



 VECTOR BIOLOGY & CONTROL

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FIELD REPORT

WORKSHOP ON INTEGRATED PEST MANAGEMENT
OF VECTOR MOSQUITOES WITH EMPHASIS ON URBAN
SETTINGS AND COMMUNITY PARTICIPATION
AND REVIEW OF SOME VECTOR CONTROL ACTIVITIES
IN LAE AND PORT MORESBY, PAPUA NEW GUINEA

by

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and

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AR-067

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EXECUTIVE SUMMARY

In collaboration with the Papua New Guinea Department of Health and the World Health Organization, VBC Vector Biologist, Lawrence Lacey, and VBC consultant, Mark Goettel, designed, implemented and participated in a USAID-sponsored week long workshop on alternative methods of vector control with emphasis on community participation. The various areas covered by the workshop included: (1) comprehensive vector control concepts; (2) use of larvicides and adulticides; (3) personal protection with emphasis on impregnated bed nets; (4) environmental management; (5) biological control (predators and pathogens); (6) involvement of the community; and (7) entomological surveillance and evaluation.

Following the workshop, visits were made to the National Capitol District and Lae City to review integrated vector control efforts. Following field visits, various recommendations were made. Both programs would benefit from routine entomological surveillance and comprehensive evaluation of their control efforts. Suspension of routine adulticiding would save money and permit more effective use of the time spent in this effort.

I. WORKSHOP ON IPM OF VECTOR MOSQUITOES WITH EMPHASIS ON URBAN
SETTINGS AND COMMUNITY PARTICIPATION

July 4-8, 1988
CAHS - MADANG

A. Background

During a visit of VBC Vector Biologist, Dr. L.A. Lacey, to Papua New Guinea (PNG) in May 1987, discussions were held with Drs. Reilly, Pyakalyia, and Dulay regarding possible technical assistance from the A.I.D. Vector Biology & Control (VBC) Project. Based on a review of current and proposed control activities, it was felt that a workshop on methods used for integrated control of vector mosquitoes with emphasis on community participation would be useful. Through the efforts of Dr. Reilly, personnel in the PNG Division of Primary Health Services, notably Drs. Pyakalyia and Dulay, and Mr. Habash (WHO), and with the support of USAID, through the office of Dr. Pat Lowry (USAID/Suva) and the VBC Project, the workshop was conducted in Madang at the College of Allied Health Sciences from July 4-8, 1988. Twenty-two participants and seven instructors/facilitators were in attendance (Annex 1).

1. Sunday, July 3

Arrival of participants at the Administrative College,
Madang

2. Monday, July 4

8:00 - 8:30	Registration of participants	
8:30 - 9:00	Welcome participants in Audio Visual Room of the School of Allied Health and Science, Madang	Dean CAHS
9:00 - 9:30	Opening speech of workshop	Dr. Pyakalyia
9:30 - 10:00	Coffee Break	
10:00 - 11:00	Introduction of Vector-borne Disease in PNG (history and current situation)	Dr. Dulay
11:00 - 12:00	Comprehensive Vector Control or Integrated Pest Management (IPM) concept; introduction to IPM components, definitions, and	

philosophy; including background
on required entomological
studies and experiences in
other countries

Dr. Lacey

12:00 - 1:30 Lunch Break

1:30 - 2:30 Film V.C.

Mr. Habash

2:30 - 3:00 Coffee Break

3:00 - 4:00 Training video, mosquito
control

Dr. Lacey

3. Tuesday, July 5

8:00 - 10:00 Chemical insecticides,
efficacy, limitations,
environmental impact,
equipment requirements
and cost

Dr. Goettel/
Dr. Lacey

a. Adulticides (other than
residual spraying) application
technique: fogging, ULV ground
and aerial

b. Larvicides conventional
insecticides, insect growth
regulators, miscellaneous
(monomolecular films, etc.)

c. Personal protection

1. Repellents including
coils
2. Zooprophylaxis
3. Toxicants

10:00 - 10:30 Coffee Break

10:30 - 4:00 a. Treating clothing
b. Treating bed nets, planning
requirements, measuring,
etc.

c. Treating curtains, etc.

d. Evaluation methods

Mr. Habash/
Dr. Dulay

4. Wednesday, July 6

8:00 - 12:00 Visit a village for mosquito
net treatment

Mr. Habash/
Dr. Lacey

- 12:30 - 1:30 Lunch Break
- 1:30 - 2:30 Cultural control-environmental management, source reduction, ditching, clearing, water management, irrigation Mr. Habash
- 2:30 - 3:00 Coffee Break
- 3:00 - 4:00 Biological control
- a. Predators including Toxorhynchites mosquitoes and larvivorous fish Mr. Habash
5. Thursday, July 7
- 8:00 - 12:00 Visit to the biological control, larvivorous fish pond Mr. Habash/
Dr. Lacey
- 1:00 - 4:00 Practical microbial control Dr. Lacey/
Dr. Goettel/
Dr. Stafford
6. Friday, July 8
- 8:00 - 10:00 Community participation, development of health education strategy to enhance public awareness and encourage participation; use of various media; production of public education materials Dr. Galowa/
Dr. Goettel
- 10:00 - 10:30 Coffee Break
- 10:30 - 12:00 Evaluation of intervention methods, larval and adult sampling and surveillance Dr. Lacey/
Dr. Goettel
- 12:00 - 1:00 Lunch Break
- 1:30 - 2:30 Evaluation of workshop and discussion All
- 3:00 Closing of workshop

B. The Workshop Agenda

After the workshop was called to order by Dr. Dulay, the consultants were welcomed to the College of Allied Health Sciences in Madang, by Mr. Salis, assistant dean of the college. The opening speech of the workshop was presented by Dr. Pyakalyia, PNG Assistant Secretary of Health, Disease Control (see Annex 2). He emphasized the need for development of alternatives to residual wall spraying for control of vector mosquitoes. The involvement of community participation in these efforts will be a key ingredient to successful vector control. He requested that the workshop also produce recommendations for the evaluation of control programs so that provinces or communities can monitor the level of public awareness and involvement. His speech and the objectives of PNG vector and malaria control are given in Annex 2.

Dr. Dulay opened the technical portion of the workshop by presenting background information on vector-borne disease and its control in PNG with emphasis on malaria. Although there is filariasis and dengue in PNG, malaria continues to be the most important of the vector-borne diseases. The country has various levels of endemicity (hypo-, meso-, and hyperendemic). Spleen and slide positivity rates are used for overall measurement of the prevalence and incidence of the disease. There is an increasing rise in the percentage of Plasmodium falciparum incidence (up to 79%).

The objectives of malaria control in PNG are:

1. Reduce or eliminate death
2. Prevent or reduce the number of severe cases
3. Shorten the period of suffering
4. Lower the overall incidence

Next, Dr. Lacey presented an introduction to the Integrated Pest Management concept. The various components of IPM that pertain to vector mosquito control were presented (Environmental Management, Personal Protection and Biological Control). It was emphasized that the IPM approach was an ecologically based strategy that relied not only on the interventions employed but also on the preservation of natural mortality factors. An in-depth background of the ecology and behavior of the larval and adult stages of the target vector are of paramount importance for optimal results of the IPM approach. Examples of the successful use of integrated methods for mosquito control in the U.S.A., India, Cuba, Panama, Singapore and the Tuvalu Republic were presented.

During the afternoon of the first day of the workshop, Mr. Habash presented video films on vector control and the use and benefits of impregnated bed nets for malaria control.

The morning of the second day was used to present background information on the use of nonresidual insecticides for control of larval and adult mosquitoes. Their efficacy, limitations and environmental impact were reviewed. One of the major problems experienced with insecticides, the development of resistance, was covered by Dr. Goettel. Larvicides, formulations used, class of larvicides (including conventional chemicals and Insect Growth Regulators), and when their use is appropriate was also covered by Dr. Goettel. Dr. Lacey presented background information on the use of adulticides, equipment used for application, and the benefits and limitations of this type of control. It was emphasized that ULV and fog applications of insecticides for control of mosquitoes has the benefit of rapid reduction of adult mosquito populations during an epidemic, but reductions are evanescent without concomitant source reduction.

Background on the use of repellents, repellent and/or toxicant treated clothing and zooprophylaxis for relief from pestiferous and vector mosquitoes was given by Dr. Lacey. Repellents can provide temporary protection, but they are not recommended for long term use. Use as supplements to other interventions was discussed.

The remainder of the day was used by Mr. Habash and Dr. Dulay to provide background on the treatment of bed nets (calculation of amount of active ingredient and impregnation of nets). In addition to the protection from malaria afforded by the nets, they also provide initial control of head lice and household insects.

Day three was spent in a small village, Busip (80 houses), approximately 120 km northwest of Madang. Bed nets were dipped and dried by the participants and distributed to the residents. Background information, in addition to that already received earlier by the inhabitants, was presented on the benefits of the nets. A mass blood survey was taken on all children.

On the fourth day of the workshop, a brief but concise background on the use of environmental management (source reduction, cleaning, ditching), and the use of fish for mosquito control was given by Mr. Habash. Supplementary to this, Dr. Goettel discussed the use of Toxorhynchites amboinensis for control of Aedes aegypti in Fiji. This session was followed by a short field visit to ponds containing Gambusia affinis in and around Madang.

The afternoon was devoted to presentations and demonstrations on the use of microbial control agents for control of mosquito larvae. The biological background, advantages, and disadvantages of bacteria and fungi were presented by Drs. Lacey and Goettel. Plot design, calculation and timing of application rates, and entomological evaluation of microbial agents was presented by Dr. Lacey.

Dr. Stafford presented information on the production of microbial control agents by Abbott Laboratories and demonstrated their efficacy against locally collected anopheline larvae.

The final day of the workshop started with presentations by Mr. Galowa, Mr. Dawana and Dr. Goettel on community participation. Elements of involving the community in control efforts included: (1) development of a health education strategy to enhance public awareness of vector-borne disease; (2) use of media and school programs to involve the public; (3) production of public health education materials; and (4) demonstration of benefit (health and economic) to the public.

Surveillance (larvae and adults) and methods of sampling used for evaluation of interventions were presented by Drs. Goettel and Lacey. Trapping methods, using baited and unbaited traps, human biting catches, egg and larval survey methods were covered.

After lunch, an evaluation form was given to the participants for their comments and criticisms. The workshop was formally closed by Mr. Salis. Responses from the questionnaire indicated variable impact of the workshop on the participants. Most called for more time devoted to practical considerations. All participants thought the idea of a follow-up workshop was worthwhile. Several requested a longer workshop. Most participants rated the workshop as "good" and all indicated that they received some benefit.

C. Recommendations

1. Future workshops should devote more time to hands-on demonstrations, and to the basic essentials of the practical aspects of integrated vector control. Smaller groups of individuals taught in their own districts would result in better retention and use of subject matter.
2. Future workshops should include more speakers from PNG. Participants of the present workshop with knowledge on the practical considerations of the use of fish, larvi-

cides, and bed nets could have made useful contributions to the workshop especially to those individuals with less experience in these approaches to vector control.

3. Both during the workshop and subsequent review of control efforts in Lae and Port Moresby, it was apparent that insufficient consideration has been given to sampling and surveillance of mosquitoes for the evaluation of interventions. It is recommended that technical training in entomological evaluation of control methods, and use of that information for planning or modifying control programs be considered for National, Provincial and City personnel responsible for vector control efforts. This training could be in the form of a visiting expert that could teach evaluation and surveillance methods, and design operational research aimed at evaluation of the various interventions in use or planned for use in PNG. It was noted that several individuals have received this type of training in the past, but they are not making use of it.

During debriefing, Dr. Dulay endorsed Recommendation 3; he suggested that an expert in entomological sampling and interpretation of surveillance data be provided for three months by VBC. Dr. Goettel suggested a Face Corps or United Nations volunteer be considered in addition to the short term expert's TA. In this manner, surveillance systems that are designed and developed during the expert's assignment can be implemented, monitored and taught to local personnel by the volunteer.

II. LAE CITY INTERIM AUTHORITY (LCIA)

A. Overview

A meeting took place on July 11 at the LCIA. Those present were the Senior Health Inspectors, L. Lukale, Health Inspector; B. Semri (LCIA) Regional Inspector of Operations, S. Yalla; Regional Disease Control Epidemiologist, K.D.P. Jayatilaka; Senior Health Inspector, Vector Control, N. Yana; Senior Medical Officer (Malaria), I.S. Dulay; and Medical Entomologists, L.A. Lacey, and M.S. Goettel (VBC/USAID).

Mr. Lukale outlined the LCIA vector control operation. The authority is responsible for a population of over 75,000 (1980 census). Malaria is high in all settlements within the city. Vector control relies on routine house-to-house inspections by the health inspectors and quarterly adulticiding (ULV).

During the routine house-to-house inspections, landowners are instructed to remove all breeding containers. Lack of compliance usually results in prosecution. The health inspectors refer all situations requiring special attention (i.e., larviciding, filling, etc.) to one health inspector with four laborers for further action and follow-up. Such actions are introduction of fish, drain cleaning or chemical larviciding.

Adulticiding consists of quarterly ULV application of malathion. Approximately 320 liters are applied over a one-month period (under optimum weather conditions) every three months.

A trial using permethrin impregnated bed nets has also been initiated in the unplanned settlement of Sawdust. This trial is presently awaiting a further supply of bed nets.

The lack of evaluation of the effect of intervention methods was discussed. It was agreed that the vector control efforts would greatly benefit from routine entomological surveillance.

The utility of quarterly ULV application was also discussed. The LCIA was not prepared to suspend adulticiding. Routine entomological data is lacking; therefore, the efficacy of the program cannot be determined at present.

B. Site Visits

Immediately after the meeting, all participants visited the Sawdust and Two-Mile settlements. The Sawdust settlement was an unplanned settlement while Two-Mile was planned. Both settlements contained numerous discarded containers and tires as active

and potential breeding sites. Several tins were found with larvae. The Sawdust settlement also contained many 44 gallon drums for rain water collection and storage. A few of these contained several larvae. Drains in Two-mile were well stocked with fish and were relatively clear of vegetation, but contained much garbage.

A major obstacle in the evaluation of the intervention method was the lack of data, both operational and entomological.

C. Recommendations

1. Entomological Surveillance

Routine entomological surveillance of the LCIA area should be implemented as soon as possible. Such a program would (1) identify breeding sources, (2) monitor seasonal incidence, and (3) evaluate intervention methods.

It is not possible to make further recommendations until such data is available; however, the recommendations for the NCDIC also would probably apply for LCIA.

2. Adulticiding

The ULV application of malathion should be suspended pending acquisition of adequate entomological data. Since each application requires one month of labor, this method of intervention is probably a waste of money, time, and effort.

III. PORT MORESBY NATIONAL CAPITAL DISTRICT INTERIM COMMISSION (NCDIC)

A. Overview

A meeting took place on July 12 at the NCDIC. Those present were the Chief Health Surveyor (NCDIC), B. Jacob; NCDIC Senior Health Inspectors, R. Kini and G. Vegoli; the Senior Medical Officer (Malaria), I.S. Dulay (Dept. of Health); the Senior Health Inspector, Vector Control, N. Yano (Dept. of Health); and Medical Entomologists, L.A. Lacey and M.S. Goettel (VBC/USAID).

Mr. Jacob outlined the history of the NCDIC. The Commission took over the responsibilities for vector control from the Department of Health over a four-year period. The takeover was finalized in 1982.

The NCDIC is responsible for an area with a population of between 150,000 and 200,000 people. There are approximately 800-1,000 confirmed malaria cases/month in Port Moresby Hospitals; however, it is believed that malaria transmission within NCD occurs only in isolated pockets.

The NCDIC Vector Control Program has a yearly budget of \$115,000 and a staff of 30. The overall program includes source reduction, enforcement of the law regarding mosquito breeding sites, utilization of fish, chemical larviciding and adulticiding, community participation, and public education.

NCDIC vector control components which lie outside the vector control program budget include: (1) routine house-to-house inspection by health inspectors; (2) a major effort on drainage improvement through construction of concrete drains by the Engineering Department; (3) public education by three health education specialists which includes instruction of school children on importance of mosquitoes and elimination of breeding through source reduction; and (4) a city-wide annual clean up campaign which includes corporate sponsors, wide coverage by the media, public education, and a free garbage removal service.

In addition to routine house-to-house inspections by health inspectors outside of the vector control program, routine Aedes surveillance and larviciding is carried out by the vector control staff. Emphasis is placed on source reduction and landowners are served notices if mosquitoes are found breeding on their premises. Noncompliance results in prosecution under the Public Health Act, Part VI, making it illegal to provide breeding places for mosquitoes within the NCD. This is a comprehensive document covering most situations which, if strictly enforced, would

eliminate all breeding on private land within NCD. A minor fault is the exclusion of a clause regarding proper sealing of septic tanks and especially septic tank air vents. A major constraint may be the low maximum fines possible, as it can be foreseen that in certain circumstances it would be cheaper to pay the fine than eliminate a breeding source (i.e., ground drainage).

Adulticiding is carried out by systematic fogging and ULV application of malathion throughout the city two to four times/year. Although the NCDIC vector control program realizes the limitation of benefits of such an adulticiding program, it is required to carry out this measure by the NCDIC commissioners.

In summary, the NCDIC vector control program outlined by the chief health surveyor has most of the components that are necessary for an efficient and effective urban vector control program. However, it was identified early in the meeting that a major component that was lacking was that of entomological surveillance and evaluation of intervention methods. Such an entomological component would:

- Identify the major and most important breeding sources, both within and outside NCD, that contribute to the adult population within NCD. Emphasis would be placed on evaluating clogged and overgrown drains.
- Monitor seasonal incidence of larvae and adult vector populations through larval indices, landing rates, etc. Such information would enable NCDIC to concentrate on intervention methods at the most opportune times (i.e., ULV spraying at times of maximum adult population).
- Evaluate intervention methods and make recommendations on most efficient methods for control.

The lack of an entomological component as the major deficiency in the present NCDIC vector control program was agreed on by all present.

B. Site Visits

On July 13, Messers. Vegali, Yano and Hairoi, and Drs. Dulay, Lacey, and Goettel visited Kilakila, Waigani and Vadavada settlements, Varuni village, NCD sewage settling ponds, and various drains within the NCD.

Many breeding sources were found within the settlement and village areas. Most of these were amenable to source reduction by community participation (i.e., routine maintenance of drains, stocking with fish, and elimination of discarded containers--mainly tins).

At Varuni village, previous attempts at source reduction created new breeding sites. The filling in of a mangrove swamp created pools beneath the houses. It was evident that these pools were breeding mosquitoes for some time; due to a lack of follow-up, new breeding sites were created.

The larviciding team was scheduled to visit Kilakila on the day of our visit. After our early morning visit, we revisited the settlement in the late afternoon in order to evaluate the efficiency of the larviciding efforts. The larviciding crew could not be found, and there was no evidence that any larviciding activity had been carried out. Even though the larviciding team is scheduled to visit the settlement on a weekly basis (as it is believed that malaria transmission occurs here), all evidence pointed to the fact that mosquitoes were breeding in the sites examined for well over a week. As pointed out earlier, simple introduction of fish and drain maintenance would have eliminated breeding in these sites.

After further discussions with the NCDIC Senior Health Inspector, it became evident that there was little to no follow-up of the larviciding team's efforts. Furthermore, there was little to no exchange of information between the larviciding teams and the health inspectors carrying out the routine house-to-house inspections. In addition, the only duties of the larviciding teams is to apply insecticide; no efforts are made by these teams to educate the public or use alternate control measures such as the introduction of fish or source reduction. Although the NCDIC Vector Control Program as outlined contained the most important components, it became unclear as to who was carrying out each component, and how.

Inspection of drains revealed that fish were present in most areas; however, the importance of these sites as breeding areas was not known. The fish seemed to control breeding, but it was not possible to determine if mosquito breeding was taking place within clogged and overgrown drains.

C. Recommendations

1. Entomological Surveillance

An entomological component should be implemented as soon as possible. Such a program would (1) identify breeding areas, (2) monitor seasonal incidence of mosquitoes, and (3) evaluate intervention methods.

2. Follow-Up and Supervision of Vector Control Efforts

Evidence obtained at the sites suggested that routine and proper larviciding, enforcement of the law (regarding breeding

sites) and source reduction (i.e., removal of containers, and stocking of fish) were not being strictly and effectively carried out. All areas were found breeding mosquitoes, and most drains were clogged.

Strict evaluation and follow-up of all vector control activities are required. This includes the evaluation of the efficiency and thoroughness of house-to-house inspections, source reduction and larviciding attempts.

3. Community Participation

Better efforts are needed in getting the community involved in routine source reduction and introduction of fish within communities.

4. Integration of Vector Control Activities

There is little to no communication between the health inspectors undertaking routine house-to-house inspections and the larviciding teams. The integration and cooperation of all components of the vector control program would result in a more efficient use of manpower.

IV. ITINERARY

- June 29 Departure from Washington
- June 1 Arrival in Brisbane (Dr. Lacey) and visit with personnel from Queensland Institute of Medical Research. Dr. Goettel remained in Sydney for visit with staff and personnel at the Army Malaria Research Unit.
- July 2 Departure from Brisbane. Arrival in Port Moresby, Papua New Guinea. Meeting with Dr. T. Pyakalyia, Assistant Secretary for Health (Vector Control). Preparation of lecture and demonstration materials.
- July 3 Departure from Port Moresby. Arrival in Madang. Meeting with Dr. I.S. Dulay, Senior Medical Officer, Malaria, and Mr. O.K. Habash (WHO), regarding workshop organization, location, etc.
- July 4-8 Workshop
- July 9 Preparation of report. Review of documents.
- July 10 Departure from Madang. Arrival in Lae.
- July 11 Meeting with Lae City Interim Authority vector control personnel. Review of vector control procedures and visit to proposed community action pilot study area. Meeting with Provincial Malaria Control personnel.
- July 12 Departure from Lae. Arrival in Port Moresby. Phone contact with U.S. Embassy. Meeting with National Capitol District Interim Commission (NCDIC) Health personnel regarding vector control activities in Port Moresby. A synopsis of the workshop follows. Meeting with Dr. Dulay, Mr. Pilawas (Assistant Secretary for Environmental Health), Mr. Habash, Dr. R. Montinari (WHO Malariologist) and Dr. H. Ree (WHO consultant).
- July 13 Vector control site visits in Port Moresby with NCDIC personnel.
- July 14 Preparation of report. Meeting with Dr. Q. Reilly, Secretary of Health, Dr. Dulay, Mr. Pilawas.

- July 15 Preparation of report. Departure from Papua New Guinea. Arrival in Sydney.
- July 16 Departure from Sydney. Arrival in Auckland.
- July 17-18 Meeting with Department of Zoology personnel, University of New Zealand. Departure from New Zealand.
- July 19 Arrival in Washington.

ANNEX 1

ATTENDANCE AT IPM WORKSHOP FOR VECTOR MOSQUITOES
CAHS, MADANG
JULY 4, 1988

<u>Name</u>	<u>Province</u>	<u>Position</u>	<u>Address</u>
1. Leo Yalla	ENBP	Technical Officer	P.O. Box 8 Rabaul
2. Irai Wari	WNBP	Prov. Mal. Sup.	Health Division Kimbe
3. Billy Ketsain	NSP	R/Inspector	P.O. Box 121 Arawa
4. Kenneth Korima	ORO	Ento/Para Tech Gr. 3	Health Division Popondetta
5. Bonny Moisou	Gulf	Health Inspector	P.O. Box 158 Kerema
6. Kapa Outali	EHP	Sen. Tech. Off.	P.O. Box 778 Goroka
7. Phillip Posanau	Madang	A/Sen. Health Insp.	P.O. Box 2107 Madang
8. Peter Boli	Western	Coord. Vector Ctrl.	P.O. Box 1 Daru
9. Pepena Varo	Central	Prov. Mal. Sup.	Free Mail Bag Konedobu
10. Uduru Wanenge	Morobe	Prov. Mal. Sup.	P.O. Box 458 Lae
11. Robin Tiotam	ENBP	Prov. Mal. Sup.	Health Division Rabaul
12. Simon Yala	Morobe	Health Inspector	P.O. Box 458 Lae
13. Korere Iroro	NCD	Technical Officer	Disease Control P. O. Box 3991 Boroko
14. Willie Leka	Morobe	Technical Officer	Health Division Lae

ANNEX 1 cont.

	<u>Name</u>	<u>Province</u>	<u>Position</u>	<u>Address</u>
15.	Gabriel Kaivi	ESP	Prov. Mal. Sup.	P.O. Box 395 Wewak
16.	M. Katakumb	NCD	Entomologist	P.O. Box 3991 Boroko
17.	L. Makita	NCD	Scientific Officer	P.O. Box 3991 Boroko
18.	Richard Dawana	Madang	Senior Lecturer	P.O. Box 2033 Yomba
19.	John Papi	Madang	Prov. Mal. Sup.	P.O. Box 2115 Yomba
20.	Lawrence Lacey	Washington, D.C.	Vector Biologist	VBC 1211 N. Kent St Arlington, VA
21.	Mark Goettel	New York	Entomologist	Cornell Univ. Boyce Thompson Ithaca, NY
22.	Nelson Yano	NCD	Vector Ctrl. Off.	P.O. Box 3991 Boroko
23.	Timothy Pyakalyia	NCD	A.S. Disease Ctrl.	P.O. Box 3991 Boroko
24.	Lilia del Rosario	Port Moresby	Scientific Officer	P.O. Box 3991 Boroko
25.	Muka Hairoi	Port Moresby	R/Officer	P.O. Box 3991 Boroko
26.	O. Habash	Port Moresby	WHO Sanitarian	P.O. Box 3991 Boroko
27.	I.S. Dulay	Port Moresby	S.M.O. Malaria	P.O. Box 3991 Boroko
28.	K. Galowa	Port Moresby	C.H. Inspector	P.O. Box 3991 Boroko
29.	C. Stafford	Sydney	R&D Reg. Rep.	Abbott Labs

ANNEX 2

WORKSHOP ON INTEGRATED PEST MANAGEMENT OF VECTOR MOSQUITOES
WITH EMPHASIS ON URBAN SETTINGS AND COMMUNITY PARTICIPATION¹

by
Dr. T. Pyakalyia
A/Secretary for Disease Control

It gives me great pleasure in welcoming you all to this workshop on Integrated Pest Management (IPM) of Vector Mosquitoes. On behalf of the participants and the Department of Health, I wish to thank Drs. Lawrence Lacey and Mark Goettel who have come all the way from the United States of America to share with us their experiences and expert advice on how we can effectively control the vector mosquitoes. I'm sure all of us look forward for their presentations over this one-week workshop.

Dr. Queintin Reilly, Secretary for Health, is unfortunately unable to be present with us. He asked me to give his warm greetings and wishes you a successful workshop.

I'm very pleased to announce that this workshop is fully sponsored by the United States Government through the United States Agency for International Development (USAID). In addition to the financial sponsorship, two technical experts have been sent to PNG to make this workshop successful and meaningful. Over the last few years, USAID has made the habit of not only giving financial assistance, but highly qualified experts have been made available to assist in the programmes the Organization has supported.

We are very limited in technical expertise and I am very thankful that USAID realizes this and played a leading role in overcoming the situation.

I'm glad to announce that, few weeks ago, His Excellency, Mr. Everett Bierman, Ambassador of the USA, handed over the first part of the \$8 million approved early this year for Malaria Vaccine Development in PNG. We are very happy that PNG was selected as the first country to have facilities set up for the development of malaria vaccines.

¹ Opening address of workshop. Reproduced here in its original form.

Objectives of the Workshop

The workshop will focus on the control of vector mosquitoes in urban and rural areas through community participation in an integrated health management system. The facilitators will discuss and demonstrate the use of various mosquito control methods, so that, the participants can go back to their respective provinces and mount a coordinated campaign against the common mosquito-borne diseases.

Background

Since the withdrawal of DDT spraying in the coastal provinces, the Department of Health over the last four years has been trying to promote an integrated vector mosquito control programme. Similar workshops had been conducted involving various health workers, but still done with some vertical components and in certain areas we have duplicated each others' activities. Such approaches have led to some confusion and wasted much of our limited resources.

Drs. Cooper and Lowry of USAID, while visiting PNG have become aware of our efforts and arranged this workshop so that experts present today at this workshop can help us reorganizing our limited resources and coordinating our activities effectively. Reorganization of programmes and better coordination of activities needed to be done both at National and Provincial levels.

Pilot Projects/PHC

There have been some pilot projects involving vector mosquito control both in urban and rural communities. But, I have not seen the outcome of many of these efforts. The latest pilot project that the Disease Control played a key role, is the "Malaria Control as an Entry Point to PHC". The four districts in this programme are in different stages in their implementation phase of the plan. We are anxiously waiting to learn more from these communities and provinces' experiences. We know that we are in the right direction by involving the community in the control of malaria with the use of medicated bed nets and other vector control measures but we lack the skills in approaching the community and the patience in seeing the slow response from it.

National Policy on Vector Mosquito Control

The National Health Plan prepared in 1985 sets the Department's Policy and included it under the "Vector Control" and "Malaria"; Chapters 28 and 35, respectively. Both these chapters cover many of the issues set out in the week's programme and I hope these chapters are used extensively and commented on. You

can find a copy of these two chapters attached, and any comments will be useful for our midterm review which is currently in progress.

Many people do not agree with the way these chapters were written as they are, mainly because one has been included under Environmental Health Programmes, while the other is under Disease Control. I personally feel that the two Sections could come together and rename "Malaria Control Section" to "Mosquito Vector-Borne Diseases Control Section". This I believe is the first necessary step to be made so that, all activities undertaken at all levels dealing with mosquito-borne diseases are coordinated under one section.

Areas for Discussion

I would like this workshop to look more closely at what personal protection through the use of repellents are practical for PNG communities as well as ways of promoting the introduction of medicated bed nets to the communities where they are most needed. Appropriate environmental and biological control issues brought up should be discussed fully for their relevance because what is seen to work in one country may not be practical in PNG. Even, each province may be different from others. Therefore, I hope each provincial participant will raise these situations as the subjects are discussed.

The Department of Health would appreciate the workshop coming up with techniques for evaluation the effectiveness of the control programmes so that each province can monitor the level of public awareness and community participation.

Lastly, I want to thank the Dean of the College of Allied Health Sciences and the staff for allowing us to use their facilities in conducting this workshop. The College has been the Regional Training Centre for Malaria until WHO withdrew its support in 1986. I hope the Centre will continue to support such workshops in the future.