members of staff whose main role would be to facilitate interactions with WHO Geneva and WHO AFRO.

It is expected that a memorandum of understanding will be drawn up between the WHO Pesticide Evaluation Scheme (WHOPES), the LSHTM and a number of drug companies involved in developing pesticides.
European Union

The appointment of Professor Hollingdale to the LSHTM Gates Malaria Programme provides good links with the European Malaria Vaccine Initiative (EMVI) for which he works part-time and, through EMVI, with the African Malaria Vaccine Testing Network (AMVTN).

Malaria groups at LSHTM

As malaria activities expand at LSHTM it is important to ensure that there is no duplication of effort. The LSHTM Department for International Development (DFID) malaria knowledge programme (Dr. Lines) and the LSHTM/LSTM Malaria Consortium (Dr. Meek) have many objectives in common with those of the Gates Malaria Programme. The existence of a cross-departmental Malaria Centre has been helpful in co-ordinating activities of these groups. Activities organised by the Malaria Centre include regular research seminars, business meetings and twice yearly retreats. Co-ordination of activities in Tanzania is achieved through the JMP, a collaboration between LSHTM, the CMP, NIMR and Kilimanjaro Christian Medical College (KCMC). Linkages between programmes at LSHTM is also helped by the involvement of individual members of staff in more than one programme.
Development of Research Strategy

The research outline included in the application to the Foundation was developed during discussions held by a number of working groups that had already been established through the Malaria Centre to consider how malaria research activities of LSHTM could be better co-ordinated. Discussions with colleagues outside LSHTM, including those involved in other Gates-supported malaria initiatives, led to a decision to direct the LSHTM Gates malaria research programme towards the more practical aspect of research rather than to vaccine development (covered by MVI) or new drug development (covered by MMV). Subsequently, discussions have been held within the programme to define further a realistic research strategy.

In April 2001, a meeting of LSHTM staff interested in malaria in pregnancy was held in London together with potential collaborators from LSTM, the CMP and the Walter Reed Army Institute for Research. A number of areas that require further research were identified. These included evaluation of drugs that could be used as an alternative to sulphadoxine/pyrimethamine (S/P) for intermittent treatment during pregnancy, methods of implementing S/P treatment, study of the interaction between S/P and folate and the effects of malaria on HIV in pregnancy. Discussions were held on ways in which intervention studies could be combined with studies on the immune response to malaria in pregnancy and on the effect of pregnancy on infant development. A copy of the minutes of this meeting is provided in Annex 2.

A second meeting was held in April 2001 with collaborators from Copenhagen and Tanzania on research priorities in chemotherapy, with a particular emphasis on Tanzania where both LSHTM and the Centre for Medical Parasitology, University of Copenhagen have research programmes. A wide range of issues was discussed including covering home treatment, resistance and evaluation of new combination therapy regimens. Ways in which LSHTM and the Centre for Medical Parasitology, University of Copenhagen might support the development of clinical pharmacology in Tanzania were discussed. Minutes of this meeting are also provided in Annex 2. Following this meeting the concept of a malaria clinical trials centre based at Muheza and one other centre in Tanzania, which could be supported by the new Gates laboratories to be built at Tanga, has been developed and a discussion paper is under review by interested parties. A copy of the outline proposal is provided in Annex 3.

The need for insecticides that could be used to replace pyrethroids on netting material, one of the objectives of the Gates Malaria Programme, has been given added urgency by further reports of resistance to pyrethroids in populations of Anopheles gambiae in West Africa and in populations of Anopheles funestus in Southern Africa. Links have been established with WHOPES, the division of WHO activities responsible for work in this area, by Dr. Rowland. Plans are being developed for a collaborative meeting with other research groups interested in this area, and possibly with some of the manufacturers, later in the year.

Plans for the role of the Gates Malaria Programme in the evaluation of candidate vaccines will be developed through the links already made with MVI (Professor Brian Greenwood), EMVI (Professor Mike Hollingdale) and AMVTN. Plans for a meeting to consider ways in which LSHTM staff could contribute best to the development and evaluation of malaria vaccines is to be held.

Studies will be carried out to investigate the social, cultural and economic factors that influence the use and acceptability of malaria treatment and prevention. In particular, studies are planned on the acceptability of malaria vaccines and the cost effectiveness of intermittent treatment for malaria in pregnancy. In collaboration with others at LSHTM, we are also exploring the role of the private sector in expanding insecticide treated net coverage. Finally research related to the household management of malaria is planned. The social and economic barriers to seeking treatment for malaria and the cost effectiveness of different programmes designed to improve treatment seeking will be investigated.

Innovative approaches to some of the major research questions set out in the original proposal will be developed by members of LSHTM staff interested in malaria control and submitted for review by the Research Committee described in the following section of the report.
The Gates award includes $10.5 million to support new projects that fall within the major research objectives of the Gates Malaria Programme, namely: evaluation of new forms of chemotherapy and of new insecticides; trials of vaccine candidates; methods for prediction of malaria epidemics. Of this sum, $1.5m was earmarked for the WHO LapDap Taskforce and $300,000 for a joint LSHTM/LSTM programme on geographical information systems (GIS). The remaining funds are open to proposals made by staff from with the Malaria Centre of LSHTM.

To ensure both a fair and open form of assessment and a rigorous evaluation of each proposal submitted, a Research Committee has been set up. The committee contains senior members of the School staff whose combined expertise covers the range of disciplines that could be expected within the proposals. The committee is complemented by two external members (from DFID and LSTM) with the Gates Malaria Programme Director and Deputy Director as advisors. The review process being used is one adopted by many external funding agencies. Pre-proposals are considered and an invitation sent for a full proposal from those selected. Assessment by external referees forms part of the process of review by the committee to decide on the scientific merit of each submission and its relevance to the objectives of the Gates Malaria Programme.

The Research Committee will dispense about $8 million. The proposals invited are either small project grants of less than $75,000 or larger project/programme grants of up to $750,000. In addition about $700,000 will be set aside to allow small initiative grants to be awarded through the Gates Malaria Programme managed without recourse to the Research Committee. These will mainly be for pilot studies.

During the first round of submissions 12 pre-proposals were considered. These were reduced to one small and three large full proposals. The following projects were approved by the Gates Research Committee at their meeting on 12 June:

- *In vitro/ex vivo* assessment of vaccine-induced immunity to malaria (PI: Professor Riley);
- *New* systems for prediction of malaria epidemics in the East African islands (PI: Dr Cox);
- *Evaluating the effect of combination therapy on the selection of drug resistance in Plasmodium falciparum*, and the implications for public health (PI: Dr Sutherland et al).

The challenge is clearly to keep the research focus within the objectives of the Gates Malaria Programme but without stifling innovative ideas - guidance has been given to the Research Committee about major developments to be expected.

Protocols of approved projects can be found in Annex 4.
Research Laboratories

Tanzania

Plans are being developed for the construction of research laboratories at Tanga and Moshi. The original proposal envisaged building laboratories only at Moshi but it soon became apparent that there was a need to provide well appointed laboratory support for research in hospitals and study areas south of the Usambara mountains.

The Tanga laboratories will be associated with the proposed relocation of the NIMR Amani Research Centre, directed by Dr Martha Lemnge. The laboratories will be equipped particularly for research in pharmacology and molecular biology and will be developed collaboratively with colleagues from the Centre for Medical Parasitology, University of Copenhagen (CMP). These laboratories could provide the necessary support for a new clinical trials centre to be based at Teule Hospital, Muheza, and at Bombo Hospital, Tanga.

The laboratories at Moshi will be built on the campus of the Kilimanjaro Christian Medical College, close to the new offices of the Medical Research Council (MRC) malaria programme. They will form the essential laboratory base for the MRC programme on malaria at different altitudes and for other field and clinical projects being developed under JMP.
Around 130 applications have been received for the PhD/DrPH studentships, 78% of which were from malaria endemic countries. A long shortlist is currently being considered by LSHTM, LSTM, CMP and DBL, which will result in a minimum of six awards being offered to students, enabling them to start their research in October 2001. It is likely that there will be many more suitable candidates than available funding from the Gates Malaria Programme. Efforts will be made to secure additional funding from other sources to enable the most able students who cannot be supported by the Gates Malaria Programme to pursue their studies. There will be a further round of recruitment next year for entry in October 2002.

Activities in Africa

Key activities in this area have revolved around recruitment of staff (see Recruitment above), development of building plans for the training centres, and in some cases, conducting a situational analysis of existing training initiatives in each country in order to develop an appropriate range of courses.

School of Public Health, University of Ghana, Ghana
Training Programme
Discussions have centred on the training programmes that already take place, particularly those within the Ministry of Health. Training needs and opportunities were identified and included developments with the MPH programme of the School of Public Health and, in particular, inservice training for mid level staff. There was a strong support for the development of methods of accreditation linked to all training as a means of enhancing career development prospects. A draft Ghana Training Programme has been drawn up. The local steering committee will comprise representatives of the School of Public Health, Ministry of Health and the Noguchi Memorial Institute of Medical Research.
Training Centre

The training agreement is with the University of Ghana but the School of Public Health will be the lead institution in developing training programmes, working very closely with the Ministry of Health and other partner institutions.

The ambitious proposal is to build a new School of Public Health on a site adjacent to the Noguchi Memorial Institute for Medical Research. The Gates Training Centre would be the ground floor of the new School and it is confidently expected that the Gates funding for the building can be used to leverage the remaining funds needed for completion of the whole building. In addition, there is a plan to site a College of Biomedical Sciences alongside, the three institutes providing an excellent opportunity for enhancement of training facilities. The building programme will be phased allowing for the Gates Training Centre to be built independently in advance if required.

College of Medicine, University of Malawi, Malawi
Training Programme

Any proposed training initiatives will be devised to complement and build on existing training and/or support offered through the following:

- CoM
- The National Malaria Control Programme
- Malaria Project/Malawi-Liverpool-Wellcome Trust Research Programmes
- Blantyre Integrated Malaria Initiative
- Integrated Management of Childhood Illnesses
- Population Services International
- Primary Health Care Training Centres
- RBM

Proposals for potential training courses will be drawn up over the next few months, paying particular attention to the need to evaluate the impact of each course. The work will be driven forward by the Director with support from a working group, comprising representatives from a number of the organisations listed above, which will meet monthly. This working group will report to an Advisory Board within Malawi, which will meet twice a year.

Training Centre

The CoM has buildings both on the Mahatma Gandhi campus, and also on the site of the Queen Elizabeth Central Hospital which is located about 1km distant. After careful consideration of a number of options, the College has endorsed in principle that the building of a core training facility will be on the Queen Elizabeth Central Hospital site. The Director of the Hospital has indicated that he will support this option.

The specification of the building is currently being drawn up and will include office space, classrooms, IT suite, study/resource area. A teaching laboratory has not been included, as teaching will either take place at the district level or, should there be a need for a laboratory within Blantyre, at one of the new laboratories located within the College on the Mahatma Gandhi campus. Basic student accommodation can be provided on the hospital site, and further accommodation is available on the Mahatma Gandhi campus.
National Institute for Medical Research, Tanzania

Training Programme

Stakeholders have met and a situational analysis has been completed. This has been collated by NIMR into a document called ‘Tanzania Malaria Control and Research Training Centre’. The training programme will be developed by the NIMR with assistance from the stakeholders who consist of representatives from:

- NIMR
- Muhimbili University College of Health Sciences
- KCMC
- Commission for Science and Technology
- Tanzania Food and Nutrition Centre
- Ministry of Health, Tanzania

Based on the situational analysis, the stakeholders have identified that the training should be focused at the district level in keeping with the Tanzanian health sector and local government reform programme. The main themes of the training programme will be training in:

- Management of malaria
- Prevention of malaria and malaria epidemics
- Community based malaria control
- Operational research for malaria control

These themes are more fully described in a document called ‘Training Programme for Tanzania Malaria Control and Research Training Centre’. The stakeholders will meet at least quarterly to develop the training programme based on these themes.

Training Centre

The training centre will be located within the existing grounds of NIMR HQ in Upanga, Dar es Salaam. Negotiations are under way to identify whether additional funding could be provided by DFID, and perhaps other donors in order to build a more substantial building that would incorporate staff employed in the National Malaria Control Programme. This very exciting prospect will significantly enhance the effectiveness of the training centre.

MRC Laboratories, The Gambia

Training Programme

Plans are in hand for a short course for malaria control officers to be held later in the year. Participants will be drawn from countries of the sub-region including francophone countries.

The Training Centre

There is already an active general training programme for all categories of staff at the MRC Laboratories, Fajara. However, it has been agreed that a small financial contribution from the Gates Malaria Programme will be used to assist with the provision of office space for a trainer. This will be built in the forthcoming year.
Training Activities in Europe

Progress in this area had initially been hampered by the difficulties encountered in recruiting a Head of Training, as mentioned in the recruitment section. However, now that Lecturers/Advisers in Postgraduate Education have now been appointed by the northern partners, and equivalents are beginning to be recruited by the southern partners significant progress can be made during 2001/2002. The training activities for both Europe and Africa will be co-ordinated by the Gates Training Committee, which will meet at least twice a year. It is anticipated that the Committee will meet for the first time on the 1/3 of October 2001 in Liverpool. The Committee composition will include representatives with training expertise from all the Gates partner organisations within the Gates Malaria Programme.
Investment of Income

$20 million was received from the Bill & Melinda Gates Foundation in September 2000. A further $20 million will be forthcoming in September 2001 provided a satisfactory annual report and financial statement have been received by the Foundation. The total budget required is US$42.741 million, the shortfall of $2.741 million achieved through judicious investment by the LSHTM.

LSHTM’s objectives for managing the funds are to maximise the investment return (net of charges) with minimal risk, with the flexibility to withdraw funds as required. All investment returns will be spent on the project.

Union Fund Management were selected to manage these funds on LSHTM’s behalf, based on their experience and understanding of our requirements. UFM is an established specialist in low risk, short and medium term investment of surplus funds. They have over 30 higher education clients and were recommended to LSHTM by several of these.

The funds are invested in a money market portfolio of short term cash deposits and certificates of deposit issued by well rated major banks with a high profile of credit worthiness and low interest rate risk, with a limit of £2 million (US$3 million) on any one bank.

We have also entered into a forward foreign exchange contract on the second tranche of funds due in September 2001. This minimises the risk from exchange rate fluctuations and gives greater certainty as to the amount available to spend on the project.

Budget Requirements

Following an assessment of needs, virements to the original budget have occurred to reflect changes in priorities, and identification of categories that had not been included in the original budget. Inflation and salary assumptions have been incorporated to allow a more detailed cash flow forecast to be derived. In addition, the budgets for Research and Overheads have now been more clearly defined and a contingency has been created.

The overall budget requirement of US$42.741 million remains the same. More detail on the budget and the financial statement for the year to June 2001 can be found in Annex 5.

Financial Agreements

Financial agreements with each partner have been drawn up with clauses clearly stating the role that each organisation will play and the funds that will be transferred to fulfil the identified role. Further clauses have been included to give guidance regarding the submission of financial statements by partners receiving funds and the auditing process that will be employed at the end of five year period. The following partners have agreed to sign the Financial Agreement:

- University of Ghana
- KCMC
- NIMR
- DBL

CMP will not be signing a Financial Agreement directly with the LSHTM, as funds for the CMP will pass though DBL. The Financial Agreement’s to be signed by the LSTM and the CoM have been delayed due to a request by LSTM that funding for the CoM should pass through the LSTM. Under these Agreements LSTM and LSHTM will be jointly responsible for the delivery of the Programme in Malawi. These Agreements are being re-drafted and should shortly be ready for signing.
Priorities for the Second Year of the Programme

Priorities for the second year of the programme (July 2001 - June 2002) will include the following:

**Strategy**
The development of a conceptual framework to link all the programme components together and a programme strategy to define a mechanism under which the various components will operate has been identified by the International Advisory Committee as being of the highest priority. This will be developed early in the year as a matter of urgency.

**Research**
The implementation, after due scientific and ethical review and discussions with endemic country partners, of at least one major research project in the areas of:

- Evaluation of anti-malaria drug combinations;
- Evaluation of new insecticides that could be used to treat netting material;
- Vaccine evaluation;
- Epidemic prediction.

**Training**
Objectives for training will be:

- The identification of at least 12 PhD or DrPH candidates and their acceptance by one of the partner institutions;
- The establishment of an effective training team at each of the African centres;
- The initiation of training course at each of the training centres;
- Production of distance learning materials to support training course in endemic areas.

**Recruitment**
The remaining posts at LSHTM will be filled during the second year of the programme. These posts include a statistician, a computer scientist and two co-ordinating posts. Strenuous efforts will be made to identify high quality post-doctoral students in malaria endemic areas through personal contacts.

**Logistics**
A major objective will be to start building the training centres in Ghana, Malawi and Tanzania, and the laboratories in Tanzania, by early 2002. The triennial MIM Malaria Conference will be held in Arusha, Tanzania in November 2002. Mr. Gates has been invited to the opening of this meeting. If he accepts this invitation, his visit to Tanzania would provide an opportunity for him to open the training centre and/or laboratories.