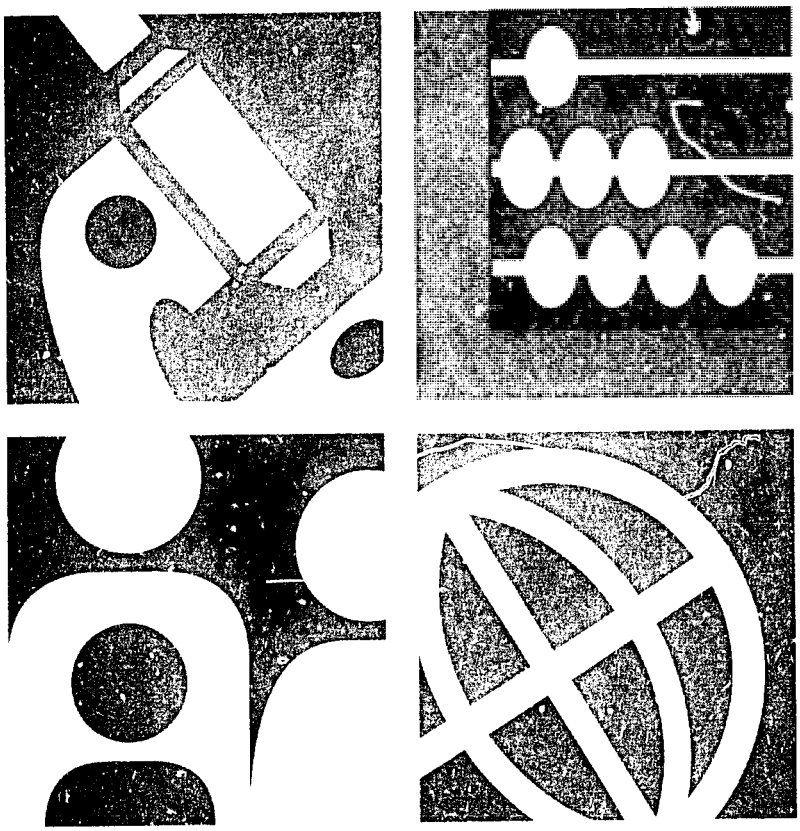
PD-ABL-613

VECTOR-BORNE DISEASE CONTROL: CHANGING STRATEGIES



PROJECT TITLE: Vector Biology and Control II (VBC II)

PROJECT #: 936-5948.5 AGREEMENT #: DPE-5948-C-00-9030-00

PURPOSE/DESCRIPTION: This project is designed to create more effective and cost efficient vector-borne disease control programs in less developed countries (LDCs).

SERVICES:

- Assistance To USAID and Regional Bureaus in formulating strategies for vector-borne disease control
- Technical Assistance to improve the design, implementation, and/or evaluation of vector control programs
- Technical assistance to improve data management of vector control programs
- Training host-country and regional control personnel at operaional and management levels.
- Technical assistance to strengthen Research Institutions and Training Centers in LDCs
- Distribution of information and training materials to host-country vector-borne disease control institutions and VBDC information centers.

FIELD RESEARCH

Research objectives include testing of new tools for control of disease and/or transmission, operational research to guide personnel in the selection of the most cost-effective control options, field research to identify populations at high risk and to stratify control efforts and social and economic research to improve community participation and measure economic impact.

PUBLICATIONS: Technical reports available through Medical Service Corporation International

DURATION: FY 90 - FY 94 GEOGRAPHIC AREA: Worldwide

PROJECT MANAGER: Name: Arthur Dennis Long, ScD. Phone: 703/875-4743
Address: S&T/H/WVC AID/W

IMPLEMENTING AGENCY: Medical Service Corporation International
1611 North Kent Street
Suite 503
Arlington, VA 22209

Contact: Robert R. Lennox, ScD. Phone: 703/527-6500

OTHER IMPLEMENTING AGENCIES:

Centers for Disease Control
World Health Organization
Harvard University
The Henry M. Jackson Foundation
Tulane University

Vector-Borne Disease Control:

Changing Strategies

The VBC Project Fiscal Year 1990 Work Plan

a

Cover art: *The challenge for the 1990s -- a challenge that VBC accepts with enthusiasm -- is to implement comprehensive programs that effectively combine the biological, behavioral and management components of global disease control.*

MSCI

February 7, 1990

A. Dennis Long, P.E., Sc.D.
Public Health Advisor
Office of Health
Bureau for Science and Technology
Agency for International Development
Washington, DC 20023

Dear Dr. Long,

Medical Service Corporation International and its subcontractors, Harvard University, Tulane University and the Henry M. Jackson Foundation, are pleased to present our Work Plan for the first year of the Vector Biology and Control (VBC) II contract. Like the Project itself, the plan is a departure from the past, both in content and format. Rather than presenting a list of activities, we have outlined our objectives for the Project and described a comprehensive plan for achieving those objectives.

VBC II was designed to increase the contract's resource pool and the technical skills of the core staff to allow the VBC team to address all elements of vector-borne disease control. These changes enable VBC to be more responsive to Agency, Bureau and Mission needs and to proactively explore new directions in helping host countries achieve effective and financially sustainable disease control.

The enclosed Work Plan acknowledges variations in the needs of countries within each region and strives to introduce the best of disease control technology into the host-country setting. Special care has been taken to preserve the flexibility built into the Project's design to enable the VBC team to take advantage of new initiatives and opportunities for collaboration with A.I.D.'s development partners.

The plan is ambitious and the VBC team is enthusiastic about its implementation. We welcome your comments and suggestions so that the first year of the VBC Project may be one of exciting new initiatives in an area of health care so badly in need of them.

Sincerely,

Robert W. Lennox, Sc.D.
Project Director

Table of Contents

1. Introduction 1

2. Analysis of the Problem 2

   Africa 3
   Asia and the Near East 6
   Latin America and the Caribbean 9

3. The VBC Approach 13

   Five-Year Objectives 13
   VBC Project Strategies 15

      Institutional Development 15
      Sociocultural Factors in VBD Control 16
      Health and Management Information Systems 16
      Epidemiologic Surveillance 17
      Planning and Management Tools 17
      Design of Behavioral Interventions 18
      Vector Control 18
      Applied Research 19
      Human Resource Development 19
      Information and Communications 20

4. VBC FY 90 Activities 21

   Planning and Management Tools 23
   HIS/MIS 24
   Epidemiology 25
   Vector Biology 26
   Human Resources 27
   Behavioral Interventions 29
   Applied Research 29
   Intersectoral Collaboration 30
   Communications and Information 31

5. Life-of-Project Activities 33

6. Budget 35

7. The VBC Team 37

   VBC Core Staff 40
   VBC Subcontractors 42
   Senior Advisory Committee 44

8. Developing the VBC II FY 90 Work Plan 45

1. Introduction

Vector-borne diseases are an increasing cause of death and disability worldwide. Water and agricultural projects, colonization, road building and other development efforts often exacerbate health risks by creating new opportunities for contact between people and the vectors of disease.

Malaria strikes an estimated 200 million people and results in 2 million deaths every year. It is the leading cause of mortality among young children in a number of African countries. Dengue hemorrhagic fever is a severe threat to child survival in many Asian and Latin American cities. Malaria, schistosomiasis, river blindness and other vector-borne diseases are also tremendous obstacles to economic development because they result in debilitating illness or even permanent disability in workers.

Historically, efforts to confront vector-borne diseases have been focused narrowly on chemical control of vectors. More recently, the availability of a growing arsenal of drugs made chemotherapy a popular intervention. But as the scope of the problem expands in the face of sweeping environmental change and drug and insecticide resistance, it is clear that no single approach is sustainable, appropriate or environmentally acceptable.

The Agency for International Development has recognized the need for more viable alternatives. Through its Vector Biology and Control Project, A.I.D. is working with its health and development partners throughout the world to design new strategies to control vector-borne disease.

The VBC Work Plan for fiscal year (FY) 1990 translates these changing strategies into action. The plan emphasizes disease control rather than vector control. It adds a new focus on understanding human behavior to improve disease prevention and control efforts. It also recognizes that vector-borne disease is not only a health problem, but a development problem that must be tackled with assistance from all development sectors.

This action plan initiates the second phase of VBC, a 10-year project to improve vector-borne disease control efforts in A.I.D.-assisted countries. Medical Service Corporation International (MSCI) and its subcontractors, Harvard, Tulane and the Henry M. Jackson Foundation, have been awarded the five-year VBC II contract. Other groups participating in the VBC Project include the Centers for Disease Control (CDC), the World Health Organization (WHO) and the Institute of Medicine (IOM).

VBC II staff members worked closely with the subcontractors, A.I.D.'s Bureau for Science and Technology (S&T), regional Bureaus and overseas Missions to develop this work plan. The result is a well-balanced plan, but not a closed agenda. We anticipate additional buy-ins and are prepared to respond to requests from Missions and Bureaus.

2. Analysis of the Problem

WHO initiated global efforts to eradicate malaria in the late 1950s with programs that used insecticides to control vectors in Asia and Latin America. These programs demonstrated short-term effectiveness, but it soon became clear that eradication was not a realistic goal. During the 1970s, as rising levels of drug and insecticide resistance made control increasingly difficult and expensive, WHO, A.I.D. and others working to combat malaria began to focus their efforts on disease control. By 1980, they had recognized the need for new approaches based on public health strategies. This redefinition of the control strategy implied the need for alternatives to chemical control, more attention to financial and manpower constraints, and greater community participation.

Some progress has been made in pilot testing alternative methods of controlling malaria and other vector-borne diseases, but implementation of programs using these methods at the local level remains problematic. The challenge for the 1990s -- a challenge that VBC accepts with enthusiasm -- is to implement comprehensive programs that effectively combine the biological, behavioral and management components of disease control.

Coordinating vector-borne disease control and other development efforts is also an important challenge. Despite the close link between effective disease control and successful development, these sectors often work at cross purposes. Many economic development projects falter or fail because of the morbidity and mortality caused by vector-borne diseases. Development projects, in turn, frequently increase disease transmission by disturbing vector habitats and encouraging movements of immunologically vulnerable people into disease-endemic areas.

Effective disease control contributes to economic development by improving the productivity of the workforce. Careful planning of development projects in agriculture, water and sanitation, forestry, mining and other sectors can prevent some of the harmful environmental effects that promote disease transmission. All sectors must work together to design disease control efforts that enhance economic development and development efforts that do not exacerbate the problem of vector-borne disease.

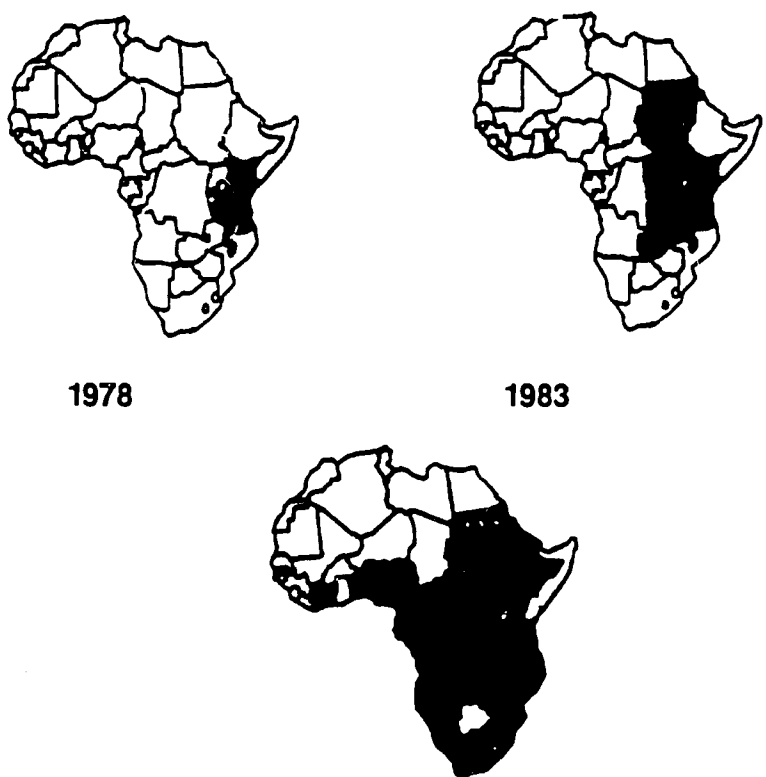
Regional differences in the epidemiology and control of these diseases will play an important role in the evolution of future control programs in the three A.I.D. regions. This section describes the vector-borne disease problem and approaches to control within each region.

Africa

Africa's vector-borne disease profile is characterized by a wide variety of debilitating diseases and alarming increases in chloroquine-resistant malaria. The steady shift of African populations from rural to urban environments and the ecological modifications required to accommodate them have changed the epidemiology of these diseases in ways that are poorly understood and largely unaddressed.

More than half of the world's cases of falciparum malaria, the most deadly form of the disease, occur in Africa. Chloroquine-resistant falciparum malaria has spread to 23 African countries (Figure 1). Figure 2 illustrates how chloroquine resistance limits the effectiveness of treatment. Treatment efficacy also is compromised by the poor quality of some of the imported and indigenously produced drugs available through health establishments and the private sector.

Figure 1. Spread of Chloroquine Resistance in Africa



Source: A.I.D Bureau for Africa, 1989

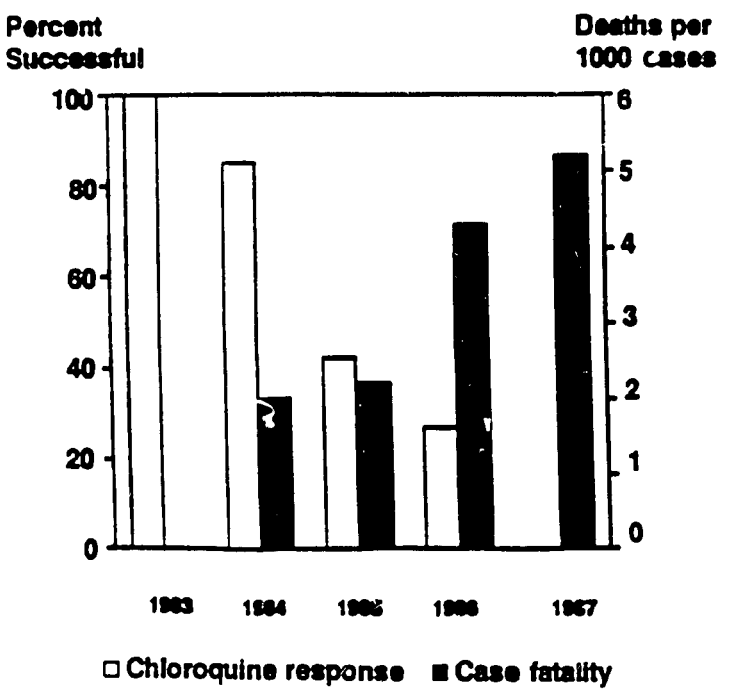
Every year, malaria results in an estimated one million deaths in African infants and young children. A 1987 study in the Gambia indicates that malaria may cause about one out of four deaths among children younger than five. It is the leading cause of death in young children in Malawi and Ghana. Malaria is also a severe constraint to adult productivity, with a conservative estimate of 20 person-years of work lost for every 1,000 cases of malaria.

Malaria, schistosomiasis, dracunculiasis and other debilitating diseases hamper economic productivity by reducing a person's capacity for sustained work for weeks or even months. Schistosomiasis occurs in 30 A.I.D.-assisted countries in Africa and infection rates as high as 100 percent have been reported in West Africa. Dracunculiasis, or Guinea worm disease, affects approximately 15 million people in 19 African countries every year. Global losses in marketable goods due to the disability caused by Guinea worm may be as high as US $1 billion a year.

Approximately 17 million people in Africa are infected with onchocerciasis and 326,000 of them are blind. Those infected become gradually disabled during the peak production years between 20 and 50 and about half of them suffer blindness for an average of 10 years.

Figure 2.

***Plasmodium falciparum in vivo* Response to Chloroquine Treatment and the Malaria Case Fatality Rate Among Treated Individuals in Zaire**



Source: A.I.D., Bureau for Africa, 1989

An estimated 50 million people in 36 African countries are at risk of acquiring trypanosomiasis, or sleeping sickness, which is almost always fatal if left untreated. "Nagana," another form of trypanosomiasis that attacks domestic cattle and horses, makes livestock production virtually impossible on some 10 million square kilometers in higher rainfall areas, or 45 percent of all the land in sub-Saharan Africa.

The lack of an effective response to these vector-borne diseases in Africa has been attributed to the overwhelming magnitude of the problem, scarcity of human and financial resources, competing priorities and insufficient will. Because the worldwide effort to eradicate malaria between 1956 and 1969 was not extended to African nations, the development of infrastructure and manpower that accompanied the campaign did not occur south of the Sahara.

Cost-effective control programs will enhance A.I.D.'s efforts to encourage sustainable growth through the Development Fund for Africa.

Although this lack of infrastructure and trained manpower is a problem, it may give Africa the advantage of flexibility. Without a history of unsuccessful eradication efforts, Africans may find it easier to build more appropriate, cost-effective control programs. Such programs will enhance A.I.D.'s efforts to encourage sustainable economic growth through the Development Fund for Africa (DFA). This fund was established by Congress in 1987 to give A.I.D. greater flexibility to find ways to make U.S. assistance to the African region more cohesive and effective.

Two of the DFA's four strategic objectives address the need to increase productivity and improve food security in Africa. Reducing the disability caused by vector-borne diseases in agricultural workers and other working-age adults is an important first step toward achieving those objectives. Increased attention to planning, management and finance in vector-borne disease control programs will also contribute to A.I.D.'s efforts to improve the management of African economies by ensuring that public funding for disease control is used equitably and efficiently. Effective malaria control interventions will strengthen A.I.D.'s African Child Survival Initiative, which has targeted chloroquine-resistant malaria as one of the three most serious threats to child survival in Africa.

Asia and the Near East

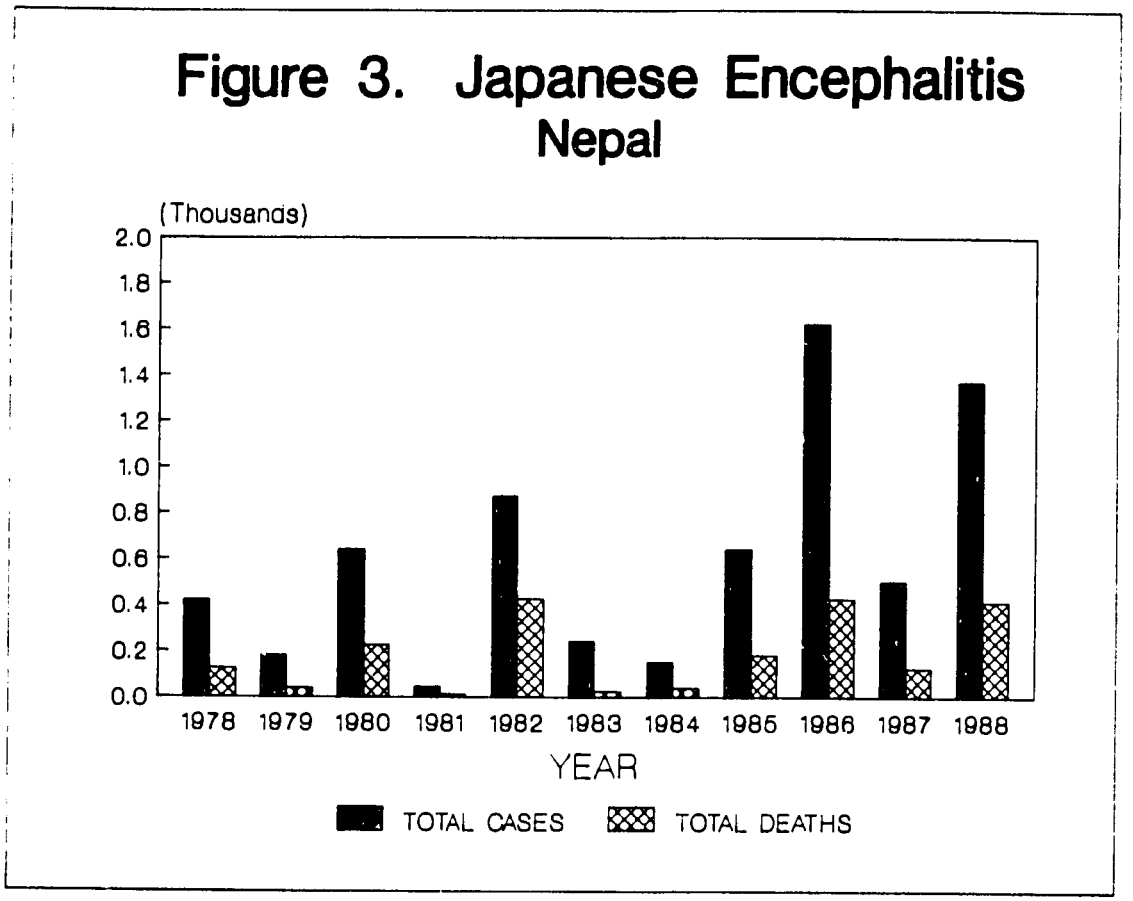
The temporary gains in malaria control achieved during the eradication era are being reversed in many Asian countries. Ecological and social changes have exacerbated the vector-borne disease problem throughout the ANE region. Movement of human populations into endemic areas, deforestation and urbanization are critical factors in the changing patterns of disease transmission.

Endemic malaria has reappeared in many countries where the disease was formerly under control. For example, in Sri Lanka, where the number of reported cases had been reduced to 17 in 1963, a severe outbreak began in 1982 and the number of cases rose to 600,000 in 1987. In Nepal, malaria incidence increased by 33 percent from 1980 to 1985. Rising levels of drug resistance, as well as resistance of vector mosquitoes to insecticides, make it increasingly difficult to control malaria using eradication methods.

Dengue hemorrhagic fever and dengue shock syndrome are among the 10 leading causes of hospitalization and death in children in at least eight tropical Asian countries.

Severe outbreaks of dengue frequently occur in urban areas of Asia and the Western Pacific, taking a particularly high toll on children. Dengue hemorrhagic fever (DHF) and dengue shock syndrome are among the 10 leading causes of hospitalization and death in children in at least eight tropical Asian countries. DHF kills many children each year despite intensive hospitalization procedures that divert health resources needed for other interventions. For example, half of all pediatric beds in Thailand were occupied by children with DHF during a 1988 outbreak.

Outbreaks of Japanese encephalitis (JE) in Nepal, India, Sri Lanka, Thailand and Burma result in high morbidity and mortality. A case fatality rate of 30 percent is common and those who survive an attack of JE often suffer severe brain damage. Epidemics of the disease frequently are associated with pig farming because the pig serves as an intermediate host for Japanese encephalitis virus. JE epidemics occur at approximately two-year intervals and more cases are reported in each successive epidemic in many countries. Figure 3 illustrates how JE cases tend to increase every two years.



Leishmaniasis occurs throughout the ANE region, affecting populations in India, Nepal, Bangladesh, Afghanistan, Algeria, Morocco, Tunisia, Egypt, and Israel. In Egypt, Morocco and Tunisia, approximately 85 percent of the cases of visceral leishmaniasis, the most deadly form of the disease, are in children. It is believed that 70 percent of those who contract visceral leishmaniasis will die if they are not treated.

Filariasis continues to be one of the most debilitating diseases in the ANE region. It is a disease of the rural poor, as well as increasing numbers of people living in urban areas, where completely different epidemiological transmission patterns are observed. In endemic countries, such as Sri Lanka, India, Nepal, Burma, Thailand and Indonesia, infection and disease often begin in early childhood.

The majority of the vector-borne diseases that occur in ANE have major economic consequences for the countries of the region. For example, schistosomiasis has been estimated to cause annual economic losses of $500 million in Egypt, where more than 20 percent of the population is infected.

Schistosomiasis causes estimated annual economic losses of $500 million in Egypt, where more than 20 percent of the population is infected.

Many countries face difficulties in incorporating vertical vector-borne disease control programs into their national health infrastructures. High commodity costs, lack of trained manpower and weak organizational and management structures hamper efforts to integrate vector-borne disease control into primary health care systems.

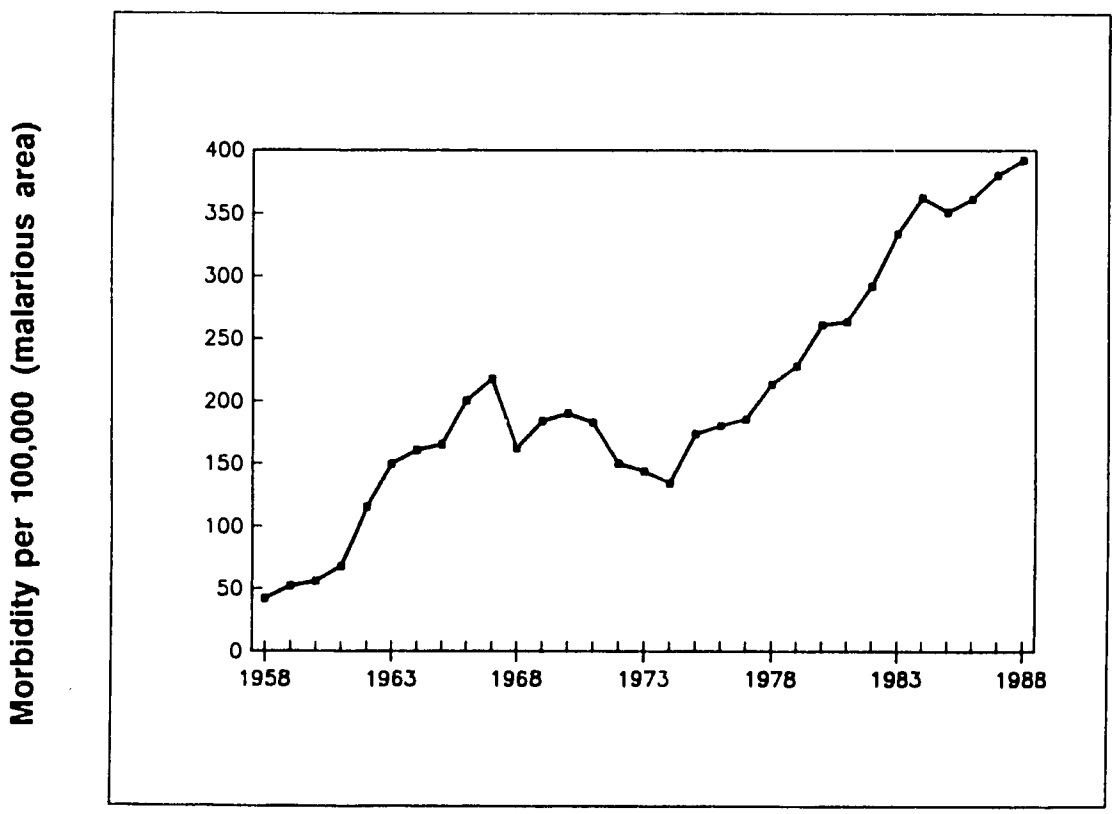
On the other hand, India, Nepal and Thailand have developed successful community-based programs in areas such as source reduction, biological control, epidemiologic surveillance and health education. In an effort to expand these approaches to Indonesia, VBC I designed a successful pilot study of community participation in malaria control in West Timor. Such programs should be examined more closely for their potential as models for vector-borne disease control in other areas.

Latin America and the Caribbean

The vector-borne disease profile in the Latin American and Caribbean (LAC) region is strongly influenced by environmental change and human population movements. In South America, particularly in the Amazonian jungle regions of Ecuador, Brazil, Bolivia and Peru, the opening of new frontiers for agricultural land, timber exploitation and mining enhances opportunities for disease transmission.

The number of malaria cases in Latin America rose from 399,000 in 1977 to more than 1 million in 1987 (Figure 4). Chloroquine resistance is an increasing problem in Ecuador, Bolivia, Venezuela, Colombia, Brazil and Guyanas. Primarily as a result of heavy use of pesticides in agriculture, the principle malaria vector in Central America is resistant to virtually all the insecticides commonly used in one country or another in the region.

Figure 4. Malaria Morbidity in the Americas 1958–1987

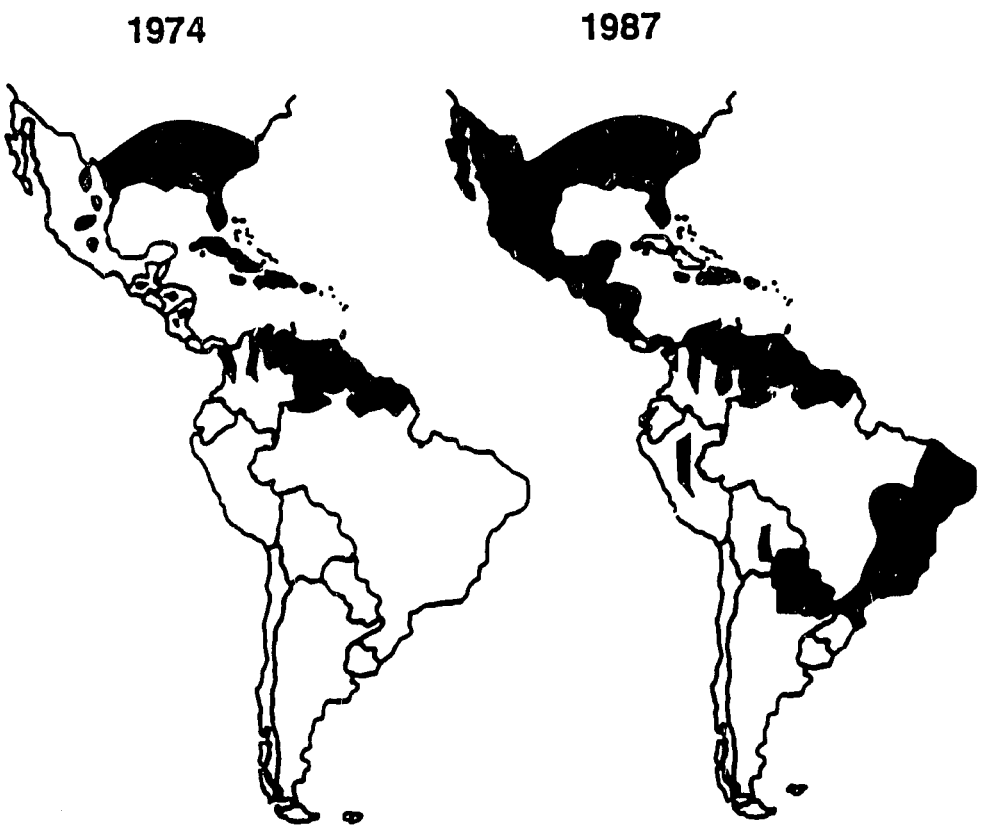


Source: PAHO/WHO, 1988

In Haiti, 88 percent of the population lives in malarious areas and almost 100 percent of cases are falciparum malaria. Extreme poverty and civil strife have hindered progress in malaria control. The Dominican Republic has had more success in controlling malaria, but 99 percent of its population lives in malarious areas and the country is particularly vulnerable to renewed transmission from imported cases from Haitian sugarcane workers.

Hispaniola is the only Caribbean island with endemic malaria, but dengue epidemics have occurred throughout the Caribbean basin. Rapid urbanization contributes significantly to the growing threat of dengue, dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) in many LAC cities (Map 2). Most recently,

Figure 5 Distribution of Aedes aegypti, Principle Vector of Dengue in the Americas



Source: PAHO. Epidemiological Bulletin 10(1)

dengue occurred in Asuncion, Paraguay, in 1989, in several cities in Brazil in 1987-88, in Guayaquil, Ecuador, in 1988, Santa Cruz, Bolivia, in 1987 and Havana in 1981. During the outbreak in Cuba, there were at least 24,000 cases of DHF, 10,000 shock cases and 158 deaths. Since that outbreak, confirmed or suspected cases of DHF have been reported in many LAC countries, including El Salvador, Puerto Rico, Suriname and St. Lucia. An epidemic of DHF is raging currently in Venezuela.

The appearance of DHF in these countries following the explosive outbreak in Cuba has raised fears that DHF will become a major public health problem throughout the LAC region, as it did in Asia, where it first appeared in the Philippines in 1953 and spread quickly to other countries. DHF is a serious threat to child survival in the Americas. Without intensive supportive care, 10 to 40 percent of DHF cases may result in death.

Contamination of blood bank supplies and infection with Chagas' disease through transfusions is an increasing problem in Latin America.

Chagas' disease is a persistent problem in rural areas in every Latin American country and migrants are introducing the disease to urban areas. Chagas' causes severe incapacitation during peak working years, as well as premature death in the chronic phase and childhood mortality during the early acute phase. One study in Brasilia found that one in 10 of those who died in the 25-65 year age group had heart disease directly associated with Chagas' disease. Investigators calculated a loss of 2,275 working years per 100,000 males and 1,363 per 100,000 females. Studies in Bolivia showed that eight percent of newborns suffered from congenital Chagas'. Thirteen percent of acute cases in children developed into chagastic meningitis.

Contamination of blood bank supplies and Chagas' infection through transfusion or use of other blood products is an increasing problem in Latin America. Studies report contaminated blood levels of five to 50 percent in certain regions. Sale of blood by people migrating to cities from infected areas is an important concern.

Leishmaniasis, a debilitating disease that can result in permanent disfigurement, is a growing problem in Belize, Panama, Guatemala and Honduras. The number of cases is rising in some places as a result of agricultural colonization and other human activity in forested areas. In

other areas, economic development efforts are hampered by leishmaniasis. During the 1970s, sand flies and leishmaniasis thwarted a Bolivian colonization program, with 60 percent of return migrants citing this disease as their reason for leaving.

Vector-borne disease control in the LAC region is in a state of programmatic transition, moving from eradication to control. Although there is wide regional support for more integrated approaches that emphasize disease control, most national programs are using a modified eradication strategy to promote control goals. Countries often find it difficult to identify and adopt cost-effective, community-based control strategies and reshape infrastructure and manpower to support such strategies.

Many LAC countries are taking steps to integrate their control programs with national health services. Given decreasing external and national financial support for vector-borne disease control, integration may offer opportunities to reduce the cost of control programs. However, it will not reduce the need to identify the appropriate control methods and the manpower and logistical requirements to achieve their successful implementation.

3. The VBC Approach

Despite the differences highlighted above, the three regions share some common problems and face many of the same challenges. Governments in all three regions must confront the reality of limited resource availability during the 1990s. They also must identify and use new methods of disease control to complement or replace traditional vector control operations. In every region, methods that emphasize community participation and human behavioral change, such as personal protection and source reduction, will be particularly important.

It is generally agreed that the control of vector-borne diseases should be an integral part of a country's national health program and that control measures should be incorporated to the extent possible into a primary health care system of surveillance and service delivery. Recommendations for accomplishing these goals often emphasize the necessity of community collaboration in planning and implementating control strategies. Guidelines for individual, community and health facility collaboration have been developed, but detailed procedures for their implementation have not.

The multidisciplinary team assembled by MSCI has established as its goal the development of operational procedures for vector-borne disease control that reflect variations in national financial and manpower resources, cultural factors, the state of health infrastructure development, and rapidly changing ecological conditions exacerbated by development technologies.

VBC II will work with A.I.D. Bureaus and Missions as well as local institutions to improve disease control efforts in both vertical and integrated programs. The project will emphasize approaches that strengthen the viability of local efforts to control vector-borne diseases.

Five-Year Objectives

Institutional development is one of VBC II's top priorities, but the team's 10 objectives do not include a separate objective for institutional development activities. The omission is intentional. The VBC II team does not consider institutional development an objective in and of itself. In our plan, institutional development is an integral part of a series of complementary objectives and strategies for building sustainable vector-borne disease control programs. To achieve this goal, we will accomplish the following objectives during the next five years:

Objective 1 To develop planning and management tools that will assist host country governments and A.I.D. Bureaus and Missions in devising sustainable regional and country strategies to address vector-borne diseases.

Objective 2 To improve planning, monitoring and evaluation of control programs by designing integrated health and management information systems (HIS/MIS) that permit appropriate information flow between policy makers, program managers, field staff and community workers.

Objective 3 To design and implement epidemiologic surveillance systems to provide the information communities and program managers need to plan, conduct and evaluate control efforts.

Objective 4 To develop and promote the use of cost-effective, environmentally sound vector control and surveillance methods that will reduce human-vector contact and disease transmission.

Objective 5 To implement human resource development (HRD) programs that improve the viability of developing country efforts to plan, manage and evaluate regional, national and community-based interventions to control disease.

Objective 6 To strengthen the capacity of less developed country (LDC) institutions and communities to conduct and use applied research to solve managerial and operational problems.

Objective 7 To develop and test effective ways of achieving behavioral change to prevent and control vector-borne diseases through personal protection and community-level interventions.

Objective 8 To work with donors and development organizations to integrate vector-borne disease control efforts into other sectors, including agriculture, forestry, water, housing, health service delivery and financing.

Objective 9 To improve LDC program managers' and policy makers' access to information about vector-borne diseases and to support their research and control efforts by strengthening the ability of LDC information centers to collect, use and disseminate information.

Objective 10 To strengthen VBC communications initiatives to inform U.S. and LDC audiences about vector-borne diseases and promote advocacy for innovative approaches to control.

VBC Project Strategies

VBC II will promote a community-based approach to vector-borne disease (VBD) control wherever possible by developing tools and methods to help Missions and host country governments implement a mix of control strategies appropriate for given local settings. Tools to analyze the managerial, logistical and manpower requirements for operating such programs will be developed. The VBC team will continue to respond to Mission requests for technical assistance and training, attempting to use methods that promote a greater emphasis on cost-effective control strategies, program management and cost recovery. Although many activities already have been planned, funds have been reserved to provide additional technical assistance in the following areas:

Institutional Development

The VBC team believes that institutional development (ID) initiatives should focus on sustainability, which we define as the ability to continue identifying and solving problems after external assistance has been withdrawn. Translated into action, this means that ID must enhance the abilities of national and local institutions to marshal their own human and financial resources for vector-borne disease control. Communities should assume a high level of involvement in planning and managing the curative and preventive aspects of disease control. This kind of participation requires a major elaboration and strengthening of the responsibilities of community groups, traditional providers, malaria volunteers and other local organizations. The effectiveness of local institutional development depends on strong links with a more complex, multi-level support system that can handle referrals, provide supervision, conduct research and evaluation, and distribute supplies.

Sociocultural Factors in VBD Control

VBC II will use quantitative and qualitative methods to identify the sociocultural factors that may constrain or facilitate vector-borne disease control programs. The ultimate measure of the success of any disease control program is its adoption by families and communities. Therefore, program planners and managers must work with communities to define problems and identify solutions.

The first step is understanding how families and communities define and manage vector-borne diseases with available resources. Examples of important research questions include: How important do communities consider vector-borne diseases? What symptoms prompt people to seek treatment for themselves or their children? Do they use home remedies, go to a healer, a malaria volunteer or a clinic? What symptoms determine where they will seek help? What are the political, economic and cultural forces that contribute to the creation of favorable vector breeding environments? Do people have the time and interest to eliminate breeding sites? Why don't people act on available information about vector-borne disease prevention or treatment?

Health and Management Information Systems

Relatively inexpensive microcomputers offer the potential for effective information management. However, faster access to incomplete or incorrect data does not improve an information system. Therefore, in developing integrated health and management information systems (HIS/MIS) for vector-borne disease control, VBC II will emphasize the quality and flow of data to promote informed decision making.

We will assist in developing information systems that enable institutions to respond rapidly to changing disease and ecological patterns and to monitor and evaluate the efficacy of specific interventions. These systems will ensure the timely flow of information about disease and ecological trends, finance, and personnel needs between all levels of the health system. They also will enable programs to target resources where they are needed most and to anticipate factors that promote disease transmission rather than merely responding to outbreaks.

Epidemiologic Surveillance

VBC II will help Missions and host-country governments develop systems for collecting, processing and analyzing data that will provide a better understanding of disease transmission, risk of infection, efficacy of treatment and the cost-effectiveness of vector-borne disease control efforts. Combined with an understanding of the cultural context of a population, these data can provide a basis for developing case management guidelines, analyzing the economic consequences of disease and establishing vector-borne disease control priorities.

We believe that giving health providers at all levels a role in epidemiologic surveillance will improve the quality and relevance of data from the field. It also will enable communities to understand and manage their vector-borne disease problems. Beginning at the village level, health workers should receive training in routine collection of data on VBDs. We plan to develop manuals and procedures for surveillance, case management and referral. These materials will be appropriately designed for the educational levels of health workers in specific regional settings where baseline sociocultural data indicate that community-supported surveillance can be maintained.

Planning and Management Tools

VBC II will develop a series of tools to improve program planning and management. Vector-borne disease control is highly complex and much of the information required to address national and regional problems in disease control is not available in a useful format. We will address this problem by helping host country planners and A.I.D. Bureaus and Missions analyze important issues in disease control, such as urbanization, environmental change, the economic impact of disease and the role of health education and community participation.

We also will support improved program management by 1) preparing guidelines for conducting institutional assessments and designing institutional development activities; 2) consolidating information on integrated vector control into a set of institutional guidelines for preserving environmental quality; and 3) conducting national assessments and developing action plans.

Design of Behavioral Interventions

Elaboration of educational messages and selection of communications channels must reflect the local context and must be monitored for effectiveness. VBC II will use applied research techniques to develop, pretest and evaluate different educational interventions to strengthen the roles of personal protection and source reduction in community-based vector-borne disease control.

The role of behavioral change in vector-borne disease control must be defined in terms of both human behavior and vector behavior and resistance. Therefore, we will develop culturally sensitive educational interventions in tandem with cost-effective vector control and surveillance. For example, educational programs to increase the use of bed nets will have little impact on morbidity if human-vector contact occurs primarily outside of the home or during waking hours. Use of bed nets also is conditioned by availability, cost and cultural factors such as local theories of disease susceptibility, the severity and frequency of malaria compared to other diseases, and which insects are believed to transmit disease.

Vector Control

The VBC team will use data from studies of human behavior and vector ecology to develop strategies for limiting contact between humans and vectors of disease. Our emphasis will be on reducing the need for insecticides and increasing the use of alternatives to chemical control, particularly those that are sustainable at the community level. We will encourage integrated vector control strategies that incorporate a mix of control methods, including source reduction, personal protection and biological control. When chemical control is required, VBC II will work with governments and Missions to ensure that insecticides are used safely, effectively and with minimal effect on the environment.

The Project also will help development planners incorporate disease prevention and control measures into projects in other sectors, including agriculture, forestry, housing, nutrition and disaster relief, that are likely to be hampered by vector-borne diseases or to exacerbate the risk of disease transmission.

Applied Research

The application of research methodologies to identify problems and evaluate solutions associated with vector-borne disease control programs is reflected in many of the activities in the VBC II Work Plan for FY 90. Such applied research can lead to improved methods of control, health services and drug distribution, and surveillance and information flow.

VBC II applied research activities will identify the strengths and weaknesses of vector and disease surveillance systems, the educational components of programs, and case management and referral strategies. We also will assess the effectiveness of personal protection, source reduction and pesticide control. Studies at multiple sites will test methods for measuring the economic impact of vector-borne diseases and the financial costs of control programs.

In many countries, there are few people with the basic skills to conduct problem-solving research. We will address this problem by developing and assessing procedures for training cadres of trainers in simplified operations research strategies.

Human Resource Development

Before designing HRD activities, the VBC team will identify the manpower capabilities required to plan, manage and evaluate control programs. In the past, little attention has been given to defining the administrative and supervisory structures required to support a given mix of control strategies at the local or district level. For example, low productivity among village malaria volunteers is often attributed to volunteers' skill levels, but it may be more strongly associated with inadequate or inappropriate supervision.

During the next five years, we will develop training programs and materials needed to support and sustain community-based approaches to disease control. Assessments will be used to identify the training needs at all institutional levels, from policy makers to village educators. Training of trainers will increase the ability of national programs to meet continuing manpower requirements.

Information and Communications

VBC provides A.I.D./Washington, Bureau and Mission staff, host country personnel, VBC consultants and others working in development with state-of-the-art information about vector-borne diseases and their control. In addition to responding to information requests, we will inform these groups and other decision makers about successes and lessons learned in vector-borne disease control and build advocacy for new strategies. We plan to develop outreach materials, including a VBC II video and bulletins about developments in vector-borne disease control interventions, to help fulfill our proactive mandate.

The VBC team will strengthen the information capabilities of less developed country (LDC) institutions by developing regional centers for information about vector-borne diseases. Through these regional centers, our information center will serve as a secondary source of information about vector-borne diseases to a network of LDC institutions. We also will help design and conduct training workshops for information specialists in LDCs.

4. VBC FY 90 Activities

The large portfolio of activities for FY 90 includes all of the initiatives the VBC staff considers important to project start-up. The subcontractors played an active role in developing the portfolio and will manage or participate in a number of activities.

Many of the initiatives in this work plan are multi-year activities that will begin during the first year of the project. Several preliminary planning and liaison activities that will be be initiated during FY 90 will grow in scope in subsequent years. Considerable emphasis is placed on developing guidelines and methodologies to ensure that in future years, Project staff and consultants, host country personnel and A.I.D. Bureaus and Missions share the same objectives and tools. Field activities have been planned in response to Mission cables, but many of these tasks will require buy-ins. It should also be noted that the VBC I Project runs concurrently with VBC II through August and is executing activities in areas complementary to those outlined below.

A table showing the level of effort VBC II will give to each technical area and region is followed by a brief description of planned activities. Regional activities requiring buy-ins are marked with an asterisk.

REGION	PLANNING AND MGMT. TOOLS	HIS/MIS	EPIDEMI-OLOGY	VECTOR BIOLOGY	HUMAN RESOURCES	BEHAVIORAL INTERVEN-TIONS	APPLIED RESEARCH	INTER-SECTORAL COLLABORA-TION	COMMUNI-CATION AND INFOR-MATION
GLOBAL	1.Guidelines for conducting institutional assessments. 2.Background paper on urbanization and VBDs.	10. Initial design of Guinea Worm Geographic Information System (GIS).	16.Methods for implementing guidelines for referral and treatment of severe malaria.	22.Dengue decision guidelines. 23.Paper on insecticide repellency and avoidance behavior 24 Malacology sourcebook. 25 Paper on site selection for focal snail control.	29.Development of 5-year training agenda. 30.Local institutional development guidelines 31.Training program guidelines	35.Health education and community participation paper 36 Development of a methodology for field studies of malaria case definition, management by families and communities	40.Identify case studies of man-made environmental changes that exacerbate VBDs	43 Guinea worm information network. 44.Urban/peri-urban information network 45 Pre-conference/ workshop/ ASTMH	49.Curriculum development for information specialists. 50.VBC II Video. 51.Outreach materials.
LAC	3.Institutional assessment to improve financial sustainability and technical impact 4.VBD control program evaluation.	11 ,12,13. Continued development of HIS/MIS in 3 countries.	17.LAC trend analysis.	26 Feasibility of Chagas' and leishmaniasis control.	32 Case studies on community participation in VBD control	37 Implementation of field study on malaria case definition and management by families and communities	41.Training strategy for implementation of operations research to solve managerial problems.	46 Needs assessment for intersectoral national action plan.	
AFR	5.VBD control program evaluation. 6.Assessment of requirements for national ivermectin distribution system 7 Feasibility of VBC participation in national action plan	14-15.HIS/MIS needs assessments in 2 countries.	18.Clinical record study. 19.AFR VBD situational analysis		33.HRD feasibility studies with African training institutes	38 Implementation of field study on malaria case definition and management by families and communities 39 Ethnographic research on VBDs	42.Analyses of economic impact of VBDs and cost-effectiveness of interventions.	47 Assessment of OCP, FEWS linkages	52.Institutional capability assessment for regional information distribution
ANE	8.VBD control program evaluation 9 Needs assessment for developing national action plan		20 Analysis of dengue treatment cost and child mortality 19 Methods for identification and referral of drug-resistant malaria cases	27 Feasibility of developing a leishmaniasis control component in an existing PHC program 28 Workshop on cost-effective vector control and surveillance	34 District level workshop on epidemiology			48 Workshop on environmental engineering for VBD control	

Planning and Management Tools

1. **Guidelines for conducting institutional assessments. (Global)**

   These guidelines will serve as a diagnostic tool for identifying institutional strengths and weaknesses. The results of such analyses will serve as a basis for developing ID programs that enable institutions to set goals relevant to local needs, achieve those goals and become self-sustaining.

2. **Background paper on urbanization and vector-borne disease control. (Global)**

   In response to Bureau interests, VBC II will develop a strategy paper on urbanization and vector-borne diseases.

3. **Institutional assessment to improve financial sustainability and technical impact. (LAC*)**

   Technical, operational and managerial components of existing systems will be assessed to identify logical targets for change toward more effective and efficient programs of control.

4,5,8. **VBD control program evaluation. (LAC*, AFR*, ANE*)**

   VBC II will review an existing program in each of the three regions during year one to assess its impact on indicators of morbidity and mortality, case management and drug distribution, data management, surveillance of cases and responses to treatment, surveillance of vector behavior, program management, and levels of community support and participation.

6. **Assessment of requirements for a national ivermectin distribution system. (AFR)**

   Prior to the implementation of ivermectin treatment programs in areas of high onchocerciasis endemicity, VBC II will assess parameters necessary for an efficient distribution system.

   * Will require a buy-in.

7. **Feasibility of VBC participation in the development of a national vector-borne disease control plan of action. (AFR)**

The advantages of multilateral, inter-institutional collaboration will be explored in the African region as a first step toward the multidisciplinary development of a national control program.

9. **Needs assessment for the development of a national action plan for VBD control. (ANE)**

VBC will conduct an assessment of the extent of available epidemiologic information about the prevalence of vector-borne diseases, the human and financial resources available to combat them and the sociocultural factors that contribute to success or failure of control programs in order to make recommendations for program development.

HIS/MIS

10. **Initial design of a Guinea worm geographic information system (GIS). (Global)**

In collaboration with the Peace Corps and UNICEF, VBC will begin developing a computerized system to map the worldwide prevalence of Guinea worm disease. This system will be used to monitor the global effort to control the disease. During 1990, necessary software and hardware will be obtained and the GIS database will be developed.

11*,12,13. **Continued development of HIS/MIS. (LAC)**

During VBC I, the Project began developing information systems for epidemiological, entomological and management data in several countries. System development will continue during VBC II.

14, 15. **HIS/MIS needs assessment. (AFR)**

The data management needs of two African control programs will be assessed and plans for HIS/MIS will be developed for future implementation.

Epidemiology

16. **Methods for implementing guidelines for referral and treatment of severe malaria. (Global)**

In collaboration with other agencies, VBC II will explore appropriate presentation of guidelines for referral and treatment of severe malaria and methods to encourage their application at all levels of service delivery.

17. **LAC trend analysis. (LAC)**

Further elaboration of the VBC database that defines and continuously updates the epidemiologic profiles of vector-borne diseases and the status of control program services and resources in the LAC region will continue during year one.

18. **Clinical record study. (AFR)**

In response to a request from the Africa region, VBC II will conduct a retrospective study of clinic admissions for malaria treatment, with particular attention to case definition problems. For further clarification, these data will be combined with those obtained in a separate study of non-formal health sector perceptions and definitions of illness.

19. **Situational analysis of vector-borne diseases in selected African sites. (AFR*)**

In response to the urgent need to clarify the magnitude of vector-borne disease problems in sub-Saharan populations, VBC II will begin the systematic collection of data that epidemiologically describe prevalent diseases in selected sites. The model for a computerized system of continuously updated information on morbidity and mortality and other indicators of control program effects has already been established in the LAC region (#17) and will be modified to accommodate data collection deficits specific to Africa.

20. **Analysis of mortality and treatment costs associated with dengue outbreaks. (ANE)**

In response to a request to further define the aggregate costs of dengue infection in children and to encourage implementation of control measures appropriate to the region, VBC will conduct an analysis of existing data in one ANE country.

21. **Methods for identification and referral of drug-resistant cases of malaria. (ANE)**

VBC II will develop and implement methods that will enable village-level health workers in one ANE country to maintain a system of surveillance of treatment failures and prompt referral to secondary/tertiary levels of care when identified by procedures appropriate to local infrastructure.

Vector Biology

22. **Dengue decision guidelines. (Global)**

VBC II will prepare and distribute guidelines for health managers to react to threats of dengue outbreaks. The guidelines will include recommendations on the data necessary to predict outbreaks.

23. **Paper on insecticide repellency and avoidance behavior. (Global)**

This paper will review what is known about this critical phenomenon that limits the effectiveness of residual insecticides and results in waste of costly resources. It will conclude with guidelines for maximizing spraying program effectiveness.

24. **Malacology sourcebook. (Global)**

This sourcebook will be a practical guide for LDC vector control operations to control schistosomiasis and other snail-associated diseases. Its emphasis will be on conservation of resources through the rational application of focal interventions in selected areas of intense transmission.

25. **Paper on selection of sites for the use of focal interventions for schistosomiasis control.**

A companion piece to the malacology sourcebook, this paper will present criteria for site selection for effective focal snail control to prevent schistosomiasis.

26. **Feasibility of incorporating Chagas' and leishmaniasis control components into existing health services. (LAC)**

VBC II will work with the national health sector to assess the feasibility of incorporating vector control strategies to reduce Chagas' disease and leishmaniasis transmission and to develop an action plan.

27. **Feasibility of a leishmaniasis control component in an existing primary health care program. (ANE)**

The feasibility of including epidemiological and entomological services to control leishmaniasis in a primary health care program will be examined. Where incorporation of these components is feasible, VBC II will develop an action plan.

28. **Workshop on cost-effective vector control and surveillance methods. (ANE*)**

This workshop will define the elements of vector control that could be employed by community members at the village level. Its emphasis will be on environmentally safe technologies that will reduce dependency on spraying, such as source reduction, housing improvement and personal protection.

Human Resources

29. **Development of VBC II five-year training agenda. (Global)**

VBC II will compile and review existing training materials for vector-borne disease control. In collaboration with our subcontractors, we will hold an in-house workshop to develop priorities for our five-year training agenda, including materials development, target audiences, training methodologies and budget requirements.

30. **Local institutional development guidelines. (Global)**

These guidelines will be used to identify the kinds and combinations of community institutions that can be effective in vector-borne disease control, the level of support from outside the community required to sustain effective local control efforts, and appropriate activities for specific local institutions. Local institutions that could be analyzed include membership organizations, cooperatives, service organizations, and traditional healers and other private providers.

31. **Training program guidelines. (Global)**

VBC II will develop guidelines for conducting training needs assessments, designing HRD activities and evaluating their effectiveness. This strategy will serve as the basis for developing training modules over time.

32. **Case studies on community participation in vector-borne disease control. (LAC*)**

An anthropological analysis of several villages where community participation is an integral component of vector-borne disease control will focus on levels of participation, manpower, supervisory systems, educational materials, costs and potential long-term sustainability.

33. **HRD feasibility studies with African training institutes. (AFR)**

To enhance the long- and short-term training opportunities within Africa, VBC II will identify a partner organization interested in strengthening its vector-borne disease curriculum. During the first year of VBC II, we will analyze current training resources. During subsequent years, curricula and materials will be developed.

34. **District-level workshop on epidemiology. (ANE*)**

The primary focus of this workshop for district health officers will be the role of epidemiologic surveillance of vector-borne diseases in primary health care programs.

Behavioral Interventions

35. **Background paper on health education and community participation. (Global)**

The paper will provide a critical review of the lessons learned in using behavioral interventions to control vector-borne diseases. It will outline procedures for designing and evaluating health education programs and increasing the potential sustainability of community participation.

36,37,38. **Developing a methodology and implementing field studies on malaria case definition and management by families and communities. (Global, LAC*, AFR)**

Using qualitative and quantitative methods, VBC II will assess how families and communities define and treat vector-borne diseases. This information is essential for planning and monitoring educational programs, developing community-based epidemiologic surveillance systems and improving coordination and communication between the formal and nonformal health sectors.

39. **Ethnographic research on vector-borne diseases. (AFR)**

Sociocultural data related to vector-borne diseases are essential to developing behavioral interventions to control the diseases, but these data have rarely been collected. VBC II will collect ethnographic data from several African sites. During the first year of VBC II, we will develop the protocol for this research.

Applied Research

40. **Identify case studies for man-made environmental changes that exacerbate VBDs. (Global)**

During FY 90, VBC II will identify A.I.D.-assisted projects associated with ecological changes and design strategies to control enhanced vector-borne disease transmission during subsequent years of the contract.

41. **Training strategy for implementation of operations research to solve managerial problems. (LAC*)**

VBC II will develop materials and procedures for their use that will enable health care managers at all levels of the system to identify and resolve problems through the application of operational research methods.

42. **Analyses of the economic impact of vector-borne diseases and the cost-effectiveness of existing interventions. (AFR*)**

In collaboration with subcontractor faculty members and in consultation with development agency health economists, VBC II will research the most viable methods for obtaining data and assessing the costs of morbidity and mortality and the loss of productivity associated with vector-borne diseases, as well as the individual and community expenditures on treatment and other forms of intervention. Analyses of these parameters will subsequently be undertaken in those sites where data exist or can be obtained by rapid survey.

Intersectoral Collaboration

43. **Guinea worm information network. (Global)**

VBC II will continue working with A.I.D.'s WASH Project to provide information about Guinea worm disease to more than 500 participants in 30 countries.

44. **Urban/peri-urban information network. (Global)**

VBC II will contribute information about the effects of urbanization on vector-borne diseases to an information network on urban and peri-urban issues in development. We will work with the WASH Project and EPA to disseminate this information to people and organizations working on health and development projects in urban and peri-urban areas.

45. **Preconference workshop at the American Society of Tropical Medicine and Hygiene (ASTMH) annual meeting. (Global)**

VBC II and Tulane University will organize a workshop on the integrated approach to vector-borne disease control for scientists attending the annual meeting of ASTMH.

46. **Needs assessment for intersectoral national action plan for the control of VBDs. (LAC*)**

A needs assessment for a national plan of action will examine the feasibility of an intersectoral approach for VBD control. VBC II will analyze the potential roles of the housing, forestry and agriculture sectors.

47. **Assessment of possible linkages with the Onchocerciasis Control Project (OCP) and the Famine Early Warning System (FEWS) Project (AFR).**

VBC II will assess possible roles it might play in OCP's devolution process. Possible collaboration with the USAID FEWS Project also will be explored.

48. **Workshop on environmental engineering for VBD control. (ANE*)**

This workshop will examine the role of environmental engineering methods as an alternative to chemical methods of vector control.

Communications and Information

49. **Curriculum development for information specialists. (Global)**

Beginning in year two of VBC II, information specialists from each of the three regions will receive training in vector-borne disease information collection, maintenance and dissemination. The curriculum for this training program will be developed during FY 90.

50. **Video on VBC II (Global).**

The video will focus on VBC II's five-year agenda, highlighting the major challenges for vector-borne disease control in the 1990s.

51. **Outreach materials. (Global)**

The Project will develop outreach materials to promote advocacy for the VBC II approach to disease control. Examples of these materials include a new brochure, briefing materials for Missions and policy makers, and updates on methodological and technical advances.

52. Institutional capability assessment to determine capacity for regional information distribution. (AFR)

During the next five years, the VBC II Project will work with regional information centers to enhance their abilities to disseminate materials on vector-borne diseases. In 1990, the Project will initiate this institutional strengthening activity with one African center in response to regional interest.

5. Life-of-Project Activities

Life-of-Project activities are those that will continue throughout the five years of the VBC II contract. They include administrative responsibilities, facility operations, liaison with A.I.D. and other development organizations, outreach, and planning and activity development.

The chart on the next page shows the VBC staff members responsible for liaison with A.I.D. and other health and development organizations. In addition to maintaining strong relationships with S&T/H and the regional Bureaus, VBC II plans to establish collaborative links with other A.I.D. offices, departments and projects so that we can work together to integrate vector-borne disease control into development efforts in agriculture, forestry, housing, women in development, health communications, refugee assistance and other areas. We will continue collaborative efforts with VBC Project participants WHO and CDC, with an emphasis on working with the WHO Special Programme on Research and Training in Tropical Diseases (TDR) to identify new technologies for field testing. We also will strengthen collaborative relationships with the Peace Corps, UNICEF, private voluntary organizations and other health and development groups.

VBC II outreach initiatives include information dissemination, an internship program and a seminar series. In addition to responding to information requests, VBC has a dynamic proactive dissemination program that provides information about vector-borne diseases and control efforts to A.I.D. Missions and Bureaus, policy makers, scientists, development organizations and other target audiences.

The VBC internship program is designed to encourage more young people to enter the field of vector-borne disease control and international health. We offer senior graduate students and recent graduates three-month opportunities to work with the VBC technical staff. During the next five years, we also will continue to host a regular series of open seminars featuring experts in vector-borne disease control in LDCs.

Other important Life-of-Project activities include the Senior Advisory Committee, which is described in Chapter 6, and the planning workshop where the VBC team began developing this Work Plan (Chapter 7).

The 20 Life-of-Project activities that form the administrative foundation of the VBC II Project and their budgets for FY 90 are presented in the Table 1 below.

	Activity	Project Manager	Budget
Administration	General Administration/Office Management Computer Systems Maintenance	Lennox Silverman	$291,000.00 81,000.00
Liaison with A.I.D.	Liaison with S&T/H Liaison with the Bureau for Africa Liaison with the Bureau for LAC Liaison with the Bureau for ANE Liaison with other A.I.D. Bureaus, Offices and Departments	Lennox Sullivan Arata Andre Silverman	32,000.00 5,200.00 4,800.00 4,400.00 4,100.00
Collaboration	Liaison with CDC Liaison with WHO and PAHO Liaison with other non-A.I.D. organizations	Arata Arata O'Connor	6,400.00 13,500.00 5,700.00
Activity Development	General Technical Services and Preplanning Core Contract Activity Development Requirements Contract Activity Development	Arata Lennox Lennox	74,000.00 81,500.00 89,000.00
Outreach	VBC Intern Program Professional Development/VBC Seminars Information Dissemination - Proactive Information Dissemination - Reactive	Sullivan O'Connor Nayeri Nayeri	40,900.00 36,000.00 19,700.00 23,400.00
Planning	Senior Advisory Committee VBC Start-up Workshop Development of FY 1991 Annual Work Plan	Lennox Lennox Silverman	51,300.00 48,185.00 42,000.00

6. Budget

The summary budget for fiscal year 1990 (October 1, 1989 to September 31, 1990) is an estimated $2,506,400, of which it is anticipated $565,000 will be in buy-ins from Missions and Bureaus.

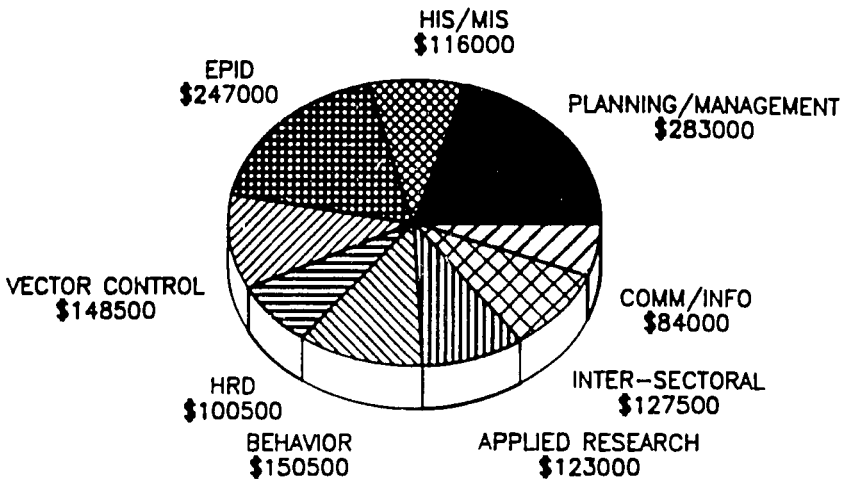
The two columns on the left represent the budgets for the two parallel VBC II contracts awarded to MSCI. A.I.D. designed this unique, two-contract mechanism to ensure flexibility and accountability.

The first contract is a standard cost reimbursement instrument that contains core funds from central sources. This contract provides the resources to maintain the Washington-based operations center and VBC information center, to plan centrally funded activities, conduct proactive efforts and respond to emergency and Mission requests.

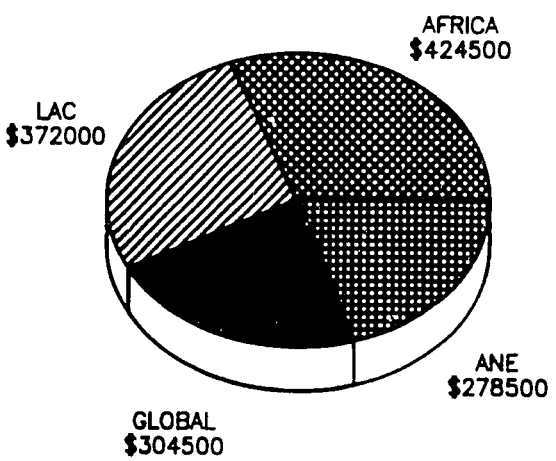
The second contract is called a requirements contract. Its purpose is to receive funds from Bureau and Mission sources in the form of PIO/Ts, or buy-ins to VBC II. It functions much like an Indefinite Quantity Contract (IQC), which allows a Mission to use its own resources to contract for a specific Scope of Work. This contract provides a mechanism for Missions and Bureaus to ensure a full level of VBC II services without drawing down on limited core funds. S&T/H has sent Missions and Bureaus guidelines for using the requirements contract that were prepared by A.I.D.'s Contracts office.

Regional	Core Contract	Requirements Contract	Total
Planning and Management Tools	$142,000	$141,000	$283,000
HIS/MIS	91,000	25,000	116,000
Epidemiology	172,000	75,000	247,000
Vector Control	123,000	25,000	148,000
Human Resource Development	48,000	52,500	100,500
Behavioral Interventions	100,000	50,500	150,500
Applied Research	8,000	115,000	123,000
Intersectoral Collaboration	46,500	81,000	127,500
Communications and Information	84,000	0	84,000
Total Projected Regional Budget	$839,500		$1,379,500
Total Life of Project Budget	926,900		926,900
Total Emergency Mission Request	200,000		200,000
Total Annual Work Plan Budget	$1,942,400	$565,000	$2,506,400

FY 90 Activity Budget Distribution by Sector



FY 90 Activity Budget by Region



7. The VBC Team

The VBC Project is A.I.D.'s unique, cost-effective mechanism for addressing the problem of vector-borne disease. It combines the skills and experience of the Agency's staff in Washington and the field, a core staff of experts in various areas of vector-borne disease control, university scientists and a large network of consultants. It also draws upon the expertise of two of the world's leading disease control organizations.

The VBC II core staff works with A.I.D. Missions through the Bureau for Science and Technology's Office of Health (S&T/H) and the Bureaus for AFR, LAC and ANE. USAID Missions seeking technical assistance and other organizations that would like to collaborate with the VBC II team should contact Dr. A.D. Long, the Project's Technical Officer, and the appropriate regional Bureau representative: James Shepperd, M.D., of the Bureau for Africa; Patricia Moser of the Bureau for Latin America and the Caribbean; or Linda Lou Kelley of the Bureau for Asia and the Near East. The Contracts Specialist for the VBC Project is Lori Doheny.

S&T/H's Division of Water and Vector-Borne Disease (WVC) is responsible for the VBC Project. The technical staff of S&T/H/WVC include:

Division Chief, John Austin. Ph.D., P.E.

Dr. Austin is an environmental engineer with extensive experience in the U.S. Public Health Service, the Environmental Protection Agency, A.I.D.. the private sector and academia. As chief of the WVC Division, he coordinates the Agency's water, sanitation and vector-borne disease control activities with international and bilateral organizations as well as within A.I.D. Dr. Austin has advised local, state, federal and international organizations on developing environmental training systems. During the 1950s, he worked for A.I.D. in Viet Nam as an advisor in rural water supply and sanitation.

VBC Technical Officer, A. Dennis Long, Sc.D., P.E.

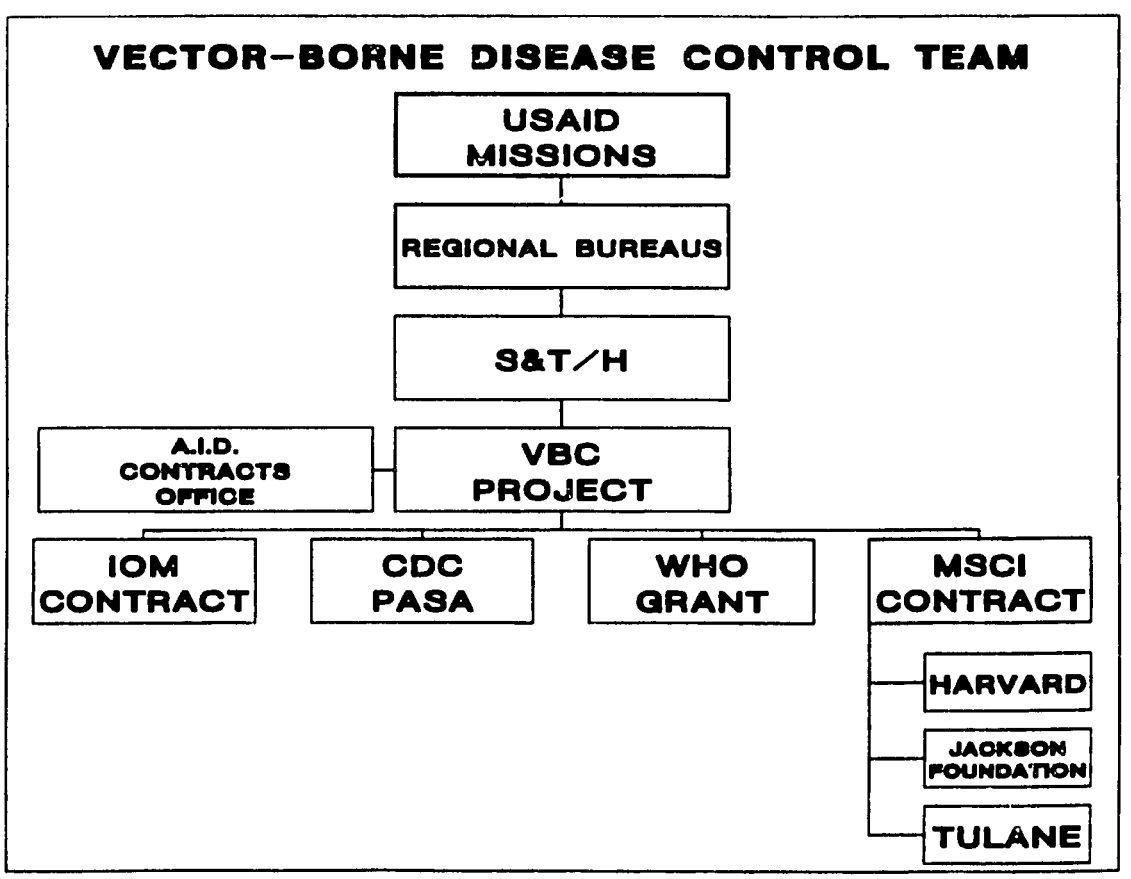
Dr. Long is a public health engineer with a doctorate in tropical public health from Harvard University. He wrote his doctoral dissertation on mathematical modeling of schistosomiasis. Dr. Long has worked in the private sector, academia and A.I.D. in countries in every A.I.D. region, including Haiti, Mali, Swaziland, Togo, Burkina Faso, Senegal and Yemen. His long-term overseas experience includes working as manager of the environmental

health unit of a large project in Papua New Guinea, where he was responsible for vector control, water and sanitation and other environmental health programs. Dr. Long also manages S&T/H's WASH Project.

AAAS Diplomacy Fellow, Dennis Carroll, Ph.D.

Dr. Carroll is a cellular biologist who provides technical support to WVC through a Science, Engineering and Diplomacy Fellowship from the American Association for the Advancement of Science. In addition to his doctoral studies in biological sciences, he did graduate work in tropical diseases at Tulane's School of Tropical Medicine. Dr. Carroll also worked for two years as a volunteer in a leprosy colony in India.

VBC II receives technical guidance and support through subcontractual agreements with Harvard and Tulane Universities and the Henry M. Jackson Foundation and through a participating agency agreement (PASA) between S&T/H and the Centers for Disease Control. Robert Kaiser, M.D. is responsible for the CDC PASA. Mechanisms have been established for developing collaborative activities with the World Health Organization, including the TDR program. Most recently, the National Academy of Sciences' Institute of Medicine received a grant from the A.I.D. to review malaria vaccine research malaria control and to make recommendations to guide future research and control strategies. Dr. Stanley Oaks is director of the IOM study.



VBC Core Staff

VBC II's core staff brings a wealth of interdisciplinary skills and experience to the Project. To help broaden the scope of the VBC effort, S&T included two new technical positions in the VBC II contract: an epidemiologist and an ID/HRD specialist. Our epidemiologist will expand VBC's efforts to help host-country governments gain a better understanding of disease transmission and the impact of vector-borne diseases on health and economic productivity. The addition of an ID/HRD specialist to the core staff will give VBC II an opportunity to develop a systematic framework for institutional strengthening and human resource development in developing countries. The members of VBC's core staff are:

Name	Position
Robert Lennox	**Director** Administrative issues Subcontractor coordination
Andrew Arata	**Deputy Director** Technical Issues Senior Advisory Committee coordination
Peggy Sullivan	**Epidemiologist**
Patricia O'Connor	**ID/HRD Specialist**
Barry Silverman	**HIS/MIS Specialist**
Richard Andre	**Vector Biologist**
Ralph Schmidt	**Operations Manager**
Ellen Nayeri	**Information Specialist**
Writer/Editor	**Kathleen Henry**

Director, Robert Lennox, Sc.D.

Dr. Lennox is a parasitologist with 17 years experience in designing and managing tropical disease control and public health projects in the developing world. He has been the director of the VBC Project since its inception in 1985 and has directed or participated in 10 long-term A.I.D. health projects. Most recently, he directed the design of the 10-year, $40 million Schistosomiasis Research Project for USAID/Cairo and the government of Egypt.

Deputy Director, Andrew Arata, Ph.D.

Dr. Arata is an expert in the ecology of vector-borne diseases, with 25 years experience in training, research and vector-borne disease control. He worked for the WHO in Geneva for 11 years, rising to Chief of Vector Genetics and Bionomics in the VBC division and also served as head of the WHO/PAHO Center for Research and Training in Venezuela. Dr. Arata has been VBC I's senior technical officer since 1985.

Epidemiologist, Peggy Sullivan, Ph.D.

Dr. Sullivan has more than 15 years' experience in research, training and project development in developing countries. Before joining VBC, she was an assistant professor at the University of Texas Medical School's Division of International Health, where she helped establish a WHO collaborative center for health manpower research and allied health sciences education. Dr. Sullivan is an expert in training health professionals to use epidemiological principles and techniques to improve primary health care delivery.

ID/HRD Specialist, Patricia O'Connor, Ph.D.

Dr. O'Connor has an interdisciplinary background in social epidemiology, anthropology and sociology, with extensive experience in ID/HRD and operations research on behavioral interventions. Previously, as a consultant to the Costa Rican Demographic Association's Department of Socio- demographic Research, she provided technical support in training and program development to behavioral research projects. Dr. O'Connor also worked as a consultant for VBC I, designing a national plan for increasing community participation in malaria and dengue control in Ecuador.

HIS/MIS Specialist, Barry Silverman, Sc.D.

As a member of the VBC I technical staff for the past four years, Dr. Silverman has worked with Ministries of Health and other host country institutions in Nepal, Pakistan, Ecuador, El Salvador and Bolivia to develop integrated computerized health and management information systems for vector-borne disease control. He also designed a database for the LAC Bureau that will be used to monitor disease and funding trends in the region and trained host-country personnel in six countries in database applications. Before joining the VBC Project, Dr. Silverman was an Assistant Professor at the University of Maryland's School of Medicine.

Vector Biologist, Richard Andre, Ph.D.

The vector biologist will use his technical expertise to help host country governments develop cost-effective, environmentally sound vector control and surveillance methods. The Jackson Foundation, a VBC subcontractor, will provide the Project's vector biologist, Dr. Richard Andre. A medical entomologist, Dr. Andre directed and conducted research on vector-borne diseases for 10 years in the overseas laboratories of the Walter Reed Army Institute of Research (WRAIR) in Malaysia and Thailand. He was head of the department of entomology at WRAIR and has served as a consultant for A.I.D., the National Academy of Sciences and WHO.

Operations Manager, Ralph Schmidt

Mr. Schmidt has been operations manager for the VBC Project since 1985. Before that, he spent 15 years at The Johns Hopkins University, where he served as department administrator for the Department of Immunology and Infectious Diseases, senior center administrator for the Tropical Medicine Center and administrator of the International Center for Medical Research (ICMR) in Calcutta.

Information Specialist, Ellen Nayeri, M.L.S.

Ellen Nayeri has 17 year's experience as an information specialist. She has managed the VBC information center since 1988, after serving for five years as the reference librarian in A.I.D.'s Development Information Center. Mrs. Nayeri also worked as a librarian for VITA (Volunteers in Technical Assistance), where one of her responsibilities was to train host-country personnel to establish and maintain libraries.

Writer/Editor, Kathleen Henry

Kathleen Henry has seven years' writing and editing experience. She has been the VBC Project's writer/editor for a year. Her previous experience includes writing a quarterly newsletter about family planning and AIDS for Family Health International and covering medical and political issues as a reporter for a monthly newspaper for federal physicians.

VBC Subcontractors

MSCI's subcontracts with Tulane University, Harvard University and the Henry M. Jackson Foundation are designed to give the VBC Project access to the technical expertise and conceptual strength of the academic community. Through these subcontracts, we can draw upon the skills and ideas of faculty members in a broad range of disciplines. These universities were chosen for their technical depth and for their faculties' complementary regional experience and language skills.

Harvard University

Through its Department of Tropical Public Health and the Harvard Institute for International Development, Harvard has brought together faculty members with expertise in economics, management, vector biology and mathematical modeling of disease transmission and intervention coverage to contribute to the VBC II subcontract. The university has interest and capability in institutional strengthening and a commitment to finding alternatives to chemical control of vectors. Harvard's field affiliates include institutions in Ethiopia, Kenya, Thailand, China and Brazil. Andrew Spielman, Sc.D., is Harvard's subcontract coordinator.

Henry M. Jackson Foundation

The Jackson Foundation has an impressive record of implementing field programs, conducting operational rather than theoretical research and providing practical training for LDC nationals. It has strong affiliations with laboratories in Pakistan, Belize, Mexico and Zambia. Skill and emphasis areas of its staff include medical entomology, training, clinical medicine, remote sensing, geographic information systems, health services administration and interactive video media. Donald Roberts, Ph.D., is the Foundation's subcontract coordinator.

Tulane University

The Tulane University subcontractor brings many years of faculty experience in research and control programs in Africa and Latin America and the Caribbean to VBC II. Centered in the School of Public Health and Tropical Medicine, the subcontract also can call upon expertise from other university areas, including biostatistics, quantitative epidemiology, clinical medicine and data management. Affiliates in the New Orleans Mosquito Control Association give Tulane access to practical vector control technologies. Barnett Cline, M.D., MPH, is Tulane's subcontract coordinator.

Senior Advisory Committee

MSCI has invited a group of experienced scientists, managers and experts in areas complementary to the Project's mandate to serve on the VBC II Senior Advisory Committee (SAC). Committee members will advise VBC II on maintaining a balanced portfolio of activities. They also will help identify new opportunities and monitor the quality of VBC products. The members of the VBC II SAC are:

Dr. Harold Chapman	Entomologist and past president of the American Mosquito Control Association
Mr. Roger Ernst	Management specialist and economist, former A.I.D. Mission Director
Dr. Grace Goddell	Development anthropologist and Professor, Johns Hopkins University School of Advanced International Studies (SAIS)
Dr. Norman Gratz	Entomologist and former Director of WHO's Division of Vector Biology and Control
Mr. Ellis Turner	Environmental engineer and Director of A.I.D.'s Water and Sanitation for Health Project (WASH)
Dr. Rodrigo Zeledon	Vector-borne disease control specialist from the National Institute of Science and Technology, San Jose, Costa Rica

8. Developing the VBC II FY 90 Work Plan

Development of this Work Plan began in June 1989, when S&T/H sent all Missions and regional Bureaus a worldwide cable describing the Project and inviting expressions of interest. The VBC II staff used the responses to the cable in establishing five-year objectives and developing the 1990 portfolio of activities.

In November, VBC II held a three-day workshop where representatives of S&T/H, the regional Bureaus, A.I.D.'s Contracts office, MSCI's subcontractors, VBC's Senior Advisory Committee and the VBC II core staff discussed objectives and specific regional needs. The workshop also provided an opportunity to explore the proactive component of the Project and identify matches between the capabilities of the subcontractors and expressed needs.

VBC staff members held a series of meetings with our colleagues in the regional Bureaus during December and January to more precisely define objectives and priorities. They shared that information with the members of the subcontractors' interdisciplinary VBC Activities Committees, who had begun developing concept papers responsive to the Project's long-term goals and objectives. Many of these concept papers have been approved as activities for VBC's FY 90 program. We anticipate the addition of more subcontractor activities as the year progresses.

The result of this process is a well-balanced agenda of programmed activities that responds to Mission and Bureau needs, initiates a number of promising proactive actions and reserves sufficient resources for meeting needs as yet unidentified. The agenda is far from closed. We have significant capability to program funds for 1990 and subsequent years.

The VBC II staff has more proactive ideas than programmable funds. We will be contacting Mission and Bureau personnel to explore the possibilities of working together to use the buy-in process to seek new solutions to long-term problems. We hope that A.I.D. and its development partners will consider the VBC Project a valuable resource for the next five years.