



VECTOR CONTROL IN MALAYSIA

**Consultative Meeting / Workshop On
Management of Vector Control Programs
Siem Reap, Cambodia
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Vector Borne Disease Control Program
Disease Control Division
Ministry Of Health

Introduction: Malaysia

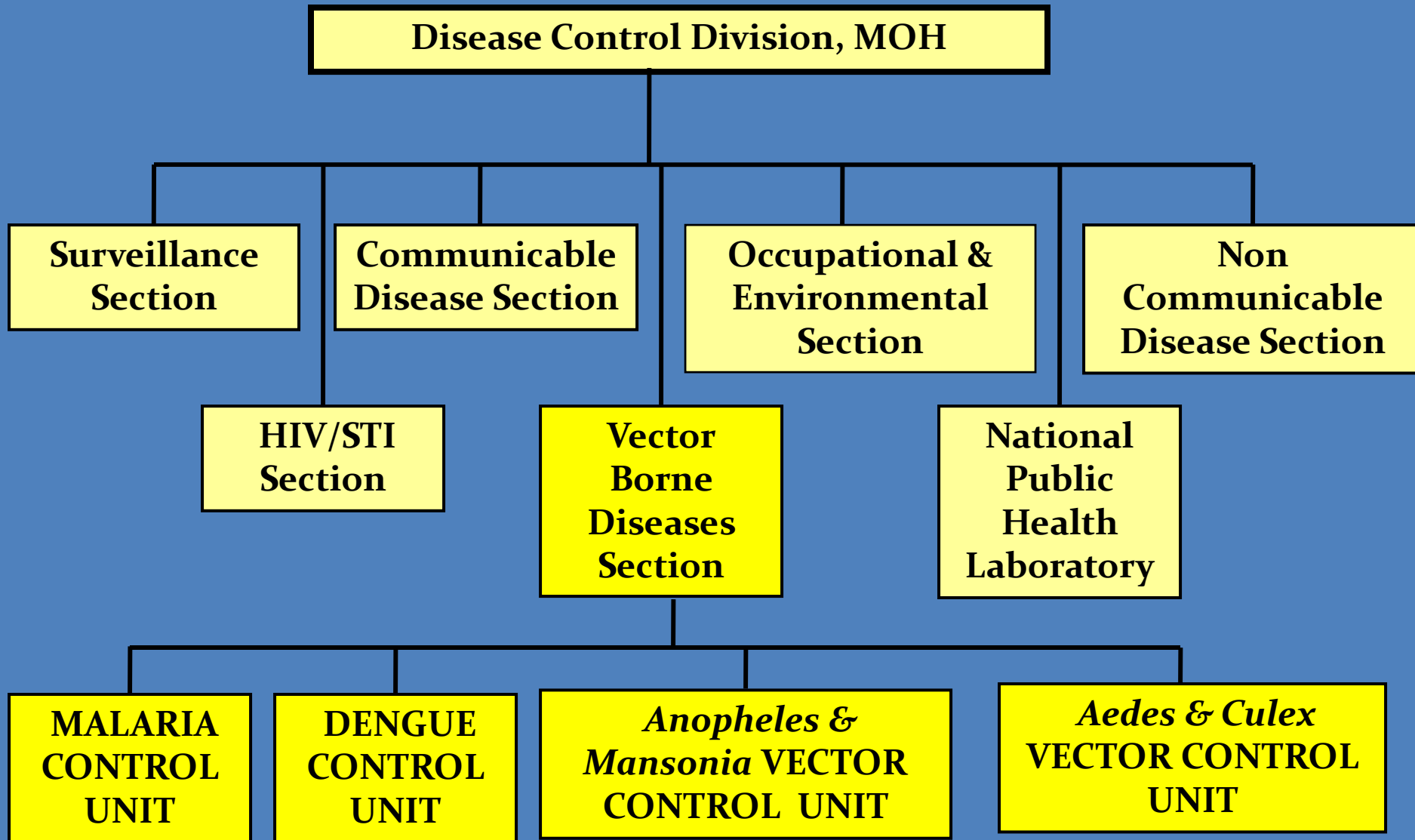
- Area: 329,748 sq. km.
- Terrain: Coastal plains and interior, jungle-covered mountains. The South China Sea separates Peninsular Malaysia from East Malaysia on Borneo.
- Subdivision: 13 States and 3 Federal Territories
- Estimated population: 27.5 million.
- Capital City: Kuala Lumpur
- Government: Federal parliamentary democracy with a constitutional monarch.
- Ethnic Groups: Malay (53.3%), Chinese (26.0%), Indigenous (11.8%), Indian (7.7%), others (1.2%)
- Religions: Islam (60.4%), Buddhism (19.2%), Christianity (9.1%), Hinduism (6.3%), others/none (5.0%)
- Languages: Malay, Chinese, English, Tamil, indigenous.



VECTOR BORNE DISEASE CONTROL PROGRAM

- The Vector Borne Disease Control Program was established in 1983.
- Previous programs;
 - 1967: Malaria Eradication Program in Peninsular Malaysia
 - 1970: Malaria Control Program in Sarawak
 - 1971: Malaria Control Program in Sabah
 - 1980: Malaria Control Program in Peninsular Malaysia
- The Vector Borne Disease Control Program is responsible to control 7 vector borne diseases – Malaria, Dengue, Filariasis, Japanese Encephalitis, Plague, Scrub Typhus, Yellow Fever.

ORGANISATION STRUCTURE FOR MALARIA CONTROL UNIT IN DISEASE CONTROL DIVISION



THE BURDEN OF MAIN VECTOR-BORNE DISEASES

Type of Disease	Prevalence / Incidence	Morbidity/ Mortality
Dengue	Incidence Rate: 180 / 100,000	Case Fatality Rate: 0.2%
Malaria	Incidence Rate: 2.01 / 100,000	Mortality Rate: 0.33
Filariasis	Prevalence: 0.68 / 100,000 population	185 cases detected / No mortality

MOST COMMON VECTOR-BORNE DISEASES

Type of Disease	Peak of Transmission Season	Endemicity	Risk Population
Dengue	June - August		Congested urban areas
Malaria	Peak transmission season	Endemic in certain parts of East Malaysian States of Sabah & Sarawak and the interior areas of Peninsular Malaysia.	2.5 million
Filariasis	Peak transmission season	Microfilaremia rate: 0.14%	1,018,000 population in endemic areas (3.7%)

VECTOR SPECIES

Type of Vector Borne Diseases	Primary and Secondary Vectors	Information on Vector Species		
		Feeding Behavior	Resting Behavior	Adult Larval Ecology
Dengue	<i>Aedes aegypti</i> <i>Aedes albopictus</i>	Peak biting: Dawn & dusk.	Rest indoor & outdoor (vegetation / foliage)	Clean & clear stagnant water in natural & artificial receptacles.
Malaria	<i>Anopheles maculatus</i>	Zoophilic Exophagic	Exophilic	Slow flowing clean clear water exposed to sunlight (seepages).
	<i>An balabacencis</i>	Zoophilic Exophagic	Exophilic	Small pools of muddy water in the forest & periphery
	<i>An latens</i>	Simio-anthropagic	Exophilic	Small pools of muddy water in the forest & periphery

VECTOR SPECIES

Type of Vector Borne Diseases	Primary and Secondary Vectors	Information on Vector Species		
		Feeding Behavior	Resting Behavior	Adult Larval Ecology
Malaria	<i>An sundaicus</i>	Zoophilic Exophalic	Exophilic	Coastal / Brackish water
	<i>An letifer</i>	Zoophilic Exophagic	Exophilic	Stagnant, somewhat acidic water, usually in shade
	<i>An donaldi</i>	Zoophilic Exophagic	Exophilic	Stagnant pools, edge of forest
	<i>An campestris</i>	Anthropophagic Endophagic	Endophilic	Still fresh water - rice fields, marshes, drains

VECTOR SPECIES

Type of Vector Borne Diseases	Primary and Secondary Vectors	Information on Vector Species		
		Feeding Behavior	Resting Behavior	Adult Larval Ecology
Filariasis	<i>Mansonia uniformis</i>	Exophagic & Zoophilic. Biting starts immediately after dust.	Exophilic	Open ponds & swamps with floating and emergent vegetation.
	<i>Mansonia bonnea</i> <i>Mansonia dives</i>	Zoophilic Exophagic	Exophilic	Swamp forest breeders

CHEMICAL CONTROL

Type of Disease	Intervention	Quantity of Chemicals Used	Type of Spraying	Frequency of Application
MALARIA	IRS	Deltamethrine WP – 7,500 kg. Lambda-cyhalothrin WP – 1,200 kg	Residual spraying	6 monthly
	ITN	Deltamethrine SC – 8,000 liter Lambda-cyhalothrin EC – 3,000 liter		6 monthly re-treatment of nets.
	Larviciding (Anti-Larval Urban Malaria Free Areas & outbreak areas)	Temephos EC – 1,000 liter		weekly

CHEMICAL CONTROL

Type of Disease	Intervention	Quantity of Chemicals Used	Type of Spraying	Frequency of Application
DENGUE	ADULT CONTROL Space Spraying (Outbreaks)	Permethrin EC – 20,000 liter Permethrin EW – 10,000 liter Malathion TG – 15,000 liter	Space spraying	2 cycle of space spraying for every case notified Preventive
	Larviciding	Temephos SG – 11,000kg Bti WG	Direct application Misting	3 monthly (Temephos SG 1%) Biweekly (Bti)

OTHER VECTOR CONTROL METHODS

Type of Diseases	Environmental Management		Biological Control	
	Indicate Importance (Major or Minor)	Responsible for Implementation	Operational	Experimental
Malaria	<p>Minor</p> <p>Environmental manipulation Environmental modification</p>	Malaria Vector Control Unit		<i>Bacillus thuringiensis israelensis</i>
Dengue	<p>Major</p> <p>Source reduction through community participation – clean up campaign</p>	Dengue Vector Control Unit / Community Committee	<i>Bacillus thuringiensis israelensis</i>	

Supervision Carried Out To Monitor Efficacy Of Intervention

Type of Disease	Type of Efficacy Monitoring	Indicators
Malaria	Bioassay IRS / ITN	% mortality of test specimen
	Direct supervision	
Dengue	Bioassay of space spraying	% mortality of test specimen
	Ovitrap Monitoring	% of ovitrap positive.
	Quality Surveillance	% of re-inspected premise with positive 4 th Instar <i>Aedes</i> larvae.
	Direct Supervision	

VECTOR CONTROL POLICY

Type of Disease	Vector Control Policy Available	Vector Control Policy Guidelines
Malaria	Vector control measures implemented in malaria stratified areas. Mosquito nets distributed free to high risk local population and in outbreak areas. Elimination of <i>Anopheles</i> vector breeding in urban areas	Guideline on IRS / ITN Guideline on Insecticide Usage in Malaria Control
Dengue	Vector control action taken for notified case Preventive action through elimination of breeding	Guideline on Space Spraying

VECTOR CONTROL POLICY

Type of Disease	Ranking Based On National Priority	Budget Allocation
Dengue	1	2008 budget allocation for Disease Control Division is RM56 million (US\$17 million)
Malaria	2	States Budget: US\$10 million
Filariasis	3	US\$3 – 4 million used for purchase of insecticides
Japanese Encephalitis	4	
Other vector borne diseases	5	

FINANCIAL SUPPORT

- The federal government allocated budget for the purchase of insecticides annually.
- Application equipments are purchase by the government and are adequate.
 - Compression sprayer
 - Portable thermal fogger
 - Vehicle mounted ULV machine
 - Mist blower
- Adequate funds are provided for implementation of vector control operations and for monitoring and evaluation of vector control activities.
- Kuala Lumpur City Hall & a number of City Councils / Municipalities finance their own vector control activities.

SUPERVISION, MONITORING & EVALUATION

- Supervision of vector control activities are carried out by supervisory & technical personnel – Scientific Officer (Entomology), Assistance Environmental Health Officers (AEHO), Senior Public Health Assistant (SPHA), etc.
- State Entomological Teams conduct entomological studies during outbreaks and surveillance activities.
- The districts can request entomological studies to be carried out if the needs arises (outbreaks).

SUPERVISION, MONITORING & EVALUATION

- Data on vector control activities collected were shared through weekly, monthly, quarterly and half yearly returns. (District → State → National) →
- Operation Room are operational during outbreaks. At the Ministry level monitoring the control activities is from the “The Crisis Preparedness and Response Centre”.
- Data on control activities are monitored, analyzed and evaluated daily at the operation room at all levels until the outbreak is over.
- Officers of VBDCP were required to supervise outbreak control activities in the field to ensure these activities were carried effectively and efficiently.

GAPS BETWEEN POLICY & IMPLEMENTATION

MALARIA VECTOR CONTROL

- Specified vector control measures implemented in stratified malaria areas
 - IRS
 - ITN
 - Larviciding
- Elimination of *Anopheles* vector breeding in urban areas
- IRS strategy implemented in all malarious areas. Achievement for 6 monthly cycle is more than 90%
- The use of ITN strategy implemented in malarious areas. Re-treatment of the nets and replacement achievement ranges from 50% - 90%.
- Many of the anti larval drainage system have been destroyed by development and not replaced.

REGULATORY POLICIES

- The Pesticides Act, 1974 is the principal legislation for the regulation of the pesticide industry.
- Pesticides Board is the National Regulatory Body for the use of pesticides.
- Registration of public health insecticides will be decided by the Pesticides Board
 - *Pesticides (Registration) Rules 2005*
- Regulations for storage, distribution and sales of public health insecticides are regulated as prescribes in the Pesticide Act.
 - *Pesticides (Licensing For Sale And Storage For Sale) Rules 1988*

QUALITY CONTROL & ASSURANCE

- There are Government and private laboratories that are available to conduct evaluation of the active ingredient of insecticides to ensure the quality with the specified standards.
 - National Poison Centre, University of Science
 - Pesticides Laboratory, Division Of Pesticide Control, Department of Agriculture.
- Registered public health insecticides are available for used.
 - Licensed pest control operators which provide vector control services (public, construction sites, etc.)
 - public

PREVENTION & EXPOSURE TO INSECTICIDES

- Storage facilities are provided at all levels (federal, state & district) to safely and securely stored insecticides.
- However, in a few districts & sectors, due to lack of available building space, there are situations whereby these insecticides are place within the work place of the personnel.
- Training in safe handling of insecticides were conducted for VBDCP personnel. Guidelines on the safe use of insecticides were made available.
- Protective clothing and equipment are supplied to personnel handling chemicals (mixing, applying, etc).

THANK YOU