

PD ABG-973

8/17/93

AGENCY FOR INTERNATIONAL DEVELOPMENT PPC/CDIE/DI REPORT PROCESSING FORM

ENTER INFORMATION ONLY IF NOT INCLUDED ON COVER OR TITLE PAGE OF DOCUMENT

1. Project/Subproject Number 9365948	2. Contract/Grant Number DPE-5984-Q-00-9031-00	3. Publication Date September, 1993
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4. Document Title/Translated Title

**Trip Report
Review of Current Status of the Nepal Malaria Information System and A Plan for
Re-implementation
June 12- July 2, 1993**

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6. Contributing Organization(s)

**Vector Biology and Control Project
Medical Service Corporation International**

7. Pagination 50	8. Report Number 82171	9. Sponsoring A.I.D. Office R&D/H
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10. Abstract (optional - 250 word limit)

11. Subject Keywords (optional)

1. Nepal	4. Parasitic Diseases
2. Malaria	5.
3. Health Information System	6.

12. Supplementary Notes

13. Submitting Official Robert W. Lennox, Sc.D.	14. Telephone Number 703-527-6500	15. Today's Date 9/28/93
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16. DOCID	17. Document Disposition DOCRD [] INV [] DUPLICATE []
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VBC PROJECT

Tropical Disease Control for Development

Trip Report

Review of Current Status of the Nepal Malaria Information System and A Plan for Re-implementation

June 12 - July 2, 1993

by

Mary B. Ettlting, Sc.D.

Michael P. Edwards, Ph.D.

VBC Report No. 82171

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Acknowledgements

The authors gratefully acknowledge the support throughout the consultancy of Mr. Shreedhar Pradhan, USAID Malaria Program Specialist; and the assistance and cooperation of Malaria Control Programme staff in Kathmandu, Biratnagar, Hetauda, and Bhairawa. Particular generous with their time were Dr. B. L. Shrestha, Chief, MCD, Dr. M. K. Banerjee, Epidemiologist, MCD, Dr. B. B. Karki, Director, Western Regional Health Services Directorate, Dr. Paul MacKenzie, JSI Resource Person, Dr. M. P. Bista, Chief Epidemiologist, Division of Epidemiology, Dr. James Veney, WHO Consultant in the Ministry Of Health Planning Office, and Mr. Adjit S. Pradhan, Chief, Planning, Research and Evaluation Section, FP/MCH Division. We also thank Mr. David Oot, Chief, USAID HPN, and Mr. Matt Friedman, USAID Population Officer, for their comments and suggestions.

Preparation of this document was sponsored by the Vector Biology and Control Project under Contract No. DPE-5984-Q-00-9031-00 to Medical Service Corporation International, Arlington, Virginia, U.S.A., for the Agency for International Development, Office of Health, Bureau for Research and Development.

Executive Summary

A team comprised of a malaria epidemiologist and a MIS specialist was sent to assess the current status of the information system of the Malaria Control Division of the Nepal Ministry of Health (MOH) and to outline a plan of action for the strengthening of this system. The team was present in Nepal from June 12 to July 2, 1993. During this time, discussions were held with senior staff of the Malaria Control Programme, the Family Planning/MCH Division, and the Epidemiology Division of the Ministry. In addition, field visits were made to several malaria regional offices and the Western Regional Health Services Directorate, as well as to local health posts and district health offices.

The team found the existing computerized malaria information system in some disarray due to several problems. They included equipment failure, inability to retain trained personnel, and imminent drastic changes to the Ministry organization and staffing. Because of these problems, the team has recommended the re-implementation of a malaria information system in a series of stages which can accommodate the Ministry changes.

Specific recommendations include:

- 1) The five Regional Health Directorates, National Malaria Research and Training Centre, and Malaria Unit of the restructured Disease Control Section in Kathmandu should be equipped with the necessary hardware and software to implement a malaria information system.
- 2) Relevant personnel, when they are in place after the restructuring in late 1993, should be trained in basic computer literacy. After this training, more intensive, hands-on training should prepare them to handle the routine reporting of malaria operations, using programs prepared jointly by consultants and persons within the Ministry responsible for MIS.

- 3) A workshop of senior Ministry staff and Programme managers should be held to define the elements of a more sophisticated Malaria MIS, including operational and epidemiological indicators, GIS requirements, and a feasible early warning system.
- 4) An individual from the MIS Section of the Ministry should be designated as the person responsible for troubleshooting and supervision for the malaria information system. This person should be sent for three months of advanced computer training.
- 5) The team strongly suggests follow-up technical assistance for MIS development in the form of a counterpart to the senior statistician within the MIS Section who can work on full development and implementation of a Malaria MIS within the integrated Division of Epidemiology and Disease Control and the decentralized MIS in the regions.

This report includes a detailed plan of action and budget for realizing these steps toward the development and implementation of a Malaria MIS.

1. Background

1.1 History of Technical Assistance to the Malaria H/MIS

In 1987, USAID/Nepal agreed to work with the Malaria Control Division (MCD), Ministry of Health, to develop a malaria information system for Nepal. To carry out this activity, USAID/Nepal requested assistance from the Vector Biology and Control Project (VBC) to assess the feasibility and usefulness of computerizing the MCD epidemiological and entomological information within the MCD and the Central Region.

In this regard, several activities, summarized below, were carried out:

- During August 1988, an initial review of the existing malaria information system was conducted. An initial computer format was prepared, and training of MCD staff in Kathmandu and the Central Region was conducted.
- During January 1989, training was expanded within the Central Region, and database development was continued. An assessment of the need for computerization within the Eastern and Western Regions was conducted.
- During October 1989, additional software was installed, additional training was given to MCD staff, and hardware and software were installed in the Eastern Region. Training of Eastern Region staff was conducted, and the regional databases were further developed.
- In March 1990, the system for data collection and management for vector-borne disease control was reassessed, and recommendations for follow-on were made.

A full account of these activities can be found in the VBC documents listed under Background in the References, Section 5.

1.2 Present Scope of Work

To continue the development and implementation of the MCD Management/Health Information System (M/HIS) and the expansion of the system into the Western, Mid-Western and Far-Western Regions, several activities were planned, including:

- Preparation of a digitized map of Nepal showing administrative districts and regions.
- Preparation of a data entry program to capture relevant MCD data.
- Advice to USAID/Nepal on selection of computer hardware to be provided to the MCD regions.
- Designing and conducting a computer literacy course for MCD data entry personnel of the Western, Mid-Western and Far-Western Regions.
- Designing and conducting a refresher computer training course for MCD data entry personnel in the MCD Eastern and Central Regions.
- Identification of a Nepalese national working within the MCD for advanced computer training.
- Installation of computers in the Western, Mid-Western and Far-Western MCD Regions.
- Determination of assistance required to provide follow-up support for H/MIS activities in the MCD Regions.

1.3 Restructuring of MOH

At the time of the present consultancy, June 1993, the MCD, together with the entire Ministry of Health (MOH), is planning a radical restructuring of its organization and staffing to be implemented in July 1993. Two aspects of this restructuring are relevant to the Malaria H/MIS development: the integration of MCD activities into a broader Division of Epidemiology and Disease Control and new regulations concerning recruitment for the new posts in the restructured MOH.

Tentative plans and staffing levels of the restructured MOH at the national, regional and district levels are shown in detail as Appendix A. The salient points are:

- a) Malaria control activities change from a division within the MOH with 10 sections and a headquarters staff of approximately 80 to a unit within the Disease Control Section of the Division of Epidemiology and Disease Control with a malaria staff of four.
- b) Ministry-level MIS activity is located in the MIS Section of the Division of Epidemiology and Disease Control with a staff of eight.
- c) The Research and Training Centre at Hetauda retains a staff of 20.
- d) Regional malaria control activity changes from a regional office staff of 221 for all five regions (32-51 per region) to a two-tiered structure. The Regional Directorate will include a Disease Control sub-section with a malaria staff of four (three in the Mid-West and Far-West Regions). A malaria unit will operate throughout each region, although based in the districts formerly serving as the sites of the Malaria Regional Office. This unit will consist of 10 persons and be responsible for entomology and blood slide cross checking in the region.
- e) District-level malaria activities will fall under the Public Health unit of the District Health Office. Staffing levels will be approximately 10-20 per district instead of the present 13-76 persons. This level will carry out surveillance, spraying and health education activities as required by each district.
- f) Regional-level MIS activities will be located in a Planning, Monitoring and Evaluation Section of the Regional Directorate with a staff of four (three in the Mid-West and Far-West Regions).

- g) There are no positions allocated strictly for data management at any level of malaria control operations. Rather, this function is allocated to the MIS Section and the Regional Planning, Monitoring and Evaluation Sections.

The second major issue facing the MCD is staffing under the restructured MOH. Those positions rated as "development" rather than "regular" status must be filled by recruits not over 35 years old. The great majority of the present, experienced MCD workforce will, therefore, be ineligible for these new positions. Dr. B. L. Shrestha, head of the MCD, hopes that the government will make some provision to hire current employees for an interim period of one to two years until new recruits can be trained. It is unclear if this will occur.

A very fruitful discussion with Dr. B. B. Karki, Director of the Western Regional Health Services Office in Pokhara and a member of the government task force on restructuring, revealed the government's plan for the flow of authority in the new MOH. One of the fundamental goals of the restructuring is the decentralization of health services planning and activity. Dr. Karki hopes that most planning will originate at the district and regional levels with the national level assisting with coordination.

Reports and data will flow up from the health post to the District Health Office. Data and plans will flow from the District to the Regional Health Directorate, where most of the data processing and analysis will take place in the Section of Planning, Monitoring and Statistics. This section will assist both the districts, and the Directorate Disease Control sub-section. Compiled regional reports will be forwarded to the national MIS Section, which will cooperate with the other Sections in the Ministry, including Epidemiology and Disease Control.

The WHO has been assisting in the development of an integrated set of MIS forms for the new MOH. Dr. James Veney, the WHO consultant in the planning office of the MOH, explained that the list of forms was still tentative and under review by a MOH task force which includes representatives of the MCD. After the committee finishes its review, the new forms will be field tested before implementation. The WHO plans no further support in the form of training, consultants or equipment after

the task force's work is finished. This work does include training in the use of the final set of forms at the health post, district, regional and national levels.

The tentative set of data collection forms for all levels are shown in Appendix B.1 with translation of malaria-related forms. In Appendix B.2 are recommendations on the possible data to be used for a malaria information system. These comments and recommendations have been passed on to Dr. M. P. Bista, Chief Epidemiologist of the Division of Epidemiology and the Secretary of the Task Force on the integrated MIS.

Currently, most data on slide collection, positive cases, treatment and PCD surveillance are generated at the health post. Patient-wise, PCD post-wise and species classification-wise reports are forwarded to the district. These reports are essentially appended rather than compiled or analyzed at the district office and forwarded to the Malaria Regional Office at present. The district also reports health education activity and establishment or loss of PCD posts. Under the new MOH, it is expected that similar reports will be assembled and forwarded to the Regional Planning, Monitoring and Statistics Section.

The Regional Malaria entomology team reports routine investigations, primarily vector densities collected by a variety of standard methods, and numbers (but not the results) of dissections of salivary glands. These data are reported un-analyzed to MCD headquarters. Under the new MOH, it is expected that similar reports will be forwarded from the special entomology teams (located in the former Malaria Region Districts) to the Malaria Unit of the Regional Disease Control Sub-section. It is assumed that a similar flow of slide cross checking reports will occur.

2. Current Status of the Malaria H/MIS

2.1 Headquarters, Kathmandu

As part of the initial development of the 1988-89 H/MIS, several persons from MCD headquarters were trained. Mr. R. G. Vaidya, a senior entomologist, was central in both the development of the system and for training of regional and district personnel. Mr. Vaidya has now retired, although he occasionally comes in to help. Of the four headquarters staff trained, only one, Mr. H. P. Poudel, an entomologist, remains, performing all of the computer analysis, data entry, and report production at headquarters. Mr. Poudel is forty years old, and it is unclear if he will remain with the malaria control project after July 1993.

Data entry and reporting programs devised for the 1988-89 H/MIS are not available on the headquarters computer. Mr. Poudel states that the programs were lost when the hard disk crashed once in 1990. The consultants were unable to obtain any programs, files, reports, or documentation from the 1988-89 H/MIS at headquarters. It is not clear if the system was ever used at headquarters.

Mr. Poudel maintains several programs, primarily for analysis of entomological data from special studies and for production of annual reports. He uses Lotus 123® spreadsheets to record routine data reported monthly from the regional offices. The annual report is essentially compiled by hand, with the data recording system used as a word processor. The most recent data entered in the spreadsheets were from April 1992.

Each of the 50 districts with malaria control activity produce a detailed annual report which is forwarded to headquarters. The report from Morang District, the site of one of the 1988-89 H/MIS computers, was produced by hand in 1992.

Mr. Poudel has developed several dBase III+® databases to handle administrative data for headquarters.

There were numerous problems detected on the computer in the MCD. The hard disk was full of bad sectors, and even after correctional diagnostics were implemented, more bad sectors appeared. This was also causing the loss of data and the corruption of software programs on the hard disk. Even a scan for viruses was unsuccessful due to the numerous bad sectors. The MCD had a plotter that would function during testing, but would not receive input from the computer. The cable that was available in the MCD was not the same as the cable that is specified in the documentation for use with the plotter.

2.2 Eastern Region, Biratnagar

The consultants were unable to see any of the 1988-89 H/MIS programs or data, as the computer was not functioning at all. Two persons trained in the 1988-89 H/MIS were present: one now works for UNICEF, and the other has never really used the system and has forgotten his training.

The problem with the computer in the Eastern Region was that the disk controller card was not functioning. The UPS was also not being used. There were numerous rat droppings inside the computer.

2.3 Central Region, Hetauda

Mr. Murari L. Das, the Chief of the Regional Malaria Office and a trained entomologist, is the person who uses this regional computer. He was in the Philippines for master's studies when the 1988-89 H/MIS was installed and initial training given. He picked up some computer literacy as part of his studies and has proceeded on his own.

Mr. Das explained that the computer had originally been located in the Research and Training Center (RTC), which is also located in Hetauda, but that it had been shifted to his office on his return from the Philippines. He has been working only in WordPerfect® as he states that the necessary keys to effectively use Lotus 123® were malfunctioning. He produces routine annual and monthly reports in WordPerfect®, using no software for data entry or analysis.

Some of the 1988-89 H/MIS data entry programs still are present on the computer, but the most recent entries are dated March 1989. Mr. Das states that the entomologist from the RTC who was trained for the 1988-89 H/MIS comes occasionally to use the computer to generate reports and schedules for the RTC.

The keyboard for the computer in the Central Region had numerous keys that were not functioning. They did work after cleaning them with isopropyl alcohol and cotton swabs. The keyboard still should be replaced.

The consultants visited the District Public Health Office in Hetauda and talked with the malaria assistant. Although trained in the 1988-89 H/MIS data entry, he hasn't entered any data for the last three years. He states that most district-level workers are not motivated to travel to the Regional office to enter data; for some, the trip is a long one.

The RTC is carrying out virtually no activity while the construction of the new facility is underway. The man trained to use the 1988-89 H/MIS was in the field.

2.4 Problem Analysis

2.4.1 Failure of the 1988-89 H/MIS

There are several reasons for the failure of the 1988-89 H/MIS for malaria:

- 1) Hardware breakdowns;
- 2) An inability to retain trained personnel;
- 3) The inability of the data entry programs to meet changing reporting needs;
- 4) Inappropriateness of the district-level data entry scheme;
- 5) A lack of upper-level oversight of H/MIS activities; and

- 6) A lack of long-term technical assistance to upgrade programming ability; help solve problems with software and equipment; and develop H/MIS capability to a level of in-house expertise.

Much of the failure of the 1988-89 H/MIS has been ascribed to equipment breakdowns: crash of a hard disk, keyboard problems, and an inability to boot the entire system. In the future, greater attention needs to be paid to acquisition of spare parts and maximum utilization of local maintenance. Computer users also need to be more fully trained in basic maintenance (e.g., simple cleaning of machines, proper use of surge protection, storage).

Most of the individuals trained in the computerized 1988-89 H/MIS have been retired or left service in the malaria program. In the future, this problem should be addressed by choosing candidates for basic training who are young enough to promise at least 10 years of continued service and neither so high in the program that they move out to other work or too low to fully utilize the special training.

The programs used in the 1988-89 H/MIS appear to have been the creation of a single individual and not particularly well understood by other users. In the absence of that individual, users were unable to alter the programs to meet new operational structures. In the future, all programs should be developed in collaboration between consultants and local users. The new MOH structure provides one computer programmer in the MIS Section of the Division of Epidemiology and Disease Control. This person, as well as representatives from the Regional Planning, Monitoring and Statistics Sections, should be closely involved in the development of malaria reporting and MIS programs.

The 1988-89 H/MIS required district-level data entry by District Malaria Unit personnel, who were to travel to the Regional Malaria Office monthly for data entry. This task seems not to have been carried out successfully. Reasons for the failure include lack of interest, and difficulty and expense of travel. Under the new MOH, it seems even less likely that malaria-related reports will be handled differently from all other routine reports sent from the district to the Regional Directorate. For this reason, it seems unnecessary to insist on data entry by district personnel at this time.

The lack of a single oversight position at the MCD to handle the Malaria H/MIS was repeatedly remarked on by consultant teams. Yet the gap has not been filled. Under the new MOH, with its unified MIS units, there are staff positions which are clearly responsible for MIS activities. The senior statistician of the national Directorate and the planning officers in the Regional Directorates will be directly responsible for MIS activities.

Creation of a viable H/MIS is a long-term undertaking. The 1988-89 H/MIS effort appears to have left the Nepal Malaria Control Programme unable to continue to use the system without technical support. In the future, there should be some provision of long-term support for the development of staff capabilities; appropriate programs and systems to meet changing operational and epidemiological situations; an increasingly sophisticated malaria MIS with GIS and early-warning elements; and increasing integration of malaria-related information into the overall MIS of the MOH.

2.4.2 Problems with Development of a New Malaria H/MIS

The present situation, with the old structure of the Ministry in effect gone but the new structure not yet in place, creates several problems for the detailed planning of development for a revised Malaria H/MIS.

First, appropriate staff positions within the new MOH can be identified for training in the revised Malaria H/MIS, but the actual persons to fill those positions are not yet known, and in some places, not even recruited. Recruiting is expected to take six months, and to be accomplished after the change to the new structure in July 1993.

Second, details of the flow both of information and authority within the new structure are not yet clear. Some of these details may take the same six months to sort out.

Third, the new structure and staffing patterns suggest that the appropriate locus of a Malaria H/MIS shift from the old Regional Malaria Offices in Biratnagar, Hetauda, Bhairawa, Nepalganj and Dhangauri to the Regional Health Directorates in Dhankuta, Kathmandu, Pokhara, Surkhet and Dandeldhura.

Last, the general demoralization of the current staff of many district and regional malaria units has meant that the relevant authorities in most cases have not been available for discussions with the consultants about the development of a revised Malaria H/MIS. Those authorities available have been for the most part rather preoccupied with the imminent restructuring and what it will mean for their careers.

3. Recommendations

The consultants make 10 recommendations concerning the continued development of a malaria H/MIS in Nepal:

- 1) A new effort to create an appropriate Malaria Information System should be made within the new Ministry of Health staffing and MIS structures.
- 2) Hardware and trained personnel for this new malaria information system should be located nationally (within the malaria unit, the MIS section and the Hetauda Research and Training Centre) and regionally (within both the malaria unit and the planning, monitoring and statistics section of each region).
- 3) Software utilized by the Malaria Information System, in the use of which personnel should be trained, should include Lotus 123[®], WordPerfect[®], dBase IV[®] and Norton Utilities[®] at all sites and POPMAP or EPIMAP, EPIINFO and SPSS[®] at the national sites.
- 4) A three-week basic course in computer literacy, including familiarization with Lotus 123[®], WordPerfect[®], dBase IV[®] and Norton Utilities[®], should be offered to 21 persons involved with the Malaria Information System. These will be the two senior malaria assistants of the national malaria unit, the computer assistant at the Hetauda Centre, the junior statistician and two statistical assistants at the MIS section, and the computer assistant, planning officer, and malaria assistant within each regional directorate. Trainees should have at least 10 more years of service remaining before retirement.
- 5) The junior statistician of the MIS section should be sent for three months of advanced computer training. This training should emphasize aspects which will prepare him to act as a trouble shooter and overseer of the day-to-day work of the Malaria Information System. This person should have at least 10 years of service remaining in the MOH.

- 6) Training on the use of information for decision making and operations management as well as the content of the Malaria Information System should be incorporated as part of the training curriculum of mid-level staff at the Hetauda Research and Training Centre.
- 7) Computer programs for routine data entry and report production for malaria activities should be jointly developed by consultants, the senior statistician, computer programmer, and senior malariologist in the national health directorate.
- 8) More sophisticated elements of the Malaria Information System, including GIS, operational indicators, and an early warning system, should be developed over time in collaboration between consultants and program managers. In preparation for this step, top program managers and advisors should participate in a workshop on data for decision making with consultants.
- 9) Provision should be made for long-term support for the Malaria Information System in the form of a counterpart to the senior statistician working to fully implement the system and assist integration into the broader ministry of health MIS. The consultants suggest that without such long-term support, the implementation of an effective Malaria Information System could fail.

3.1 Expansion/Development of Malaria H/MIS

A coherent Malaria H/MIS does not exist at present within the Nepal Malaria Control Program. Isolated efforts have been made by interested individuals to use the existing poor computer resources to produce tables and standard reports, usually in a word-processing rather than analytic mode.

Development of a Malaria H/MIS can be carried out in sequential steps:

- 1) Provision to the five Regional Health Directorates, the Research and Training Center, the Malaria Unit of the Division of Epidemiology and Disease Control, and the MIS section of the National Directorate of adequate hardware, basic software including word processing, spreadsheet and rudimentary data base management, together with introductory training necessary to operate, maintain and begin to use the system for administrative and reporting tasks;
- 2) Further training in the form of collaborative development by consultants and users of elementary data entry, summarizing, and report-generating programs to produce the existing routine reports to monitor malaria activities; and
- 3) Collaborative development by consultants and program managers of an enhanced Malaria Information System, one that includes GIS elements and particular indicators for evaluating operations and for rapidly responding to developing epidemics.

It is more appropriate to put computers in place at the Regional level, the level at which data handling will logically fall under the new MOH structure. It is also necessary to train workers at this level, being careful to select those workers most likely to remain within the MOH. These workers can be used in the routine reporting for malaria while they develop the expertise in computing necessary for a more sophisticated Malaria Information System. Clearly, coordination of the malaria MIS effort with the overall MOH/MIS will have to be close. Once the individuals responsible for the Epidemiology and Disease Control Division and the MIS Section are identified, such coordination will be possible.

The consultants saw no reason not to provide computers and initial training to workers in all five regions and at the RTC in Hetauda.

3.2 Hardware Requirements of a Malaria H/MIS

In order to implement a decentralized information system for malaria control and other public health activities, the consultants recommend the purchase of computer systems for each of the regional health offices, the national MIS Section within the Division of Epidemiology and Disease Control, and the Hetauda Research and Training Centre. Also, they recommend that the computers in the Central and Eastern regions be repaired. The MCD has just acquired a new desktop computer with WHO assistance; additional hardware for this unit is, therefore, not required.

For each of the five regional health directorate offices, notebook computers might be considered. Notebook computers are extremely durable. They are easily put away in a case and then locked in a cabinet. Their batteries diminish data loss during power outages, and there is no need for external uninterrupted power supply units. For both the national MIS Section and the RTC, the consultants recommend the purchase of a desktop computer to aid in the development of GIS and graphics capability. A notebook computer for the MIS Section would aid them in the development of the decentralized data entry and reporting programs, which will be implemented on notebooks at the regional level.

It is recommended that a new keyboard be purchased for the Central Region's computer, and a new disk controller card be purchased for the Eastern Region's computer.

A full description, with budget estimates, of the hardware requirements for a new Malaria Information System is given in Appendix C.

3.3 Training Requirements of a Malaria H/MIS

The consultants recommend six training elements to support development and implementation of a Malaria Information System:

- 1) Basic computer literacy taught by a local computer firm for a three-week period to 21 persons in the malaria and MIS units of the MOH who will be primarily involved in data entry, report production, and oversight of the Malaria Information System at the national and regional levels;
- 2) Intensive training for one week by consultants and senior staff to the same 21 persons in the particular hardware, software and programs used by the Malaria Information System;
- 3) A three-day workshop for senior staff on identification of indicators of operational progress, GIS requirements, and an early warning system for incorporation into the Malaria Information System;
- 4) Advanced training of three months for the junior statistician within the MOH/MIS Section, who will be responsible for oversight of the Malaria Information System, to develop the skills necessary to act as a trouble shooter and advisor to regional computer users;
- 5) Incorporation into mid-level training curriculum at the Hetauda Research and Training Centre of formal elements covering the structure and function of the Malaria Information System and the use of information in managerial decision making; and
- 6) Long-term hands-on training of staff of both the Malaria Control Programme and the MOH/MIS units by a consultant expert acting as a counterpart to the senior statistician of the MIS section in the development and implementation of MIS.

Details of the content, participants, instructors, budget and timing of each training element are given in Appendix D.

4. Plan of Action

The activities necessary to carry out the implementation of a renewed Malaria Information System within the MOH, Nepal, fall into five phases:

- Phase I. Preparation for second consultant trip
- Phase II. Second consultant trip
- Phase III. Preparation for third consultant trip
- Phase IV. Third consultant trip
- Phase V. Follow-up

Tentative timing, tasks, and responsible parties for each phase are described below.

4.1 Phase I - Preparation for 2nd Consultant Trip

Preparation for the second consultant trip will take place in the latter part of 1993. Tasks to be accomplished include:

VBC: assistance in identifying essential hardware and software
preparation of preliminary computer programs
preparation of detailed plan for intensive training

USAID/Nepal: arrangements for basic training
start of basic training on January 2, 1994
arrangement of computer maintenance contracts
identification of staff postings under new MOH
exploration of arrangements for advanced training
send copies of final new MIS forms to VBC

4.2 Phase II - Second Consultant Trip

The second consultant trip could take place between January 17 and February 22, 1994. Tasks to be accomplished include:

- briefing and debriefing of consultants at USAID/Nepal

- intensive training
- installation of computer capability at Kathmandu, Hetauda, Dhankuta, Pokhara, Surkhet, and Dandeldhura
- further development of computer programs for data entry and routine reporting for the Malaria Information System
- identification of person for advanced training
- final arrangements for advanced training
- preliminary arrangements for workshop

4.3 Phase III Preparation for 3rd Consultant Trip

Preparation for the third consultant trip could take place in March and April 1994. Tasks to be accomplished include:

VBC: detailed planning for workshop
 USAID/Nepal: local arrangements for workshop

4.4 Phase IV - 3rd Consultant Trip

The third consultant trip could take place from May 13 to June 13, 1994. Tasks to be accomplished include:

- briefing and debriefing with USAID/Nepal
- conduct of a three-day workshop on Malaria MIS
- development of computer programs to implement product of the workshop
- follow-up visits and training in Kathmandu, Dhankuta, Hetauda, Pokhara, Surkhet and Dandeldhura

4.5 Phase V - Follow-up

Follow-up and continued development of the Malaria Information System and integration into the MIS of the MOH could take place over a number of months. Tasks to be accomplished would include:

- Advanced computer training of statistician of the MIS Section and technical assistance to the Malaria Information System through the mechanism of a MIS expert serving as counterpart to the senior statistician of the MIS Section; and
- Incorporation of training about the Malaria Information System and the use of data for management decision-making for disease control into training modules of the Hetauda RTC

A detailed list of tasks involved in the development and implementation of a new Malaria Information System and example timelines for the activities are given in Appendix E.

5. References

Background

VBC. 1987. Trip Report Nepal: Malaria Data System. November 6-17, 1987. Barry A. Silverman and Lawrence A. Lacey.

VBC. 1988. Nepal: Malaria Data System (Part II). August 3-27, 1988. Barry A. Silverman.

VBC. 1989a. Nepal: Malaria Data System Part III. January 16-February 1, 1989. Barry A. Silverman.

VBC. 1989b. Nepal: Malaria Data System Part IV. September 13-October 4, 1989. Barry A. Silverman.

VBC. 1990. Trip Report. Assessment of the system for collection and management of vector-borne disease information in Nepal. March 21-April 11, 1990. Peggy S. Sullivan and Barry A. Silverman.

6. Itinerary and Persons Visited

1993

- June 12 Arrive Kathmandu
- June 13 Review documents from VBC and schedule
- June 14 Meetings at USAID/Kathmandu office with Mr. David Oot, HPN and Acting Director, and Mr. Shreedhar Pradhan, malaria program specialist at USAID.
- Meetings at Malaria Control Division office with Dr. B. L. Shrestha, Director.
- June 15 Meetings at MCD with Dr. M. K. Banerjee, MCD Epidemiologist, and Dr. Oleg L. Lossev, WHO Malariologist.
- Work with Mr. H. P. Poudel, MCD computer person, and Mr. R. G. Vaidya, retired MCD Senior Entomologist, on problems with hardware and software at MCD Headquarters.
- Informal meeting with Shreedhar Pradhan.
- June 16 Work at MCD office on collection and translation of proposed H/MIS forms under restructured MOH.
- Further work on hardware and software problems.
- Informal meeting with Shreedhar Pradhan.
- June 17 Edwards: initial installation of mapping software and development of GIS for Nepal. Check of digitizer and plotter for mapping.

- June 17 Ettling: review of forms and documents, preliminary report preparation.
- June 18 Meeting with Dr. Paul MacKenzie. Family Planning Resource Person, John Snow International concerning technical support for H/MIS within MOH.
- Meeting with Mr. Ajit S. Pradhan, Chief of Planning, Research and Evaluation, Family Planning/MCH Division, MOH. Visit to FP/MCH computer unit.
- Meeting with David Oot and Shreedhar Pradhan to review agenda and preliminary plan of action.
- June 19 Saturday. Free day.
- June 20 Travel to Hetuada, accompanied by Shreedhar Pradhan.
- Meeting with Mr. Murari L. Das, Acting Regional Malaria Officer.
- June 21 Meeting with District Public Health Office staff, Hetauda.
- Visit to Manahari Health Post, Malaria PCD Volunteer, and Mkawanpur Health Post.
- Meeting with Mr. Isswari Bhatta, Acting Chief of the Malaria Research and Training Centre.
- June 22 Travel to Biratnagar, Morang District, East Region.
- Visit to Regional Health Training Center, Pathlaiya and training of Female Community Health Volunteers.
- Visit to Godari Health Post, Dhanusha District.
- June 23 Meeting with Mr. Murari Adikhari, Acting DPHO, Morang District. Review of district malaria reports and activities.

- June 23 Meeting with regional Malaria Office staff, head not available. Review of flow of regional surveillance and entomology reports.
- Survey of the condition of the computer and information system.
- June 24 Travel to Bhairawa, West Region.
- June 25 Meeting with Mr. Ram Chandra Chaudhary, Acting Regional Malaria Officer. Review of flow of information into and out of regional office.
- Travel to Pokhara.
- June 26 Meeting with Dr. B. B. Karki, Director of the Western Regional Health Services Office and member of HMG's task force on MOH restructuring.
- Saturday. Partial free day.
- June 27 Travel to Kathmandu.
- Report preparation.
- Informal discussion with Shreedhar Pradhan.
- June 28 Report preparation.
- Disturbances and curfew in Kathmandu.
- June 29 Report preparation.
- Disturbances and curfew in Kathmandu.
- June 30 Report writing.
- Meeting with Shreedar Pradhan and Dr. B. L. Shrestha.
- Work on new computer at MCD.

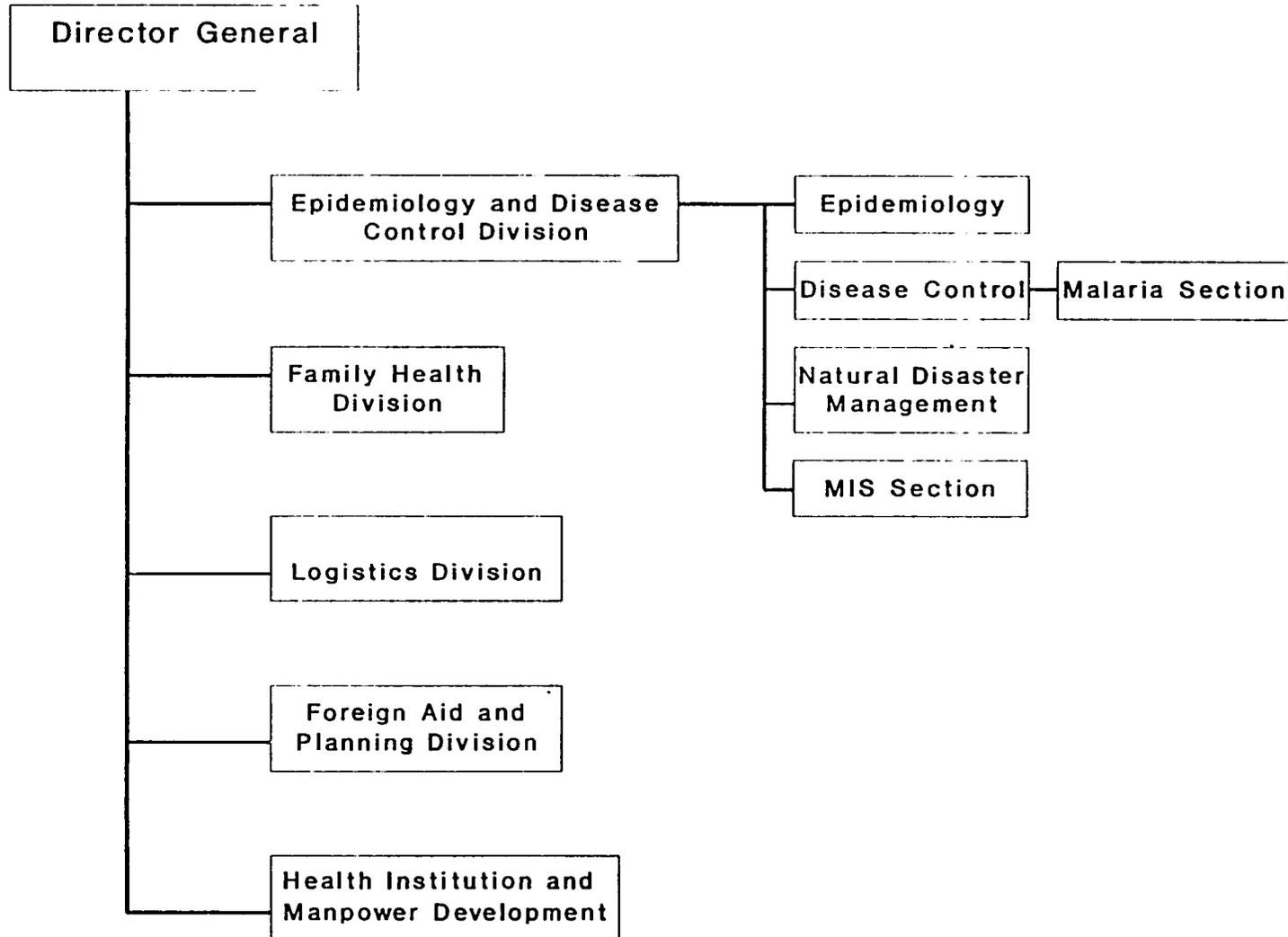
- July 1 Debriefing USAID/Nepal. Discussion.
- Meeting with Dr. M.P. Bista, Epidemiology Division,
 Ministry.
- Meeting with Dr. James Veney, WHO Planning
 Consultant.
- Report revision and amendment.
- July 2 Ettlting - leave Kathmandu.
- July 3 Edwards - leave Kathmandu.

Appendix A

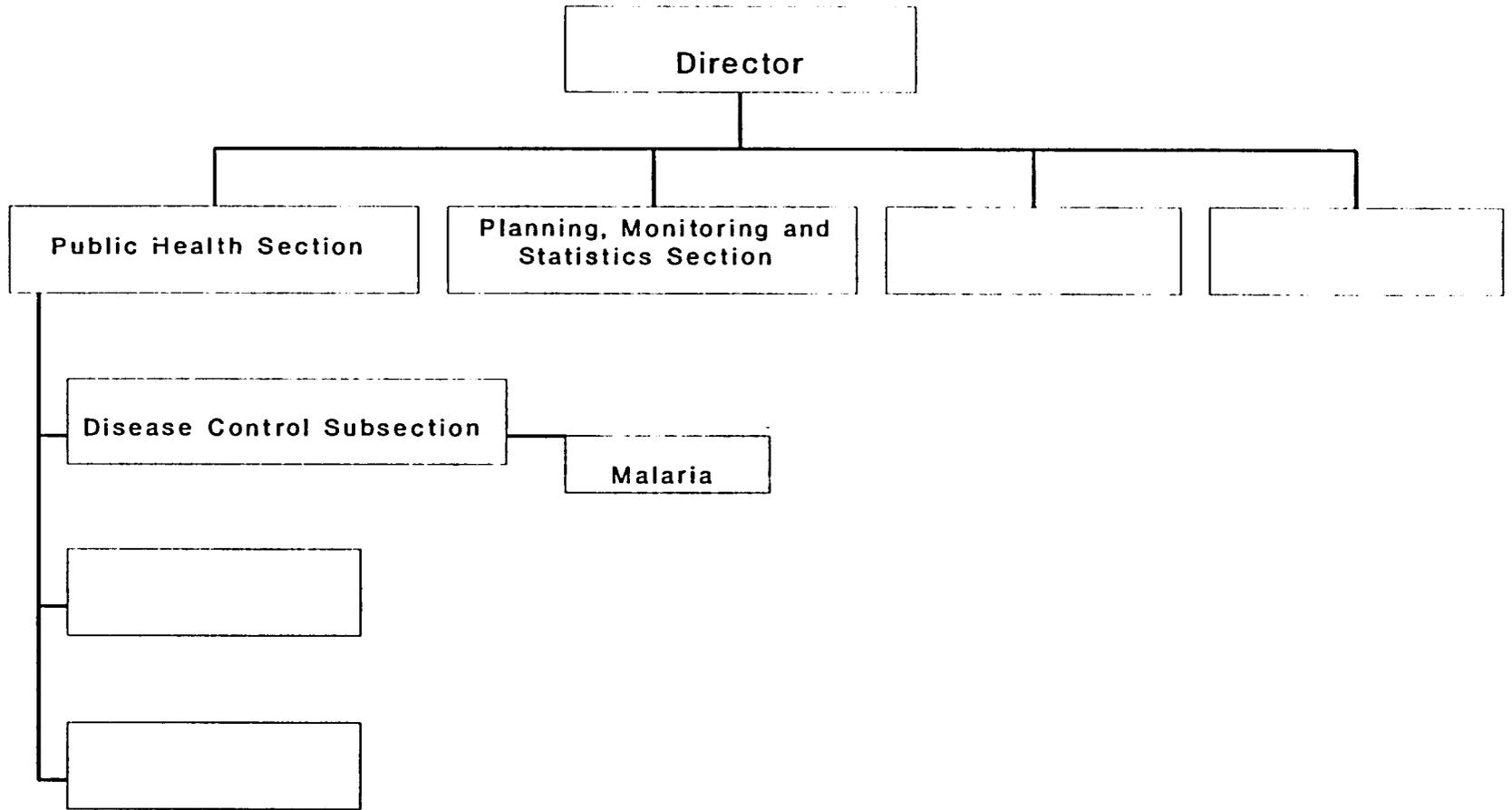
Plan of the Restructured Ministry of Health National, Regional and District Levels

National Staffing	Location	Activities	Staff
Malaria Unit of Disease Control Section	Division of Disease Control, Kathmandu	Coordination, Policy and Planning	Malariologist Vector Control Officer Senior Malaria Assistant (2)
MIS Section	Division of Epidemiology and Disease Control	MIS for all Ministry of Health	Senior Statistician Computer Programmer Demographer Cartographer Tracer Statistical Assistant (2)
Research & Training Center	Hetauda	Research and Training	Chief Entomologist Parasitologist Vector Control Officer Computer Assistant Support Staff (15)
Regional Staffing	Location	Activities	Staff
Malaria sub-section of Disease Control Section of Div. of Epidemiology and Disease Control, Regional Directorate	Dandeldhura Surkhet	Supervision and Planning	Malaria Officer Malaria Assistant
	Kathmandu Dhankuta Pokhara		Additional: Supervision Officer
Entomology & Laboratory	Biratnagar Hetauda Bhairawa Nepalganj Dangauri	Entomology and Lab cross-check	Entomologist Assistant Entomologist Entomology Technician (4) Lab Assistant Microscope mechanic Pump mechanic Lab technician (as needed)
Planning, Monitoring & Statistics Section of Regional Directorate	Dandeldhura Surkhet	MIS for Region	Planning Officer Supervision Officer Computer Assistant
	Kathmandu Dhankuta Pokhara		Additional: Administrative Assistant
District Staffing	Location	Activities	Staff
Malaria Unit under Public Health Office of District Health Office	Hill Districts	Surveillance, treatment, spraying, health education	Malaria Inspector (2) Lab Assistant (# of Parliamentary seats)
	Other Districts with Malaria Activity		Additional: Senior Malaria Assistant Lab Technician

Nepal Ministry of Health Restructuring of Health Divisions

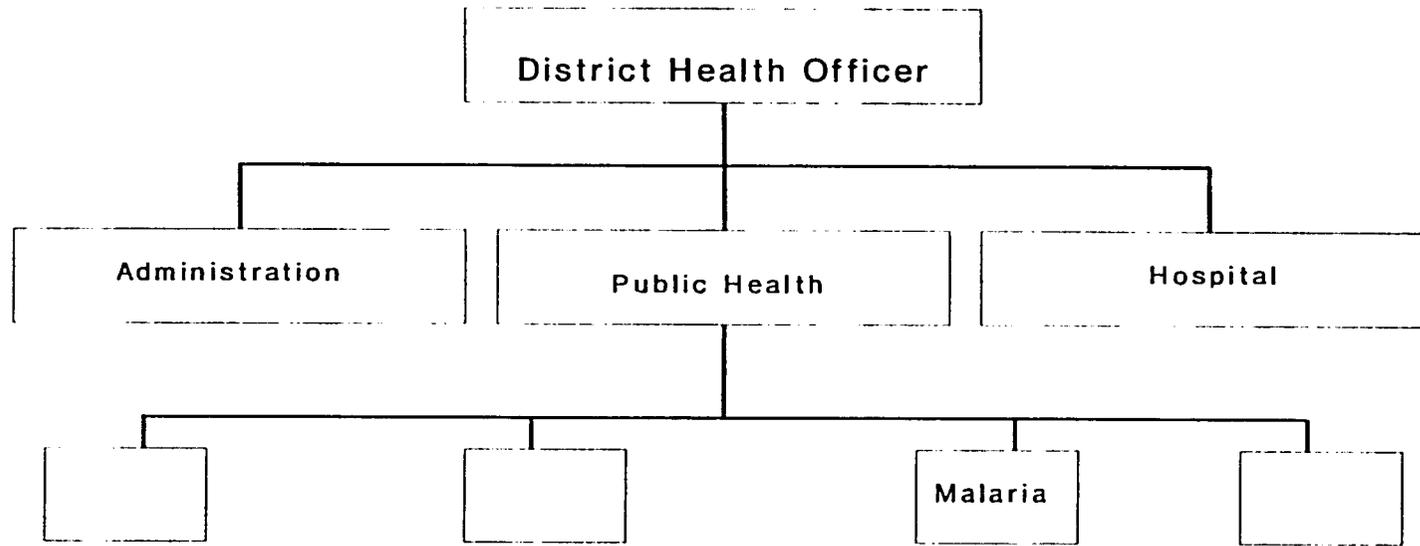


Nepal Ministry of Health Regional Restructuring



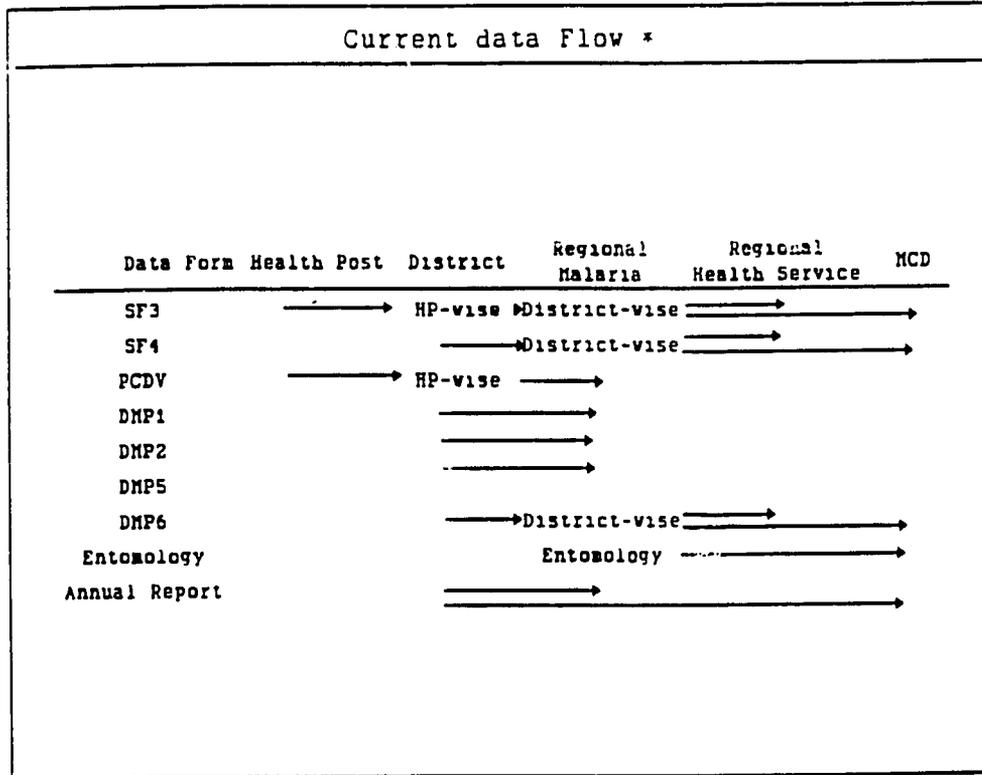
Nepal Ministry of Health District Level Restructuring

30



Appendix B.1

Data Collection Forms and Data Flow for the Current Malaria MIS.



*varies from place to place and very erratic. Consultants saw no spraying reports other than annual report.

SF3-	Source-wise slide collection and positives.
SF4-	Species-wise classification of positives.
PCDV-	Post-wise activity of Passive Case Detection Volunteers.
DMP1-	Personnel, performance report.
DMP2-	Spraying, surveillance and lab summary.
DMP5-	Pending cases.
DMP6-	Health education activity.
Entomology-	Species density and dissections.
Annual report-	20 different forms, map.

Appendix B.2

Suggested Data Forms for a Malaria MIS.

Basic Population Census Data By Locality

Basic List of Slide Sources By HP or District

(Enumeration with updates)

Case Investigation Form

I. Items to include:

- patient name, age, sex, occupation
- address in detail
- slide number or other unique identifier
- source of slide, including code number or other identifier of HP, PCDV
- VHW or other source (from basic register)
- date slide collected and date examined
- parasite species, density (if desired)
- date of radical treatment
- medicine for radical treatment--kind and number of tabs
- date of fever onset
- prior medication both self and/or presumptive
- medicine taken for prior treatment--kind and amount

- classification of case
- if imported, location of assumed transmission
- investigator (coded)

II. Reports that can be generated from this form

1. Location of cases -- village, locality, district, receptivity
2. Species
3. Classification
4. Prior treatment
5. Radical treatment
6. Time to treatment
7. Age, sex, occupation of patient
8. Source of positive slides
9. Time from slide to treatment
10. Comparison of cases to prior year, month, etc. for early warning.
11. Can replace/generate SF4
12. List of cases to be followed

III. Requirements

- Timely summary and feedback to District.
- Programs to coordinate CI Form with basic registers

Follow Up Report

I. Items to include:

- unique case identifier (see CI Form)
- date of follow-up
- follow-up slide number if needed
- results of slide examination
- fever history
- classification (resistant Pf., relapse, etc.)
- age, sex, occupation and location (or use tie-in with initial CI Form)
- medication given -- kind and amount

II. Reports to be generated:

1. Possible drug resistant cases
2. Location of such cases
3. Age, sex and occupation of such cases
4. Treatment history of such cases (with Case Investigation)

III. Requirements

- Feedback on CI Forms from Regional MIS to produce follow-up forms with shared CI and Follow-up form items
- Policy on case follow-up: timing, which cases (Pf or all)

Slide Collection Form

I. Items to include:

- post-wise slide collection (post means individual PCDV, VHW, HP, etc. as in Basic Register of posts)

II. Reports to be generated:

1. Post-wise slide collection activity, including each PCDV, VHW, HP, Hospital, etc.
2. Notification of post-wise inactivity, efficiency.
3. Can replace SF3 with Basic Registers
4. ABER with Basic Population Census

III. Requirements

- Feedback from Region with print-out of all posts
- Computerized update from Post form (see below)

Slide Collection Post Form

I. Items to include:

- PCDV added or lost
- HP added or changed
- VHW schedule changes or additions
- any post changes

II. Reports to be generated:

1. Update of roster of PCDV by locality, etc.
2. Number active or inactive (with slide collection form).
3. Update of basic register of posts
4. Feedback from Region in terms of printed list

Spray Activity Form

I. Items to include:

- location, village, ward, etc.
- type of spray (focal, regular cycle 1 or 2)
- type of insecticide
- start date
- end date
- number houses sprayed
- number shelters sprayed
- population covered
- insecticide when started
- insecticide used
- manpower used

II. Reports generated

- with basic population census--% covered
- insecticide dose per house
- structures sprayed per man or per day, etc.
- running estimate of insecticide stocks and location
- relation of spraying to cases, etc.
- initial plan for next cycle, etc.

Laboratory and Cross-Check Form

I. Items included:

- microscopist identifier
- total slides examined/ number negatives to x-check
- total slides positive/ number to slide check
- supplies needed
- days work lost and reason
- cross-check identifier
- quality of slides
- number/ % error rate
- identification of false negatives

II. Reports generated

1. Lab-wise slides examined
2. Lab-wise cross-check results
3. Technician-wise efficiency
4. Supplies required
5. Reporting of false negatives for CI

IV. Requirements

- Form filled by microscopist, forwarded with slides to cross check
- Feedback from cross-check to District for supervision
- Separate feedback of report of false negatives

Forms Used Locally, Not Computerized

1. VHW person-wise slide collection and treatment
2. HP or other facility patient register

These would be used locally to generate the CI Forms

Total Forms From District To Region = Six Types

Feedback with Automatic Form Production from Region Computer

Appendix C

Detailed List of Computer Equipment and Costs for Five Regional Health Offices

Item	Quantity	Unit Price	Total Price
COMPAQ Contura 4/25CX Notebook Computer	5	\$1,999	\$9,995
Hewlett Packard Deskjet 500 Printer	5	399	1,995
WordPerfect 5.2	5	256	1,280
Dbase IV	5	389	1,945
Lotus 123	5	318	1,590
Norton Utilities with Antivirus	5	188	940
Computer Case	5	50	250
Printer Cable	5	10	50
Box of Paper	5	35	175
Cleaning Kit (Diskette, Screen, Compressed Air)	10	20	200
Printer Cover	5	5	25
Printer Ink Cartridge	15	15	225
Diskette Box (10 diskettes per box)	10	15	150
Power Strip Surge Protector	5	79	395
Spare Batteries	3	100	300
Diskette Cases	10	5	50
Total			\$19,565

National MIS Section Office

Item	Quantity	Unit Price	Total Price
COMPAQ Contura 4/25CX Notebook Computer	1	\$1,999	\$1,999
COMPAQ Prolinea 4/33	1	1,799	1,799
120 Mg Tape Backup	1	149	149
Hewlett Packard Deskjet 500 Printer	1	399	399
WordPerfect 5.2	2	256	512
Dbase IV	2	389	778
Lotus 123	2	318	636
Epi Info 5	1	50	50
Clipper 5.2	1	453	453
SPSSPC	1	1,695	1,695
Harvard Graphics 3.0	1	346	346
Computer Case	1	50	50
Printer Cable	1	10	10
Paper	2	35	70
Cleaning Kit	4	20	80
Printer Cover	1	5	5
Printer Cartridge	3	15	45
Power Strip Surge Protector	2	79	158
Diskettes (10 per box)	4	15	60
Diskette Cases	2	5	10
Total			\$9,304

Hetauda Research and Training Center

Item	Quantity	Unit Price	Total Price
Compaq Proline 4/33 Computer	1	\$1,799	\$1,799
Hewlett Packard Deskjet 500 Printer	1	399	399
WordPerfect 5.2	1	256	256
Dbase IV	1	389	389
Lotus 123	1	318	318
Epi Info 5	1	50	50
Computer Cover	1	5	5
Printer Cable	1	10	10
Paper	2	35	70
Cleaning Kit	2	20	40
Printer Cover	1	5	5
Printer Cartridge	3	15	45
Power Strip Surge Protector	1	79	79
Diskette Cases	2	5	10
Total			\$3,475

Repair Needs for Current Malaria Office Systems

Item	Quantity	Unit Price	Total Price
Hewlett Packard HP17255D Special RS-2232-C Cable (Kathmandu)	1	\$25	\$25
Extended Keyboard (Hetauda)	1	50	50
Disk Controller Card (Biratnagar)	1	300	300
Total			375
Grand Total for all equipment			\$32,719

Appendix D

Details of Training Requirements

Appendix D.1. Basic Computer Literacy Training

Content: Introduction to DOS, WordPerfect, Lotus, dBase

Participants:	MIS Section	Junior Statistician	1
		Statistical Assistant	2
	Malaria Unit	Senior Malaria Assistant	2
	Hetauda RTC	Computer Assistant	1
	Regional MIS	Planning Officer	5
		Computer Assistant	5
	Regional Malaria	Malaria Assistant	5
Total			21
Instructors:	Local Kathmandu firm		
Timing:	3 weeks. January 2 — January 21, 1994		
Budget:	Course fee: \$50 per person x 21 persons		\$1,050
Subsistence:			
Gazetted:	\$6 per day x 21 days x 4 persons		\$504
Ungazetted:	\$4 per day x 21 days x 9 persons		\$756
Total			\$2,310

Appendix D.2

Intensive Malaria MIS Training

Contents:		
	Installation of software	
	Organization of hard disk	
	Back-up systems	
	Care and maintenance of hardware	
	Data entry for malaria MIS	
	Report production for Malaria MIS	
Participants	Same as for basic training	
Instructors:	VBC Consultants MIS Section Senior Statistician MIS Section Computer Programmer Malaria Unit Senior Malariologist USAID/Nepal Malaria Program Specialist	
Timing:	6 days. January 23 - 28, 1994	
Budget:	Room rent: \$100 per day x 6 days	\$600
Subsistence:		
Gazetted:	\$6 per day x 7 days x 4 persons	\$168
Ungazetted:	\$4 per day x 7 days x 9 persons	\$252
Stationary:		
Lunch and coffee/tea breaks		\$440
	Total	\$1,460

Appendix D.3

Workshop for Senior Staff

Contents: determination of data needs for management of malaria control program (indicators, GIS, early warning, etc.)

Participants:	Division Director	1
	Disease Control Chief	1
	Regional Health Director	5
	Malaria Unit Senior Malariologist	1
	Malaria Unit Vector Control Officer	1
	MIS Section Senior Statistician	1
	MIS Section Computer Programmer	1
	MIS Section Junior Statistician	1
	Hetauda RTC Chief	1
	Regional Planning Officers	5
	Regional Malaria Officers	5
	VBC Consultant Epidemiologist	1
	VBC Consultant MIS Specialist	1
	VBC Consultant Workshop Facilitator	1
	USAID/Nepal Malaria Program Specialist	1
Total	27	
Budget:	Conference Room and Lunch:	\$700
	Stationary	\$100
	Subsistence: \$6 per day x 4 days x 9 persons	\$216
	Total	\$1,016
Timing: 3 days, May 15 - 17, 1994		

Appendix D.4

Advanced Training In Computers

Contents:		
	Hardware Maintenance	
	Systems Organization	
	Programming	
	SPSS	
	EpiInfo	
	Harvard Graphics	
Participants	MIS Section Junior Statistician	
Instructors:	Training Institute, New Delhi, India	
	MIS Section Senior Statistician	
	MIS Section Computer Programmer	
	Malaria Unit Senior Malariologist	
	USAID/Nepal Malaria Program	
	Specialist	
Budget:		
Course:		\$2,000
Subsistence:	\$50 per day x 100 days x 1 person	\$5,000
	Total:	\$7,000
Timing:	3 Months, July - September 1994	
	Grand total for all training	\$11,786

Appendix E

Task List and Timeline For Second Trip

Activity	Jan	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		
Training by Local Firm (January 2 - January 21, 1994)	XXXXXXXXXXXXXXXXXXXX								XXXXXXXXXXXXXXXXXXXX								XXXXXXXXXXXXXXXXXXXX						
Program Development (January 17 - 28)																	XXXXXXXXXXXXXXXXXXXX						
	Jan	22	23	24	25	26	27	28	29	30	31	Feb	1	2	3	4	5	6	7	8	9	10	
Intensive Training by Consultants (January 23 - 28)		XXXXXXXXXXXXXXXXXXXX																					
Program Development		XXXXXXXXXXXXXXXXXXXX																					
Installation of Equipment in Regions (January 29-February 21)																							
Travel to Dandeldhura									XXXXXXXXXX														
Work in Dandeldhura												XXXXXXXXXX											
Travel to Surkhet													XXXXXXXXXX										
Work in Surkhet																	XXX		XXX				
Travel to Pokhara																				XXXXXX			
Work in Pokhara																						XXXXXX	
	Feb	11	12	13	14	15	16	17	18	19	20	21	22	23	24								
Travel to Hetauda		XXX																					
Work in Hetauda			XXX																				
Travel to Dhankuta				XXX																			
Work in Dhankuta					XXXXXXXXXX																		
Travel to Kathmandu								XXX															
Work in Central Region Office									XXXXXXXXXX														
Work in MIS section												XXXXXXXXXX											
USAID/Nepal Debriefing																	XXX						

