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*Vector Biology  
and Control Project*

**Final Evaluation Report**

**USAID Health Systems Management  
Project (9517-0153)**

**Disease-Control Component**

**Dominican Republic**

**February 1991**

**by**

**Samuel G. Breeland**

**VBC Report No. 81236A**

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## **Executive Summary**

This report is a final evaluation of the disease-control component of the Health Systems Management (HSM) Project (517-0153), Dominican Republic (DR). The project was authorized Feb. 28, 1984, with an original Project Assistance Completion Date (PACD) of April 30, 1989, amended to Oct. 31, 1990. The component was evaluated by reviewing documents, interviewing personnel and visiting sites in the DR. The disease-control component of the HSM Project was to establish surveillance systems to monitor transmission of schistosomiasis, dengue and yellow fever. It was also to propose programs for controlling these diseases.

The disease-control component was allocated \$250,000 in A.I.D. funds (dengue/yellow fever, \$100,000; schistosomiasis, \$150,000). The dengue funds were used primarily to equip a laboratory and train personnel to identify dengue; the schistosomiasis funds went for equipment and supplies and for training and travel support for Centers for Disease Control (CDC) experts. Counterpart funds from the government (GODR) totaled \$470,000 (cash \$20,000; in-kind, \$450,000) and covered salaries of Secretaria de Estado de Salud Publica y Asistencia Social (SESPAS) personnel. Inputs were well used and resulted in successful completion of planned outputs at the end of the project (EOP), including an operational laboratory service at the national level for dengue and at the regional level (Region V) for schistosomiasis. Also, at the EOP protocols and plans were in place to respond to routine and emergency control of the diseases.

The new in-country capabilities have improved SESPAS' ability to diagnose, report and control these vector-borne diseases.

Principal recommendations resulting from the evaluation are that:

- o SESPAS maintain active national committees for both disease groups;
- o the surveillance and control networks for both disease groups continue to operate;
- o SESPAS require that dengue be a reportable disease;

- o continuing efforts be made to involve doctors and other members of the medical community in the country's vector-borne disease network, particularly for dengue;
- o a CDC expert in cell culture spend some time at the National Laboratory working under DR conditions; and
- o the schistosomiasis control section be assisted, where possible, in procuring molluscicides, the principal means of controlling the disease's snail intermediate host.

## 1. Scope of Work and Supporting Documents

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### Work scope

The scope of work for this consultancy was to evaluate the disease-control component of the Health Systems Management Project (No. 517-0153). An evaluation of the rest of the project was conducted separately.

In the evaluation, the consultant was to a) determine whether the disease-control component of the project was implemented according to the project agreement, including whether the goals had been accomplished and at what level the systems were working; b) determine whether the project institutionalized significant and necessary improvements in SESPAS' ability to deal with schistosomiasis, dengue and yellow fever; and c) recommend ways SESPAS could be assisted in the future.

The work was carried out through a review and analysis of project documents, discussions with appropriate A.I.D. project officers and meetings with SESPAS personnel.

### Supporting documents

The following basic documents were used for this evaluation:

- o Health Systems Management Project Paper, Dominican Republic (Project No. 517-0153)
- o Health Systems Management Project Paper, DR, Amendment No. 2
- o Health Systems Management Project Status Report, April 1, 1990 - Sept. 30, 1990 (USAID/Santo Domingo)
- o Project Implementation Document, HSM Project No. 517-0153 (dengue and schistosomiasis)

- o Plan de acción para el control del *Aedes aegypti* a corto plazo. SESPAS, 1989
- o USAID/Santo Domingo Files:
  - Health Systems Management Project (0153), Dengue 1.8
  - Health Systems Management Project (0153), Schisto. 1.9
  - Health Systems Management Project (0153), PID, Dengue 2.9.2
  - Health Systems Management Project (0153), PID, Schisto. 2.9.3
  - Health Systems Management Project (0153), Mission Rpts. 2.8.2

## 2. Description of Project

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The Health Systems Management Project is intended to improve SESPAS management systems and develop SESPAS' capacity to manage health services. The disease-control component of the project was to set up systems to monitor the transmission of schistosomiasis, dengue and yellow fever. The component was also to propose control programs to reduce the possibility of epidemics in these areas.

The disease-control component was allocated \$250,000 in A.I.D. funds. The dengue/yellow fever element of \$100,000 financed a small amount of laboratory equipment and training for Dominican laboratory personnel in disease identification and surveillance. A.I.D. funding for the schistosomiasis element amounted to \$150,000 (two vehicles, \$36,000; equipment and supplies, \$16,000; molluscicides, \$48,000; a small amount for training; and travel support for CDC experts).

Major accomplishments were expected to be:

- o establishment of laboratories that could diagnose dengue;
- o vector and dengue studies;
- o publication of epidemiological bulletins with information on dengue surveillance;
- o training of health personnel abroad in dengue surveillance;
- o in-country training of health personnel in dengue surveillance;
- o establishment of laboratories that could diagnose schistosomiasis;
- o health personnel trained in-country to diagnose schistosomiasis;

- o doctors trained in-country in schistosomiasis referral; and
- o health personnel trained abroad in schistosomiasis control.

The disease-control component of the project had only one planned EOP goal -- that disease control programs be fully established and operating for dengue/yellow fever and schistosomiasis.

### 3. Previous Evaluations

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No previous evaluations of the disease-control component of the Health Systems Management Project have been made. The component was not addressed in the final evaluation of the project.

#### 4. Sustainable Development Benefits

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- o The National Laboratory of Public Health, through its Virology Department, has established an in-country capability to diagnose dengue.
- o SESPAS has named a coordinator for the surveillance and control of dengue. There is now a system for collecting blood samples from fever cases for disease detection and follow-up focal mosquito control.
- o Under Vector Control Project No. 517-0235, SNEM has developed the capacity to apply up to six vector-control strategies for dengue. This capacity is useful to the disease-control component of the Health Systems Management Project (517-0153).
- o SESPAS has developed a detailed written action plan for both dengue and schistosomiasis surveillance and control, including preventive and emergency strategies.
- o The schistosomiasis activities in Region V are working well at the regional level and should be transferable if new foci develop.
- o A cadre of people has been trained in both dengue/yellow fever and schistosomiasis surveillance and control, routine and emergency.

## 5. Evaluation Results

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### Background

The disease-control component is a relatively small part of the Health Systems Management Project. Most of the project, which was evaluated separately, concerns improving management systems. According to the project paper, vector-borne diseases such as schistosomiasis, dengue and yellow fever require a different approach than the other parts of the project. Also, the absence of local technical expertise to develop coherent epidemiological approaches for surveillance and disease control dictated a separate entity in the larger project -- and a separate evaluation.

Funding for the disease-control component was originally set at \$720,000 (A.I.D., \$250,000; GODR, \$470,000), representing about 6.5 percent of the \$11 million allocated to the Health Systems Management Project from all sources and only 3 percent (\$250,000 of \$8 million) of A.I.D. funding. The counterpart funds from GODR of \$470,000 (cash, \$20,000; in-kind, \$450,000) were to be used to cover salaries of SESPAS personnel assigned to the dengue/yellow fever and schistosomiasis elements. Because the Dominican Congress failed to ratify the loan portion of the project, an amendment in August 1985 de-obligated the loan and reduced grant funding to \$1.5 million. Goals were maintained, and the disease-control component was unaffected. However, the budget was amended in 1988 to reflect the devaluation of the peso against the dollar, which meant that fewer dollars were required to carry out planned activities. The A.I.D. funds for disease control were reduced by \$20,000, to \$230,000. The GODR contribution was amended to \$282,000, for a total of \$512,000.

### EOP status

Under the disease-control component, the project was to establish surveillance systems to monitor transmission of schistosomiasis,

dengue and yellow fever and to propose control programs to reduce the possibility of epidemics in these areas.

By July 1988, the project had installed a laboratory for diagnosing dengue and yellow fever, set up a system for monitoring dengue prevalence and developed a plan for managing dengue hemorrhagic fever (DHF) epidemics. Also SESPAS, through the schistosomiasis control section (Region V), had begun enacting a plan to detect, treat and control schistosomiasis in the higher endemic areas in the eastern part of the country. By the EOP, the schistosomiasis activities were up and running.

At the EOP evaluation, the only goal projected for the disease-control component—that disease control programs for dengue/yellow fever and schistosomiasis be fully established and operating -- has been realized. The dengue/yellow fever laboratory is fully operational for countrywide service, and the schistosomiasis control section is fully operational in Region V. Also, detailed protocols have been written for the surveillance and control of both disease groups. Planned project inputs were adequately provided and used, and expected EOP objectives were accomplished for both elements of the disease-control component of the Health Systems Management Project.

Project accomplishments and the outlook for controlling each disease are discussed in greater detail below.

## **Dengue/yellow fever element**

### **1. Accomplishments**

A review of planned versus actual accomplishments in the dengue/yellow fever element of the disease-control component shows the following:

- o The national laboratory is fully functional, provides diagnostic services and participates in the surveillance-control network (100 percent completion).

- o The dengue surveillance system and the vector-control efforts of SNEM are completed to the point that at least six interventions are available for focalized vector control (> 100 percent completion).
- o Epidemiological bulletins on dengue were printed and distributed, 10 planned, 13 completed (> 100 percent completion). Dengue information is also published in departmental serial publications, e.g., the Bulletin of Epidemiology, and national and regional conferences have been held.
- o Health personnel, including the chief and two technicians from the National Laboratory, were given out-of-country training (CDC, San Juan) in dengue surveillance -- 6 planned, 10 trained (> 100 percent completion).
- o Health personnel trained in-country in dengue surveillance -- 100 planned, 765 trained (> 100 percent completion).

The evaluation shows that the virology section of the National Laboratory used project inputs in an exemplary manner and with full reciprocal cooperation with other participants. The government provided personnel, buildings and extensions; CDC provided training and consultation (at the San Juan, Puerto Rico laboratory); A.I.D. supplied equipment and supplies (basic lab equipment, freezers, microscopes, balances, diagnostic equipment and supplies, computer system, office supplies and equipment); and SESPAS gave management and logistics support. Considering the modest investment of \$100,000 in A.I.D. funds, the operational capability of the dengue lab far exceeds what could have been reasonably expected.

## 2. Outlook

The surveillance system established under the project has enabled the GODR to discover widespread dengue transmission and the first confirmed cases of DHF in the country. This information has convinced SESPAS and CDC that something must be done to prepare the country for a possible epidemic.

The emergency plan prepared under the project recommends that the following activities be carried out, for which funding would be provided under the 1988 HSM Project amendment. I consider them important enough to repeat here (from PP, Health Systems Management Project, Amendment No. 2).

- o The National Committee for the Control of Dengue Emergencies needs to be strengthened.
- o SESPAS should require that dengue be a reportable disease.
- o Periodic serosurveys should be conducted and the results disseminated to relevant health and vector control authorities.
- o Medical personnel should be trained to diagnose and treat dengue and DHF.
- o Medical facilities should be surveyed to determine whether they have basic equipment for dengue diagnosis.

Many of these recommendations have been accomplished, but constant vigilance will be required to maintain project gains.

### 3. Constraints and needs

- o The project held seminars to educate doctors on dengue surveillance, but attendance was poor.
- o The National Laboratory is well-equipped under the project, but the responsible personnel should have been more involved in selecting equipment, furniture and supplies.
- o At EOP, the greatest need is to have someone from the CDC Laboratory at San Juan actually work with cell cultures in the DR laboratory to delineate problems with local conditions and recommend corrective measures.

## **Schistosomiasis element**

### **1. Accomplishments**

A comparison of planned versus actual outputs in the schistosomiasis element of the disease-control component shows that:

- o the project has contributed to the development of a laboratory that can diagnose, confirm and treat schistosomiasis on a regional basis (Region 5), with expertise that can be transferred to areas of new foci if needed;
- o health personnel, mostly laboratory technicians, have been trained by SESPAS in the diagnosis and control of schistosomiasis -- seven planned, seven trained (100 percent completion);
- o doctors were to be trained in-country in schistosomiasis referral -- 108 planned, but none completed, partially because of a delay in local currency disbursement;
- o health personnel were to be trained abroad in schistosomiasis control -- two physicians planned, two trained in Venezuela (100 percent completion).

Collectively, the program included project inputs in epidemiological survey and diagnosis, chemotherapy, snail reconnaissance and control, training, evaluation through CDC consultations, and financing of vehicles and training aids. The inputs, though relatively small, seemed well used, and their use met or exceeded implementation expectations.

The basic objective of the schistosomiasis element was to establish the prevalence and incidence of the disease, together with the ecological, social and demographic parameters for a control strategy. This work continues, but the objective has essentially been accomplished through:

- o serological studies of a sample of the population;

- o concentration on the most susceptible group -- school populations between five and 20 years of age;
- o familiarizing health personnel (such as doctors, nurses, supervisors and educators) with the magnitude and importance of schistosomiasis in the eastern region of the country;
- o health education activities to inform the general public with emphasis on areas of high endemicity;
- o the implementation of an adequate system of epidemiological surveillance;
- o the improvement of sanitary conditions in areas of high endemicity;
- o surveys to determine foci of transmission of *Schistosoma mansoni*, the causative agent;
- o treatment of infected patients with praziquantel and the evaluation of side effects;
- o vector control activities against the snail vectors; and
- o public identification of contaminated water sources.

To conduct these broad-based activities, the schistosomiasis control section, Hato Mahor del Rey, employs 17 people in Health Region V: the coordinator, a brigade supervisor, a laboratory chief, a laboratory technician, two laboratory aides, two statistical secretaries, a snail collector, five spraymen, a chauffeur, a messenger and a janitor.

In spite of constraints, the schistosomiasis control section has, mainly through the coordinator:

- o produced an organizational and operational manual;
- o improved the location and furnishing of facilities; and

- o obtained through donation appropriate hydrographic and topographic materials to delineate endemic zones, a step toward stratification.

The current operational plan and pattern of the schistosomiasis control section of SESPAS involves surveillance, case treatment and control of the disease in the eastern region of the country where the disease is endemic. Priority is given to Higuey, El Valle and Hato Mayor. At EOP, the schistosomiasis activities in Region V met project requirements. These activities can be applied to other parts of the country should new foci develop.

## **2. Outlook**

Since 1987, SESPAS has had a Schistosomiasis Control Committee that oversees a plan for detecting, treating and controlling the disease in the DR. Because of A.I.D.'s emphasis on dengue, most of the funding for schistosomiasis activities has had to come from local currency funds. Thus, with a relatively strong base of GODR funds, the activities are likely to continue at the EOP level.

With strong coordination at the national level through the epidemiology department of SESPAS, the CDC's continuing interest and assistance, and a center of activity in the DR, Schistosomiasis will probably receive appropriate attention in the future.

## **3. Constraints and Needs**

Although alternatives to molluscicides have been tried (e.g., topographic alterations, biocontrol agents), chemical control of the snail intermediate host of schistosomiasis is still important. The chemicals are costly, and the GODR can use help in its constant training and retraining of laboratory technicians caused by large turnovers in personnel.

**A lack of physician participation in educational programs on schistosomiasis surveillance and reporting needs to be resolved to improve case reporting and control follow-up through chemotherapy.**

## 6. Recommendations

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- o SESPAS should maintain active national committees for both dengue and schistosomiasis that should meet regularly and coordinate with the SESPAS epidemiologist.
- o The surveillance and control networks established under the project for both disease groups should continue to operate.
- o SESPAS should require that dengue be a reportable disease.
- o Periodic serosurveys should be conducted and results disseminated to appropriate health and vector control authorities.
- o Continuing efforts should be made to train medical personnel, particularly doctors, to diagnose and treat dengue, DHF and schistosomiasis. At a minimum, medical personnel should participate in surveillance.
- o Appropriate medical facilities should be equipped with the basic needs for diagnosing dengue.
- o Efforts should be made to have a CDC expert, preferably from the San Juan Laboratory, spend up to a month at the DR National Laboratory to assist in cell cultures.
- o USAID/Santo Domingo should be cognizant of the ongoing need for molluscicides in the schistosomiasis program and help where possible.
- o The problem of excessive turnover in health personnel should be evaluated in an effort to reduce training and retraining needs.
- o SESPAS should find some way to improve doctor participation in GODR sponsored training and educational activities involving vector-borne disease in the Dominican Republic.

## 7. Contacts and Itinerary

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Dra. Carmen S. Rodriguez	Director General of Epidemiology, Project Coordinator, SESPAS
Profesora Ellen Koenig	Chief of Virology, National Laboratory of Public Health "Dr. Defillo"
Dra. Jacqueline Medina	Director, Servicio Nacional de la Erradicacion de la Malaria (SNEM)
Lic. Carlos Peña	Vector Control Specialist, SNEM
Sarah George	Project Officer, USAID/Santo Domingo