

PROGRAMME BUDGET FOR THE 1988-1989 BIENNIUM
AND ESTIMATES FOR 1990-1991

ADDENDUM

The Proposed Programme Budget for the 1988-1989 Biennium and Estimates for 1990-1991 were approved by the TDR Joint Coordinating Board (JCB) at its Tenth Session held at WHO headquarters, Geneva, on 24 and 25 June 1987, with one amendment and one comment as follows:

Programme Development Fund (page 18, item 5. Programme Area II: Research and Development - 5.1 General Activities)

JCB(10) did not approve the establishment of the Programme Development Fund. The Board agreed that the TDR Scientific and Technical Advisory Committee (STAC) should be consulted on the use of the resources proposed for this budget item in 1988 and STAC's recommendations should be submitted to JCB(11) in 1988 for approval. The use of any remaining amount will be considered by the Board in light of the recommendations of the External Review Committee whose report on the second external review and evaluation of TDR will be discussed by JCB(11) in 1988.

Operational Support (page 14, item 3. Development and Presentation of the Programme Budget - 3.2 Presentation)

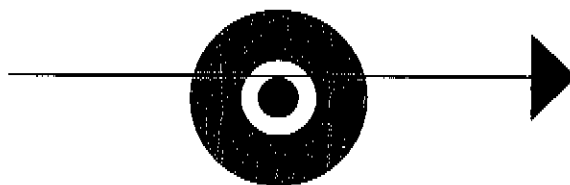
JCB(10) commented on the budget items for operational support in Programme Areas II (Research and Development) and III (Research Capability Strengthening). Each budget item for operational support includes provision for three subitems: meetings, consultants and temporary advisers, and staff duty travel (tables 5.2 - 5.14 and 6.2 refer). The Board agreed to the operational support budget items as presented in the Programme Budget, provided the Programme's financial reports showed the expenditures (obligations) for these subitems within the overall budget element for operational support.

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SEE ADD.

TDR/PB/88-89



special programme for research and training in tropical diseases

PROPOSED PROGRAMME BUDGET FOR
THE 1988-1989 BIENNIUM AND
ESTIMATES FOR 1990-1991



DIST.: LIMITED
DIST.: LIMITEE

ABBREVIATIONS AND ACRONYMS

BCV	Biological Control of Vectors Component
CHEMAL	Chemotherapy of Malaria Component
DIF	Director's Initiative Fund
FIELDMAL	Applied Field Research in Malaria Component
GS	General Service staff
IMMLEP	Immunology of Leprosy Component
IMMAL	Immunology of Malaria Component
JCB	Joint Coordinating Board
M	Million
MISTR	Management Information System of TDR
OCT	Onchocerciasis Chemotherapy Project
P	Professional staff
RSC	Research Strengthening Group
SER	Social and Economic Research Component
SFR	Swiss franc
STAC	Scientific and Technical Advisory Committee
STRC	Scientific and Technical Review Committee
SWG	Scientific Working Group
TDR	Special Programme for Research and Training in Tropical Diseases (Tropical Disease Research)
THELEP	Chemotherapy of Leprosy Component
UNDP	United Nations Development Programme
WHO	World Health Organization

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EXECUTIVE SUMMARY

The UNDP/WORLD BANK/WHO Special Programme for Research and Training in Tropical Diseases (TDR) was established in 1975 to undertake research and development to obtain new and improved tools to control six major groups of tropical diseases and to strengthen the research capabilities of tropical countries in which these diseases are endemic. TDR's technical and administrative bodies provide both scientific advice on and review of its activities, and technical, administrative and financial support and coordination (Section 1, Programme Overview).

TDR's finances are affected by both currency fluctuations and inflation. In particular, fluctuation in the value of the US dollar against other major currencies, especially the Swiss franc, has a significant impact on both contributions and expenditures. The depreciation of the US dollar against the Swiss franc during the past two years has increased considerably the cost of Geneva-based expenditures. The high inflation rates of the early 1980s combined with a levelling of contributions between 1982 and 1985 have resulted in a severe erosion in the real value of contributions to the Programme and in Programme expenditures. The Programme Budget proposed for the 1988-1989 biennium, US\$ 59 349 000, reflects both Programme requirements and estimates of resources likely to be available during the biennium. The Special Programme depends on voluntary contributions for most of its income. For the 1988-1989 biennium, total contributions are estimated to be about US\$ 56 million, and total funds available US\$ 60 million. Twenty-five per cent of the Proposed Budget is allocated to Programme Area III, Research Capability Strengthening, in accordance with the views of TDR's technical and administrative bodies. Most of the increased funds in the Proposed Budget will be devoted to Programme operations, with decreases in the proportions allocated for personnel services, operational support and other expenses (Section 2, Programme Budget and Financing).

Several changes in the presentation of the Programme Budget are intended to improve financial management and control. The provisions for meetings, consultants, temporary advisers and duty travel are consolidated into a single budget line for operational support under each Component in Programme Area II, and separate texts and tables are presented for the three Scientific Working Groups (SWGs) on malaria and for the two SWGs on leprosy (Section 3, Development and Presentation of the Programme Budget).

The budget proposals for Programme Area II include a new item, a "Programme Development Fund", intended to provide the degree of flexibility needed for TDR to respond to changing requirements and new scientific and technical opportunities which may arise after the budget has been approved. This new fund would complement the existing Director's Initiative Fund, a mechanism for responding rapidly to promising research leads which require a small amount of seed money. The objectives, current and planned activities, and financial requirements for the 1988-1989 biennium are contained in separate texts for each of the 13 SWGs in Programme Area II (Section 5, Programme Area II: Research and Development).

The planned activities for the Research Capability Strengthening Component reflect proposals for the reorganization of the Programme to improve collaboration between this Component and the Research and Development Components. As part of this reorganization, the Epidemiology Component will work closely with the Research Capability Strengthening Component, and the personnel of the Epidemiology Component will be transferred to Area III (Section 6, Programme Area III: Research Capability Strengthening).

Programme Area IV provides direction and guidance for all Programme activities, through the Office of the Programme Director, and support for the technical and administrative bodies and for scientific activities and operations. Area IV is responsible for financial management and for information, publications, personnel and procurement services for TDR. A major feature of the 1988-1989 biennium will be the continued introduction of microcomputer technology into TDR, which is being integrated with existing mainframe central computing facilities (Section 7, Programme Area IV: Programme Management).

As a result of the proposed reorganization and streamlining of TDR's activities and the conversion of some existing General Service posts to Professional posts, the Proposed Budget for 1988-1989 includes a reduction in the total number of General Service staff years required, from 91 to 86.5 (Section 8, Personnel Requirements).

TABLE 1 BUDGET SUMMARY (US\$000 AND PER CENT)

PROGRAMME AREA/COMPONENT	1986-1987		1988-1989			1990-1991
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL. 3-COL. 2 US\$000	5 INCREASE (DECREASE) COL. 3-COL. 2 PER CENT	6 ESTIMATED
<u>I Technical and Administrative Bodies</u>	813.0	660.0	645.0	(15.0)	(2.3)	705.0
PER CENT OF TOTAL	1.5	1.3	1.1	(0.2)		1.0
<u>II Research and Development</u>						
General Activities	2 662.6	2 146.7	2 398.0	251.3	11.7	2 780.0
Chemotherapy of Malaria	4 306.0	4 140.0	4 734.0	594.0	14.3	5 825.0
Immunology of Malaria	4 380.6	3 950.0	4 487.0	537.0	13.6	5 550.0
Applied Field Research in Malaria	1 800.6	1 690.0	1 887.0	197.0	11.7	2 400.0
Schistosomiasis	2 280.6	2 170.0	2 387.0	217.0	10.0	2 800.0
Filariasis	3 230.6	3 260.0	3 787.0	527.0	16.2	4 550.0
African Trypanosomiasis	2 930.6	2 820.0	2 937.0	117.0	4.1	3 500.0
Chagas' Disease	1 700.6	1 670.0	2 137.0	467.0	28.0	2 500.0
Leishmaniasis	1 880.6	1 915.0	2 287.0	372.0	19.4	2 700.0
Immunology of Leprosy	3 450.6	2 940.0	3 337.0	397.0	13.5	3 900.0
Chemotherapy of Leprosy	1 980.6	1 700.0	1 887.0	127.0	7.5	2 300.0
Biological Control of Vectors	2 211.2	2 005.0	2 274.0	269.0	13.4	2 680.0
Epidemiology	1 903.3	1 690.0	800.0	(890.0)	(52.3)	-
Social and Economic Research	1 680.6	1 580.0	2 037.0	457.0	28.9	2 505.0
PROGRAMME AREA II SUBTOTAL	36 398.5	33 676.7	37 376.0	3 699.3	11.0	43 990.0
PER CENT OF TOTAL	65.1	64.4	63.0	(1.4)		63.5
<u>III Research Capability Strengthening</u>						
General Activities	1 766.2	1 830.0	1 557.0	(273.0)	(14.9)	1 555.0
Institution Strengthening	4 935.0	4 600.0	5 850.0	1 250.0	27.2	7 000.0
Training	6 570.0	5 800.0	6 700.0	900.0	15.5	8 000.0
Epidemiology	-	-	734.0	734.0	-	825.0
PROGRAMME AREA III SUBTOTAL	13 271.2	12 230.0	14 841.0	2 611.0	21.3	17 380.0
PER CENT OF TOTAL	23.7	23.4	25.0	1.6		25.1
<u>IV Programme Management</u>						
Personnel	2 445.9	2 525.0	3 035.0	510.0	20.2	3 365.0
Operational Support Activities	618.0	890.0	650.0	(240.0)	(27.0)	720.0
General Support	1 342.0	1 700.0	1 849.0	149.0	8.8	2 100.0
Regional Offices	1 006.5	640.0	953.0	313.0	48.9	1 050.0
PROGRAMME AREA IV SUBTOTAL	5 412.4	5 755.0	6 487.0	732.0	12.7	7 235.0
PER CENT OF TOTAL	9.7	11.0	10.9	(0.1)		10.4
GRAND TOTAL	55 895.1	52 321.7	59 349.0	7 027.3	13.4	69 310.0

1. PROGRAMME OVERVIEW

1.1 Objectives

The Special Programme for Research and Training in Tropical Diseases (TDR) was established in 1975 in view of the urgent need for new and improved tools to control major tropical diseases and for strengthening the capability of developing endemic countries to undertake research on tropical diseases. One of the critical assumptions was that modern biology could provide novel approaches to the prevention and control of tropical diseases, especially parasitic diseases.

The Special Programme is thus an international response to major health problems of tropical developing countries. The Programme was planned and initiated by the World Health Organization (WHO), with the assistance and co-sponsorship of the United Nations Development Programme (UNDP) and The World Bank. The Programme promotes the participation of the world's scientific community in its globally coordinated effort aimed at two interdependent objectives:

- to develop new methods of preventing, diagnosing and treating selected tropical diseases, methods that would be applicable, acceptable and affordable by developing countries, require minimal skills or supervision and be readily integrated into the health services of these countries;
- to strengthen -- through training in biomedical and social sciences and through support to institutions -- the capability of developing endemic countries to undertake the research required to develop these new disease control technologies.

TDR's activities are targeted towards six disease groups: malaria, schistosomiasis, filariasis (including onchocerciasis or river blindness), the trypanosomiasis (both African sleeping sickness and the American form, Chagas' disease), the leishmaniasis and leprosy.

1.2 Policy Framework and Management Structure

The Special Programme operates within the policy and programme framework of the World Health Organization and is regularly reviewed by the World Health Assembly, the Executive Board, and the Regional and Global Advisory Committees on Health Research. The Programme's strategies and priorities are developed and coordinated within this framework, and TDR is operated, reviewed and evaluated through the mechanisms established by its management structure, which includes the following technical and administrative bodies:

The Joint Coordinating Board

The Joint Coordinating Board (JCB) is the top management body of TDR. Its 30 members consist of representatives of 12 governments selected by the financial contributors to the Programme, of 12 governments of countries that are directly affected by the diseases of concern to TDR or that provide scientific support to the Programme, of three governments or agencies selected by the JCB itself, and of the three co-sponsoring agencies, the UNDP, The World Bank and WHO. The JCB meets annually to review all TDR activities, decide on its budget, evaluate its progress and consider its long-term plans and their financial implications.

The Executing Agency and the Standing Committee

In response to a resolution passed in 1974 by the Twenty-Seventh World Health Assembly calling on the Director-General of WHO "to intensify WHO activities in the field of research on the major tropical parasitic diseases", WHO established the Special Programme (in 1975) and became its sponsor and Executing Agency. Representatives of the three co-sponsors meet at least twice a year as the Standing Committee to consider matters relating to the overall management of the Programme.

The Scientific and Technical Advisory Committee

The Scientific and Technical Advisory Committee (STAC) is composed of 15 to 18 members with expertise in a wide range of scientific disciplines. It meets annually to review all Scientific Working Group and Research Strengthening Group activities (see below) and to make recommendations on Programme activities, including the distribution of funds to different TDR Components. Detailed evaluation of the work of each TDR Component is carried out by Scientific and Technical Review Committees (STRCs), which are composed of STAC members and other experts. STAC reports its findings to the co-sponsoring agencies and to the JCB and thus constitutes a direct link between those overseeing and conducting the scientific activities of the Programme and its top management body.

Scientific Working Groups

TDR's research and development activities are conducted by Scientific Working Groups (SWGs), which are established on the recommendation of STAC for each of the diseases or disciplines under which TDR's activities are organized. SWG participants are scientists involved in any aspect of TDR's work; they may be carrying out a scientific project funded by TDR or may have simply attended a TDR scientific meeting. "Trans-disease" SWGs deal with research that cuts across disease lines, such as biological control of vectors, epidemiology, social and economic research, and, up to December 1985, biomedical sciences.

Steering Committees

SWG activities are managed by Steering Committees, which usually comprise eight to ten members and meet at least once a year. The main tasks of Steering Committees are to assess scientists' research proposals for their scientific quality and relevance to TDR's objectives and to review the progress of research already being funded. Projects supported by TDR are conducted by scientists working within their own institutions. Research proposals for small, especially urgent or innovative, projects can be funded under a Director's Initiative Fund.

The Research Strengthening Group

Within TDR the major responsibility for strengthening the research capabilities of tropical countries lies with the Research Strengthening Group (RSG), which has 12 members selected on the basis of their experience in research management and training. The RSG meets annually to prepare overall plans, review proposals and specific activities for research strengthening, and evaluate progress. A Research Strengthening Team (RST), composed of key members of the TDR Secretariat, meets several times a year to consider proposals for training under TDR auspices.

1.3 Targets

The targets established for the Special Programme in the Seventh General Programme of Work of WHO covering the period 1984 to 1989 are as follows:

- (1) Goal-oriented research and development should have reached a stage of:
- field application and/or advanced clinical trials of improved or new chemotherapeutic agents for at least five of the six disease groups;
 - large-scale trials of a candidate leprosy vaccine and early trials of one or more possible malaria vaccines;
 - field application and/or field trials of new, simple diagnostic tests and techniques for monitoring malaria parasite sensitivity to drugs;
 - field application and/or trials of two or more new biological agents for the control of disease vectors;
 - establishment of the epidemiological, social and economic bases for the development of more effective national strategies for the integrated control of the six diseases.
- (2) By strengthening national institutions of tropical countries affected by the target diseases, TDR will be able to support the development of:
- a network of 60 to 80 self-reliant national research and training centres in tropical diseases and technical cooperation among developing countries;
 - through training, a base of 200 to 300 scientists from tropical developing countries who will be able to contribute to the self-reliance of those countries.

1.4 Operations

From its inception in 1975 to 31 December 1986, TDR supported a total of 2917 projects in 106 Member States of WHO. More than 4500 scientists from 129 Member States participated in the operation, management and evaluation of the Programme, and over 4900 publications resulted from activities supported by TDR. A total of US\$ 157 million was spent worldwide in direct support to scientists and institutions, and the proportion of project funds devoted directly to developing countries where the target diseases are endemic rose from 29% in 1977 to an average of 56% between 1982 and 1986. All support for research capability strengthening goes to scientists or institutions in developing countries. Moreover, many research and development projects in industrialized countries include direct collaboration with institutions in developing countries and/or the training of their scientists.

The activities of the Special Programme are carried out in close collaboration with those of other WHO programmes cooperating with developing countries on disease control measures. These include the Malaria Action Programme, the Parasitic Diseases Programme, the Leprosy Unit and the Division of Vector Biology and Control. Close relationships are also maintained with other special programmes of WHO, notably, the Special Programme of Research, Development and Research Training in Human Reproduction, the Diarrhoeal Diseases Control Programme, the Expanded Programme on Immunization and the newly established Special Programme on AIDS.

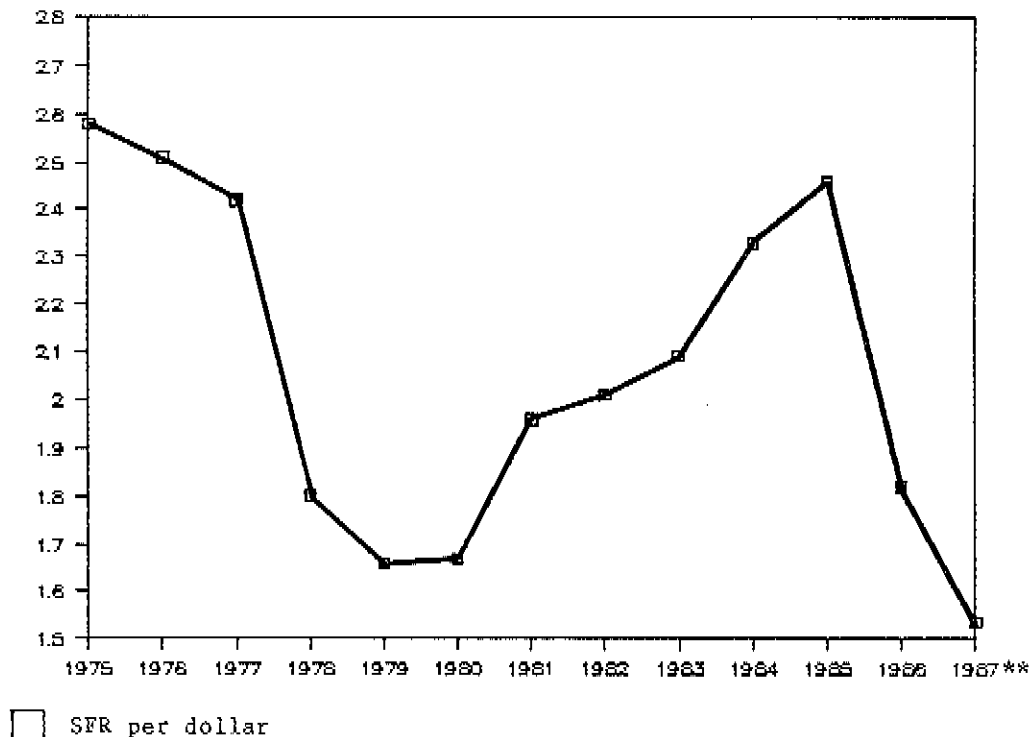
2. PROGRAMME BUDGET AND FINANCING

2.1 Budget Level

The Programme Budget proposed for the 1988-1989 biennium is US\$ 59 349 000. This compares with the budget of US\$ 55 895 100 approved by the JCB for the 1986-1987 biennium and the 1986-1987 Revised Budget amount of US\$ 52 321 700. The Proposed Budget for 1988-1989 represents an increase of US\$ 7 027 300 or 13.4% over the 1986-1987 Revised Budget. The Proposed Budget has been established in the light of both Programme requirements and estimates of resources likely to be available to TDR during the biennium.

Although the Proposed Budget represents an increase in terms of US dollars over the 1986-1987 Revised Budget, a large amount of the increase is accounted for by higher costs in certain expenditure categories as a result of the depreciation of the US dollar against other major currencies, including the Swiss franc, which accounts for a very high proportion of non-operational expenditures (i.e. non-project expenditures). The fluctuation of the value of the US dollar against other currencies has a significant impact on TDR's finances, both income (contributions) and expenditures (obligations). For budget purposes, the value of the US dollar against the Swiss franc is the most relevant; Figure 1 illustrates the fluctuation in the official UN exchange rate between 1975 and 1987. In summary, the US dollar depreciated in value between 1975 and 1978, remained low up to 1980, gradually increased from 1981, reached a peak in 1985, and has since fallen sharply in value -- from a high of SFR 2.83 in March 1985 to a low of SFR 1.48 in May 1987: a depreciation of 48% in two years. (Effects of the depreciation of the US dollar on TDR are also discussed in section 3.3.)

FIGURE 1. SWISS FRANC/US DOLLAR AVERAGE ANNUAL EXCHANGE RATES*, 1975-1987



* UN official exchange rates

** 1987: January - May

TDR finances are also affected by inflation. Although inflation has decreased considerably in the past few years, the high inflation rates of the late 1970s and early 1980s severely eroded the real value of funds available to the Programme and of Programme expenditures. Table 2.1 presents inflation rates considered applicable to TDR over the past eight years (see footnote, Table 2.1). The table shows an average annual inflation rate of 6.1% between 1979 and 1986.

TABLE 2.1 INFLATION RATES*, 1979 TO 1986 (PER CENT)

1979	1980	1981	1982	1983	1984	1985	1986
8.5	10.2	8.7	7.1	4.5	3.8	3.5	2.1 (Estimate)

* The GDP deflator for industrialized countries from the publication International Financial Statistics (International Monetary Fund) has been used to derive the inflation rates in Table 2.1. The GDP deflator for industrialized countries is a fairly conservative measure of inflation, since the "world" figures show much greater variation because of high inflation in many developing countries. Similarly, the Consumer Price Index also shows higher rates than the GDP deflator. Although the Consumer Price Index may be a more suitable deflator for TDR obligations, the GDP deflator has been used for both contributions and obligations to maintain comparability.

From 1982 to 1985, contributions to TDR averaged about US\$ 20.2 million, after reaching a peak of US\$ 25.6 million in 1980. Contributions in 1986 rose to US\$ 24.4 million, largely as a result of the decreased value of the US dollar. Inflation has had the effect of eroding the real value of contributions even more than the decline in current dollars, as Figure 2 shows. The value of contributions to TDR in constant 1980 dollars declined from US\$ 25.6 million in 1980 to US\$ 15.4 million in 1985 -- a decline of some 40% -- and increased to US\$ 18.3 million in 1986, still considerably below the 1980 value.

The effect of inflation on TDR obligations is also considerable, although the impact of declining contributions was cushioned until after 1984, when TDR obligations in both current and constant 1980 dollars fell sharply (Figure 3).

The combined impact of currency fluctuations and inflation has been considerable on TDR. There has been, in the first place, a fall in Programme volume or output, as measured in dollar value. This has meant that a number of important scientific and technical activities have had to be abandoned or delayed until additional funding became available. In addition, it has created a sense of financial insecurity in the Programme, which has made long-term planning difficult. For example, after 1982-1983, little "promotional" work -- the encouragement of scientists and institutions to become involved in the Programme and to submit proposals for funding -- was undertaken by the Programme, especially for Research Capability Strengthening. Such promotional activities are important to maintain a constant flow of new ideas and new sources of scientific expertise into the Programme, as well as to identify tropical disease research institutions in developing endemic countries which require strengthening.

After a period of declining contributions and general financial uncertainty, the increase in contributions in 1986 was a welcome boost to

FIGURE 2. EFFECT OF INFLATION ON TDR CONTRIBUTIONS, 1979-1986

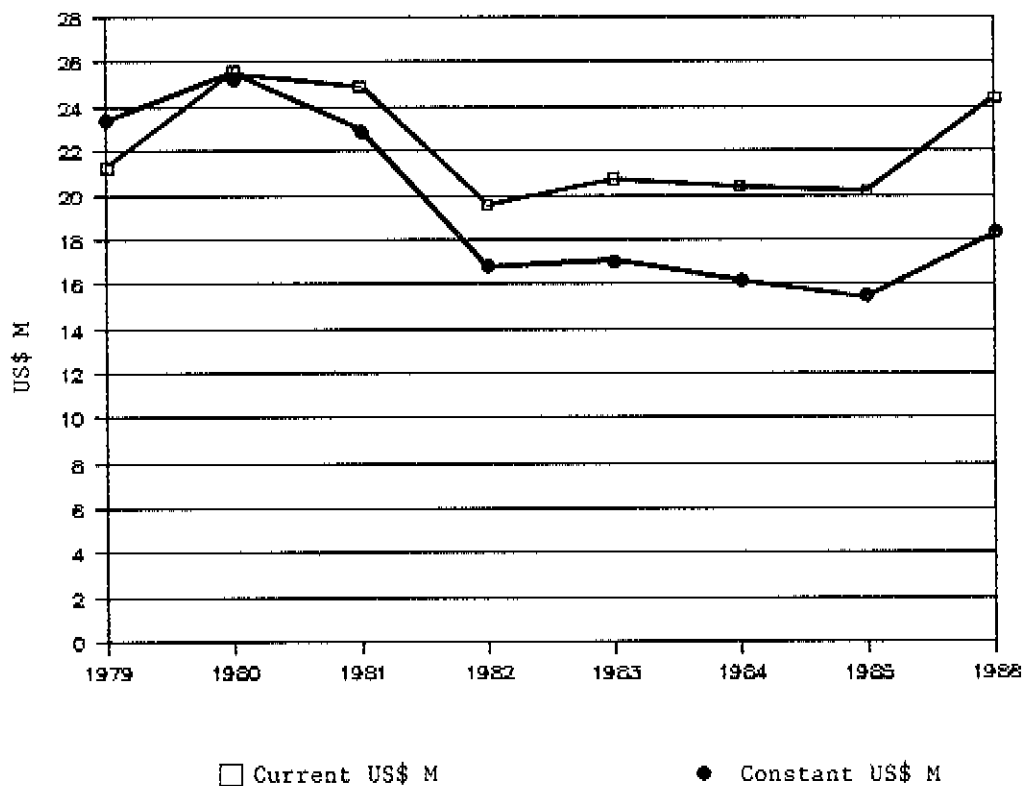
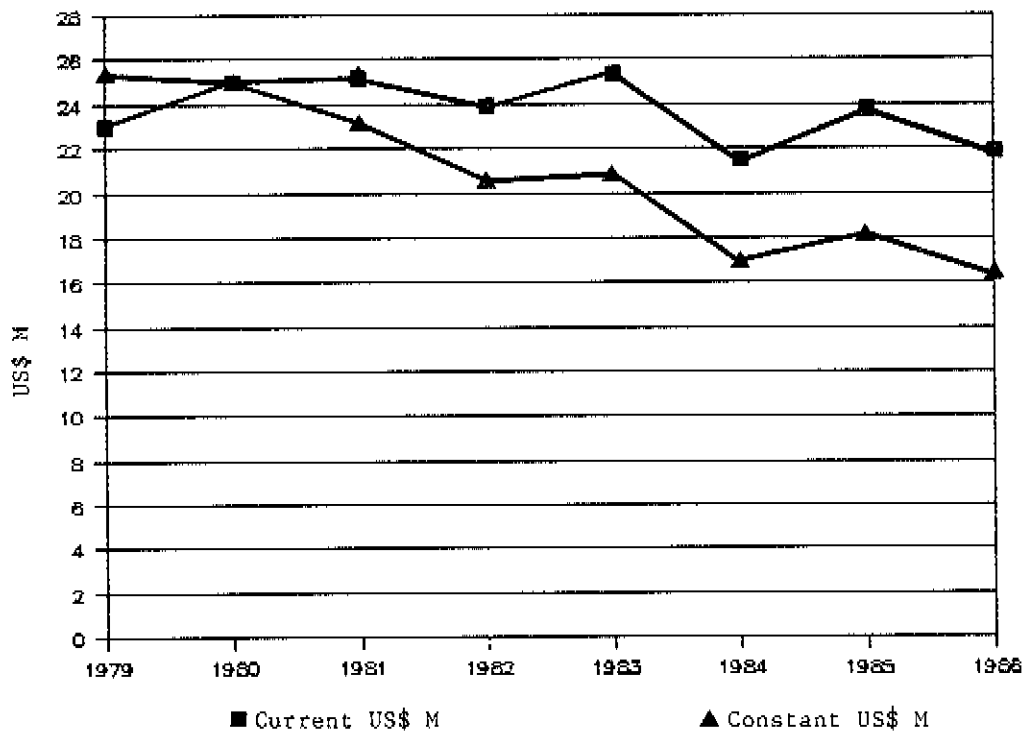


FIGURE 3. EFFECT OF INFLATION ON TDR OBLIGATIONS, 1979-1986



TDR. However, the Standing Committee and the Secretariat consider that a continuation of the policy of cautious financial management is in order for the period 1988-1989. This suggests setting the budget at a less than optimal level in the hope that funds will in fact be available to finance the entire budget, thereby creating a necessary element of financial stability for the biennium. This financial stability is needed to create a proper atmosphere in which scientific and technical activities can move forward. In addition, greater certainty with respect to the financial situation over the next few years would assist in planning scientific and research capability strengthening activities. Active promotional work, especially for institutional strengthening and training, generates requests for assistance that extends over a period of five to seven years and hence requires stability and certainty with regard to funding.

2.2 Financing the Programme Budget

The Special Programme depends on voluntary contributions from governments, international institutions and nongovernmental organizations for most of its income. Contributions are made either to the Special Account for the Tropical Diseases Research Fund, maintained for the Programme by The World Bank, which makes disbursements to WHO/TDR as and when needed, or to the Trust Fund for the Special Programme for Research and Training in Tropical Diseases, maintained by WHO. Both The World Bank and WHO maintain undisbursed funds in interest earning accounts that provide a further source of income for the Programme. In addition, funds undisbursed at the end of each biennium become available for financing the Programme in the subsequent biennium.

It is estimated, based upon the recent pattern of contributions, that in the 1988-1989 biennium contributions will be about US\$ 56 million, the exact level depending on a number of uncertainties, including, of course, the rates of exchange at which contributions are converted into US dollars. This is an increase of US\$ 6 million or 12% over estimated contributions of US\$ 50 million in the 1986-1987 biennium. Interest and other income is estimated to total US\$ 2.7 million. The carry-over of undisbursed funds from 1986-1987 to the 1988-1989 biennium is expected to be about US\$ 1.3 million. Accordingly, funds available during the 1988-1989 biennium are estimated to total some US\$ 60 million (see Table 2.2). With estimated obligations (i.e. the Proposed Budget) set at US\$ 59.3 million, there is an estimated closing balance of US\$ 0.7 million at the end of the 1988-1989 biennium.

TABLE 2.2 ESTIMATED FUNDS AVAILABLE AND OBLIGATIONS, 1988-1989

	US\$ M
Estimated opening balance, 1 January 1988	1.3
Income:	
Contributions	56.0
Interest	1.7
Other income*	1.0
Total income	58.7
Total estimated funds available	60.0
Estimated obligations (Proposed Budget)	59.3
Estimated closing balance, 31 December 1989	0.7

* Primarily savings on unliquidated obligations

2.3 Distribution of the Proposed Budget for 1988-1989

The budget of the Special Programme may be divided in two ways: by Programme Area and by budget element. The Programme Areas (PA) are as follows:

- PA I Technical and Administrative Bodies include budget provisions for the JCB, STAC, the Standing Committee and related items;
- PA II Research and Development covers budget provisions for the disease and trans-disease Components, which correspond to Scientific Working Groups;
- PA III Research Capability Strengthening;
- PA IV Programme Management includes budget provisions for the Office of the Programme Director and covers other administrative, management, information, common services, premises and communications expenditures, as well as the costs of personnel in Regional Offices.

Budget elements represent a functional or objects-of-expenditure division of the budget:

- Operations are actual expenditures for research and development projects, institution-strengthening activities and training grants;
- Personnel services include salaries and other related costs for TDR personnel, including temporary staff and Regional Office personnel paid by TDR, and for administrative support at WHO headquarters;
- Operational support costs cover meetings, consultants, temporary advisers and duty travel;
- Technical and administrative bodies correspond to Programme Area I;
- Other costs include such items as information systems, public information and publications, office supplies, common services (such as communications) and premises.

Tables 2.3 and 2.4 show the distribution of the budget by Programme Area and by budget element. As noted above, the Proposed Budget for 1988-1989 represents an increase of US\$ 7 million over the 1986-1987 Revised Budget. Of this increase of US\$ 7 million, US\$ 3.7 million is proposed for increases in Programme Area II, Research and Development, and US\$ 2.6 million for Programme Area III, Research Capability Strengthening (see Table 2.3). The views of STAC and the JCB have been reflected in the allocations among Programme Areas, notably in the allocation of about 25% of total Programme funds to Programme Area III, Research Capability Strengthening.

In terms of budget elements (Table 2.4), the per cent of the total budget devoted to operations increases from 70.7% in the 1986-1987 Revised Budget to 72.5% for 1988-1989. As a result of reductions in staff posts and in temporary assistance, the provision for personnel services is reduced from 18.0% of the 1986-1987 Revised Budget to 17.5% of the 1988-1989 Proposed Budget. Expenditures for operational support are reduced from 6.2% to 5.6%, while "other" expenses are reduced from 3.9% to 3.3% in the Proposed Budget for 1988-1989.

TABLE 2.3 BUDGET SUMMARY BY PROGRAMME AREA (US\$000 AND PER CENT)

PROGRAMME AREA	1986-1987		1988-1989		1990-1991
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2	5 ESTIMATED
I Technical and Administrative Bodies	813.0	660.0	645.0	(15.0)	705.0
PER CENT OF TOTAL	1.5	1.3	1.1	(0.2)	1.0
II Research and Development	36 398.5	33 676.7	37 376.0	3 699.3	43 990.0
PER CENT OF TOTAL	65.1	64.4	63.0	(1.4)	63.5
III Research Capability Strengthening	13 271.2	12 230.0	14 841.0	2 611.0	17 380.0
PER CENT OF TOTAL	23.7	23.4	25.0	1.6	25.1
IV Programme Management	5 412.4	5 755.0	6 487.0	732.0	7 235.0
PER CENT OF TOTAL	9.7	11.0	10.9	(0.1)	10.4
TOTAL	55 895.1	52 321.7	59 349.0	7 027.3	69 310.0

Table 2.4 SUMMARY BY BUDGET ELEMENT (US\$000 AND PER CENT)

PROGRAMME AREA	1986-1987		1988-1989		1990-1991
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2	5 ESTIMATED
Operations	40 565.1	36 994.5	43 045.0	6 050.5	51 170.0
PER CENT OF TOTAL	72.6	70.7	72.5	1.8	73.8
Personnel Services	8 622.6	9 407.2	10 389.0	981.8	11 525.0
PER CENT OF TOTAL	15.4	18.0	17.5	(0.5)	16.6
Operational Support	4 320.5	3 230.0	3 320.0	90.0	3 735.0
PER CENT OF TOTAL	7.7	6.2	5.6	(0.6)	5.4
Technical and Administrative Bodies	813.0	660.0	645.0	(15.0)	705.0
PER CENT OF TOTAL	1.5	1.3	1.1	(0.2)	1.0
Other	1 573.9	2 030.0	1 950.0	(80.0)	2 175.0
PER CENT OF TOTAL	2.8	3.9	3.3	(0.6)	3.1
TOTAL	55 895.1	52 321.7	59 349.0	7 027.3	69 310.0

3. DEVELOPMENT AND PRESENTATION OF THE PROGRAMME BUDGET

3.1. Development of the Programme Budget

The development of the TDR budget level takes into account, on the one hand, the estimated funds expected to be available to the Programme during the biennium and, on the other hand, the planned activities of the SWGs and the RSC.

In order to establish a realistic target amount for the biennial budget, the Secretariat projects total funds available for the biennium on the basis of past experience and indications from contributors. Funds available consist of amounts carried over from the preceding biennium, contributions to TDR, interest on cash balances, and other income, mostly refunds on unliquidated obligations from prior years. The Standing Committee uses these estimates to establish a target budget amount within which the Programme Director develops details of the Programme Budget.

On the basis of the workplans of the SWGs and of the RSG, the Secretariat develops cost estimates for the various Programme Areas and Components. These estimates are consolidated by the Programme Director into a draft Programme Budget, taking into account guidelines established by the Standing Committee and the JCB. The draft Programme Budget is submitted to STAC for review and comment. The Programme Director prepares the final Proposed Programme Budget and presents it to the Standing Committee for review and comment and to the JCB for approval or amendment.

The Proposed Budget for 1988-1989 does not take into account possible impacts on the budget which may result from the report and recommendations issuing from the second external review and evaluation of the Special Programme. The Programme Budget for 1988-1989 may have to be reviewed and, if necessary, revised in the light of External Review Committee recommendations with budgetary implications.

3.2 Presentation

The format of the 1988-1989 budget follows the same general pattern as for previous Programme budgets. The introductory chapters (Parts 1, 2 and 3) are followed by separate sections dealing with each Programme Area. Part 4 covers Programme Area I, Technical and Administrative Bodies. Parts 5 and 6 present descriptive summaries and budgetary tables for Area II, Research and Development, by Component, and for Area III, Research Capability Strengthening. Part 7 presents a summary for Area IV, Programme Management.

Within this general format there are a number of changes in presentation:

- In order to increase the flexibility of SWG Steering Committees and their Secretaries in supporting activities deemed essential to the implementation of Programme operations, the provisions for meetings, consultants, temporary advisors and staff duty travel have been combined into a single budget line for operational support under each Component in Area II. The amounts budgeted for each Steering Committee reflect the estimated needs based on workplans and past experience.
- Separate texts and tables are presented for each of the three SWGs for malaria research, i.e. Chemotherapy of Malaria (CHEMAL), Immunology of Malaria (IMMAL) and Applied Field Research in Malaria (FIELDMAL). Similarly, separate texts and tables are presented for the two SWGs on leprosy, i.e. Immunology of Leprosy (IMMLEP) and Chemotherapy of Leprosy (THELEP).

- The costs of editing, translating and printing the Programme Report have been budgeted in Programme Area I, Technical and Administrative Bodies, rather than in Area IV, Programme Management. This change is deemed appropriate since the Programme Report, rather than being an Area IV document, is a formal report to the JCB and constitutes a summary of progress made throughout the Programme.
- Budgetary provision for temporary assistance has up to now been made exclusively under Area IV, the provision having been designed to cover the needs of Areas II and III as well. Since temporary assistance expenditures are in fact also incurred under Areas II and III, it is thought that budgetary provision should be made under all three Programme Areas, according to the estimated needs of each.

The tables contain the amounts approved by the JCB for the 1986-1987 biennium and those of the 1986-87 Revised Budget, the amounts proposed for the 1988-1989 biennium and the changes (increases/decreases) compared to the 1986-1987 Revised Budget. Projections for 1990-1991 are shown only in the summary tables in Part 2 and not in the detailed tables of each Programme Area, since these projections are highly tentative.

3.3 Cost Factors

Standard cost factors are developed by WHO for a number of cost elements and are based on analysis of costs of previous years and changes in rates of exchange. The most important standard cost data concern the salaries and allowances of Professional and General Service staff, for which WHO standard costs have been used.

Cost increases or decreases, in general, result from increases or decreases in activity, inflation and changes in rates of exchange when converting into the currency of account, the US dollar. Of these elements, inflation is expected to account for an increase of about 5% between the 1986-1987 Revised Budget amounts and those of the Proposed Budget for 1988-1989. As to changes in the level of operational activities, TDR's research and research-strengthening grants are with very rare exception expressed in US dollars. The total amount budgeted for operations in 1988-1989 is US\$ 43 045 000; this compares with a 1986-1987 amount of US\$ 36 994 500 (Revised Budget). This increase is largely an increase in activity, although it does contain some measure of inflation and currency adjustment.

The WHO budgetary rate of exchange of SFR 1.65 has been used to convert Swiss franc expenditures into US dollars. This compares with a rate of SFR 2.50 used in the 1986-1987 Programme Budget. This depreciation of the US dollar by 34%, for budgetary purposes, has in particular affected the US dollar equivalent of the cost of salaries and allowances of staff in Geneva and of all support costs incurred in Geneva, such as communications, supplies and premises. Overall, the devaluation of the US dollar from SFR 2.50 to SFR 1.65 per US dollar is estimated to cost an additional US\$ 3 million in 1988-1989.

4. PROGRAMME AREA I: TECHNICAL AND ADMINISTRATIVE BODIES

Provisions are made in this Programme Area for meetings of the Joint Coordinating Board, the Standing Committee and the Scientific and Technical Advisory Committee. The amounts proposed are based upon past experience and provide for one annual meeting each of the JCB and STAC, and for meetings of the Standing Committee, normally three times a year.

The provision for Scientific and Technical Review Committees (STRCs) includes the cost of site visits. The amount proposed is at the same level as that of the 1986-1987 Revised Budget. Under guidelines established by STAC, expenditures for STRCs should be limited to about US\$ 30 000 for each review. As noted in Part 3 above, the costs of editing, translating and printing the biennial TDR Programme Report have been transferred (from Area IV) to Programme Area I, in recognition of the fact that the Programme Report is a formal report to the JCB and constitutes a summary of progress made throughout the Programme.

The provision for fundraising activities covers primarily activities such as visits to present and potential contributors, and special publications intended primarily for general publicity and fundraising.

Since the External Review Committee will complete its task by the end of 1987, only a minor provision to cover costs of issuing its report is made for the financial period 1988-1989.

TABLE 4.1 PROGRAMME AREA I: TECHNICAL AND ADMINISTRATIVE BODIES (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Joint Coordinating Board (JCB)	116.0	120.0	140.0	20.0
Standing Committee	25.0	35.0	30.0	(5.0)
Scientific and Technical Advisory Committee	189.0	140.0	160.0	20.0
Scientific and Technical Review Committees	179.0	100.0	100.0	-
Programme Report	-	-	150.0	150.0
Fundraising Activities	79.0	40.0	50.0	10.0
External Review Committee	225.0	225.0	15.0	(210.0)
TOTAL	813.0	660.0	645.0	(15.0)

5. PROGRAMME AREA II: RESEARCH AND DEVELOPMENT5.1 GENERAL ACTIVITIES

Budgetary provisions under general activities cover those research and development activities and staff which are not assigned to a particular disease or trans-disease Component.

The principal budgetary change for general activities is a provision of US\$ 1 million for a "Programme Development Fund" (Table 5.1.2). This new budget item is proposed in order to provide the degree of flexibility needed for TDR to respond to changing requirements and new scientific and technical opportunities which may arise after the budget has been approved. The funds under this budget item would be allocated to specific Components on the recommendation of STAC.

The new fund would complement the existing Director's Initiative Fund (DIF), which was established to provide a mechanism for responding rapidly to promising research leads. Grants made under the DIF do not normally exceed US \$15 000 and are not renewable. Should additional funds be required for follow-up of the initial research, the request is channelled to the relevant SWG in the normal fashion. While the DIF continues to perform a valuable function, a greater measure of flexibility is needed within the budget for operations. The flexibility of a Programme Development Fund would permit the Programme to respond to larger funding requirements than possible through the DIF, while remaining within established procedures for project review and approval.

In summary, key features of the two funds are as follows:

<u>Director's Initiative Fund</u>	<u>Programme Development Fund</u>
• Intended for start-up or "venture" activities	• Intended for ongoing or newly established priorities
• Allocation and project decision by Director, TDR	• Allocation on recommendation of STAC
• Funding separate from Component budgets	• Project decisions recommended by Component Steering Committees
• Normal maximum of US\$ 15 000 per project	• Funding to increase Component budgets
• Support from DIF not renewable.	• No limit
	• Project support may be renewed.

The introduction of operational support allocations for individual Components in Programme Area II will result in a substantial decrease in allocation for operational support under general activities. Although operational support costs are budgeted under each Component, an amount of US\$ 400 000 is budgeted here (Table 5.1.2) for costs of meetings, consultations, duty travel and consultants not provided for under individual Components.

The number of research and development projects supported by TDR and their total value by Component, from the Programme's inception in 1975 to 31 December 1986, is shown in Table 5.1.1:

TABLE 5.1.1 RESEARCH AND DEVELOPMENT PROJECTS, 1975-1986

	NUMBER OF PROJECTS	FUNDING (US\$000)
Director's Initiative Fund	154	1 554
Chemotherapy of Malaria	176	13 109
Immunology of Malaria	134	11 922
Applied Field Research in Malaria	123	5 928
Schistosomiasis	187	10 974
Filariasis	175	13 517
African Trypanosomiasis	160	12 647
Chagas' Disease	157	5 801
Leishmaniases	187	5 631
Immunology of Leprosy	128	8 840
Chemotherapy of Leprosy	113	5 119
Biomedical Sciences	50	3 800
Biological Control of Vectors	167	4 318
Epidemiology	54	5 731
Social and Economic Research	99	3 715
TOTAL	2 064	112 606 000

TABLE 5.1.2 GENERAL ACTIVITIES (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Director's Initiative Fund	525.0	525.0	525.0	-
Programme Development Fund	-	-	1 000.0	1 000.0
Personnel Services	302.2	302.2	203.0	(99.2)
Temporary Assistance	-	-	50.0	50.0
Operational Support	1 700.0	1 200.0	400.0	(800.0)
Publications	115.9	100.0	200.0	100.0
Shipping and Insurance Adjustments	19.5	19.5	20.0	0.5
TOTAL	2 662.6	2 146.7	2 398.0	251.3

5.2 CHEMOTHERAPY OF MALARIA

Objectives

The major objectives of the Chemotherapy of Malaria Component are to develop new drugs for the treatment and prophylaxis of malaria, to achieve better use of available drugs and to foster basic research aimed at the rational identification of new compounds with antimalarial potential.

Current Activities

TDR supports laboratory and clinical research on a number of anti-malarial drugs, both standard and new antimalarial compounds. Mefloquine, the blood schizonticide which has been made available largely through the efforts of the Special Programme, continues to be the subject of research, particularly the optimization of prophylactic and treatment dose regimens. Its use in special groups, especially in the treatment and prophylaxis of chloroquine-resistant malaria in pregnant women and small children, remains a research priority. Preclinical and clinical studies aim at the identification of possible adverse interactions with other commonly used medications.

Research is under way on the pharmacokinetics of existing drugs in order to provide information for the optimization of dosage schedules. In vitro and in vivo studies to identify effective synergistic drug combinations with therapeutic and/or prophylactic potential are continuing. Industrial concerns are being encouraged to give priority to the development of promising compounds, such as the naphthoquinones and triazines, and "neglected" compounds with apparent antimalarial activity (such as amopyroquine, piperaquine and pyronaridine) will be reviewed.

The Component is expanding its system of in vivo (rodent malaria model) and in vitro screens for blood schizontocidal, gametocytocidal and tissue schizontocidal activity, focusing on lead-directed selection of candidate compounds.

Drug assay methods are being improved and simplified to make the assessment of blood and urine levels of antimalarials possible under field laboratory conditions, in order to gain a better understanding of optimum dosage regimens, treatment and prophylaxis failures, and factors influencing drug compliance.

Planned Activities, 1988-1989

A concentrated effort will be made to develop promising new blood schizontocides to the stage of clinical trial as quickly as possible. Preclinical evaluation of arteether, the ethyl ether derivative of the Chinese plant preparation qinghaosu, will be expeditiously carried forward, and information will be assembled for the submission of an IND (investigational new drug application) to appropriate drug regulatory agencies. This class of drugs shows important potential for the parenteral treatment of severe malaria both in hospitals and for initial treatment at the primary health care level. If the preclinical work progresses as expected and funding is available, Phase I and II clinical trials will be initiated within the biennium. Halofantrine, a phenanthrene methanol shown to be active against chloroquine-resistant Plasmodium falciparum, is being tested in hospitalized patients with naturally acquired infections, and the optimum formulation and dosage regimen will be determined.

A DNA diagnostic probe for P. falciparum infection is being developed to provide a rapid test for species-specific detection of malaria parasites in

blood, which could replace microscopic examination. This work will be expanded to include the production of a probe for chloroquine-resistant falciparum parasites and a probe for P. vivax.

Basic research in parasitology will continue to be supported with the aim of fostering the rational development of new antimalarial compounds. Parasite metabolic pathways will be studied further and genes encoding relevant enzymes will be cloned. More research will be directed towards understanding biological mechanisms of drug action and resistance. In vitro and in vivo human malaria parasite models will be developed further for biological and drug-resistance research. The mechanisms of parasite entry into host cells will be studied, as well as parasite genetic factors influencing virulence and transmission of resistance.

TABLE 5.2 CHEMOTHERAPY OF MALARIA (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	3 800.0	3 580.0	4 000.0	420.0
Personnel Services	356.0	440.0	484.0	44.0
Operational Support	150.0*	120.0*	250.0	130.0
TOTAL	4 306.0	4 140.0	4 734.0	594.0

* Cost of meetings only

5.3 IMMUNOLOGY OF MALARIA

Objectives

The major objective of the Immunology of Malaria Component is the development of malaria vaccines. A second objective is the improvement of diagnostic tests for malaria. The Component also includes studies of the mechanisms involved in protective immunity and in the immunopathology of malaria, with the aim of ensuring that antigens used in vaccines stimulate protection and not other undesirable responses. TDR is also increasingly involved in the coordination of malaria vaccine research and development.

Current Activities

The malaria vaccine programme pursues the development of vaccines based on pure parasite antigens that specifically stimulate protective immune responses. Several stages of the parasite life cycle are potential vaccine targets: the sporozoite, the asexual blood stages and the sexual stages and related forms that develop in the mosquito vector. The strategy for vaccine development comprises the identification and characterization of protective antigens, isolation of the corresponding genes and their expression in bacteria, analysis of the amino acid sequence of the encoded molecules and production of the antigenic molecules (or parts of them) by genetic engineering methods or chemical synthesis. Research on sporozoite vaccines has reached the stage of Phase I clinical trials in human volunteers of vaccines based on part of the surface molecule covering P. falciparum sporozoites. Anti-P. vivax sporozoite vaccines are also being developed. Several candidate vaccine antigens from P. falciparum asexual blood stages have been identified and the genes encoding most of these have been cloned; vaccine experiments in nonhuman primates are being carried out. Antigens on sexual and related parasite stages that are recognized by transmission-blocking antibodies have been identified and gene cloning studies are in progress. TDR supports research on all three types of vaccine.

Improved diagnostic methods will be required for vaccine evaluation. Cloned gene products and monoclonal antibodies are now being applied in malaria serology for the measurement of antibody levels and for the detection of sporozoite infection in mosquitos. Assays of cell-mediated immunity are being evaluated.

Planned Activities, 1988-1989

TDR will continue both to fund vaccine research and to coordinate the development of candidate vaccines, focusing particularly on:

- laboratory-based research on malaria vaccines against sporozoites and asexual blood-stage and sexual-stage parasites;
- the significance of liver-stage parasites in immunity and their potential as vaccine targets;
- further analysis of immune responses and immunopathological complications of malaria infections and following malaria vaccination;
- better tests for detecting infection and measuring immune responses, which could be used to assess vaccine efficacy, particularly during field trials, as well as in other epidemiological studies of malaria;

- the preparation of guidelines for vaccine trials to assist health authorities and scientists in endemic countries where vaccine trials may be carried out.

The Programme will continue to foster closer links between laboratories, industry and funding agencies involved in vaccine research in order to ensure that available resources are used efficiently, that vaccines are tested according to protocols that will yield clear-cut and comparable results and that the interests of population groups participating in field trials in endemic areas are protected.

Additional resources may be required within the biennium for work on transmission-blocking vaccines, for which TDR is a major source of funds, and for additional activities, including the use of vaccinia for malaria vaccine production, adjuvants and delivery systems for malaria vaccines, and the exploration of other candidate vaccine antigens. In the event that field trials of malaria vaccines begin within the biennium, further funding will be required, particularly if transmission-blocking vaccines become available for clinical testing.

TABLE 5.3 IMMUNOLOGY OF MALARIA (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	4 000.0	3 550.0	4 000.0	450.0
Personnel Services	230.6	280.0	287.0	7.0
Operational Support	150.0*	120.0*	200.0	80.0
TOTAL	4 380.6	3 950.0	4 487.0	537.0

* Cost of meetings only

5.4 APPLIED FIELD RESEARCH IN MALARIA

Objectives

The general objective of the Component on Applied Field Research in Malaria is to improve malaria control through a thorough analysis of the existing situation and through the planning, application and evaluation of appropriate control measures. The Component's specific role is to develop and test methods applicable to all steps of this process, to validate and test in the field new tools for the control of malaria and to transfer the resulting techniques to areas where they are needed.

Current Activities

Activities focus on study of the spread of P. falciparum drug resistance, characterization of malaria vectors and study of vector roles in the epidemiology of malaria. Different approaches to malaria control, especially the prevention of human-vector contact and the use of drugs, are evaluated with the participation of local communities. Epidemiological studies needed either for developing various control strategies or for future vaccine trials are planned and carried out.

Planned Activities, 1988-1989

The activities currently in progress will continue, with added emphasis on the following:

- epidemiological studies to investigate the mechanisms of the development of drug resistance, and trials to contain resistance;
- field application of new diagnostic methods, such as DNA probes and immunodiagnostic tests;
- evaluation in the field of new drugs and drug regimens, with particular attention to the protection of vulnerable groups such as pregnant women;
- the use of defined antigens and monoclonal antibodies as serological reagents in epidemiological studies;
- further development and evaluation of new methods for the identification of vectors and their infective malaria parasites;
- evaluation of new or modified vector control measures (biological control agents, selective use of insecticides/repellents);
- the effect of environmental modifications on malaria and malaria vectors;
- preparatory studies for future P. falciparum and P. vivax vaccine trials.

In addition, several new leads and opportunities may arise. If vaccine studies make rapid progress, field trials may begin during the biennium. There are indications that certain vectors impose intrinsic limitations on the sporogonic development of plasmodia and it is possible that refractoriness could be artificially induced through various genetic methods. Trials of vector population replacement would then be possible. Substances which act as specific attractants for particular vector species have been detected in parts of their bodies. If these could be synthesized, their use in vector control could be attempted.

TABLE 5.4 APPLIED FIELD RESEARCH IN MALARIA (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	1 420.0	1 290.0	1 450.0	160.0
Personnel Services	230.6	280.0	287.0	7.0
Operational Support	150.0*	120.0*	150.0	30.0
TOTAL	1 800.6	1 690.0	1 887.0	197.0

* Cost of meetings only

5.5 SCHISTOSOMIASIS

Objectives

The Schistosomiasis Component supports research on schistosomiasis by identifying and strengthening neglected areas of research. Epidemiological studies and measures for controlling the snail intermediate host remain central issues. The Component's objectives include the development of safe and reliable antischistosomal drugs, simple diagnostic methods applicable in the field and preventive measures, such as better sanitation and health education. The development of a schistosomiasis vaccine capable of providing long-term protection is now given high priority.

Current Activities

Field research on improved control strategies is being emphasized, but progress has been slow since these projects are generally expensive and require teams of experienced researchers willing to spend much time in the field. Currently, control strategies are being investigated in Côte d'Ivoire and in Burundi with the long-term purpose of providing baseline data which could assist in the creation of national plans of action. Other projects on the integration of experimental and field results are being carried out in natural foci of schistosomiasis transmission. Studies of larval development and vector-parasite relationships, chemical characterization and testing of plant molluscicides are also being investigated.

Current studies on chemotherapy concentrate on elucidating the mode of action at the molecular level of a number of antischistosomal compounds, including praziquantel and oxamniquine. To identify leads for alternative drugs, attention is also focused on the adult schistosome membrane and metabolic transport of ions and molecules across this membrane.

New quantitative diagnostic methods are being encouraged, particularly serological techniques which can be applied in field-based laboratories. Work towards a prototype vaccine has been stepped up and the number of candidate antigens being identified is increasing. Several protein epitopes have been identified, cloned and expressed in bacteria and viruses. The number of available genetic libraries continues to increase at a quick pace, as does production of monoclonal antibodies with new antischistosomal specificities.

Planned Activities, 1988-1989

Applied field research remains the highest priority of the Component. Work on the mode of action of schistosomicidal compounds will continue to be encouraged and research on the identification of snail inhibitory compounds will be emphasized, including the role of ecdysteroids in miracidial-snail interactions. High priority is also given to basic and applied research on a vaccine against schistosomiasis. The work towards production of monoclonal antibodies and identification of candidate vaccine antigens, using molecular biology techniques, will go hand in hand with the design of new diagnostic test systems geared to the detection of circulating or excreted antigens. Field trials of serological assays will be stimulated, and a collaborative serological study involving a number of Chinese institutions engaged in the evaluation of schistosome infection is being planned. Control of schistosome egg production by biochemical and/or immunological means will be emphasized and research on granuloma formation will be encouraged. More work on species other than Schistosoma mansoni will be promoted and the service supplying antigens for research will be extended to include materials made from S. haematobium.

Planned activities also include the establishment of a schistosomiasis vaccine committee, whose main purpose will be to coordinate human vaccine trials envisaged for the early 1990s, as well as to facilitate primate research and cooperation with industry.

TABLE 5.5 SCHISTOSOMIASIS (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL. 3-COL. 2
Operations	1 900.0	1 790.0	1 950.0	160.0
Personnel Services	230.6	280.0	287.0	7.0
Operational Support	150.0*	100.0*	150.0	50.0
TOTAL	2 280.6	2 170.0	2 387.0	217.0

* Cost of meetings only

5.6 FILARIASIS

Objectives

The objectives of the Filariasis Component are to obtain and develop better drugs and drug regimens, to develop better immunodiagnostic tests and possible vaccines, to reduce inflammatory reactions to dead worms, and to improve epidemiological methods, including those for vector control.

Current Activities

Dosage schedules of diethyl carbamazine (DEC) are being further tested to improve its use in lymphatic filariasis, including its possible use as a chemoprophylactic agent. Community-based trials of ivermectin, which has proved to be a safe, effective, single-dose microfilaricide for onchocerciasis, are being started in order to monitor adverse effects and safety under large-scale administration and to determine its effects on morbidity in the eye and skin and on transmission.

Two macrofilaricides from industry (Ciba-Geigy S.A.) are now being tested in humans: one compound for onchocerciasis is in Phase II studies (conducted by the Onchocerciasis Chemotherapy Project [OCT]) and another, which has undergone Phase I trials for lymphatic filariasis, will soon undergo Phase II trials. Several promising compounds identified in animal screens are now being tested in tertiary screens for onchocerciasis (Onchocerca gibsoni/cattle screen [OCT]) and for lymphatic filariasis (Brugia or Wuchereria/leaf monkey screen).

The search for better antigens and diagnostic tests has continued, taking advantage of hybridoma and recombinant DNA technology, with emphasis on detection of prepatent and active infection by demonstration of circulating antigen in body fluids and through the use of simple test systems, like enzyme-linked immunosorbent assays (ELISA), that can be carried out in the field. New technology is also being used to identify and differentiate different forms of the parasites in vectors.

More research has been done on the Mazzotti reaction in onchocerciasis and on the immunopathology of lymphatic filariasis.

Both laboratory and field studies of vectors of onchocerciasis and lymphatic filariasis have continued to provide useful information.

Planned Activities, 1988-1989

The search for a single-dose, nontoxic macrofilaricide (especially for onchocerciasis), in collaboration with the OCT, will continue through biochemical studies, screening and synthesis. Further development of the three new drugs currently in clinical trials -- ivermectin and the two Ciba-Geigy compounds -- will continue, and community-based trials of ivermectin for the treatment of onchocerciasis will be carried out both within and outside countries covered by the Onchocerciasis Control Programme in West Africa (OCP).

With regard to immunology, priority will be given to the continued search for a sensitive, specific immunodiagnostic test for prepatent, occult and current infection, with emphasis on detection of nonimmunogenic (and therefore nonimmunocomplexed) circulating parasite products.

Greater support will be given to research on protective immunity and on the feasibility of vaccine development, using the recently established DNA libraries of different parasite life-cycle stages to obtain key filarial antigens in sufficient quantities for vaccine research. Studies on pathogenesis will continue, using the newly developed animal models.

Methods of identifying parasites in vectors and of differentiating between different forms of parasites and vector complexes will be further developed with a view to improving vector control. Field testing of promising biological control agents such as Bacillus sphaericus will be initiated.

Further epidemiological studies will be undertaken, especially on risk factors for infection and disease.

TABLE 5.6 FILARIASIS (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	2 850.0	2 850.0	3 300.0	450.0
Personnel Services	230.6	280.0	287.0	7.0
Operational Support	150.0*	130.0*	200.0	70.0
TOTAL	3 230.6	3 260.0	3 787.0	527.0

* Cost of meetings only

5.7 AFRICAN TRYPANOSOMIASES

Objectives

The objectives of the African Trypanosomiasis Component are to obtain a better understanding of the epidemiology of the African trypanosomiasis as a basis for improved disease control, to develop new and effective drugs and to improve the use of existing drugs, and to better knowledge of the diseases' immunology and pathology to improve clinical management.

Current Activities

The existence of animal reservoir hosts of Trypanosoma brucei gambiense and the significance of their role in the epidemiology of the disease are being studied. Long-term multidisciplinary studies on the epidemiology of T.b. rhodesiense infection in Zambia are continuing.

Vector-parasite relationships, concerning aspects such as differences in the transmission rate of T.b. gambiense by Glossina, are being studied. The participation of rural communities in tsetse control through the use of traps and screens is being evaluated in West and Central Africa.

Preliminary trials of DFMO in 129 patients with gambiense infection, most of whom had not responded to treatment with melarsoprol, showed the drug to be remarkably effective, curing 116 of the subjects. Results from a limited number of patients with rhodesiense infection have indicated that DFMO may not be as effective as in gambiense disease. Double-blind trials involving reduced dosages of melarsoprol are in progress.

Nine glycolytic enzymes have been isolated in pure form from the trypanosome and four have been crystallized and are being studied as potential targets for chemotherapeutic attack.

An ELISA-based test system has been developed for estimating melarsoprol concentration in body fluids.

Planned Activities, 1988-1989

Clinical trials of DFMO will continue to be a priority. Additional centres in endemic countries will be strengthened to enable them to participate in these trials. The efficacy of drug combinations with DFMO for the treatment of rhodesiense infection will be assessed. The evaluation in mice of MFMO, a potent analogue of DFMO, will continue. Triacetylbenzene tris(guanylhydrazone) (TCB) will be tested in primate models. Screening of compounds for trypanocidal activity will continue, and research on the development of suitable in vitro systems to replace in vivo assays in primary screening will be pursued.

Studies to delineate the scope of trypanosome antigenic variation and to identify predominant antigenic types that could provide the basis for developing more sensitive diagnostic tests will continue. Studies on parasite antigen detection methods for the diagnosis of active infection and on the pathogenesis of African trypanosomiasis will also continue.

Large-scale evaluation of tsetse traps and screens and community participation in sleeping sickness control will be undertaken, and pilot studies are envisaged to identify appropriate land resource management strategies in cases where they could be integrated into sleeping sickness control.

TABLE 5.7 AFRICAN TRYPANOSOMIASIS (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	2 550.0	2 390.0	2 500.0	110.0
Personnel Services	230.6	320.0	287.0	(33.0)
Operational Support	150.0*	110.0*	150.0	40.0
TOTAL	2 930.6	2 820.0	2 937.0	117.0

* Cost of meetings only

5.8 CHAGAS' DISEASE

Objectives

The objectives of the Chagas' Disease Component include the development and evaluation of vector control methods, research towards improved knowledge of parasite molecular biology with a view to possible vaccine development, and better understanding of the immunopathogenesis of chronic lesions to improve treatment.

Current Activities

Two new methods for controlling the vector, the triatomine bug, have been field tested in collaboration with the Chagas' disease control programmes in Brazil and Argentina. Paints containing insecticides have been tested in 4800 rural houses in Posse, State of Goias, Brazil, and an insecticide fumigant canister has also been used in Santiago del Estero, Argentina. Initial evaluation of effectiveness of the two methods is very encouraging and both are very well accepted by the community. The fumigant canister is already being produced commercially, and talks have started between the university laboratory that developed the paints and local interested companies.

An important advance towards the development of a vaccine was accomplished with the cloning of the gene encoding a major T. cruzi surface antigen involved in parasite penetration of the host cell. The antigen contains repetitive sequences of amino acids, which are now being produced by chemical synthesis for initial evaluation as serodiagnostic reagents.

Research on better compounds to sterilize blood for transfusion has continued and candidate compounds are being tested against different parasite strains.

Planned Activities, 1988-1989

The newly developed vector control methods will be field tested in other Latin American endemic countries in close collaboration with national disease control programmes.

Seroepidemiological evaluation of the synthetic peptides based on the repetitive sequences of the T. cruzi surface antigen will be started. Basic research on the molecular biology of the parasite aimed at vaccine development and the identification of molecules for chemotherapeutic attack will continue. Analytical epidemiological studies leading to a better understanding of possible associations between distinct T. cruzi strains and different clinical manifestations of the disease will be initiated. A continental network of collaborating laboratories for standardized production and characterization of T. cruzi strains will be set up. Evaluation of improved diagnostic tests based on parasite or antigen detection, using monoclonal antibodies and DNA probes, will be undertaken.

TABLE 5.8 CHAGAS' DISEASE (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	1 320.0	1 320.0	1 700.0	380.0
Personnel Services	230.6	240.0	287.0	47.0
Operational Support	150.0*	110.0*	150.0	40.0
TOTAL	1 700.6	1 670.0	2 137.0	467.0

* Cost of meetings only

5.9 THE LEISHMANIASES

Objectives

The main objectives of the Leishmaniasis Component are the development of: vaccines against different forms of the disease; simple, sensitive and inexpensive diagnostic tests adapted for use under field conditions; nontoxic and effective drugs; and tools for the control of reservoir hosts and vectors in different geographic areas.

Current activities

Several simple serological tests have been developed for the measurement of antileishmanial antibodies and are now being compared and adapted for field application. These include a rapid dot ELISA, a simple precipitation test and a direct agglutination test. The latter has given encouraging results in limited field trials.

A new antileishmanial drug, allopurinol riboside, has shown promise in a preliminary clinical trial against human cutaneous leishmaniasis and a multi-centre trial is being planned.

Nonhuman primate models, which are essential for preclinical studies of vaccines and new drugs, are being developed at various centres for different forms of leishmaniasis.

Immunological studies in patients with different clinical manifestations are under way.

Parasite antigenic analysis is continuing. Some glycolipid and glycoprotein molecules that can induce protective immune responses in a highly sensitive mouse strain have been identified.

Planned Activities, 1988-1989

Vaccine development will be pursued with two main approaches: the use of whole killed Leishmania and the identification and production of individual parasite antigens that stimulate protective immune responses. Clinical trials of a vaccine against cutaneous leishmaniasis will be initiated and coordinated in the biennium. This vaccine is based on whole killed parasites and has shown some promise in tests in Brazil.

Selected fractions (glycolipids, glycoproteins) shown to be protective in animal models will be evaluated for potential use in vaccines. Selected genes will be cloned and expressed in bacterial or viral vectors with the aim of producing vaccine antigens by recombinant DNA technology.

Field tests of new diagnostic tests will continue.

Selected drugs already in use for other diseases and shown to have antileishmanial activity in vitro and in animal models will be tested in humans. A multicentre trial of allopurinol riboside alone and in combination with antimonial compounds will be started. A full-scale clinical trial of an ointment shown in preliminary studies to be effective against cutaneous leishmaniasis will be started.

The new nonhuman primate models of leishmaniasis will be used for vaccine studies and drug development.

A standard "leishmanin" preparation for use in skin testing for epidemiological studies and as an aid to diagnosis in individual patients will be produced in an endemic country. This should start in 1987.

Field research on the transmission cycle and ecology of the leishmaniases will be continued in selected areas, in preparation for assessing new control methods as they become available. It has been shown that some bacterial and viral infections can inhibit the development of Leishmania infection in the sandfly vector. The potential use of these agents for biological control of vectors in certain areas will be studied.

TABLE 5.9 LEISHMANIASES (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	1 500.0	1 500.0	1 850.0	350.0
Personnel Services	230.6	290.0	287.0	(3.0)
Operational Support	150.0*	125.0*	150.0	25.0
TOTAL	1 880.6	1 915.0	2 287.0	372.0

* Cost of meetings only

5.10 IMMUNOLOGY OF LEPROSY

Objectives

The major objectives of the Immunology of Leprosy Component are the development of vaccines against leprosy and ways of using them effectively in the control of the disease, the development of improved immunodiagnostic tests and a better understanding of the pathology of the disease in order to deal more effectively with the tissue damage and deformity associated with leprosy.

Current Activities

Two large-scale immunoprophylaxis vaccine trials are under way in Venezuela and Malawi and involve a total of about 180 000 study subjects. The main purpose of these trials is to assess whether a vaccine combination of BCG plus killed Mycobacterium leprae will give greater antileprosy protection than BCG alone.

The armadillo colonies which supply M. leprae for the vaccine are being maintained.

The entire M. leprae genome has been cloned and expressed in Escherichia coli, and a leprosy recombinant DNA bank set up, together with a relevant computer database. Monoclonal antibodies to M. leprae-specific antigens have been used to isolate the genes of five highly antigenic M. leprae proteins. Cloned M. leprae-specific T cells isolated from volunteers vaccinated with M. leprae were shown to recognize an M. leprae protein expressed in E. coli. Several serological studies, based on M. leprae-specific phenolic glycolipid, were carried out, both separately and in conjunction with vaccine trials.

Planned Activities, 1988-1989

The leprosy vaccine trials in Venezuela and Malawi will be continued and a third major trial, possibly in India, will be initiated. Evaluation of serological tests based on phenolic glycolipid and monoclonal antibodies will continue.

Research will also continue on DNA sequencing of M. leprae gene fragments, characterization of the complete genes and their expression in microbial vectors. The M. leprae genes encoding antigens involved in protective immunity will be cloned, and development of a second generation of leprosy vaccines based on recombinant DNA technology will be initiated. The use of genetically engineered BCG as a vehicle for genes encoding protective antigens of M. leprae will be explored.

Specific immunodiagnostic tests based on synthetic peptides will be developed.

TABLE 5.10 IMMUNOLOGY OF LEPROSY (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	3 300.0	2 760.0	2 900.0	140.0
Personnel Services	-	60.0	287.0	227.0
Operational Support	150.0*	120.0*	150.0	30.0
TOTAL	3 450.0	2 940.0	3 337.0	397.0

* Cost of meetings only

5.11 CHEMOTHERAPY OF LEPROSY

Objectives

The major objectives of the Chemotherapy of Leprosy Component are the promotion of research leading to improved use of existing drugs, the development of new drugs and new approaches for monitoring chemotherapy and the development of immunotherapy of leprosy.

Current Activities

Two controlled clinical trials of combined chemotherapy in untreated lepromatous leprosy have just been completed in India and Mali. After three months of treatment with five regimens, results have demonstrated a rapid killing of M. leprae. Two large-scale field trials of combined therapy in multibacillary leprosy are under way in India. Two other field trials of combined therapy in paucibacillary leprosy are being conducted in Indonesia and Malawi. Short-term clinical trials of rifampicin and intermittent clofazimine are under way in Mali. A field trial of a prolonged-release dapsons formulation is being conducted in Nigeria.

A variety of analogues of different compounds are being tested in the mouse footpad model for their activity against M. leprae. The bactericidal activity of fluorinated quinolone derivatives, such as pefloxacin and ofloxacin, has been demonstrated. These drugs have now entered clinical trials in Côte d'Ivoire.

Recombinant DNA technology is being used to clone M. leprae genes coding for enzymes that are potential targets for the development of new anti-leprosy drugs.

The prevalence of dapsons-resistant leprosy has been well documented through formal surveys in endemic countries worldwide. A formal survey of secondary, as well as primary, rifampicin-resistant leprosy is being conducted in Cuba.

Several in vitro tests for rapid drug screening are being compared in a blind evaluation.

Pilot trials to determine the ability of the heat-killed M. leprae plus BCG vaccine to induce skin-test conversion, and to determine patient acceptability, are being conducted in smear-negative lepromatous patients in China, France and the Philippines.

M. leprae-specific antigen assays are being developed for early diagnosis of bacteriological relapse in patients discontinuing chemotherapy.

Planned Activities, 1988-1989

Studies on the efficacy, acceptability and operational feasibility of combined therapy regimens of shorter duration than those currently being used will be conducted in patients with multibacillary leprosy.

Development of new drugs will proceed through synthesis and screening activities based on leads from research on other diseases and "molecular modelling". Validation and improvement of the rapidity, sensitivity and specificity of in vitro drug screening systems will be carried out.

The impact of combined therapy on leprosy transmission will be evaluated. New approaches, including inoculation of nude mice that lack T lymphocytes and

cannot mount cell-mediated immune responses, and development of specific antigen assays for monitoring chemotherapy, will be undertaken.

Research will be carried out on the development of effective, nonsteroidal, nonteratogenic drugs to prevent and control leprosy reactions and nerve damage.

TABLE 5.11 CHEMOTHERAPY OF LEPROSY (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	1 600.0	1 340.0	1 450.0	110.0
Personnel Services	230.6	240.0	287.0	47.0
Operational Support	150.0*	120.0*	150.0	30.0
TOTAL	1 980.6	1 700.0	1 887.0	187.0

* Cost of meetings only

5.12. BIOLOGICAL CONTROL OF VECTORS

Objectives

The main objective of the Component on Biological Control of Vectors is the identification and development of natural biological regulators of vectors, such as pathogens and parasites, toxin-producing organisms, and vertebrate and invertebrate predators suitable for control of vectors of diseases of concern to the Special Programme.

Current Activities

Several products of research on biological agents with vector control potential may now be used in disease control programmes: Bacillus thuringiensis H-14, B. sphaericus and different species of fish. Testing of the commercial samples of B. sphaericus has shown good results against Culex and some Anopheles and Mansonia species; they are capable of recycling, even in heavily polluted water, and of providing effective mosquito control for up to ten weeks, under certain conditions.

Studies on toxin production, genetic coding and mode of toxic action confirmed the possibility of producing more potent larvicidal bacterial agents by genetic engineering methods. Efforts have been made to promote local production of B. thuringiensis H-14, to develop long-acting formulations, and to identify natural habitats suitable for application against mosquito vectors in several countries.

Planned Activities, 1988-1989

The identification and evaluation of biological agents potentially pathogenic to vectors will continue, focusing on promising new agents, especially those indigenous to tropical environments.

A number of biological agents are being accorded high priority for future development, particularly asporogenic Bacillus mutants, indigenous larvivorous fish, nematodes and long-acting formulations of B. thuringiensis H-14, B. sphaericus and Lagenidium giganteum.

The use of new technology, such as genetic engineering techniques for modifying toxins and ensuring their production in new hosts, will be encouraged, and methods will be explored for developing formulations of biological control agents adapted specifically for safe use in tropical developing countries.

Field trials of new agents will be conducted in different parts of the world in an attempt to study as many vector species in as wide a range of environmental conditions as possible.

Innovative methods of vector control, such as the restriction of a vector's disease-transmitting capacity and biological control of adult vectors, will be investigated.

Biological control agents included in integrated disease control programmes will be evaluated from an epidemiological standpoint in collaborative research involving disease-specific TDR components.

TABLE 5.12 BIOLOGICAL CONTROL OF VECTORS (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	1 600.0	1 340.0	1 550.0	210.0
Personnel Services	461.2	550.0	574.0	24.0
Operational Support	150.0*	115.0*	150.0	35.0
TOTAL	2 211.2	2 005.0	2 274.0	269.0

* Cost of meetings only

5.13 EPIDEMIOLOGYObjectives

The objectives of the Epidemiology Component are to support epidemiological research aimed at improved strategies for tropical disease control, to develop and disseminate epidemiological methods appropriate for the study of tropical diseases, and to stimulate and provide resources for epidemiological training for personnel who will implement control programmes and conduct research to improve control strategies. The Epidemiological Component works in close collaboration with disease-specific Components. For this reason, the summary of activities highlights epidemiological advances of the Programme as a whole.

Current Activities

The most important areas of epidemiological activities for the biennium include the field testing of new diagnostic tools. Examples are synthetic peptides corresponding to part of the major surface antigen of the P. falciparum sporozoite, which have been used to study the epidemiological pattern of P. falciparum ant sporozoite antibodies, and a new simple direct agglutination test for kala azar. This test, which can be performed in the field, was found to be highly sensitive and specific in studies in India and Kenya.

Field tests have been conducted of new methods for surveillance, including an approach for monitoring infant and child deaths due to malaria in Ghana using a combination of routinely available data, and a simplified diagnostic screening method that has made possible early case finding and treatment of rhodesiense trypanosomiasis in Zambia, leading to a dramatic decline in cases.

Advances in epidemiological knowledge have accrued from the use of case-control studies. For example, this approach was useful in examining why clinical symptoms of Chagas' disease differ so in different regions of Latin America. It was also used in a study of risk factors for rhodesiense infection in Zambia, which revealed no evidence of naturally acquired immunity to sleeping sickness.

Descriptive and ecological studies of leishmaniasis vectors, reservoirs, hosts and parasites showed diverse epidemiological patterns in different geographic areas.

Clinical and community trials of new control tools are assuming an increasingly important place within the Programme. The Epidemiology Component participated in the development of guidelines for epidemiological evaluation of anti-P. falciparum sporozoite vaccines. Trials of community-based mass treatment schedules of DEC have shown that a single annual dose is a more cost-effective approach for controlling bancroftian filariasis in Samoa than is the traditional approach.

Epidemiological research training continued to receive high priority. Support was given to postgraduate training courses at several institutions in endemic countries. In coordination with the Research Strengthening Group, a number of individual grants were given for more advanced training; workshops were held on epidemiological research methods; and coordination was maintained with other groups for the promotion of epidemiological research training in developing countries. Despite these efforts, a gap still remains between the Programme's need for an increasing number of epidemiological field studies of new disease control tools and the supply of epidemiological expertise needed

to conduct such research. Hence there will be an increased emphasis on epidemiological research development as indicated below.

Planned Activities, 1988-1989

The main task of the Epidemiology Component will be to strengthen epidemiological research in tropical disease-endemic countries by:

- maintaining a regular overview of epidemiological research throughout the Programme;
- participating in the development and assessment of epidemiological research plans of other SWGs;
- participating in the development of methods and specific protocols for epidemiological studies;
- participating in the development and implementation of community-based studies;
- securing additional epidemiological input into research capability strengthening.

In addition, the secretariat of the Epidemiology Component will participate in the overall promotion, development and monitoring of research capability strengthening activities.

The Proposed Budget changes reflect a shift of funding for epidemiological research projects from the operations budget of the Epidemiology Component to the operations budgets of the disease-specific Components. The personnel services and operational support for this Component are being transferred from Programme Area II to Programme Area III to reflect the closer working relationship of the Epidemiology Component with Programme Area III to meet the special need for strengthening epidemiological field activities.

TABLE 5.13 EPIDEMIOLOGY (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	1 350.0	1 180.0	800.0	(380.0)
Personnel Services	403.2	400.0	*	(400.0)
Operational Support	150.0	110.0	*	(110.0)
TOTAL	1 903.3	1 690.0	800.0	(890.0)

* 1988-1989: See Table 6.2, Programme Area III: Research Capability Strengthening.

5.14 SOCIAL AND ECONOMIC RESEARCHObjectives

The overall objective of the Social and Economic Research Component is to increase the effectiveness of disease control programmes by integrating human behavioural factors (social, cultural and economic) in programme conception, design and management. The intermediate objectives are to determine the impact of social, cultural, demographic and economic conditions on tropical disease transmission and control and to promote the design and use of cost-effective, acceptable disease control measures and policies. To meet these objectives, TDR supports research directly relevant to disease control and encourages new approaches to the research itself. Projects are carried out by social scientists and disease control programme personnel based in institutions in tropical countries.

Current Activities

Projects in this Component analyse factors such as human behaviour, attitudes and beliefs in relation both to disease transmission and to broader societal conditions. Lack of acceptance of disease control measures is attributed not only to people's perception of the disease and disease control activities but also to the possibility that these activities may not have been chosen with due regard for the convenience of the local people. From these studies, health and adult education materials have been developed and are being tested for: leprosy in Malaysia; malaria, schistosomiasis, guinea-worm infection and onchocerciasis in Nigeria; schistosomiasis in Brazil; African trypanosomiasis in Cameroon. From studies in Colombia, the Philippines and the Sudan, project results have indicated that economic impact needs to be evaluated in terms of time lost to the family rather than only in terms of monetary impact or occupational productivity. Costs and effectiveness of control activities are being assessed from the perspective not only of control programmes but also of the users of control measures. Research results from projects on malaria in Colombia, Guatemala, Sri Lanka and Thailand are contributing to changes in spraying operations, surveillance reliance and monitoring methods, the role of village volunteers and overall stratification of control programme activities. The complex interactions between economic development, disease transmission and human responses to disease control activities are becoming major topics of study by social scientists and disease control programme staff.

A Social Sciences and Tropical Diseases Network has been established in WHO's Region of the Americas. The network -- the first of its kind -- will enable investigators (social scientists, disease specialists and disease control programme staff) to share research findings, compare research methods and develop collaborative activities.

Planned Activities, 1988-1989

Future research supported by SER will focus on: assessment of the social acceptability and economic feasibility of control tools emerging from TDR's biomedical research activities; problems and issues identified by local disease control programmes, including the impact of population movements and the use of social and economic factors in the planning and implementation of disease control strategies by programmes and communities; new concepts and methods of social science research and economics in relation to tropical disease transmission and control; increasing communication between research workers and those involved in disease control through networks of social scientists, biomedical scientists and control programme personnel.

In collaboration with TDR's Research Strengthening Group (RSG) and WHO Regional Offices, attention will be given to strengthening, especially through training, the capability of tropical countries to conduct social and economic research as applied to tropical diseases, especially in economics, sociology and anthropology.

TABLE 5.14 SOCIAL AND ECONOMIC RESEARCH (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
Operations	1 300.0	1 140.0	1 500.0	360.0
Personnel Services	230.6	320.0	287.0	(33.0)
Operational Support	150.0*	120.0*	250.0	130.0
TOTAL	1 680.6	1 580.0	2 037.0	457.0

* Cost of meetings only

6. PROGRAMME AREA III: RESEARCH CAPABILITY STRENGTHENING

Objectives

The activities supported by Programme Area III aim at strengthening the national research capability of developing endemic countries to undertake the research required to improve the prevention and control of the TDR target diseases.

Current Activities

Using a variety of approaches, the Programme has continued to support promising institutions that meet the criteria established by the Research Strengthening Group (RSG). RSG grants assist these institutions in building up their capability to carry out research relevant to the control of TDR target diseases prevalent in their respective countries. To date, 103 institutions have received research-strengthening grants, including 56 long-term support grants. These grants, which are for a period of five years and have accounted for nearly half the funds allocated so far to Area III, have assisted the recipient institutions in building up their infrastructures for both laboratory and field research. TDR support has enabled several of these institutions to gain recognition and to obtain additional resources from their own governments and from other funding sources. Most of the institutions have been strengthened for research capability in two or three TDR target diseases and in a number of scientific disciplines.

In accordance with staff development plans submitted by institutions receiving research-strengthening grants, scientists and other research workers in these institutions are being provided with opportunities for training leading to the acquisition of postgraduate degrees or, in some cases, of specialized skills. So far, 499 research training grants have been awarded, including 94 for doctoral level studies. Of these 94 trainees, 21 received training in social sciences or economics, 21 in medical entomology and 10 in epidemiology. In order to help trainees pursue their research on return to their home institutions, 108 re-entry grants have been awarded.

To make up for the dearth of research workers in fields such as epidemiology, entomology and health economics, the Programme has supported the establishment of Master's level courses in developing countries. So far, support has been provided for 15 courses: seven in entomology, five in epidemiology, one in health economics, one in parasitology and one in biomedical engineering.

In 1986 the RSG carried out an in-depth study of the 17 institutions which had completed long-term support grants. This evaluation showed that three factors -- national and institutional commitment to research, integration of the institution's programme into national health priorities and the leadership qualities of the project leader -- were positively correlated with the success of the strengthening grant provided by TDR. It was also obvious that staff training was a requisite for strengthening and that it should start early in the strengthening process. It was generally thought that it was still too early to judge the scientific output of many of the institutions and that this could be better assessed five years after an institution had completed its long-term support grant.

Since the Research Capability Strengthening Component has now assumed responsibility for the activities previously sponsored by the Biomedical Sciences Component (dis-established, on the recommendation of STAC, at the end of 1985), efforts are under way to identify the potential of a number of strengthened institutions to undertake research and training activities in fields of basic biomedical sciences and biotechnology relevant to research aimed at improving control of the TDR target diseases.

TABLE 6.1 SUMMARY OF RESEARCH CAPABILITY STRENGTHENING ACTIVITIES
TO 31 DECEMBER 1986

INSTITUTION STRENGTHENING	NUMBER OF PROJECTS	FUNDING (US\$000)
Long-Term Support Grants	56	21 901.7
Capital Grants	25	1 841.6
Short-Term Support Grants	7	552.3
Small Grants	15	142.1
Evaluation and Management Activities	8	345.0
TOTAL	111	24 782.6
<hr/>		
TRAINING	NUMBER OF PROJECTS	FUNDING (US\$000)
<u>Research Training Grants:</u>		
Doctorate	94	
Master's Degree	112	
Non-degree	293	
SUBTOTAL	499	13 327.9
<hr/>		
Visiting Scientist Grants	52	452.5
Re-entry Grants	108	1 767.9
<u>Group Training Grants:</u>		
Master's Degree Courses	15	
Workshops	33	
Other	13	
SUBTOTAL	61	3 587.8
<hr/>		
Small Training Grants	22	461.9
TOTAL	742	19 598.2

Planned Activities, 1988-1989

In view of the RSG's in-depth evaluation of strengthened institutions (see above) and the review of RSG activities conducted in 1986 by the Scientific and Technical Review Committee, the strategic plan for research capability strengthening will be revised, with increased emphasis on collaboration between this Component and Programme Area II, Research and Development.

Attempts will continue to be made to identify new institutions for strengthening in developing endemic countries. Henceforth, human resource development will be initiated from the start of the strengthening process. Opportunities for training in field research, which has tended to lag, will be sought in large parasitic disease control operations.

Institutions which have completed long-term support grants will be encouraged to collaborate with each other and with other institutions pursuing research on tropical diseases. The Programme will continue to provide facilities for research training of staff of strengthened institutions, especially in the fields of epidemiology, biomedical sciences and social and economic research.

Necessary material and technical assistance will be made available to research trainees returning to their home institutions to enable them to pursue research relevant to the TDR target diseases endemic in their countries and in line with the strategic plans of the Steering Committees.

The Proposed Budget for 1988-1989 incorporates the transfer of the Epidemiology Component's personnel services and operational support from Programme Area II to Programme Area III, which is being undertaken in order to strengthen epidemiological research development (see item 5.13, Epidemiology).

TABLE 6.2 PROGRAMME AREA III: RESEARCH CAPABILITY STRENGTHENING (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL.3-COL.2
<u>General Activities</u>				
Personnel Services	1 208.1	1 400.0	1 037.4	(363.0)
Temporary Assistance	-	-	50.0	20.0
Operational Support	512.5	390.0	450.0	60.0
Publications	20.0	20.0	20.0	-
Shipping and Insurance Adjustments	25.6	20.0	-	(20.0)
SUBTOTAL	1 766.2	1 830.0	1 557.0	(273.0)
<u>Operations</u>				
Institution Strengthening	4 935.0	4 600.0	5 850.0	1 250.0
Training	6 570.0	5 800.0	6 700.0	900.0
SUBTOTAL	11 505.0	10 400.0	12 550.0	2 150.0
<u>Epidemiology</u>				
Personnel Services	*	*	484.0	484.0
Operational Support	*	*	250.0	250.0
SUBTOTAL	*	*	734.0	734.0
TOTAL	13 271.2	12 230.0	14 841.0	2 611.0

* 1986-1987: See Table 5.13, Epidemiology (Programme Area II).

7. PROGRAMME AREA IV: PROGRAMME MANAGEMENT

Objectives

The objectives of Programme Area IV are to provide direction and guidance for all Programme activities, through the Office of the Programme Director, and all necessary support for Programme activities and operations carried out by the technical and administrative bodies (Area I), the Research and Development Components (Area II) and the Research Capability Strengthening Component (Area III).

Budgetary provisions are made for the Office of the Director and for all central administrative support given to the Programme. Provision is also made for one Professional and one General Service staff post at each of the five WHO Regional Offices.

Current Activities

In addition to the technical direction of the TDR Secretariat, Area IV provides Secretariat services to the Programme's technical and administrative bodies. The level of Programme's activities is to a large extent determined by the amount of contributions to TDR; accordingly, a number of steps are taken to inform contributors and the public at large of progress in research and of other activities in TDR. This activity is supported by promotional visits of the Programme Director and senior staff and by publications. Area IV is also responsible for the production of statistical data on research funded by TDR and of financial reports on both income and expenditure (obligations). In addition, it provides communications, personnel and procurement services for the TDR Secretariat.

TDR's computerized management information system (MISTR) stores and provides ready access to information useful to both the daily and the longer-term running of the Programme. This information includes data on scientific proposals that have been submitted to TDR for funding, the scientists and institutions receiving TDR's Newsletter, those participating in TDR research activities and the scientific papers stemming from TDR-supported projects. MISTR data are analysable by discipline, geographic location and timespan.

TDR's policy is to disseminate information on its activities as widely as possible. Public awareness of the Programme's activities is promoted through contacts with the media. A variety of reports and other documents -- biennial Programme Reports, reports of TDR meetings, a Newsletter, reviews on specialized scientific topics, bench and field manuals and other publications -- inform scientists, administrators and policy makers of current or planned activities. The results of research funded by the Programme are widely reported in the scientific literature. In addition, a Quarterly Bibliography of Major Tropical Diseases is produced in collaboration with the United States National Library of Medicine and provides abstracts of publications on the six diseases.

Planned Activities, 1988-1989

Programme Management will continue to provide direction and support services for the Programme as a whole. The organization and methods of work of the TDR Secretariat will be kept under continuous review. As a result of the rising US dollar costs of staff salaries and allowances, a review was made of the need for temporary assistance in TDR and a significant reduction (US\$ 400 000) in the provision for temporary staff in Area IV is proposed.

During 1986-1987 biennium TDR initiated office automation and management through the use of microcomputer technology, following recommendations of consultants from The World Bank. There will be a progressive introduction of personal computers throughout TDR, connected with WHO's Local Area Network. Hardware purchases during the 1986-1987 biennium are shown under office supplies and equipment. For the 1988-1989 biennium, an amount of US\$ 150 000 has been budgeted under information systems equipment and development for the acquisition of microcomputer hardware and software, and US\$ 100 000 for the development of microcomputer applications and specialized training. The provision of US\$ 200 000 for information systems services and maintenance represents the estimated cost of charges for central computing facilities (International Computer Centre), mainframe programming and maintenance of existing databases, software, report production and supplies.

TABLE 7. PROGRAMME AREA IV: PROGRAMME MANAGEMENT (US\$000)

DESCRIPTION	1986-1987		1988-1989	
	1 JCB- APPROVED BUDGET	2 REVISED BUDGET	3 PROPOSED BUDGET	4 INCREASE (DECREASE) COL. 3-COL. 2
<u>Personnel</u>				
Personnel Services	2 045.1	1 900.0	2 760.0	860.0
Temporary Assistance	366.8	600.0	200.0	(400.0)
Consultants/Temporary Advisers	-	-	50.0	50.0
Overtime	34.8	25.0	25.0	-
SUBTOTAL	2 445.9	2 525.0	3 035.0	510.0
<u>Operational Support Activities</u>				
Information Systems:				
Equipment and Development	-	-	250.0	250.0
Services and Maintenance	300.0	300.0	200.0	(100.0)
Public Information	120.0	200.0	50.0	(150.0)
Duty Travel	92.0	80.0	80.0	-
Office Supplies and Equipment	106.0	300.0	50.0	(250.0)
Audit Fees	-	10.0	20.0	10.0
SUBTOTAL	618.0	890.0	650.0	(240.0)
<u>General Support</u>				
Administrative Support Costs	430.0	600.0	689.0	89.0
Common Services and Premises	912.0	1 100.0	1 160.0	60.0
SUBTOTAL	1 342.0	1 700.0	1 849.0	149.0
<u>Regional Offices</u>				
Personnel Services	940.5	600.0	913.0	313.0
Duty Travel	66.0	40.0	40.0	-
SUBTOTAL	1 006.5	640.0	953.0	313.0
TOTAL	5 412.4	5 755.0	6 487.0	732.0

8. PERSONNEL REQUIREMENTS

A review of the staffing pattern in TDR was carried out with the aims of achieving greater functional integration and reducing the cost of personnel services. In particular, a greater degree of integration of the research and development activities of the SWG Steering Committees (Programme Area II) with the research capability strengthening activities of the Research Strengthening Group (Programme Area III) will lead to economies in staff years. The Proposed Programme Budget for 1988-1989 provides for a reduction in the total number of General Service staff years required, from 91 to 86.5 (Table 8.1).

The principal staff changes for the 1988-1989 biennium contained in the detailed tables on personnel requirements (Tables 8.2, 8.3 and 8.4) are described below:

- In order to streamline operations, the responsibilities of the post of Responsible Officer, Programme Area II, will be re-distributed among other Programme Area II personnel and the Office of the Programme Director. On this basis, the post is no longer required.
- In view of continuing rapid developments in the Leprosy Components, it has been found necessary to restore the post of Steering Committee Secretary for the Immunology of Leprosy Component, along with one General Service support staff post for this Component.
- The personnel associated with the Epidemiology Component will be transferred to Programme Area III to improve collaboration in institution-strengthening activities.
- As a result of a transfer of some responsibilities for research capability strengthening from staff in Programme Area III to Steering Committee Secretaries (Programme Area II), it is proposed to phase out two Professional posts and two General Service posts in Programme Area III. However, because of the transfer of personnel from the Epidemiology Component, there is only a small net change in the number of Programme Area III posts and staff years.
- In Programme Area IV, it is proposed to convert an existing post of Clerk/Coder to a Programmer/Analyst post in view of the increasing requirements for professional expertise in office automation, and to convert an existing post of Clerk-Stenographer to a second post of Editor in the Communications Unit to cope with the increased workload in this unit.
- It did not prove possible to phase out one General Service post in Operations and Finance, as intended in the 1986-1987 Programme Budget.

TABLE 8.1 SUMMARY OF PROGRAMME PERSONNEL REQUIREMENTS

PROGRAMME AREA	PERSONNEL REQUIREMENTS IN STAFF YEARS					
	1986-1987 APPROVED		1988-1989 PROPOSED		1990-1991 ESTIMATED	
	P	GS	P	GS	P	GS
I Technical and Administrative Bodies	-	-	-	-	-	-
II Research and Development	32	30	28	30	28	30
III Research Capability Strengthening	10	12	10.5	10.5	10	10
IV Programme Management	14	27	18	24	18	24
Regional Offices	10	10	10	10	10	10
Administrative Support Services	-	12	-	12	-	12
TOTAL	66	91	66.5	86.5	66	86

TABLE 8.2 PERSONNEL REQUIREMENTS, PROGRAMME AREA II: RESEARCH AND DEVELOPMENT

COMPONENT	PERSONNEL REQUIREMENTS IN STAFF YEARS			
	1986-1987 APPROVED		1988-1989 PROPOSED	
	P	GS	P	GS
General Activities	2	4	-	4
Chemotherapy of Malaria	4	2	4	2
Immunology of Malaria	2	2	2	2
Applied Field Research in Malaria	2	2	2	2
Schistosomiasis	2	2	2	2
Filariasis	2	2	2	2
African Trypanosomiasis	2	2	2	2
Chagas' Disease	2	2	2	2
Leishmaniases	2	2	2	2
Immunology of Leprosy	-	-	2	2
Chemotherapy of Leprosy	2	2	2	2
Biological Control of Vectors	4	4	4	4
Epidemiology	4	2	*	*
Social and Economic Research	2	2	2	2
TOTAL	32	30	28	30

* 1988-1989: See Table 8.3, Personnel Requirements, Programme Area III.

TABLE 8.3 PERSONNEL REQUIREMENTS, PROGRAMME AREA III: RESEARCH CAPABILITY STRENGTHENING

DESCRIPTION	PERSONNEL REQUIREMENTS IN STAFF YEARS			
	1986-1987 APPROVED		1988-1989 PROPOSED	
	P	GS	P	GS
<u>Research Capability Strengthening</u>				
Responsible Officer	2	-	2	-
Medical Officer	6	-	2.5	-
Technical Officer	2	-	2	-
Secretarial Support	-	12	-	8.5
<u>Epidemiology</u>				
Medical Officer	*	-	4	-
Secretarial Support	-	*	-	2
TOTAL	10	12	10.5	10.5

* 1986-1987: See Table 8.2, Personnel Requirements, Programme Area II.

TABLE 8.4 PERSONNEL REQUIREMENTS, PROGRAMME AREA IV:- PROGRAMME MANAGEMENT

DESCRIPTION	PERSONNEL REQUIREMENTS IN STAFF YEARS			
	1986-1987 APPROVED		1988-1989 PROPOSED	
	P	GS	P	GS
<u>Office of the Programme Director</u>				
Programme Director	2	-	2	-
Secretarial Staff	-	4	-	4
<u>Programme Management</u>				
Responsible Officer	2	-	2	-
Administrative Officer	2	-	2	-
Secretarial Staff	-	2	-	4
<u>Communications</u>				
Communications Officer	2	-	2	-
Editors	2	-	4	-
Editorial Assistant	-	2	-	-
Secretarial Staff	-	2	-	4
<u>Information Systems</u>				
Management Officer (Information)	2	-	2	-
Programmer/Analyst	-	-	2	-
Clerks/Coders	-	6	-	4
Secretarial Staff	-	4	-	2
<u>Operations and Finance</u>				
Management Officer (Finance)	2	-	2	-
Technical Assistant	-	3	-	4
Secretarial Staff	-	4	-	2
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SUBTOTAL	14	27	18	24
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<u>Regional Offices</u>				
(One Medical Officer and one Secretary at AFRO, AMRO, EMRO, SEARO and WPRO)	10	10	10	10
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<u>Administrative Support Services</u>	-	12	-	12
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TOTAL	24	49	28	46
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