

Special Programme of Research, Development
and Research Training in Human Reproduction

**Strengthening research capabilities in
the least developed countries**

Report of a joint HRP, TDR, GPA Consultation



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EXECUTIVE SUMMARY

The burden of ill health in the least developed countries (LDCs) deserves closer attention by the international community. In these countries a disproportionately high number of deaths is caused by disease or conditions that can be prevented through public health measures. Unfortunately, owing to their extreme poverty, LDCs are neither in a position to undertake such measures, nor do they have the resources to conduct relevant research to generate data that could be used to improve public health systems.

Overseas development aid (ODA) to LDCs is generally low. Of the disbursements to these countries, the amount for research and development, especially in the health sector, is insignificant. The combined effect of all these factors is that the majority of LDCs, which are in sub-Saharan Africa, continue to lack trained human resources and the necessary infrastructures for health research.

The Special Programmes of WHO have in the past decade or two invested significantly in research capability strengthening (RCS) in developing countries. Despite their efforts there is widespread agreement that the least developed category of developing countries has not received sufficient health research support. There are many reasons for this lack of support, one of which has been the absence of clear strategies on how to approach RCS in these very underprivileged countries.

In 1990, the Commission on Research for Development extensively examined the constraints associated with health research in developing countries. It is now a widely held view that even the poorest of the countries ought to be in a position to conduct minimum relevant research, now better referred to as "essential national health research (ENHR)", in order to provide information of use in health care delivery systems. The essential requirement, however, is the creation of a "critical mass" of relevant human skills if meaningful contributions from researchers have to be made. Since a scarcity of financial resources to support RCS in LDCs is an important constraint, it is essential that WHO coordinate and optimize its inputs so that the countries benefit from its investments. The Special Programmes, in particular since they hold large research portfolios, need to have common RCS strategies. They need to mobilize jointly

some of their existing resources, at the same time attempting to find additional funds for extended support to LDCs. Their collaboration with other donors and agencies, including the Task Force on Health Research for Development, would seem a useful way to increase RCS efforts.

In approaching RCS in LDCs it is important that the donors appreciate that the process will need a long-term commitment. Further the form of support would need to have appropriate flexibility in order to respond to rapidly changing and sometimes unique situations.

The series of actions and steps listed below would seem to constitute a logical approach to RCS in least developed countries.

1. There is a need to create awareness among decision-makers of the value of research in health development. This step, which is often forgotten, would ensure national support for research and continuity of effort.

2. Needs in health research are often not well articulated. Therefore, to achieve a solid basis for RCS activity, it is important that relevant authorities and researchers have a good idea of the priorities and fundamental research issues for improving health care delivery.

3. The development of human resources for health research, which should be multidisciplinary in nature, ought to be based on identified health research needs in order to establish relevance and application of appropriate technologies and to enable institutional strengthening to grow in unison with development of human resources.

4. Research aimed at improving health services and devising disease control strategies should receive the highest priority so that research results can be used in planning services of ministries of health.

5. As far as possible, research training should occur in setting similar to ones in which the trainees will work on completion of their training. Thus, more South-to-South linkages should be established for training.

6. RCS activities in LDCs will need intensified efforts and constant monitoring over a long period of time.

I. INTRODUCTION

A consultation on research capability strengthening in least developed countries (LDCs) was held in Geneva from 10 to 12 December 1990. It was sponsored by three WHO Programmes: Special Programme for Research, Development and Research Training in Human Reproduction (HRP); Special Programme for Research and Training in Tropical Diseases (TDR); and Global Programme on AIDS (GPA).

1.1 Statement by Director, HRP

Dr. M. Fathalla, Director, HRP, welcomed the participants and thanked them on behalf of the three Programmes for agreeing to participate in this very important meeting. He emphasized that the WHO Secretariat needed advice on how best to proceed with RCS in the least developed countries and needed to draw on the experience of the participants to devise the most appropriate strategies.

1.2 Official opening

The meeting was officially opened by Dr. M. Abdelmoumène, Deputy Director-General of the World Health Organization. He observed that the theme of support to countries in most need had been emphasized by the Organization in a series of activities. At the meeting of the WHO Executive Board in January 1990, the Director-General had identified five areas for priority attention in the Organization's programme of work. On top of the list was the relationship between the state of the world economy and health development, especially as it affects the lesser developed countries. The Director-General had responded to this challenge by developing an initiative to collaborate with countries "in greatest need" through country-specific support to national health programmes. He went on to submit that the need for health research for development of health care was universally accepted and that the issue therefore was not whether research should be undertaken or not. Rather the question was what kind of research should be conducted and by whom. He said it was imperative that the capacity of countries to carry out research be strengthened.

Dr Abdelmoumène further said that the problem was that the countries with the weakest economies were also the countries with the highest

burden of ill health and with the least resources to carry out the necessary research. He identified the available resources as the political commitment of the individual countries, the favourable attitude of bilateral and multilateral donors, and the commitment of WHO to research as part of health development. He described the functions of the Programmes and concluded that the task before the meeting was to assess current RCS activities of the Programmes, recommend the most appropriate strategies, and establish principles for feasible and practical strategic framework.

1.3 Objectives

The overall objective of the consultation was to recommend the most appropriate strategies for research capability strengthening (RCS) in LDCs.

The specific objectives were:

1. To review current research and RCS activities that address health issues in LDCs.
2. To define and recommend the optimal role of the three Programmes in responding to needs in research capability strengthening within the framework of health development in LDCs.
3. To recommend the most appropriate strategies for fulfilling the optimal role, including evaluation of progress.
4. To recommend strategies for the coordination of inputs from within WHO and between WHO and other bodies.
5. To estimate the likely financial requirements for successful implementation of the recommended strategies.
6. To recommend mechanisms for assisting the countries in assessing their own needs for research and in collaborating with WHO in other areas of research capability strengthening, such as: training of scientists, communication among scientists and between scientists and policy-makers, improved research management, coordination of inputs of bilateral and multilateral agencies, and transfer of technology.

3. WORKING PAPER

Dr. M. Mugambi presented a working paper, which defined the "least developed countries" and identified some of the constraints to research capacity building in these countries. The paper also suggested possible strategies for research capability strengthening (RCS). The discussions that ensued form the basis of this report.

4. LEAST DEVELOPED COUNTRIES

4.1 Definition

The countries considered to be "least developed" are those whose per capita GNP is very low—on average less than US\$ 300 per annum. A list of these countries, prepared by the United Nations in 1989, is given in Table 1. Whereas there were 25 LDCs in 1970, in 1990 there were 42, showing almost a twofold increase during the intervening twenty-year period.

The list shows that close to 70% of LDCs are located in sub-Saharan Africa. This list, however, does not portray the full picture of poverty and health need in these and a few other countries. It was noted that the definition of "least developed countries" provided by the United Nations Organization which is based on per capita gross national product (GNP) was not suitable for the purposes of RCS for health because some countries with low GNP had better health indices than others with medium levels of GNP. Moreover research traditions were better established in some LDCs than in others. It was therefore considered that for the purpose of RCS, different modified criteria had to be identified for categorizing countries as LDCs, and that within LDCs themselves were at different levels of development in terms of research tradition, technology, and infrastructure for health research.

4.2 Characteristics

Apart from per capita GNP there are other characteristics common to LDCs. One of them is low real rate of economic growth brought about by sociopolitical problems, unfavourable international economic order, and

Table 1. List of LDCs (total 42) by WHO Region

<i>Africa (26)</i>	Mauritania	<i>South-East Asia (6)</i>
Benin	Mozambique	Bangladesh
Botswana	Niger	Bhutan
Burkina Faso	Rwanda	Burma
Burundi	Sao Tome	Laos
Cape Verde	Sierra Leone	Maldives
Central African Republic	Togo	Nepal
Chad	Uganda	
Comoros	United Republic of Tanzania	<i>Americas (1)</i>
Djibouti		Haiti
Equatorial Guinea	<i>Eastern Mediterranean (5)</i>	
Ethiopia		<i>Western Pacific (4)</i>
Gambia	Afghanistan	
Guinea	Democratic Yemen	Kiribati
Guinea-Bissau	Somalia*	Samoa
Lesotho	Sudan*	Tuvalu
Malawi	Yemen	Vanuatu
Mali		

*Outside sub-Saharan Africa

various catastrophes such as floods and droughts. The mean population growth rate of LDCs is about 2.7%, which compares unfavourably with the global mean of 1.7% and 2.3% for developing countries as a whole. Their high population growth rates significantly erode any economic gains that they make. It is recognized that rapid population growth in these countries slows the attainment of development goals as the demand on recurrent expenditure to sustain basic social services rises. In many of these countries school enrolment, which is a measure of the level of education, is often less than 50%. It is important that in these countries the population policies should be incorporated into the national development plans.

LDCs are also heavily indebted and the long-term debt burden for sub-Saharan countries now exceeds 30% of their export earnings. Servicing of foreign debts siphons a great proportion of the hard earned foreign

currency. The remaining foreign exchange earnings are often depleted by imports of food, fuel and machinery, leaving little for other essential purchases and services.

The official overseas development aid (ODA) in 1987 amounted to about US\$ 40,000 million. This figure represents only 0.2% of the accumulated GNP of the OECD countries. Grants to LDCs amounted to only 0.08% of the OECD countries' GNP. Out of this amount the health sector received less than 10% of the ODA through bilateral and multilateral agencies, underlining the low priority accorded to this sector. The available facts and figures show that LDCs are attracting very little tangible assistance.

4.3 The health burden

The health burden of LDCs brought about by disease is heavy. This is borne out by the following facts: infant mortality rate (IMR) in LDCs averages 129/1000 live births as compared to 45/1000 in the more advanced developing countries and 10/1000 in industrialized countries (UNICEF, State of the World Children, 1989). For most of sub-Saharan Africa, IMR ranges between 100 and 170/1000 live births. Mean life expectancy in LDCs is only 49 years as compared to 59 years for all developing countries and 72 years for the industrialized countries.

Of the estimated 50 million global deaths that occur annually due to disease, nearly 75% occur in developing countries, with a disproportionately high number occurring in LDCs. The recent problem of infection with human immunodeficiency virus (HIV) and AIDS will in time significantly complicate this state. Table 2 lists the major causes of deaths in developed and developing countries.

In developing countries, the main causes of mortality are infectious and parasitic diseases, including those which can be prevented through vaccination. Infant and early childhood deaths account for over 50% of these fatalities. Also high on the list are pregnancy-related and perinatal problems. Each year about 150,000 mothers in Africa die from pregnancy-related problems, while approximately an equal number suffer permanent disabilities brought about by complications of pregnancy and childbirth.

Table 2. Major causes of death in developed and developing countries (in thousands of persons)

<i>Category of country</i>	<i>Infectious/ parasitic diseases</i>	<i>Circulatory and degenerative diseases</i>	<i>Other diseases</i>	<i>Total</i>
Developing	16,500	6,500	15,000	38,000
Developed	500	6,000	5,000	11,500
World Total	17,000	12,500	20,000	49,500

*Adapted from: Commission on Health Research for Development. *Health Research: essential link to equity in development*. Oxford, Oxford University Press, 1990.

In many LDCs, only less than 50% of pregnant mothers receive antenatal care while an even smaller number get the services of properly trained birth attendants.

The tropical and subtropical climates, where LDCs are located, favour rapid multiplication of vectors (e.g. airborne insects) that transmit diseases. Availability of safe water is less than 35% in the rural areas where over 80% of the population lives. At the same time the declining availability of food has worsened childhood malnutrition. Moreover, access to essential facilities and basic health services in these countries is very limited due to various economic, managerial and sociocultural factors. Only less than half of the populations have access to any form of local health care.

Large-scale and expensive programmes to control selected tropical diseases such as malaria, schistosomiasis and filariasis were undertaken in the past. Earlier efforts to eradicate malaria met with limited success and the lapse in the control programmes in the last two decades has brought a resurgence of malaria. In the case of onchocerciasis a fairly successful control programme is currently under way in West Africa. The economic crisis facing many LDCs has depressed incomes and worsened the already

poor living conditions. The crisis has also weakened the ability of the health sector to cope with reduced public expenditure on drugs and medical supplies. The health sector which has hitherto received less than 5% (as low as 1% in some countries) of government resource allocation is therefore bound to suffer significantly during the prevailing economic hardships.

5. RATIONALE

There are at least three reasons why the optimal role of the three WHO Programmes and strategies for research capability strengthening in the least developed countries should be reassessed. First, the initiative of the Director-General to give increased technical and financial support to the least developed countries was lauded by the World Health Assembly in 1989 when it endorsed the plans and urged implementation in resolutions WHA42.3 and WHA42.4. These sentiments were repeated at the 43rd World Health Assembly in May, 1990, when the Director-General was requested to ensure that WHO takes the lead in the coordination of collaborative activities, "particularly with countries and population groups in greatest need". Secondly, experience in institution strengthening to date has shown that there are constraints which deserve special attention in these countries. Finally, the needs of these countries are so many that more coordination of effort between interested parties will be required if the inputs are to have an impact. There is a particular need for the WHO Programmes to coordinate the efforts of the interested parties.

Subsequently, the Director-General has initiated mechanisms for intensifying WHO cooperation with Member States and increasing coordination of all available resources to support country strategies giving priority to countries in greatest need. For this initiative to succeed it is imperative that WHO utilize all available funds as effectively as possible through a better integration of its activities. Additionally, WHO should involve bilateral and multilateral development cooperation agencies as partners and urge national governments to recognize their responsibility in the coordination of external cooperation in their national health plans.

As a first step under the Director-General's initiative, WHO intended to involve 15 countries to discuss this cooperation by the end of 1990. Contact was established with Guinea-Bissau in January 1989 followed by Ecuador, Guatemala, Haiti and Jamaica in April 1989, and Guinea and Nepal in June 1989. Although some of these countries are not on the

United Nations list of LDCs, nonetheless the initiative taken by WHO to contact the governments of countries in great need is commendable and should be intensified and even selectively targeted to LDCs where great health needs exist. The situation in these countries and other similar ones is that more effective implementation of primary health care (PHC) is of key concern particularly because the number of people living in poverty and poor health conditions has increased since the Alma-Ata conference on PHC of 1978.

As part of their ongoing activities, the Special Programmes (TDR & HRP) have for more than 10 years invested substantial resources into the strengthening of research capacity in developing countries, including some LDCs, so as to enable these countries to respond more effectively to their national health needs.

As a further response to the above challenges, the Special Programmes wish to consider the best possible options and strategies for coordinated efforts in health research development activities, particularly in LDCs.

6. CURRENT STATUS OF HEALTH RESEARCH IN LEAST DEVELOPED COUNTRIES

6.1 Status and need for research in LDCs

Policy-makers and managers of disease control in ministries of health often fail to realize the important role that health research could play in the planning and implementation of health programmes. The demand for health research is therefore low in many cases. Yet to have a lasting commitment for health research it is important to get policy-makers and managers to appreciate the value of research in their work but without raising their expectations beyond reason as this could prove counter productive in the short and medium term. There is no doubt that research is an important tool for development with two main objectives: to produce new knowledge and strategies; and to create a capacity to utilize existing tools. Available information, however, indicates that research, including that on health, is poorly supported in LDCs. Table 3 shows research and development (R&D) expenditures in developing countries and compares these with expenditures in industrialized countries.

The figures in the Table show that developing countries, with 80% of the global population, have access to only 6% of the total world R&D expenditure. A further examination of these figures demonstrates that sub-

A typical scenario in a "least developed country"

A land-locked country in West Africa is approximately 274,000 km² in area and has a population of about 9 million, with 92% of its people living in the rural areas. It is situated in a zone characterized by considerable variation in rainfall with land resources increasingly deteriorating as a result of poor agricultural practices and population pressure. The GNP/GDP per capita is approximately US\$ 200.

The mean annual GDP growth rate in the last 10 years has averaged 5% in real terms. In certain bad years annual growth rates have been as low as between 1.8% and 0.8%. Exports are small, the majority of the products being agricultural or agro-industrial based. The trade deficit in relation to GDP has averaged 22 per cent in the last few years. External debts of 1985 stood at about US\$750 million, two-thirds being owed to multilateral donors and most of the balance to bilateral donors.

Unemployment is high. The agriculture sector remains the main job and income-generating sector. The industrial sector, mainly located in the urban areas, is small and accounts for under 20% of the GDP. The public sector and financial institutions provide most of the jobs. For this reason future development plans are aimed more at rural development, especially in the agricultural sector. Road networks total about 14,000 km, but most of them are dust roads that are impassible during the rainy season. Rail transportation is poorly developed and so is telecommunications.

Politically, the last decade was marked by major sociopolitical and economic upheavals brought about by a people's revolution. The present economic plans are aimed at building a self-reliant national economy to avert future revolutions that surface at times of poor economic performance. Official development assistance at US\$ 30 per capita per year was higher compared to the 1970s but is still lower than in other neighbouring countries.

A few selected demographic and social indicators of the country are given below. The total fertility rate is 6.5 and contraceptive prevalence rate is 1%. Female and male literacy rates stand at 6% and 16%, respectively. Infant mortality rate (IMR) is 138 per 1000 live births and total maternal mortality rate is 600 per 100,000 births. Immunization coverage, except for BCG and measles, is under 50% of infants. Only 10% of the pregnancies are seen in antenatal clinics and about 30% of deliveries are attended by trained personnel. Life expectancy averages 48 years. In 1985 less than 30% of the population had access to safe water supplies.

Table 3. Comparison of research expenditure in developing and developed countries

<i>R&D Expenditure (US\$ billion)</i>		<i>Percentage share in world total</i>		
		<i>R&D</i>	<i>GNP</i>	<i>Population</i>
Global total (1980)	207.8			
Developed	194.9	94	79	19
Developing	12.9	6	21	81
Developing total (1980)	12.9			
Sub-Saharan (Africa)	0.8	68	11	
Arab States	1.0	8	24	7
Latin America	3.9	30	31	11
Asia	7.2	56	37	71

Source: Modified from IDRC publication 1986.

Saharan Africa, with most of the LDCs, receives a mere 6% of the amount that goes to all developing countries put together or less than 0.5% of the global R&D budget. Following the first United Nations Conference on LDCs in 1981, more aid in dollars per capita has gone to LDCs compared to other developing countries, but this amount still remains small considering the amounts needed for meaningful and sustained development to occur.

According to the Commission on Health Research for Development, most (95%) of the funds available for health research are spent on health problems of the industrialized countries, although as already pointed out, the health burden due to disease is highest in the poorest countries.

According to World Bank sources, African research systems are heavily dependent on public sector support with government exchequers often financing more than 90% of the national research and university budgets. This support may be as high as 95% for health research. The balance comes from bilateral and multilateral sources. In comparison, in industrialized countries the public and private sectors contribute almost equally (about 30% each) towards the budget for health research.

The high dependence of developing countries on public financing of health research has its high price, including that of inadequate, suboptimal, and discontinuous financing. With worsening economic conditions major financial cutbacks are usually made in areas like research which are perceived as non-essential sectors. As a result of these cutbacks, the last decade has witnessed a major deterioration of research infrastructures in many developing countries and a significant slowing in the development of technical and research manpower.

Among LDCs, the status of research and its establishment varies from country to country. A few of the LDCs have some research tradition with established research councils, institutes and universities. The majority of the LDCs have no real tradition of research and development and have inadequate systems for coordinating research. In most of these countries, the focal point for health research may be at the only university in the country. This may be supplemented by a small nucleus of health researchers within the disease control divisions of the ministries of health. In as much as research infrastructures will be wanting so will be the manpower at both scientific and technical levels. The R&D personnel ratio is lowest in sub-Saharan Africa (<10 per million population).

The few researchers that are actively engaged in health research operate within financial constraints, isolation, inadequate remuneration, inappropriate career structures, shortage of training opportunities, etc. Tables 4

Table 4. Research capacity in selected countries

<i>Country</i>	<i>Health researchers</i>	<i>Health researchers per million population</i>
Ethiopia	300	6.9*
Bangladesh	150	1.5*
Mali	10	1.3*
Phillipincs	939	16.4
Zimbabwe	125	14.4
Brazil	8,521	61.6
Mexico	4,380	54.6

*LDC

Source: Commission on Health Research for Development, *Health Research; essential link to equity in development*. Oxford, Oxford University Press, 1990

and 5 summarize the R&D personnel ratios and the constraints within which researchers in developing countries operate, respectively.

Research would be expected to be successful in countries with developed research infrastructures and appropriate research manpower. The risk of investment in research is higher in the LDCs due to many shortcomings, some of which include infrastructural and manpower deficiencies named above. This risk has to be recognized by the Programmes and their donors. With this realization, activities should be planned and implemented in order to minimize chances of failure.

When considering research support inputs into LDCs, there may be merit in grading these countries into three categories depending on facilities and manpower available while at the same time taking into consideration the socioeconomic and political situations of each country. Interest and commitment to research by national authorities, existence of suprastructural organizations for research coordination, willingness to utilize research results for disease control or health services improvement, and availability of potential researchers should be additional considerations for the grading process. Such grading should assist the Programmes in determining the degree, intensity, and duration of the support required.

Table 5. Constraints on researchers in a developing country

<i>Macro-environment</i>	<i>Work environment</i>
Lack of demand for research	Lack of access to information
Lack of scientific culture	Inadequate support staff
Weak public support	Institutional instability
Bureaucratic rigidity	Weak facilities
	<i>Personal</i>
	Intellectual isolation
	Low salaries
	Limited promotion
	Few career paths
	Restricted research choice
	Insufficient training

Source: Commission on Health Research for Development. *Health Research; essential link to equity in development*. Oxford, Oxford University Press, 1990

6.2 Views of LDC's

In the last decade, in most LDCs socioeconomic conditions have deteriorated and health services have fallen in quality, particularly in rural areas. Parallel with this decrease in supply there has been an increase in demand for services, resulting in an expansion of the health gap between LDCs and other countries. LDCs do recognize that some of the essential elements of PHC include prevention and control of endemic diseases. They also appreciate that to implement PHC effectively they need to intensify their efforts in strengthening health infrastructures and developing research manpower and technical skills. The need to ensure the optimum use of inputs and the mobilization of additional resources are also seen important. However, the intensification of efforts to strengthen managerial capabilities, including measures to ensure that sound policy decisions are made with a sharper focus on priorities and targets, may depend on availability of valid information. The strengthening of national capacities for assessing and projecting health need requires appropriate research and evaluation. In matters of science and technology there is an increased realization of the need for South-South collaboration.

7. WHO AND OTHER DONORS

7.1 Special role of WHO

World Health Organization's country programmes are viewed positively by the developing countries. WHO is politically acceptable and its activities are seen as having been initiated in response to the expressed needs of these countries. The Organization is seen as part of a global United Nations network with expertise to implement programmes and to mobilize resources. More specifically, the Programmes of WHO are seen as having been created and mandated to address, through scientific research, the health issues in developing countries. Their holistic approach to research development is greatly valued in developing countries.

7.2 The three Programmes

To date it has been a deliberate policy of both HRP and TDR to direct their research capability strengthening (RCS) support to institutions of developing countries which show good prospects for success. The outcome of this undertaking has been a qualified success and one now finds a growing number of active health scientists in these countries. This

success story has involved considerable investment by the Programmes in terms of human resource development and institutional support. For example, in the case of TDR, over 150 institutions had received Long-term Support Grants (LTS) and by 1989 over 1000 Research Training Grants (RTG) had been awarded by the Programme since its establishment. In the same period the total investment in research capability development has been in excess of US\$ 60 million of which 99% has gone to developing countries. In the 15 year period (1974–1989), TDR supported research projects, RCS and training activities in 112 countries of which 87 (78%) were developing countries. In the latter category, at least 24 (28%) were LDCs. Twenty-one institutional grants went to LDCs out of the total 157 (13.4%). Both TDR and HRP have had activities in the same LDCs in at least 7 countries namely, Bangladesh, Benin, Ethiopia, Sierra Leone, Sudan, United Republic of Tanzania, and Uganda.

HRP has also made a comparable investment whose impact in developing countries has been shown to be significant (*Report of the External Impact Evaluation*, 1990). Since 1986, at least 38 institutions in 29 developing countries have received Long-term Institutional Development (LID) and other grants for strengthening of research capabilities. HRP has supported research or institutional development activities in at least 80 countries of which 60 (75%) were developing. There were 8 (10%) LDCs in the latter category. So far, HRP has awarded over 1000 RTG and spent over US\$60 million on RCS activities.

Institutional development grants have normally been awarded for a period of 5 years. In the case of TDR, only in exceptional circumstances and only in a few institutions have these grants been extended beyond this period. In the case of HRP, however, this type of support has in many cases lasted for up to 10 years. Research training has been a major activity of the Special Programmes. LDCs have been better favoured in this respect than is the case with disease-specific research projects. Since its inception TDR has allocated 177 (17.4%) of its over 1000 RTG grants to LDCs. In the biennium 88/89 HRP allocated 18 (11.4%) out of 158 RTG to LDCs. In the past, TDR and HRP have demonstrated flexibility and creativity in dealing with RCS process and seem most suited to handle this new initiative of RCS in LDCs.

Established in 1987, GPA is a relatively new WHO programme. Actions taken so far have mainly been exploratory and fact-finding in nature. The following five areas were identified as needing strengthening: (a) development of methodological and managerial skills for researchers

and staff of National Aids Programmes; (b) increasing willingness of national policy-makers and external partners to promote and participate in RCS activities; (c) laboratory sustainability; (d) training; and (e) networking.

To date, 18 research training grants (for up to 12 months duration) have been supported from GPA funds allotted the country, medium-term plans. In addition, some institutions have benefited directly from support from GPA's scientific and technical units through specific projects.

In addition, GPA has computerized an inventory of research activities in 35 sub-Saharan African countries and has held research-priority-setting workshops in Cameroon, Senegal, Thailand, and Uganda.

7.3 Views of donor agencies

The strengthening of research capabilities has two main objectives: (a) to assist countries to address their own specific research needs (create self-reliance); and (b) to ensure participation of research institutions and scientists from developing countries in global research efforts. Some of the constraints facing national research institutions have been shown to include: (a) lack of adequately trained staff for project leadership; (b) absence of national science and technology plans; (c) lack of priorities on which to base programmes; and (d) poor linkages between researchers and users of research findings.

According to some of the major donors of health research such as the International Development Research Center of Canada (IDRC), the Swedish Agency for Research Cooperation with Developing Countries (SAREC), and the United States Agency for International Development (USAID), institutional support in LDCs should be of long duration, ranging from 10 to 15 years. They propose an approach that should ensure improvement in management and administration capabilities and creation of national institutional linkages and training covering research support staff as well. According to IDRC, a strategy for research in sub-Saharan Africa should have three objectives. It should: (a) strengthen research capability for long-term viability; (b) facilitate sharing of results within and beyond national boundaries and; (c) promote the application of research to developmental problems. In providing such support IDRC stresses that attention should be given to the assessment of institutional needs and research environment, provision of phased support, careful sequencing of inputs, strengthening of other support services, provision of an enabling

and productive environment and indigenization of training. IDRC also emphasizes the need for donors to work together to complement and supplement the efforts of LDCs. Apart from the major donors of health research, it is possible in a given LDC to find bilateral donors or other funding agencies conducting research or training in parallel and sometimes in isolation from national efforts. Sometimes the research undertaken may not have relevance to the needs of the host countries. Furthermore, some of these agencies may also not always show interest in research-related developments such as institutional development or post-graduate training. The existence of such a state is not helpful to a country and attempts should be made at a very early stage to interest donors in the country's research programmes so that training and institutional support can be better focused and coordinated.

7.4 Lessons

1. Human resources and institutions in developing countries do not always correspond to the magnitude of disease. Often countries in greatest need are the ones with the poorest resources.

2. In LDCs recently visited by WHO teams, the following were common findings: (a) weak management systems; (b) inadequate human resources for health; (c) poor health systems design; and (d) inability to ensure economic support for health.

3. Among developing countries in general and LDCs in particular there are wide differences in infrastructures and even in the degree of need.

4. Although a time limitation for RCS has been set, it has been observed that institutions are at different levels of development and each institution needs to be viewed in its own context.

5. Phased institutional development has been proposed, with the general sequence being training, improvement of facilities, and finally specific projects.

6. There have been problems in bringing researchers, policy-makers and disease-control personnel close enough to work together in planning, utilization of results, dissemination of information and evaluation of programmes.

7. General poverty and underdevelopment makes it difficult to make

rational management decisions and management by crisis tends to be the rule in the poor countries. The consequence is perpetuation of poverty.

8. Good research leadership and governmental support are crucial to the success of RCS of institutions. The criteria for selecting an institution must at least include these two among others.

9. Due to scarcity of high-level research manpower, countries tend to overburden the few available researchers with other responsibilities, some of which are irrelevant to their training, background, or interest.

10. Research career development is a slow process that needs continuous support in various forms, including provision of research materials, literature, re-training, etc. Promising young researchers need adequate support.

11. The isolation of researchers in developing countries is a common cause of low productivity which should be minimized through literature support, peer visits, postgraduate exchanges, networking, etc.

12. Developing countries without research management systems such as national research councils should be persuaded to establish these as one way of demonstrating political commitment to research.

8. RESEARCH AGENDAS

8.1 WHO Programmes in LDCs

There is ample evidence to show that little research is undertaken in LDCs. This is even more true of health research whose quantity and quality is limited. It is only in a few LDCs, where the infrastructures are relatively better, that some significant investments in health research have been made. However, worsening economic conditions in the recent past have led to a partial loss of these investments.

Review of participation of the WHO Programmes in LDCs reveals that TDR to date has supported RCS activities in at least 9 LDCs. These include two where some research tradition has existed (Ethiopia, and Tanzania). However, TDR support for research projects per se has involved more countries, at least 24 LDCs. In these countries the number of research projects supported (excluding RTG) have varied from one project in one country (Vanuatu) to as many as 19 in another country (Tanzania). Funds

disbursed to a country for these projects have ranged from US\$1,700 to about US\$ 3 million (Ethiopia and Tanzania). This is to be contrasted with projects in major recipient developing countries for instance Kenya (57) Brazil (182) and Thailand (97). Funds spent in the latter category of developing countries have been as high as US\$ 12 million (Brazil). However, even among the LDCs, Ethiopia and Tanzania are the exception. Most of the other countries have none or few projects and receive relatively little support.

In the case of TDR, the research supported in LDCs has been in all the Programme's six target diseases. Projects have involved all disciplines at laboratory, clinical and field levels. However, research in these countries has tended to be more applied in nature, e.g. epidemiology/prevalence studies, behavioural determinants of transmission, control strategies, test of diagnostic methods, drug sensitivity testing, etc. In only very few LDCs has sophisticated laboratory research received support.

In reproductive health, the types of project undertaken in LDCs with support from HRP have been varied but comparable to those in other developing countries although on a smaller scale. They have covered topics like infertility, maternal morbidity, abortion, family planning, and HIV infection, among others. None of the LDCs or their institutions have been part of HRP global network of formally designated WHO collaborating centres (CCR).

9. MECHANISMS AND STRATEGIES

9.1 Research capability strengthening

HRP and TDR were established in 1972 and 1976, respectively. GPA was established more recently. When founding the first two programmes, WHO aimed at assisting developing countries to develop the capacity and capability to define and address their own health research priorities. The two programmes are supported almost entirely through extra-budgetary funds and have a research orientation and therefore differ from most of the other WHO programmes, which are more oriented towards health care services. Since their founding, HRP and TDR have allocated up to one-third of their operational budgets to activities that are aimed at promoting research capability in developing countries. The approach for research strengthening has been to provide support to countries rather than to individual institutions. For this reason, institutions with a country or a

regional leadership role received higher priority. To implement their objectives, the two Programmes have established management systems that maintain a constant dialogue among WHO, developing countries, and the donors. RCS activities are overseen by a Research Strengthening Group (RSG) in case of TDR and by a Committee on Resources for Research (CRR) in case of HRP.

9.2 Objectives of RCS

One of the main objectives of RCS is to assist countries to develop self-reliance. This, in the words of the Commission on Health Research for Development, would enable countries to implement "essential national health research (ENHR)." National self-reliance has been recognized as a complex process which depends on several variables including social, political and economic factors.

RCS has to be approached in a holistic manner. Components of the process should include: improvement of infrastructures, development of human resources, support of returning trainees, support of postgraduate training, promotion of good managerial practices, and promotion of research networks. RCS must be in line with national health research needs. The two Special Programmes, and GPA should respond to these needs.

9.3 Strategies for RCS

Two strategies are used by the Special Programmes for RCS.

1. *The development of human resources through training.* The objective of research training has been to eventually produce an adequate number of leaders, researchers and support staff who are able to conduct quality research in the laboratory, clinic or in the field. Training has taken several forms including, for example, formal degree courses, short-term courses, visiting scientists grants, seminars and workshops.

2. *Institutional development.* Institutional support is provided to upgrade facilities and logistics to create a suitable research environment. It is provided through the award of various grants which are either long-term (LTS or LID), capital or small. Long-term support has normally lasted for 5 years and covers all or part of the following: equipment and supplies, salaries, consultant support, transport, library materials, data processing facilities etc. Also supported is the development of managerial skills and evaluations as a tool for better management.

10. COMMON RESEARCH INTERESTS OF HRP, TDR, AND GPA

10.1 HRP and GPA

A meeting of African researchers in the fields of reproductive health and HIV infection and AIDS was held in Kenya in 1987. The objective of the meeting was to examine how HIV-AIDS affected reproductive health and to identify priority research needs. Some of the issues discussed touched on HIV-AIDS as it affects obstetric and gynaecological practice, paediatrics, family planning programmes and the youth.

Some of the broad areas identified as needing further research included:

1. information, education and communication (IEC), e.g., knowledge, attitude and perceptions (KAP) and behavioural studies, assessment of IEC methods, counselling;
2. sexuality and cultural practices;
3. condoms and spermicides, e.g., use and acceptability of lubricated condoms and vaginal sponges as preventive measures
4. role of other STDs in HIV transmission;
5. contraception and HIV infection;
6. prevalence studies, e.g., various high-risk groups;
7. youth and infection, e.g., sexual behaviour, adolescent pregnancy and HIV infection, STD and HIV infection;
8. pregnancy and infection, e.g., outcome of pregnancy, vertical transmission, breast-feeding, fetal abnormalities; and
9. risk of health workers to HIV infection.

The above outline indicates some of the areas of common interest where both Programmes could have joint projects in countries or institutions receiving support from them. The list is by no means exhaustive but it serves as an indicator that there is considerable common ground for the two Programmes to coordinate their efforts.

10.2 TDR and GPA

An informal consultative meeting on the interrelations of tropical diseases and HIV infection (TDR/GPA/TD-HIV/87.3) was held in Kenya in December 1987. The meeting which attracted participants with expertise in both tropical diseases research and HIV infection not only examined areas needing further research but also addressed methodological issues for selected studies.

The information available at that time regarding HIV and malaria, mycobacterial diseases (e.g., leprosy), protozoan diseases (e.g. African trypanosomiasis, Chagas disease, leishmaniasis) and helminthic diseases (e.g., schistosomiasis) was reviewed and gaps in knowledge identified. Taking malaria as an example, some of the following areas were identified as needing further study:

1. assessment of the influence of HIV infection on the course of malaria infections, e.g., risk and severity of clinical malaria, response to treatment, reactions to antimalarial drugs, tropical splenomegally syndrome; and
2. assessment of effects of malaria infection on the evolution of HIV infection or disease, e.g., perinatal transmission, malaria and course of pre-existing HIV infection.

Similar reviews were made for all the other areas mentioned above. The above WHO document with some updating clearly identifies areas where collaboration between the two programmes is possible. Again it is possible to use some of the identified studies for RCS activities in institutions which both Programmes wish to support.

11. RECOMMENDED RCS STRATEGIES FOR LDCs

11.1 General remarks

LDCs are a subgroup in the poorer half of the developing countries. Whereas some of the proposed strategies for RCS are specific to these countries, others are more general in nature and are applicable to the rest of the developing countries.

RCS aims at building the capacity of a country to be self-reliant in conducting research on health issues that the country considers to be of high priority. The entry point for RCS initiatives within a country is

high priority. The entry point for RCS initiatives within a country is usually an institution. For the purposes of this report we define an institution as follows: "an organized entity incorporated within a country, with a specific mandate and objectives, established with a view to fulfilling national needs. It usually takes the form of a critical mass of scientists and support staff, housed in an appropriate physical structure and provided with requisite facilities to enable them to discharge the mandate. It could be within a University, government or private sector, with a certain continuity of effort (although it may change its course to suit changing needs). It should have a structure of governance and management and resource inputs to enable it to function in an effective manner. It may establish linkages with other institutions, national and international, in a networking process. In some instances in the least developed countries the institution may be in the early stages of development."

RCS activities at the country level will have a greater chance of success and sustainability if they are part of national endeavour to set priorities for and to build capacity in essential national health research (ENHR). To this end the three WHO Programmes should promote and spearhead efforts to initiate the development of ENHR at the country level. Such efforts should be coordinated with bodies such as the Task Force on Health Research for Development that are similarly engaged in assisting countries to build ENHR capacity. Health problems addressed by the Special Programmes relate very closely to needs of LDCs. RCS efforts of the Programmes in these countries will therefore be relevant and responsive to their needs.

Training to develop human resources for health research has particular strategic importance as a means of RCS. Training can be formal or informal, short or of long duration, degree or non-degree oriented, etc. Whatever its type, the training should result in the acquisition of requisite knowledge and skills needed to conduct essential health research.

The favourable attitude of donors towards LDCs expressed at the United Nations Second Conference on LDCs in Paris in 1990 should be drawn upon when attracting financing for the implementation of proposed joint RCS activities. In the meantime the three WHO programmes should significantly increase their support for RCS in LDCs.

11.2 Country approaches

An early and country-specific step is to stimulate and facilitate a candidate LDC to take an overview of its research organization and environment. This initial survey should: (a) examine such basic aspects as

the existence or non-existence of research coordination mechanisms (e.g., research ministries, councils, institutes); (b) gauge or feel for evidence of national appreciation for research (policies, political commitment); and (c) identify potential collaborating institutions and potential researchers and research leaders. Good indicators would establish sound basis for the next set of moves or plans.

It is important to endeavour to create awareness among the political establishment and other decision-makers to garner support for health research as an instrument for promoting health. This step is vital if any research initiative is to be sustained. The value of research as a tool for development should be highlighted, and it should be clarified that research need not be "threatening". This is particularly necessary when dealing with research that touches on sensitive areas where managerial or other weaknesses may come to light (e.g., health systems research). It should be stressed that health research is important for improving systems and services.

It is the responsibility of countries themselves to select research institutions for further development. The Special Programme may assist in this process but national leaders should play a full part in the exercise. In selecting an institution, its future potential role in national health development should be borne in mind. No institution or accompanying jobs should be created if they are likely to prove redundant in the foreseeable future. Evidence of clear research career systems should be considered as a positive index of national awareness and commitment to research. Training of staff and provision of other support to institutions provided by donors should be done so as to facilitate the eventual control of these institutions by the national authorities, which is the aim for any assistance given. Donors should encourage and facilitate the development of national coordinating mechanisms for health research.

National assessment of health needs and, more specifically, research needs in tropical diseases, reproductive health, and HIV/AIDS constitute an important step. During the exercise of needs assessment a survey of existing infrastructures and manpower, identification of researchable health issues, and significant constraints should be made. Participation to this conference should be wide and ought to include researchers, decision-makers and prospective donors. Ideally, the coordinator of this meeting should be a local person for future follow-up purposes.

At the end of the needs assessment meeting, a list of health research

priorities should be drawn. Documentation of these priorities should be of value for the government in marketing its research programmes or when considering donor assistance. The three Programmes, particularly HRP, have supported the organization of such meetings in developing countries. In sub-Saharan Africa, where most of the LDCs are located, there is a great need to have similar assessments undertaken. Research becomes a more powerful and significant tool for national development and planning if countries themselves draw up their own research priorities and set their own agendas. The undertaking may not always be easy due to lack of reliable data and local expertise. Consultant help may therefore be needed by a country. The Programmes have an important role in facilitating this important step. The expressed health research needs of the country should take the highest priority in donor assistance programmes.

Support including training should be country specific and directed to fill gaps revealed by the needs assessment exercise. Efforts should be made to link research to services with in-built mechanisms within projects for feedback of results to health administrators. To start the development of a research tradition, the introduction of appropriate research projects in the curriculum for students of medicine and nursing is useful.

Research in LDCs should be directed towards solving priority problems. The aim of research should be to provide ministries of health with solutions to prevailing health problems or information needed to make rational decisions. With this approach ministries of health and governments will increasingly appreciate the value of research, and hence will be encouraged to provide more support to it. Therefore, it may be a better strategy in the initial stages to lay greater emphasis on topics such as health systems research, epidemiology, health economics, social anthropology, and operational and applied research. Whereas sophisticated research may not be appreciated in the early stages, information on such topics as contraceptive use, fertility rates, teenage pregnancy, STD, prevalence of parasitic disease, vectors of disease, drug resistance in malaria, field diagnostic tools, etc. will have a bigger immediate impact.

The three Programmes should collaborate in research capability strengthening activities in three to six countries in the least developed category within the next 12 months. Other Divisions within WHO and the WHO Regional Offices and the Task Force on Essential National Health Research should be involved in this exercise.

11.3 Institutional support

When planning support for LDCs, it should be borne in mind that they are not all at the same level of underdevelopment. The type and degree of assistance should be related to the level of underdevelopment in order to minimize the risk of failure. Some of the risk-reducing measures include intensified training prior to institutional support, more formal or informal networking (South-to-South or South-to-North), carefully selected research projects, funding at a higher level and for a longer duration, more frequent monitoring including expert visits, etc.

Potential research leaders should be identified early and assisted in the development of their research careers through additional support to their projects, re-training and exchange visits. Training of research leaders and managerial skills should not be overlooked since sound managerial practices are crucial to the success of research institutions.

Infrastructural support for institutional development should be closely linked to the development of human resources. Training has continued to play an important role in the success of institutions. The three Programmes could offer selected joint training courses in countries particularly for certain universal support skills such as research methodology, research management and use of computers. Two of the risk reduction measures referred to earlier were frequent expert visits and increased monitoring. These requirements will demand man-hours that may not be met by the Programmes' Secretariat staff. In any case, some LDC institutions will need specialists to establish programmes and assistance in resolving urgent issues faster and on the ground. For selected institutions in LDCs this should merit the recruitment and secondment of scientists who are conversant with their problems for periods of up to 12 months. Such a measure could prove of great value during the formative period of an institution.

11.4 Research and training

In most LDC institutions, it will be advantageous to conduct a training programme in the context of a package that provides an "enabling research environment" following the completion of training. Such a package should take into account relevant and feasible research projects, provision of materials for research, personal support where applicable (e.g. a salary supplement). Re-entry grants are a useful mechanism for initiating research in a trainees' home country after a period of training abroad.

In the early stages of institutional development, research should be kept practical and relevant to disease control or health systems management and appropriate to the level of the country's technological development. The quantity and sophistication of research should be an incremental process based on progress indicators. However, quality of research should not be compromised at any stage. Social science and behavioural research should be recognized as essential to RCS strategies.

A lack of experience in research protocol development is a major handicap for young researchers especially in countries where peers are few. The confidence of young researchers should be enhanced through the provision of support in protocol generation, development and execution. Staff of the three Programmes, or experts identified by the Programmes, should spend time with the young researchers and go through the motions of preparing good proposals. Whereas this approach may appear cumbersome, it is nonetheless a vital step in a research career development.

Where research personnel are scarce and basic facilities are inadequate, as will be the case in many LDCs, it will be preferable to start with training programmes before embarking on major infrastructural institutional development. This step-wise approach should ensure that resources are carefully sequenced and do not unduly stretch donor resources or provide institutions with facilities that are not of immediate use. Training should stress technical skills to create a "do-it-yourself" attitude and ability.

In organizing training programmes, the use of national and regional facilities and resources should be considered first before looking at industrialized countries for placement. Training within a country or region minimizes possible brain drain. Moreover, it is cheaper and more relevant. It also ensures availability of the trainee's services within the country and region where few of his or her skills may be available. Training should provide tools or essential technology for research and must improve the trainees' scientific and technological absorptive capacity.

In LDCs, even more than in other developing countries, it is essential to train other research staff including technicians, nurses, etc. Support and encouragement should be given to the formation of research teams that involve non-physicians. This may call for collaboration with non-biomedical faculties or institutes that have relevant disciplines such as sociology, demography, statistics and economics. The maximization of available local human resources will provide added benefits.

When used judiciously, consultants, seminars, workshops and other informal visits provide useful inputs into training. Over-reliance on consultants should however be avoided due to problems of cost among other reasons.

11.5 South-South and South-North linkages

An important consideration for LDC institutions is the identification of neighbouring support (stronger) institutions. As a form of South-to-South linkage, if compatibility can be found between an LDC institution and another stronger institution within the region, exchanges of expertise between them will be mutually beneficial to both institutions. Such collaboration should be actively promoted and supported in all ways by the three Programmes.

Some of the centres previously supported by the Special Programmes which have continued to be active in research and that show promise in network activities should be developed further into centres of excellence which will support nearby LDC institutions. This would make South-South linkages a reality. The creation of new centres or a few international centres of excellence is not a good idea. International centres are costly, are seen as an imposition and are unlikely to be responsive to research on local health needs or significantly engage in training of local staff.

Complementary to South-South collaboration will be the need to establish links between LDC institutions and advanced institutions in industrialized countries (North-South exchanges). The attendant risk in the North-to-South linkages is the temptation for the stronger developed country institution to exploit the weaker (South) partner. However, if a sincere relationship can be built up between North-South institutions such an association will be mutually beneficial. The LDC institution will benefit from training opportunities, research implementation, supervision and evaluation, among other things.

Collaborative ventures (South-South or North-South) will further assist the three WHO Programmes in providing additional experts for site visits. Site visits to institutions have proved to be of great value. Scientists from the stronger institutions however need to understand the objectives of both the WHO Programmes and the recipient countries so that true partnerships can be cultivated. Patronising attitudes by visiting experts can do harm.

11.6 Collaboration and resources

This should enable institutions to channel all needed resources into specific objectives, and this exercise also helps the donors to appreciate more clearly the actual requirements. This requirement should start by ensuring coordination of efforts within WHO and especially among the three Programmes. As examples of coordination, needs assessments could be undertaken jointly, consultancies could be shared, certain training workshops, (e.g., epidemiological methods or computer applications) could be organized jointly. In time and where possible other donors should be encouraged to contribute towards national RCS activities and work together with the three Programmes. RCS support once started should remain open-ended with no time limitation. Review mechanisms that allow for incremental assistance, reduced support for satisfactory development or termination of grants for lack of progress should be in place. Planning for support for at least 10-15 years is realistic. Donors should be made to appreciate that assistance for RCS in LDCs should be flexible to cater for varying situations.

A forum between Special Programmes and major donors to consider and approve the degree of intensive care to be provided will pay dividends and ensure good return on investment. A committee of the WHO Programmes and willing donors such as SAREC or IDRC could serve as a starting point for collaboration between various donors.

12. INSTITUTIONAL FRAMEWORK

12.1 Coordination at WHO Headquarters

The Secretariats of HRP, TDR, and GPA are well set to collaborate. The two older Programmes (HRP & TDR) already have stable administrative and scientific mechanisms in place. These include mechanisms used in both Research and Development and Resources for Research components of the Programmes, which are well suited to respond to the needs of LDCs.

The Programmes may wish to establish a small in-house committee to discuss support to LDCs. This group would meet informally or formally several times a year and revisit problems and plans of LDCs. To enable a wide WHO participation, the WHO Office of International Cooperation and the Office of Research Promotion and Development could be part of

this committee. Other interested parties from WHO might also be invited. The committee would appraise the Directors of Special Programmes who in turn would use mechanisms available to them for further action.

12.2 Coordination at the regional level

Regional Offices should continue to play an important role in health policy development and programme implementation in the LDCs. There is need therefore for the three Programmes to work with appropriate officers in the Regional Offices. WHO Regional Offices are well placed to provide information on countries, select countries and institutions, and to participate in needs assessments and in the mobilization of regional resources including the South-South linkages. At the country level, the WHO office could play a pivotal role in helping coordinate donor assistance and maintaining regular dialogue with policy-makers in ministries of health. If the WHO country offices in the LDCs are strengthened sufficiently they should be in a position to keep the WHO Programmes apprised of the progress of institutions receiving support. This information would be of value for further planning.

12.3 Use of other donors facilities

Some donors have regional offices in developing countries. It may be useful for the WHO Programmes to explore the possibility of using those facilities for coordination of activities such as training seminars, scientific meetings, dissemination of results, etc.

12.4 Dissemination of research results

Policy-makers and consumers of research are usually not involved in the planning of research. Researchers tend to work in isolation and usually present their findings either at specialized meetings or in scientific journals. The latter are few and often not locally available. Scientific meetings are patronized by a limited number of people and discussions held in these meetings rarely reach the public domain.

There is therefore a case for wider dissemination of research results in a language that can be understood by the general public. Country networks of formal and informal meetings should be promoted. At some of these national seminars policy-makers and health personnel should be invited to participate. Scientific writers should find a place in research establishments to help simplify research finding and to develop other avenues of

communications including the public media.

Policy-makers and disease control workers should as much as possible be encouraged to participate in the selection of health research priorities. Needs assessment meetings should provide a useful starting point for this exercise. Researchers should also from time to time prepare reports of their findings for ministries of health. This could be in the form of technical reports, monographs, etc.

Collaborative networks within the Regions should continue to be promoted. These serve as forums for sharing knowledge on common problems and encourage joint research and the sharing of facilities. The three Programmes and other donors should take steps to facilitate the dissemination of results as part of institutional development in LDCs. Data available within WHO should be availed to countries to foster rational planning processes.

Relevant regional coordinating organizations that are involved in information exchange should be utilized. An example is FAMESA in the East African region. There may be other similar bodies in the same and other regions.

12.5 Transfer of technology

One reason that developing countries lag behind in development is that they are short of technology of their own. There are of course problems of application and sometimes misapplication of the same. The development of appropriate technology and its application needs a good scientific base with sufficient manpower and well equipped and adequately funded infrastructures. Purchase of technology is costly and is one reason for the growing gap between the rich and the poor. Some developing countries have now attained a fairly high level of advancement and are generating technologies that they are marketing to industrialized countries and other developing countries. LDCs are not in a position to make major technological breakthroughs for reasons already outlined above.

In case of LDCs at the present time the issue is that of transfer of appropriate technologies. There are at least three transfer points that are relevant to this consultation:

- (a) the three WHO Programmes;
- (b) collaborating laboratories (South-South, North-South); and
- (c) industry.

The technologies transferred from developed countries to the developing ones are often inappropriate for the real needs of those countries. In the context of health research in LDCs, the best means of technology transfer is likely to come from collaborating laboratories whether in a South-South or North-South arrangement. WHO and the three Programmes have a useful role in this process by acting as partners in the processes of choice and advise. They of course will have their own technologies to transfer. They are well placed to do this effectively. Where collaboration with industry is deemed necessary (e.g., testing of a drug or device) then the three Special Programmes should join in with other partners and assist the LDCs in making rational choices.

For effective technology transfer there is great merit in providing the right type of training to both scientists and technologists. Good training of the latter is very important. For the former, hands-on training in laboratory techniques and their application is vital. Training of both cadres in the context of their own environment is important for relevance. The buildup process following initial training should be gradual without making major leaps that leave gaps (e.g., the use of automated equipment instead of simple titration). The system should not get asphyxiated through over enthusiasm, rather it should be tailored to ensure that introductions can be absorbed and do not distort choices.

The Programmes (HRP and TDR) through the mechanisms of institutional strengthening (RSG, CRR) in close collaboration with Steering Committees or Task Forces should assist in making the right choices because they should be in a position to understand the condition of LDCs. After all these bodies have a large number of developing country scientists.

13. FINANCIAL IMPLICATIONS

It has been demonstrated that LDCs are operating within severe financial constraints while at the same time their health burden is heavy. In these countries investment for health and health research in particular is extremely low. There is an urgent need therefore to raise the level of investment for health research in LDCs as a means of generating tools to improve their status of health. This calls for more commitment by donors and better cooperation between them.

All the strategies proposed for LDCs carry a price tag with them. For example, intensified training will require more money for larger numbers

of trainees. In addition, to raise and update technical skills a trainee will need more frequent retraining in the form of VSG, seminars, postdoctoral attachments, sabbaticals, etc.

The returning trainee will also need support to operate smoothly within an enabling research environment. This may require support in the form of transport for field research, laboratory supplies, basic equipment and, scientific literature.

In due course material support to institutions will be a vital part of the RCS exercise. Although the requirements for institutional support will vary from institution to institution depending on its strength and the type of research being supported, some of the major components of this process will include the provision of equipment, supplies, specialized physical facilities, other supporting services (e.g., data processing facilities, library). Additional to this will be expert visits, salary supplements, etc. All the above, even though at this stage may not be costed in monetary terms, demand the following:

1. More cooperation is needed between the three Programmes and other WHO systems so that all resources can be directed towards common objectives in RCS.

2. The three Programmes should strengthen their support for LDCs. The fund should be exclusively used for RCS activities in these countries but administered through existing mechanisms. The fund could also serve as seed money for an LDC initiative to which other donors could be invited to contribute.

3. More coordination is needed between the donors. The major donors of health programmes, including research, need to create a forum for exchange of information. At these forums achievements can be reviewed, coordinated plans drawn, and financial requirements articulated.

4. A higher level of financial inputs will be needed. With LDCs receiving less than 0.5% of the funds allocated to research there is a case for raising this amount substantially towards a more realistic figure of 5-10%.

5. Open-ended support should be planned since some institutions will take long to develop to an acceptable level at which they can compete for funds on merit.

6. More national commitment in support of health research is a vital first step in guaranteeing viability. The degree of national commitment required should not at least initially be expected to be matched by major financial contribution at the beginning.

7. SAREC and IDRC have had considerable experience of working in LDCs, especially in sub-Saharan Africa. Their experiences could be shared with the WHO Programmes and cooperation negotiated between the agencies.

8. WHO as a whole, and the three Programmes in particular, will require additional donor support because of the extra needs of LDCs. An attempt to cost these needs should be made with a view to presenting the donors with a request for extra funds.

While this report is calling for increased financial inputs to support more and higher quantity of essential health research in LDCs, it also needs to be pointed out that individual research projects need not always be too expensive. Very useful data can be obtained from relatively inexpensive but well designed projects. It is preferable to place emphasis on quality and relevance rather than quantity.

14. CONCLUSIONS AND ACTION PLAN

14.1 Conclusions

The participants welcomed recent efforts within the Organization, of which this Consultation is an example, to coordinate RCS activities of the three Programmes. The Group expressed the hope that this initiative will be expanded to other Programmes within WHO. The participants recognized that there were different levels of development in relation to research capacity within the category of LDCs and that the classification of LDCs based on economic indices alone was inadequate for the purposes of RCS.

The participants reaffirmed the view that RCS activities should apply equally to LDCs as much as to other developing countries, but that different strategies may be necessary in case of the former.

The participants expressed concern about the apparent fragmentation of RCS activities at the country level and to an extent within WHO, and welcomed recent efforts within the Organization to produce a "harmonized" strategy.

The participants fully recognized the fact that LDCs have major health needs and welcomed the recent WHO effort to highlight this issue at the recent United Nations meeting on LDCs in Paris.

The participants believed that creation of self-reliance to conduct essential national health research will contribute significantly in finding solutions to some of the critical health problems afflicting these countries. The current RCS initiatives of the three Programmes are vital to the success of national initiatives to develop health research capacity.

Although re-allocation of available resources of the three Programmes will be of value for RCS initiatives in LDCs, the participants strongly felt that meaningful and sustained initiatives for LDCs will need additional funds. The Group expressed hope that donors will see and respond to this need.

Better coordination of donors activities at the country level would be a useful way of mobilizing more resources that would make RCS a more positive country effort.

14.2 Initial action plan

In the next twelve months the Special Programmes should select three to six countries for LDC initiatives.

Health profiles of these countries should then be prepared in collaboration with the Programmes and other relevant WHO Divisions.

Health needs assessment should follow for each of the countries. More specifically health research needs should be identified within the framework of essential national health research.

In the meantime a body could be formed at the country level with assistance from WHO and the Task Force on ENHR, to coordinate essential national health research.

Key individual players and institutions are to be identified at an early stage to allow for training to commence at the outset.

A few projects within the essential national health research agenda and also within the mandates of the three Programmes should be initiated in the same period of time. At the level of the three Programmes, internal

mechanisms for coordinating LDC initiatives with other relevant WHO divisions should be established. The Programmes could take a special lead in promoting better integration of RCS activities within WHO. The Task Force on essential national health research has a particularly important role to play in initiating ENHR at country level and in coordinating international efforts in this regard. The three Programmes ought to work closely with the Task Force in catalysing national efforts in health research.

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