Report on the

Regional consultation on a proposed postgraduate course in medical entomology and vector control

Cairo, Egypt
29–30 August 2006
CONTENTS

EXECUTIVE SUMMARY ........................................................................................................... 1

1. INTRODUCTION ................................................................................................................. 1

2. TECHNICAL PRESENTATIONS ............................................................................................ 2
   2.1 Human resource development in the field of medical entomology and vector control in the Eastern Mediterranean Region ................................................................. 2
   2.2 Postgraduate training in medical entomology and vector control at the London School of Hygiene and Tropical Medicine .......................................................... 3
   2.3 Medical and vector control training at the Blue Nile Research and Training Institute in collaboration with the University of Gezira and the Ministry of Health, Sudan ......................................................................................................................... 4
   2.4 Medical entomology and vector control training at the Research and Training Center on Vectors of Diseases, Ain Shams University ........................................... 5
   2.5 Istituto Superiore di Sanità, Rome, National Institute of Health of Italy and Department of Parasitology postgraduate courses: past experiences ........................................ 6
   2.6 The international master’s degree in medical and veterinary entomology by the Institute of Research and Development, France .................................................. 7
   2.7 Capacity-building: entomological support for vector control at the South African National Institute for Communicable Diseases .................................................... 8
   2.8 Training in medical entomology and vector control at the Liverpool School of Tropical Medicine .............................................................................................................. 8

3. ISSUES ARISING FROM THE PRESENTATIONS AND DISCUSSIONS ............................... 9

4. DRAFT CURRICULUM OF THE WHO POSTGRADUATE TRAINING COURSE IN MEDICAL ENTOMOLOGY AND VECTOR CONTROL ......................................................... 10

5. LOGISTICS, FINANCIAL AND ADMINISTRATIVE ISSUES IN ESTABLISHING THE TRAINING COURSE IN MEDICAL ENTOMOLOGY AND VECTOR CONTROL ............................................................................................................................ 11

6. PROPOSED PLAN OF ACTION ............................................................................................ 12

7. RECOMMENDATIONS .......................................................................................................... 13

Annexes
   1. AGENDA ............................................................................................................................ 14
   2. PROGRAMME ...................................................................................................................... 15
   3. LIST OF PARTICIPANTS ..................................................................................................... 16
EXECUTIVE SUMMARY

In 2005, the WHO Regional Committee for the Eastern Mediterranean issued a resolution on integrated vector management (EM/RC52/R.6) in which it recognized the weak capacity in medical entomology and vector control in the Region and requested the Regional Director to establish a diploma course in this field, funded by allocations from country regular budgets and other sources. In response, a regional consultation was held in Cairo, Egypt from 29–30 August 2006 to discuss the establishment of a postgraduate training course in medical entomology and vector control. The objectives of the consultation were to:

- review regional capacity needs in medical entomology and vector control
- identify potential course venue(s) and assess adequacy of facilities
- draft the curriculum for a Master's Degree Programme in Medical Entomology and Vector Control
- identify external resources for the facilitation of the proposed degree programme
- draft a plan of action and recommend the way forward.

A total of 20 participants attended the regional consultation. Thirteen represented different academic and research institutions within and outside the Region and seven were from the WHO secretariat. The participating academic and research institutions were the Ain Shams University of Egypt, El Gezira University of Sudan, the South African National Institute for Communicable Diseases, the Istituto Superiori di Sanità of Italy, and the Liverpool School of Tropical Medicine and the London School of Hygiene and Tropical Medicine of the United Kingdom.

After the opening remarks by Dr Zuhair Hallaj, Director, Communicable Disease Control, WHO/EMRO, emphasizing the increasing vector-borne disease burden in the Eastern Mediterranean Region and the simultaneous decline of capacity in medical entomology and vector control, technical presentations highlighting the need for this course were made. These were followed by group work in which a course curriculum was developed, logistical, financial and administrative issues were presented and an action plan was developed (see copy attached).

Recommendations

1. The course should be a one-year master's degree (not a postgraduate diploma) jointly hosted by Ain Shams and El Gezira universities, with the first batch of students starting September 2007.

2. The course should be oriented to medical entomology for operational decision-making and vector control programme management purposes, and comprise classroom, laboratory and field study, including a research project for a dissertation.

3. The Regional Office should establish a Steering Committee to finalize the course curriculum before the end of 2006 and to oversee the implementation of the plan of action developed for this course.
4. In view of the fact that all the regions of WHO are facing an acute shortage of medical entomologists and vector control experts for planning, implementing, monitoring and evaluation of vector-borne disease control programmes; that strengthening capacity in medical entomology and vector control is of global public health importance; and that the EMRO initiative for a WHO postgraduate training course is of interest and relevance outside the Region, it is recommended that:

- This initiative and experience be shared with other regions of WHO;
- Where appropriate, facilitators and potential trainees from other Regions of WHO also engage with the course, to ensure sustainability and enhance its international repute;
- Countries of the Region consider bringing the issue of capacity-building and training in medical entomology and vector control to the Executive Board of WHO;
- Countries identify ways to enhance the career opportunities for medical entomologists and vector control experts within Ministries of Health, at all levels of vector control implementation and, where necessary, establish new positions.
1. INTRODUCTION

In 2005, the WHO Regional Committee for the Eastern Mediterranean issued a resolution on integrated vector management (EM/RC52/R.6) in which it recognized the weak capacity in medical entomology and vector control in the Region and requested the Regional Director to establish a diploma course in this field, funded by allocations from country regular budgets and other sources. In response, a regional consultation was held in Cairo, Egypt from 29–30 August 2006 to discuss the establishment of a postgraduate training course in medical entomology and vector control. The objectives of the consultation were to:

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The increasing vector-borne disease burden in the Region and the simultaneous decline of capacity in medical entomology and vector control was emphasized by Dr Zuhair Hallaj, Director, Communicable Disease Control, WHO/EMRO in his opening remarks. Dr Hallaj reminded participants of the Regional Committee resolution and urged them to take advantage of the conducive political environment and country commitment to establishing a postgraduate training course in medical entomology and vector control. He added that Member States would also need to undertake the further effort of creating or re-profiling existing vector control posts and providing career opportunities, otherwise the intended beneficiaries of the course would be frustrated and the public health benefits would be lost.

Dr Hallaj also emphasized the need for a high quality course of international standards – countries were expecting a course that balanced the operational needs of control programmes with academic needs. Although several institutions in the Region had been supporting countries by training their staff, development of a postgraduate training course was a challenge that required the support of institutions outside the Region – especially those that were currently offering similar courses.

The participation of Dr Lorenzo Savioli, Director, Department of Control of Neglected Tropical Diseases and other WHO staff from headquarters and the Regional Office for Africa at the consultation were cited by Dr Hallaj as examples of the commitment of WHO to the initiative at all levels of the Organization.
After a round of introduction by participants, the consultation was officially opened with presentation of technical papers. The agenda, programme and list of participants and their respective institutions are included in Annexes 1, 2 and 3.

2. TECHNICAL PRESENTATIONS

2.1 Human resource development in the field of medical entomology and vector control in the Eastern Mediterranean Region

Dr Abraham Mnzava, WHO/EMRO

Vector-borne diseases (VBDs) are expanding geographically, seasonally and in severity. Prevention of VBDs is becoming more complex, requiring innovative approaches with increased intrasectoral and intersectoral coordination. At the same time, there is a shortage of medical entomologists and vector control experts capable of planning, implementing, monitoring and evaluating vector control interventions.

An entomologist has in-depth understanding of the biology and ecology of vectors and the transmission dynamics of vector-borne diseases, and is well equipped to carry out entomological surveillance and assess the impact of interventions. The ability to plan and execute control operations would be a valuable additional skill. In countries where more than one VBD exists, such as Sudan, it may be necessary to have an expert for each disease.

In contrast, a vector control expert shares with the entomologist the in-depth knowledge of transmission dynamics of vector-borne diseases, parasitology and basic principles of VBD epidemiology, but is also able to plan, apply, monitor, and evaluate vector control interventions and tools. To address a broad range of both human and animal VBD problems there is a need to train both entomologists and vector control experts.

Potential trainees should hold a degree in one of the following: biological sciences, medicine or veterinary medicine, agricultural sciences (with bias in entomology), medical/science laboratory technology, or environmental health. Motivation and interest in fieldwork is a pre-requisite.

External support will be needed via a network of institutions, from using facilitators in areas where expertise is lacking, through accessing knowledge from a pool of retired academicians and researchers, to providing financial assistance. The issue is how the resources from institutions such as the Liverpool School of Tropical Medicine, Istituto Superiori di Sanità, National Institute for Communicable Diseases of South Africa, London School of Hygiene and Tropical Medicine and Institute of Research and Development can be tapped.

It is proposed that the course run for 12 months in which four months are for coursework and eight months for fieldwork and a research project for a dissertation. In the worst-case scenario the course would run for 20 months – eight months for coursework and 12 months for fieldwork and a research project for a dissertation.
To retain trainees, each country needs to have clear job descriptions, career paths and job opportunities for entomologists and vector control experts, providing ample opportunity to practice what was learnt in a balance between office and field work. WHO should devise an award system in which projects are identified in consultation with course facilitators and WHO, to provide funds at the end of the fellowship to support operational research, similar to the system used with WHO/TDR re-entry grants.

In conclusion, entomology and vector control is a very broad field; transmission and subsequent prevention of VBDs is becoming more complex; potential trainees must be well equipped to address VBDs affecting humans and animals; a network of institutions is necessary to synergize resources; and the commitment of government, WHO and partners is necessary for retention of trainees.

2.2 Postgraduate training in medical entomology and vector control at the London School of Hygiene and Tropical Medicine

Dr Mary Cameron, LSHTM

The London School of Hygiene and Tropical Medicine (LSHTM) is research and a postgraduate teaching institute with over 100 years of experience in tropical medicine and public health. Every academic year, it hosts over 2000 students, from over 120 countries, who are taught by 800 members of staff, all international leaders in their field of research. It offers 22 in-house, quality-validated MSc courses. The two most relevant to the purpose of the consultation are the MSc in Parasitology (MP) and MSc in Biology and Control of Disease Vectors (BCDV), which have been running successfully for over 30 years and 14 years respectively. The courses take one year (full-time), or two years (part-time, split study) to complete.

Both MP and BCDV have international appeal. Students come from a variety of cultural and scientific backgrounds, and have different objectives for registering for their course. In general, the courses attract students who either wish to pursue a research career, or wish to go into operational control programmes on completion of the course. Due to the extensive facilities available at LSHTM, students' differing needs are addressed by offering a choice of study modules in semesters 2 and 3. The core teaching in semester 1 provides training in parasitology and entomology, analysis and design of research studies, molecular biology, and critical skills through lectures, hands-on practicums and group work.

Students choose six modules from a range allocated to six different timetabling slots in semesters 2 and 3. Each of these modules has a different type of assessment to ensure that the student acquires a skills matrix. For the more specific BCDV course, students must include the modules 'Vector Sampling, Identification and Incrimination' and 'Methods of Vector Control' in their choice. Students also undertake a compulsory one week field course, and an 8–10 week research project as part of their studies. As we have strong collaborations with many institutes worldwide, we can arrange for this project to take place in a VBD-endemic country that is most appropriate to the student.
To run a successful course of this quality in the long-term, the host institute and the student need to overcome constraints. The institute requires: well-equipped teaching laboratories, well-equipped lecture rooms, audio-visual support, computer laboratories and wireless provision, insectaries, information technology support, library access, access to the field and collaboration with scientists in other international institutes. The selection criteria for the candidate student are vital. Even with stringent entry requirements, there is a mixed ability entry regarding English language skills, computer skills, statistical skills and laboratory skills. In addition, the course should evolve by responding to student and external examiner evaluations, and periodical external reviews.

The LSHTM is happy to support the proposed regional MSc course in Medical Entomology and Vector Control by offering entry to its short study programme (short course, or relevant in-house or distance-learning MSc modules), if a stop-gap during initial phases of the proposed course is required, or access to LSHTM staff. Its entomology staff, several of whom have field projects in countries of the Region, have a special interest in public health and vector control and are willing to serve as guest lecturers or evaluators (for quality validation) for the proposed course.

2.3 Medical and vector control training at the Blue Nile Research and Training Institute in collaboration with the University of Gezira and the Ministry of Health, Sudan
Dr Abdalla Gebreel, BNRTI

The Blue Nile Research and Training Institute (BNRTI) was founded in 1993 to serve the common health problems in al-Gezira. Such initiatives as the Blue Nile Health Project, (1979–1990), which succeeded in controlling malaria, schistosomiasis and other water-borne diseases, were achieved by adopting the philosophy of the faculty of medicine of the University of Gezira, where greater emphasis is placed on community-based education with problem-solving strategies. The BNRTI is indeed a model of partnership between academic institutions, the Ministry of Health and WHO. It is a national/regional centre for medical training, recognized by WHO, UNICEF and the Global Fund to fight AIDS, Tuberculosis and Malaria. The BNRTI also has wide collaboration with international institutes such as the Danish Bilharziasis Laboratory, Liverpool School of Tropical Medicine and Royal Tropical Institute (Netherlands).

Previous experience in the training of medical entomologists and vector control includes eight batches of graduates with postgraduate diplomas in malariology, which includes a 12-week medical entomology and vector control module, three regional short (3–8 week) training courses on vector control with participants from countries of the Region, six national short (3–8 week) courses in vector control for staff of the national malaria control programme, as well as several PhD and MSc (by research) students who have graduated from BNRTI in collaboration with Sudanese universities since 1979.

The BNRTI, in collaboration with the University of Gezira, should be considered to host the proposed WHO postgraduate training in medical entomology and vector control for the following reasons: a number of vector-borne diseases are endemic in different parts of the
country such as malaria, schistosomiasis, leishmaniasis, lymphatic filariasis, dengue fever, Rift Valley fever, onchocerciasis, African sleeping sickness and yellow fever; there are plenty of materials to learn from; long experience in the control of vector-borne diseases (since 1906); strong internal collaboration with federal and state ministries of health, the science and medicine faculties at the universities of Gezira and Khartoum and other national institutes; and low costs of running the course.

BNRTI held six meetings to explore the possibility of hosting the proposed course, established an academic committee and, after a two-month working program, successfully developed a detailed proposal that defined the training modules, designed the curriculum and assessed the available and needed resources for the course.

As this course is a collaborative program, the facilities of the University of Gezira and other institutions will be utilized as follows: entomology laboratory, lecture room (with audiovisual tools), library, computer laboratory with internet, and insectary (all BNRTI); national health laboratory and faculties of medicine and science at the University of Khartoum; parasitology laboratory; molecular biology laboratory; insect museum; Sennar Malaria Training Centre; and three well equipped field stations.

Facilities also include 10 well-furnished accommodation rooms to host up to 20 candidates (males and females); one room for an international visiting expert; a kitchen and dining room; a further eight rooms will be available by the end of 2006 in a proposed accommodation building funded by the Global Fund.

At the BNRTI there is a multidisciplinary teaching staff of five professors, 10 associate professors, five assistant professors, five senior technicians, five laboratory assistants, five field assistants and three administrative secretaries. Still needed are the budget to run the course; new vehicles for fieldwork; additional audiovisual equipment; upgrading of the laboratories for entomology, parasitology and molecular biology; upgrading of the insectary and improving the library.

2.4 Medical entomology and vector control training at the Research and Training Center on Vectors of Diseases, Ain Shams University

Professor Adel Gad, Ain Shams University

Ain Shams University was introduced as a potential venue to host the proposed postgraduate MSc degree in Medical Entomology and Vector Control. The degree is urgently needed to fulfil the needs of countries of the Region for qualified medical entomologists to conduct vector studies, and plan and manage control programmes.

The Entomology Department at the Faculty of Science has well-established postgraduate degree programmes in medical entomology (Diploma, MSc and PhD programmes). Enrolment of students in the MSc and PhD programmes is restricted to holders of a BSc in entomology. This represents an obstacle for potential trainees who have not graduated from a faculty of science to register at the university. To overcome this administrative obstacle, it was suggested to have an agreement between Ain Shams and WHO
that would allow the enrolment of students in a new international MSc degree in Medical Entomology and Vector Control. The degree programme would be sponsored by WHO. The tentative degree format will be based on taught courses for one academic year and the presentation of a dissertation for another year. The course activities could be executed in collaboration with potential international institutions with renowned experience in the field.

The university's Research and Training Center, as a WHO collaborating centre, will be the cornerstone of this degree programme. The centre is unique in the Region with its research and training resources, collaboration with the university's Entomology Department, Faculty of Science, and Institute of Environmental Studies and Research, as well as international institutions. The centre successfully executed 28 short training courses (and one diploma in medical entomology for three trainees) in various aspects of medical entomology and control of VBDs. Of these, eight were international courses sponsored by the WHO Regional Office, with a total of 58 trainees.

The suggested taught courses will consist of seven modules: four core modules covering biology, ecology and control of vectors and vector-borne diseases and three supplementary modules covering computer science, biostatistics, bioethics and scientific writing.

In summary, due its teaching and research experience, bilingual teaching staff, and low study costs and living expenses, Ain Shams University offers a great opportunity for international students to study.

2.5 Istituto Superiore di Sanità, Rome, National Institute of Health of Italy and Department of Parasitology postgraduate courses: past experiences

Professor Giancarlo Majori, ISS

Between 1982 and 1984 several international courses organized jointly by Italy (Rome, Palermo) and Turkey (Adana) were given on malaria and other tropical diseases. The courses were of 3–5 months' duration and included 3–5 weeks' training for medical officers, scientists and health personnel responsible for the control of tropical diseases. Emphasis was on malaria and programme management but parasitology, entomology, teaching techniques and epidemiology were also covered. From 1987 to 1991 the same course was jointly conducted in Thailand (Bangkok and Phrabuddhabat) and Italy (Rome) for three months.

The course provided practical experience of malaria both in the field and in planning its control, and also training in basic epidemiology and simple statistics, teaching skills development, introduction to computer applications in malaria control, other tropical diseases, malaria parasitology, malaria diagnosis, entomology, vector control, disease management, chemotherapy, an epidemiological approach to malaria control and malaria control programme planning and management. In addition to conducting a situation analysis in the field, the participants also developed, individually, a plan for malaria control for their country, or part of their country, based upon information that they had brought with them and using the knowledge and competence gained from the training course.
Another international course on malaria management and other tropical disease control programmes was held in Rome, Italy for six weeks in 1994 for senior health personnel with high national-level management responsibilities in programmes designed to control tropical diseases. Advanced training for tropical disease control programme managers was jointly organized with the Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand in 1995. The major subject areas taught were: the Global Strategy and World Declaration on Malaria Control; introduction to computer applications in VBD control; information systems and programme evaluation; the economics of healthcare related to VBDs; and programme planning and management.

From 1982 to 1995 a total of 12 participants were trained in Italy, a further 51 in Italy and Turkey, and 101 in Thailand and Italy.

The ISS has comprehensive and up-to-date facilities for the epidemiology and taxonomy of *Leishmania* agents; a spectrum of state-of-the-art techniques are used in laboratory diagnosis and vector control. There is also capacity in assessing risk factors for leishmaniasis transmission and other VBDs re-emerging with global ecosystem change. The ISS participates in several projects in this area such as the Emerging Diseases in a Changing European Environment (EDEN) project.

2.6 The international master’s degree in medical and veterinary entomology by the Institute of Research and Development, France

*Dr Lucien Manga, WHO/AFRO*

The need for a master’s degree in Medical and Veterinary Entomology stems from many causes: there are many emerging/re-emerging vector diseases; vector control is the main strategic approach for vector-borne disease control; the teaching of medical and veterinary entomology is receiving less attention; the discipline is evolving constantly; and there has been a dramatic decrease of medical–veterinary entomologists worldwide. Thus an international master’s degree programme following the French License–Master’s–Doctorate (LMD) system has been established by the Institute of Research and Development to cater for French- and English-speaking students from developed and developing countries, involving universities in both developed and developing countries and including the opportunity for field work in VBD-endemic countries.

The course will include training in vector systematics, vectorial ecology, population genetics (of vectors), genomic and post-genomics and vector control. This is to be followed with laboratory and field activities and with practical training in an affiliated laboratory. The course is open to students with an interest in public health, animal health, teaching and research from Africa, Europe, America and Asia. Coursework will take place at the Institut Régional de Santé Publique of Ouidah, Benin and the Centre de Recherche Entomologique of Cotonou, Benin, while field training will be held in Benin and Burkina Faso and research training in over 30 affiliated laboratories in Africa and Europe.

The course will be managed by a director located in Cotonou, Benin, assisted by an administrative and technical officer, and a deputy director based in France and assisted by a
teaching and technical committee composed of 12 members. The first batch of 14 students will begin the course in September 2006 for one year.

The course is partly funded from tuition fees — the cost per student is approximately €12,000 (the equivalent of US$15,000). This lump sum includes all expenses: air tickets to Cotonou, 12 months fellowship, operating costs, etc. Potential funding agents for the course for the 2006–2007 academic year include: the Institut de Recherche pour le Développement, the Institut Régional de Santé Publique, Centre de Recherche Entomologique of Cotonou, the Université d'Abomey-Calavi, WHO/AFRO, the French foreign ministry, the Université de Montpellier III, the Université de Montpellier I, the Institut Pasteur of Paris, and the Conseil Général de la Réunion. New students may apply from February, 2007 via the website http://www.mie.bj.refer.org

2.7 Capacity-building: entomological support for vector control at the South African National Institute for Communicable Diseases

Professor Maureen Coetzee, NICD

An integrated VBD control programme comprises four distinct operational areas: vector control, disease management, monitoring and surveillance, and health promotion. The entomologist in charge of vector control also needs a sound grounding in monitoring and surveillance, and basic knowledge of disease management and health promotion.

The National Institute for Communicable Diseases (NICD) has, in the past, offered specialized short-course training in specific aspects of entomology for vector control. Theoretical and practical training in mosquito biology, behaviour and identification, insect rearing in the insectary, field collections, insecticide resistance testing and conducting bioassays was given. The management of insecticide resistance within a vector control programme and the options available to programmes was also covered.

Possible topics for an MSc degree in vector biology and control include introduction to medical entomology, vector biology, population biology and control, insecticide resistance, molecular biology of vectors and parasites, molecular identification of mosquitoes, statistics for the biological sciences and research project design and proposal writing. The University of the Witwatersrand requires that the split between coursework and research project is 50:50 and the masters degree be completed within one year. The NICD is in the early stages of setting up such an MSc programme and will be using information and ideas put forward at this workshop.

2.8 Training in medical entomology and vector control at the Liverpool School of Tropical Medicine

Dr Martin Donnelly, LSTM

The Liverpool School of Tropical Medicine (LSTM) is an international postgraduate centre of excellence, devoted to research, education and training, and consultancy. Staff from the vector group within the school teach vector biology to a variety of health professionals but the two courses that are most germane to the consultation are the MSc in Biology and Control
of Disease Vectors and the MSc in Molecular Biology of Parasites and Disease Vectors. These courses have on average 15 students per year. The courses are modular and take approximately one year to complete.

There are three exit points for students: the end of the first semester, the end of the second semester and at the end of the course. Students who fulfil all course requirements and exit at one of these time points receive a Certificate, a Diploma or an MSc respectively. The courses begin in August and the first semester covers core modules common to both courses. In brief these comprise introductory entomology and parasitology, statistics and laboratory skills. Teaching is by a combination of didactic teaching, problem-based learning exercises, practicals, demonstrations and fieldwork.

On completion of the first semester students choose from a range of modules that allow them to tailor their education to their career needs. The final section of the course is a three month research training exercise. This can involve analysis of extant data sets or laboratory or field-based research. Alumni from the course go on to a range of careers, many returning to positions within the public health sector, continuing with a research career or entering clinical training. The LSTM hosts the largest group of vector researchers in Europe with a range of skills and interests that are relevant to the proposed MSc course. As part of its capacity-building mandate the LSTM is willing to assist with the development, delivery and evaluation of the proposed course.

3. ISSUES ARISING FROM THE PRESENTATIONS AND DISCUSSIONS

Participants representing different institutions and those from the WHO secretariat shared their experiences in training and capacity-building in general and on medical entomology and vector control in particular. The following issues came up from the presentations and were discussed at length: candidate profile(s); language for potential candidates; teaching of classic medical entomology versus vector control; classroom learning and practical or field-based methods; multiple venues and their cost implications; the adoption of a modular structure for flexibility purposes; course duration; career paths, ceilings and incentives for the course graduates; financing and sustainability of the proposed training course; course accreditation by the hosting academic institutions; offering an MSc degree rather than a postgraduate diploma; how to take full advantage of the political commitment of Member States; the use of problem-based learning methods compared to didactic teaching methods; how to track alumni as a means to measure the relevance and impact of the course; resources that will be needed – including the need for external facilitators to teach in the course.

These issues were further discussed in group work – one group drafted a curriculum outline and the other considered the logistics, financial and administrative issues of conducting the course, as well as developing a detailed plan of action for establishing the course. The details are found in the following sections of the report.
4. **DRAFT CURRICULUM OF THE WHO POSTGRADUATE TRAINING COURSE IN MEDICAL ENTOMOLOGY AND VECTOR CONTROL**

At the end of the first day of the consultation, a small group of four people was assigned to draft the course aims and objectives and the modules for the curriculum of the proposed WHO postgraduate training course in medical entomology and vector control. The draft was discussed the following day in a plenary session and a number of amendments agreed upon. One of two working groups was then tasked with expanding the modules' contents. The draft was subsequently shared and discussed in plenary. The following is a summary of the draft curriculum.

It was agreed that the course duration should be 1 year. Upon completion, participants should be able to:

- identify VBD problems in relation to the general health situation; and
- plan, implement, monitor and evaluate vector control programmes based on integrated vector management approaches in accordance with the prevailing epidemiological, social and economic conditions.

This will be achieved through acquisition of:

- knowledge of the major vectors and VBDs of relevance to the Region;
- skills to conduct entomological surveillance and operational research;
- knowledge of the principles of epidemiological investigations of VBDs;
- skills to develop vector control strategies based on the principles of integrated vector management;
- skills to facilitate and train others, and effectively document and disseminate information on entomology and vector control.

A total of seven modules were proposed as follows:

**Module 1: Vectors and Vector-borne Diseases** – introduction to VBDs and their burden, vector biology and ecology, modelling and dynamics of disease transmission

**Module 2: Epidemiological Investigations and Statistics** – introduction to general epidemiology, statistics principles and methods, computer based applications in vector-borne disease control and study design

**Module 3: Entomological Investigations** – sampling and rearing methods, vector identification, vector incrimination and vector surveillance

**Module 4: Vector Control** – principles of vector control: methods and approaches, the integrated vector management approach, pesticides and their management and insecticide resistance management
Module 5: Essential Principles of Programme Management – programme management, political and institutional frameworks in vector control, planning vector control programmes, monitoring and evaluation, resource mobilization and advocacy, social mobilization, partnership and intersectoral collaboration.

Module 6: Field training (2 months)

Module 7: Dissertation (3 months minimum)

The group also proposed some minimum requirements for hosting the course, namely, that the institution must:

- be a university or research institution affiliated to one or more universities
- be able to deliver a degree at least at master’s level that is internationally recognized
- have a medical entomology training course programme
- have adequate laboratory facilities, capacities and logistics for fieldwork
- have insect rearing facilities with established colonies of selected disease vectors of public health importance.

WHO will provide certification to institutions to run the course based on the above minimum requirements.

Noting the possibility of variation in the qualifications of potential candidates, it was considered necessary that candidates undertake an entry examination.

5. LOGISTICS, FINANCIAL AND ADMINISTRATIVE ISSUES IN ESTABLISHING THE TRAINING COURSE IN MEDICAL ENTOMOLOGY AND VECTOR CONTROL

The logistics, financial and administrative issues were assessed based on the assumption that the proposed training course in medical entomology and vector control will be jointly conducted by Ain Shams University in Cairo, Egypt and El Gezira University in Wad Medani, Sudan, in collaboration with WHO. Noting that neither institution has adequate staff capacity to address some of the proposed operational areas of vector control and to give the course a true international flavour, some external facilitation will also be needed. This may include but is not necessarily limited to assistance from the London School of Hygiene and Tropical Medicine, the Istituto Superiori di Sanità, the South African National Institute for Communicable Diseases, the Liverpool School of Tropical Medicine and the Institute for Research and Development, France.

Ideally, potential candidates will have at least a bachelor's degree in different but related disciplines, with a minimum of two years' work experience. Special cases where candidates have a high diploma in the field of public health with several years of field experience will also be considered. It is particularly for this group that an entry examination is proposed. The contents and modalities of this examination will be developed jointly by WHO and the
training institutions. This will ensure that good candidates who lack certain qualifications may not be excluded. Potential candidates must be English- and computer-literate and must be below the age of 45 years. Selection of students must also be based on country needs.

The maximum and minimum numbers of students per enrolment will be 20 and 5 respectively. The students will be registered in September of each year with October as the course starting date. It was also considered important that the course programme (field work, project for a dissertation etc.) be prepared with seasons of high vector density and disease transmission in the host country in mind.

There were concerns that sometimes funds earmarked for certain activities are not easily accessible to the intended institutions. It was therefore recommended that funds for this training course be sent directly to the institution(s) for their efficient use. This should be clearly stated in the agreement between WHO and the hosting institutions. Financial arrangements for external tutors, examiners and reviewers should be budgeted for.

6. PROPOSED PLAN OF ACTION

<table>
<thead>
<tr>
<th>Activity/Issue</th>
<th>Responsible</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develop terms of reference of a steering committee for the course</td>
<td>RBM/VC</td>
<td>5 September 2006</td>
</tr>
<tr>
<td>2. Establish a steering committee to oversee the implementation of the plan</td>
<td>DCD</td>
<td>1st week of September 2006</td>
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<tr>
<td>4. Submit executive summary, conclusions and recommendations to Regional Director</td>
<td>DCD</td>
<td>6 September 2006</td>
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<td>5. Present the report of the Consultation to the 53rd Regional Committee meeting</td>
<td>Regional Director</td>
<td>12 September 2006</td>
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<tr>
<td>6. Recruit a consultant to develop learning objectives and a summary of each module of the draft curriculum</td>
<td>RBM/DCD</td>
<td>15-30 September 2006</td>
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<td>7. WHO to write officially to the administration of Ain Shams and Gezira Universities to seek their agreement to conduct the one year MSc training in their institutions</td>
<td>Regional Director</td>
<td>October 2006</td>
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<td>8. Develop a memorandum of understanding between WHO and the two hosting institutions</td>
<td>WHO and the two institutions</td>
<td>November 2006</td>
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<tr>
<td>9. Review staff and financial needs for the course</td>
<td>Steering committee</td>
<td>November 2006</td>
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<tr>
<td>10. Develop web site to announce the course</td>
<td>WHO/RBM</td>
<td>January 2007</td>
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<tr>
<td>11. Send course announcement to countries and to other regions of WHO</td>
<td>WHO</td>
<td>January 2007</td>
</tr>
<tr>
<td>13. Select candidates</td>
<td>All concerned – including the Ministry of Health</td>
<td>June 2007</td>
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<tr>
<td>14. Course begins</td>
<td>All concerned</td>
<td>September 2007</td>
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</table>
7. **RECOMMENDATIONS**

1. The course should be a one-year master's degree (not a postgraduate diploma) jointly hosted by Ain Shams and El Gezira universities, with the first batch of students starting September 2007.

2. The course should be oriented to medical entomology for operational decision-making and vector control programme management purposes, and comprise classroom, laboratory and field study, including a research project for a dissertation.

3. The Regional Office should establish a Steering Committee to finalize the course curriculum before the end of 2006 and to oversee the implementation of the plan of action developed for this course.

4. In view of the facts that: all the regions of WHO are facing an acute shortage of medical entomologists and vector control experts for planning, implementing, monitoring and evaluation of VBD control programmes; strengthening capacity in medical entomology and vector control is of global public health importance; and the EMRO initiative for a WHO postgraduate training course is of interest and relevance outside the Region, it is recommended that:

   - This initiative and experience should be shared with other regions of WHO;
   - Where appropriate, facilitators and potential trainees from other Regions of WHO should also engage with the course, to ensure sustainability and enhance its international repute;
   - Member States of the Region should consider bringing the issue of capacity-building and training in medical entomology and vector control to the Executive Board of WHO;
   - Countries should identify ways to enhance the career opportunities for medical entomologists and vector control experts within Ministries of Health, at all levels of vector control implementation and, where necessary, establish new positions.
Annex 1

AGENDA

1. Opening session
2. Review human resource development in the field of medical entomology and vector control
3. Identification of potential partners in establishing a postgraduate degree programme in medical entomology and vector control
4. Identification of potential course venue and assessment of adequacy of course facilities
5. Developing a draft curriculum for a postgraduate degree programme in medical entomology and vector control
6. Discussion of logistical, administrative and financial issues related to the proposed programme
7. Developing a plan of action for the implementation of a postgraduate degree programme in medical entomology and vector control
8. Conclusions and recommendations
9. Closing session
PROGRAMME

Tuesday, 29 August 2006

08:30–09:00 Registration

09:00–09:30 Opening session

09:30–11:30 Human resource development in the field of medical entomology and vector control and discussion

11:00–14:00 Capacity strengthening in medical entomology and vector control and opportunities for collaboration and discussion

14:00–17:00 Developing a draft curriculum for a postgraduate degree programme in medical entomology and vector control

Wednesday, 30 August 2006

09:00–14:00 Logistical, administrative and financial issues related to the proposed postgraduate degree programme in medical entomology and vector control

14:00–15:30 Development of a plan of action and recommendations

15:30–16:00 Conclusions and recommendations

16:00 Closing session
Annex 3

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Ms Fatma Abdel Meguid, Technical Assistant, HIS, WHO/EMRO
Ms Nahla Ibrahim, Secretary, Communicable Disease Control, WHO/EMRO