

# RESEARCH CAPACITY DEVELOPMENT FOR CVD PREVENTION: THE ROLE OF PARTNERSHIPS

Recent studies have demonstrated an increase in the burden of cardiovascular diseases on developing countries. This increased disease prevalence and health burden has far exceeded the technical and human capacity of developing countries to use existing global knowledge, and to generate new strategies for their own countries to use in combating these diseases. Therefore, it is necessary to assist developing countries in building indigenous research capacity in order to undertake studies within their own boundaries, the results of which will lead to the development of appropriate local management and control strategies. It is important to explore ways of enhancing research capacity in developing countries, in order to narrow the research gap between the rich, developed countries, and the poor, developing countries. Partnerships, both North-South, and South-South, lend themselves to the use of suitable modern tools and strategies, as well providing a promotional approach for strengthening research capacity in developing countries. This review describes prerequisites for building successful research capacity, and, in particular, details the process for building such capacity in the area of cardiovascular diseases (CVDs). Some of the constraints and challenges in research capacity strengthening (RCS) have also been summarized. When correctly utilized, partnerships are probably the most egalitarian form of research collaboration, offering mutual advantages to both partners. International and bilateral agencies funding research in developing countries are urged to include a RCS component in new projects, in order to ensure the sustainability of these projects through the training of those who will carry out the research, and to support the national institutional framework where the research will be conducted. (*Ethn Dis.* 2003; 13[suppl2]:S2-40-S2-44)

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Address correspondence and reprint requests to Thomas C. Nchinda, MD (Lond), DTPH; Epidemiologist and Senior Public Health Specialist; 5, route de Courte-Raye, 1297 Founex; Switzerland; 41 22 791 3808; 41 22 791 4394 (fax); nchindat@who.int

Thomas C. Nchinda, MD, DTPH

## CARDIOVASCULAR HEALTH PROBLEMS

The ISHIB2003 World Congress will focus attention on the increasing prevalence rates, worldwide, of cardiovascular diseases, which have now acquired pandemic status. This recent trend complicates the disease landscape in developing countries, which has been dominated historically by communicable diseases. In addition to the ISHIB Congress, the International Conference for Cardiovascular Disease Control and Prevention in Africa took place in Brussels in May 2003. These 2 important international conferences target the same health problem, noncommunicable diseases, with one focusing on developing countries, in general, and the other focusing specifically on Africa, the least developed of the developing countries. The World Health Organization's Ad Hoc Committee sounded the alarm on the growing prevalence of this problem in its report.<sup>1</sup> According to a report with a similar focus, 24.5% of all deaths in developing countries in 1996 were due to cardiovascular diseases (CVDs),<sup>2</sup> while a more recent publication,<sup>3</sup> estimates the CVD mortality toll to be 30% of total deaths. The projected contributions of CVDs to the number of Disability Assisted Life Years (DALYs) lost in developed and developing countries are shown in the table below. Some of the leaders and steering committee members of that initiative will probably present and discuss their findings at the ISHIB2003 World Congress.

Many international and bilateral health programs, as well as international foundations, are being lobbied to make control of CVDs a priority on their agendas. Strategies already exist to prevent and control this pandemic in de-

veloped countries. For example, the major objective of the Initiative for Cardiovascular Health Research in Developing Countries (ICHealth) is the advancement of research programs designed to support the prevention and control of cardiovascular health problems in developing countries. The WHO has outlined elaborate strategies for controlling CVDs in developing countries. Other international organizations with similar interests in the prevention and control of CVDs will be in attendance. Thus, attendees of the ISHIB2003 Congress are likely to witness presentations supported by results of studies conducted for the purpose of dramatically advancing the prevention and control of CVDs in developing countries. In addition, presentations will probably include recommendations for prioritizing research on CVDs in the health research and action taking place in developing countries. Already, as the "White Book"<sup>4</sup> suggested, the principal questions that must be addressed when defining these strategies are as follows:

- Does the magnitude of the problem justify urgent attention and early public health action?
- Are community resources available, or is the capacity of the public health system adequate to meet the present and projected needs?
- What global and national responses are required in order to reduce the global burden of disease through interventions designed to affect all stages of the natural progression of this disease burden?

The central issue addressed in this review is whether there is sufficient research capacity in developing countries to meet the present need to acquire accurate, relevant data, which can be used

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*Research capacity development is a long-term effort that is sometimes unpredictable and not amenable to short cuts and quick results.*

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as the foundation for all future prevention and control efforts. Is there, in fact, a place for research at all? Are there adequate numbers of researchers in developing countries available to provide such evidence? If yes, what should be the best strategies for mobilizing research toward CVD prevention? If no, what would be the best strategy for building and strengthening such research capacity? Are policymakers committed to the development of this capacity?

## RESEARCH STRATEGY FOR CARDIOVASCULAR HEALTH

Research has, in recent times, come to be recognized as the key to sustainable national development. However, researchers from developing countries have lagged behind their counterparts in developed countries, regarding the quality and volume of their scientific output, though these researchers have made efforts during the last 30 years to strengthen research capacity. In general, developing countries have lacked indigenous research capacity to conduct any form of research, a legacy of colonialism and the post-colonial period.

Many developing countries have no research tradition, and what little research was conducted was in the area of communicable diseases. Research and training in the home country of the colonial power was usually preferred, and tended to conform to the agenda of the

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### Contribution of CVD to DALY loss (% of total)

Region	1990	2020
World	10.8%	14.7%
Developed countries	25.7%	22.0%
Developing countries	8.9%	13.8%

Source: the World Health Report 1999 adapted from Murray 1997.

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home scientists, with no provisions made for the prevailing condition in the developing country.

Scientists from the North\* visited research sites in developing countries to collect field data, or to inform their "counterparts" (in name only) in these countries about the type of data needed. This form of research was conducted to meet the scientific agenda of the Northern scientists, most of whom needed to "publish or perish." This research often had no relevance to the health problems of the regions in which the data were collected. In the end, research findings played virtually no role in development plans in countries of the South.

Considering these historic conditions, it makes sense for researchers and policymakers in post-independence developing countries to question the motives of outside researchers, and to consider their research findings to be irrelevant to the development process of their countries.

There is a dearth of valid data for use in planning CVD control and prevention efforts in developing countries. It is essential for such data to be collected by local investigators in the developing countries, in order to lend authority and relevance to the findings. The absence of such research capacity remains a major constraint, and handicaps the planning of evidence-based control strategies.

Research capacity development has

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\* Throughout this article, the terms, "North or Northern," refer to developed countries and the terms, "South or Southern," refer to developing countries.

become a top priority on the agendas of both the developing countries, and all multilateral and bilateral development agencies interested in cooperating with the countries of the South. Most bilateral cooperation programs with developing countries, which generally oversee the prevention and control of communicable diseases, have some elements of capacity development built into the programs (generally short-term on-the-job training), to ensure successful implementation of the supported programs. In an increasing number of cases, training is being provided at much higher levels (master and doctorate levels). The favored disciplines have been primarily in the biomedical and public health sciences. Developing countries still lack the capacity for conducting research in the social and behavioral sciences. This research remains a new area of focus in the future, which is in need of rapid development.

## PARTNERSHIPS FOR SUSTAINING RESEARCH CAPACITY STRENGTHENING

There are presently many strategies for building research capability in developing countries, the methodologies for which have been adequately described.<sup>3,5,6-8</sup> Even sufficient capacity, built through training, must be strengthened through the provision of appropriate infrastructure and logistics, and should be sustained by encouraging scientific growth among researchers.<sup>9</sup> This relationship and development are certainly not linear, but, rather, consist of a continuous series of training, expanding capacity to meet changing needs, and additional training.

International collaboration in health research through the development of partnership research projects with developing countries (eg, between a research group in the North, or a strong group in the South and a partner in the

South) is an important strategy for ensuring research sustainability,<sup>5,9</sup> and has been used successfully in capacity strengthening for research on communicable diseases. The best examples of this have been conducted through the auspices of Multilateral Initiative for Malaria in Africa/WHO's Tropical Diseases Research grants (MIM/TDR grants), which have funded 23 partnership grants across Africa from 1998 to the present.<sup>10</sup>

An international multidisciplinary workshop, held in Bern in 2000, was sponsored by the Swiss Commission for Research Partnerships with Developing Countries (KFPE) on Enhancing Research Capacity in Developing and Transition Countries.<sup>11</sup> That workshop brought together over 120 scientists and researchers from 52 countries, and from different disciplines (health, agriculture, environment, etc), to discuss different approaches to promoting RCS. The discussions illustrated that the process of building research capacity follows the same pattern in all disciplines, with partnerships playing an important role. Attendees of the workshop made a plea for initiating more concerted efforts at building research capacity.

Good partnerships link a research institution with demonstrable strength in the South, with a stronger partner with a similar research interest in the North or South. The 2 institutions must be working on the same broad research project, but the actual research activities of either team should be clearly distinct. In this way, the stronger, more established institution in the North, with a larger component of researchers, and more advanced equipment, will help the weaker institution in the South to acquire expertise, and to reach sufficient capacity more rapidly. In the case of the MIM/TDR grants mentioned above, the Southern partner chooses its Northern partner, and the 2 groups apply for, and obtain, a grant. The grant proposal should be written collaboratively, so that the Southern partner becomes more fa-

miliar with writing grant proposals, another step in building capacity. The grant proposals should clearly identify which partner will perform the required activities. When funded, each partner carries out its own activity in the home institution, but with the stronger partner making regular visits to assist and supervise the developing country (DC) partner. The training of younger scientists in the South is a logical outcome of partnership grants.

There are 6 principles that should govern the development of good partnerships<sup>5,9</sup>:

- At least one of the scientists in the partner institution in the South, the team leader, should have demonstrable competence in the research subject area, in order to have a balanced partnership, and to eliminate any superior/inferior relationship;

- Partnerships should focus immediately on development and nurturing sustainable institutional capacities for quality research by the Southern scientists, in the interest of furthering research beneficial to both parties;

- The research must cover common themes set by the partners, but with clearly defined areas of research for each partner. The partners should hold frequent meetings to discuss progress;

- The young scientists from the South (and those from the North, to a lesser extent) should be the privileged beneficiaries of partnerships providing opportunities to obtain valuable, and irreplaceable, experience through an association with both institutions;

- Training should remain the central focus of partnerships, with "learning by doing," and "hands-on training," of young trainees from the South, being strongly emphasized and encouraged; and

- The research leaders of the two partnership groups should have similarly high scientific qualifications, should be compatible, and feel, mutual respect for each other.

## THE PROCESS OF BUILDING RESEARCH CAPACITY FOR CVD PREVENTION

In order to advance the building of appropriate research capacity for CVDs in developing countries, researchers should gain insight from the RCS experiences of others in communicable diseases, as exemplified by the MIM/TDR grants mentioned earlier. One such example was presented at a Forum 6 Conference of the Global Forum for Health Research held in Arusha, Tanzania, in November 2002,<sup>12</sup> during the plenary session of a MIM/TDR anti-malarial drug resistance network, comprising investigators and malaria control groups from 5 African countries. Each group, led by an African principal investigator (PI), had received a partnership grant from the MIM/TDR Task Force on Malaria Research Capability Strengthening in Africa from 1998–2001. The 5 research centers that compose the network are:

1. Noguchi Memorial Institute for Medical Research, in Accra, Ghana;
2. The Malaria Research and Training Centre, in Bamako, Mali;
3. The Malaria Research Laboratories Postgraduate Institute for Medical Research and Training, in Ibadan, Nigeria;
4. Ifakara Health Research and Development Centre, in Ifakara, Tanzania; and
5. The MEDD Biotech/Makarere University, in Kampala, Uganda.

Dr. Olusola Gbotosho, the PI from the Ibadan team, presented the work of the network on behalf of the other four members. She explained this approach of linking institutions (generally a strong institution in the North with a weaker one in the South, but sometimes a strong institution in the South with a weaker institution in the South). In all cases, the PIs had to come from the South, which proved valuable for rapidly building a critical cadre of scientists

with appropriate experience to respond to malaria research needs in their respective countries. The positive outcomes from this network are:

- The network developed was used successfully to build research capability for the institutions, with most of the training occurring within the countries; and

- Management of the resources of the grants and the network provided the African PIs with practical experience in a “learning-by-doing” situation, and in managing complex, multidisciplinary research groups, thereby providing them with important leadership training.

The PIs and scientists in each team were involved in setting priorities for malaria research within their countries, and then developed strategies to implement these. In addition, they learned to collaborate with the malaria control teams, in order to use the results generated by their research in developing policies for malaria control.

CVD research strategies should adopt this model by promoting RCS in the context of partnership grants that link research groups in the North with partners in the South to implement research projects. Research capacity and infrastructure must equip a country's researchers and professionals with the relevant skills required to conduct studies designed to determine the underlying causal factors of a high prevalence of CVDs in a particular community.

Some examples of the skills a competent cardiovascular health investigator should have, but which might not be acquired through specialized training, include:

- Techniques for developing and composing good research protocols for all types of studies (clinical, community-based trials of management schedules and intervention trials, surveillance techniques, etc);

- Questionnaire design for clinical and community-based studies, including interview techniques, techniques for

focus group discussions, and all techniques related to quantitative and qualitative research in the analysis of data obtained;

- Data analysis techniques for various forms of research, as well as the art of good scientific writing;

- Standard techniques specific for CVD studies (obtaining standard blood pressure measurements, performing electrocardiography, analyzing echocardiographs, etc).

Some of the young researchers in the team may need short-term (up to 3 months), or longer-term, training in epidemiology or other areas (up to an academic year in length), in order to have sufficient competence to provide guidance, and be a specific resource, to the group. When a good partnership grant has been provided, all of the training mentioned above can be obtained in the context of that grant, although this might require the senior partner in the North traveling to the South in order to hold these training sessions for the Southern partner. This strategy allows many members of the team to participate in, and benefit from, this training. Where a partnership grant links a number of Southern partners with a particular Northern partner, the training could take the form of a workshop held for participants of all collaborating institutions. These training opportunities are beneficial, since they are likely to be presented by faculty with special skills in social and behavioral sciences research, data analysis, and other important areas. Further orientations can be organized later in the Northern institution, where the young researchers from the South may meet and interact with their Northern colleagues. The overseas component of higher-level training for the younger members of the team from the South should, preferably, take place in the Northern-partner institution, where appropriate additional orientation will be provided by researchers familiar with the prevailing conditions of the trainees' home institutions.

A certain number of prerequisites should be met in building research capacity in the South:

- Capacity development should always build on what exists.

- Capacity development should be relevant to the priorities of the countries, and the needs of their populations.

- Ideally, this capacity should address the needs of: individual cardiovascular health scientists in a hospital or medical school settings; those who have to plan and execute research programs; policymakers who will define the policy; and, the ordinary medical personnel (doctors and nurses working in the peripheral hospitals) who will conduct prevention efforts among the population.

- The trainees' past knowledge should serve as a springboard for their future training.

- Partnerships should be developed with stronger institutions in the North or South to further enhance aspects of capacity as mentioned earlier.

The results of these studies will enable researchers to make recommendations to policymakers, and to CVD professionals, on the issue of CVD prevention, before the epidemic gets out of control. These recommendations should provide clear and succinct guidelines on which clinical (hospital-based) professionals can base their management.

Some major constraints have been identified (Global Forum for Health Research, 2002):

- Developing countries are not homogeneous, and some of the more advanced of the low-income countries have already utilized training opportunities offered through competitive training grant awards, which have built up their indigenous research capacity much more rapidly than capacity has increased in their lesser developed counterparts. Therefore, the challenge lies in developing strategies to close this gap.

- There is disharmony and gap between researchers located in the univer-



sities and research institutes, and administrators and policymakers. The challenge is to find ways to bring these 2 parties together, in order to develop further evidence-based strategies for tackling this pandemic of CVD.

- Many developing countries do not have a comprehensive priority health research plan, and have not designed a coherent program for research capacity development. The challenge here is to persuade the policymakers of the necessity for both components. Past advocacy efforts have not produced the desired effects.

- Governments in developing countries are still not engaged in knowledge-based and "science-based" decision-making, nor are they demanding evidence from their advisers to back up recommendations for action. The benefits of research are not fully appreciated, and research continues to be low on the national priority list.

- Past recommendations about proportions of the national health budgets, or of funds provided as technical assistance for development purposes, that should be used for research have largely been ignored. The challenge is, therefore, to convince policymakers to demand more evidence from their researchers, and to make research a priority on the national agenda.

## CONCLUSIONS

The discussions above indicate that, in the absence of valid data, relevant studies, and appropriately trained local experts in developing countries, the health situation will deteriorate even further. There is presently a strong momentum building for continued, and even accelerated, action in support of research capacity development in developing countries. International and bilateral agencies that provide technical assistance to developing countries for conducting research and control activities, are encouraged to add capacity devel-

opment to their projects and budgets. If a project is collaborative, such as a partnership, then it should be used for RCS, as described in this paper. Such research should, in addition, be used for more expeditious translation of research results into action, which requires competence from both those conducting research, and from policymakers, who must have the capacity to absorb the outcomes of research, and then be willing to commission studies to add validity to their policy decisions. Within the many health problems developing countries face, it is clear that no one person at the policy level can absorb and provide appropriate recommendations using the wide array of research results that must be coming through the policymaking office. Advice from senior and experienced scientists from academic and research communities, who are conversant with the subject matter, should guide appropriate government action. Strengthening partnership programs in the field of research capacity is crucial to developing countries, and should be actively encouraged, as it contributes to building a science culture in developing countries, which should enable these countries to conduct research relevant to local health problems, including the increasing burden of CVDs.

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