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Vector Biology
and Control Project

Swaziland: Malaria Control Information System

September 18 - October 8, 1991

by

Steven Yoon, MPH

and

Barry A. Silverman, Sc.D.

VBC Report No. 81254

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1. Introduction

1.1 Scope of Work

At the request of USAID/Mbabane and the Malaria Control Unit (MCU) of the Ministry of Health (MOH) of the Government of Swaziland (GOS), the Vector Biology and Control (VBC) Project supplied two consultants to: 1) install a computer system at MCU Headquarters at Manzini; 2) further train the staff of MCU in the use of the computer, DOS, Lotus, dBASE, WordPerfect and Harvard Graphics; 3) review the information needs of MCU; 4) review the MOH Health Information System (HIS) to ensure compatibility of the Malaria Information System (MALINFO); 5) develop a prototype malaria information system; 6) prepare documentation for MALINFO; 7) train MCU staff in the use of new MALINFO and 8) demonstrate MALINFO to MOH and USAID/Mbabane personnel.

1.2 Background

This consultancy is a followup of a review of the MCU data collection system conducted by the VBC Project in September 1990. An analysis of the malaria information system, data elements, data forms, data collection procedures, data flow, and information generation and use was conducted during the 1990 visit. Data used by MCU generally were either slide data (epidemiology) or data about spray operations. Very little entomological work was being done by the MCU and there was no evidence of operational research efforts. The findings of the 1990 analysis are summarized below.

1.2.1 Epidemiological data

1.2.1.1 Passive case detection (PCD)

Approximately 8000 to 10,000 slides a year are taken from patients presenting at the country's approximately 60 hospitals and clinics with signs and symptoms of malaria. These slides are being forwarded to MCU at Manzini to be stained and read. Slide infor-

mation is submitted on Form MC6.[1] Patients are given a complete dose of Daraclor (150 mg chloroquine + 15 mg Pyrimethamine) at the time the slide is taken. The vast majority of these slides are negative for *Plasmodium*. Weekly PCD slide results are summarized on form MC9. MCU follows up all positive slides by relocating the patient and taking a second slide. Feedback to the clinics and hospitals was scant or nonexistent.

1.2.1.2 Active case detection (ACD)

MCU conducts an aggressive ACD program, collecting approximately 60,000 slides a year. All these slides are stained and read in Manzini. MCU follows up on all positive slides. The positivity rate is usually between 2.5 and 3.5 percent. ACD slide information is submitted on form MC5, and weekly ACD slide results are summarized on form MC10.

1.2.1.3 Ministry of Health's (MOH) Health Information System (HIS)

Under the sponsorship of USAID/Mbabane's Combatting Communicable Childhood Diseases (CCCD) program, an HIS was developed to collect maternal and child health data from the country's hospitals and clinics. In September 1991, this system was about to be launched. The collection and analysis of data was to be decentralized to the four districts of the country (Hhohho, Lubombo, Manzini and Shiselweni), with information being forwarded to the MOH headquarters in Mbabane for aggregation of national health statistics. Presumptive malaria cases would be recorded as part of this database. MCU indicated that there had been discrepancies between reported presumptive cases and slide data.

1.2.1.4 Reporting units

As reported above, the MOH's HIS uses the four districts of the country as its units of aggregation and the hospitals and clinics as the basic reporting unit. The malaria unit has developed a

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[1]Copies of MCU forms are available from the VBC Project.

1:150,000 grid map and has divided the country into three sectors; North (1-10), Central (11-23) and South (24-36). Hospitals and clinics are the basic reporting unit for PCD, but the localities described by grid map coordinates are the basic reporting unit for ACD.

1.2.2 Spray data

Spray information is reported to MCU at Manzini on Form MC4, which is the Locality Completion Report. This information has to be summarized from MC3, the Daily Spray Report that aggregates information from the reports of individual spraymen (MC1). The basic reporting unit for spray information is the localities and these are defined by their coordinates on the grid map.

1.2.3 Decentralization of malaria control efforts

Construction of the first of three malaria camps had begun in the Big Bend area (Bar J Ranch). There were plans to decentralize malaria control operations to camps in each of the three sectors. This first camp was planned to initially serve both the Central and South sectors. Spray operations and slide collection and reading would be directed from these camps, with MCU in Manzini providing technical and administrative support to the Sectors.

1.2.4 Recommendations of 1990 VBC MIS technical assistance

1.2.4.1 Malaria Information System (MALINFO)

A followup visit to develop a prototype database for slide and spray data was recommended. It was further recommended that the computerized database should be developed so that data would be compatible with the HIS of the MOH.

1.2.4.2 Hardware and software

It was recommended that the MCU be supplied with a microcomputer, a printer and software. USAID/Mbabane agreed to supply MCU a 80286 processor, 25 mHz, with 80 mb harddisk

with two 5 1/4 inch floppy drives, one high density and one 360 mb. The computer was also to be equipped with an internal magnetic tape backup and an uninterrupted power supply.

Based on the above findings and recommendations, the scope of work for this current consultancy was developed by USAID/ Mbabane and the VBC Project.

2. Review, Training and HIS Development

2.1 Installation at MCU

Following the recommendations of the 1990 review of MCU data management needs, USAID/Mbabane purchased the hardware described in 1.2.4.2. In addition, copies of WordPerfect 5.1, dBaseIV, Lotus, Harvard Graphics and Norton Utilities were purchased by USAID/Mbabane. This hardware and software was delivered to the VBC Project offices, where the software was installed on the computer and the equipment was "burned-in" and prepared for shipment to MCU. The hardware and software were delivered to MCU Manzini by the VBC Project consultants and installed at MCU Offices on arrival.

2.2 Training MCU and Bilharzia Control Unit Staff

Prior to the arrival of the VBC team, four members of the MCU staff (Simon Kunene, Queenton Dlamini, Elias Dlamini and Paulos Dlamini) received training in "Introduction to the Computer and DOS," "Introduction to Lotus" and "Introduction to dBase." The courses were given by Computronics, a private sector computer training facility in Manzini. During this consultancy, the VBC team provided training for MCU staff in the use of these software packages as well as the use of WordPerfect and Harvard Graphics. The training stressed the use of the computer for the malaria control. Staff members of the Bilharzia Control Unit also received this training (Annex 1). MCU's new computer, the Bilharzia Control Unit's computer and the consultants' portable computer were used for the training. Examples were developed for spreadsheets, databases and graphics using malaria and schistosomiasis data.

2.3 Review MCU Database Requirements

Although there has been much progress towards establishing the malaria camp for the Central and South Regions since the VBC consultancy in 1990, MCU continues to enter and analyze all malaria slide and spray data in Manzini. There are still plans to decentralize malaria control operations to the three sectors. It was suggested that MALINFO be develop so that it could be used when decentralization occurs.

Simon Kunene, Chief of MCU, and his assistant, Queenton Dlamini, pointed out that passive case detection, active case detection and spray coverage data are critical to the MCU operations. MCU staff decided that the initial databases of MALINFO would have data entry screens for data recorded on forms MC5 (Active Case Detection), MC6 (Passive Case Detection) and MC4 (Locality Spray Completion Report). Long-term malaria advisor Kobus LeGrange suggested that information on source of infections, which is obtained during case follow-up, should be included. MCU staff agreed to include this information in the database. It was further agreed that MALINFO should be able to generate weekly, monthly, quarterly and annual reports on passive case detection (MC9) by hospitals/clinics and by sectors, on active case detection slide data (MC10) by localities, and summaries of spray coverage data by localities. Localities would continued to be coded according to their coordinates on the 1:150,000 grid map. Paulos Dlamini was designated by Simon Kunene to be responsible for data entry on a trial basis.

2.4 Review of MOH Health Information System

The VBC team met September 19, 1990, with Dr. Qhing Qhing Dlamini, the Deputy Director of Medical Services of the Ministry of Health, Simon Kunene and Queenton Dlamini of MCU, and Anita Sampson of USAID/Mbabane to discuss its proposed scope of work. Dr. Dlamini stated that the Ministry would like to see an information system developed for MCU that could eventually be integrated into the Ministry of Health's health information system. She stressed that the initial system development must primarily

serve the needs of MCU, but future incorporation of malaria data into the MOH information system would be desirable. All agreed that this would be considered in the development of MALINFO.

The VBC team met September 30, 1991, with Mr. Luke Dumisani Mavuso, who is responsible for completing and implementing the Ministry of Health's health information system. He had recently returned from the United States, where he took a B.S. degree in computer science at the University of Maryland's Eastern Shore campus. Simon Kunene and Queenton Dlamini also attended the meeting to discuss plans for the development of MALINFO and the status of the MOH HIS. It was stated that the MOH HIS was being revised. The current version of the database had been implemented at the regional health offices and data were being aggregated by the Biostatistics section. National health statistics reports were being generated on an ad hoc basis.

The basic reporting units of the MOH HIS are clinics and hospitals, and data are aggregated at the district level. Mr. Dumisani Mavuso agreed that it would be useful to be able to report MCU data on both the hospital/clinic level and district level so that the information would be comparable and compatible with the MOH HIS. He agreed to include summary malaria data in the MOH HIS reports. He further agreed, to the extent possible, to serve as a resource person to MCU for MALINFO's implementation and further development.

2.5 Development of MALINFO

2.5.1 Database development

Based on the findings of the 1990 visit and the results of the reviews discussed above, MALINFO was developed. A menu system for data entry, report generation, and backup of the database was developed along with databases for epidemiology and spray operations. Since forms MC5 (ACD) and MC6 (PCD) contain approximately the same information, one data entry form was developed for both with a field to indicate the source of the blood slide.

Most information is entered with a keystroke. This will make data entry quicker and reduce the number of typographic errors. The exceptions are patient's and householder's names for positive cases, which must be typed in. Age and sex of patients are recorded for both positive and negative slides.

To make malaria data compatible with the MOH database, a database of all possible grid map coordinates defined by district was created. A data entry screen was also created for the addition of new hospitals, clinics and localities. As each new entry is added to the database, it will be assigned coordinates that will automatically assign it to a sector and district.

MALINFO has been designed so that all reports can be generated for one week, one month, a range of weeks or annually. Reports also can be automatically generated for hospitals and clinics, sectors, districts, or on a national level.

Staff of MCU were trained in all aspects of the use of MALINFO including data entry, report generation, maintenance and backing up of data. The VBC team also drafted documentation for MALINFO and demonstrated the system to Dr. Qhing Qhing Dlamini, Mr. Dumisani Mavuso, Ms. Sampson and members of the Bilharzia Control Unit.

Annex 1
Training Participants

List Of Training Session Participants

Malaria Control Unit

Simon Kunene

Queenton Dlamini

Elias Dlamini

Paulos Dlamini

Dumisani Makhubu

Bilharzia Control Unit

William Gama

Thoko Dlamini