

Report on the

**First intercountry meeting of national vector
control focal points**

Amman, Jordan
4–6 November 2008



**World Health
Organization**

Regional Office for the Eastern Mediterranean

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EXECUTIVE SUMMARY

In response to the call by Member States to endorse and support the implementation of the integrated vector management (IVM) approach for vector control, the first intercountry meeting of vector control focal points was held in Amman, Jordan, from 4 to 6 November 2008. The participants, through presentations and discussions, reviewed progress on the implementation of IVM in the Region. They concluded that despite available opportunities (a Regional Committee resolution and a progress report, relevant guidelines and tools for conducting vector control needs assessment, funding opportunities, and in some countries, available IVM strategies and established IVM coordinating mechanisms, etc.), much still needed to be done. The participants identified a number of challenges and constraints that hinder the maximum implementation of IVM in the Region. These include insufficient political commitment; weak intersectoral coordinating mechanisms; inappropriate institutional arrangements; weak capacity to scale up vector control interventions; lack of an adequate and supportive regulatory environment for sound pesticide management; and lack of strategies for mobilization and awareness of community involvement/empowerment in vector control. While the meeting proposed a number of key actions to address the identified challenges and constraints to implementing IVM in countries of the Eastern Mediterranean Region (see operational plan in Annex 4), they also made the following recommendations for immediate response.

Recommendations

The meeting broadly recommended to WHO and Member States to ensure that the agreed operational plan of action for IVM is implemented by providing the necessary resources and support. They also requested WHO to ensure that advocacy for political commitment to implement IVM globally is included and discussed in the next World Health Assembly agenda.

Implementation of IVM

To Member States

1. Conduct regular advocacy and consensus meetings at the highest national level, involving different sectors, to advocate for political commitment on IVM.
2. Initiate vector control needs assessment process using WHO guidelines with a view to developing, endorsing and incorporating it into a national policy in countries with no IVM strategies. Update strategies regularly in those countries in which strategies have been developed.
3. Establish, and where applicable, strengthen national coordination mechanisms and partnerships for IVM implementation, including relevant stakeholders (the private sector and community representatives).
4. Facilitate the legal status of multisectoral IVM coordinating bodies and appropriately sustain them with resources through appropriate channels.

5. Establish and strengthen existing cross-border coordinating mechanisms/networks for vector control with technical support from WHO.
6. Establish/strengthen units/structures responsible for vector control and public health pest control within the ministry of health where applicable, with clear responsibilities; appoint a national vector control focal point with clear terms of reference; and allocate a special budget line for the unit.
7. Establish/upgrade laboratories of entomology and quality control of pesticides.
8. Develop emergency preparedness plans, which include response, and utilize existing expertise in malaria vector control to address them emerging and re-emerging vector-borne diseases.
9. Empower communities in IVM implementation. Develop a national communication strategy and utilize the mass media and other channels for increased IVM awareness.

To WHO

10. Establish an updated database on all attributes of disease vector species and efficacy of control measures through a commissioned regional project; develop and update relevant vector control monitoring and evaluation guidelines; and continue to support the regional MSc course in medical entomology and vector control and other relevant short courses.

Sound management of public health pesticides

To Member States

11. Be actively involved in the process of pesticide legislation and regulation (registration, monitoring and evaluation, application, disposal, transportation, storage), including the development of a national reporting system; establishment of national quality control schemes; and the development of an environmental health monitoring scheme for the use of public health pesticides, including spray persons.
12. Use available IVM coordinating mechanisms as an additional platform for inter- and intrasectoral coordination in public health pesticide management.

To WHO

13. Provide technical support to Member States to strengthen sound management of public health pesticides in the Region.
14. Establish a distribution list for scientific data exchanges and distribution of WHO publications.
15. Urge Member States to revisit/review pesticides acts to ensure the issue of public health pesticides are well addressed.

16. Organize additional workshops on the management of public health pesticides noting the urgent need identified by the meeting on such a need.

1. INTRODUCTION

In response to the call by Member States to endorse and support the implementation of the integrated vector management (IVM) approach for vector control, the first intercountry meeting of vector control focal points was held in Amman, Jordan, from 4 to 6 November 2008. A total of 38 participants attended the meeting, of which 26 were representatives from 18 countries, 11 participants were WHO staff and one participant was from the United Nations Environmental Programme/Global Environment Facility. The objectives of the meeting were to:

- review country progress on the implementation of IVM;
- provide important updates on key vector control interventions;
- review the challenges faced in scaling-up insecticide residual spraying (IRS) and long-lasting insecticidal nets (LLINs);
- identify challenges, constraints and opportunities faced in implementing IVM in countries of the Region;
- identify critical issues on the sound management of public health pesticides in the framework of IVM; and
- develop an operational plan on IVM implementation in the Region.

The meeting was inaugurated by Dr Hashim Ali El-Zein El-Mousaad, the WHO Representative to Jordan, who delivered the message of Dr Hussein A. Gezairy, WHO Regional Director for the Eastern Mediterranean. Dr Gezairy said that during the Fifty-second Session of the Regional Committee for the Eastern Mediterranean in 2005, Member States had recognized the immense burden due to vector-borne diseases in the Region; the potential threat of emerging and re-emerging vector-borne diseases, as well as their geographical and seasonal expansion; the general weakness in national capacities to implement vector control in most countries of the Region; the inadequate national policies for vector control; the allocation of insufficient resources for vector control; the inappropriate institutional arrangements; and the duplication of meagre resources among different sectors of health.

It was with this background that the Regional Committee adopted resolution EM/RC52/R.6, in which it endorsed integrated vector management as the strategy for the implementation of vector control in the Region; and requested Member States to establish vector control units in each Ministry of Health and to strengthen intersectoral coordination and provide guidance and leadership in that regard. To implement integrated vector management nationally, the Committee also recognized the need to establish a regional Master's degree programme in medical entomology and vector control.

Dr Gezairy said that nine of the twelve countries of the Region endemic for vector-borne diseases were now implementing integrated vector management. They had national strategic plans and had received support from the United Nations Environment Programme (UNEP).

These countries had also established intersectoral coordinating mechanisms drawing representatives from different sectors under the leadership of ministries of health. Four of the nine countries had also established integrated vector management units in the ministry of health to coordinate the implementation of vector control for all vector-borne diseases. Moreover, a total of

17 million people now had access to long-lasting insecticide-treated nets as part of scaling up access to this key intervention. It was projected that approximately 30 million people would have access to this intervention by the end of 2008.

Dr Gezairy said that the establishment of a Vector Biology and Control unit had ensured that different programmes in the Regional Office were coordinated and that Member States were served efficiently. It was recognized also that vector control was a cross-cutting programme. A robust curriculum for an MSc degree programme in medical entomology and vector control had been developed. The curriculum included a six-month field training component, which was a unique feature of the programme.

The meeting was co-chaired by Dr Khalil Abdul-Aziz Kanani, (Jordan) and Dr Samyah Al-Tubaikh, (Kuwait). The programme and list of participants are included as Annexes 1 and 2, respectively. Annex 3 contains a two-year operational plan for IVM implementation in the Regional Office, 2009–2010.

2. PROGRESS ON THE IMPLEMENTATION OF IVM AT GLOBAL AND REGIONAL LEVELS

2.1 Implementation of IVM at global level

Kazuyo Ichimori, WHO/HQ

Vector control strategies have a proven track record of successfully reducing or interrupting disease transmission when coverage is sufficiently high. However, vector control also has proven weaknesses that are contextual in nature and relate especially to technical and managerial deficiencies and obstacles, although it is now known how to better monitor and manage vector resistance. Similarly, significant success in the short term may be a weakness because it can lead to premature diversion of resources. Any particular intervention may not be suitable for every setting; additionally, over-reliance on a single intervention may undermine the flexibility needed by health services to use an adaptive management approach to the control of vector-borne diseases.

Vector control is well suited for integrated approaches as some vectors are responsible for multiple diseases, and some interventions are effective against several vectors. It requires careful consideration of synergies and antagonisms to achieve vector control goals in specific settings. It also requires reconsideration of these combinations over time, as contexts change and needs evolve. Integrated vector management is a rational decision-making process for the optimal use of resources for vector control. Its goal is to make a significant contribution to the prevention and control of vector-borne diseases. Implementation of IVM requires decision-making criteria institutional arrangements and regulatory frameworks. It also requires decision-making skills that support intersectoral action and are able to establish vector control and health-based targets.

WHO promotes these management principles as set out in the Global Strategic Framework for Integrated Vector Management (2004). In 2007, a global consultation on IVM identified a number of areas that needed to be addressed for the implementation of IVM. These were in line with the Global Plan (2008–2015) to combat neglected tropical diseases through delivery of multi-

intervention packages that include the promotion of integrated vector management (IVM). WHO's position statement on IVM (2008) was produced to support the advancement of IVM.

2.2 Implementation of Regional Committee resolution EM/RC52/R.6

Abraham Mnzava, WHO/EMRO

Nine of the twelve disease-endemic countries have developed IVM plans, established national intersectoral coordination mechanisms and four countries have a vector control unit responsible for all vector-borne diseases. It was also reported that a regional initiative to strengthen capacity in medical entomology and vector control has been established to ensure that countries have the appropriate capacity to implement IVM. In view of this, an MSc course was established in August 2008 in Sudan. Two other courses in collaboration with WHO will be set in the Islamic Republic of Iran and in Pakistan in January 2009.

Where LLINs are a strategy for vector control and prevention, countries have made good progress in scaling up this intervention. These countries include Afghanistan, Djibouti, Somalia and Sudan. Over the last three years, the number of people accessing this intervention in the Region has increased from 3.6 million in 2005 to about 18 million people in 2007. The projection for 2008 is about 30 million people given the availability of resources and access to WHOPES-approved LLINs. In the absence of any other vector control intervention, the goal is universal access to LLINs (1 LLIN for every two persons). Implementation of this strategy must be based strictly on epidemiological stratification and where resources are limited, a phased approach is recommended. On the other hand, the capacity to monitor insecticide resistance is weak in most countries. Recent reports of pyrethroid resistance in parts of central Sudan have not only reduced the number of available arsenals to fight vector-borne diseases, but also pointed to the need for strengthening the capacity to monitor and manage vector resistance. There is a need to assess the potential epidemiological impact of the resistance as well as the identification of resistance mechanisms in the framework of the current TDR network. Based on studies elsewhere, pyrethroid resistance reduces the impact of insecticides on transmission control, as well as for personal protection. In other words, vectors are not killed on contact and also succeed in taking a blood meal, increasing the probability of transmitting disease vectors.

Reporting on IVM implementation in the Region, a number of questions were raised. For example, why is IVM still not yet a national policy in 13 countries, 3 years after the Regional Committee endorsed it as a regional strategy? What would be the next step from here? What support would be needed to initiate IVM in these countries? In those countries that IVM has been initiated, what challenges are they facing and how could these be addressed? Key to IVM implementation is sound management of public health pesticides. Countries were requested to critically review and consider issues, such as pesticide specifications and determination of equivalence; quality control; procurement; application; storage/disposal; monitoring of insecticide resistance.

Eighty percent (80%) of disease-endemic countries now have plans for IVM implementation ; other countries need to review their vector control needs in order to develop their national IVM plans; vector control interventions need to be scaled up, especially LLIN implementation based on epidemiological stratification for universal coverage; and the need to strengthen capacity for sound

pesticide management, including the capacity for monitoring and management of insecticide resistance.

2.3 Demonstrating and scaling-up of sustainable alternatives to DDT in vector management

Jan Betlem, UNEP/GEF

The joint UNEP/WHO global programme “Demonstrating and Scaling Up of Sustainable Alternatives to DDT in Vector Management” (DSSA) aims at the protection of human health and the environment through the reduction of emission of DDT into the global environment by means of decreasing the use of DDT through introduction, demonstration and scaling-up of sustainable alternatives to DDT in disease vector management. The programme aims at doing this through interventions in various geographical, cultural, social, climatic, and eco-epidemiological regions in the world:

- Development, introduction, demonstration, and scale enlargement of various alternative approaches related to vector management. This includes not only alternatives to DDT through replacement with other chemicals, but also includes environmental measures to discourage the development of the vector population, increasing efforts to avoid human–vector contact, as well as improving the resistance of humans against relevant vector-borne diseases.
- Strengthening of institutional structures related to vector management in actual and potential DDT-using countries in order to encourage a sustainable way of vector management based on IVM, and decentralization of strategic government health intervention programmes related to vector management in order to obtain maximum community involvement and awareness, cost–effectiveness and sustainability.
- Demonstration of safeguarding and, depending on the specific project situation, disposal of stocks of DDT which, with new decentralized IVM strategies and alternative approaches in place, are no longer needed for vector control purposes. These stocks can consist of formal stocks as known and managed through the respective governments, but may include illegal stocks, and stocks without any proper management which act as a resource base for DDT as well.

A programmatic approach is envisaged as it is expected that related projects will yield valid basic information and experiences which can be applied (although adapted to the specific local circumstances) in other proposed project intervention areas. Through inter-linkage of the various projects in this global DSSA programme, the outcomes and experiences can easier be transferred and applied in new projects within the programme, and in replication efforts in both programme and non-programme countries. As such, the combination of achieved results under the DSSA programme will give documented evidence of the regional and global community on cost–effectiveness and sustainability of environmentally-friendly interventions, providing basis for adapted global vector management strategies without the use of DDT, finally resulting in a total global elimination of DDT use.

The global DSSA programme will result in a yearly reduction of DDT application in vector management of about 4000 tons by the end of the programme period (2014). Baseline estimates and indicators and targets for the global programme are considered from the start of the programme. Co-funding for the programme will be received from the GEF. The programme consists of: two

projects for US\$ 11.3 million approved under GEF-3 (2002–2006). This includes the WHO Regional Office/EMRO/UNEP project; one project for US\$ 4.0 million approved under GEF-4 (2006–2010); six projects for US\$ 16.7 million expected for future GEF-4 approval; and one project planned for approval during GEF-5 (2010–2014).

2.4 Identification of major challenges in the management of public health pesticides in the context of IVM

Morteza Zaim and Stephanie Guillaneux, WHO/HQ

Pesticide management refers to the regulatory control, proper handling, supply, transport, storage, application and disposal of pesticides to minimize adverse environmental effects and human exposure, i.e. a life-cycle approach to the regulation of pesticides. Governments should introduce the necessary legislation for the regulation of public health pesticides and make provisions for its effective monitoring and enforcement. Pesticide management is the shared responsibility of the public and private sectors. Inter- and intrasectoral collaboration play a vital role in the regulation of pesticides, and there is an important collaborative role of the health, environment and agriculture sectors in this effort.

The increasing complexity of evaluation and assessment of pesticides and their management requires substantial resources and adequate national infrastructure which includes well-trained personnel in the various fields of pesticide management. This may therefore require the establishment of a single national authority for registration of all pesticides to optimize the use of limited resources available in most countries.

There is an urgent need for capacity strengthening on the sound management of public health pesticides as a result of the: (1) increased use of insecticides in the health sector and greater international focus and advocacy, as well as global investment in control of vector-borne diseases, such as malaria; (2) decentralized health services and challenges associated with the management of public health pesticides; (3) inadequate infrastructure and resources for the sound management of public health pesticides in the majority of developing countries; including lack of effective collaboration and coordination of efforts between health and agriculture sectors.

There is an urgent need for the establishment of national policies for IVM to ensure rational and judicious use of insecticides in public health.

The most important challenges faced in the management of public health pesticides are related to the areas of legislation and regulation, procurement and quality control; storage, transportation and distribution; pesticide application; monitoring and evaluation; the disposal of pesticide waste and containers; and community awareness.

2.5 Progress towards malaria control and the potential for elimination

Hoda Atta, WHO/EMRO

Malaria is endemic in nine countries of the WHO Eastern Mediterranean Region, with low intensity of transmission in most areas. High and stable transmission was limited to the southern zone of Somalia and southern Sudan, which represented only 5% of the population at risk for

malaria in the Region. Since the launch of the Roll Back Malaria (RBM) Initiative in the Region in 1999 and particularly in the past few years, malaria control had intensified in endemic countries and has resulted in a reduction of the malaria burden. In 2008, WHO estimated 8.1 million annual malaria episodes in the Region compared to an estimated 15 million in 2000.

A technical discussion paper on “Malaria elimination in the Eastern Mediterranean Region: vision, requirements and strategic outline” was presented to the Regional Committee October, 2008 and a resolution was adopted supporting the way forward for malaria elimination (EM/RC55/R.9). With the availability of new tools for case management and prevention, improvements in communication technology, availability of financial resources from the Global Fund and other sources, and the global interest in elimination, it was considered feasible to accelerate efforts to eliminate malaria in low transmission areas by 2020. In high transmission areas in the southern zone of Somalia and southern Sudan, substantial reduction of transmission could be achieved with full-scale deployment of available tools.

Moving toward elimination requires targeted, custom-tailored mosquito control interventions to reduce the vectorial capacity in the active foci with the aim of halting transmission nationwide. Interventions in a pre-elimination programme should include geographical reconnaissance, establishing GIS database on foci, vectors, cases and full coverage by effective vector control tools (mostly IRS and/or LLINs). It should be noted that capacity to monitor essential entomological indicators for transmission is weak.

EM/RC55/R.9 adopted certain resolutions concerning strengthening vector control activities, coordination and system for delivery in all Member States where malaria is endemic as follows: ensuring universal coverage of all populations at risk with effective diagnostic, treatment and prevention tools free of charge and exempt from all taxes and tariffs; strengthening collaboration with research agencies to address programme needs for elimination; ensuring that the malaria control and elimination programme has the necessary resources and make use of the resources available from donors for health system strengthening (including the infrastructure for IVM implementation); and strengthening collaboration with neighbouring countries in malaria control, with particular attention to the surveillance network for monitoring vector resistance to insecticides.

2.6 The challenges of leishmaniasis control and prevention in the Region

Riyadh Ben-Ismail, WHO/EMRO

Visceral and cutaneous leishmaniasis are endemic in 88 countries of the world. The disease affects between 12 and 14 million people with an estimated incidence of 2 million cases a year. It also causes about 59 000 deaths a year with a disease burden of approximately 2.35 million DALYs and resulting in unmeasurable stigma, especially among young women. The three forms of leishmaniasis (anthroponotic cutaneous leishmaniasis, zoonotic cutaneous leishmaniasis and visceral leishmaniasis) are characterized by different causative agents, vector species, kind of lesions, length of incubation period, seasonality, reservoirs and potential control measures.

Zoonotic (rural) cutaneous leishmaniasis due to *Leishmania major* is prevalent in desert zones of Egypt, Islamic Republic of Iran, Iraq, Jordan, Libyan Arab Jamahiriya, Morocco, Pakistan, Saudi Arabia, Sudan, Syrian Arab Republic and Tunisia. Its control includes the mechanical destruction

(ploughing) of rodent burrows which are the main reservoirs of the disease. This method of control was found very effective in Tunisia in the early 1990s. Anthroponotic (urban) cutaneous leishmaniasis due to *L. tropica* is a major problem in Syrian Arab Republic and in some urban foci of Afghanistan, Islamic Republic of Iran and Pakistan. This form of leishmaniasis could potentially be prevented through timely application of vector control interventions. However, experiences in the Syrian Arab Republic where the application and types of insecticide formulations with short residual efficacy have not been appropriate, sometimes applications not coinciding with transmission. Visceral leishmaniasis incidence is also reported to be increasing in some countries of the Region.

Case management of leishmaniasis has not been without problems. Some of these include unavailability of antimonials which are not only expensive, toxic but also painful resulting in lack of compliance by patients. There are also no treatment guidelines to follow. Reports indicate that more than 60% of cases are ineffectively treated. Reports also show that prevalence of chronic cases including those of leishmaniasis recidivans cases have been on the increase. Given the importance of leishmaniasis, through a World Health Assembly Resolution in 2006 Member States were requested to set up, among other activities, national leishmaniasis control programmes for the treatment of cases, vector control interventions, where these are feasible supported with operational research. Detection and treatment of active cases is essential to ensure that they do not serve as a source of infections.

2.7 The threat of insect-borne haemorrhagic fevers in the Region

Martin Opoka, WHO/EMRO

In the last decade, new emerging and re-emerging infectious diseases have been witnessed. Most of these diseases are caused by viruses that are frequently zoonotic and often vector transmitted. Haemorrhagic fevers in general and viral haemorrhagic fevers (VHF) in particular are among these emerging and re-emerging diseases.

VHF is syndromic description of a constellation of viral infections. Most of them belong to biosafety level 4 pathogens that result into very high mortality. The disease presents with acute fever and bleeding diathesis. VHFs are difficult to treat and/or prevent. Nosocomial outbreaks can occur. Many VHF viruses are transmitted by a variety of vectors, and thus, the roles of vector control experts are paramount in the control and containment of outbreaks due to these viruses. The following are some of the vectors responsible for the transmission of VHF: mosquitoes (mainly *Aedes aegypti*) are responsible for the transmission of dengue haemorrhagic fever, yellow fever and Rift Valley fever. Ticks on the other hand, are responsible for the transmission of Crimean–Congo haemorrhagic fever, Kyasanur Forest Disease and Omsk haemorrhagic fever. Dengue haemorrhagic fever, yellow fever, Rift Valley fever and Crimean–Congo haemorrhagic fevers have been reported and have caused outbreaks in a number of countries in the Region. Many more countries are at risk of these diseases, and moreover, the risk of importation of these diseases in the Region through international travel and tourism is real.

The Region faces many challenges with regard to vector-borne VHF. This includes: lack of forecasting and early warning system (environ-climatic trigger events), epidemiological surveillance programme in human and animals (support to laboratory diagnostic, inter-disciplinary

working partnership with Ministry of Health, the Ministry of Agriculture, veterinary services, national parks, nongovernmental organizations), general shortage of medical entomologist and lack of clear policies to promote vector control programmes in relation to insect-borne VHF in the Region.

3. PROGRESS AND CHALLENGES OF COUNTRY IVM IMPLEMENTATION

3.1 Bahrain

Bahrain is free of vector-borne diseases that occur locally. The last local malaria case was reported in 1980. However, the total number of imported malaria cases in 2006, 2007 and September 2008 were 68, 103 and 65 cases, respectively. Moreover, there have been no outbreaks of other vector-borne diseases over the last 30 years. There are two vector control programmes—malaria and insect control and rodent control in the Ministry of Health. Their activities are coordinated with other relevant ministries and municipalities and control methods include a wide range of larval and adult control.

Pesticide management is not a major problem in Bahrain except the lack of quality control facilities. Disposal of obsolete pesticides for vector control is also not an issue as the responsible control programmes do not order more insecticides than are required. As a result of successful vector control, vector-borne diseases do not feature high as a national health problem. In view of this, there is a need to maintain the achieved status and strengthen vector surveillance.

3.2 Egypt

The major vector-borne diseases in Egypt include malaria, lymphatic filariasis, leishmaniasis and Rift Valley fever. Two mosquito vector species: *Anopheles pharoensis* and *An. sergentii* are responsible for the transmission of *Plasmodium falciparum* and *P. vivax* malaria. Since 2000 only imported cases have been reported; 30 cases in 2007 and 40 cases in 2008 in Fayyoun and Aswan governorates. Filariasis is endemic in Egypt and 29 villages are implementing annual mass drug administration of ivermectin. Two types of leishmaniasis; visceral and zoonotic cutaneous occur widely in the Nile Valley and Sinai Peninsula. The prevalence of cutaneous leishmaniasis in north Sinai continues to increase every year. For example, between 2002 and 2008 there was an increase from 0.6% to 11.4%, with 109 cases in 2007 and 334 cases in 2008. Rift Valley fever is an epidemic disease of animals and humans which appeared in Egypt in 1977 and reappeared in 1987, 1988, 1993 and 2003, after which no further cases were reported.

In controlling these vector-borne diseases, Egypt is applying IVM principles with each governorate having its own committee for IVM. This is based on the national IVM steering committee with representatives from the Ministries of Agriculture, Irrigation, Environmental Affairs, Municipalities and Research and scientific institutions. This was made possible by support from a WHO/UNEP/GEF project. As for critical issues related to pesticides management, WHO guidelines are applied. For example, the Ministry of Health and Population has a laboratory for quality control; insecticides are properly stored, there are no obsolete pesticides and monitoring of insecticide resistance is conducted regularly.

Although IVM has been introduced as a national policy, Egypt still faces a number of constraints, such as insufficient manpower in the sector of vector control, especially trained entomologists and pest control operators. This problem is compromised due to the government policy of not appointing new staff; the lack of adequate facilities for proper survey analysis and databases; and the instability of IVM committee membership due to retirement. If these critical issues could be addressed, IVM implementation in Egypt would not face problems.

3.3 Islamic Republic of Iran

Three vector-borne diseases are prevalent in the Islamic Republic of Iran. In 2007, the following numbers were reported: 26 493 cases of leishmaniasis mainly from eight provinces; 15 712 cases of malaria, mainly from three south eastern provinces close to the border with Pakistan; 73 cases of Crimean–Congo haemorrhage fever, occurring mainly in the areas close to the eastern border with Afghanistan and Pakistan. Indoor residual spraying (IRS) is the main vector control intervention for malaria, and to a lesser extent, for anthroponotic cutaneous leishmaniasis. A total of 50 000 LLINs were distributed in 2007, mainly for leishmaniasis control and only a few for malaria control. In 2007, a total of 114 188 houses were sprayed with a pyrethroid insecticide out of 126 275 houses targeted during the first round of spraying. Another 144 741 houses were sprayed out of 160 198 houses targeted during the second round of spraying, giving an average of 90% coverage. Although there is a need to regularly conduct community awareness and refresher courses for spray persons, community compliance to IRS is a big challenge. Other challenges in scaling-up vector control interventions include: the existence of different authorities responsible for pesticide registration; the lack of clear policy/plan for the management of obsolete pesticides (17 tons in the Ministry of Health and Population warehouses, around 50 tons in the Ministry of Agriculture warehouse); unauthorized (illegal) pesticide importation; taxes and tariffs put on LLINs; and the lack of facilities for quality control of pesticides.

The country is one of eight in the Region, that with the support of WHO/UNEP/GEF, was able to establish a multisectoral national IVM steering committee (WHO, Ministry of Agriculture, Environment Department, Ministry of Health and Medical Education (MoHME) and other academic institutions); the vector control needs assessment tool was administered and analysed to identify needs, gaps and opportunities for IVM implementation; the VCNA report was used to draft a national IVM plan which was presented and endorsed during a national stakeholders' meeting. The report was also used to draft a GEF demonstration project to implement and promote sustainable and cost-effective DDT alternatives. Despite having a national IVM strategic plan, implementation of IVM is faced with the lack of a vector control/IVM unit in the MoHME to address all vector-borne diseases, due to organizational and administrative problems, and because vector control responsibilities are disease-specific. The country needs to learn from the experiences of other countries in this regard. The country also lacks sufficient experience to actually implement IVM and is unable to sustain the established national intersectoral collaboration mechanism. It is therefore proposed that national capacity for vector control (human and financial resources) be strengthened; a VC/IVM unit in the MoHME be established for all vector-borne diseases; a stakeholders' workshop will be organized by the MoHME; IVM and intersectoral coordination will be advocated and promoted; and that there will be an opportunity to use the GEF and other international resources to implement IVM.

3.4 Iraq

Iraq has witnessed a significant reduction in malaria from 1860 cases in 2000 to 3 cases in 2007. There were also 1443, 782 and 918 cases of visceral leishmaniasis in 2006, 2007 and 2008, respectively. As for cutaneous leishmaniasis the number of cases was 1339, 636 and 918 in 2006, 2007 and 2008 respectively. There are a total of 190 sentinel sites in the whole country to monitor the cases of the two diseases—10 in each governorate with approximately 10–20 monthly visits. In terms of interventions, IRS is conducted in two rounds with a total number of house structures targeted for spraying as follows: RI = 34 978 and RII = 34 978 and actually sprayed as RI = 33 872 and RII = 34 102. Space spraying is also conducted with a population of 6 000 000 people actually protected. Larval control using temephos on the other hand, covers approximately 250 000 hectares. The number of LLINs distributed is 520 000 aimed at covering approximately 800 000 people for both malaria and leishmaniasis.

Despite this significant progress in malaria and leishmaniasis vector control, IVM has not yet been initiated in Iraq. Iraq has a strong public health infrastructure for vector control and its ability to deliver is also linked to available emergency resources which cannot be guaranteed in the future. To ensure sustainability, it is recommended that once stability has improved, Iraq would need to undertake a comprehensive vector control needs assessment using WHO guidelines and tools as a pre-requisite for developing an IVM national strategy and the establishment of IVM coordinating mechanisms.

3.5 Jordan

In Jordan, most malaria cases are imported (124 cases per year) with the low-lands areas of the country being receptive. Urinary schistosomiasis cases (327 cases from 1998–2007) are also mainly imported and the few cases (152) locally transmitted occurred in the low lands (Jordan Valley and Ghor Safi). Cutaneous leishmaniasis (zoonotic) is endemic in Jordan. There is evidence that reported cases have been increasing during the last 2 years with most cases coming from South Shunah and Aqaba health districts. Vector control activities include: environmental management; drying; canalization and clearance of vegetation; destruction of rodent burrows; new irrigation methods (drip, intermittent irrigation); wastewater management, and improved housing. Chemical methods include larviciding: using temephos 50% EC with an average amount of 1000 kg (a.i.)/year all over the country; space spraying: using (deltamethrine 2.5% EC) against *Anopheles* mosquitoes, sandfly and *Culex* mosquitoes; and chemical control of snails (niclosamide 70% WP). The annual average amount used is 150 kg a.i. Entomological surveillance of larvae and adult mosquitoes, including susceptibility tests is regularly undertaken. Indoor residual spraying and the use of LLINs are not implemented in Jordan.

Jordan, however, faces the following challenges in scaling-up vector control interventions: inadequate insecticide storage facilities; empty containers of insecticides are not always safely destructed and dumped; obsolete stock of DDT (22 tons) has been stored since 1990 and Jordan has no capacity to dispose of them, including the lack of packaging materials for 13 015 kgs of DDT 100%; the need for training on the appropriate application of insecticides; and weak capacity in monitoring the susceptibility of vectors to the used insecticides.

Jordan is also among the eight countries in the Region that through the support of WHO/UNEP/GEF is implementing IVM. Jordan established a national IVM steering committee; a vector control needs assessment tool was administered and analysed to identify needs, gaps and opportunities for IVM implementation; the VCNA report was used to draft a national IVM plan which was presented and endorsed during a national stakeholder's meeting. The report was also used to draft a GEF demonstration project to implement and promote sustainable and cost-effective DDT alternatives. Jordan, on the other hand, faces a number of challenges in implementing IVM. These include: low level political commitment to vector control; weak intersectoral collaboration; weak infrastructural capacity for vector control (human, physical, transport and financial resources); lack of community involvement. As a way forward, there is a need to address the obsolete stocks of DDT; advocate for high-level political support for vector control; strengthening intersectoral collaboration; request WHO support to implement IVM; recruit additional human resource; training of staff on vector biology and control; establish an entomology laboratory; strengthen and support research on vector biology, ecology and control; and advocate for community mobilization and involvement in vector control.

3.6 Kuwait

Except for leishmaniasis (nine cases in 2007 and three cases in 2008) and typhus fever (two cases in 2008), all other vector-borne diseases are imported. For example, there were 139 cases of malaria in 2007 and 148 cases in 2008 and 26 and 14 lymphatic filariasis cases in 2007 and 2008, respectively. A total of 90 030 hectares were sprayed with temephos E.C. 50. In Kuwait, the Ministry of Health established a Vector Control Department to control vector-borne diseases; conduct vector surveillance and identify of emerging insects and rodents; assess the sensitivity and residual efficacy of insecticides and rodenticides; and monitor the importation of insecticides to the country. Implementation of vector control in Kuwait aims at ensuring the use of environmentally-friendly methods in the context of IVM. The use of chemicals is restricted to the breeding sites of mosquitoes and flies in agricultural and urban areas. Space spraying and larviciding is conducted in March, April, October and November. There are no unacceptable pesticide management practices in Kuwait in terms of procurement, quality control, storage, disposal and monitoring of insecticide resistance.

The following are challenges that Kuwait is facing in implementing vector control: reduced public awareness of vector control; population movement; potential threat as a result of the geographical expansion of vector-borne diseases in the Region (malaria, Rift Valley fever, White Nile fever, dengue and leishmaniasis); accessing WHO guidelines on the use of pesticides; and weak border coordination between neighbouring countries on common problems for vector control. The meeting, on the other hand, recommended that Kuwait initiated the process of conducting vector control needs assessment with the view to developing IVM national strategy and its incorporation as a national policy.

3.7 Lebanon

In Lebanon, the two main vector-borne diseases reported are malaria and leishmaniasis. There are no local cases of malaria reported. Both forms of leishmaniasis, cutaneous and visceral are found, especially among populations living in areas where basic infrastructure and public hygiene

are limited. The reported cases are few, in spite of the temperate climate, as well as the appropriate ecological conditions favouring the activity of the vectors, in addition to the widespread presence of the reservoir host. The control programme, however, faces the following challenges: lack of qualified personnel in entomology and vector control (because of retirement), financial resources, and transport. Support is requested from WHO to strengthen vector control surveillance all over the country and conduct training in entomology and vector control at all levels and in the application of insecticides.

Despite the occurrence of sandfly fever in 2007, this was never mentioned in the report—a clear indication that coordination with other programmes in the Ministry of Health is weak. Like many other countries where burden due to vector-borne diseases is low, there is still a need for Lebanon to undertake a comprehensive vector control needs assessment using the WHO guidelines and tools with the aim of developing a national IVM strategy and incorporating IVM in the national health policy. This will place the country in a better position to respond to potential outbreaks of vector-borne diseases.

3.8 Libyan Arab Jamahiriya

Leishmaniasis is a major public health problem the Libyan Arab Jamahiriya. Every year the country reports approximately 5000 cases of the zoonotic form of cutaneous and about four cases of visceral leishmaniasis. Sandfly fever occurs sporadically while about 30 cases of imported malaria are reported annually. Although there is no IVM policy implemented currently in the country, the public health pest control is managed through three different sectors: (1) National Centre for Infectious Diseases Prevention and Control (Department of Parasites and Vectors of Diseases). The centre provides relevant technical support and advice; conducts national surveys of vectors (entomological surveillance and monitoring); provides training courses; and conducts interventions in emergency situations by contracting with private pest control firms. (2) General Environmental Authority (Public Health Pests Control Department). This department provides technical support and advice on environmental modification/management; conducts pest control interventions on a small scale and when needed; regulates the importation of pesticides and provides training and awareness. (3) The third department is the Environmental Protection and Restoration of the local councils. The department conducts health pest control when needed at local level (town) working independently and not integrated with the Ministry of Public Health; has limited capacity with only field technicians who are only familiar with urban pest problems.

In terms of pesticide management issues, only government authorized dealers can import pesticides. There are, however, no facilities for quality control of pesticides neither are there national guidelines for pesticide applications. Except for public health use of pesticides, other users are not trained and certified. Safe storage of pesticides is also mandatory. The country lacks national guidelines and facilities to dispose of expired, obsolete unwanted pesticides. There are also no facilities and capacities for monitoring insecticide resistance in the country.

The country does not have an IVM as a national policy. They consider the following as potential factors that hinder its introduction and subsequent implementation: lack of information on the vectors; weak capacity in entomological surveillance and monitoring; and the lack of an established national body to organize and implement IVM, including national experts on IVM. The

Libyan Arab Jamahiriya requests support from WHO to initiate the process of IVM at country level; capacity-building in medical entomology and vector control; advice on pesticides usage; establishing of quality control laboratories; support on implementing integrated health pest management policy; and technical guidelines on conducting proper evaluation of control programmes and for entomological surveillance and monitoring of insecticide resistance.

3.9 Morocco

Vector-borne diseases in Morocco include malaria, schistosomiasis and leishmaniasis. Since 2002 there has been no active transmission of malaria, one relapsing case was detected in 2004, 75 and 69 imported cases in 2007 and 2008, respectively, and now embarking on the malaria elimination programme. There has also been no active transmission of schistosomiasis since 2003 and only eight cases reported in 2007 (five local and three imported), and two cases in 2008. A total of 1938 cases of *Leishmania tropica* were detected in 2007 and 1252 in 2008. Those due to *L. major* were 1353 cases detected in 2007 and 1326 in 2008. One hundred and sixty cases of visceral leishmaniasis were reported in 2007 and 90 cases in 2008. Morocco also experiences the biting nuisance from other species of mosquitoes and flies. Vector control interventions include source reduction (filling in of breeding sites and weeding); biological control methods (larvivorous fish and *Bti*); larviciding with Abate in breeding sites of *Anopheles* mosquitoes; space spraying for nuisance control; indoor residual house spraying of 561 houses and 1030 animal sheds with 10% WP lambda-cyhalothrin in 2007; and the distribution of 1400 insecticide-treated bednets in 2007.

Morocco is among the eight countries in the Region that through the support of WHO/UNEP/GEF is implementing IVM. Morocco established a national IVM steering committee; vector control needs assessment tool was administered and analysed to identify needs, gaps and opportunities for IVM implementation; the VCNA report was used to draft a national IVM plan which was presented and endorsed during a national stakeholders' meeting. The report was also used to draft a GEF demonstration project to implement and promote sustainable and cost-effective DDT alternatives. With the support of WHO, Morocco developed a protocol for the project demonstration activities, which include seven demonstration sites (three in provinces with malaria risk and four in provinces affected by leishmaniasis). Local IVM steering committees have also been established in the demonstration sites. Mapping of breeding sites of mosquitoes in the three demonstration sites risk of malaria has also been undertaken, including entomological surveillance. Implementation of vector control interventions are planned in a phased approach in the four demonstration sites affected with leishmaniasis (IRS with synthetic pyrethroid, distribution of ITNs, community campaigns to promote environmental sanitation, monitoring of cases of leishmaniasis and sandfly surveillance. One of the critical areas of pesticide management in Morocco is related to: lack of quality control facilities of pesticides; lack of storage facilities of pesticides; disposal of obsolete pesticides; and the lack of a scheme to regulate and certify private vector control companies.

However, opportunities for IVM implementation in Morocco include available funding from the GEF project, WHO/Bill and Melinda Gates project on "Reduction of health risks through sound management of pesticides" and recently the approved SAICM project on strengthening capacity for management of obsolete pesticides. The way forward for IVM implementation in Morocco, is to

ensure that all the activities planned in the framework of the national IVM plan of action are implemented and that Morocco develops a plan of action for the judicious use of pesticides.

3.10 Oman

Malaria, leishmaniasis (cutaneous and visceral), lymphatic filariasis, arboviruses (West Nile fever and dengue fever) and schistosomiasis are some of the vector-borne diseases occurring in Oman. Control methods include chemical control (mainly larviciding), environmental management and biological control. Larviciding is mainly with Abate 50%, emulsion concentrate and 1% sand granules. There are no national guidelines for procurement of vector control products. Each ministry has its own procedure of purchasing insecticides for public health use. Tender documents even in Ministry of Health have no article. The main agencies using public health pesticides are the Ministry of Health, Ministry of Development and municipalities.

During the malaria eradication time, all pesticides had to be laboratory and field-tested, before application. Currently, professional expertise on pesticide usage resides only in the Ministry of Health. Capacity for monitoring insecticide resistance is only available in the Ministry of Health. Oman lacks exposure assessment for workers on pesticide poisoning. Codes of practice for transport of pesticides are monitored by the civil defence department, as well as the chemical department of the Ministry of Environment and Climate Affairs. The specifications for proper storage was developed by the Ministry of Environment and Climate Affairs and Civil Defence and monitored through periodic checking before and after. Pesticide disposal is covered by regulations and laws, but unfortunately there is no facility for safe disposal currently.

In terms of IVM implementation, available expertise in vector-borne disease prevention and control resides in the national malaria control and eradication department of the Ministry of Health. In the context of the regional strategic framework for IVM which was endorsed in 2005 by Member States in the Region, Oman has embarked to strengthen its capacity to effectively respond and manage all vector-borne disease threats. The establishment of a national intersectoral steering committee and carrying out of a vector control needs assessment for developing a national IVM plan and the incorporation of IVM into national health policy has been undertaken. The national intersectoral committee was established under Ministerial Decree No: 69/2008. Shortly, the first meeting of the intersectoral committee will be called to discuss and agree on their terms of reference; agree on the time frame to complete the vector control needs assessment; identify data collectors; compile the national report and identify needs, gaps and opportunities for an IVM national plan. Support from WHO has already been requested. Parallel with this is the strengthening of capacity building in medical entomology for vector-borne diseases other than malaria; capacity-building for safe and judicious use of insecticides; and updating manuals and guidelines on insecticide resistance monitoring and management with WHO.

3.11 Pakistan

Vector-borne diseases are a significant public health problem in Pakistan. The country has a rich fauna of disease vectors, such as mosquitoes, sandflies, houseflies, biting midges, ticks, lice, mites, fleas, cockroaches and bed bugs. Major vector-borne diseases, however, include malaria, leishmaniasis, dengue and Crimean–Congo haemorrhagic fever. Malaria is the second most

prevalent and devastating communicable disease and accounts for 16% of the disease burden in the country. Leishmaniasis is also showing a rising trend in recent years. During 2005-2006 Pakistan faced regularly outbreaks of dengue fever.

Selective indoor residual spraying has been the main stay intervention from the malaria eradication era. From 1995, the insecticides of choice have been pyrethroids. The national malaria control programme has recently developed national vector control guidelines to help provincial and district malaria managers to implement vector control. The other vector control intervention is the use of LLINs. These are usually distributed free of cost and major beneficiaries are pregnant women, children under 5 years of age, non-immune population and populations at risk during emergencies/outbreaks. WHO, on the other hand, recommends universal coverage (1LLN for every two persons) for all populations living in areas of high risk for vector-borne diseases. Implementation of vector control interventions is, however, faced with the following challenges: lack of clear policy/vision on the control and prevention of vector-borne diseases; lack of operational guidelines for vector control operations; weak intersectoral coordination and border collaboration; lack of political commitment for vector control; low coverage of interventions resulting in no significant impact; lack of technical expertise (no professional entomologists); lack of updated knowledge on insecticide resistance; and lack of access to certain areas of the country due to security situations. Pakistan also faces problems related to procurement, quality control, application, storage and disposal of public health pesticides.

Until now, Pakistan is among the 13 countries of the Region that have not yet embarked on IVM implementation. The country faces a number of vector-borne diseases in which the Ministry of Health is not the only sector involved. By establishing an IVM platform implementation of vector control activities would be coordinated well by different sectors avoiding duplication of efforts and maximizing synergy. The current malaria control management is motivated and could take the lead in spearheading the process of introducing IVM through a step-wise process as follows: establish a multisectoral IVM steering committee; agree on their terms of reference, including that of carrying out a very comprehensive vector control needs assessment using WHO guidelines and tools; identifying data collectors; compiling a national vector control needs report; using identified gaps, needs and opportunities to develop a draft national IVM strategy; holding a national stakeholders' meeting to present the report and the IVM strategy for endorsement and for incorporation into a national health policy. Support from WHO will be needed.

3.12 Qatar

The main vector-borne diseases in Qatar include malaria due to *Plasmodium falciparum* and *P. vivax* and leishmaniasis. Both are imported as there is no local transmission. A total of 198 and 185 malaria cases were reported in 2007 and 2008, respectively. Nine and eight cases of leishmaniasis were reported in 2007 and 2008, respectively. No vector-borne disease outbreaks have been reported in recent years. The municipalities perform routine spraying activities of houses against cockroaches and flies. Larviciding is also carried out against *Culex* mosquitoes breeding in stagnant waters.

Vector-borne disease unit was established in late 2006 and is located within the Department of Communicable Disease Control. However, Qatar has no national policy for IVM for the control and

prevention of vector-borne diseases. Intersectoral collaboration for vector control needs a formal establishment to support the current coordination between the relevant sectors, such as the municipality's insect and rodent control section with the vector-borne disease unit of the Ministry of Health.

The Ministry of Health will ensure that a comprehensive vector control needs assessment is carried out using WHO guidelines and tools with the intention of developing IVM national strategy and by strengthening existing intersectoral collaboration between the relevant sectors. Qatar will also ensure that preventive measures for the control of vector-borne diseases will be strengthened through proper case management, epidemiological surveillance and detection of imported cases in all country ports to reduce the number of cases among those travelling from endemic areas.

3.13 Saudi Arabia

A few cases of malaria still occur in Jazan, Asir, Baha, Gonfoda, Medina, Jeddah and Makkah with 467 reported cases in 2007 and 55 cases in 2008. With this achievement, Saudi Arabia has embarked on malaria elimination and has extended its support and operations to neighbouring districts in Yemen. Outbreaks of dengue fever have recently been reported in Jeddah, Makka and Jazan. An outbreak of Rift Valley fever was reported in 2001 in Jizan and Asir. Three hundred and seventy-four cases of dengue fever were reported in 2007 and 846 cases in 2008 mainly in Jeddah. Cutaneous leishmaniasis occurs in Riyadh, Gasseem, Hofuf, Medina, Hail, Asir, Baha and Jazan with 3286 cases reported in 2007 and 1058 in 2008. Visceral leishmaniasis occurs in Jazan and Asir with 41 reported cases in 2007 and 17 cases in 2008.

The vector control programme has successfully forecasted and reviewed the vector control situation and needs and developed activities and plans for vector control. Coupled with supervision, vigilance, intersectoral collaboration and cost-effectiveness are done to ensure optimal use of resources. More sentinel sites for entomological surveillance and for monitoring insecticide resistance have also been established. Distribution of LLINs to population at high risk in endemic areas is implemented whereby about 350 000 LLINs are distributed every year. IRS in endemic areas is carried out every year and space spray during the population increase of vector species. Source reduction of breeding sites by mechanical methods, especially during the rainy season, for mosquito control is implemented. Its cost-effectiveness against *Anopheles arabiensis* is still not known. The control programme carries out destruction of rodent burrows for leishmaniasis control. Health education programmes, especially in highly-infected areas, are given regularly. Progress has also been made in the area of human resource development; surveillance and information system; epidemic preparedness and response; and strengthened collaboration and cooperation with Yemen.

Regarding the management of public health pesticides, their procurement is based on WHO specifications. The Saudi Arabia Standardization Organization is responsible for the registration of all public health pesticides. The control programme also carries out both laboratory and field tests against target vectors before application. The Ministry of Health purchases pesticides from suppliers through annual Gulf Cooperation Council (GCC) tenders and direct purchase by the Ministry of Health in case of any shortage of a specific product. Storage facilities for pesticides are adequate. The greatest weakness is coordination with other government sectors (e.g. municipalities, agriculture, environment and transportation) and the private sector.

Saudi Arabia has not yet initiated the process of implementing IVM. The vector control challenges that the control programme faces in relation to the different types of vector-borne diseases vis-à-vis malaria, leishmaniasis, dengue fever and to some extent, Rift Valley fever, offers an opportunity to benefit from an IVM programme that builds on the strength of intersectoral coordination. It is highly recommended that Saudi Arabia initiates a comprehensive vector control needs assessment using available WHO guidelines and tools, establishes a multisectoral steering committee for IVM, identifies needs and gaps from the assessment reports to develop national IVM plans and incorporates IVM into national health policy.

3.14 Sudan

North Sudan

Countries of the Eastern Mediterranean contribute to 11% of the global burden due to vector-borne diseases. Sudan alone shoulders 6% of this burden. Sudan is also faced with increasing threat of emerging and re-emerging vector-borne diseases with several outbreaks in recent years of dengue fever, Rift Valley fever and yellow fever. Other major vector-borne diseases with estimated cases in 2007 include malaria (3.4 million); leishmaniasis (2352 cases of visceral leishmaniasis); lymphatic filariasis (4%–20% prevalence from different states); onchocerciasis (figures not available); African trypanosomiasis (figures not available); dengue fever (247 cases); Rift Valley fever (673 cases); yellow fever (700 cases in 2005 and 4 cases in 2007); Crimean–Congo haemorrhagic fever (figures not available); and schistosomiasis (7 million cases).

Major vector control interventions carried out as part of scaling-up include: the distribution of LLINs in rural areas targeting children 5 years of age and pregnant women; IRS in high transmission areas (irrigated schemes); larviciding with Temephos 50% EC in major cities with known limited/well defined breeding sites; use of larvivorous fish, mainly *Gambusia*, in irrigated schemes; environmental management (intermittent irrigation among others—canal levelling, canal de-weeding and draining). Distribution of LLINs has been scaled-up to increase coverage and promote proper use with 2 600 000 LLINs distributed in 2007 and 2008. IRS has been carried out in selected high-transmission areas with a total of 126 690 house structures sprayed. Insecticide space spraying has been occasional, mainly reserved for special situations and during epidemics of vector-borne diseases. Critical issues related to pesticide management include: weak legislative control of public health pesticides; lack of published guidelines, labelling and transportation by-laws; monitoring of insecticide resistance limited to *Anopheles* mosquitoes and not to other disease vector species; and lack of awareness of control programme priorities among academic and research institutions.

Sudan is among the eight countries in the Region that through the support of WHO/UNEP/GEF is implementing IVM. Sudan established a national IVM steering committee; vector control needs assessment tool was administered and analysed to identify needs, gaps and opportunities for IVM implementation; the VCNA report was used to draft a national IVM plan (2007–2012) which was presented and endorsed during a national stakeholders meeting. The report was also used to draft a GEF demonstration project to implement and promote sustainable and cost-effective DDT alternatives. Integrated vector management principles have been incorporated into the national health policy; a national vector control focal point has been appointed; a national vector

control unit has been established; advocacy for partnerships and community mobilization enhanced; and capacity in entomology and vector control strengthened with the goal of having a well-trained entomologist/vector control (MSc level) at state level. Opportunities for IVM implementation in Sudan include: the long experience of the control programme with vector-borne diseases; ratification of Stockholm convention and other agreements; presence of strong pesticide management authorities; renewed attention to vector-borne diseases; recurrent outbreaks of vector-borne diseases and lessons learnt thereof; and successful vector control stories.

Sudan faces a number of challenges in implementing IVM. These include: health system issues in relation to the incorporation of IVM into the national health policy; the private sector is not always in line with national control plans; inadequate capacity of entomological laboratories; lack of adequate funds for human resources; and the need for proper disposal facilities. The way forward is to strengthen the capacities of medical entomology and vector control; improve community mobilization and partnership; solidify coordination of relevant sectors; include vector control in health impact assessment of development projects; and continue to document success stories.

South Sudan

A number of major vector-borne diseases occur in southern Sudan. Malaria contributes to 30%–40% prevalence among children under 5 years of age and 27%–29% at outpatient consultations are due to malaria. Incidence rates of 38/1000 per year with case fatality rates of 20% are due to leishmaniasis. It is also estimated that 4.1 million people in Bahr el Ghazal, Upper Nile and Equatoria are at the risk of onchocerciasis of which 80% (3.4 million) is targeted for ivermectin treatment being distributed over 24 endemic counties. African trypanosomiasis, on the other hand, is endemic in Eastern, Central and Western Equatoria in which from January to September 2008, a total number of 238 cases were reported treated in five counties. About 52% of schistosomiasis in southern Sudan is found in Western Equatoria states. An outbreak of yellow fever occurred in 2005 with 605 cases and a 27% case fatality rate. South Sudan has also experienced outbreaks of dengue fever recently.

The only vector control intervention implemented in southern Sudan is the distribution of LLINs. The goal is universal coverage with 1 LLIN for every two persons. The strategy is reliant on mass campaigns beginning with distribution in three major states with least LLIN coverage based on the results from a household survey. During a recent campaign, a total of 162 000 LLINs (750 000; 114 000; 180 000 and 18 000) were distributed in Warap, Western Bahral-Ghazal, western Equatorial states and Abyei, respectively. With more resources becoming available, the objective is to reach the entire area of southern Sudan for all people at the risk of vector-borne diseases. On critical issues related to pesticide management, further assessment is needed because of lack of data. However, this is a major problem in southern Sudan.

In terms of IVM implementation, southern Sudan established a national IVM steering committee; vector control needs assessment tool was administered and analysed to identify needs, gaps and opportunities for IVM implementation; the VCNA report was used to draft a national IVM plan which was presented and endorsed during a national stakeholders meeting. Recently, a Director of Neglected Disease Control unit was appointed and three public health officers were sent for the

Regional MSc degree in medical entomology and vector control at the Gezira University in Wad Madani. Opportunities for IVM implementation in southern Sudan include: high political commitment to addressing communicable diseases, including vector-borne diseases; national interim health policy emphasizing equity; wide range of potential partners currently supporting various activities related to vector control and prevention; availability of national malaria strategic plan, including ITN/LLIN strategy; and good relationships with development partners and commitments from line ministries to jointly support vector control with the Ministry of Health/Government of South Sudan.

Implementation of IVM in southern Sudan is not without challenges, which include: the lack of capacity in vector control, especially, medical entomologists to plan, implement, monitor and evaluate vector control interventions at all levels; the lack of appropriate infrastructures, including entomology laboratories and insectaries; a weak national IVM intersectoral coordinating body; and the lack of a vector control unit current Ministry of Health organogram that would address vector control of all vector-borne diseases with clear terms of reference and responsibilities. The proposed way forward is the establishment of a vector control unit and relevant infrastructure within the Ministry of Health/Government of South Sudan; the incorporation of IVM into a national health policy; strengthening of the coordination body for vector control; resource mobilization for IVM; promotion of community mobilization for IVM; and continued capacity building for vector control.

3.15 Syrian Arab Republic

Malaria and schistosomiasis were endemic in the Syrian Arab Republic a few years ago and the country is now moving towards elimination. The main vector-borne disease problem is leishmaniasis. It is currently spreading into other provinces from the two original foci (Aleppo and Euphrates). Leishmaniasis due to *Leishmania tropica* contributes to 85%–90% of all the cases of cutaneous leishmaniasis occurring, mainly Aleppo and Edlib (northwestern); Latakia and Tartous (coastal region) and Hama and rural Damascus (central). The main vector is *Phlebotomus sergenti* and the reservoirs are humans. Leishmaniasis due to *L. major* represents about 10%–15% of cutaneous leishmaniasis. This form is endemic in rural Damascus, Deir Ezzour, Homs, and Al Hasakeh. The main vector is *P. papatasi* and reservoirs are: *Psammomys obesus*, *Meriones sp.* and *Nesokia indicas*. The total number of visceral leishmaniasis cases reported is very low. It is distributed in villages of four governorates, including Edlib, Latakia, Aleppo and Dara'a. The main vector is *P. tobbi* and reservoirs are stray dogs.

The main vector control intervention currently in place is the spraying of homes with insecticides against the anthroponotic form of leishmaniasis. However, due to the geographical spread of the disease, topography and lack of human (capacity in entomology and vector control) and financial resources, this intervention is not used to the maximum benefit. For example, instead of using wettable powder formulation with potential long residual, the programme still uses EC formulations because they are cheap per unit cost. Moreover, there is community reluctance in affluent areas to allow their houses to be sprayed. The use of LLINs could be a possible alternative. In terms of pesticide management issues in the Syrian Arab Republic, there are problems related to safe use, storage, transportation, disposal, registration and monitoring and reporting poisoning incidents, taxes and tariffs on pesticides and spraying equipment, capacity to monitor and report on insecticide resistance.

The Syrian Arab Republic is among the eight countries in the Region that through the support of WHO/UNEP/GEF is implementing IVM. The Syrian Arab Republic has established a national IVM steering committee; vector control needs assessment tool was administered and analysed to identify needs, gaps and opportunities for IVM implementation; the VCNA report was used to draft a national IVM plan which was presented and endorsed during a national stakeholders' meeting. The report was also used to draft a GEF demonstration project to implement and promote sustainable and cost-effective DDT alternatives. The IVM steering committee has representatives from different relevant ministries such as the Ministry of Health, Agriculture, Local Governorate and Environment, Irrigation and Army Medical Services. In implementing IVM, the country is facing: weak political commitment to vector control; inappropriate institutional framework; insufficient financial resources; ineffective intersectoral collaboration; inadequate human resources; inadequate technical capabilities; insufficient facilities and infrastructure for vector control; inadequate training and education infrastructure relevant to medical entomology; lack of scientific knowledge on vector-related topics leading to inadequate basis for vector control programme development and implementation; and insufficient enforcement of pesticide management practices. The Syrian Arab Republic proposed expansion of the national IVM coordinating body; upgrading and sustaining their legal status; building human resources at the national level; establishing a quality control and entomology laboratories; and promoting community mobilization for IVM.

3.16 Tunisia

Cutaneous leishmaniasis is a major vector-borne disease in Tunisia affecting mainly the southern and central parts of the country with about 2735 reported cases in 2006/2007 and an incidence of 26.6 cases/100 000 population. There are also about 100 reported cases of visceral leishmaniasis in 2007 in the northern part of the country. Malaria was eliminated in 1979. Cases of West Nile virus were sporadically reported in 1997 and 2003. In Tunisia, there is a vector control unit at the national level—the Entomology and Vector Control Section. The same is available at the regional level. Vector control activities are coordinated at national level through the existence of permanent cell of insect control, and at the regional level, the regional committee of insects control. The Ministry of Public Health has a strong capacity in vector control (training in vector control, entomological surveillance, mapping of insecticides resistance but the same capacity is not available in the municipalities (non-qualified personnel, inadequate facilities and irregular activities). Control of nuisance insects in urban and peri-urban breeding sites of *Culex pipiens* include: draining of ditches and streams (137); filling in of flooded areas (64); applying paraffin oil in wells; and larviciding with temephos EC 50%–5528 litres. For Anopheles mosquito control (*An. labranchiae*) in lakes (2008) predator fish (*Gambusia affinis*) is used. No major pesticide management issues were raised in this report.

Tunisia has not yet embarked on IVM implementation. Whereas, it is recommended that the country begins the process of carrying out a comprehensive vector control needs assessment using the available WHO guidelines and tools to develop a national IVM plan, endorse and incorporate it into a national health policy, the country is faced with the following challenges: weak intersectoral coordination as there are many departments involved to be considered; limited human, technical and infrastructural capacities; and partnerships, including communities. Opportunities for IVM initiation include: the existence of the environmental protection agency comprising of government

and civil society; the Ministry of Public Health (facilities and qualified personnel); results of monitoring insecticide resistance are available; and basic elements of IVM are already identified.

3.17 United Arab Emirates

There are no vector-borne diseases occurring locally in the United Arab Emirates and vector-borne disease outbreaks have been reported recently. Malaria was a public health problem until 1997 when it was successfully eliminated. However, the country has been reporting imported cases of malaria from disease-endemic countries. For example, 1163, 2119 and 2099 cases were reported in 2006, 2007 and 2008, respectively. The fact that malaria vectors are still available, the potential for local transmission is possible. Strengthened vigilance and adequate preparation for prompt response is recommended.

There are three main partners responsible for disease and pest control in the country. Municipalities are responsible for the control of all types of pests in urban areas through basic sanitary measures (filling, drainage and grading of potential breeding sites). They also conduct larviciding, space spraying and treatment of houses for domestic pests using chemicals. The use of larvivorous fish and bacteria (*Bti*) is also practised. The Ministry of Health is responsible for the control of malaria vectors. They usually employ chemicals for larviciding of potential mosquito breeding sites, as well as the use thermal fogging and ULV. A very successful larvivorous fish programme is implemented by the Ministry of Health. Private companies, on the other hand, are responsible for the control of pests in private premises, exclusively using chemicals.

In terms of pesticide management, insecticides are managed by the Ministry of Water and Environment. Use of pesticides by any sector must be registered with this ministry by law. Current laws also define the appropriate use, storage and disposal. The quality control of pesticides is assessed by the laboratory of the responsible ministry. Monitoring of insecticide resistance is routinely carried out by the malaria department of the Ministry of Health and data are regularly being shared with WHO. Municipalities also claim to carry out such tests but no data have been shared to date.

To scale up pest control in the country, the General Secretariat of the Municipalities established a committee with members from different sectors to: identify training programmes for pest control operators; identify promotional/awareness programmes for targeting communities; develop plans for emergency outbreak response, including availability of emergency stocks; and unify and coordinate the regulation of pesticides by all users. Although, there are no vector-borne diseases of major public health problem in the country, participants felt the need for the country to initiate the vector control needs assessment with the view to developing a national IVM strategy and to establishing a coordinating mechanism for IVM. This will enhance the ability of the vector control programme to respond to potential outbreaks and to minimize the potential health and environmental hazards from pesticides.

3.18 Yemen

There are a total of 800 000–1 million cases of malaria in Yemen of which 223 299 were officially reported in 2007. The prevalence of schistosomiasis among school children (6–15 years)

was 12.4% in 2008. There have also been frequent dengue outbreaks annually since 2003, with 1001 reported cases in 2007 and 1600 in 2008. Nine hundred and seventy-four (974) cases of leishmaniasis (visceral and cutaneous) were reported in 2005 and 1970 cases in 2006. The elimination programme on lymphatic filariasis has been ongoing since 2001 with a prevalence of 0.01% on the mainland in 2008, and 4% and 1% in Socotra Island in 2007 and 2008, respectively. Onchocerciasis is endemic in eight governorates, mainly along the western valleys system with a prevalence of 1%–4.5% (January 2007). Yemen experienced a major regional outbreak in September 2000 of Rift Valley fever.

Yemen is scaling up the distribution of LLINs through GFATM (round 2 and round 7) support. The national malaria control programme is considering implementing universal coverage with LLINs for the entire at-risk population, which started with Socotra Island in 2008. Resources have been mobilized to establish 60 malaria units nationwide to launch specialized malaria services, including entomological surveillance. Five sentinel sites to monitor vectors' susceptibility to insecticides have been established. IRS has been expanded to increase coverage in the joint Yemeni–Saudi project for malaria control in the border area from 44 400 house structures in 2007 to 102 000 in 2008. A total of 717 249 LLINs have also been distributed between 2005 and 2008. Additional resources have been mobilized for scaling-up LLINs to 1.2 million. Space spraying operations in response to outbreaks of dengue fever in Shabwa, Abyan and Hadramout governorates were carried out between May and August 2008 and in Taiz governorate in September 2008. Larviciding with temephos EC 50% has been temporarily suspended for review in 2007 but continued in Socotra Island.

Challenges in scaling-up of vector control interventions include: favouritism and bias in LLINs distribution: political, gender and geographical biases; weak capacities for control and follow up of LLINs and IRS operations; under-staffed entomology department; weak GIS capacities; inadequate health education promotion with no focus on behavioural impact, e.g. on the importance of regular use of LLINs; larviciding interventions not based on epidemiology and impact on vectorial capacity; rejection for IRS (e.g. honey bee farmers, cultural barriers, i.e. absence of a male inmate at the time of spraying; and very weak health and management information system).

Yemen is among the eight countries in the Region that through the support of WHO/UNEP/GEF is implementing IVM. Yemen established a national IVM Steering Committee; administered vector control needs assessment tool and analysed it to identify needs, gaps and opportunities for IVM implementation; the VCNA report was used to draft a national IVM plan which was presented and endorsed during a national stakeholders meeting. The report was also used to draft a GEF demonstration project to implement and promote sustainable and cost-effective DDT alternatives. The IVM steering committee has representatives from different relevant ministries, such as the Ministry of Health and Population, Agriculture, Local Government and Environment, with national malaria control programme as the technical Secretariat. Yemen has also approved an action plan to establish 20 malaria units with the support from the GCC to provide specialized malaria services which could be expanded to include other vector-borne diseases. The Ministry of Health and Population is also strengthening capacity in medical and vector control with four fellows currently studying in Egypt and Sudan.

Although the national malaria programme is hosting the national vector control unit for all vector-borne diseases and a national intersectoral collaboration mechanism is in place, Yemen still faces a number of challenges in implementing IVM: there is a lack of baseline data on most vector-borne diseases; lack of a national coordinating body on pesticides legislation and regulation; unauthorized use of pesticides; and intersectoral collaboration needs promotion and strengthening. Yemen proposes the following as the way forward: to consolidate the newly established IVM coordinating mechanism between the different sectors to deal with pesticides as well; increase the awareness on the safe use and disposal of pesticides among all users; strengthening capacity-building for related sectors dealing with pesticides in terms of registration, analysis, use, disposal and monitoring; update the existing national strategic plan for IVM; amend the existing legislation to include the pesticides used for public health and veterinary; upgrade the existing laboratories in the Ministry of Agriculture to include analysis for all pesticides used by the different sectors and monitoring the susceptibility of the different pests and vectors; and Ministry of Public Health and Population to establish centres for early detection and management of pesticide poisoning.

4. IDENTIFICATION OF CHALLENGES, CONSTRAINTS AND OPPORTUNITIES AND PROPOSED STRATEGIES AND ACTIONS

The following is a summary of the challenges and opportunities identified for IVM implementation in countries of the Eastern Mediterranean Region by participants from four working groups.

4.1 Political commitment for IVM implementation

The challenges include inadequate political commitment to promote, advocate for resources and implement IVM in countries. In terms of opportunities there is a Regional Committee resolution in which countries endorsed IVM as the regional strategic approach for the control of vector-borne diseases and in which they agreed to support its implementation in their countries. Some countries through the vector control needs assessment and with support mainly from the GEF have an IVM strategy and plan of action. Member States re-affirmed their commitment to implement IVM when a progress report for IVM was presented by the Regional Director of WHO Eastern Mediterranean during the recent Fifty-fifth Session of the Regional Committee. Member States have ratified a number of relevant global conventions for vector control. Recommendations of this first meeting of national vector control focal points should help to advocate further political commitment for IVM.

4.2 Weak or non-functional intersectoral coordination/collaboration and partnerships

The challenges are that in countries where national IVM steering committees have been established, it is a big challenge to make them functional. Established national coordination mechanisms/bodies have no legal recognition/status and incentives. They also have no clear mandate and responsibilities. Other sectors do not consider vector control as their responsibility and think this is the job of the ministry of health. Their functioning in most countries has depended on external (GEF) resources. There is a lack of cooperation with the private sector and there is a lack or weak border/intercountry coordination for vector control of disease vectors.

Some countries have already established IVM multisectoral steering committees. WHO guidelines and tools are available on the process to establish national coordination mechanism and how they should function. There is existing border coordination for malaria (Yemen and Saudi Arabia) and (Afghanistan, Pakistan and Islamic Republic of Iran).

4.3 Weak or lacking institutional arrangements and capacity for IVM implementation

In some countries, there are no vector control/IVM units to coordinate the implementation of vector control for all vector-borne diseases. Vector control seems to be disease-specific and there are insufficient resources for vector control infrastructure (human, technical, financial and physical resources). A Vector Biology and Control unit has, however, been established to coordinate all vector control activities at the Regional Office of WHO and with countries. There is potential for, and availability of, external resources (GEF, GFATM, etc.) and commitment by Member States to establish these units and to set aside resources (budget lines) specific for vector control in the Regional Committee resolution. A regional MSc training course in medical and vector control has also been established in Sudan and two other institutions in the Region have adopted the curriculum.

4.4 Planning and scaling up of vector control interventions based on IVM principles

There is a lack of sufficient updated knowledge on vector ecology, behaviour and epidemiology to target vector control interventions. The monitoring and evaluation system for entomology and vector control as a weak tool for a rationale decision-making process, including monitoring for insecticide resistance. There is a lack of capacity for the safe and judicious use of pesticides and inadequate regulation of public health pesticides, including disposal of waste. There is, however, available research capacity in some countries and the opportunity to coordinate and make use of this capacity. There are available national vector control needs assessment reports in those countries that have carried out this assessment and available WHOPES guidelines and publications for the sound management of public health pesticides.

4.5 Community empowerment for IVM implementation

There is a lack or insufficient experience of control programmes to empower communities for vector control. Sufficient awareness, cooperation and compliance for vector control interventions is lacking in affected communities. Community members are not represented in most of the established IVM steering committees. Opportunities include available communication strategies (communication for behavioural impact COMBI). The strategy has been utilized successfully with some vector-borne diseases (dengue fever and lymphatic filariasis) to empower communities for their support.

A number of countries in the Region are implementing basic development needs (BDN) projects and these could be utilized as entry points to the communities for vector control support.

After the groups identified these challenges and opportunities, they also proposed some key strategies and actions which are summarized in Annex 4 as the regional operational plan of action for IVM implementation in countries of the Eastern Mediterranean for 2009 and 2010. Although the

timing is not in phase with the joint planning cycle between countries and WHO, it is hoped that resources would be mobilized from other sources to initiate some of the proposed activities in 2009.

5. CONCLUSIONS

In response to the call by Member States to endorse and support the implementation of the integrated vector management (IVM) approach for vector control, the first intercountry meeting of vector control focal points was held in Amman, Jordan from 4–6 November 2008. The participants, through presentations and discussions, reviewed the progress on the implementation of IVM in the Region. They concluded that despite available opportunities (a Regional Committee resolution and a progress report, relevant guidelines and tools for conducting vector control needs assessment, funding opportunities, and in some countries available IVM strategies and established IVM coordinating mechanisms, etc.), much still needed to be done. The participants identified a number of challenges and constraints that hinder the maximum implementation of IVM in the Region. These include insufficient political commitment; weak intersectoral coordinating mechanisms; inappropriate institutional arrangements; weak capacity to scale up vector control interventions; lack of adequate and supportive regulatory environment for sound pesticide management; and lack of strategies for mobilization and awareness of community involvement/empowerment in vector control. While the meeting proposed a number of key actions to address the identified challenges and constraints to implement IVM in countries of the Eastern Mediterranean Region (see operational plan in Annex 4), they also made the following recommendations for immediate response by Member States and WHO.

6. RECOMMENDATIONS

The meeting broadly recommended to WHO and Member States to ensure that the agreed operational plan of action for IVM is implemented by providing the necessary resources and support. They also requested WHO to ensure that advocacy for political commitment to implement IVM globally is included and discussed in the next World Health Assembly agenda.

Implementation of IVM

To Member States

1. Conduct regular advocacy and consensus meetings at the highest national level, involving different sectors, to advocate for political commitment on IVM.
2. Initiate vector control needs assessment process using WHO guidelines with a view to developing, endorsing and incorporating it into a national policy in countries with no IVM strategies. Update strategies regularly in those countries in which strategies have been developed.
3. Establish, and where applicable, strengthen national coordination mechanisms and partnerships for IVM implementation, including relevant stakeholders (the private sector and community representatives).

4. Facilitate the legal status of multisectoral IVM coordinating bodies and appropriately sustain them with resources through appropriate channels.
5. Establish and strengthen existing cross-border coordinating mechanisms/networks for vector control with technical support from WHO.
6. Establish/strengthen units/structures responsible for vector control and public health pest control within the ministry of health where applicable, with clear responsibilities; appoint a national vector control focal point with clear terms of reference; and allocate a special budget line for the unit.
7. Establish/upgrade laboratories of entomology and quality control of pesticides.
8. Develop emergency preparedness plans, which include response, and utilize existing expertise in malaria vector control to address them emerging and re-emerging vector-borne diseases.
9. Empower communities in IVM implementation. Develop a national communication strategy and utilize the mass media and other channels for increased IVM awareness.

To WHO

10. Establish an updated database on all attributes of disease vector species and efficacy of control measures through a commissioned regional project; develop and update relevant vector control monitoring and evaluation guidelines; and continue to support the regional MSc course in medical entomology and vector control and other relevant short courses.

Sound management of public health pesticides

To Member States

11. Be actively involved in the process of pesticide legislation and regulation (registration, monitoring and evaluation, application, disposal, transportation, storage), including the development of a national reporting system; establishment of national quality control schemes; and the development of an environmental health monitoring scheme for the use of public health pesticides, including spray persons.
12. Use available IVM coordinating mechanisms as an additional platform for inter- and intrasectoral coordination in public health pesticide management.

To WHO

13. Provide technical support to Member States to strengthen sound management of public health pesticides in the Region.
14. Establish a distribution list for scientific data exchanges and distribution of WHO publications.

15. Urge Member States to revisit/review pesticides acts to ensure the issue of public health pesticides are well addressed.
16. Organize additional workshops on the management of public health pesticides noting the urgent need identified by the meeting on such a need.

Annex 1

PROGRAMME

Tuesday, 4 November 2008

- 08:30–09:00 Registration
- 09:00–09:45 Opening session
- Message from Dr Hussein A. Gezairy, Regional Director, WHO/EMRO
 - Message from H.E. Minister of Health, Jordan
 - Introduction of participants
 -
- 09:45–10:00 Objectives of the workshop, method of work and *Dr J. Mahjour* nomination of officers

Progress on the implementation of IVM at global and regional levels

- 10:30–10:40 Implementation of IVM at global level *Dr K. Ichimori*
- 10:40–11:10 Implementation of Regional Committee resolution *Dr A. Mnzava*
EM/RC52/R.6 – where are we
- 11:10–11:25 Progress towards malaria control and the potential for *Dr H. Atta*
elimination
- 11:25–11:40 The challenges of leishmaniasis control and prevention in *Dr R. Ben-*
the Region *Ismail*
- 11:40–11:55 The threat of insect-borne haemorrhagic fevers in the *Dr M. Opoka*
Region
- 11:55–12:20 Discussion

Progress and challenges of country IVM implementation

12:20–13:00 *10 minutes per presentation*

- Afghanistan
- Bahrain
- Djibouti
- Egypt
- Islamic Republic of Iran

14:00–15:10 *10 minutes per presentation*

- Iraq
- Jordan
- Lebanon
- Libyan Arab Jamahiriya
- Morocco
- Oman
- Palestine

15:10–15:20 Discussion

15:40–17:00 *10 minutes presentation*

- Pakistan
- Qatar
- Saudi Arabia
- Somalia
- S/Sudan
- Sudan
- Syrian Arab Republic
- Tunisia
- Yemen

17:00–17:30 Discussion

Wednesday, 5 November 2008

Further identification of challenges and constraints of IVM implementation–group work

08:30–10:30 Identification of challenges, constraints and opportunities to *Group work*
implement IVM in countries

- 11:00–13:00 Report back on challenges, constraints and opportunities to implement IVM in countries *Plenary*
- 15:20–15:45 Proposed key strategies and actions to address the challenges identified *Group work*
- 16:05–17:45 Draft a regional plan of action for IVM implementation *Plenary*

Thursday, 6 November 2008**Workshop "Management of public health pesticides"**

- 08:30–08:50 Objectives of the workshop on management of public health pesticides *Dr M. Zaim*
- 08:50–10:30 Identification of major challenges of countries in management of public health pesticides *Dr M. Zaim and S. Guillaneux*
- 11:00–13:00 Briefing countries on WHO resources available for sound management of pesticides
- 14:00–15:00 Develop and agree on a reporting system for pesticides use as an integral part of the national reporting for disease vector control and preventions
- 15:20–16:45 Regional plan of action, conclusions and recommendations
- 16:45 Closing session

ANNEX 2

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**TWO-YEAR OPERATIONAL PLAN FOR IVM IMPLEMENTATION,
2009–2010**

Area of Plan	Strategy	Actions/Activities	Responsible	Estimated budget (US\$)
1. Policy	Advocacy for political commitment	<ol style="list-style-type: none"> 1. Develop/update national IVM strategy based on VCNA 2. Incorporate IVM into national health policy for vector control 3. Conduct high national level meetings involving different sectors 4. Conduct national consensus meeting to adapt IVM policy 	<ol style="list-style-type: none"> 1. Countries 2. Countries 3. Countries 4. Countries 	500 000
2. Coordination and partnerships	National coordinating mechanisms	<ol style="list-style-type: none"> 1. Establish/strengthen national IVM coordinating mechanisms through planning of adequate national resources 2. Establish/strengthen national IVM steering committee and determine terms of reference with the support of WHO, including legal status 3. Organize national stakeholder meetings, including representatives from the private sector and community 	<ol style="list-style-type: none"> 1. Countries 2. Countries 3. Countries and WHO 	200 000
	Cross-border/subregional coordination	<ol style="list-style-type: none"> 1. Establish/strengthen existing cross-border coordinating mechanisms/networks for vector control with WHO support, and also through GCC Executive Secretary Council and/or the League of Arab States where applicable 2. Conduct annual border coordination meetings 	<ol style="list-style-type: none"> 1. Countries and WHO 2. Countries and WHO 	120 000
3. Institutional arrangements	Infrastructural strengthening	<ol style="list-style-type: none"> 1. Establish/strengthen units/structures responsible for vector control and public health pest control within MOH, where applicable, with clear responsibilities 2. Appoint a national vector control focal point with clear terms of reference 3. Allocate special budget line for vector control unit and mobilize additional resources 4. Establish/upgrade laboratories of entomology and quality control of pesticides 	<ol style="list-style-type: none"> 1. Countries 2. Countries 3. Countries and WHO 4. Countries 	1 000 000
4. Interventions and operations	Planning and scaling up	<ol style="list-style-type: none"> 1. Apply IVM principles to public health pest control 2. Develop emergency preparedness plans which include response to vector-borne diseases 	<ol style="list-style-type: none"> 1. WHO 2. Countries 3. Countries and WHO 	2 000 000

		<ol style="list-style-type: none"> 3. Utilize existing expertise in malaria vector control to address other endemic vector-borne diseases, including the emerging and re-emerging diseases 4. Adapt WHO guidelines on sound management of public health pesticides throughout their life-cycle 5. Explore the GCC purchasing system for harmonization of registration and regulation of public health pesticides 6. Raise awareness for political commitment to apply existing guidelines for disposal of obsolete insecticides 7. Raise awareness of decision-makers on IVM interventions for the timely release of resources to ensure timely application 	<ol style="list-style-type: none"> 4. Countries 5. Countries and WHO 6. Countries and WHO 7. Countries 	
5. Community mobilization	Community empowerment	<ol style="list-style-type: none"> 1. Develop a national strategy for strengthening community involvement in IVM implementation 2. Adapt/adopt COMBI strategy for community mobilization for IVM implementation 3. Utilize mass media and other channels for increased IVM awareness 	<ol style="list-style-type: none"> 1. Countries 2. Countries and WHO 3. Countries 	200 000
6. Capacity-building	Training	<ol style="list-style-type: none"> 1. Identify existing and suitable training courses, including resources 2. Provide continuous support to the regional MSc course in medical entomology and vector control 3. Train managers of vector control/public health pest control on (1) sound management of pesticides and preferably establish certification schemes, (2) on entomology and vector control monitoring and evaluation with the support of WHO 4. Develop/update relevant vector control monitoring and evaluation guidelines 	<ol style="list-style-type: none"> 1. WHO and countries 2. WHO and countries 3. Countries 4. WHO and countries 	2 000 000
	Operational research	<ol style="list-style-type: none"> 1. Strengthen collaboration with research and academic institutions 2. Support scientific operational research for biology and ecology and the impact of vector control on environment and health 3. Establish an updated database on all attributes of disease vector species and efficacy of control measures/products through a commissioned regional project 	<ol style="list-style-type: none"> 1. Countries and WHO 2. Countries and WHO 3. WHO 	1 000 000

