

Report on the

**Fifth intercountry meeting of national malaria
programme managers – countries free of
malaria or with residual transmission**

Damascus, Syrian Arab Republic
21–23 June



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1. INTRODUCTION

The fifth intercountry meeting of national malaria programme managers of countries free of malaria or with residual transmission in the World Health Organization (WHO) Eastern Mediterranean Region was held in Damascus, Syrian Arab Republic, from 21 to 23 June 2005. (See Annex 1 for agenda and Annex 2 for programme). The meeting was attended by representatives from 13 countries of the Region plus Roll Back Malaria (RBM) partners, technical advisers and the Secretariat from the WHO Regional Office for the Eastern Mediterranean (WHO/EMRO) and WHO headquarters (see Annex 3).

Dr Fouad H. Mujalled, WHO Representative (WR) Syrian Arab Republic, delivered a message on behalf of Dr Hussein A. Gezairy, WHO Regional Director for the Eastern Mediterranean in which Dr Gezairy expressed his thanks to His Excellency Dr Maher Al Hossamy, Minister of Health, for his commitment to the health of the people in the Syrian Arab Republic. The Regional Director reminded the participants that the first World Malaria Report had been launched simultaneously in Cairo, New York and Geneva on 3 May 2005. The report, developed by WHO and the United Nations Children's Fund (UNICEF), summarized the status of malaria worldwide. It demonstrated that malaria was still a major global problem, exacting an unacceptable toll on the health and economic welfare of the world's poorest communities. He noted that the report clearly showed that there had been progress towards effective treatment and prevention of malaria, that more people were using insecticide-treated bednets (ITNs) and more countries were adopting artemisinin-based combination therapy (ACT) as their first line of treatment for falciparum malaria.

Dr Gezairy reminded the participants that in addition to the global objective, halving the malaria burden by 2010, in the Eastern Mediterranean Region efforts had been supported for elimination of malaria in all areas where it was considered feasible, and for preventing reintroduction of malaria to countries which had been freed from it. Within this regional commitment, malaria elimination had been achieved recently in the United Arab Emirates and Oman and would very soon be attained in Egypt, Morocco and the Syrian Arab Republic. Additionally, Islamic Republic of Iran, Iraq and Saudi Arabia, which were classified as of low to moderate malaria endemicity, had already changed, or would change in the very near future, the objective of the malaria programme from control to elimination, as a result of the progress made in control.

The Regional Director said that the vision in the Region was to expand the malaria-free areas, to create, for example, a malaria-free North Africa and a malaria-free Arabian Peninsula. In this respect, it was important to establish a strong partnership with all Gulf Cooperation Council countries to ensure sustained support to the programme in the Yemen. Dr Gezairy requested country representatives to extend further generous technical and financial support to neighbouring countries where malaria still existed and still presented a problem.

Dr Gezairy emphasized the importance of a strong malaria surveillance system to ensure early detection of cases, and the need for immediate treatment with the effective drug. He stressed that the data available from all countries with falciparum malaria showed that

resistance to chloroquine was widespread and was no longer effective. Over 40 countries had already revised their malaria treatment policy to include ACT. This reality should be considered in updating treatment policies and advising on the drugs to be used for chemoprophylaxis of travellers to endemic countries. He noted that malaria microscopy was still the gold standard for malaria diagnosis and that ensuring its quality was of utmost importance. The rapid diagnostic test was complementary and could be used for case-finding in certain situations, but blood slides should still be taken and the results should be validated by microscopy.

The Regional Office continued to provide support to countries to ensure that the few tools available for vector control (indoor residual spraying [IRS], ITNs and larval control) were used appropriately, properly and without delay. He concluded by saying that successful implementation of vector control (malaria and other vector-borne diseases) not only relied on effective tools but also on the availability of national capacities to deliver such tools; the Integrated Vector Management (IVM) strategy, which included vector monitoring, mapping and intersectoral collaboration, sustained such capacities.

Dr Hallaj, Director, Division of Communicable Disease Control, WHO Regional Office for the Eastern Mediterranean, stated the objective of the meeting as follows:

- to review the progress made and problems encountered in the implementation of malaria strategies in countries free from malaria or with residual transmission;
- to propose specific strategies and actions to maintain a malaria free status or eliminate malaria transmission altogether;
- to discuss activities for monitoring and evaluation of malaria programme;
- to provide technical updates on various aspects of malaria prevention and control;
- to discuss and plan the WHO joint activities for 2006–2007.

2. PROGRESS ON RBM IMPLEMENTATION IN THE EASTERN MEDITERRANEAN REGION, OTHER REGIONS AND GLOBALLY

2.1 Implementation of RBM interventions at global level: progress and challenges

Dr Jacob Williams

The objective of RBM, launched in 1998, is to halve the global malaria burden by 2010. In 2000, UN General Assembly proclaimed 2001–2010 the decade to RBM and African heads of states at the Abuja summit set a target of 60% coverage of suitable preventive and curative interventions by 2005 to achieve the RBM goals. In 2001, the report of the Commission on Macroeconomics and Health highlighted that countries with high malaria burden grew economically 1.3% less per person per year. At the Fifty-eighth World Health Assembly, Member States committed themselves to ensure that at least 80% of those at risk of, or suffering from, malaria, benefit from major preventive and curative interventions by 2010.

Evidence-based strategies to Roll Back Malaria are early diagnosis and prompt and effective treatment, integrated vector management, intermittent preventive treatment for

pregnant women in areas of stable transmission and prevention, and early detection and prompt control of epidemics.

Because of high prevalence of resistance to commonly used antimalarial medicines like chloroquine (CQ) and sulfadoxine-pyrimethamine (SP), WHO recommended antimalarial combination therapy to provide effective treatment and to prevent or delay the development of drug resistance. The recommended combination therapies are as follows: artemether/lumefantrine, artesunate + amodiaquine, artesunate + SP, artesunate + mefloquine and amodiaquine + SP. The first four combinations are artemisine-based, which is extracted from the *Artemisia annua*.

Fifty-eight (58) countries adopted ACT and 24 of them are deploying. There is a huge gap between estimated needs and current ACT production capacity, which means all parties should scale up their activities to fill this gap.

High prices of new regimens for treatment of malaria falciparum renewed the importance of confirmation of malaria diagnosis. For all patients in areas with low to moderate malaria transmission and for patients of above five years in a high transmission area a parasitologically-confirmed diagnosis is highly recommended prior to treatment. For patients under five in high transmission areas, because of high probability of mortality, clinical diagnosis using the Integrated Management of Childhood Illness (IMCI) algorithm is justifiable. In 2005, WHO will publish new documents on treatment guidelines, rapid diagnostic tests, technical specifications for pre-packaging antimalarial medicines and home management of malaria (HMM).

In high transmission areas, the objectives of vector control are personal protection of vulnerable groups, progressive increase of ITN coverage rates through a strategy of targeted distribution of free or highly subsidized ITNs to vulnerable groups through various channels, and use of vouchers to stimulate commercial market growth. In low transmission areas, community protection is the main objective through reduction or interruption of transmission by vector control, usually by IRS or ITNs, supplemented by additional measures when and where indicated in the context of IVM.

Although IRS is one of the most effective measures for vector control wherever recommended, insecticide resistance seriously threatens its usage. To address this problem, insecticide resistance monitoring and management should be improved. Alternatives to DDT and improved formulations (longer residual activity, suitability in modern housing) are to be developed.

A long lasting insecticidal net (LLIN) is a mosquito net treated with insecticide at factory level, which resists multiple washes and whose activity lasts as long as the net itself (e.g. around 3–5 years). They are considered one of the major advances in malaria control. Alternative technology that can be used wherever suitable include: long-lasting treatment of fabrics for clothing to prevent vector borne diseases among travellers, refugees and military forces; long lasting treated hammocks for prevention of forest malaria; tsetse traps; and treated curtains and screens.

Preparation of country profiles for the *World Malaria Report*, published in May 2005 stimulated countries to improve and update reporting of health information system (HIS) and programme data. Profiles of 40 high-burden countries were published. Remaining profiles are available on the RBM website.

RBM is working against a moving target: an organism that evolves to resist medicines and a mosquito vector that evades insecticides. Funds needed for effective malaria control programme are something like US\$3 billion per year. However, in 2004, total international investment on malaria control, including Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) was only US\$ 600 million. In addition to inadequacy of funds, disbursement is too slow and delivery of interventions and health care to the poor is challenging. Regarding prevention measures, coverage of intermittent preventive treatment (IPT) is very low; sulfadoxine-pyrimethamine is becoming ineffective in many countries and no substitute medicine is available yet. At global level, the main challenges for implementation of control measures are ACT and LLIN availability, quality assurance, price negotiations, financing and drug procurement.

2.2 RBM evaluation and progress report for 2004 in the Eastern Mediterranean Region

Dr Hoda Atta

The majority of imported cases in malaria free countries (Bahrain, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Palestine, Qatar, Tunisia, United Arab Emirates) or countries with very limited number of local malaria transmission (Egypt, Morocco, Oman, Syrian Arab Republic) are imported from the Indian subcontinent, especially Pakistan. In 2004, only Morocco and Syrian Arab Republic reported an autochthonous malaria case (Table 1.)

Table 1. Malaria cases in 2004 in malaria-free countries and those with residual transmission

Countries	Total	Autochthonous
Bahrain	86	0
Egypt	14	0
Jordan	173	0
Kuwait	290	0
Lebanon	63	0
Libyan Arab Jamahiriya	15	0
Morocco	56	1
Oman	616	0
Palestine	0	0
Qatar	72	0
Syrian Arab Republic	13	1
Tunisia	39	0
United Arab Emirates	1612	0

In countries with low to moderate endemicity (Islamic Republic of Iran, Iraq and Saudi Arabia), there has been a significant reduction in the number of reported malaria cases. In comparison with 2003, there has also been a reduction in the numbers of reported malaria cases from countries with intense malaria transmission (Afghanistan, Pakistan, Djibouti, Somalia, Sudan and Yemen), which are far from the numbers of estimated cases. This difference shows the importance of finding a methodology for correct estimation of malaria burden in this group. The malaria burden in Pakistan still is very high and for the first time the Regional Office has received data on as many as 1 831 631 clinically diagnosed cases.

For strengthening national capacity for malaria control in Member States, the Regional Office has supported several courses, including two courses on planning and management (one in English and one in Persian), a course on medical entomology and a training of trainers (TOT) course on pesticide management. The Regional Office supported the WHO collaborating centre in Cairo with a 2-month fellowship for molecular entomology.

To provide quality evidence for malaria control programmes and to support capacity building for operational research WHO supported 7 research proposals in the field of malaria and 10 in vector control in 2004 and 2005, respectively.

Strengthening malaria laboratory diagnosis is one of the main objectives of RBM. To achieve this objective, the Regional Office supported TOT courses on malaria microscopy in Afghanistan and Somalia, and an evaluation and training exercise for malaria microscopy in Sudan.

The Regional Office has supported sentinel sites for drug efficacy monitoring in all Member States in which malaria falciparum is endemic. At this stage, 4 sites in Afghanistan, 5 in Islamic Republic of Iran, 4 in Pakistan, 5 in Saudi Arabia, 3 in Somalia, 5 in Sudan and 4 in Yemen are functioning. The results of all of these studies show that there is a high prevalence of resistance of plasmodium falciparum to CQ. Based on this evidence, Afghanistan, Islamic Republic of Iran, Somalia and Sudan have updated their treatment guidelines.

Access to effective and reliable diagnosis and treatment is one of the main pillars for malaria control. Countries with low health system coverage and endemic for malaria, namely Afghanistan, Djibouti, Somalia, Sudan and Yemen, developed a plan of action for home management of malaria in a one-day workshop that followed this meeting.

Integrated vector management (IVM) is a crucial element of a malaria control programme. In 2004: a vector control needs assessment tool was developed; an intersectoral coordination mechanism for IVM implementation was initiated in Egypt, Islamic Republic of Iran, Morocco, Sudan and Yemen; reporting on DDT use, manufacturing, storage and transportation was piloted in four countries of the Region (Djibouti, Morocco, Oman and Sudan); and a regional proposal to the Global Environmental Facility (GEF) was approved initially for US\$ 650 000.

The Regional Office supported countries to establish malaria monitoring and evaluation systems during the regional workshop on monitoring and evaluation in Luxor, Egypt, 5–9

December 2004. A national monitoring and evaluation workshop was also held in Khartoum, Sudan, 7–20 September 2004. To have a more accurate estimation of malaria burden, operational research studies in Sudan and in Yemen were supported.

In early 2005, a malariometric survey was conducted in Somalia and is being analyzed. In the forthcoming transmission season of 2005, the national malaria control programme in Sudan will have a malaria indicator survey (MIS) and a parasite prevalence survey in states under GFATM support.

The most important achievements of the Regional Office in resource mobilization were approval of a regional proposal to the GEF initially for US\$ 650 000, a proposal for Afghanistan to USAID in 2004 (US\$ 500 000 approved) and for south Sudan to the European Community Humanitarian AID Department (ECHO) (€ 135 000). A paper was presented during the annual symposium of the Islamic Development Bank (IDB) in the Islamic Republic of Iran, August 2004. A joint proposal with WHO headquarters and WHO Regional Office for Africa was developed by consultants.

In December 2004, a Memorandum of Understanding (MOU) was signed between UNICEF and WHO for US\$ 1 326 060 for implementation of the Somalia GFATM proposal. A letter of agreement between WHO and UNDP was signed in February 2005 for north Sudan (US\$ 7 132 122) and south Sudan (US\$ 352 000).

The Regional Office supported coordination of cross-border malaria control activities during a malaria cross-border workshop between Iraq, Syrian Arab Republic and Turkey, in Aleppo, Syrian Arab Republic, 20–22 April 2004 and a second malaria cross-border meeting for Afghanistan, Islamic Republic of Iran and Pakistan, in Peshawar, Pakistan, 30 August to 1 September 2004.

To implement the Division of Communicable Disease Control vision for malaria elimination wherever possible, WHO will continue to support sub-regional projects for malaria elimination including: Malaria Free north Africa, Malaria Free Arabian Peninsula, Malaria elimination in the Islamic Republic of Iran and Iraq and maintenance and expansion of the Khartoum and Gezira Malaria Free Initiative.

To address the new era of malaria control, the Regional Office will develop a regional RBM strategy for 2006–2010 and support Member States to develop their own strategies. To implement the newly developed strategy and to monitor and evaluate the programme, WHO will continue to support human resource development activities including human resource needs assessment and capacity building on monitoring and evaluation and estimation of malaria burden.

2.3 Highlights from the World Malaria Report 2005

Dr Ghasem Zamani

The *World malaria report 2005* was launched on 3 May 2005. The report, which is the most comprehensive global account of progress in malaria control efforts since the launch of RBM, was developed by WHO and UNICEF for RBM (and is available online at <http://www.rbm.who.int/wmr2005>).

WHO and UNICEF developed the report through consultation at global (RBM Monitoring and Evaluation Reference Group), regional (WHO regional offices) and ministry of health level in all malaria-affected countries. The report draws on many sources of information including evidence from national and sub-national community surveys such as demographic and health surveys (DHS), multiple indicator cluster surveys (MICS), national malaria control programmes, research studies and ongoing activities at sentinel surveillance sites.

The report presents the best available evidence on malaria burden, including what countries report to WHO, coverage of key interventions including access to antimalarial treatment and insecticide-treated nets, national programme efforts to deliver malaria services, current country-level policy and financial environments, and results of antimalarial drug efficacy studies.

An estimated 3.2 billion of the world's population are at risk of malaria. Around 350–500 million clinical cases of malaria occur each year, most caused by *P. falciparum* and *P. vivax*. *P. falciparum* malaria directly causes more than 1 million deaths each year and contributes indirectly to many additional deaths in synergy with other infections and illnesses. An estimated 60% of cases worldwide, 75% of global falciparum cases and more than 80% of all deaths are from sub-Saharan Africa.

The *World Malaria Report 2005* suggests real progress is being made in revitalizing national malaria control programmes in Africa, Asia and the Americas, scaling up interventions in Africa, distributing ITNs, adopting recommendations for malaria control during pregnancy, changing drug policies, collecting evidence on antimalarial drug efficacy and making finances available at the global level for malaria control efforts.

However, despite real progress, much more needs to be done to face the ongoing challenges. A huge gap remains between the resources needed (minimum of US\$ 3.2 billion per year for at least the next decade) and what is available. The supply of ITNs and drugs also needs to be scaled up to meet increasing demand. Investment is needed in capacity building, especially at country level, and in research to improve present tools and develop new tools. More attention is needed to develop effective monitoring and evaluation systems.

The report suggests that in order to effectively monitor progress in malaria control efforts, there is need for strengthening country capacity for monitoring and evaluation and strengthening the national health information system, improving efforts to understand the malaria burden, conducting household surveys to assess coverage of key malaria interventions

and continued monitoring of antimalarial drug efficacy. More systematic efforts are needed to monitor malaria finances and services delivered by programmes.

3. RBM PROGRESS, SUCCESS STORIES AND CHALLENGES IN COUNTRIES WITH LIMITED FOCI OF MALARIA TRANSMISSION

3.1 Malaria situation in Egypt in 2004

Dr Ibrahim Abdel Wahab Elaish Dawoud

The last reported malaria cases were from Fayoum in 1998. In 2004, 43 malaria cases were reported, out of which 37 were Egyptian fisherman returned from Sierra Leone. More than 90% of reported cases were falciparum malaria.

The elements of the malaria control strategy in Egypt include: integrated vector management, mainly through environmental modification, and chemical and biological larval control; entomological surveillance in rural and urban areas, especially in Cairo; the continuing Gambia project with Sudan; providing chemical prophylactic prevention for travellers to endemic countries; human resource development; and strengthening the surveillance system.

3.2 Malaria elimination strategy in Morocco

Dr Abderrahmane Laamrani Elidrissi

The objectives of the malaria elimination plan, adopted in 1999, are to eliminate autochthonous malaria by 2006 and to control imported malaria. In 2004, 55 imported cases were reported, and only one autochthonous case, from Chefchaouen, was detected.

The main achievements of the malaria elimination strategy in 2004 were maintenance of political commitment and awareness of the health system and the population, reinforcement of surveillance activities, and quality assurance and quality control of malaria control activities. The latter included: establishment of a network of 8 sentinel sites of insecticide resistance monitoring and mosquito identification; creation of regional laboratories of quality control; mapping of breeding sites of mosquitoes; establishment of IVM committee training and retraining of staff in different disciplines including 10 technicians of microscopy and personnel in charge of resistance monitoring; and strengthening and establishment of intersectoral collaboration.

3.3 RBM progress, successes stories and challenges

Dr Majid Shahoo Al-Zedjali

In 2004, for the first time, no autochthonous cases were detected in Oman. More than 80% of imported cases were from the Indian subcontinent; 26% of 615 reported cases were infected by *P. falciparum*. Private institutions diagnosed more than 45% of malaria cases, indicating the importance of the role of the private sector in control, management and

surveillance of malaria. The main challenge for malaria control in Oman is illegal population movement.

The main strategies for prevention and control of malaria in 2004 were strengthening surveillance and case detection, redesigning vector control activities, assessment and training in malaria microscopy and strengthening regional malaria offices. The main activity for the next year is to start the process of establishing a WHO collaborating centre for malaria microscopy.

3.4 The current status of the malaria situation in the Syrian Arab Republic

Dr Mahmoud Karim

The objective of the malaria control programme in the Syrian Arab Republic is to eliminate malaria and prevent its reintroduction. The number of endogenous case has decreased from 15 in 2002 to 1 in 2004. Nine (9) of the 12 imported malaria cases in 2004 were caused by *P. falciparum* or mixed malaria infection, mainly from sub-Saharan African countries and Pakistan.

The malaria control programme aims to eliminate malaria and prevent its reintroduction through: early passive case detection; free of charge treatment in specialized centres; vector control using IRS, larval control and ITNs; intersectoral coordination; and information, education and communication (IEC). During 2004, 4000 ITNs were distributed in 31 villages in Al Malkiyeh and Ras Al Ein provinces.

4. RBM PROGRESS, SUCCESS STORIES AND CHALLENGES IN MALARIA-FREE COUNTRIES

4.1 Malaria situation in Bahrain in 2004

Dr Abdulla Alsitrawi

Local transmission of malaria has been interrupted in Bahrain since 1980 and maintaining this status is the major objective of the malaria control programme. Malaria and vector control operations are being continuously monitored and compared with their objectives for improvement, and oriented towards the WHO RBM strategies.

In 2004, 85 imported malaria cases were reported. The cases were imported, mainly from the Indian subcontinent (43 from Pakistan, 37 from India, 2 from Bangladesh), with only 1 case from Sudan and 2 cases of unknown origin.

A gradual increase in the number of imported cases was noted during 2003 and 2004. This is mainly due to migration of families from malarious areas, particularly India, Pakistan, and Yemen, whom were given Bahraini nationality. The second reason is the improved reporting system for detected cases from many sources countrywide.

Challenges include the lack of a reliable database of the antimalarial drugs used for first-line and second-line treatment, the quantities used annually of each drug in the governmental and private medical sectors, and the cost and efficacy of treatments. There is also no unified national malaria treatment policy to guide the use of antimalarial drugs by both governmental and private sectors.

4.2 Progress of malaria control in Jordan in 2004

Dr Mohammed Diab Obaidat

In 2004, there were 160 imported cases, of which 21 were falciparum with 1 death; 100 cases of *P. vivax* were imported from Eritrea. From 1995 to 2004, the proportion of Jordanian malaria cases increased from 26% to 79%.

The objectives of the malaria control programme are the prevention of reintroduction of malaria, the prevention of mortality due to imported *P. falciparum* malaria and maintaining a state of preparedness to contain likely outbreaks of introduced malaria.

A steering committee for vector control was established and personal protection and chemoprophylaxis for travellers strengthened.

The main challenges for the malaria control programme are provision of ACT for imported falciparum cases, the high percentage of relapses of vivax cases imported from Eritrea and East Timor, weak intersectoral, intrasectoral and international coordination, lack of well defined and established guidelines and policies for malaria free countries, and inadequate financial support.

The national malaria control programme needs help to dispose of obsolete DDT stocks, support in IVM and insecticide resistance monitoring, support for training on the geographic information system (GIS), and training on malaria control and treatment in countries with malaria transmission. Operational research to provide evidence on the use of temephos as a larvicide, active case detection (ACD) in receptive areas, cost-effectiveness of activities and cost benefit analysis of the whole programme are needed for the preplanning and assessment of the programme.

4.3 Malaria control efforts in Kuwait

Dr Abdullah Abbas Haider Mohammed

There has been no local malaria transmission for 15 years. The majority of imported cases are from India and Pakistan. In 2004, 293 malaria cases were reported, of which 47% were *P. vivax*.

The main strategies for control of malaria are: entomological surveillance; screening of non-Kuwaiti new arrivals, students returning from endemic areas and high risk groups such as farm workers; management of detected cases; medical research; strengthening the surveillance system; and cooperation with GCC countries, Iraq and WHO.

4.4 Malaria situation in Lebanon

Dr Raymond Seeman

In 2004, 68 malaria cases were reported; of which 61 were falciparum malaria. All cases were imported, mainly from Africa. Lack of political commitment, trained personnel, drugs and sufficient monitoring and evaluation are the main challenges for malaria prevention and control. There is no current programme for prevention of malaria in Lebanon.

4.5 Malaria in Libyan Arab Jamahiriya during 2004

Dr Ibrahim Suliman Kraza

The objective of the malaria control programme is the prevention of the reintroduction of malaria transmission. The main strategies are strengthening malaria surveillance, updating epidemiological and entomological information and maps, training and retraining of personnel, and increasing the awareness of decision-makers.

The main challenges for the control programme are the lack of awareness of decision-makers and lack of cooperation by people travelling to endemic countries, the insufficient capacity of professional staff in diagnosis and treatment of malaria, and the uncontrolled population movements from neighbouring sub-Saharan countries.

4.6 The current situation of malaria in Palestine

Ali Khader Melad

In 2004, no local or imported case was reported from Palestine. Recent investigations indicate that there is no anopheles species in Palestine. Cutaneous and visceral leishmaniasis are the main vector-borne diseases in Palestine.

4.7 The current malaria situation in Tunisia

Dr Ibrahim Belgacem

As a result of the national malaria eradication programme, the number of reported malaria cases decreased from 2200 cases in 1968 to 3 cases in 1979. Interruption of transmission was confirmed by a serologic survey in 1991 among children who were born after the last transmitted malaria cases. In 2004, 39 imported cases were reported; 67% of them were falciparum malaria.

The current strategies of the malaria control programme are selective screening of at risk groups, prevention of malaria among travellers, strengthening diagnosis at border checkpoints, early diagnosis and reporting, and free treatment of all cases.

4.8 A success story: elimination of malaria in United Arab Emirates

Dr Abdel Aziz Mosaad Almuthanna

During 2004, 1612 cases were detected; of these, 242 were *P. falciparum*, 10 were mixed infection and 1360 were *P. vivax*. Epidemiological investigation of 1602 cases (99.4%) showed that 58.3% of cases were from Pakistan and 26.8% from India.

During the last quarter of 2004, active detection of malaria among newcomers was initiated. As part of a seroepidemiological study for validation of malaria free status, 10 000 persons were examined using ELISA, of whom 647 were found IgG positive (6.5%). The proportion positive among Pakistanis was 414/1708 (24.2%).

The drug policy is to be updated soon. First line of falciparum treatment will be artesunate + mefloquine, 2nd line will be artemether + lumefantrine or proguanil + atovaquone and 3rd line will be quinine + doxycycline or quinine + clindamycin.

During 2004, 94 712 breeding places were checked and 1067 were found to be positive. Monitoring of vector-breeding sites across the common border between the United Arab Emirates and Oman continued. During the year, joint teams carried out a periodical survey in 13 selected localities in different regions across the international border.

5. DRUG POLICY AND STRENGTHENING MALARIA SURVEILLANCE

5.1 Drug policy updates for malaria-free countries and countries with residual foci

Dr Andrea Bosman

In view of the high levels and widespread distribution of *P. falciparum* resistance to CL and SP, WHO recommends the adoption of artemisinin-based combination therapies (ACT). Artemisinin derivatives produce a rapid and sustained parasite clearance, rapid resolution of clinical symptoms and reduce gametocyte carriage. Combining artemisinin derivatives with an antimalarial drug with different modes of action (and thus drug targets) increases cure rates and provides mutual protection against emergence of resistance. In addition, when deployed in combination, duration of treatment is reduced to 3 days as compared to 7 days when artemisinin derivatives are used in monotherapy.

The optimal treatment choices for malaria free-countries and countries with residual foci depends on the dynamics of local transmission (endemicity/receptivity potential, origin of imported and introduced malaria, and their sensitivity to antimalarials) as well as on existing malaria control measures (case detection capacity at airport, borders and inland, coverage of facilities providing access to treatment, including to illegal foreigners, and vector control response led by case reporting).

For many countries two ACT products will offer the highest cure rates (> 95%) against falciparum malaria, including areas with multi-drug resistance.

Artemether-lumefantrine is available as a fixed-dose combination and recommended in the 6-dose regimen. The advantage of this combination is that lumefantrine is not available as monotherapy and has, therefore, never being used by itself for the treatment of malaria. Provided that there is adequate absorption of lumefantrine, this combination would be expected to be effective everywhere. Absorption of lumefantrine is increased by taking the drug with fats (food, milk) and improves as the patient recovers from illness. The combination is remarkably well tolerated.

Artesunate plus mefloquine is currently available in co-blistered packs, but a fixed-dose combination is under development. Despite the high levels of resistance to mefloquine that have been reported in South-East Asia (Cambodia, Thailand, Myanmar and Viet Nam), artesunate-mefloquine combination is highly effective even in these areas. The artesunate dose used has been 4 mg/kg/day for 3 days. The higher dose of mefloquine at 25 mg base/kg is recommended. The principle problems are nausea and vomiting in young children, and central nervous system adverse effects (mainly dizziness, dysphoria, and sleep disturbances). Chloroquine is still the treatment of choice for *P. vivax*, *P. ovale* and *P. malariae*.

5.2 Malaria elimination: historical background, definition, challenges and the way forward for expanding malaria free areas/Strategies for elimination of residual foci and prevention of reintroduction of malaria

Dr Anatoli Kondrachine

The disease/infection elimination concept can be defined from different points of view. For some diseases like leprosy, tuberculosis, measles, neonatal tetanus and onchocerciasis in Africa, disease elimination has been defined according to public health targets e.g. when the incidence of tuberculosis lowered to less than 1 per million, tuberculosis is no longer a public health problem and has been eliminated. Interruption of transmission of some diseases such as Chagas disease, onchocerciasis in Latin America and dracunculiasis is certified when transmission of diseases is interrupted.

In John Lasts' *A dictionary of epidemiology* (2001), elimination of communicable disease connotes the reduction of case transmission to a predetermined very low level. For Molyneux (2004), elimination of disease is 'a reduction to zero of the incidence of a specified disease in a defined geographical area as a result of deliberate efforts. Continued intervention measures are required'. Duerf (2005) defined elimination as 'a local reduction to zero of the incidence of infection; because infection can be imported from other areas that are still endemic, permanent intervention is required to maintain elimination as a stable state of the trivial equilibrium'.

In 1960s, in the USSR, China and North Vietnam, malaria eradication was defined as malaria incidence less than 0.1 per 100 000 population. In the national malaria elimination programmes, malaria elimination status roughly corresponded to the last year(s) of consolidation phase. In Europe, USA and Australia, malaria eradication was achieved in the course of implementation of malaria control in a staged manner, initially by elimination of malaria as a public health problem and then by interruption of malaria transmission.

Elimination of malaria is a logical transition from effective control to malaria eradication. The eventual goal of malaria eradication may be achieved firstly through the elimination of disease as a public health problem with subsequent interruption of local transmission.

Strategies for malaria elimination include preparatory and attack stages. The core activities during the preparatory stage are situation analysis including collection and analysis of information related to malaria foci, needs assessment, training of health staff, epidemiological classification of all cases and operational classification of all malaria foci. Selection of the most effective and evidence-based control interventions including vector control measures is the main focus in the attack stage.

A well designed integrated surveillance system with an appropriate mechanism for information exchange and well defined indicators will help malaria control programmes to monitor and evaluate their elimination strategy and to verify interruption of malaria transmission.

Prevention and control of reintroduction of malaria needs sustained surveillance of fever cases by various diagnostic measures and treatment of imported cases, availability of reagents, antimalarials, materials and equipment, the training and re-training of personnel, and establishment of an epidemiological malaria early warning system.

The main challenges for prevention of malaria reintroduction are: inadequate availability of international information on malaria status in different areas; inadequate cooperation between malaria endemic countries, especially in border areas; risk of introduction of multidrug resistant *P. falciparum*; difficulties in tracing imported cases; inadequacies in malaria vigilance; lack of awareness of malaria reintroduction among general health staff; and inadequacies in malaria training.

5.3 A surveillance and monitoring and evaluation system for malaria-free countries and countries with residual foci

Dr G. Zamani

Activities for strengthening the malaria monitoring and evaluation system in the Eastern Mediterranean Region have included regional and national (Sudan) workshops, designing a new regional malaria surveillance form, contributing to the development of the *World Malaria Report 2005* and supporting development of monitoring and evaluation plans for Somalia and Sudan.

The objectives of antimalarial measures at the stage of elimination of foci are as follows: achieving a sustainable interruption of malaria transmission, depleting the reservoir of infection and preventing a reestablishment of malaria from the same area, from the same country or from abroad. To achieve these objectives, strengthening the malaria monitoring and evaluation system is the first priority of all malaria control programmes.

Priority activities for strengthening the malaria monitoring and evaluation system include: strengthening integrated surveillance systems; quality assurance of laboratory diagnosis; entomological surveillance including insecticide resistance monitoring; sharing information and cross-border surveillance; and developing a mechanism for validation of malaria free status.

6. STRENGTHENING INTERSECTORAL ACTION FOR VECTOR MONITORING AND CONTROL

6.1 Strengthening national vector monitoring and control capacities through IVM

Dr Abraham Mnzava

In recent years, the Region has been witnessing not only a geographical spread of vector-borne diseases but also an increase in their severity and burden. This is regardless of the effective tools available. Some of the factors responsible for this problem include both environmental (climatic and man-made), managerial and technical factors and inappropriate policies. Whereas we do not have much direct control on the climatic factors (droughts, floods and global warming), addressing managerial, technical and policy constraints for vector control is within our reach.

For example, policies to decentralize health services without critically looking at the impact this would have on vector control and the associated policy of emphasizing curative and diagnostic services, has not only marginalized vector control as an area of work but has also eroded capacity in entomology and vector control. However, countries that continue to retain vector control as one of the preventative strategies have not only seen reduction in disease burden but some have also witnessed elimination. A number of countries participating in this meeting fall under these categories – especially for malaria.

These countries, like others in the Region, are threatened by other vector-borne diseases (leishmaniasis and arboviruses) and are also faced with the threat of malaria re-introduction. While, strengthening of entomological surveillance (including mapping vector distribution) is critical, the need for intersectoral coordination and partnership is also crucial. It is for this reason that adopting the IVM strategy will provide a platform to synergistically address this threat by maximizing resources in a sustainable manner. Making use of the guidelines for vector control needs assessment (VCNA), will allow these countries to identify needs, gaps and opportunities to develop their IVM plans of actions that will address the policy, institutional, managerial and technical constraints. Countries are therefore encouraged to include in their 2006/2007 country plans the relevant activities that will lead to developing IVM plans.

6.2 Strengthening vector monitoring and mapping using GIS tools

Dr A. Hassan

A brief introduction of the GIS followed with emphasis on its infrastructure requirements and potential functions that would assist vector-borne disease managers to do

their jobs. The notion that GIS can be used for very simple as well as sophisticated applications was discussed.

The question of whether vector-borne disease managers really need GIS was addressed by providing a list of potential real-world uses of GIS from data collection to decision-making and results communication. Use of GIS in an adaptive management framework was emphasized.

The different map types that GIS can be used to produce include: descriptive, correlation, predictive and decision-guiding maps. To give an overall idea about GIS application, examples of its uses from Egypt were selected.

The examples included applications of GIS and remote sensing in developing databases for malaria in Egypt (developed under a TDR small grant scheme project), including a mosquitoes and mosquito-borne diseases database and one for mosquitoes and mosquito-borne diseases in urban environments. The work was carried out in collaboration with the Ministry of Health and Population.

The presentation then provided specific examples of the outputs generated under these activities, covering most potential applications of GIS and remote sensing. The applications included, inter alia, simple mapping, spatial analysis, identifying predictors of vector distribution, setting priorities for IVM based on simple and multiple selection criteria and setting priorities for action based on available resources. The use of high-resolution remote sensing data to identify mosquito breeding habitats was also discussed.

7. EASTERN MEDITERRANEAN REGION EXPECTED RESULTS FOR MALARIA AND VECTOR CONTROL AREAS OF WORK

Dr H. Atta reviewed the resolution of the Fifty-eighth World Health Assembly related to malaria control and drew the attention of Member States to the global objectives and targets of the malaria control programme. She presented regional expected results for 2006–2007 and asked the participants to develop a country specific plan of action for 2006–2007. Regional expected results are as follows:

- national capacity for malaria control and prevention strengthened in all malaria endemic countries;
- access of populations at risk to effective treatment of malaria promoted and facilitated through guidance on treatment policy and implementation;
- application of effective preventive measures against malaria for populations at risk promoted in endemic countries;
- functional malaria surveillance systems and system for monitoring and evaluation of malaria control programmes;

- high priority operational research implemented to guide the control programmes;
- effective partnership for malaria prevention and control sustained and resources mobilized.

Using a tool developed by regional office and based on their national strategic plan, the WHA resolution and regional expected results, participants drafted a country-specific plan of action for malaria control and integrated vector management for 2006–2007. Developed plans were presented and discussed in plenary.

8. RECOMMENDATIONS

To Member States

Strategic planning

1. Develop national strategic plans for maintaining malaria free status and elimination of residual foci for 2006–2010, including plans for monitoring and evaluation.

Case management

2. Update national malaria treatment guidelines, ensuring the use of the most effective drugs for treatment of falciparum malaria. The recommended drugs to be used as the first line for uncomplicated falciparum malaria should be artemether-lumefantrine or artesunate + mefloquine. These drugs should be registered in all countries by the end of 2005.
3. Take immediate measures necessary to improve malaria microscopy and assure its quality. Rapid diagnostic tests can be used in certain situations as a complementary measure together with malaria microscopy.
4. Establish a mechanism to improve capacity for case management and to ensure continuous awareness of health staff in public and private sectors regarding imported malaria and its prevention and control.

Vector control capacity strengthening

5. Update or develop the information related to vectors of all vector-borne diseases using the new technology available for mapping, including geographic information systems technology and remote sensing.
6. Establish or strengthen entomological surveillance systems to monitor vector and insecticide resistance.

Malaria surveillance

7. Strengthen malaria surveillance with immediate notification and ensure information dissemination and feedback to all levels, including the private sector.
8. Establish a mechanism to share information related to imported malaria cases.
9. Ensure transparency in reporting of local malaria transmission.

Border coordination

10. In countries with a cross-border malaria problem, intensify activities and explore all possible mechanisms to facilitate coordination of malaria control, including involvement of ministries of foreign affairs.

To WHO

11. Provide technical support for updating malaria drug guidelines and assist countries, where necessary, in the procurement of these medicines until procured by the national health authority.
12. Support countries in strengthening national capacity for medical entomology, vector control, surveillance and mapping by various means, including organizing regional and national training courses and workshops and ensuring the flow of new information and tools to national malaria control programmes.
13. Continue to support cross-border coordination activities among countries of the Region and with countries in other regions.

Annex 1

AGENDA

1. Opening session
2. Objectives and expected outcomes of the meeting
3. Review progress in the implementation of the Roll Back Malaria strategies at global, regional and country levels: success, problems and constraints faced in countries free from malaria or with residual transmission
4. Follow up on the implementation of the recommendations of the 2004 RBM meetings and workshops
5. Propose specific strategies and actions to maintain a malaria free status or eliminate malaria transmission
6. Discuss appropriate activities for monitoring and evaluation of malaria programme in countries free from malaria or with residual transmission
7. Provide technical updates on various aspects of malaria prevention and control
8. Review of the progress on the malaria border coordination in relevant countries
9. Discuss national intersectoral coordination mechanisms for carrying out vector control needs assessment for the development of IVM plans of action
10. Present the WHO expected results for 2006–2007 and develop country-specific expected results with comprehensive plans of action, including joint activities with partners
11. Review the progress for the development of human resource in the Region
12. Recommendations
13. Closing session.

Annex 2

PROGRAMME

Tuesday, 21 June 2005

- 08:30–09:00 Registration
- 09:00–09:40 Opening Session
Message from Dr Hussein A. Gezairy, Regional Director, WHO/EMRO
Message from H.E. Dr Maher Al-Hossamy, Minister of Health, Syrian Arab Republic
Objectives of the meeting and method of work
Nomination of Officers
- 10:00–10:30 Implementation of RBM interventions at the global level – progress and challenges, Dr J. Williams
- 10:30–11:00 RBM evaluation and progress report for 2004 in the Eastern Mediterranean Region, Dr H. Atta
- 11:00–11:20 Highlights from the World Malaria Report, Dr G. Zamani
- 11:20–12:50 RBM progress, success stories and challenges in countries with limited foci of malaria transmission: Egypt, Morocco, Oman and Syrian Arab Republic country presentations
- 12:50–13:00 Discussions
- 14:00–16:00 RBM progress, success stories and challenges in malaria-free countries, country presentations
- 16:00–16:15 Discussions
- 16:00–17:00 Review of the implementation of the recommendations of the meetings and workshop conducted in 2004, Dr G. Zamani
Review of the progress on the malaria border coordination in relevant countries, Dr H. Atta

Wednesday, 30 June 2005

- 09:00–09:30 Drug policy updates for malaria-free countries and countries with residual foci, Dr A. Bosman
- 09:30–10:00 Malaria elimination: historical background, definition, challenges and the way forward for expanding malaria free areas, Dr A. Kondrachine
Strategies for elimination of residual foci and prevention of reintroduction of malaria, Dr A. Kondrachine
- 10:00–10:30 Surveillance and monitoring and evaluation system for malaria-free countries and countries with residual foci, Dr G. Zamani
- 10:45–13:00 Group work for updating drug policy and strengthening malaria surveillance system
- 14:00–14:20 Strengthening national vector monitoring and control capacities through IVM, Dr A. Mnzava
- 14:20–13:40 Strengthening vector monitoring and mapping using GIS tools, Dr A. Hassan

- 14:40–14:50 Discussions
- 14:50–15:10 Establishment of national intersectoral coordination: policy and institutional frameworks, Dr J. Williams
- 15:10–15:30 Introduction to the draft VCNA guidelines and tools, Dr J. Williams/ Dr A. Mnzava
- 15:30–16:00 Group work to review content and relevance of the VCNA guidelines and tools
- 16:15–18:00 Group work to review content and relevance of the VCNA guidelines and tools

Thursday, 23 June 2005

- 09:00–09:15 Regional expected results for 2006–2007, Dr H. Atta
- 09:15–10:30 Developing country specific expected results for 2006–2007, group work
- 10:45–12:45 Developing comprehensive plans of action for malaria control and integrated vector management – including activities with partners
- 12:15–13:00 Conclusion and recommendations
- 13:00–13:30 Closing session

Annex 3

LIST OF PARTICIPANTS

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