

*gcdpp*

**An advisory group to the WHO Pesticide Evaluation Scheme (WHOPEs) on issues related to the development and safe and proper use of pesticides and pesticide application equipment**



# **Second Meeting of Global Collaboration For Development of Pesticides For Public Health (GCDPP)**

**Salle A, WHO/HQ, Geneva  
6-7 April 2000**

## **Provisional List of Participants**

### **1. Industry**

- ✓ Mr I. **Adams**, Reckitt & Colman Products, NSW, Australia
- ✓ Dr D. **Coppen**, American Cyanamid, Gembloux, Belgium
- ✓ Mr J.E. **Davis**, Morflex, Inc. North Carolina, USA
- ✓ Dr G. **Hesse**, Bayer AG, Leverkusen, Germany
- ✓ Mr R.C. **Hudson, Jr.**, H.D.Hudson Manufacturing Co., Chicago, USA
- ✓ Dr J. **Invest**, Aventis, Environmental Health, Bucks, UK
- ✓ Dr D. **Kelili**, DowElanco Europe HQ, Sophia Antipolis, France
- ✓ Mr Mike **de Lara**, Curtis DynaFog, Indiana, USA
- ✓ Dr D.L. **Lawson**, SC Johnson & Son Inc. WI, USA
- ✓ Mr M. F. **Lluber**, H.D. Hudson Manufacturing Co., Chicago, USA
- ✓ Dr J. **Milliner**, FMC Corporation, Philadelphia, USA
- ✓ Dr J. **Naro**, Clarke Engineering Technologies, INC. IL, USA
- ✓ Mr K. **Walcher**, Clarke Engineering Technologies, INC. IL, USA
- ✓ Dr N. **Williams**, Zeneca Public Health, Surrey, UK

### **2. National and government supported agencies**

- ✓ Dr N. **Agui**, National Institute of Infectious Disease, Tokyo
- ✓ Dr K.S. **Aultman**, National Institute of Allergy and Infectious Diseases, Maryland, USA
- ✓ Dr D. **Barnard**, USDA, ARS, CMAVE, Florida, USA
- ✓ Dr P. **Carnevale**, Institute Pierre Richet, IPR/OCCGE, Bouake, Ivory
- ✓ Dr Michel **Galoux**, Station de Phytopharmacie, Gembloux, Belgium
- ✓ Dr J.M. **Hougard**, Institut de recherche pour le développement, Montpellier, France
- ✓ Dr J.B. **Jespersen**, Danish Pest Infestation Laboratory, Lyngby, Denmark
- ✓ Dr M. **Macdonald**, BASICS, Arlington, USA
- ✓ Dr G. **Majori**, Istituto Superior di Sanita, Rome, Italy
- ✓ Dr A. **Kilian**, GTZ, Darmstadt, Germany
- ✓ Dr H. **Townson**, Malaria Consortium, Liverpool School of Tropical Medicine, UK
- ✓ Dr E.N. **Zerba**, Centro de Investigaciones de Plagas e Insecticidas, Buenos Aires, Argentine

### **3. Regional and international organizations**

- ✓ Ms A. **Sunden-Byléhn**, United Nations Environmental Protection, Chemicals (IRPTC),  
Châtelaine, Switzerland



- ✓ Dr C.J. **Schofield**, ECLAT, Latin American Network for Research on the Biology and Control of Triatominae, London School of Hygiene & Tropical Medicine, London, UK
- ✓ Dr J.B. **Willis**, United Nations Environmental Protection, Chemicals (IRPTC), Châtelaine, Switzerland
- ✓ Dr M. **Younes**, WHO/International Programme on Chemical Safety

#### **4. Scientists, universities and research institutions**

- ✓ Dr J.I. **Arredondo Jimenez**, Centro de Investigacion de Paludismo, Tapachula de Cordova Chiapas, Mexico
- ✓ Dr D. **Dame**, American Mosquito Control Association, Lake Charles, LA, USA
- ✓ Dr D. **Molyneux**, Liverpool School of Tropical Medicine, Liverpool, UK
- ✓ Dr A.M. **Oliveira Filho**, Nucleo de Pesquisas de Produto Naturais, Universidade Federal do Rio de Janeiro, Brazil
- ✓ Dr B.L. **Sharp**, Medical Research Council, Durban, South Africa
- ✓ Dr S.K. **Subbarao**, Malaria Research Centre, New Delhi, India
- ✓ Dr G.B. **White**, Douvaine, France
- ✓ Dr R.A. **Wirtz**, Centre for Disease Control & Prevention, Atlanta, USA

#### **5. Secretariat**

##### **5.1. Regional Offices**

- ✓ Dr L. **Manga**, Regional Advisor, WHO Regional Office for Africa
- ✓ Dr K. **Palmer**, Regional Advisor, WHO Regional Office for the Western Pacific
- ✓ Dr C. **Prasittisuk**, Regional Advisor, WHO Regional Office for South-East Asia
- ✓ Dr H.R. **Rathor**, Regional Advisor, WHO Regional Office for the Eastern Mediterranean
- ✓ Dr G. **Sabatini**, Regional Advisor, WHO Regional Office for Europe

##### **5.2. WHO/HQ**

- ✓ Mr R. **Bos**, PHE/WSH
- ✓ Dr. M.K. **Cham**, CDS/RBM
- ✓ Dr J. P. **Clark**, CDS/RBM
- ✓ Dr D.L. **Heymann**, Executive Director, Communicable Diseases (CDS)
- ✓ Dr P. **Guillet**, CPE/PVC
- ✓ Dr D. **Nabarro**, Manager, Roll Back Malaria (RBM)
- ✓ Dr M. **Nathan**, CPE/PVC
- ✓ Dr M. **Neira**, Director, Communicable Disease Control, Prevention and Eradication (CPE)
- ✓ Dr L. **Savioli**, Coordinator, Strategy Development and Monitoring for Parasitic Diseases and Vector Control (CPE/PVC)
- ✓ Dr A. **Teklehaimanot**, CDS/RBM
- ✓ Dr M. **Zaim**, CPE/PVC/WHO Pesticide Evaluation Scheme



# **Second Meeting of Global Collaboration For Development of Pesticides For Public Health (GCDPP)**

**SALLE A, WHO/HQ, GENEVA**

**6-7 April 2000**

## **Provisional agenda**

**Thursday, 6 April 2000**

- 8.30 – 9.00                      Registration
- 9.00 - 9.10                      Opening of the meeting and appointment of officers.**  
Dr David Heymann, Executive Director, Communicable Diseases (CDS)
- 9.10 – 9.30                      Welcome addresses and presentation of the participants:**  
Dr Maria Neira, Director Communicable Disease Control, Prevention and Eradication (CPE)  
Dr David Nabarro, Manager Roll Back Malaria (RBM)
- 9.30 – 9.40                      Vector Control – The way forward**  
Dr Lorenzo Savioli, Coordinator, Strategy Development and Monitoring for Parasitic Diseases and Vector Control (PVC)
- 9.40 - 10.00                      The WHO Pesticide Evaluation Scheme (WHOPES) –  
progress report and objectives of the meeting**  
Dr M. Zaim, CPE/PVC/WHOPES
- 10.00 – 10.30                      Coffee Break**
- 10.30 - 16.00                      Roll Back Malaria (RBM)**
- By the end of this session:
- ✓ The RBM global partnership and the RBM Cabinet Project presented and their objectives and strategies outlined.
  - ✓ The role of vector control as an element of the RBM strategy, is discussed.
  - ✓ The constraints of malaria vector control activities are identified.
  - ✓ Recent developments on technical aspects of malaria vector control are discussed.
  - ✓ Ways and areas in which GCDPP can contribute towards the realization of the RBM objectives is identified and recommended.



- 10.30 – 10.45 The RBM Project – Objectives and strategy  
Dr David Nabarro, Manager RBM
- 10.45 – 10.55 Report of the 3<sup>rd</sup> RBM Global Partner's Meeting and the recommendations related to vector control  
Dr Awash Teklehaimanot, RBM
- 10.55 – 11.05 Implications for GCDPP of the recommendations of RBM Global Partnership Meeting  
Dr Mohammadou K. Cham, RBM
- 11.05 – 12.30 Discussion
- 12.30 – 14.00 Lunch break
- 14.00 – 15.30 RBM – discussions continued
- 15.30 - 16.00 Coffee break
- 16.00 – 17.30 Conclusions and recommendations of the 1<sup>st</sup> day**

## **Friday, 7 April 2000**

### **8.30 – 15.30 Judicious use of insecticide in malaria vector control**

By the end of this session:

- ✓ The constraints related to chemical control of malaria vectors are identified.
- ✓ The ways for selective use of insecticides for malaria vector control are identified/recommended.
- ✓ Relevant WHOPES actions for the promotion of selective vector control and judicious use of insecticides are recommended.

8.30 – 8.35 Chairman remarks

8.35 – 8.50 The status of DDT in the negotiations of a Global POPs treaty and UNEP's immediate actions on POPs.  
Mr J.B. Willis



- 8.50 – 9.10 Decision making criteria and procedures for the judicious use  
of insecticides  
Dr G.B. White
- 9.10 – 10.00 Discussion
- 10.00 – 10.30 Coffee break
- 10.30 – 12.00 Discussions continued
- 12.00 – 14.00 Lunch break
- 14.00 – 15.00 Discussions continued
- 15.00 – 15.30 Conclusions and recommendations
- 15.30 - 16.00** Coffee break
- 16.00 - 17.15** **GCDPP – A technical resource**  
Discussions/recommendations on further strengthening of  
GCDPP and future activities.
- 17.15 – 17.30** **Closure of the meeting**



*about*

**WHOPES**



## **WHOPES Objectives:**

- **Facilitate the search for alternative pesticides and application methodologies that are safe and cost-effective; and**
- **Develop and promote policies, strategies and guidelines for the use of pesticides in public health, and to assist and monitor their implementation by the Member States.**



**PRODUCTS UNDER EVALUATION BY WHOPEs  
(APRIL 2000)**

<b><i>Compound</i></b>	<b><i>Formulation</i></b>	<b><i>Manufacturer</i></b>
<i>Bifenthrin</i>	ME, SC, WP	FMC Corporation, USA
<i>Deltamethrin</i>	WG	Aventis, UK
<i>IR3535</i>	Technical	Merck, Germany
<i>KBR 3023</i>	Technical	Bayer AG, Germany
<i>Lambda-cyhalothrin</i>	CS	Zeneca, UK
<i>Methoprene</i>	EC, GR	Babolna Bioenvironmental Centre, Hungary
<i>Pyriproxyfen</i>	GR	Sumitomo Chemical, Japan

Olyset nets	Sumitomo Chemical, Japan
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IGEBA U15 M ULV aerosol generator	IGEBA Geraetebau GmbH, Germany
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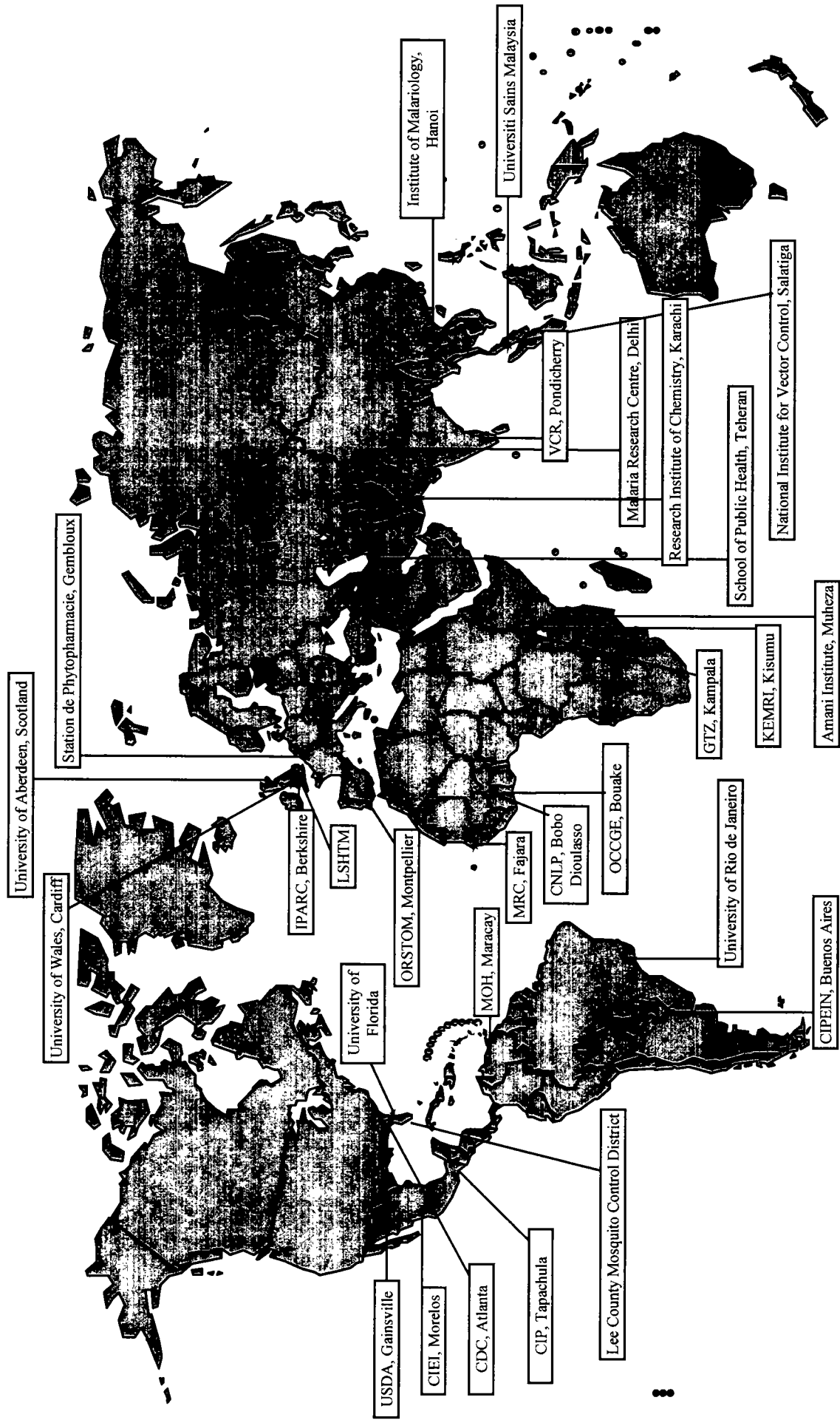
**PRODUCTS SUCCESSFULLY PASSED WHOPEs  
(1998 - 2000)**

<b><i>Compound</i></b>	<b><i>Formulation</i></b>	<b><i>Application</i></b>
<i>Alpha-cypermethrin</i>	SC, WP	Indoor residual spraying
	SC	Impregnation of mosquito nets
<i>Cyfluthrin</i>	EW	Impregnation of mosquito nets
	WP	Indoor residual spraying
<i>Deltamethrin</i>	SC, WT	Impregnation of mosquito nets
<i>Etofenprox</i>	WP	Indoor residual spraying
	EW	Impregnation of mosquito nets

PulsFog K10 SP Thermal Fogger	Space spraying
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# WHOPE'S COLLABORATING INSTITUTIONS (1998-2000)





## WHOPES, LIST OF PUBLICATIONS 1998 - 2000

- Schofield, C.J. - Challenges of Chagas control in Central America – Position paper. Geneva, World Health Organization, 1999 (unpublished document WHO/CDS/WHOPES/GCDPP/2000.1).
- Fact sheet – Safety of pyrethroid-treated mosquito nets. Geneva, World Health Organization, 1999 (unpublished document WHO/CDS/CPE/WHOPES/99.5).
- Report of the 3<sup>rd</sup> WHOPES Working Group meeting – deltamethrin 1%SC and 25%WT and etofenprox 10%EC and 10%EW, 23-24 September 1999, Geneva, World Health Organization, 1999 (unpublished document CDS/CPE/WHOPES/99.4).
- Cochran, D.G. Cockroaches – Their biology, distribution and control. Geneva, World Health Organization, 1999 (unpublished document WHO/CDS/CPC/WHOPES/99.3).
- Safe and effective use of household insecticide products – Guide for the preparation of educational and training materials. Geneva, World Health Organization, 1999 (unpublished document WHO/CDS/CPC/WHOPES/99.1).
- Guideline specifications for bacterial larvicides for public health. Report of the WHO Informal Consultation, WHO/HQ, Geneva, 28-30 April 1999, Geneva, World Health Organization, 1999 (unpublished document WHO/CDS/CPC/WHOPES/99.2).
- Zerba, E.N. Past and present of Chagas vector control and future needs – Position paper. Geneva, World Health Organization, 1999 (unpublished document WHO/CDS/WHOPES/GCDPP/99.1).
- Report of the 2nd WHOPES Working Group Meeting – Review of alpha-cypermethrin 10%SC and 5%WP and cyfluthrin 5%EW and 10%WP, 22-23 June 1998, Geneva, World Health Organization, 1998 (unpublished document WHO/CTD/WHOPES/98.10).
- Interim specifications for pesticides used in public health – Alpha-cypermethrin, cyfluthrin and deltamethrin, Geneva, World Health Organization, 1998, (unpublished document WHO/CTD/WHOPES/98.8).
- Guidelines for the purchase of pesticides for use in Public Health, Geneva, World Health Organization, 1998, (unpublished document WHO/CTD/WHOPES/98.5).
- Report of the WHO Informal Consultation on draft guideline specifications for household insecticide products, Geneva, World Health Organization, 1998, (unpublished document WHO/CTD/WHOPES/98.3).



## **FORTHCOMING WHOPE'S PUBLICATIONS**

- Decision making criteria and procedures for the judicious use of insecticides in malaria vector control.
- Insecticides for treatment of mosquito nets – Review status 1999.
- Insecticides for indoor residual spraying for malaria control – With particular emphasis to alternatives to DDT.
- Manual for indoor residual spraying – Application of residual sprays for vector control.
- Space spraying application of insecticides for vector and public health pest control.
- Insect repellents – Position paper.



## Malaria – a global crisis

- Malaria kills at least 1 million people each year, about 3,000 a day.
- Nearly 500 million people suffer from acute malaria each year: the majority of victims are children.
- 40 percent of the world is at risk of malaria but 9 out of 10 cases occur in Africa south of the Sahara.
- Health systems' failure, drug resistance, population movement, deteriorating sanitation, climatic changes and, in some cases unplanned development activities, are contributing to the spread of malaria.

### **MALARIA AND CHILDREN**

- Up to 700,000 children, many under five, will die needlessly from malaria this year. With acute disease a child may die within 24 hours.
- Malaria kills a child every 30 seconds, often in combination with other diseases.
- Children can suffer an average of six malaria bouts each year. In endemic areas, as much as 60 percent of schoolchildren's learning may be impaired.

### **MALARIA AND MOTHERHOOD**

- In endemic countries women are four times as likely to suffer malaria attacks – causing low-weight babies and stillbirths – during pregnancy than at any other time. Nearly 60 percent of miscarriages are due to malaria.

### **MALARIA AND DRUG RESISTANCE**

- The cheapest malaria drug – chloroquine – is rapidly losing its effectiveness in almost all endemic countries.
- In some parts of the world strains of malaria have developed resistance to the four leading antimalarial drugs.

### **MALARIA IN EMERGENCY AND EPIDEMIC SITUATIONS**

- Population movements, due to migration or wars, into malaria-endemic countries are causing major disease outbreaks.
- Malaria is a major killer of refugees in Africa.

### **COST OF MALARIA**

- The cost of malaria control and treatment drains African economies. Endemic countries have to use scarce hard currency on drugs, nets and insecticides.
- Malaria cost Africa countries south of the Sahara more than US \$2 billion in 1997. Malaria-endemic countries are some of the world's most impoverished.
- In Thailand, malaria patients pay nine times their average daily wage for care.
- A malaria-stricken family spends an average of over one quarter of its income on malaria treatment, as well as paying prevention costs and suffering loss of income.
- Workers suffering a malaria bout can be incapacitated for 5 to 20 days.
- Malaria-afflicted families on average can only harvest 40 percent of the crops harvested by healthy families.

t h e p r o b l e m

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# Roll Back Malaria – a massive effort

t h e s o l u t i o n

- The RBM partnership includes governments, development agencies, commercial organisations, professional associations, civil society, research groups and the media.
- RBM partners have set a 10-year target to half the world's malaria burden by 2010. This will be achieved by creating a social movement that enables countries to take effective and sustainable action against the disease.
- RBM partners plan a massive, continuing attack on malaria. It aims to secure a 30-fold expansion in the proportion of people who can get effective treatment, ideally within two hours travel of the onset of symptoms, and in those who use treated bednets. RBM particularly seeks to help pregnant women at risk.
- RBM partners aim to achieve this by strengthening countries' health systems; mobilising social movements to support local malaria control needs; evaluating results and monitoring progress; and developing new tools.

## **SIX ELEMENTS OF ACTIONS TO ROLL BACK MALARIA**

- Evidence-based decisions using surveillance, appropriate responses and building community awareness.
- Rapid diagnosis and treatment.
- Better multi-pronged protection using insecticide-treated mosquito nets, environmental management to control mosquitoes and making pregnancy safer.
- Focused research to develop new medicines, vaccines and insecticides and to help epidemiological and operational activities.
- Coordinated actions for strengthening existing health services, policies and providing technical support.
- Harmonised actions to build a dynamic global movement.

## **RBM AND CHILDREN**

- RBM partners promote the use of mosquito nets treated with recommended insecticides. This can prevent over 20 percent of children's deaths from malaria.
- RBM partners support research into new medicines and vaccines which will develop new tools to save children's lives.
- RBM partners back interventions such as the Integrated Management of Childhood Illnesses (IMCI) to reduce children's deaths from malaria.

## **RBM AND MOTHERHOOD**

- RBM partners seek a 30-fold increase in the proportion of pregnant women at risk who receive effective malaria protection. This makes pregnancy safer.

## **RBM AND DRUG RESISTANCE**

- Tracking the spread of drug resistance, improving access and use of quality anti-malarials and careful selection of treatment regimes help reduce the malaria burden.
- The Medicines for Malaria Venture aims to produce a new, affordable anti-malarial drug every five years.

## **MALARIA IN EMERGENCY AND EPIDEMIC SITUATIONS**

- Methods for forecasting and preventing malaria epidemics are being developed along with techniques for early detection and control.
- Mapping epidemic prone areas and coordinating efforts through networks are contributing to the prevention and containment of epidemics.

## **COST-EFFECTIVENESS OF RBM**

- RBM partners promote cost-effective available interventions which reach those who need them most.
- RBM partners work globally to remove taxes and tariffs on mosquito nets and insecticides and to provide subsidised marketing for those who can not afford them.
- By reinforcing health systems, synergistic services are made available for the treatment of other communicable diseases, particularly HIV and TB.

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## **REPORT OF THE 3<sup>RD</sup> RBM GLOBAL PARTNERS MEETING AND THE RECOMMENDATIONS RELATED TO VECTOR CONTROL**

**By:**

**Dr Awash Teklehaimanot  
Team Leader  
Technical Support and Capacity Development  
Roll Back Malaria**

The World Health Organization/Roll Back Malaria (RBM) project convened the third meeting of the Global Partnership to Roll Back Malaria in Geneva from 2-3 February 2000.

The meeting was organised around discussions on four distinct tracks in order to provide the partner's representatives to interact with each other and to pursue particular issues.

- Developing effective partnerships to RBM for ensuring partnership support to effective country action;
- Consensus on information in the RBM Partnership;
- Partnership support to address technical needs in countries;
- Meeting the challenge of halving the malaria burden in the next ten years: massive increase of access to prevention, disease management and research.

### **Partnership support to address technical needs in countries**

Participants in the group were briefed in plenary on critical technical issues relating to disease prevention and disease management of malaria within the context of health sector development.

Following discussion during the plenary, the participants in the group were divided into two sub-groups to discuss in detail on disease prevention and disease management respectively.



***The sub-group on disease prevention identified:***

1. Priority technical areas for rolling back malaria (vector control, ITNs, malaria in pregnancy, epidemics and complex emergencies);
2. The need for capacity development of malaria endemic countries; and
3. Establishment and maintenance of technical support networks.

Specific recommendations on each of the above categories were presented and approved by participating partners in plenary.

It is important to note that vector control is involved in all aspects of preventive measures. The specific recommendations were as follows:

**I. Vector control**

- Better targeting of vector control interventions
- Global monitoring of insecticide resistance and quality of insecticides
- Residual spraying in selected situations
- Promote the development of alternative insecticides
- Promote environmentally-based interventions
- Incorporate health impact assessment for development projects
- Appropriate training of vector biologists.

**II. On insecticide treated netting materials**

Large scale implementation of ITNs.

- Availability, affordability, promotion and dissemination
- Mechanisms for delivery
- Production of local production of nets
- Long lasting treatment of nets
- Address issues related to long-term use of ITNs and other operational research aspects.



## **IMPLICATIONS FOR GCDPP OF THE THIRD RBM GLOBAL PARTNERSHIP MEETING**

**By:**

**M K Cham  
RBM Partnership Support Team**

The Global Partnership to Roll Back Malaria is committed to enabling people to halve the burdens they experience as a result of malaria by the year 2010 through intensified application of existing tools for malaria control. Within this frame, the third RBM Global Partnership meeting recommended, among other things, going to scale with insecticide treated netting materials through intensified efforts to address their availability, affordability, promotion and distribution.

This scaling up will need to be undertaken through effective movements involving a range of organizations active at community and national levels. All partners must, therefore, maintain strong and consistent commitment at the highest level. However, there is also need to maintain flexibility and thereby avoid too rigid an approach. Significant additional human and financial resources will be required.

The technical challenges that need to be addressed within the concept of going to scale will include:

- 3.1 Selection of insecticide
- 3.2 Quality control of insecticide
- 3.3 Safe and effective use of insecticide
- 3.4 Monitoring insecticide resistance, and
- 3.5 Longer term health and environmental impact

During the presentation, discussions will focus both on partnerships with the private sector to make ITN sustainable and available to the population at large and on the technical issues to be considered as the use and coverage of ITN are scaled up.



## DECISION MAKING CRITERIA AND PROCEDURES FOR THE JUDICIOUS USE OF INSECTICIDES IN MALARIA VECTOR CONTROL

By:

G B White

To reduce the risks of malaria transmission there are many ways to protect individuals and communities against the infective vector anopheline mosquitoes. Apart from using insecticides, traditional methods include source reduction (elimination of specific mosquito breeding sites) and screening houses against the nocturnally active *Anopheles*. These physical methods have proved to be generally more reliable and effective than biological control methods (e.g. larvivorous fish) for malaria vector control. Chemical insecticides provide a wide range of powerful options for vector control. The objective of insecticide applications is not simply to reduce mosquito density, but also to achieve major reduction of vectorial capacity. This depends on stopping *Anopheles* females biting person after person and reducing probability of the vector surviving to infectivity. The use of residual insecticides for house-spraying or treatment of bednets (mosquito nets) can be particularly effective against man-biting *Anopheles*, cutting their malaria vectorial capacity to levels that substantially reduce or even prevent the risks of malaria transmission.

Personal protection against malaria vectors (by correct use of repellents, bednets, house-screening etc.) is generally advisable for individuals in malaria endemic situations, but may not be feasible for various reasons (economic, socio-cultural or practical). Thus it is usually desirable to organize malaria prevention and control activities on a community-wide basis. Many factors must be taken into account when deciding whether or not to implement vector control operations. Sector-wide and inter-sectoral approaches to 'Roll Back Malaria' should normally include vector control activities if they are going to be cost-beneficial. For each situation and administrative level (local, national and regional), it is necessary to assess the options for vector control as well as their costs and likely outcomes. This requires a logical process of deciding:-

- What are the characteristics of malaria vectors (species, ecology, behaviour) and malaria transmission (indoors or outdoors, endemicity level) in the area concerned;
- Whether or not vector control is a feasible component of the malaria control programme (i.e. logistical and cost implications as well as vectors being vulnerable);
- Which vector control methods are appropriate (environmental, personal, chemical etc);



Assuming that the use of insecticides is an important component of integrated malaria control operations in the 'Roll Back Malaria' strategy, then for each situation it is necessary to decide:

- What to apply: selection criteria for insecticide products (compounds and formulations), including cost, safety and efficacy (with respect to vector behaviour and resistance status);
- Where to apply: vector resting sites, breeding sites, stratification, selectivity and coverage; personal protection;
- When to apply: seasonality of vectors and malaria transmission; insecticide residual activity;
- How to apply: methods of application; safe and effective use and handling of insecticides.

This presentation reviews the advantages and constraints of insecticide use for malaria vector control. Decision making criteria are provided for choice of products and application equipment; target coverage requirements and selective applications; budget and social implications; personal and environmental safety; resistance management and relevant actions for WHOPES.





**WORLD HEALTH ORGANIZATION  
DIVISION OF CONTROL OF TROPICAL DISEASES  
WHO PESTICIDE EVALUATION SCHEME (WHOPES)**

*gcdpp*

Global Collaboration for Development of Pesticides for Public Health

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**INSTITUTIONS FORMALLY JOINED GCDPP, AS OF APRIL 2000:**

**Industry**

- American Cyanamid, Gembloux, Belgium (Dr D. Coppen)
- Aventis, Aylesbury, UK (Dr J. Invset)
- Bayer AG, Leverkusen, Germany (Animal Health, Dr G. Hesse; Consumer Care, Mr K. Röder)
- Clarke Engineering Technologies, Roselle, Illinois, USA (Mr K. Walcher).
- Curtis DynaFog, Westfield, Indiana, USA (Mr Mike de Lara)
- Dow Agro Sciences, Sophia-Antipolis, France (Dr D. Kelili)
- FMC Corporation, APG Speciality Products, Philadelphia, USA (Dr J. Milliner)
- Fumakilla Malaysia Berhard, Penang, Malaysia (Mr R. Ismail)
- H.D. Hudson Manufacturing, Chicago, USA (Mr R.C. Hudson, Jr)
- Morflex, Inc., Greensboro, North Carolina, USA (Mr J.E. Davis)
- Reckitt & Colman Products, NSW, Australia (Mr I. Adams)
- SC Johnson & Son, Racine, WI, USA (Dr D.L. Lawson)
- Sumitomo Chemical, London, UK (Dr B. Martin)
- Zeneca Public Health, Fernhurst, UK (Dr N. Williams)

**National and government supported agencies**

- BASICS, John Hopkins University, Arlington, USA (Dr M. Macdonald)
- Centro de Investigaciones de Plagas e Insecticidas (CIPEIN), Buenos Aires, Argentina (Dr E.N. Zerba)
- Danish Pest Infestation Laboratory, Lyngby, Denmark (Dr J.B. Jespersen)
- Department de Phytopharmacie, Gembloux, Belgium (Dr I.M. Galoux)
- GTZ, Health, Education, Nutirion and Emergency Aid, Darmstadt, Germany (Dr A. Kilian)
- Instituto Superiore di Sanita, Rome, Italy (Professor G. Majori)
- Institut de recherche pour le développement, Laboratoire de Lutte contre les Insectes Nuisibles, Montpellier, France (Dr J.M. Hougard)
- Malaria Consortium, Liverpool, UK (Ms J. Hill)
- National Institute of Allergy and Infectious Diseases, Bathesda, Maryland, USA (Dr K.S. Aultman)



- National Institute of Infectious Diseases, Tokyo, Japan (Dr N Agui)
- Organisation de Coordination et de Coopération pour la lutte contre les Grandes Endémies (OCCGE), Institute Pierre Richet, Bouake, Cote d'Ivoire (Dr P. Carnevale)
- Organisation de Coordination et de Coopération pour la lutte contre les Grandes Endémies (OCCGE), Bobo Dioulasso, Burkino Faso (Professor Ag. Rhaly)
- Organisation de Coordination pour la lutte Contre les Endemies en Afrique Centrale (OCEAC), Yaounde, Cameroon (Dr L. Manga)
- Russian Academy of Science, N.I. Vavilov Institute of General Genetics, Moscow, Russia (Dr M.I. Sokolova)
- USDA, ARS, Centre for Medical & Veterinary Entomology, Gainesville, USA (Dr D. Barnard)

### **Regional and international organizations**

- ECLAT, Latin American Network for Research on the Biology and Control of Triatominae, London School of Hygiene & Tropical Medicine, London, UK (Dr C.J. Schofield)
- International Pesticide Application Research Centre, Berkshire, UK (Dr G. Matthews)
- International Programme on Chemical Safety, Geneva, Switzerland (Dr M.M. Younes)
- UNEP, Chemicals, Geneva, Switzerland (Dr J.B. Willis)

### **Universities and research institutions**

- Liverpool School of Tropical Medicine, Liverpool, UK (Dr D. Molyneux)
- London School of Hygiene & Tropical Medicine, London, UK (Dr C.F. Curtis)
- Malaria Research Centre, Delhi, India (Dr S.K. Subbarao)
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