

Delhi

- Development of an action plan for mosquito control
- Production of health education materials for distribution to the field units and other organisations
- Investigation of malaria outbreaks, situation analysis in different parts of the country, and evaluation of different malaria control activities of NVBDCP
- Coordination of the work of IDVC project with field units, ICMR and other organisations

Background

Delhi unit of IDVC was created in 1987 to examine the problem of mosquito nuisance in urban slums of Delhi and for coordinating the activities of all field units located in different parts of the country. The audio-visual unit was established for production of health education materials for distribution to the field units and other organisations. The staff of IDVC deployed at Delhi was also assigned investigation of malaria outbreaks, situation analysis in different parts of the country, evaluation of different malaria control activities of NVBDCP and production of health education material.

The IDVC project was reviewed at 6-monthly intervals by a high power committee. National and international reviews were organised. This required collation of data from all the field stations, preparation of quarterly, six monthly and annual reports, preparation of presentation material and laboratory back up. In addition, Delhi unit was also responsible for administrative and financial matters of the IDVC project including submitting reports to ICMR, Ministry of Health and other organizations.

Activities, Progress and Achievements

Major activities carried out

- Surveyed mosquito menace in Delhi slums and developed action plan for mosquito control.
- Situation analysis of malaria under Roll Back Malaria programme of WHO was studied in Aizawl (Mizoram), Goa, Jodhpur (Rajasthan), Keonjhar (Orissa) and Tumkur (Karnataka).
- Situation analysis of malaria was undertaken in Ghaziabad (U.P.), Patiala, Faridkot (Punjab), and Gadchiroli (Maharashtra).
- Evaluation was done of different insecticides for indoor residual spraying and impregnation of bednets and curtains, larvicides and biolarvicides, and repellents (Figs. 1– 4).
- Malaria outbreaks were investigated at various places such as in Jodhpur (Rajasthan), Gurgaon (Haryana), Visakhapatnam (Andhra Pradesh), Bahraich and Ghaziabad (U.P.), and reports were submitted to NVBDCP.
- The Malaria clinic at 2 Nanak Enclave premises in Delhi provided support in early case detection and treatment. Hospitals/nursing homes/private practitioners also referred cases to this clinic. In addition to providing services, the clinic served as a resource for epidemiological, parasitological and clinical research and clinical drug trials.
- Evaluated the national programme like use of larvivorous fish in Delhi and Kota (Rajasthan) and ITNs in Assam, Meghalaya, Durg (Jharkhand) and Andhra Pradesh.

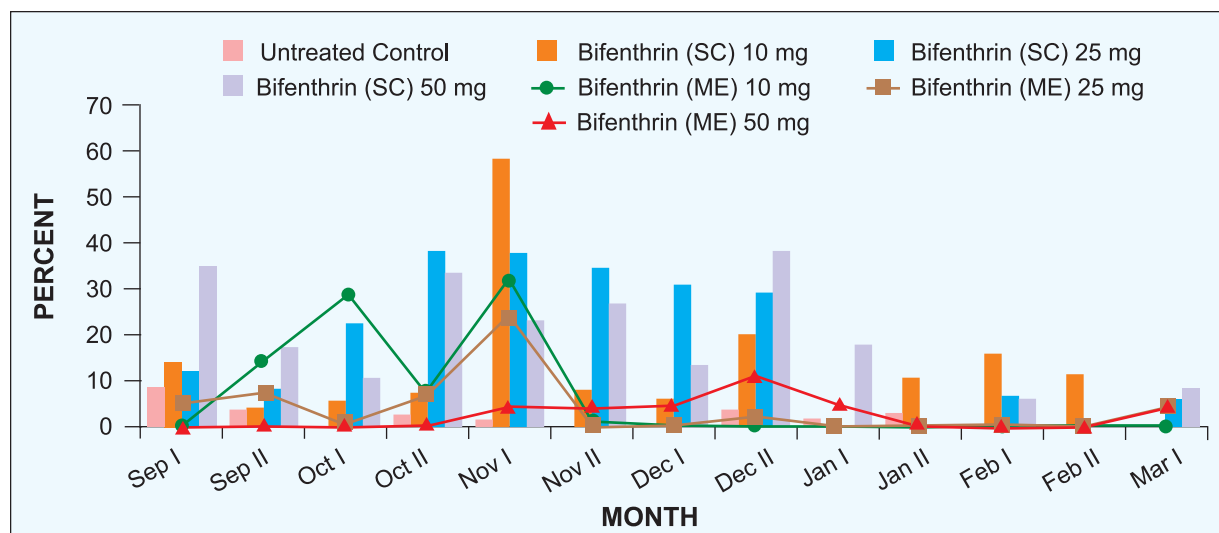


Fig. 1: Excito-repellency in mosquitoes with nets impregnated with different formulations of bifenthrin

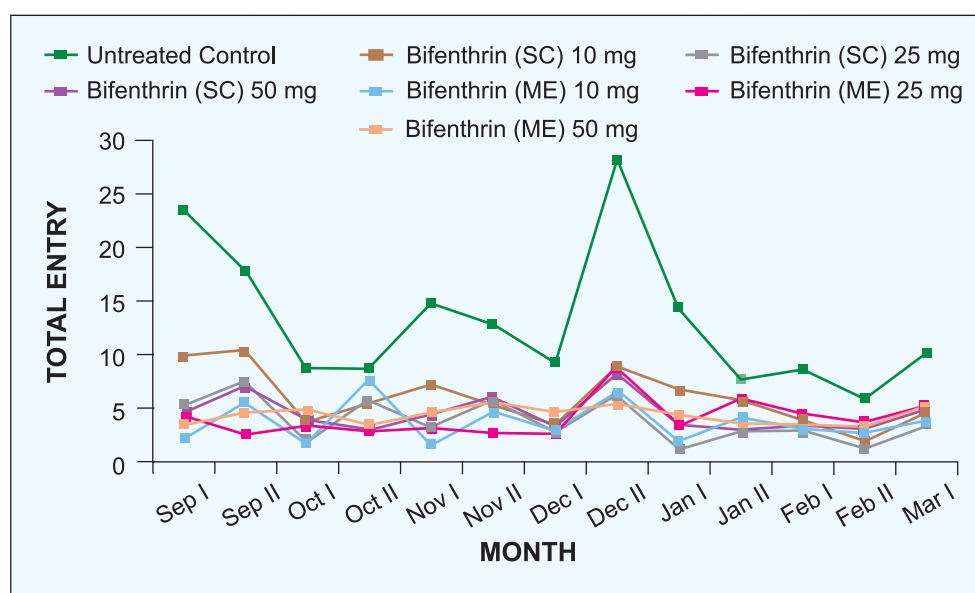


Fig. 2: Total entry of mosquitoes into the habitats with bifenthrin-treated nets and control nets during the intervention period

Field evaluation of deltamethrin against *An. culicifacies*

An. culicifacies, responsible for bulk of malaria transmission in rural areas, has become resistant to conventional insecticides—DDT, HCH and malathion in most parts of the country. To control double or triple resistant *An. culicifacies*, new insecticides namely synthetic pyrethroids have been introduced for indoor residual spraying and also for impregnation of mosquito nets. The first trial of a synthetic pyrethroid by indoor residual spraying was carried out in some villages of

PHC Razapur of District Ghaziabad in U.P. Deltamethrin wettable powder formulation (2.5%) was sprayed in three doses—12.5 mg/m² (3 rounds), 20 and 25 mg/m² (2 rounds each). One section in Dadri PHC located at a distance of 22 km away from this area was taken as control, where three rounds of HCH were sprayed @ 200 mg/m². Deltamethrin was sprayed indoors for three years. Results revealed that spraying deltamethrin @ 25 mg/m² resulted in drastic reduction of DDT and HCH resistant *An. culicifacies* and other anophelines (Fig. 5) and caused interruption of malaria transmission (Fig. 6).

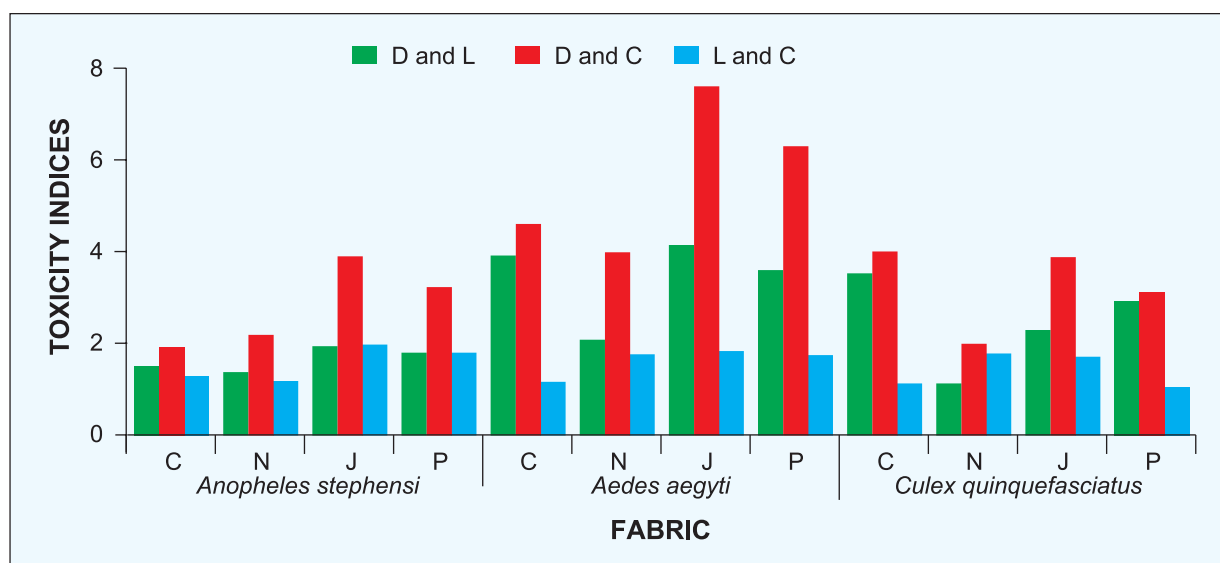


Fig. 3: Relative toxicity indices on different fabrics treated with deltamethrin (D), lambda-cyhalothrin (L) and cyfluthrin (C); (C: Cotton, N: Nylon, J: Jute, and P: Polyethylene)

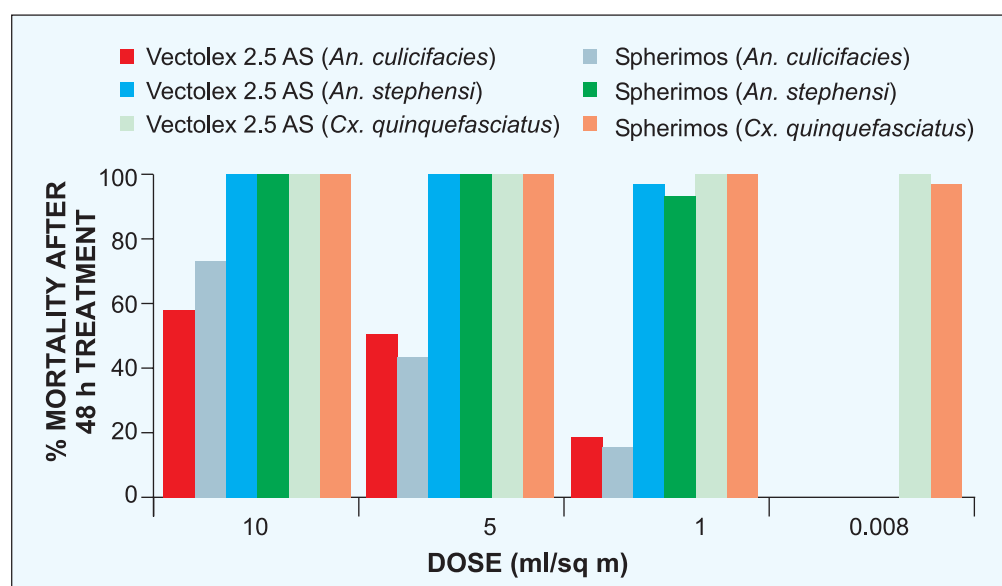


Fig. 4: Laboratory evaluation of *B. sphaericus* 2362 flowable formulations against mosquito larvae

Health education material produced

Several manuals for health personnel, a mosquito identification key, brochures, folders, pamphlets for creating awareness in the scientific community as well as for general purpose were published by the Audio Visual Unit. A series of folders on "Bioenvironmental control of malaria: A Holistic Approach", in Assamese, Gujarati, Oriya and Tamil were brought out to encourage the community for effective malaria control. The titles of various publications are listed below.

(a) Booklets

1. Larvivorous Fishes in Mosquito Control (1995)
2. National Malaria Control Strategy (Revised edition, 1996)
3. 7-Point Action Plan for Malaria Control in Urban Areas (1996)
4. Pyrethroid Impregnated Mosquito Nets: Protection from Mosquitoes and Malaria (1996)
5. Biolarvicides (*Bacillus thuringiensis* var *israelensis* Serotype H-14)

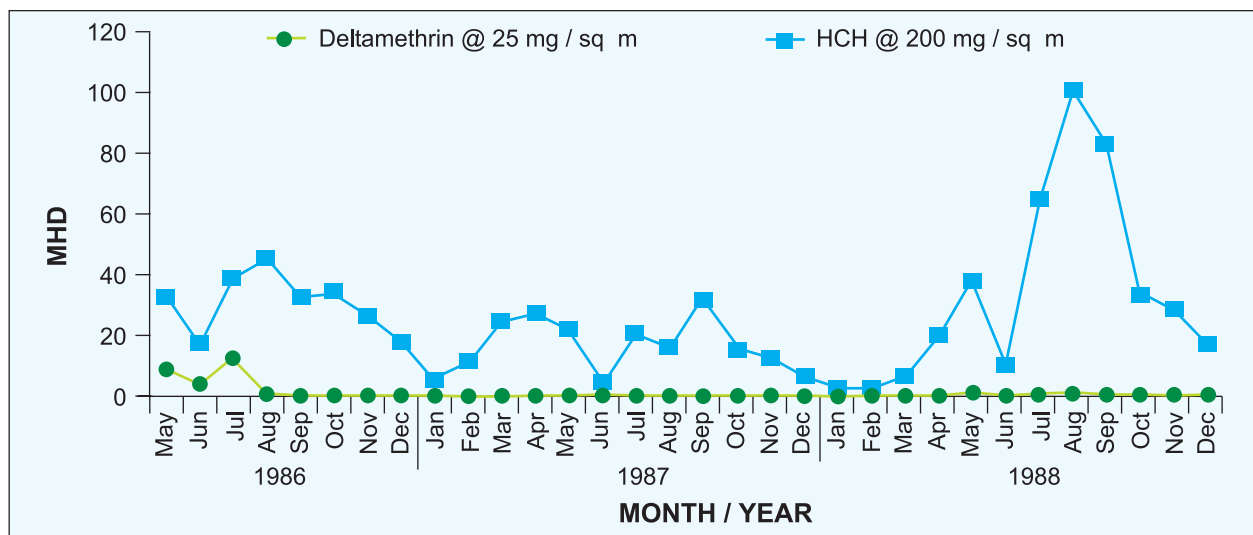


Fig. 5: Impact of deltamethrin indoor residual spraying on *An. culicifacies*

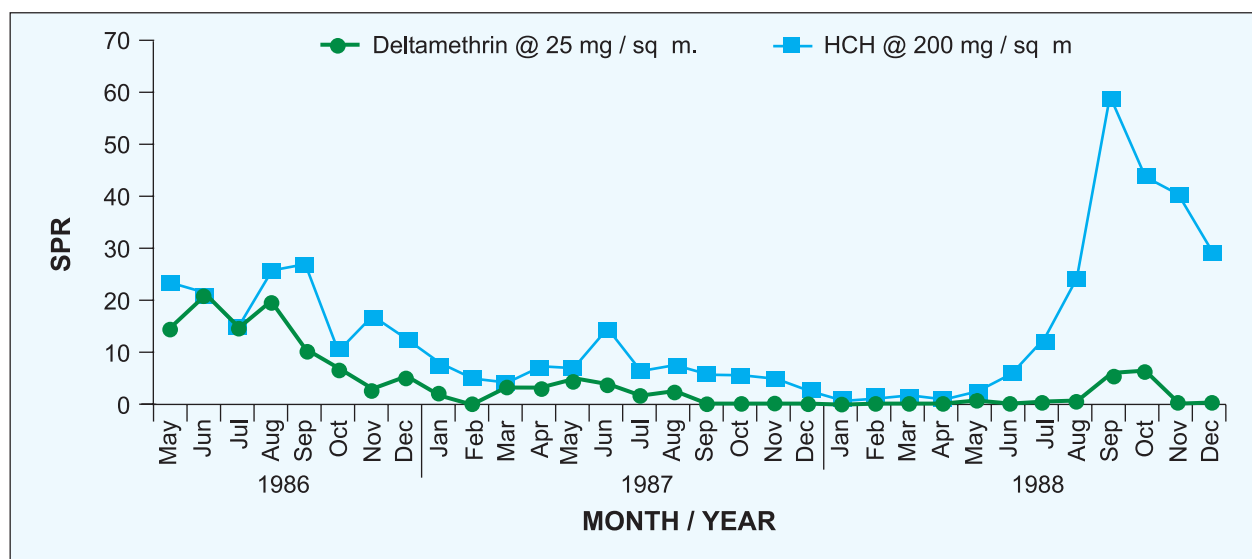


Fig. 6: Impact of deltamethrin indoor residual spraying on slide positivity rate

6. Malaria Diagnosis and Treatment
7. Insecticide Impregnated Bednets

(b) Folders

1. National Malaria Control Strategy (1995)
2. Bioenvironmental Control of Malaria: A Holistic Approach (1995)
3. Malaria Ki Roktham, Ek Anootha Prayog (1995)
4. Bioenvironmental Control of Malaria in Shankargarh (1995)
5. Malaria Education Campaign for School Children (1996)
6. Expanded Polystyrene (EPS) Beads to Control Mosquito Breeding (1996)

7. Insecticide Spray Strategy for the Control of *An. culicifacies*, the Rural Malaria Vector (1996)
8. Neem Oil: Mosquito Repellent and Larvicide (1996)
9. Major Vectors of Malaria in India (1996)
10. Biological Control of Mosquitoes for Prevention of Malaria (1996)
11. Quick Identification Key for Indian Anophelines (1996)

(c) Flyers

1. *Malaria Ki Roktham: Assan Tarike* (Hindi edition) (1996)
2. *Save Yourself from Malaria* (2001)

3. Malaria se Bachiye (Hindi, 2001)

(d) Coloured biological charts

1. Life-cycle of *Plasmodium falciparum* (1995)
2. Life-cycle of *Plasmodium vivax* (1995)
3. Life-cycle of *Plasmodium malariae* (1995)
4. Fever Periodicity in Malaria Infection (1995)
5. Differences between various Developmental Stages of *Anopheles*, *Aedes* and *Culex* Mosquitoes

(e) Brochures

1. Malaria Research Centre: Mandate, Achievements, Opportunities (2003)
2. Malaria Anusandhan Kendra: Uddeshya - Uplabdhan—Avsar (Hindi, 2003)

(f) Video films produced

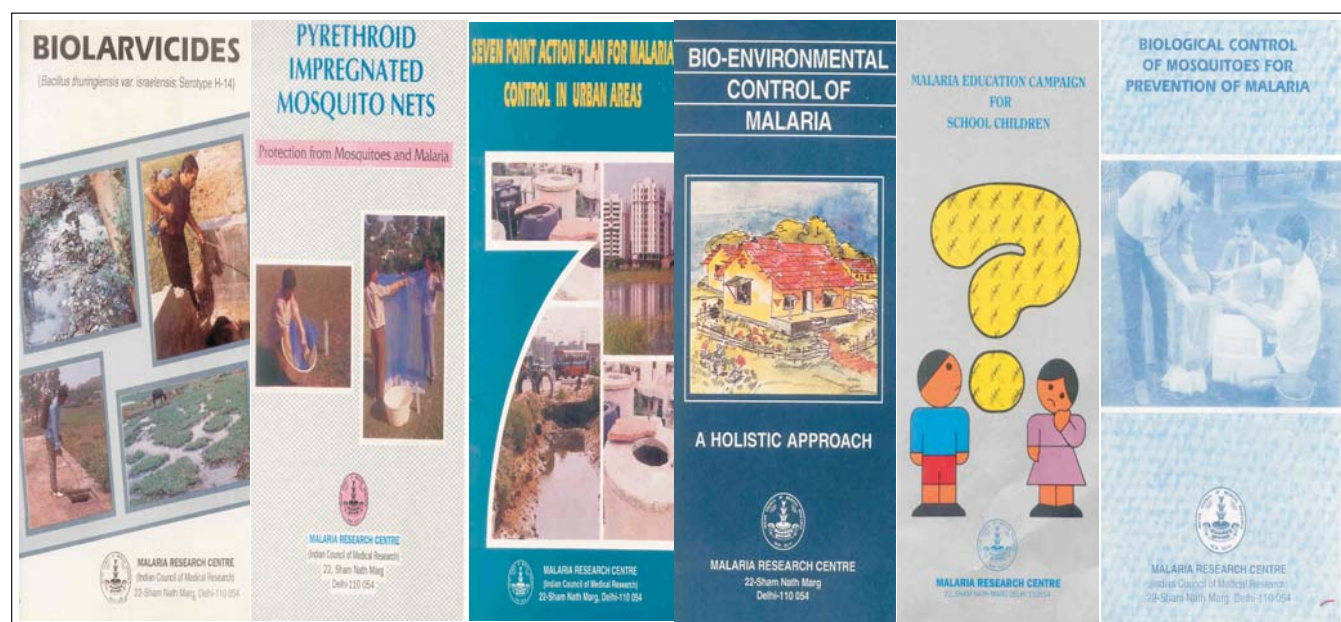
Documentaries

1. Fighting Malaria (English) (2000) Duration—18'
2. Malaria Control in Shahjahanpur (English) (6003) 14' 47"
3. Malaria Control in Shahjahanpur (Hindi) (6001) 14' 47"
4. Defeating the Invincible – Hardwar (English) (6004) 22'
5. A Seven Point Action Programme for Malaria Control in Madras (English) (2010) 17' 27"

6. A Seven Point Action Programme for Malaria Control in Madras (Tamil) (2208) 17' 6"
7. Tackling Malaria in Orissa (English) (2011) 16' 17"
8. Insecticide Impregnated Bednets for Malaria Control (Assamese) (2008) 19' 39"
9. Insecticide Impregnated Bednets for Malaria Control (English) (2006) 19' 39"
10. Insecticide Impregnated Bednets for Malaria Control (Hindi) (2061) 19' 39"
11. Man-made Malaria (English) (2002) 12' 20"
12. Sirf Ek Muskan (Hindi) (2018) 17' 12"
13. Ek Anootha Prayog (Hindi) (2003) 19' 51"
14. Malaria Control in Madras (English) (2153) 11' 37"
15. Man, Mines and Malaria (English) (2018) 7' 37"
16. Mosquito Menace (English) (6049) 30' 29"
17. Mosquito and the Neem (English) (3015) 15' 49"
18. Konkan Railways – No Ticket for Mosquitoes (English) (3096) 14"

Teaching material

1. Lifecycle of Malaria Parasite (English) (2247) 11'
2. The Microscope (English) (2240) 14' 49"
3. How to Treat Uncomplicated Malaria (English) (6045) 25' 58"
4. Cerebral Malaria (English) (2200) 8' 57"
5. Malaria in Pregnancy (English) (6060) 23'
6. Laboratory Diagnosis of Malaria (English) (6060) 29' 53"



7. Morphology of Mosquitoes (English) (2474) 16'
8. Breeding Sites of Mosquitoes (English)(2533) 10''

Health education

1. Malaria—Bednets a TV Spot (Hindi) (2013) 56''
2. Malaria—Bednets a TV Spot (English) (2072) 1' 2''
3. Malaria—Spread the Knowledge (English) (2071) 7' 23''
4. Malaria—Mukti Pavoo (Hindi) (2236) 5' 9''
5. Malaria—Arivay Parappivoo (Tamil) (2214) 7' 10''
6. Malaria—Gnanava Haradona (Kannada) (2261) 9' 15''
7. Malaria—Overhead Tanks and Malaria Control— A TV Spot (Tamil) (2282) 1' 18''

Scientific discussions

1. Synthetic Malaria Vaccine: A Hope for Future (English) (2121) 15' 6''
2. Malaria Vaccine: A Perspective (English) (2204) 18' 57''
3. Malaria Vaccine: A State of Art (English) (2122) 17' 38''
4. Malaria Vaccine: Status and Future Prospect (English) (2211) 19' 26''
5. Dengue Fever (Hindi) (2421) 7' 52''
6. Dengue Bukhar (2422) 3' 32''
7. M-10, A New Environment Friendly Insecticide for Disease Vector Control (English) (2212) 16' 46''
8. Global Malaria Control—An Approach Plan (English) (2275) 21' 28''
9. Chelating Agent in Severe Malaria (2140) 17' 45''

