
Review of Danida Funded Research in the Health Sciences

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Table of Contents

1. Introduction	139
2. The International Health Research for Development. Landscape and Context	140
3. Danida Funded Development Research in Health Sciences ENRECA health research	143 143
4. Conclusions, Issues and Recommendations	164
 Annex	
1. Terms of Reference, Health Team	171

1. Introduction

The Minister for Development Co-operation of Denmark has appointed an international Commission to present options and recommendations for a new strategic framework for Danish development-related research. The Commission is supported by a team from the Chr. Michelsen Institute, Bergen, Norway. This support team has contracted three specialist review teams, one with reference to health sciences. The specialist review team (health sciences) is composed of Professor Claus Ola Solberg, a specialist in internal medicine and infectious diseases, who is attached to the University of Bergen, and Professor Pieter Streefland, a specialist in health and development, who is attached to the University of Amsterdam and to the Royal Tropical Institute, Amsterdam, and who is also a member of the Commission.

The specialist review team (health sciences) started its activities in October 2000. With support from the ENRECA (Enhancement of research capacity) Health Network it collected written material from Danish research institutes, submitted a brief questionnaire to Danish researchers and their partners engaged in ENRECA projects, and paid visits to research centres and had interviews with Danish researchers. Regrettably, the team was not able to have discussions with the senior researchers in the South who are the partners of the Danish researchers. To get information on their views, the team had to draw upon the recently completed ENRECA evaluation.

It is clear that the team only had limited time to do its work. Its task was not to evaluate, but to describe and assess the Danish development-related health research sector, its position in the international research landscape, and to provide recommendations towards further strengthening of the sector.

The report contains three chapters: one on the international health research for development landscape, one on the Danida funded health research for development (ENRECA projects and The Danish Council for Development Research projects), and finally a chapter with conclusions, issues and recommendations.

2. The International Health Research for Development. Landscape and Context

In late 1987 the independent international *Commission on Health Research for Development* began its activities. The Commission was headed by John Evans, then Chair of the Rockefeller Foundation (RF)'s Board of Trustees and Lincoln Chen, then Professor of International Health at Harvard, now Vice-President of the RF, was heading the secretariat. Among its members the Commission counted heavyweights from the South, including F.H. Abed, Gelia Castillo, A.O. Lucas and V. Ramalingaswami. The Commission held a range of consultations and commissioned various studies, e.g. on global health research financing patterns and on disease control priorities in developing countries and presented its final report *Health Research Essential Link to Equity in Development* in 1990. The Commission's recommendations emphasised (1) strengthening of national, problem-oriented research capacity, which it called Essential National Health Research (ENHR); (2) enhancement of international research networks; (3) sustained strengthening of global research financing; and (4) the establishment of an international mechanism to support strengthening of national research capacity. For this purpose in due course the *Council on Health Research for Development* (COHRED) was set up. It is placed in Geneva and Danida is represented on its board.

In the second half of the 1990's there were two important global level initiatives in the field of development-related health research. First, WHO established an *Ad Hoc Commission on Health research Relating to Future Intervention Options*, which in due course published its report *Investing in Health Research and Development*. The recommendations emphasised: the strengthening of national research capacity in developing countries; possibilities for co-operation between the public and the private sectors; the founding of an international discussion platform for governments and administrators from the South, donor representatives, and researchers. Second, the establishment of the *Global Forum for Health Research* in 1997.

In the following years the Forum organised an annual international platform meeting. Besides, it published its policy document *The 10/90 Report on Health Research 2000*, as well as some other reports.

The 1990's were characterised by a number of important changes in the fields of health policy, prevailing disease patterns, health research in developing countries, and overall social, economic, and political conditions in developing countries. They are briefly mentioned:

Health policy: internationally, and increasingly nationally, primary health care, including, for instance, the activities of village health workers, got out of sight. Instead, emphasis was put on the financing, the efficiency and the quality of the government health services. However, these days important PHC principles, notably equity and community participation appear to have a strong comeback. Another significant development is that the links between poverty-health-poverty have been put on the international agenda by WHO and World Bank. Finally, in the field of population, the 1994 Cairo Conference on population and development changed the long standing emphasis on fertility and demography to one on reproductive and sexual health.

Disease patterns: HIV/AIDS developed into a real pandemic, with dire effects in many developing countries, particularly in Sub-Saharan Africa. Apart from its enormous morbidity and mortality effects, it puts a big burden on the health services and on the educational, economic and administrative systems. In a number of Asian countries HIV/AIDS is becoming a very serious epidemic, but in others, including large poverty societies such as Bangladesh, it is as yet unclear how serious the epidemic will turn out to be. Major infectious diseases which pose a global burden are malaria and tuberculosis. There also is an increase in prevalence of chronic diseases, including mental health problems, which lately have become more prominent on the international agenda. Besides, some infectious diseases, including AIDS and tuberculosis have chronic implications. Among the poor in the South infectious illness are the major health complaints, although quite a number of poor households are facing the double burden of infectious and chronic illness.

Health research: measuring ill health for the purpose of problem formulation and priority setting gained much prominence. Accordingly, a concept like the Burden of Disease, and instruments like the DALY (Disability Adjusted Life Years) received much attention. As a discipline, health economics came to the fore, its work directed foremost at problems of health care financing. In clinical research the possibilities of DNA recombinant research and the results of the Genom project set the tune. Finally, organisationwise the increased attention for global public private partnerships (GPPP) in research must be mentioned. Examples are the support to children's vaccine research by the GAVI (Global Alliance on Vaccines and Immunisation), to HIV/AIDS vaccine research by the IAVI (International AIDS Vaccine Initiative), and to malaria vaccine research by the MVI (Malaria Vaccine Initiative).

Social, economic and political changes: First, in the wake of the demise of the Soviet Union liberalisation of the global economy took off, with implications for poverty conditions and prospects in many developing countries. It must be realised that in many places such impacts occur after economic recession in the 1980's and early 1990's and after the constraints of structural adjustment programmes. Second, closely related is the process of globalization of services, ideas, and interpretations, which has, for instance, implications for the spreading of biomedical concept. Third, rapid development of information and communication technology has facilitated the emergence of global and regional networks, and international partnerships. If and when it makes international journals more accessible it also will strengthen the Southern research base in other ways. Fourth, in many places civil war and political tension between states lead to large scale misery, migration, insecurity and instability, conditions which are absolutely not conducive to health development and related research.

In October 2000 *the International Conference on Health Research for Development* was held in Bangkok. It was attended by around 800 participants, by far most from the South. Among the participants were representatives from Danida and from various ENRECA health projects. The conference aimed to review health research over the past decade (since the Commission presented its report) and draw lessons for the future; agree on a common strategy for the future; and agree on a framework for improved international co-operation in health research. It is as yet too early to gauge to which extent the conference has attained its objectives, but personal experience indicates the following trend. First, there was not much information on what the ENHR approach has achieved thus far. Second, there was much demand from the South for support of their research capacity, both to raise its quality and to stop the brain drain. Third, there

was emphasis from the South on the establishment of regional networks and South – South collaboration. Fourth, the following guiding principles for health research for development, which were discussed widely in the trajectory towards the Conference, which included many regional consultations as well as analytical work, were emphasised throughout: equity, ethics, effective governance, health as a human right, the necessity of partnerships, and the importance of knowledge as a public good. In the coming months it has to become clear how the organisational implications of the Conference will be elaborated. Various possibilities have been mentioned and claimed, including strengthening WHO's role in controlling and convening health research for development; strengthening the COHRED secretariat to enable that organisation to provide more support at national level and establishing a new *Coalition for Health Research for Development*. The lessons presented at the International Conference on Health Research for Development in October 2000 form the basis for the present report on Danish health research assistance in developing countries.

3. Danida Funded Development Research in Health Sciences

The Danida funded health research in developing countries comprises 1) the support to the international public sector, e.g. WHO/TDR programme, 2) the ENRECA health research projects, and 3) the health research projects supported by The Danish Council for Development Research (RUF). The present report focuses on the ENRECA and the RUF projects.

ENRECA Health Research

The ENRECA programme in developing countries was initiated by Danida in 1989 as a bilateral programme within the fields of health, agriculture, other natural sciences, and social and behavioural sciences. The health issues include projects in 13 countries, 9 African and 4 Asian countries (Table 1).

The primary objective of the ENRECA health research projects is to support research capacity building in low-income countries in order to improve the management and control of the most serious public health problems in a sustained way and to stimulate the participation of local researchers in global health research collaboration. A secondary objective is the strengthening of the Danish institutional research base and the collaboration with institutions in developing countries. The ENRECA support is provided to individual collaborative research projects (“twinning arrangements”) through Danish research institutions which are responsible for the day-to-day management of the ENRECA support. Each ENRECA project aims at training 3-4 Ph.D. students over a 3-4 year period and also M.Sc. students.

Interdisciplinary health systems research is encouraged as a tool to monitor and evaluate health sector reforms. However, basic research is considered of utmost importance to combat malaria, tuberculosis and other serious diseases.

A project has a limit of 12 years. The financial support is about DDK 6 millions per project for a three-year period. To further support co-operation between health researchers within the ENRECA programme, a network has been established. The objectives of the network are further to strengthen cross-disciplinary and cross-institutional co-operation, to present information about project results, to facilitate dialogue between the project participants, Danida and the Danish resource base in international health, and to contribute to research capacity strengthening by organising Ph.D. courses.

In the following, the ENRECA health research projects and the Danish institutions engaged in these projects are briefly reviewed in alphabetical order.

Danish Research Institutions Engaged in the ENRECA Health Research Projects in Developing Countries

There are many relations between the institutions, both at an institutional and at a personal level. Institutes may be co-partners in ENRECA projects and researchers may meet in the field or at meetings of the ENRECA Health Network. Most institutions are in Copenhagen. However, efforts are made to include institutions outside the capital.

Centre for Medical Parasitology

The Centre for Medical Parasitology (CMP) was established in 1991, formalizing the close collaboration between research groups at the Institute for Medical Microbiology and Immunology and the Institute of Public Health, University of Copenhagen and the Departments of Infectious Diseases and Clinical Microbiology, the State University Hospital (Rigshospitalet). Research focuses on epidemiological, immunological, and pharmacological aspects of malaria and leishmaniasis and on health systems in low-income societies. Through ENRECA CMP has close collaboration with research centres in Ghana, Sudan and Tanzania and is active at The Graduate School of International Health, University of Copenhagen, African Malaria Vaccine Testing Network, European Malaria Vaccine Consortium, and European Malaria Vaccine Initiative. Collaboration is also established with The London School of Hygiene and Tropical Medicine. Grants are obtained from Danida, European institutions, and WHO.

Since 1991, 22 CMP students have obtained Ph.D. degrees and of these 11 were from Africa and 2 from China. Annually CMP publishes about 30 articles in international journals. The institutions hosting CMP do not have international health research and capacity building as their main objective, and have only been able to support CMP with laboratory space. Funds for running costs are limited and have to come from grants. The same holds for staff since only 2 staff members have permanent positions.

Danish Bilharziasis Laboratory

The Danish Bilharziasis Laboratory (DBL) is a private institution formally associated with the Faculty of Science, University of Copenhagen but with close ties to the Faculties of Health Sciences and Social Sciences. The University is represented on the Board of DBL. One staff member is an adjunct professor at the Veterinary High School, three staff members are external lecturers. DBL (formally established in 1964) has developed from a small laboratory on snail taxonomy and ecology in the control of schistosomiasis to a larger institution involved in training, research and technical co-operation in order to improve health conditions in developing countries, primarily through research on vector-borne water-related disease (e.g. schistosomiasis, filariasis and malaria). It is a WHO Collaborating Centre for Applied Medical Malacology and Schistosomiasis Control and a joint WHO/ FAO/ UNEP/ UNCHS Collaborating Centre for Disease Vector Control in Sustainable Development. The laboratory collaborates closely with other Danish institutions and institutions in several African countries. DBL receives the majority of its financial support from the Ministry of Foreign Affairs (Danida). In 1999, 7 African and 3 Danish students were awarded Ph.D. degrees within the framework of DBL's research programme, several students received their Masters degree, and more than 30 articles were published in international journals. Several workshops, seminars and courses were given. By the end of 1999, DBL had 26 scientific /project (academic) staff and 28 administrative /technical staff.

Danish National Institute for Educational Research and Royal Danish School of Educational Studies, Copenhagen

The Danish National Institute for Educational Research and the Royal Danish School of Educational Studies are engaged in the Kenyan-Danish Health Research Project (see later). This project is one of ENRECA's largest projects, comprising 10 institutions and 6 disciplines. The Danish National Institute for Education and the Royal Danish School of Educational Studies are involved in several studies of children at primary school age, particularly studies of the influence of antihelmintic drugs and nutrients on school performance and school attendance. The results obtained will be used to implement a better school health system. Other studies include health education and the impact of antimalaria agents and vitamin A on child development.

Department of International Health, University of Copenhagen

The Department of International Health (DIH) was established in 1998 at the Institute of Public Health, the Faculty of Health Sciences, University of Copenhagen. International health focuses on poverty related health problems and health systems in low- and middle-income countries such as analysis of the most widespread and serious diseases, e.g. tropical diseases, relationship between health systems and society, disaster management and prevention, and the impact of international health programmes. DIH has close collaboration with other Danish institutions (the Department of Health Systems Research, the Institute for Medical Microbiology & Immunology, the Laboratory for Medical Parasitology, the Institute for Anthropology, and the Danish Bilharziasis Laboratory, Copenhagen) and institutions in Sudan and Tanzania. Research focuses upon malaria, particularly resistance development, and refugee health. Teaching includes a one year Masters degree programme in international health for up to 28 students, many from developing countries. DIH is involved in several Ph.D. programmes and several articles published in international journals. There are only 2 permanent academic positions at the Department. Two more academic positions are funded by income generated from the Masters degree programme.

Institute of Anthropology, University of Copenhagen

Medical Anthropology has been a priority area at the Institute of Anthropology (IA) since 1986. Three of IA's 18 full time teaching staff specialise in medical anthropology and international health. Susan Whyte is the Professor, who works mainly in East Africa, focusing on local perceptions and treatment of misfortune, changing health care systems, pharmaceutical anthropology, and disability. Her two colleagues, both assistant professors, work on respectively reproductive health, gender issues, and family planning in Vietnam, and local understandings of AIDS, child illness recognition and treatment, and health reform in Uganda and Zambia. Of the other 15 IA staff, one associate professor has worked on AIDS in Uganda, and three staff members work in medical anthropology concentrating on problems in Denmark. The IA offers an introductory course in medical anthropology about every other year. In addition there are more ad hoc topical courses, e.g. on substance abuse, or African systems of healing. The IA contributes heavily to the annual Ph.D. course on topics in international health organised by the ENRECA Health Network, as well as to the Master's in International Health course. The IA has 20-30 Ph.D. students at any one time, including several from developing countries. About a quarter of these are in the field of health. Until now 11 Ph.D. projects in international health have been completed, and another 6 are on-going. The IA staff working on international health have an excellent network within Denmark, and close relations with medical anthropology institutes in the Netherlands and UK. Prof. Whyte is a board member of the Council for Health research in Developing Countries (COHRED).

Institute of Psychology, University of Copenhagen

Together with the Department of Social Pharmacy, the Royal Danish School of Pharmacy and the Department of Epidemiology and Social Medicine, University of Aarhus, the Institute of Psychology, University of Copenhagen has been engaged in the project: *Enhancement of research capacity in Nepal. A primary health care project*. The primary health care system in Nepal has several problems, not least lack of qualified health personnel, an unreliable health information system and lack of coordination of activities and planning. The aim of the present project is to strengthen multidisciplinary research competence in primary health care and the integration of primary health care into local communities.

Royal Danish School of Pharmacy

The Department of Social Pharmacy and the Institute of Medicinal Chemistry, Royal Danish School of Pharmacy are involved in 3 ENRECA health research projects. The Department of Social Pharmacy has been engaged in the project: *Enhancement of research capacity in Nepal. A primary health care project* (see Institute of Psychology, University of Copenhagen). The Institute of Medicinal Chemistry is engaged in identification of anti-malarial components in medicinal plants used for traditional therapy of malaria in Ghana. So far, 2 Ph.D. theses have focused upon this subject. In India, the Institute is involved in an extensive programme to improve the knowledge of medicinal plants and to develop traditional herbal medicine into new products. The project has hosted 2 national Indian Conferences on ethno-pharmacology. Ph.D. studies are being carried out and several articles are published in international journals.

Royal Veterinary and Agricultural University

The Research department of human nutrition, the Royal Veterinary and Agricultural University are involved in two extensive ENRECA health research programmes, one on *“Food and nutrition security in Bangladesh: Energy and micronutrients availability in rice-based diets”* and the other on the influence of nutritional status and micronutrient supplementation on disease pattern, child development and school performance. Several Ph.D. theses are completed and a number of articles are published in international journals.

School of Dentistry, University of Copenhagen

The School of dentistry is involved in a project to improve research in preventive oral health care and to develop a national oral health promotion programme in Madagascar. Nation-wide data on oral health have been obtained, training programmes for dental students have been implemented, M.Sc. degrees have been completed and Ph.D. students are enrolled. The future perspectives of the project are most interesting.

State Serum Institute (Statens Serum Institut)

The State Serum Institute is the national central laboratory of the Danish health care system, particularly focusing on prevention and control of infectious diseases and congenital disorders. The Institute has more than 1100 employees, houses 3 national and 7 international WHO Centres, and gives advise, nationally and internationally, on vaccine programmes, combating of epidemics, diagnostic services, and hospital hygiene. The Department of Epidemiology Research, the State Serum Institute is one of the largest epidemiological research environments in Denmark. The Department has contributed significantly to health research in developing countries, particularly Guinea Bissau. Malaria research has also been prominent at the State Serum Institute (S. Jepsen, M. Melbye, E. Petersen). The Department of Virology is involved in development of

drugs against hepatitis B and C in Egypt. Over the years, researchers at the State Serum Institute have been involved in many Ph.D. theses on health problems in developing countries and published a large number of articles in international journals.

University of Odense

The Department of Chemistry, University of Odense, together with the Department of Virology, The State Serum Institute, has contributed to establish an autonomous research unit in chemistry in Egypt for synthesis of new drugs against hepatitis B and C. Eleven Egyptian research fellows have been trained at the Danish institutions and are now ready to start synthesizing new drugs at the Menoufia University, Egypt. Four Ph.D. and 6 M.Sc. degrees have been completed and several publications have appeared in international journals.

University of Aarhus

The Department of Epidemiology and Social Medicine and the Department of Oral Epidemiology and Public Health, University of Aarhus are involved in 2 projects. Together with the Institute of Anthropology, University of Copenhagen both departments are involved in a community and health system research project in Uganda. This is a successful long-term, interdisciplinary project that has also resulted in several most interesting publications. The Department of Epidemiology and Social Medicine has also been involved in the project: *Enhancement of research capacity in Nepal. A primary health care project* (see Institute of Psychology, University of Copenhagen).

ENRECA Health Research Projects

Bangladesh

Food and Nutrition Security in Bangladesh: Energy and Micro-nutrients Availability in Rice-based Diets

Project Period: 1st and 2nd phases 1995-2003

Collaborating Institutions

- Institute of Nutrition and Food Sciences, University of Dhaka
- Grain Quality and Nutrition Division, Bangladesh Rice Research Institute
- Faculty of Fisheries, Bangladesh Agricultural University
- Royal Veterinary & Agricultural University, Copenhagen.

Objectives

To increase research and education activities in Bangladesh in the areas of nutrition and food supply, with particular emphasis on the applied aspects of the research and the dissemination of the results to the population and the decision makers.

Background

The project has an applied approach and multi-disciplinary focus, trying to combine agricultural, social and health aspects of nutrition. Emphasis is on providing training and research outcomes which will improve the link between food production and nutritional needs.

Activities

- Several Ph.D., M.Sc. and MPhil degrees have been completed
- Technicians and other staff have been trained in new methodologies and technologies
- Laboratory and library facilities in Bangladesh haven been improved
- Various courses for postgraduate students and junior researchers have been held in Bangladesh
- A Ph.D. project, RUF financed, on aquaculture in small seasonal ponds in Mymensingh is presently undertaken.

Conclusions and Perspectives

Nutrition is an important subject in Bangladesh and the partners in the country are all distinguished research centres. Capacity strengthening through training appears as yet to be the main thrust of the project. Nutrition is a field that is very well suited to a multi-disciplinary approach. Probably some more emphasis could be put on the conditions of the poorest category of consumers, particularly female-headed households, by studying their preferences and productive possibilities from an anthropological perspective. Both in Bangladesh and Denmark there are suitable specialist anthropological knowledge and skills available. Another venue to strengthen the project is to stronger link it to the Danish supported relevant sector programs in the country. There are promising starting points in that direction. It appears that the embassy may play a co-ordinating role here.

Egypt

Development of Drugs Against Hepatitis

Project Period: 1st, 2nd, and 3rd phases 1992-2001

Participants

- Department of Chemistry and National Institute of Liver Diseases, Menoufia University
- Chemistry Department, Tanta University
- Department of Chemistry, Odense University
- Department of Virology, State Serum Institute, Copenhagen.

Objectives

To establish an autonomous research in chemistry in Egypt for the synthesis of new drugs against hepatitis B virus (HBV) and hepatitis C virus (HCV). The drugs are to be tested at the National Institute of Liver Diseases.

Background and Activities

It is estimated that 350 mill. people are chronic carriers of HBV and 170 mill. of HCV world-wide. HBV causes 60-80 per cent of all primary liver cancers and both viruses are frequent causes of chronic liver diseases. In Egypt about 10 per cent of the population are infected with HBV and the mortality is 15-40 per cent. HCV infection is even more widespread. A vaccine is available against hepatitis B. Therapeutic agents include interferon- and lamivudine, a nucleoside analogue, for hepatitis B and interferon for hepatitis C. The therapeutic agents are expensive, the effect variable, and the side effects of interferon pronounced.

In the period 1992-1998, well equipped research laboratories have been established at the Department of Chemistry and the National Institute of Liver Diseases, Menoufia University. Eleven Egyptian research fellows have been trained at Odense University and the State Serum Institute and are now ready to start synthesizing new drugs (nucleosides) using the same procedures as they were taught in Odense. The activity of nucleosides against HBV and other microorganisms will be tested at the Institute of Liver Diseases, Menoufia University and at the Chemistry Department, Tanta University.

So far, about 500 nucleosides developed within this program have been tested for activity against HBV and HIV in Denmark, 3 postgraduate research projects are being established, 4 Ph.D. and 6 M.Sc. degrees have been completed and several publications have appeared in international journals.

Conclusions and Perspectives

The Egyptian researchers should now be able to implement advanced frontline research in their own country. Intensive training in Denmark is no longer needed and the resources may be used for new equipment and other running expenses in Egypt – a good example of Danish capacity building in an important health care field of Egypt.

Ghana

The Accra-Copenhagen Research Link – Malaria Research Programme

Project Period: 1st, 2nd, and 3rd phases 1993-2002

Main Collaborating Institutions

- Nogushi Memorial Institute for Medical Research, University of Ghana
- Department of Child Health and Centre for Tropical Clinical Pharmacology and Therapeutics, Korle-Bu Teaching Hospital, University of Ghana.
- Institute for Medical Microbiology and Immunology, University of Copenhagen.
- Institute for Medicinal Chemistry, Royal Danish School of Pharmacy.

Objectives

To increase the capacity of malaria research in Ghana at an international level by training of Ghanaian scientists up to Ph.D. level, and by training of Ghanaian technical staff.

Background

Malaria is a major health problem in Ghana and it is crucial to reduce the morbidity and mortality from this disease. Medicinal herbs are frequently used as anti-malaria agents by the people of Ghana. The effect of these herbs is not documented. The present project includes 4 components:

1. Identification of anti-malarial components in medicinal plants for traditional therapy of malaria.
2. Longitudinal studies of humoral and cell-mediated immunity against malaria in individuals with natural acquired immunity.
3. Studies of immunological factors involved in the pathogenesis and prevention of severe malaria.

4. Studies of alternative drugs (herbs) in the management of malaria. Component 4 depends on the results obtained in component 1 and is so far not initiated.

Activities

1. Traditional medicinal herbs as potential new antimalarials.
Compounds are purified by bioassay-guided fractionation followed by structure elucidation by spectrometry and other methods. So far, 2 Ph.D. theses have focused upon this subject.
2. Immunoepidemiological study of malaria.
Longitudinal studies of humoral and cell-mediated immunity have been carried out in several cohorts of up to 300 children for periods of up to 2 years. These studies are the subject of one Ph.D. thesis and several M.Sc. programmes.
3. Studies of pathogenesis of severe malaria.
Immunological parameters have been studied in several cohorts of hospitalized children with cerebral malaria, severe malarial anaemia, and uncomplicated malaria. Furthermore, a number of clinical studies (e.g. drug resistance, prognostic markers) have been undertaken. These studies form the basis of one Ph.D. programme and several M. Sc. programmes.

Other activities included several externally financed workshops and 3 projects in immunology. Fifteen very good articles, mainly on malaria immunology, are published in international journals. Collaboration has been established with The London School of Hygiene and Tropical Medicine, The University of Edinburgh, Institut Pasteur, Paris, The University of Tübingen and some other malaria research institutions.

Conclusions and Perspectives

Significant scientific contributions have been made in several fields of malaria research, particularly in epidemiology, immunology, and pharmacology. A malaria research laboratory has been established at the Korle-Bu Teaching Hospital and research in herbal medicine is upgraded. The research capacity of Ghanaian partner institutions has been markedly strengthened, and collaboration with other important international research institutions has been established. There is a strong and continuous interaction between the north and south partners. The education of scientific and laboratory personnel is very good. Overall the project is progressing very well and is consistent with Danida's policy. Possibly, the project may be improved by adding a component on use of antimalaria agents.

Guinea-Bissau

Long-term Community Studies to Evaluate and Improve Primary Health Care Programmes in Guinea-Bissau

Project Period: 1st phase 1997-2001

Participants

- Ministry of Health, Guinea-Bissau
- Laboratorio Nacional de Saude Publica
- Epidemiological Research Unit, State Serum Institute, Copenhagen.

Objectives

- To examine the long-term effects of the primary health care system in Guinea-Bissau focusing on mother and child health
- To build research capacity through training, particularly in epidemiology.

Background

The project builds on the renowned BANDIM Health Project, which was established in 1978. Essentially it entails continuous data collection on important epidemiological parameters in a number of communities. In addition, specific studies have been carried out, in particular on measles and measles immunisation. Guinea-Bissau is a poor and not very large Portuguese speaking West African society. The country went through the turmoil of a civil war in 1998/1999, and the project has been able to gain first hand information on the impact of such a disaster, which presently, unfortunately, prevails in several developing countries. The educational system, including that at university level, is weak; a public health school does not exist.

Activities

- studies on:
 - impact of immunisation campaigns
 - impact of immunisation versus naturally acquired immunity to measles
 - diarrhoeal diseases
 - clinical determinants of post-hospitalisation mortality at discharge
 - causes of major differences in maternal mortality in Guinea-Bissau
 - determinants of the survival of motherless children
 - HIV/AIDS and tuberculosis
- monitoring regional and ethnic differences in mortality and their relation to the use of health services
- building research capacity through training and education: at Ph.D., M.Sc., and, in the field, at lower levels.

Conclusion and Perspectives

Scientifically this is an outstanding project. Dozens of high quality papers have been published in international peer reviewed journals. Many Ph.D. candidates have been supported. Its findings may also be of great policy relevance, far beyond the country where they have been acquired. The training component appears to be strong. The project is well linked to research institutes in Gambia and Senegal. Its longitudinal approach and database are of great significance. Its weak spot is, however, its sustainability. Guinea-Bissau is not one of the Danida programme countries. Moreover, within the country a really good partner is lacking, which significantly limits the prospects of research capacity building.

India

Ethnopharmacology of Indian Medicinal Plants

Project Period: 1st, 2nd, and 3rd phases 1993

Participants

- Tropical Botanical Garden and Research Institute (TBGRI)
- Royal Danish School of Pharmacy, Copenhagen.

Objectives

- To contribute to knowledge about Indian medicinal plants
- To strengthen utilisation of herbal medicine in India by providing scientific validation and control of plant products used in the primary health care systems
- To develop traditional herbal medicine into new products for the Indian pharmaceutical industry.

Background

Herbal medicine plays an important role in developing countries. Biomedicine is, of course, also extremely popular when available, but is also relatively expensive and therefore not always accessible. Correct use of herbal medicine is important, as is the screening of plants and validation and control of new medicines.

Activities

- Joint research projects in phytochemistry and pharmacology
- Screening of plants
- Creation of a database of ethnomedical information
- Development of scientifically documented herbal medicines
- Training at various levels
- Organisation of conferences on Ethnopharmacology
- Establishment of a phytochemical laboratory at TBGRI.

Conclusions and perspectives

Ethnopharmacology and herbal medicine are important subjects in India. Herbal medicine plays an important role in the Ayurveda and Unani medical systems, as well as in folk medicine. Although biomedicine is an important subject as well, herbal medicine is often used side by side even if biomedical drugs are available. However, reliance on herbal medicine is most pronounced where biomedicine is least available or accessible. As to the future of this interesting and long standing project a few questions emerge. First, the relation with Indian pharmaceutical industry, presumably in the private sector, raises points of intellectual property rights; second, in Denmark there is a sound knowledge base on pharmaceutical anthropology (Prof. Susan Whyte and her group) that could be included for further enrichment of the project focussing on the use of herbal medicines, and on the relation between biomedicine and herbal medicine.

Kenya

Kenyan-Danish Health Research Project (KEDHR)

Maternal and Child Health in Bondo District (earlier Siaya District) – A Community Based, Transdisciplinary Study

**Project Period: 1st and 2nd phases 1994-2000
(3rd phase being prepared)**

Collaborating Institutions

Anthropology

- Institute of African Studies, University of Nairobi
- Institute of Anthropology, University of Copenhagen

Health Education

- Division of Health Education, Ministry of Health, Nairobi
- Royal Danish School of Educational Studies, Copenhagen

Health Systems Research

- Centre for Public Health Research, Kenya Medical Research Institute, Nairobi
- Danish Bilharziasis Laboratory, Copenhagen

Nutrition

- Centre for Public Health Research, Kenya Medical Research Institute, Nairobi
- Research Department of Human Nutrition, Royal Veterinary and Agricultural University, Copenhagen

Parasitology

- Division of Vector Borne Diseases, Ministry of Health, Nairobi
- Danish Bilharziasis Laboratory, Copenhagen

Psychology

- Departments of Educational Psychology, Kenyatta University, Nairobi
- Danish National Institute for Educational Research, Copenhagen

Objectives

To improve the health condition of the people of the Bondo district and neighbouring areas, focusing particularly on pregnant women and children.

To strengthen the research and training capacity of the participating institutions and to consolidate the interaction of the researchers.

Background

The health condition of the people of Kenya, as well as most African countries, needs marked improvement. Particularly this holds for pregnant women and for children. Such improvement is a multidisciplinary task, and in the KEDAHR project, more than 15 senior scientists and a number of Ph.D. and M.Sc. students and technicians within 6 disciplines are involved and linked together by a functional network of communication. The KEDAHR project is one of ENRECA's largest projects, comprising 10 institutions and 6 disciplines. The Kenyan institutions have received communication and laboratory equipment, computers, and literature. Because of the complexity of the project, a solid administrative unit with a permanent staff has been established in Kenya.

Activities

1. *Health systems research* aims at establishing vital health statistics such as infant mortality statistics, drug prescription patterns at governmental health care facilities and community-based pharmacies, and figures on the distribution of impregnated bed-nets. This information is vital for implementing health systems reforms. Daily life activities of children at school age and people's perception and practices related to nutrition and important diseases (malaria, worm diseases) are also being explored.
2. *Studies of children at primary school age* include prevalence of parasitic diseases, nutritional status, school performance, health education, and school attendance and absence. The results obtained will be used to implement a better school health system.

The influence of antihelmintic drugs and daily micronutrient supplementation on school performance and anthropometric and medical parameters is being studied.

3. *Studies of pregnant women and their new-born babies* include monitoring of the impact of an antimalaria agent and vitamin A on the morbidity and mortality from malaria and on child development, respectively. Socio-cultural aspects of pregnancy, child birth, and child care are also explored.

Participants of the KEDAHR project have also engaged in joint venture activities with agencies outside the KEDAHR framework, activities that are externally funded but carried out in the study area. The intention is to ensure that the research findings contribute to continuous improvement of health services. Several Ph.D. and M.Sc theses are completed. So far, publications in international journals are limited.

Conclusion and perspectives

The KEDAHR project is large and complex, and implementation of the extensive research and training activities of the project has represented a significant challenge. In fact, the progress in some fields has been slow. However, marked experience has been gained in research collaboration involving several disciplines – a type of collaboration that is highly needed in the health sector. Studies of health systems, school children, and pregnant women and infants seem to be progressing well.

Madagascar

Oral Health Systems Research Development and Implementation on Oral Health Promotion in Madagascar

Project Period: 1st, 2nd, and 3rd phases: 1992-2000

Main Collaborating Institutions

- School of Dentistry, University of Madagascar
- Copenhagen School of Dentistry

Objectives

- To improve local research in preventive oral health care.
- To establish a “training of schoolteachers” programme in order to improve oral health care.
- To develop a national oral health promotion programme in collaboration with the Ministry of Health.

Background

Traditionally, the prevalence of oral disease has been high in western industrialized countries. In recent years, however, oral health status, particularly in children, has improved because of better living conditions, oral health services, and self-care practices. In contrast, many developing countries, and particularly those where preventive oral care systems have not been established, are now facing the problems of poor oral health. In Madagascar, the prevalence of dental caries is disturbingly high, and it continues to increase. This is partly explained by the children’s increasing consumption of sugary foods, and partly by the lack of tradition of oral hygiene among parents and teachers.

Activities

- Nation-wide data on oral health have been obtained and analyzed.
- Courses and training programmes have been implemented for dental students, educational material has been developed, and schoolchildren have been taught dental care.
- M.Sc. degrees have been completed in Copenhagen and Ph.D. students are enrolled at the University of Copenhagen.
- Research and educational materials have been given to the University of Majunga, Madagascar and a department for community dentistry and a research library have been established. Also, postgraduate studies in Public Health (a 2-years M.Sc. and a 1-year Diploma) have been established. Workshops have been given for local researchers and technicians. Several articles are published in international journals.

Conclusions and Perspectives

The objective of future projects is to consolidate the research capacity at the dental school, University of Majunga and to expand the dental care programme to related fields of public health and medicine. Research activity will include analyses of oral health care data and programmes. Training at Ph.D. level will improve future research activity. Special emphasis will be given to communication of research findings. National oral health care programmes are to be developed in collaboration with the Malagasy Ministry of Health.

The planning of the project is well performed, the results obtained are of significant importance and the future perspective most interesting.

Mozambique

Danish-Mozambican Research and Research Capacity Development Programme in Malariology and Malaria Control. A Pilot phase Project

Project Period: Pilot phase: April 1999 to September 2000

Main Collaborating Institutions

- Instituto Nacional de Saude (INS) (National Institute of Health)
- Danish Bilharziasis Laboratory (DBL).

Objectives

- To establish the scientific, administrative, and collaborative framework for a future long-term research and research capacity development programme involving institutions in Mozambique and Denmark.
- To complete advanced research capacity training programmes for three researchers from Mozambique.
- To maintain malaria research activities at the National Institute of Health until a long-term programme has been established.

Background

Malaria is a major health problem in Mozambique, as well as in the other Sub-Saharan countries, and it is crucial that the morbidity and mortality due to the disease are reduced. The present project is based on the research capacity established during a

previous 9 years ENRECA project between INS and the State Serum Institute. Research in malaria control is urgently needed, e.g. to define more cost-effective vector control methods and better ways to ensure the use of bed-nets. It is also of utmost importance to reduce the steadily increasing parasite drug resistance and to develop better methods to deal with high-risk population groups. To facilitate the integration of the research findings into national control programmes the research and training capacity in Mozambique has to be improved.

Activities planned

In the pilot phase the framework for the future long-term research programme between Danish and Mozambican institutions will be defined. Funds have been set aside for completing Ph.D. programmes initiated earlier. A research component linked to a TDR project evaluating the geographical distribution of severe malaria in the Maputo Province will be implemented. A network of collaborators will be established.

Conclusions and Perspectives

A workshop on malaria control in Mozambique is to be held, comprising representatives from the Ministry of Health in Mozambique, Danida, INS and DBL and also international researchers. On the basis of the research priorities identified, a long-term research programme will be forwarded to Danida. Two students have completed their Ph.D. theses and one more student will enter a Ph.D. programme. The project is highly relevant and the planning of the long-term programme seems well in hand.

Nepal

Enhancement of Research Capacity in Nepal: A Primary Health Care Project

Project Period: Phase I 1993-1998

Participants

- Tribhuvan University, Kathmandu:
- Department of Community Medicine and Family Health, Institute of Medicine
- Department of Clinical Pharmacology, Institute of medicine
- Central Department of Sociology and Anthropology
- Central Department of Psychology
- The Royal Danish School of Pharmacy: Department of Social Pharmacy
- University of Copenhagen: Institute of Psychology
- University of Aarhus: Department of Epidemiology and Social Medicine.

Background

The research collaboration dates back to a pilot study of the pharmaceutical sector in Nepal carried out in 1991-92. Massive problems prevail in Nepal with regard to the activities and organisation of the Primary Health Care (PHC) sector, pertaining, for instance, to quality and utilisation of the services. Moreover, despite large scale support to the health sector by many donors, research activities and research training of local researchers in regard to PHC are underrepresented or lacking.

Objectives

- To strengthen multi-disciplinary research competence in the field of PHC, and thereby strengthen integration of selected PHC activities in local communities
- To strengthen the research competence of university students in Nepal
- To establish a relevant Ph.D. program at Tribhuvan University.

Activities

The objectives of the project are to be reached by integrating two development scenarios: a researcher training program and an interdisciplinary research program focussing on PHC. Studies undertaken include: the quality of data reported throughout the health information system (HIS), including immunisation coverage and maternal mortality; people's health care seeking behaviour; a user perspective on tuberculosis treatment; women's perceptions of autonomy, fertility choice, and reproductive health. Training includes Ph.D. training in Nepal and Denmark and supplemental graduate research courses in Denmark.

Conclusions and Perspectives

The project's focal area of PHC is of great importance in Nepal, but effective implementation of PHC in a socially and culturally appropriate way faces very substantial problems. Multi-disciplinary research is one major venue to finding solutions.

Development of both research and research training capacity is an excellent aim. The project has had to shift its original base in Jajarkot district to elsewhere due to political problems. In regard to content, quite some work has been established, particularly in fields of drug use and supply, and immunisation. Nepal has been open to the outside world only since the 1950's. It is a poor country and faces serious health and ecological problems. Its geography presents enormous challenges to the implementation of a basic health care system. The cultural diversity and socio-economic inequality among its population are, together with the mobility and economic problems, great challenges to finding an appropriate Nepalese form of PHC.

Establishing an ENRECA project as the present one in the Nepal society and university environment is a long and winding road. As is also the case in other developing countries, there is scarcity of high level research partners who can afford to spend much of their time on the ENRECA project activities. In this specific case it appears that also administrative problems at the Danish side have been a hindrance to the development of the project towards the next phase. The latest information is that it is highly doubtful that such a phase will ever be started, which is a great pity.

Sudan

The Sudanese-Danish Research Collaboration on Malaria and Leishmaniasis

Project Period: 1st, 2nd, and 3rd phases: 1991-1999

Participants

- The Departments of Biochemistry and Pathology, University of Khartoum
- The Centre for Medical Parasitology, University of Copenhagen (The Institute for Medical Microbiology and Immunology and the Institute of Public Health, University of Copenhagen and The Department of Infectious Diseases and The Department of Clinical Microbiology, Copenhagen University Hospital (Rigshospitalet)).

Objectives

To finalize ongoing studies in malaria and leishmaniasis immunology undertaken by four Sudanese students enrolled in Ph.D. programmes at The University of Copenhagen. Improved knowledge of the immune defense mechanisms against malaria and leishmaniasis is a prerequisite for the development of vaccines against these diseases.

Background

Malaria is one of the major causes of morbidity and mortality in Sudan and leishmaniasis is also a serious health problem. The participants of the present project have established several field sites for studies of these diseases, particularly epidemiological studies, and a high level of productivity has been documented, including a number of important publications.

In 1996, due to the political and human rights situation in Sudan, Danida decided to terminate funding of development projects in the country, including the ENRECA programme. However, some Sudanese students had entered Ph.D. programmes, after several years of preparation. Danida, therefore, decided to support these students to complete their studies at The University of Copenhagen.

The field sites are most valuable for further research and cannot easily be replaced. Through grants from WHO/TDR, the European Union, the Wellcome Trust, and the Council for Development Research, Danida, it has been possible to continue some of the projects. For a longer period, however, it is not realistic to keep the field stations running by means of short-term project grants.

Activities

Since 1995 the participants of the project have published about 50 studies on malaria and leishmaniasis in international journals.

The following studies (Ph.D. theses) are being completed:

- An immunoepidemiological study of malaria in an area of unstable and seasonal transmission in Eastern Sudan.
- The molecular mechanism of malaria resistance to anti-folate drugs.
- The pathogenesis of post kala-azar dermal leishmaniasis. A prospective longitudinal study of immunological parameters in patients with kala-azar.
- The pathology of post-kala-azar dermal leishmaniasis. A study of the immunohistology of the lesions and immunoreactivities in the peripheral blood.

Conclusions and Perspectives

The project in Sudan has been most successful both in terms of research activity and training. However, following the termination of the project in 1996, the leishmaniasis research has been markedly reduced. The leishmaniasis group at CMP was one of the largest in the world and recognized as a leading group. During a period of 10 years the group published more than 60 studies, and expertise was developed in molecular biology, parasite cultivation, histology, and animal experiments. Furthermore, a large bank was established of plasma and lymphocyte samples from patients with various forms of leishmaniasis.

When the ENRECA project was terminated for political reasons, the investigators made several unsuccessful grant applications to other funding organisations, and subsequently

decided to close the leishmaniasis work at CMP. Accordingly, 10 years of hard work and investment in research infrastructure may soon be lost. This clearly demonstrates the vulnerability of basing research on less secure short-term contracts when working in Africa. Consequently, it is important that Danida devises a system of bridging grants to solve problems of continuity when political matters interfere with research projects. Moreover, given the importance of the work done, continuation of research on leishmaniasis in other countries with Danida support might be considered.

Tanzania

Tanzanian – Danish Collaborative Research and Training Programme in Malaria, Bancroftian Filariasis, and Health Systems Research

Project Period: 1st, 2nd, and 3rd phases 1992-2001

Participants

- National Institute for Medical Research, Tanzania
- Amani Research Centre, Tanga Region
- University of Dar es Salaam
- Institute for Public Health, University of Copenhagen
- Department of Infectious Diseases, The State University Hospital, Copenhagen
- Danish Bilharziasis Laboratory, Copenhagen
- The Institute of Anthropology, University of Copenhagen.

Objectives

- To train Tanzanian scientists at Ph.D. and M.Sc. levels, laboratory technicians, and district health management personnel and to improve laboratory facilities in Tanzania.
- To improve malaria and filariasis control at district level and to stimulate national health care policies.
- To provide data for decision making by developing an appropriate health district information system.

Background

The problem of malaria and resistance to antimalaria drugs is growing in Tanzania. In the Muheza district (Tanga region) f. ex., resistance to common agents such as chloroquine and Fansidar has been reported to 80 per cent and continuous monitoring of drug efficacy has been advocated by the Ministry of Health. Furthermore, lymphatic filariasis is also a heavy disease burden in Tanzania, not least in the Tanga region.

Due to the health sector reform in Tanzania local needs have appeared for training of health district staff, particularly in using tools for the planning of health services. The Health sector reform causes marked organizational and managerial changes at the health district level. The impact of these changes on health care provision will be examined.

Activities

A controlled study of the efficacy and side-effects of Artemether, a new antimalaria drug, versus the currently recommended first line agent chloroquine has been carried out in uncomplicated malaria. Artemether proved most effective and no severe side-effects were observed. The eradication rate for chloroquine was only 50 per cent. This is a practical and important study. More recently, a study of the antimalaria effect of quine

has been implemented to see whether the effect of this important agent is declining. Since resistance to first and second line antimalaria drugs is spreading alarmingly in the Muheza district, the effect of another inexpensive antimalaria agent, co-trimoxazol, was studied. This agent seemed to be effective in uncomplicated, drug resistant malaria, but recrudescence was not uncommon.

Drug resistance of malaria was the subject of a workshop in Copenhagen in 1996 and was also the major subject of the NIMR annual meeting in 1997 where the results of the above malaria studies were presented. These studies and meetings were an impetus to establishing the East-African network to curb resistance development, and the ambition of the project participants, in collaboration of the London School of Hygiene and Tropical Medicine, is to establish Northern Tanzania as one of the world leading centres for malaria research. The activities within the programme will include all aspects of malaria from anthropology, through medical health care research and clinical studies to molecular biology.

Two Ph.D. students have completed their thesis, a Tanzanian physician has obtained her M.Sc. degree and more Tanzanian researchers are expected to obtain their M.Sc. degrees from Danish universities. In January 2000, the participants of The Tanzanian-Danish Collaborative Research and Training Programme in Malaria, Filariasis, and Health Systems Research together with The ENRECA Health Network, The Kilimanjaro Christian Medical Centre, The North/South Co-ordination Group, University of Copenhagen, and The Graduate School of International Health, University of Copenhagen arranged an extensive (8 days) cross-disciplinary workshop and Ph.D. course in malaria control in Africa (Rolling Back Malaria. Prospects and Constraints) in Arusha, Tanzania.

Conclusions and Perspectives

The Tanzanian-Danish Collaborative Research and Training Programme had a rather slow beginning but the activity in malaria research has increased markedly in the recent 3-4 years. Participants of this research and training programme are active in several national and international fora. The members of the Centre for Medical Parasitology (CMP) are active in the African Malaria Vaccine Testing Network (AMVTN), the European Malaria Vaccine Consortium, and the European Malaria Vaccine Initiative. Of the 3 training centres supported by the Gates foundation for malaria research (40 mill. US dollars), 2 are placed at CMP partner institutions in Tanzania and Ghana and the CMP has been invited by the London School of Hygiene and Tropical Medicine to become a partner in the research/training programme. Furthermore, members of the CMP are recipients of several research grants from the European Commission. Finally, the CMP publishes about 30 articles annually in international journals, many dealing with epidemiological, immunological and pharmacological aspects of malaria. Accordingly, participants of the Tanzanian-Danish Collaborative Research and Training Programme represent a productive environment that has managed to combine high-level scientific training and capacity building with a very good scientific out-put in Africa and Denmark (see also Sudan). A strong research environment in Denmark is a prerequisite for contributing to high-level research and training in Africa.

Uganda

Community and Health System: Interaction and Change in Uganda: The Tororo Community Health (TORCH) Project

Project Period: 1st and 2nd phases: 1994-2001

Participants

- Child Health and Development Centre, Makerere University
- Institute of Anthropology, University of Copenhagen
- Institute of Epidemiology & Social Medicine and
- Department of Oral Epidemiology and Public Health, Aarhus University.

Objectives

- To strengthen the Ugandan capacity to undertake strategic health research in primary health care and child health.

Background

The project is rooted in long standing research co-operation between Makerere University and the Danish partners. One focal point in this has been studies on the use of medicines. It focuses on long term studies in two districts in eastern Uganda. Starting from priority problems, including quality of care of the health services and malaria, emphasis is on multi disciplinary research (epidemiology and medical anthropology mainly, and to a lesser extent tropical medicine, Health Systems Research, health economics, political science and involvement of health services staff (district health teams)). Three perspectives are included: that of the providers, that of the users, and that of the interface between both.

Activities

- Related research projects on:
 - decentralisation, donor dependence, the relation between government and NGO health services, and financing
 - studies from the users perspective, which include cross-sectional surveys and in depth ethnographic community studies
 - quality of care at six health care units
 - training and education at different levels and in different appropriate ways.

Conclusions and Perspectives

This is an outstanding example of focused long term interdisciplinary and applied research, which bears rich fruits in terms of results. Several Ph.D.'s and many scientific articles have been completed. But, "noblesse oblige" and now that the project is almost entering its 3rd phase the following questions emerge: first, can the link to the MOH (and the sector programme) be strengthened, so that lessons learned get even better disseminated; second, is there a possibility to formulate approaches and methodologies which may be followed and applied in rather similar situations, including the bottom line requirements needed; third, is it possible to make links to other research institutes in Uganda, in order to build capacity on a still wider scale; finally, is the mix of studies optimal or would there be a niche for intervention studies.

Vietnam

Strengthening Reproductive Health Research in Vietnam: A Capacity-Building and Interdisciplinary Research Project

Project Period: 1st phase: 1999-2003

Participants

- Centre for population studies and information (CPSI), Hanoi
- Community Health research Unit, Hanoi
- Institute of Anthropology, University of Copenhagen
- Institute of Public Health, University of Copenhagen.

Objectives

- To improve the capabilities of researchers and research institutions in Vietnam to analyse and address reproductive health problems in effective and comprehensive ways
- To conduct policy- and programme-oriented research on selected reproductive health issues
- To strengthen the links between researchers and the users of research results
- To strengthen the Danish resource base in international reproductive health.

Background

Following the Cairo International Conference on Population and Development the till then prevailing demographic approach was changed to one which emphasises sexual and reproductive health needs and rights.

The government of Vietnam has endorsed the related programme of action, but practical implementation has not yet come off the ground. Yet, Vietnamese society is facing severe reproductive health problems. Abortion rates are among the world's highest, and maternal health is relatively poor, particularly in remote areas. There are indications that prevalence of STI's is high, and that the number of people infected with HIV/AIDS and other STI's are increasing. Infertility is a problem. There is a strong reliance on the intra-uterine device for contraception. A clear understanding among health staff at different levels of the concept of reproductive health and its implications appears still to be lacking.

Activities

- Research activities will strengthen research capacities and provide insight in reproductive health needs
- A comprehensive training programme, encompassing in-country short courses and advanced level training abroad
- Two Vietnamese institutions will receive infra-structural support
- Establishment of national and international linkages and networks will be pursued
- Through workshops and discussions linkages between research and the utilisation of results will be pursued
- Danish research capacity will be strengthened through participation of Danish senior and junior researchers.

Conclusions and Perspectives

This important project has only started at the end of 1999 and preliminary activities have been carried out. The subject is extremely relevant and it is hoped that experience gained in future will be used in other Danida programme countries as well.

Health Research Projects in Developing Countries Supported by The Danish Council for Development Research (RUF)

Approximately 130 research projects carried out by researchers affiliated with Danish research institutions are currently being supported by RUF. Approximately 60 projects are approved by RUF annually; about 14 are Ph.D. projects. So far, RUF has supported the education of 202 researchers in various fields of development research, and since 1978, 635 research projects have been carried out by means of RUF funding.

RUF supports research within all fields but with emphasis on natural resources, social conditions, and health. Grants are also provided for research professorships. RUF grants are not confined to projects directly related to conditions in Denmark's programme countries. However, the large majority focus on the conditions in these countries and the remaining projects tend to be of relevance for these countries. Although the main qualifications for a grant are scientific merit and a general bearing on development research, more and more emphasis is being placed on relevance to Danish assistance. In the period 1996-1998, grants were awarded to 26 projects in health sciences, including 11 Ph.D. projects. As many as 15 projects were affiliated with ENRECA health research projects.

4. Conclusions, Issues and Recommendations

Health research for development activities which are supported by Danida provides a differentiated picture. Some of the activities are carried out in the international public sector, for instance through Danida's financial support to the WHO/TDR programmes. Others have their base in Denmark, or in a partnership between a Danish research centre and its partner in the South. Here, we concentrate on the latter.

The quality and the volume of research output are good to very good, with some cases of outstanding work. There is a clear and strong orientation on publishing in international peer reviewed journals. Participation in international workshops provides another way of enhancing and securing the quality of research and publication. Given the limited size of the Danish health research for development arena it is of great importance that linkages to other arenas, research centres and individual researchers are fostered. For this purpose participation in international workshops and conferences to present research findings is essential, as is the organisation of such events in Denmark. The ENRECA Health Network has been very active in organising seminars and workshops on important subjects like HIV/AIDS, water and sanitation, food and nutrition, reproductive health and malaria. However, this valuable tradition must be maintained and even strengthened. Another point to be considered is to have international experts pay review and support visits to research centres every few years.

The limited size of the Danish research arena has its advantages. The main actors know each other well and communicate regularly through activities of the ENRECA Health Network. Lines of communication are short. But there is also another side to this. Maybe the specific organisational and institutional arrangements in this modest and closely knit arena change slowly, while in its international environment changes often occur rather quickly. The Danish research capacity is, further, highly stretched, which may constrain the elasticity necessary to adapt quickly to new and emerging issues. An example is the field of HIV/AIDS research. Though internationally a very important health problem, also in countries where ENRECA projects are situated, this has not led to mobilisation of a major research effort geared to the developing countries in Denmark. One could argue, of course, that a small country has to set priorities and limit its playing field. However, a point of discussion remains whether limitations, set by research capacity specifically focused on the South, are not too severe, given the major role Danida wants to play in the global development arena. One way of dealing with this dilemma is to take care that strong linkages are fostered with all international efforts in the field of health research for development, including WHO/TDR, COHRED and WHO/WB efforts regarding Poverty and Health, but also Global Public Private Partnerships (GPPPs) such as GAVI (Global Alliance on Vaccines and Immunisation), IAVI (International AIDS Vaccine Initiative) and MMV (Medicines for Malaria Venture), to which Danida is or may be contributing significantly. Another sensible way to approach the tension between research capacity and demands for research as reflected by Danida's development aspirations is to strengthen the capacity. Working both ways, keeping close linkages between them, appears most recommendable.

Presently, there are good opportunities to engage in a process of further strengthening health research for development capacity in Denmark. First, senior academic positions exist which can stimulate health research for development on a broad front. The

University of Copenhagen has quite recently appointed a Professor in International Health and supports an agenda of internationalisation. The Danish Council for Development Research (RUF) several years ago appointed a Research Professor in International Health for a limited period. Even though the Chair will be discontinued, the incumbent will remain very active in the field. Then there is a Professor of Anthropology, who has built up a very strong base in medical anthropology. Second, content wise, Danish research capacity in the field of health research for development appears to be strong in the field of malaria (SSI, CMP, DBL, DIH), although there are also other foci of strength, including the study of use of medicines (IA) and of herbal medicine (RDSP), food and nutrition (RV&AU), and water and sanitation/water related diseases (DBL, RV&AU). Third, there are a number of strong ENRECA partnerships. Fourth, there is an international master's course (MSc) in international health. Fifth, a postgraduate research school of international health has been established at the University of Copenhagen. Sixth, the research capacity in international health for development presents a good balance of laboratory based and field based, often community oriented, capacity. Seventh, there are plans to concentrate some of the major players at the Kommune Hospital location in a few years time.

With such points of departure strengthening the research capacity should not merely entail financial support, but be directed at bringing even more focus, diminishing fragmentation, and stimulate synergies and interdisciplinarity. Hence, it is recommended to further investigate the feasibility of concentrating research capacity in an Institute of International Health for Development (IIHD), to be core-financed by Danida and by the University of Copenhagen, with additional funding from research subsidies, including ENRECA and RUF funded projects, and consultancies. Such an institute should initially focus on malaria and bring together capacity from the University of Copenhagen (Faculties of Health Sciences and Natural Sciences, Institute of Anthropology), State Serum Institute, and Danish Bilharziasis Laboratory. Besides research on malaria, research on child health, HIV/AIDS, tuberculosis, the quality of health services in developing countries, reproductive health, use of medicines, and possibly other points of priority, should be added and further developed.

The institute should, of course, have an interdisciplinary focus. Health economics expertise should be added to the existing expertise on clinical and laboratory research, health systems research, tropical epidemiology, and medical anthropology.

Although much research capacity is already available in Denmark and would increase within the context of an institute, linkages to other European research centres remain very important. Good examples are already existing links with the malaria researchers of the London School of Hygiene and Tropical Medicine and the Pasteur Institute, and with the medical anthropologists of the University of Amsterdam. Not only could existing links be strengthened, but also centres in, for instance, Antwerp, Bergen, Heidelberg and Stockholm could be considered for collaboration.

To what extent the new institute should be a walled enclosure and an open space is to be further investigated. However, a few important considerations have to be mentioned. First, though physical proximity facilitates communication and co-operation, there are limits put to it by the impossibility to move laboratories around. Hence, some researchers, for instance those working at CMP, would need to spend a considerable part of their time at their laboratories and another part at the location of the new institute. Second, the proposed institute would be the centre of a number of

concentric circles of affiliation, collaboration and co-operation, in which researchers attached to centres in Odense or Aarhus must be well positioned. The new institute should be the pivot of Danish health research for development, which implies that it should not just draw on others in such concentric circles, but that it also should focus on contributing to the work of such others. It should, in other words, stimulate and inspire, and set high standards.

Apart from salaries and costs of working environments (e.g. laboratories), health research for development by Danish research institutes is mainly funded by Danida through RUF or the ENRECA projects. The other Danish research councils are not a significant financing channel. In fact, request regarding financial support to research efforts pertaining to developing countries may not even be considered. This is an indication that such research is not a well integrated part of the national health and medical research agenda and community.

Occasional consultancies for Danida which health researchers carry out, irregular discussions between Danida staff and the ENRECA Health Network, joint participation in workshops, and the activities of an ENRECA liaison officer within Danida are presently the main points of collaboration between Danida staff and the health for development research community. There are at least four ways towards a mutually beneficial strengthening of the relation between Danida and the research community: first, by including Danida staff in the regular Network meetings, second by Danida appointing a technical advisor with the specific task of translating research results into policy relevant information, including both health specific and health environment specific information, third by Danida commissioning research on pivotal subjects, fourth by strengthening the research components of the Health Sector Programmes in countries where ENRECA projects are situated.

The ENRECA Health programme is very good, but requires much administrative work. Since it just has been evaluated, it will not be elaborated on here. Only three brief points will be mentioned. First, sustainability of ENRECA as a high quality programme requires strengthening of its secretariat. Second, because money, knowledge and experience easily put the partnership balance in favour of the North, ways must be found to counterbalance this by giving the South a strong voice in agenda setting and by putting emphasis on strengthening its research management capacity from an early stage. Third, during second and third phases of ENRECA projects there must be an open view towards including more national Southern partners in the project, in order to enhance the ultimate impact.

The RUF finances most of the Ph.D. studies in developing countries carried out by Danish researchers. Many of these studies are included in ENRECA projects. There appears little reason for the present limitation of funding eligibility to Danish researchers. On the contrary, opening the possibility for researchers from the South to apply for RUF fellowships would mean an important additional means of strengthening the research capacity in developing countries. Moreover, by opening this window, there will be an additional chance for young Danish and Southern scientists to collaborate in research.

Apart from conclusions and recommendations there are a few issues which require some elaboration.

- If it is decided to go ahead with an Institute of International Health for Development (IIHD), as outlined above, one question is what will be the position of the Danish Bilharziasis Laboratory (DBL), a private institution which is mainly funded by Danida. If the intention is to establish a Centre of Excellence in which research on malaria will play a pivotal role, DBL's malaria research should, of course, not be left outside. DBL's extensive knowledge and experience in the field of water and sanitation, could be a further valuable addition to a new IIHD. It is, therefore, recommended that the inclusion of DBL in a new IIHD be part of the feasibility study mentioned earlier. More specifically, it would mean that, different from the 1995 review of DBL which focused on a future for DBL as an independent institution and did not consider its place in national and international research landscapes in depth, DBL's strengths and weaknesses should be considered in the context of the Danish and international research landscapes. Following that, scenarios for degrees and timing of integration in the proposed institute should be developed, with careful consideration, of course, of the interests of DBL's partners, networks and staff.
- In the *Partnership 2000* strategy, prevention of and relief from the effects of HIV/AIDS have a prominent position. Denmark aims to substantially strengthen efforts to curb the spreading as well as the impact of the epidemic in the poorest countries, particularly in Africa. Specific attention is paid to support activities aimed at children and young people. It is also recognised that the epidemic and its impact should be approached along various bilateral and multilateral venues. Such an ambitious agenda requires a sound knowledge base for support, not only in the health field, but also in other development fields, including agriculture, public administration, education, and infrastructure. In Denmark, there is strong laboratory and clinical research capacity regarding HIV/AIDS. However, this important capacity is not focused on developing countries. In the field of health in developing countries, knowledge on HIV/AIDS, apart from specific studies in RUF or ENRECA context, has not been developed in Denmark as a major focus of attention. The question is how the specific HIV/AIDS related policy objectives should be implemented, now that the subject has got so much priority in the broader development strategy. Not only would it take considerable time and great effort to build the knowledge base and research capacity required, but it would also take away attention, and possibly capacity, from strong points like malaria or child health research. It appears, that the question is not so much whether a knowledge base and research capacity should be created/strengthened, but much more where it should be positioned, how wide a field it should cover and how it could most efficiently and effectively be established. Here, it appears that it should be established at the proposed Institute for International Health for Development. Further, that its focus on the development aspects of the epidemic requires a closely related input from various disciplines, not only health-related ones. Finally, efforts could be geared to bringing together already available knowledge and experience on HIV/AIDS, and the often closely related re-emerging poverty disease tuberculosis, using (and if necessary building and strengthening) a strong network with partners in developing countries, and also in Europe. In the meantime it can be considered whether and how to expand the knowledge base by Danida supported research, requiring additional research capacity. There are quite a few questions here to include in the feasibility study we mentioned earlier.

4. CONCLUSIONS, ISSUES AND RECOMMENDATIONS

Table 1
ENRECA health research projects, May 2000

Developing country	Major research objectives	Danish institute/ department involved
Bangladesh	Improve food and nutrition supply (Dissemination of research findings to the population and decision makers)	Royal Veterinary & Agricultural University, Copenhagen
Egypt	Synthesis of new drugs against hepatitis B and C viruses	1. Department of Chemistry, Odense University 2. Department of Virology, State Serum Institute, Copenhagen
Ghana	Malaria research (Immunology, identification of anti-malarial components in medicinal plants) of Copenhagen	1. Institute of Medical Microbiology and Immunology, University 2. Institute of Medicinal Chemistry, Royal Danish School of Pharmacy, Copenhagen
Guinea-Bissau	1. Long-term effects of the primary health care system on mother & child health (immunisations, diarrhoeal diseases, post- hospitalisation mortality, maternal mortality, survival of motherless children, HIV/AIDS and tuberculosis) 2. Build research capacity, particularly in epidemiology	Epidemiological Research Unit, State Serum Institute
India	1. Contribute to knowledge about Indian medicinal plants. 2. Evaluation of plant products used in primary health care 3. Develop herbal medicine into new products	Royal Danish School of Pharmacy
Kenya	1. Improve health condition in the Bondo district focusing on pregnant women & children 2. Strengthen research & training capacity of participating institutions	1. Institute of Anthropology, University of Copenhagen 2. Royal Danish School of Educational Studies, Copenhagen 3. *DBL, Copenhagen 4. Research Department of Human Nutrition, Royal Veterinary & Agricultural University 5. Danish National Institute for Educational Research, Copenhagen

4. CONCLUSIONS, ISSUES AND RECOMMENDATIONS

Developing country	Major research objectives	Danish institute/ department involved
Madagascar	<ol style="list-style-type: none"> 1. Improve local research in preventive oral health care 2. Improve oral health care by training of schoolteachers 3. Develop a national oral health promotion programme together with the Ministry of Health 	Copenhagen School of Dentistry
Mozambique	<ol style="list-style-type: none"> 1. Establish scientific, administrative and collaborative framework for future long-term research 2. Complete research training of 3 researchers 3. Maintain malaria research at the National Institute of Health 	*DBL
Nepal	<ol style="list-style-type: none"> 1. Strengthen research competence of university students 2. Direct research students' projects towards primary health care 3. Establish a Ph.D. programme at Tribhuvan University 	<ol style="list-style-type: none"> 1. Royal Danish School of Pharmacy, Department of Social Pharmacy 2. Institute of Psychology, University of Copenhagen 3. Department of Epidemiology & Social Medicine, University of Aarhus
Sudan	Finalize studies in malaria & leishmaniasis	** Centre for Medical Parasitology, University of Copenhagen
Tanzania	<ol style="list-style-type: none"> 1. Train scientists, laboratory technicians, and district health management personnel 2. Improve malaria and filariasis control and stimulate national health care policies 3. Develop an appropriate health district information system 	<ol style="list-style-type: none"> 1. Institute of Public Health, University of Copenhagen 2. Department of Infectious Diseases, The State University Hospital, Copenhagen 3. *DBL 4. Institute of Anthropology, University of Copenhagen
Uganda	Strengthen capacity to undertake strategic health research in primary health care and child health	<ol style="list-style-type: none"> 1. Institute of Anthropology, University of Copenhagen 2. Institute of Epidemiology & Social Medicine, Aarhus University 3. Department of Oral Epidemiology and Public Health, Aarhus University

4. CONCLUSIONS, ISSUES AND RECOMMENDATIONS

Developing country	Major research objectives	Danish institute/ department involved
Vietnam	<ol style="list-style-type: none">1. Improve analyses of reproductive health problems2. Conduct research on selected reproductive health issues3. Strengthen the links between researchers and users of research findings4. Strengthen the Danish resource base in international reproductive health	<ol style="list-style-type: none">1. Institute of Anthropology, University of Copenhagen2. Institute of Public Health, University of Copenhagen

* *DBL = Danish Bilharziasis Laboratory*

** *Centre for Medical Parasitology includes the Institute for Medical Microbiology and Immunology and the Institute of Public Health, University of Copenhagen, the Department of Infectious Diseases and the Department of Clinical Microbiology, Copenhagen University Hospital (Rigshospitalet).*

Annex 1

Terms of Reference, Specialist Review Team, Health Sciences

Terms of Reference

The health sciences specialist team is requested to:

- Prepare an overview of Danida-funded development research in the field of health sciences. In addition to a mapping exercise, the team is expected to point out particular features which characterise the field, such as diversity of interests, continuity and stability, national and international linkages to other research environments, linkages to development agencies, the importance of interdisciplinary approaches etc.

To the extent possible, the volume and quality of the research output should be described and assessed, e.g. with reference to internationally acknowledged publications and procedures for quality assurance.

- Assess the relationship between Danish development research and the ‘mainstream’ national research agenda within the field of health. A main issue to be examined is the extent to which development-related research is seen as an integral component of the national research agenda (and, by extension, how this is reflected in organisational and financial terms).
- Assess the contribution of Danish development research to the international health research effort with specific reference to the comparative advantages that Danish institutes may bring to the overall effort.
- Assess the ability of the overall Danish development research effort in health-related subjects to adapt to new and emerging issues, and to modify the research agenda appropriately both in terms of international and developing country priorities.
- Assess the upstream administrative and institutional arrangements and structures and their influence on the quality and focus of the research into health issues.
- Assess the impact of Danish development research in health sciences in terms of building of long term capacity in Denmark, its impact on Danida’s work and priorities and its contribution to increase the capacity of partner countries to respond to health issues.

Mode of Work

The team will review available documentation and available research output from the Danish institutions engaged in development research. Members of the team will undertake these reviews on the basis of their expertise and experience. In Denmark, the co-ordinator of the ENRECA health network will facilitate visits to the most relevant Danish research institutes, consultations with Danish colleagues, as well as with any developing country collaborators who may be in Denmark during this period.

Reporting

The team will prepare a report that will contain:

- The review and assessment of the team with respect to the quality and relevance of Danish development research in the field of health sciences.
- A discussion of issues arising from the review with regard to options, opportunities and priorities for future Danida support to development research in Denmark

Schedule

The team will start the preliminary review of written material as soon as it becomes available. The team will visit Denmark for a period of 7-10 days