The progress of Roll Back Malaria in the Eastern Mediterranean Region over the past decade

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Introduction

Malaria has plagued humankind since ancient times and is still putting nearly 40% of the world's population at risk. No one is certain how many people contract the disease, but estimates suggest that it afflicts between 350 million and 500 million people every year. The World Health Organization (WHO) estimates that 59% of the world's clinical malaria cases occur in Africa, 38% in Asia and 3% in the Americas [*1*].

Malaria in the WHO Eastern Mediterranean Region

In total, 54% of the WHO Eastern Mediterranean Region (EMR) population resides in areas at various risk of malaria transmission [unpublished annual reports on malaria surveillance submitted to WHO by ministries of health, 2004]. The intensity of transmission is generally low in most areas. Comprehensive review of the community surveys conducted in malaria-endemic countries of the Region during 1985–2007 showed that in 87% of the surveys, falciparum malaria prevalence was below 10%, indicating that malaria is hypo-endemic [*3*].

Geographical diversity in the Region determines malaria variability in terms of endemicity, intensity of transmission and type of malaria. All age groups are at risk in endemic countries where transmission is seasonal and unstable, while pregnant women and children of young age are at higher risk in areas of stable malaria transmission, which exist in the south zone of Somalia and south Sudan. In Saudi Arabia, Yemen and the sub-Saharan countries of the Region (Djibouti, Somalia and Sudan), *Plasmodium falciparum* is the dominant species, while in Afghanistan, the Islamic Republic of Iran and Pakistan, both *P. falciparum* and *P. vivax* are transmitted, with *P. vivax* as the dominant species.

According to the malaria situation, countries of the Region are categorized into 3 groups. Group 1 (13 countries: Bahrain, Egypt, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Palestine, Qatar, Syrian Arab Republic, Tunisia and the United Arab Emirates) have eliminated local malaria transmission or have very residual foci. Group 2, (3 countries, the Islamic Republic of Iran, Iraq and Saudi Arabia) retain malaria endemicity in a few localized areas and are implementing elimination strategies. More than 95% of the malaria cases in the Region occur in group 3 (6 countries, Afghanistan, Djibouti, Pakistan, Somalia, Sudan and Yemen); Sudan alone accounts for almost 50% of the total Regional burden [*4*].

The Roll Back Malaria initiative

The Roll Back Malaria (RBM) initiative was launched in 1998 by WHO, the United

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Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP) and the World Bank in response to the unacceptably huge malaria burden on health and economies. The initiative renewed the global focus on malaria and revitalized the neglected malaria control programme, developed after the loss of aspiration for global eradication in 1969. It has been clearly stated that malaria eradication is not the objective of the new initiative: it is aimed at halving malaria-associated mortality and morbidity by 2010, and it is emphasized that this can only be achieved through strengthened local health systems [*5*].

The new approach created new opportunities for partnership between the public and private sectors. RBM now has a very wide range of partners, including malaria-endemic countries, their bilateral and multilateral development partners, the private sector, nongovernmental and community-based organizations, foundations, and research and academic institutions. Voting members of the RBM Partnership Board are: malaria-endemic countries (8), donor countries (3), UNICEF, WHO, UNDP, World Bank, research and academia (1 each), non-governmental organizations (2), private sector (2), foundations (1). The board also includes 2 non-voting ex officio members [*6*].

Roll Back Malaria in the Eastern Mediterranean Region

Before the initiation of RBM, the Region had a malaria control programme. The RBM initiative in the EMR was launched in 1999. The wide spectrum of malaria eco-epidemiology and burden, from malaria-free status to the meso-hyperendemic situation, resulted in the adoption (at that time) of different objectives for 4 different groups of countries: high-burden countries and/or those with non-functional health systems, low to moderate endemicity countries with functional health systems, countries with some residual foci of transmission, and malaria-free countries. In 2002–03 this programme was evaluated by external bodies, and proved to be a successful initiative, with significant impact on the malaria burden [*7,8*].

Achievements of Roll Back Malaria in the Eastern Mediterranean Region

Impact on malaria burden

Reported malaria cases gradually decreased from 6.1 million in 2000 to 3.6 million in 2006 [unpublished annual reports on malaria surveillance submitted to WHO by ministries of health]. However, these reported figures represent only a fraction of the true incidence owing to the weakness of the health information system. It is estimated that there were about 10.5 million cases in 2005 (compared to an estimated 15 million in 2000). About 59 000 malaria-related deaths occur every year in the Region [*9*].

Since the RBM initiative, 3 countries have been freed from malaria (Oman, Morocco, Syrian Arab Republic). Iraq is implementing a malaria elimination programme and is very close to victory in the fight against the disease (only 2 local cases in 2007). There has also been significant decrease in the malaria burden in Saudi Arabia and the falciparum burden in the Islamic Republic of Iran.

Commitment and partnerships

Success in malaria control and elimination requires long-term, high-level commitment from governments, partners and donors, and the amount of resources allocated is an indicator of this commitment.

Resources allocated to malaria control increased tremendously from both internal and external sources. All countries have increased their national allocation for malaria control and elimination. Based on the 2006

country reports, the total annual budget allocated for malaria control in the Region is over US$ 84 million, 60% of this was from national resources. This expansion in financial expenditure is indicative of a significant increase in political commitment to malaria control at national and international levels.

Both the Regional Office and the countries have been very successful in establishing partnerships, particularly in those countries with a high malaria burden. Nongovernmental organizations have been active in promoting insecticide-treated nets (ITNs) in Afghanistan and Pakistan, and community mobilization in the northern and southern states of Sudan and in Yemen. Collaboration established the Malaria Atlas Project to conduct malaria operation research in Somalia and other countries that will guide implementation of relevant interventions.

Resource mobilization

The total expenditure on malaria through joint programmes between WHO and the countries increased from almost US$ 3 million in 1998/99, the first year of RBM, to just over US$ 13 million in 2006/2007. The planned budget for 2008–09 is more than US$ 19 million. RBM/EMR also supported countries in the Region in applying for funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM). By round 7 of GFATM, all eligible malaria-endemic countries that applied for a Global Fund grant were successful in being awarded at least one grant. The total approved lifetime budget for 7 countries from rounds 2 to 7 is more than US$ 382 959 000. By March 2008, the countries had already received US$ 81 853 111 [*10*].

The Arab Fund for Social and Economic Development and the International Islamic Relief Organization are regional organizations that have provided financial support for malaria-endemic countries. Individual countries have provided support for programmes in Afghanistan and Yemen. Afghanistan has received US$ 1 300 000 from the United States Agency for International Development (USAID), which has been used mainly for providing technical support and rehabilitation of the National Institute for Malaria and Leishmaniasis in Kabul. Collaboration with the Islamic Development Bank is ongoing and will support expansion of the Khartoum and Gezira malaria-free programme to 2 other states.

Planning and management

After RBM started, with technical support from the Regional Office, malaria-endemic countries developed multi-year strategic plans, regularly updating them to conform with WHO guidelines. The strategic plans have been the foundation of resource raising activities from national and donor agencies. By 2007, all malaria-endemic countries had updated their national strategic plan till 2010. Now, national malaria management teams have a strong capacity for revising and updating their national control strategy. In Afghanistan, the first national malaria control strategy was fully developed by international partners, but in 2008 the national teams took the lead in updating it.

Human resource development and institutional support

Human resource development and institutional support are key supportive strategies for RBM, and from the beginning it was realized that national capacity was weak in many poor, malaria-endemic countries, where the need was greatest. Health staff had left the malaria service or become demoralized because of low salaries, poor working conditions and the absence of essential supplies.

The Regional Office has supported institutional assessment for development/upgrading of Regional training centres. Currently 3 centres are available for Regional training courses:

- Bandar Abbas (Islamic Republic of Iran), which is a field station of the Tehran School of Public Health. It was established in 1997 for Regional training on planning and management, and upgraded in 2006.
- The Blue Nile Research and Training Institute in Wad Medani, Gezira State, Sudan, was established in 1995, and later upgraded to cover Regional training on entomology and vector control.
- The central malaria laboratory in Oman was established as a Regional centre of excellence in malaria microscopy and quality assurance in 2007.

In addition to general technical support provided by the Regional Office to all EMR countries, technical support for group 3 countries is being provided at the field level by 5 international and 13 national WHO staff.

The Regional Office also supported the development and upgrading of the national training/research centres for malaria and other vector-borne diseases. A new national malaria/leishmaniasis centre was established in Kabul in 2006 by WHO with financial support from USAID. The training centre in Jizan, Saudi Arabia was evaluated by WHO and upgraded in 2006 from national funds. The malaria headquarters in Yemen was established in Sana'a with resources from GFATM.

Training on planning and programme management of malaria control programmes is considered an important aspect of RBM. So far, 10 courses have been conducted in the Regional centre in Bandar Abbas, Islamic Republic of Iran since 1997. The total number of participants trained is 187, including some from the WHO Regional Office for Africa (AFRO) and the WHO Regional Office for Europe (EURO). The Blue Nile Research and Training Institute has hosted 20 different malaria courses since 1997 for about 388 participants, of whom 129 received diplomas in malariology (9 month course). The trained staff have contributed greatly in improving malaria management at the national and subnational levels in the countries of the EMR.

WHO supported the first Regional training course on malaria microscopy in the Regional centre of excellence in Oman in 2007. The curriculum of the Regional one-year masters course in entomology and vector control has been finalized. The first course will be conducted at Gezira University in Sudan in late 2008.

Several intercountry workshops were held to brief and train national staff on various malaria-related technical topics including: geographic information systems (GIS) for malaria; quality assurance for the laboratory diagnosis of malaria; the development of integrated vector control and monitoring the therapeutic efficacy of antimalarial drugs; monitoring and evaluation; burden estimation; and malaria elimination. The regular, annual national programme managers' meeting has been a place for sharing experiences, providing information on new technical developments, updating Regional malaria surveillance and establishing Regional and cross-border coordination among countries.

Intersectoral collaboration

Several instances of intersectoral collaboration and involvement of different sectors for implementation of malaria control and elimination have occurred in the EMR. As a recent example, in Morocco, the ministries of transport, agriculture, communication,

tourism and travel, and defence and public works, as well as travel agencies have all been involved in elimination efforts. In Sudan the success of the Malaria Free Initiative in Khartoum was due to strong collaboration between the federal ministries of health, agriculture, education, culture and social affairs, and community organization, along with the private sector. One of the most fruitful collaborations was established between the Malaria Free Initiative and Khartoum Water Corporation: it resulted in the expeditious repair of broken pipes.

A disease without borders

This is the slogan for the 2008 World Malaria Day, which marks 10 years since the launch of RBM. It reminds us that malaria is an ecological disease that cannot be confined within political borders. It shows that there are still a number of things that need to be done to strengthen cross-border coordination between countries. There are many examples of the invasion of malaria from neighbouring endemic countries: malaria epidemics in the 1940s after the invasion of *An. gambiae* (most probably Arabiensis) into southern parts of Egypt, the introduction of malaria into the northern part of the Islamic Republic of Iran from Azerbaijan in 1994 and epidemics of malaria in Tajikistan after population movements on the border with Afghanistan in 1993.

Cooperation between the WHO offices for Europe and the EMR in malaria control/elimination has strengthened since the RBM initiative. They sponsored 2 meetings, in August 1999 and in May–June 2000, in Baku, Azerbaijan between representatives of neighbouring countries from both Regions. Interregional coordination continued with several further meetings: Dushanbe in 2001, Tashkent 05, Dushanbe 06, Ashgabat 07. The development of a joint plan for elimination of falciparum malaria in Tajikistan and northern areas of Afghanistan is a successful project awaiting donor funding.

The Horn of Africa Network for Monitoring Antimalarial Treatment (HANMAT) is a successful network among Horn of Africa countries, even though not yet formally established, which has helped in information sharing on drug efficacy monitoring and proper decision making for updating drug policy.

Saudi Arabia, with focal malaria and better financial resources, and Yemen, with poor resources and a high burden of malaria, set an example of partnership for a joint malaria programme between neighbouring countries. Both are concerned about the high rate of population movement along their long and remote common border. Collaboration between the 2 countries, in the form of exchange of information and surveillance, was assisted by RBM. This intercountry coordination, with WHO support, was further expanded and included other members of the Gulf Cooperation Council; in 2007, the heads of state approved a $ 47.2 million proposal with a vision of malaria elimination in the Arabian Peninsula.

Afghanistan, the Islamic Republic of Iran and Pakistan have many common eco-epidemiological and cultural factors that necessitate their continuous and close cooperation in border areas. However, a functional mechanism has not yet been set up. Some recent activities conducted include 2 border meetings; developing a multi-country research project on molecular epidemiology and genetic characterization of the *P. vivax* populations in each country; and a course for building capacity on entomology and vector control in Pakistan and Afghanistan, hosted and supported by the Islamic Republic of Iran.

Population movement from endemic sub-Saharan African countries to Europe led to an increase in imported cases in countries in the north of Africa, where the migrants often transit. A coordination mechanism is yet to be established.

Applied research

The Tropical Disease Research (TDR) Small Grants Scheme was established in the Division of Communicable Diseases at the Regional Office in 1992, with support from the Regional Director's development fund and from the TDR (UNDP/World Bank/WHO) Special Programme for Research and Training in Tropical Diseases. It included malaria as a target disease right from the beginning. The scheme supports research into locally relevant health issues, beginning with problem identification and proposal writing, through the research process to the dissemination of findings. Since the beginning of 2000, RBM has contributed large sums to the TDR Small Grants Scheme: 55 proposals from 10 countries have been supported by the Scheme and other mechanisms, with Sudan being the highest recipient country (19 proposals) [*11*]. Yemen received an institutional capacity grant to study the determinants of severe malaria.

Strengthening monitoring and evaluation and new techniques for data collection and management

Reliable and functional malaria surveillance is essential for proper planning and management of malaria control programmes. A Regional workshop on monitoring and evaluation was conducted by the Regional Office, after which many countries developed their malaria monitoring and evaluation plan as part of their national strategy, and all endemic countries identified focal points. The main product of efforts for strengthening monitoring and evaluation was the first world malaria report, which established the baseline for the accountability and transparency of malaria control programmes. To overcome the problem of the weak malaria surveillance system and the lack of reliable routine data, a pilot implementation of global malaria data has being initiated in Afghanistan, Yemen and Sudan.

RBM/EMR introduced and encouraged countries to use *HealthMapper* software in their malaria surveillance systems to help them organize their data and to offer the possibility of a spatial view of the information. Many countries such as Afghanistan, Morocco, Pakistan, Saudi Arabia, Somalia, Sudan and Yemen are using the software as a GIS tool in malaria control and elimination.

The Malaria Early Warning Systems (MEWS), based on the weekly reporting of malaria cases in epidemic-prone districts, has been established in Sudan since 2001 and was introduced in Pakistan in 2003. With WHO support, a strategy for detection and control of malaria epidemics was developed in Somalia and epidemic detection and control in the Islamic Republic of Iran was assessed.

Malaria elimination and certification of free status

The Regional strategy for 2006–10 supports the expansion of malaria-free areas through malaria elimination initiatives at the sub-regional level (North Africa, Arabian peninsula); elimination programmes at the national level (Iraq, the Islamic Republic of Iran, Saudi Arabia; the United Arab

Emirates was certified free of malaria by WHO in 2007) and malaria-free projects at the sub-national level such as those outlined below in Socotra and Khartoum.

The malaria elimination project was initiated on Socotra Island (a unique potential tourism centre) in Yemen in September 2000. The impact of the project was a real success story with no local cases reported since 2005. The Khartoum and Gezira malaria-free initiative was launched in 2002, aimed at the elimination of malaria as a public health problem. Khartoum and Gezira were selected due to their political importance as Khartoum is the capital city and a seat of commerce and Gezira is of agricultural importance. The 2 states are home to nearly one-third of the entire Sudanese population. The initiative has resulted in a significant reduction in the malaria burden in Khartoum state, and set an example to be followed by other states. The parasite rate decreased to 0.03% in 2006, compared to 1.5% in 2001.

Current sub-national initiatives/projects in high-burden countries could be viewed as starting projects for elimination, sustainability and expansion and should be supported.

Two guidelines on "elimination of residual foci" and "prevention of reintroduction of malaria" were finalized and published [*11,12*]. For sharing successful experiences, the story of Morocco in malaria elimination was documented and published [*13*].

Challenges for Roll Back Malaria in the Eastern Mediterranean Region

Malaria-endemic countries are facing a number of challenges, such as:

- limited coverage and low quality of laboratory services for diagnosis, particularly in high-burden countries, where only one-quarter of the clinical malaria cases are laboratory confirmed;
- weak heath information and malaria surveillance systems, which are unable to provide reliable data on the malaria burden;
- limited access to effective treatment and prevention measures;
- poor leadership and management skills at national and lower levels;
- lack of compliance of the private sector with national policies and guidelines;
- weak community involvement and lack of community structures to deliver interventions to remote and inaccessible populations.

Countries aiming at malaria elimination are confronted with various obstacles, including:

- limited expertise in malaria elimination and weak national capacity for implementing elimination interventions;
- lack of an accurate and up-to-date stratification map of malaria transmission;
- lack of effective strategies for coordination of cross-border activities;
- weak intersectoral coordination.

Countries of the Region also face an additional constraint concerning the spread of resistance to drugs and insecticides. The unstable political situation in certain areas due to war or civil unrest and globalization along with rapidly changing dynamics in environment, climate and migration pose formidable challenges.

The way forward

With the vision of having a malaria-free Region, RBM/WHO Regional Office for the Eastern Mediterranean will continue to provide support to countries to provide

universal coverage for malaria control and prevention interventions, and to develop strategic plans for malaria elimination, wherever feasible.

WHO will assist countries in their efforts to mobilize resources for the malaria programme and to strengthen the health system, as well as in building up national capacity for malaria elimination and in the coordination of cross-border activities. More investment will be given to research to develop innovative strategies to address the challenges facing the programme in all phases and settings, including complex emergency situations.

Support will be sustained to consolidate the achievements already made and to prevent the re-emergence of malaria.

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