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Roll Back Malaria: Technical Support Networks in South-East Asia

Report of the Informal Consultative Meeting
Chiang Mai, Thailand, 13–17 March 2000

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Contents

Executive Summary

Technical Support Networks (TSNs) were set up in the WHO South-East Asia Region with national chapters in respective Member Countries. TSNs comprise the following networks: (i) Transmission Risk Reduction (TRR), (ii) Surveillance, Information Management and Epidemic Preparedness and Response (SIE), and (iii) Drug Resistance and Policy (DRP). These networks will serve as technical resource to support Roll Back Malaria in South-East Asia. The secretariat of the TSNs is initially based in WHO/SEARO and will rotate within Member Countries. The national chapter of each network (TRR, SIE, DRP) will have two focal persons, one from the malaria control programme and another one from a research or technical institution who will be responsible for its coordination and functioning. There will be an overall national coordinator nominated by the government. The work plan of each TSN for 2000-2003 reflects the identified priorities to be addressed by each TSN.

1. INTRODUCTION

Roll Back Malaria (RBM) was initiated by the Director-General of WHO in May 1998 aiming at reducing malaria burden by 50% by the year 2010. WHO RBM Cabinet Project was established on 23 July 1998 to support this initiative. RBM was launched on 31 October 1998 by WHO, UNICEF, UNDP and WB as the founding partners, and supported by member countries, bilateral agencies, NGOs and other sectors 'of society. Since then, several advocacy and consensus meetings have been conducted in the SEA Region. It was recognized that RBM in this Region should draw its strength through networking of the existing technical resources at national and regional levels to address priority issues related to Transmission Risk Reduction(TRR), Surveillance, Information Management, Epidemic Preparedness and Response (SIE), and Drug Resistance and Policy (DRP).

In an informal consultative meeting held from 13-17 March 2000 in Chiang Mai, Thailand, the technical support networks were organized to address the above technical areas.

2. OBJECTIVES

(1) To discuss the role and develop terms of reference of the technical support networks on TRR, SIE and DRP;

(2) To identify institutions, core groups and individuals from the SEA Region, and specific areas that require strengthening;

(3) To identify programme needs on TRR, SIE and DRP;

(4) To develop working mechanisms within and outside the resource network, and

(5) To develop a regional work plan for each TSN for 2000-2001 and 2002-2003.

3. PROCEEDINGS

The meeting was commenced with a message from the Regional Director, WHO/SEARO read by the WHO Representative in Thailand followed by the inaugural address by the Deputy Director-General, Department of Communicable Disease Control, Ministry of Public Health, Thailand. The Director, Malaria Division, Bangkok, Thailand made the introductory remarks. Representatives from RBM/CDS/WHO and RBM partners (USAID, Faculty of Tropical Medicine / Mahidol University/SEAMEO-TROPMED, JICA Philippines Office, and Tokyo Women's University) delivered their remarks.

The participants were from seven SEARO Member Countries (Bangladesh, India, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand), and two WPRO Member Countries (Philippines and Papua New Guinea) as well as from partner agencies. See *Annex 1* for list of participants.

Dr. Krongthong Thimasarn (Thailand) was elected Chairperson of the meeting while the co-chairperson was Dr Myint Lwin (Myanmar). Dr. V P Sharma (India) and Dr. Enrique Tayag (Philippines) were the rapporteurs. Three groups corresponding to the three technical support networks met simultaneously with joint sessions during the first and last day. Each group selected their respective chairperson and rapporteurs. TDR's Task Force on Research on Drug Resistance and Policy had its meeting during the same period at the same venue. They joined the plenary sessions and had joint sessions with the TSN on DRP.

The terms of reference of each TSN were developed and finalized by the respective group. Basically, the TSNs will serve as technical resource not only to the national malaria control programmes and WHO/SEARO but also to RBM partners in the Region and in the Member Countries. The TSNs will function and address relevant technical issues according to their comparative strengths. Institutional arrangement to facilitate work was also discussed.

The three groups had technical sessions wherein relevant topics were presented and discussed. Based on these discussions, major technical areas and some specific issues that each TSN will work on were identified. It was envisaged that the TSNs would have significant contributions in rolling back malaria by addressing the technical areas listed in their plan of work for 2000 - 2003.

4. INSTITUTIONAL ARRANGEMENT

4.1 Regional Network

The regional network comprises a core of experts in various disciplines relevant to TRR, SIE, and DRP from Member Countries of the WHO SEA Region. It will co-opt members from outside the Region as and when the need arises. The network has two focal persons each on TRR, SIE and DRP from each Member Country - one from the malaria control programme and another from a research institution or from other institution with technical expertise. Initially the network secretariat will be based in WHO-SEARO and function in collaboration with and within the framework of the RBM project in SEARO and HQ every two years, the secretariat will rotate within the Member Countries.

4.2 National Chapters

Two core members identified from each country will serve as the focal points who will initiate and facilitate the establishment of national chapters of the TSNs in their respective countries. The Director (National Malaria Control Programme Manager) or a more senior official in the Ministry of Health will be the overall national coordinator. The national core group members would include representatives from various disciplines, key staff from the control programmes, professional associations, research institutes, medical colleges, private health care providers, pharmaceutical industries, consumer associations, etc. Where similar technical committees or groups already exist in the country, the national chapter should be built on these existing structures and not duplicate them. The members and partners of each TSN will develop the working mechanisms after the network is established.

5. STRATEGIC DEVELOPMENT

5.1 Technical Support Network on Transmission Risk Reduction (TSN-TRR)

The group considered two modalities of transmission risk reduction- vector-based and parasite-based. Within the framework of TRR network, the group agreed to focus only on vector-based transmission risk reduction.

Within the RBM partnership, technical support to national malaria control programmes is an essential component. Technical support networks (TSN-TRR) provide the necessary mechanism.

(1) Terms of Reference

(a) To provide technical assistance to RBM partners in the Region in support of the development and establishment of integrated vector management programmes for routine control and the prevention of adverse impacts of development projects.

(b) To assist in the establishment of an agenda of relevant research questions in this area, co ordinate multidisciplinary research efforts and ensure that research outcomes reach the appropriate authorities.

(c) To review the status of the integrated vector management, compile information on experience in and outside the Regions on the promotion of integrated vector management and make this information available to the RBM partners.

(d) To assess capacity-building needs in support of integrated vector management and develop capacity building programmes in response to these needs.

(e) To assist Member Countries in the Regions in the process of developing policy review and adjustment, both in the health sector and in other development sectors, and to harmonize sectoral policies.

(2) Scope and Focus

TSN-TRR will address the following general issues:

(a) Methods currently available for achieving a reduction in the transmission potential ranging from personal protection methods (e.g., insecticide-treated bednets and repellents) to vector control based on non-chemical and chemical methods;

(b) Selective and integrated use of the available methods in the most effective and efficient manner, based on the best evidence at the local level;

(c) Methods and procedures for strategic health risk assessment and health impact assessment;

(d) Institutional strengthening for training on integrated public health measures against vector-borne diseases;

(e) Optimal use of national, regional and global expertise and resources in transmission risk reduction, and

(f) Coordination of transmission risk management efforts as a basis for the sustainability of RBM achievements.

(3) Actions for RBM

Regional trends and strategic responses

(a) Identify regional issues, define problems and assess needs to overcome these problems.

(b) Inventory the existing expertise in the Region.

(c) Document and exchange information and experience.

(d) Interface with other regional technical networks (e.g. TSN-SIE and TSN-DRP) to provide fully integrated technical advice for RBM implementation in countries.

Research & Development

(a) At regular intervals, review and update a research agenda in transmission risk reduction.

(b) Mediate the transfer of knowledge gained by research for application in control programmes.

(c) Disseminate information on up-to-date technologies and methods by reviewing the latest developments in the field.

Framework for a generic capacity-building strategy

(a) Formulate regional policies and guidelines on transmission risk reduction for adoption by Member Countries.

(b) Develop capacity to monitor and evaluate the impact of interventions directed at transmission risk reduction.

(c) Link scientists and institutions with expertise to counterparts in disease control operations at district and national levels.

(d) Afford training opportunities to a younger generation of health professionals and scientists within ongoing implementation activities of RBM.

Assistance to Member Countries

(a) Identify issues, define problems and assess needs to overcome these problems at the national level;

(b) Assist in the planning and implementation of selective transmission risk reduction methods as an integral part of the health system;

(c) Facilitate the establishment of national level networks to support district level RBM activities;

(d) Utilize national centres of excellence as collaborating centres and network national experts as a regional resource for the effective implementation of RBM;

(e) Assist in setting standards to ensure quality assurance of products/materials used in TRR, and

(f) Assist in reorienting the role of entomological services and support services for TRR, including advocacy for partnerships.

(4) Regional Issues

The group identified the following general issues across the Region.

(a) The role of entomological services needs to be redefined for the Region to address RBM.

(b) Clearly defined partnership mechanisms should be established in the Region to ensure sustainable support for RBM.

(c) Lack of coordination between countries in insecticide policy towards the control of border malaria is a common problem.

(d) Comprehensive approach should be adapted towards integrated vector- borne disease control.

(e) Knowledge transfer on sociocultural aspects in vector control operationalization needed.

(5) Priorities to be addressed by the TSN-TRR

(a) *Mosquito nets:* In order to promote treated mosquito nets in the communities the following areas required emphasis and focused work. (i) Inventory the information on ITN operationalization (standardize parameters, identify knowledge gaps); (ii) formulate evidence-based guidelines for programme implementation (decision making criteria for ITN purchase, logistics for focused delivery and maintenance); (iii) set a research agenda and strategy for resource mobilization to implement it; and (iv) social marketing of ITN and private sector involvement.

(b) *Insecticides*: It was realized that insecticides would continue to play an important role in malaria control. TSN would focus on institutional strengthening to develop training capacity for integrated public health measures against vector-borne diseases. Therefore, there is a need to: review the knowledge base and decision making procedures for judicious use of pesticides; advise on the modalities for the operationalization of selective/integrated approaches with optimal complimentarity of chemical and non-chemical transmission risk reduction interventions; and inventory regional insecticide resistance and provide guidance on resistance management strategies.

(c) *Targeting Training*. Manpower training in medical entomology in the malaria endemic countries should receive priority, with emphasis on identification of training needs and resources at different levels and development of curricula, training modules and advocacy, and IEC materials to address the acute shortage there.

(d) *Research* : (a) Studies on cytotaxonomy and vector biology (special problems related to *An. dirus, An. minimus* and *An. fluviatilis*) should be directed to: (i) complete a regional picture (including islands) of sibling species; (ii) develop a strategic approach to filling knowledge gaps; (iii) coordinate, stimulate and document at least 5 case studies on ecosystem- based TRR approaches that can serve as regional

prototype; and (iv) develop mapping and possible TRR interventions in *dirus-fluviatilis-minimus* settings, and (b) Research agenda on TRR interventions through intersectoral action.

(e) *Monitoring and evaluation*: TSN-TRR should support malaria control programmes reviewing the regional situation using TRR indicators, and assess the potential to upgrade information system (both health sector/outside the health sector) for decision-making based on the Geographical Information System (GIS).

(f) *International Borders*: Malaria control at the international borders should be organized by providing technical support and assistance in the synchronization of field operations in the border areas, and malaria control programmes should review and promote experience-sharing of existing mechanisms and partnerships for cross border collaboration in TRR operations, TRR & SIE coordination using GIS technology.

(g) *Health Impact Assessment/Health Risk Management*: National activities (assessment workshops) to review, adjust and harmonize development policy frameworks to promote HIA/HRM and adapt existing generic HIA guidelines for specific use at the country level should be coordinated; and a research agenda on TRR interventions through intersectoral action set.

In addressing these issues, the TRR would consider: RBM's pathfinder role in health sector-wide development; on-going processes and decentralization and structural adjustment, and a strengthened role of the health sector in the works of other public and private sectors.

5.2 Technical Support Networks on Surveillance, Information Management and Epidemic Preparedness and Response (TSN-SIE)

The group identified the need for TSN-SIE to: develop a reliable and rapid information management system; standardize the core indicators for monitoring and surveillance; assist countries to develop early warning systems and to mobilize resources for epidemic preparedness and control.

(1) Terms of Reference

(a) To formulate policies, strategies and guidelines on surveillance, information management, and epidemic preparedness and response;

(b) To identify common core indicators for monitoring and evaluation of the implementation of RBM in Member Countries and the Region. To strengthen the regional, national and sub-national capacity for RBM related to SIE by promoting the better use of collaborating centres / centres of excellence through networking; creating training opportunities for health professionals and scientists, and improving links between institutions/scientists and the control programme;

(c) To establish appropriate channels of communication among Member Countries and stakeholders;

(d) To identify priorities and promote research related to SIE and ensure transformation of research findings into policies and practices, and

(e) To maintain interface with other regional networks.

(2) Scope and focus

The SIE group agreed on five major technical areas and some specific issues that will be addressed by the SIE network. The number one priority activity is to validate the core indicators that were recommended during the WHO Bi regional Meeting in Kunming, China in 1999 for monitoring and evaluation of RBM implementation.

(a) Surveillance system

- Identifying and validating core indicators;
- Improving reporting of deaths, and
- Involving the private sector/other systems of health care

(b) Information management system

- Timeliness of reporting and feedback;
- Introducing information technology, and
- Information-based decision-making.

(c) Epidemic preparedness and response

- Early warning and detection systems;
- Emergency drugs and insecticides;
- Rapid response teams (RRT);
- Collaboration with other sectors for prevention of epidemics and rapid response, and
- Investigation and analysis of epidemics.

(d) Information exchange and networking

- Define priority information for sharing, and
- Level of networking.

(e) Operational research

- Validation of core indicators;
- Evaluation of use of information technology;
- Establishment of early warning and detection systems;
- Community based surveillance (lay reporting), and
- Identify weaknesses (including delays) of the existing surveillance system.

(3) Actions for RBM

(a) Selection of indicators to be validated in RBM districts and to be used in SEA Region based on those agreed upon during the SEA/WPR Bi-regional Meeting on Malaria Control, Kunming, Yunnan Province, China in 3-5 November 1999. See *Annex 2* for standard case definitions and core epidemiological and operational indicators adopted and recommended for the countries in the Mekong area which are to be validated in other SEA countries.

(b) Efficient information management system focusing on information-based decision-making and introduction of new technology such as "Health Mapper" at district levels.

(c) Epidemic preparedness and response focusing on the progressive setting up of early warning and early detection systems, as well as rapid response teams at district level.

(d) Improving the exchange of agreed information between SEA countries.

(e) Field researches focusing on the selection of community-based monitoring indicators and the development of a methodological guideline for surveillance and monitoring of RBM interventions at the periphery.

The networks on SIE and TRR should be linked up to address interrelated technical issues, for example in early warning system and forecasting of epidemics, with the application of geographical information system (GIS). Since the use of GIS in malaria control is still under development, the two networks should work together.

5.3 Technical Support Network on Drug Resistance and Policies (TSN-DRP)

The DRP group highlighted the need for drug resistance monitoring, standardized protocols, pre-packaging of drug combination, early diagnosis using dip-stick, pediatric formulation (drug combination), quality assurance, and sharing information on "fake drugs".

(1) Terms of Reference

(a) To formulate the regional anti-malarial drug policies and guidelines on drug resistance and policy for adaptation by the Member Countries.

(b) To facilitate the planning and implementation of anti-malarial drug policy and drug resistance monitoring as an integral part of RBM initiative within the context of national health development through a national level DRP networking, and provision of technical expertise.

(c) To assist the nationals programme in the development of evidence-based drug policy and facilitate or conduct research in support of policy-making.

(d) To assist the national programme in the development of a strategic plan in the area of capacity-building and operational research through optimal utilization of the network of national and regional expertise in DRP.

(2) Scope and Focus

The issues identified by DRP were grouped into four major areas as listed below. Some are not technical *per se,* such as the procurement and distribution system of anti-malarial drugs. However, the group felt that this area has very significant bearing on rolling back malaria, and the TSN-DRP would be able to provide some assistance in improving it.

(a) Data banking and information exchange

- Drug policies and drug regimens;
- Drug resistance data;
- Directory of national experts relevant to DRP;
- Activities of the network, and
- Standardization of the format for reporting and exchange of information.

(b) Capacity-building

- Support for infrastructure development for monitoring drug resistance;
- Training on development of anti-malarial drug policy;
- Anti-malarial drug quality assurance, and
- Institutional strengthening in drug monitoring and sharing information on "fake drugs".

(c) Procurement and distribution system for anti-malarial drugs

- Review of existing systems;
- Explore the feasibility of pooled procurement, and
- Social marketing of anti-malarial drugs.

(d) Priority Operational Research Issues

- Large scale trials on the impact of drug combinations on transmission potential and on delaying emergence of resistance: probable combinations artesunate and schizonticides (Sulfadoxine or Sulfalene Pyrimethamine / Chloroquine / Mefloquine);

- Research on the impact of early diagnosis and effective treatment with existing anti-malarial drugs regimens;
- Pediatric formulation with drug combination;
- Operational use of more sensitive tools for monitoring of P. falciparum drug resistance, and
- Initiation of P. vivax drug-resistant studies.

(3) Actions for RBM

(a) Anti-malarial supply management should ideally be a part of the national essential drugs supply system.

(b) The regional network on drug resistance and policies should address the issue of anti-malarial quality in South-East Asia.

(c) As drug quality and supply are critical for RBM, country and drug supply managers should, from time to time, participate in national and international fora.

(d) Studies are required on access to anti-malarial drugs for the poor in South- East Asia, as malaria control managers largely overlook this subject.

6. RBM NETWORK AND TDR TASK FORCE ON DRUG RESISTANCE AND POLICY - JOINT MEETING

A TDR Task Force meeting on Drug Resistance and Policy was held on the same dates to facilitate interaction with the Technical Support Network (TSN). In a joint meeting the TDR Task Force addressed many issues raised by the countries of the SEA Region, and in general advised that:

- Any new anti-malarial should be deployed in combination;
- Combining sulfadoxine-pyrimethamine and chloroquine will, in principle, delay the development of resistance, as their mechanisms of action are different, and
- Studies now underway will clarify many of the outstanding issues and provide the evidence required by countries for decision-making.

7. CONCLUSIONS AND RECOMMENDATIONS

(1) Three technical support networks (TSNs) are established in the WHO South-East Asia Region: (i) Transmission Risk Reduction (TRR); (ii) Surveillance, Information Management and Epidemic Preparedness and Response (SIE), and (iii) Drug Resistance and Policy (DRP).

(2) The network will basically serve as technical resource to rolling back malaria in the South East Asia Region. Each TSN has terms of reference and identified priority technical areas on which future activities will be based. The work plan of each TSN for 2000-2003 was developed See *Annex 3.* The work plan needs to be translated into a country plan with more specific details for implementation.

(3) At the regional level the TSNs shall have a secretariat to coordinate the activities, which will be initially based in WHO/SEARO and would rotate within Member Countries every two years thereafter.

(4) Two focal persons, one each from the Ministry of Health and from another institution, have been identified, who are responsible for initiation and facilitation of the establishment of national TSNs. The Malaria Control Programme (MCP) Manager or a superior officer shall be the overall coordinator of the national TSNs.

(5) The TSNs are encouraged to establish linkage with partners within the framework of RBM to mobilize resources to support its activities. Mechanisms for partnership and linkages with other organization such as UNICEF and Special Programme for Research and Training in Tropical Diseases (TDR) will be evolved.

(6) Crosscutting issues between networks such as advocacy, social mobilization, and information, education and communication (IEC) shall be discussed in a common forum.

(7) Seed money and technical support shall be available from WHO Roll Back Malaria Cabinet Project and its partners. Each network from Member Countries is encouraged to find other funding sources to support related activities.

Annex 1

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Annex 2

STANDARD CASE DEFINITIONS AND CORE EPIDEMIOLOGICAL AND OPERATIONAL INDICATORS AS RECOMMENDED BY THE MEETING FOR THE MEKONG COUNTRIES

(A) Case definitions:

In areas without access to laboratory-based diagnosis[1]:

- *Probable severe malaria*: a patient who requires hospitalization for symptoms of severe malaria and receives antimalarial treatment, or a patient who is hospitalized for symptoms of malaria and receives antimalarial treatment[2].
- *Probable uncomplicated malaria*: a patient with symptoms of malaria who is prescribed[3] antimalarial treatment, but is not classified as severe malaria.
- *Probable malaria death:* Death of a patient classified as probable severe malaria.

In areas with access to laboratory-based diagnosis:

- *Confirmed severe malaria*: a patient with laboratory confirmation of diagnosis who requires hospitalization for symptoms of severe malaria, or is hospitalized for malaria[2].
- *Confirmed uncomplicated malaria*: a patient with symptoms of malaria with laboratory-based confirmation of diagnosis, who is not classified as severe malaria.

[1] Microscopy, rapid diagnostic test ("dipstick") or other reliable method.

[2] Countries that currently distinguish severe from uncomplicated malaria in their surveillance should continue to do so. Countries reporting complicated malaria only, rather than severe malaria, may continue to do so, using complicated malaria as a substitute for severe malaria. Countries that do not currently make any distinction of severe/complicated malaria in surveillance may use hospitalized malaria as substitute.

[3] The word prescribed is used instead of receives, because the patient is a malaria case irrespective of the presence of antimalarial drugs at the facility where the diagnosis is made. The word prescribe does not necessarily imply the involvement of a medical practitioner.

- *Confirmed malaria death:* death of a patient classified as confirmed severe malaria.
- *Asymptomatic malaria*: A person with no fever or recent history of fever who has a laboratory confirmed parasitaemia.

Definition of auxiliary categories

- *Suspected malaria case:* a patient with symptoms of malaria, who is either prescribed antimalarial treatment without being tested, or examined for malaria with a laboratory-based method.
- *Patient tested for malaria:* a patient with symptoms of malaria, who has a slide or "dipstick" taken and examined[4].

(B) Data items that should be provided annually by each national programme for each geographical unit in the Mekong Region for calculation of all core indicators

Based on the definitions (A), the data items that must be recorded for calculation of the core indicators (C) can be tabulated as follows:

	Data Item	**Comment**
(a)	Mid-year population	Best estimate of real (not administrative) population
(b)	Population at risk of malaria	Nationally applied definition of population at risk should be stated
(c)	No. of suspected malaria cases	
(d)	No. of patients tested for malaria	Slides and rapid diagnostic tests.
(e)	No. of confirmed malaria cases (severe + uncomplicated) (among D)	If many rapid tests: separate reporting
(f)	No. of falciparum malaria cases (among E)	Including *P.f.* mixed with other parasites
(g)	No. of probable malaria cases (severe + uncomplicated) (C – D)	

[4] In programmes that do not use "dipsticks", this figure may be approximately equal to the number of slides examined.

	Data Item	Comment
(h)	No. of severe malaria cases (probable + confirmed)	
(i)	No. of confirmed severe malaria cases (among H)	
(j)	No. of malaria deaths (probable + confirmed)	
(k)	No. of confirmed malaria deaths (among J)	
(l)	No. of asymptomatic patients tested	.
(m)	No. of asymptomatic malaria cases (among L)	Only if active case detection
(n)	No. of asymptomatic falciparum cases (among N)	
(o)	Number of epidemics not timely detected or not controlled	Inform location, time, cases, deaths
(p)	Number of epidemics early detected and controlled	
(q)	Doses of antimalarial drugs distributed	Calculated for each treatment as drug quantity distributed by public system to health facilities/adult dosage. Sum for all treatments.
(r)	No. of nets treated in at least one round	Tally reports from operations
(s)	Average number of persons per net	Survey-based
(t)	Number of persons protected by house spraying	Sum of tallies of persons in each house sprayed

Currently, some programmes will not distinguish how many of the severe cases and deaths are confirmed and how many are probable. In that case, they should only fill in the total number of severe cases and malaria deaths. Some programmes only record confirmed cases, and should show this by filling in for example H = I and J = K. Most of the programmes that include Active Case Detection do not currently distinguish between confirmed malaria cases and asymptomatic carriers. Over time, they are expected to introduce this distinction and fill in L, M and N, instead of including asymptomatic cases under D, E and F.

(C) Core epidemiological and operatio nal indicators

Category	Indicator	Calculation[5]
Incidence	Incidence of probable malaria (uncomplicated + severe)	G/A
	Incidence of confirmed malaria (uncomplicated + severe)	E/A
	Annual Parasite Incidence (confirmed malaria + asymptomatic carriers)	(E + M)/A
	Incidence of falciparum malaria (confirmed falciparum malaria + asymptomatic falciparum carriers)	(F + N)/A
Mortality	Malaria mortality (probable + confirmed)	J/A
Prevalence/ Burden	Slide (test) positivity rate[6] ((confirmed cases + asymptomatic carriers)/(persons tested by slide or "dipstick"))	(E + M)/(D + L)
Severity	Proportion of severe cases (probable + confirmed) among all malaria cases (probable + confirmed)	H/(E + G)
Case fatality	Case fatality rate of severe malaria (probable + confirmed)	J/H
	Case fatality rate of falciparum malaria (confirmed malaria deaths/falciparum cases)	K/F
Disease management	Number of doses of antimalarial treatment distributed by public health system to curative services (public/ private/ community-based)	Q
	Number of suspected malaria cases recorded per year related to at-risk population	C/B
	Number of persons tested by slide or "dipstick" per year related to at-risk population	D/B

[5] From data elements in B. Multipliers (100, 1 000 or 100 000) omitted.

[6] As long as most programmes record few results of rapid diagnostic tests, these can be included in the calculation of the slide positivity rate. However, if a substantial number of rapid diagnostic tests are included, it is preferable to separate a slide positivity rate and a rapid test positivity rate. This is particularly important, if the tests are positive only for *P.falciparum*.

Category	Indicator	Calculation[5]
Prevention	Number of nets treated per year	R
	Proportion of population at risk covered by insecticide-treated nets, or by insecticide treated nets or spraying	R×S/B (R×S + T)/B

Population denominators

For all incidence rates (including mortality), the population denominator is the total mid-year population living in the area covered by the report, including migrants and temporary visitors irrespective of nationality. The population at risk is not a suitable denominator for international reporting of incidence rates, although it is important in malaria control planning and as a denominator for operational indicators.

Rates and ratios

'Incidence' and 'mortality' are used here as meaning reported incidence (morbidity) and mortality rates. Conventionally in malaria control, incidence rates are calculated per 1 000 person-years and mortality rates per 100 000 person-years. Ratios (e.g. case fatality rates) are expressed as percentages.

(D) Recommended geographical units for international malaria reporting in the Mekong Region by country[7]

Country	Geographical unit
Cambodia	Province
China	County
Lao PDR	Province
Myanmar	District
Thailand	Province
Vietnam	Province

Annex 3

WORKPLAN 2000 – 2003 TSN ON TRANSMISSION RISK REDUCTION

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Establishment of regional core groups on TSN -TRR																	
1.1 Identification of core group of experts	Composition of regional TSN-TRR established		→	→													
1.2 Establishment of effective communication links	Communications Established		→	→													
2. Establishment of functional national TSN-TRR																	
2.1 Identification and networking of institutions, organizations, and experts	TSN-TRR functional in each Member Country	→	→	→													
2.2 Development of detailed work plan in each Member Country and annual update of the plan	Work plan developed and updated yearly		→	→													
2.3 Linking with partners for resources	Partners support TSN-TRR		→	→													→
3. Development of regional guidelines on prioritized issues																	
3.1 Monitoring and evaluation of interventions	Guidelines developed			→	→	→											
3.2 Insecticide-treated net programme	Guidelines developed			→	→	→											
3.3 Insecticide policy	Guidelines developed			→	→	→											
3.4 Stratification and selective targeting of house- spraying	Guidelines developed		→	→	→												

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3.5 Vector resistance monitoring and management	Guidelines developed																
3.6 Minimum requirements for health impact assessment of development projects	Guidelines developed																
3.7 Integrated vector control	Guidelines developed																
4. Common framework to initiate action at country level																	
4.1 Mosquito nets																	
4.1.1 Inventorize information on ITN operationalization (standardize parameters, identify knowledge gaps)	Inventory report available																
4.1.2 Formulate evidence-based guidelines for programme implementation (decision-making criteria for ITN purchase, logistics for focused delivery and maintenance)	Guidelines developed																
4.1.3 Set a research agenda and strategy for resource mobilization to implement it	Research conducted																
4.2 Insecticides																	
4.2.1 Review the knowledge base and decision-making procedures for judicious use of pesticides	Knowledge gaps identified																

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4.2.2 Advise on the modalities for the operationalization of selective/integrated approaches with optimal complementarity of chemical and non-chemical TRR interventions	Recommendations provided					▲											
4.2.3 Inventorize regional insecticide resistance and provide guidance on resistance management	Guidelines on insecticides resistance management developed							▲									
4.3 Targeted training																	
4.3.1 Identification of training needs and resources at different levels	Recommendations for training				▲												
4.3.2 Development of curricula, training modules and advocacy and IEC materials	Training materials developed					▲											
4.4 Cytotaxonomy and vector biology (special problems relating to *An. dirus, An. minimus,* and *An. fluviatilis*																	
4.4.1 Complete a regional picture of sibling species and develop a strategic approach to fill knowledge gaps	Knowledge gaps identified and strategy developed							▲									
4.4.2 Coordinate, stimulate and document at least five case studies on ecosystem-based TRR approaches to serve as regional prototypes	Regional prototypes on ecosystem-based TRR approaches developed								▲								

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4.4.3 Develop mapping and possible TRR interventions in dirus/ fluviatilis/minimus settings	Interventions developed				→	→	→	→	→	→	→						
4.5 Monitoring and evaluation																	
4.5.1 Review the regional situation with respect to TRR indicators and their use, and assess the potential to upgrade and/or harmonize indicators	Consensus on core indicators			→	→	→											
4.5.2 Inventorize GIS resources (both health sector/outside the health sector) for ongoing and potential monitoring/ evaluation activities	Inventory of GIS resources			→	→												
4.6 International borders																	
4.6.1 Technically support and assist in the synchronization of field operations in the border areas.	Improved cross-border field operations																
4.6.2 Review and promote experience-sharing of existing mechanisms and partnerships for cross-border collaboration in TRR operations.	Improved cross-border field operations																

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4.7 Health Impact Assessment/Health Risk Management																	
4.7.1 Coordinate national activities (assessments, workshops) to review, adjust and harmonize development policy frameworks to promote HIA/HRM	Recommendations on HIA/HRM					▲											
4.7.2 Adapt existing generic HIA guidelines for specific use at the country level	Local adaptation of generic HIA guidelines										▲						
4.7.3 Set a research agenda on TRR interventions through intersectoral action	Research agenda available					▲									▲		

WORKPLAN 2000– 2003

TSN on SURVEILLANCE, INFORMATION MANAGEMENT AND EPIDEMIC PREPAREDNESS AND RESPONSE

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Networking at country level																	
1.1 Identify institutions and experts that will comprise the TSN-SIE and establish working mechanisms	TSN-SIE in each Member Countries functional			▲													
1.2 Develop detailed country plans based on the generic regional SIE plan and update yearly as necessary	Country plans developed and updated yearly			▲		▲				▲				▲			

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1.3 Linking with partners for resources	Partners support TSN-SIE																
2. Surveillance System																	
2.1 Develop protocol and provide technical assistance in piloting and validating the indicators in selected RBM districts	Finalized set of core indicators																
2.2 Review and if necessary, recommend modification of existing format for reporting of malaria deaths	Modified reporting format in use																
2.3 Develop mechanisms to strengthen hospital-based reporting of malaria deaths (CFR)	Improved reporting of malaria deaths (CFR)																
2.4 Develop strategies to collect malaria data from private sector for incorporation into the surveillance system	Improved coverage and accuracy of surveillance																
3. Information Management																	
3.1 Identify and link up with centres of excellence	Linkage with centres of excellence established																
3.2 Comprehensive needs assessment and planning for computerized information management system	Plan for computerized information management system developed																
3.3 Develop methodology for piloting test parameters in at least one district per country	Methodology developed																
3.4 Develop training modules	Training modules developed																

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3.5 Provide technical assistance in training of personnel on information management	Personnel trained																
4. Epidemic preparedness and response																	
4.1 Determine thresholds for epidemics	Epidemic thresholds established																
4.2 Set up early warning system	Early warning system established																
4.3 Evaluate and improve the early warning system	Early warning system improved																
4.4 Develop guidelines on rapid response team and assist and evaluate its implementation	Rapid response team functional																
5. Information exchange and networking																	
5.1 Identify information needs for sharing	Information needs for sharing identified																
5.2 Publication of SIE information at RBM web site	SIE information available at RBM web site																
5.3 Sharing of RBM experiences through annual regional meetings	SIE network strengthened																
6. Research																	
6.1 Identify priority research needs	Research agenda																
6.2 Develop standardized research proposals	Research proposals developed																
6.3 Conduct priority research	Research conducted																

WORKPLAN 2000– 2003
TSN on DRUG RESISTANCE AND POLICIES

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Establishment of TSN-DRP in member countries																	
1.1 Identification and networking of experts and institutions who will comprise the TSN-DRP	TSN -DRP functional in each Member Countries		→	→													
1.2 Development of detailed country plan of work to be updated yearly	Country plan of work developed		→	→		→				→				→			
1.3 Linking with partners for resources	Partners support TSN-DRP			→		→	→	→	→	→	→	→	→	→	→	→	
2. Data banking and information exchange on:																	
2.1 Directory of national experts relevant to DRP	Directory established			→		→	→	→									
2.2 Drug policies and drug regimens	Drug policies shared			→		→	→	→	→	→	→	→	→	→	→	→	
2.3 Drug resistance data	Data utilized			→		→	→	→	→	→	→	→	→	→	→	→	
2.4 Standardization of the format for reporting and exchange of information	Improved information exchange			→		→	→										
2.5 Activities of the network	Network activities monitored			→		→	→	→	→	→	→	→	→	→	→	→	

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3. Capacity building																	
3.1 Facilitate training professional staff in malaria control programmes and at province/district levels on programme management in the context of anti-malarial drug policy	Key staff trained																
3.2 Train staff on drug resistance monitoring	Improved monitoring of drug resistance																
3.3 Support infrastructure development for monitoring drug resistance	Improved monitoring of drug resistance																
3.4 Build national capacity on anti-malarial drug quality assurance	Drug quality monitored																
4. Procurement and distribution system for anti-malarial drugs and rapid diagnostic tests																	
4.1 Review of existing systems	Recommendations made																
4.2 Explore the feasibility of pooled procurement at regional level	Recommendations made																
4.3 Social marketing to promote the use of affordable and effective anti-malarial drugs and rapid diagnostic tests	Improved access to drugs and RDTs																

Priority Areas and Activities	Expected Outcomes	2000				2001				2002				2003			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
5. Operational research																	
5.1 Setting of research agenda	Research agenda available		↑			↑				↑				↑			
5.2 Review and facilitate research funding	Research funded			↑						↑				↑			
5.3 Conduct operational research	Research conducted			—												↑	
5.4 Develop and evaluate strategies to contain the spread of drug resistance	Containment of drug resistance					↑										↑	