Tropical Medicine and International Health doi:10.1111/j.1365-3156.2010.02479.x

volume 15 no 4 pp 489–494 April 2010

Trials and tribulations of an African-led research and capacity development programme: the case for EDCTP investments

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Summary We describe the initiation and establishment of The University of Zambia – University College London Medical School (UNZA-UCLMS) Research and Training Project, an entirely African scientist-led, south–north partnership. In its 16 year existence, the project, by successfully obtaining competitive grant funding, has transformed itself into one of Africa's most productive African-led R&D programmes with training and visible research outputs. The project serves as a role model and now networks R&D and training activities with six southern African (10 institutions) and six European countries. This project case study illustrates that deep commitment is essential for success and that the factors which facilitate success in R&D in Africa need to be evaluated. The long-term prospects for sustaining the UNZA-UCLMS Project appear bright and are dependent on several factors: the ability to retain trained African scientists; obtaining continued competitive or donor grant funding support; and serious investment by the African governments involved. The recent 255 million Euros EDCTP investment in sub-Saharan Africa through south–north partnerships is expected to enhance existing African-led R&D programmes. African governments and scientists must rise to the challenge.

Keywords: African scientists, capacity development, European and developing countries clinical trials partnership, funding, research, sub-Saharan Africa, training

Introduction

Since the 1950s, as African countries became independent from colonial domination, they embarked on developing their own medical schools and training programmes. The fact, that several African institutions had not been able to develop their medical and scientific Research and Development (R&D) programmes to international standards, has been a subject of debate and discussion for decades (Andersson & Marks 1989; Deacon 2000; Clarke 2007). Because of poor economies, African governments were unable to invest adequately in sustaining local R&D. In the early 1990s, several African countries took up the challenge and embarked on developing their own African-led R&D programmes. This viewpoint describes the trials and tribulations of initiation and establishment of The University of Zambia – University College London Medical School Research and Training Project, (UNZA-UCLMS Project) an entirely Zambian-led, successful, south–north, partnership.

Historical background: formation, evolution and funding of an African-led project

In 1991, a substantive NIH-RO1 grant for R&D and training on HIV / AIDS enabled Herbert Dupont (UT, USA), Chifumbe Chintu and Alimuddin Zumla to set up the University of Texas-University of Zambia R&D Project (UTZAM) at the University Teaching Hospital in Lusaka for R&D and capacity development. After the NIH grant was completed in 1994, further funds for R&D were difficult to obtain. However, this project and its research outputs (Chintu et al. 1993a,b; Luo et al. 1994; Mathewson et al. 1994, 1995; Oshitani et al. 1994) formed the foundation for the subsequent joint R&D developed with UCLMS. Chintu and Zumla, both Zambians, took the opportunity to develop a novel, African-led, equitable, collaborative south–north partnership project. Their focus was R&D on health policy relevant research on important adult and paediatric infectious diseases that would result in a good quality, R&D project for Zambia and in

networking with neighbouring countries. Several Zambian doctors were encouraged by the project to embark on specialist training overseas (UK, Japan, South Africa) through scholarships for postgraduate study; while a few of these remained abroad after qualification, others returned to work in Zambia – for example, Peter Mwaba, who did a PhD at UCLMS came back to Zambia, and later succeeded Chintu as UNZA-UCLMS Project director in 2004. He was the second African scientist to be awarded the Albert Chalmers Medal by the Royal Society of Tropical Medicine and Hygiene.

For establishing R&D projects, research grants for R&D work in Africa were increasingly difficult to obtain. For example, in the late 1990s, an application for £80 000 to a UK funding charity to perform a necropsy study in Zambian children dying of respiratory diseases obtained good review, but was turned down. The UNZA-UCLMS Project's future was fortunately secured by competitive grants obtained from the innovative UK Department of International Development-Health and Population Division (DFID-HPD) and the INCO-DEV programmes from the EU. These initiatives injected substantial funding into Africa, which resulted in focusing on R&D and training in African countries (Nabarro 1998; Pletschette & Nair 2004). The rejected paediatric necropsy application was resubmitted to DFID-HPD for a project grant and awarded £240 000. The study's results were published in major international journals (Lishimpi et al. 2001, 2002; Chintu et al. 2002; Kasolo et al. 2002) and used by WHO-IMCI and regional African paediatricians to highlight the difficulties of making accurate respiratory diagnoses in HIV-infected children and to alert WHO to the important and growing issue of paediatric TB, an issue neglected in the past.

A wake-up call for donors and funders for appropriate investment in Africa

A thought-provoking article (Costello & Zumla 2000) reminded the academic and donor communities that the following actions were needed to allow African countries to develop and expand their R&D programmes:

- Create equitable, fair and sustainable south–south and south–north partnerships and networks between institutions,
- Build a critical mass of local research capacity and develop vibrant research environments geared to national priorities across Africa, including universities in the early stage of developing research potential,
- Support the human resources and infrastructure necessary for the administrative, governance, financial and management functions needed for institutions to deliver research excellence,
- Develop and build leadership at individual, institutional and national levels so countries can better initiate and lead research activities,
- Strengthen research training and build career pathways for the best and brightest researchers in clinical tropical medicine and health research more generally.

All these have been achieved by the UNZA-UCLMS Project over the past 16 years.

The enhancing, multiplier and networking effects of European Union FW6 and FW7 programmes

The European Union's INCO and Framework Programmes (FP) were timely and introduced competitive grant calls for R&D and training in Africa enabling north–south partnerships. This allowed the UNZA-UCLMS Project to competitively obtain programme grant funding for projects from sequential EU INCO-DEV grants [VACSIS (1999–2002), VACSEL (2003–2006), TrDNA (2006–2010), SUSGENT (2009–2012)].

Visible outputs and deliverables of the UNZA-UCLMS Project

The UNZA-UCLMS Project flourished into an African-led, equitable south–north partnership based, R&D programme in sub-Saharan Africa. For Zambia, this is a landmark development, since it has taken 45 years after independence to create its own, internationally acknowledged, Zambian-led R&D programme. The UNZA-UCLMS Project has had visible deliverable outputs from this project in terms of:

- Success at competitively obtained (over 20 million Euros) research grant funding;
- Training of all grades of medical, administrative and technical staff;
- Building of clinical trials, laboratory science and database expertise;
- Building of project-specific research infrastructure, including an infectious diseases research facility;
- Research publications in high impact factor journals: R&D data have been used to change global management policy for TB and TB/HIV by the WHO and developing country governments;
- Establishing productive regional south–south and south–north networking of R&D activities;
- Developing high profile advocacy for TB for funders and politicians.

Research and governmental approval for R&D

Translational clinical, epidemiological, basic science, clinical trials and operational studies of TB, TB/HIV and respiratory diseases in both adults and children have been performed under the UNZA-UCLMS Project, and several are underway. The basic principles involved in developing the research projects are to deal with locally relevant health problems responsible for high morbidity and mortality in Zambian adults and children. All potential R&D projects are initially discussed with the Zambian Ministry of Health for their support and endorsement. The majority of studies have policy relevance so that research data can be used to influence policy and practice.

Clinical trials expertise

As its inception, the UNZA-UCLMS Project has received generous collaborative support of the UK Medical Research Council (MRC) Clinical Trials Unit in London. Four major interventional clinical trials completed under the aegis of the UNZA-UCLMS Project have been performed, on Mycobacterium vaccae adjunct immunotherapy in HIV-infected adults with TB; and on Co-trimoxazole prophylaxis in: HIV-infected adults with TB, HIV-infected children and HIV-infected post-natal women. The results of these clinical trials have yielded major policy relevant outputs (Mwinga et al. 2002; Chintu et al. 2004; Nunn et al. 2008). WHO-TDR recently funded a clinical trial on the optimal timing of highly active antiretroviral therapy (HAART) in HIV-infected Zambian adults being treated for TB through this project.

Research outputs from the UNZA-UCLMS Project

During the duration of the UNZA-UCLMS Project, 104 articles were published in peer-reviewed international journals; Zambian scientists are lead authors of 48 of them. Six articles were published in the Lancet, of which five have African lead authors (Mwinga et al. 2002; Mwaba et al. 2003a,b; Chintu et al. 2004; Onyebujoh et al. 2006). A further five Lancet papers were published by our Zambia project staff as part of their advocacy activities (Chintu & Zumla 1993; Zumla & Chintu 1994; Chintu & Mwinga 1999; Chintu & Mwaba 2000; Onyebujoh et al. 2006). Our project's research outputs have been used by the WHO to change policy and management of TB treatment, and TB/HIV antibiotic prophylaxis recommendations (Chintu et al. 1993a,b, 2004; Luo et al. 1994; Nunn et al. 2008). Advocacy articles by project staff for TB, TB/HIV and diseases of poverty have appeared in medical journals (Zumla et al. 1999, 2009; Chintu & Mwaba 2000; Grange et al. 2009) as well as health magazines, newspapers and lay literature. Recently, a comprehensive textbook with 158 global authors (including 52 from Africa) was produced (Mandalakas & Detjen 2009).

Extension of the UNZA-UCLMS Project with a formal memo of understanding with the University of Cape Town, South Africa

Four years ago, the UNZA-UCLMS Research and Training Project extended its formal collaboration with the University of Cape Town, UCLMS and UNZA. This arm of the project is being led by Keertan Dheda, who trained at UCLMS, London, and returned to South Africa to work on TB and TB/HIV R&D. This UCT collaboration also has now attracted EU FW7 and EDCTP funding for projects TB-SUSGENT, clinical trials (PANACEA partner), NOE-TESA and an evaluation of newer TB diagnostics grant, which will enhance the networks formed with other sub-Saharan African countries. The funded projects and the UCL-UCT collaboration have generated multiplier effects and leveraged funding from several South African agencies including the SA National Research Foundation, the SA MRC, and the Discovery Foundation. Several other African and Indian clinician and non-clinician scientists are being trained through the EDCTP NOE and EU FP7 programmes with co-supervision from the UK, Germany and Canada.

Development of regional networks in Africa

The motto for the launch of the UNZA-UCLMS Project is 'holding hands together and moving forward in the fight against killer infectious diseases'. The Project has lived up to this and over the past 16 years extended activities to 10 institutions in six sub-Saharan African countries [Ethiopia, Madagascar, Malawi, Tanzania (two sites), Botswana and South Africa (three sites)]. The Project's internationally acknowledged success at R&D and training attracted collaborations and investments from the University of Munich, Germany; Statens Serum Institute, Denmark; Karolinska Institute, Sweden; Institute Pasteur, France; FIND Diagnostics, Geneva; Italy; Institute of Child Health, London; Liverpool School of Tropical Medicine, UK; Durban MRC Unit, South Africa; WHO-Tropical Diseases Unit, Geneva; US-NAMRU-3, Cairo, Egypt; Dartmouth-Hitchcock Medical Centre, USA; and the All India Institute of Medical Sciences, among others. With visiting staff from collaborating countries and research institutions, the ailing local medical school has benefited by involving all external groups in examining, teaching and research, projects supervision of medical students and postgraduates.

The UNZA-UCLMS Project – a model for south–north partnerships and regional networking

As a regionally focussed project, it has fulfilled all the project aims, which the EDCTP has also delineated for its programme for sub-Saharan African countries (Bosch 2002; Olliaro & Smith 2002; Walgate 2002; Medaglini & Hoeveler 2003; Anonymous 2004; Mgone 2008; Kitua et al. 2009). The success of the project is attributable to the commitment of project staff; self-generation of competitive grant funding from various sources; asking health policy relevant scientific questions; local governmental support; regional networking of activities; focusing on training and maintaining staff; building infrastructures to accommodate for increased scientific workload; proper administrative procedures and goodwill of all northern and southern partners and their leadership.

Current needs for established African-led south–north R&D partnerships

The next step is to get the more developed R&D groups to partner with less developed sites in the region to facilitate training and R&D, and Africa-led postgraduate education. The UNZA-UCLMS Project's long-term future must be viewed with caution, as retiring senior African staff, the ability to obtain continued funding to sustain R&D infrastructures built, and attrition of trained staff to greener pastures remains constant concerns.

Sustainability

The stated aims of the EDCTP were closely related to those on which the UNZA-UCLMS Project was founded. Recent grant successes have led to substantial grant funding from the EU FP6&7, EuropeAID, WHO-TDR, and the EDCTP and local business support. The University of Munich, Germany, leads another productive north–south project on TB and HIV/AIDS setup at its R&D site in Mbeya, Tanzania. Our project has established R&D collaborations with the University of Munich and South Africa through a joint EuropAID grant. This project, Active Detection of active TB (ADAT), is unique in that it focuses on capacity and infrastructure development with improved programme performance of national TB Programmes in Tanzania. Our collaborations with the University of Munich are being enhanced further with the recent multi-million Euro grant award from the EDCTP, and the Gates Foundation for the PANACEA clinical trials networks to evaluate new anti-TB drug-shortening regimens through REMOX (moxifloxacin) and PANACEA (SQ109 and high dose rifampicin).

EDCTP's role in enhancing established and successful African-led R&D projects

In 2003, the European and Developing Countries Clinical Trials Partnership (EDCTP) was created by the European Parliament with the aim to overcome the deficiencies of research infrastructures in African countries (Bosch 2002; Walgate 2002; Anonymous 2004; Mgone & Salami 2009). The EDCTP is a partnership of 14 European Union (EU) member states, Norway, Switzerland and developing countries representatives to fund clinical trials, research and capacity development in Africa (Olliaro & Smith 2002; Walgate 2002; Medaglini & Hoeveler 2003; Bosch 2002; Anonymous 2004; Mgone 2008; Matee et al. 2009). The initial slow start of the EDCTP (Anonymous 2005, 2007) was followed by development into a formidable funding force for R&D and capacity development in sub-Saharan Africa.

The 255 m Euro EDCTP investment in developing European and sub-Saharan African countries partnerships is expected to lead to acceleration of African-led research, capacity development and training. The EDCTP to date has funded 141 projects worth 255 million Euros. This involves 126 institutions in 28 sub-Saharan African countries and 43 institutions from 17 European countries and 51 other partners, a massive investment. Importantly, partnerships need to be brokered with national governments in Africa to ensure that the new capacity can be sustained over time. It is prudent for all funding agencies involved in supporting R&D in Africa to synergistically align themselves with EDCTP investments to have maximal effects. The MRC is already an important UK partner in the EDCTP initiative. The Welcome Trust has now focussed on capacity building for health research in Africa (Whitworth et al. 2008; Nature News 2009a,b; Welcome Trust 2009). The Global Fund, Wellcome Trust, the EU and UK-DFID should join the EDCTP in pooling resources for providing flexible, long-term, funding for existing African scientist led successful consortia. Development of effective R&D capability in all African countries will allow for extending R&D to the growing problem of non-communicable diseases, especially cardiovascular, metabolic and neurological illnesses.

While 255 million Euros have been invested, the EDCTP and EDCTP-funded south–north partnerships must not become complacent. A large amount of work remains to be performed in terms of translating the investment into visible deliverables and outputs to achieve EDCTP aims. Sub-Saharan African countries must rise to the challenge and take up this opportunity to develop self-sustaining, African scientist-led R&D programmes, regionally networked, with the aim to achieve world class R&D outputs.

Acknowledgements

The authors acknowledge the valuable contributions made by Professors Chifumbe Chintu and Herbert Dupont to the initiation and success of this project. The Zambian Ministry of Health and UNZA School of Medicine provided their sustained support and infrastructure required. We are grateful to: Dr Michel Pletschette and Professor David Nabarro for their foresight for African R&D development, Professors Andrew Nunn, Janet Darbyshire and Diane Gibb (UK MRC-CTU), Professor Michael Hoelscher (University of Munich), Professors Bongani Mayosi and Eric Bateman (University of Cape Town), Professors Ben Marais, Simon Schaaf and Andreas Diacon (University of Stellenbosch), Drs Philip Onyebujoh and Mahnaz Vahedi, (WHO-TDR), Dr Mario Raviglione (WHO-STOP TB Partnership), Professor Rifat Atun (Global Fund, Geneva), Professors Anthony Costello and Andrew Tomkins (Institute of Child Health), Dr Bertie Squire (Liverpool), Professor Louise Scmidt (King's Fund) and Professor Leon Fine (UCL) for their enhancing and synergising roles; Dr Vanya Gant (UCLHNHSTrust) and Professors John Grange and Gordon Cook (UCL) for supporting our African R&D advocacy work. Professor Mark Doherty (SSI, Denmark) provided academic insights for many of our basic science collaborative projects.

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