

1. Strategic choice of focus areas for BSUII partnerships:

The purpose of the anchoring activities is to ensure that a project is relevant and important by its stakeholders and that ownership is established. The setup at KCMUCo ensures that anchoring helps the project to focus on outcomes that can achieve an impact through collaborative projects between various clinical and basic science departments..

By involving external and internal stakeholders in the development and execution of a project helps to focus on outputs that will be relevant and useful by the end-users, and such outputs are therefore more likely to have an impact. KCMUCo also aims at ensuring that the project obtains the different management support and resources needed for producing the wanted outputs for successful implementation.

In summary, KCMUCo's scope in selecting and proposing the research thematic areas is broad meaning that in each of the themes we propose research questions that address both clinical and basic science/public health issues. At KCMUCo, we propose the following thematic areas for research priorities on which capacity would be built.

- 1) *Reproductive health*
- 2) *From BSU-I, re-emerging infections: Malaria, HIV, TH and TB/HIV co-infections (we have on-going students from BSU-I)*
- 3) *Neglected tropical diseases*

The proposed studies within the three thematic areas address broader development issues such as mortality, morbidity and population survival (mother, child) hence have a direct impact on development. This is illustrated below.

1) Reproductive health

- **Clinical studies:** There is an existing collaboration between KCMC/KCMUCo and University of Southern Denmark – Odense where a number of research topics are being addressed. The research topics include maternal morbidity, pelvic floor disorders, obstetric fistula repairs, cervical cancer studies, and the use of innovative technologies (mobile phones) to perform emergency obstetric training.
- **Public health/Health promotion:** They seek to investigate on the Sexual Reproductive Health (SRH) – to identify challenges facing the university students and to develop appropriate interventions. They aim to investigate the health risk factors, barriers to the access, and services, effective interventions and preferences university students to access sexual and reproductive health services.

These studies are anchored within the department of Obstetrics and gynaecology and the department of Public health/Health promotion on the KCMUCo's envisaged Institute of Public Health.

2) From BSU-I, re-emerging infections: Malaria, HIV, TH and TB/HIV co-infections;

2.1. Malaria and co-infections - KCMC/KCMUCo and CMP-Denmark through the Joint Malaria Program (which also includes LSHTM and NIMR) have a long collaboration in malaria research for many years. Recently, a joint effort has been established through DANIDA funded PhD (under BSU I) project to investigate on the overlap between arboviruses and malaria. A pilot study conducted at KCMUCo on other febrile illnesses using hospitalized patient samples detected both borrelia and Q-fever.

These studies aim to conduct further investigations on the relationship between arboviruses, febrile illness and antimalarial antibody responses and clinical immunity to arboviruses (specifically Chikungunya and dengue viruses). Epidemiology of malaria and arboviruses which will form an integral part of the study is expected to generate baseline data for clinical site preparation.

2.2. HIV

2.2.1 Drug resistance, pMTCT and cohort studies: Little is known about drug resistance patterns among treatment-naïve and treatment-experienced HIV infected patients in regions like Tanzania where multiple HIV-1 subtypes co-circulate. We aim to conduct research on drug resistance in several groups of HIV infected patients. Other research areas include adherence, prevention of mother to child transmission of HIV.

These studies aim to investigate HIV status in several high-risk groups such as (commercial) sex workers (CSW), injecting drug users (IDU) and men having sex with men (MSM) in Tanzania, by establishing cohort-studies which may be of interest to conduct other studies such as clinical trials or vaccine related studies.

2.2.2 Morbidity and mortality among HIV/AIDS patients: The interactions of morbidity, mortality, and hospitalizations due to HIV disease remain complex in the ART era and may vary across various demographic and geographic groups. The change has been well reported in the developed world, but limited data is available from the most affected region, the Sub-Saharan Africa (SSA). The experiences from developed world are not necessarily applicable to SSA. Most of the studies in our settings were done in the pre- or early ART Era. Further studies are indicated to delineate and monitor the morbidity and mortality in HIV infected patients.

Data from these studies will help in assessing whether the morbidity and mortality pattern among HIV/AIDS patients in our settings has changed as an increasing number of people living with HIV are gaining access to ART. The knowledge of the emerging causes of morbidity and mortality will not only allow clinicians to preemptively manage the clinical complications but also will help in planning for other interventions

2.2.3 Tuberculosis (TB): TB and HIV are overlapping epidemics. Both have been declared global emergencies demanding global attention as HIV is the strongest risk factor for the development of TB. Research questions seek to address TB prevention, shortening TB treatment, treatment of TB/HIV co-infected patients and drug-resistant TB (MDR-TB). In summary:

- (i) What are the optimal TB screening algorithms to effectively find out active TB cases?
- (ii) What are the safety, efficacy and pharmacokinetic parameters of new drugs that could replace rifampicin and shorten TB treatment, to cure susceptible and drug-resistant TB.
- (iii) What is the optimal time to start antiretroviral therapy in HIV-infected patients who have active TB disease, both drug-susceptible and drug-resistant types?
- (iv) How best we can manage the adverse events due to concomitant use of second line TB drugs and antiretroviral drugs.

3) Neglected tropical diseases

In addition to the contributions in 2.1 above, we propose to also look at other neglected diseases, i.e. the so called soil-transmitted diseases [STD]. STDs have a remarkable impact on the health of

children and adolescents in the tropics; they have been neglected as if they cause negligible effects. On the contrary, children and adolescents infected with soil-transmitted pathogens experience serious nutritional deficiencies, significant reduced growth rate, interference with cognitive power and sometimes death.

We would like to rekindle research efforts on STD by engaging post graduate research students. Therefore, we aim to investigate main factors that promote the transmission of STD, investigate STD awareness among children and adolescents. We also plan to investigate whether factors responsible for the transmission of STD are surmountable at reasonable cost, and finally look at measures at community level can be adopted to reduce the transmission of STD.

From the complexity of these thematic areas some will be overlapping with others, especially so with the “*neglected diseases*” in sub-sections 2.1 and 2.2 TB/HIC co-infections. These studies are anchored within the department of Pharmacy, Internal medicine, Obstetrics and gynaecology and the KCRI. The Ph.D candidates from BSU-I have supervisors and co-supervisors from both Copenhagen and KCMUCo. Research capacity will be enhanced through hands-on approach in research.

The thematic research areas are a blend of both junior and senior researchers from the south working in close collaboration with senior researcher from south and north. Moreover, the clinical components involve actual clinical exposure coupled with faculty exchange in both directions. Infrastructure upgrade is also planned in that mobile units as well as innovative tools will be used in clinical management of patients, hence equipping our staff with competent skills to alleviate the burden of diseases of our communities with the number of healthcare staff and specialists available. This has been a serious challenge towards achieving Millennium 2025 development goals.

2. Envisaged output areas

Outcome 1: KCMU College undertakes relevant and high quality research which enhances quality of graduate and postgraduate candidates and results are actively disseminated and shared with key stakeholders

Outputs

1.1 Ph.D candidates apply theoretical and practical skills in their research work

- Increased number of research consultancies at KCMUCo
- Problem-oriented and cross disciplinary teaching approaches applied in academic staff masters and PhD candidates
- Action research approaches are a part of all 12 master and PhD courses
- Thirty (30) faculty members apply mentorship & Supervision skills in postgraduate (master & PhD) training

Outcome 2: Strengthened University-wide services & facilities to support research activities

Outputs

- PhD students use the resource centre and their research/studies improve
- Research Laboratories able to conduct GCP-compliant clinical research/trials
- Improved e-library facilities are used by students and staff
- Financial reporting and audit reports are clean and up to standard
- Grant management improved /Grant application process and consortia formation improved

3. Management structure and institutional anchoring for the partnership, including key staff

KCMUCO's BSU-II Management structure and institutional anchoring for partnership, including key staff.

The organizational structure of BSU is based upon clear leadership roles and responsibilities, a mature and trusting partnership between Kilimanjaro Christian Medical University College (KCMUCo) and Danish Universities, and a mutual commitment to effective communication.

3.1 Leadership

Prof. Noel Sam Deputy Provost Academic affairs will serve as the overall BSU Coordinator, and he will be joined by Dr. Elton Kisanga, Director of Research & Consultancy and Dr. Declare Mushi, Director of Postgraduate Studies as Coordinators.. Please note that nearly all members of the BSU Leadership have pre-existing, highly functional relationships with regular communication in the activities of the KCMUCo. The leadership structure of BSU will rely heavily on twinning relationships outlined below;

KCM College	Danish Partner
Prof. Noel Sam Deputy Provost Academic Affairs	TBN Co-Leader
Dr. Elton Kisanga Coordinator & Director of Research and Consultancies	TBN Co-coordinator
Dr. Declare Mushi Coordinator & Director of Postgraduate Studies	TBN Co-coordinator
Dr. Sia Msuya Leader, Thematic	Dr. TBN Leader,
Dr. Gileard Masenga Leader, Thematic	Dr. TBN Leader,
Dr. Reginald Kavishe Leader, Thematic	TBN Leader
Dr. Jaffu Chillongola Leader, Thematic	TBN Leader
Ahaz Kulanga Program Administrator	TBN Program Administrator

Additional BSU Faculty and Staff

The BSU Leadership Team will be assisted by the full time staff in KCMUCo. In addition, our Danish partners will enhance the desired thematic at KCMUCo within BSU. As needed, Prof. N. Sam and Coordinators (Dr. Elton & Dr. Declare) in liaison with Danish Universities will request the participation of individual faculty members from KCMUCo and Denmark.

Implementation Advisory Group

An internal Implementation Advisory Group (IAG) will be appointed to oversee all aspects of the implementation of the three thematic areas above. The IAG will also monitor and evaluate the implementation of the BSU-II broad objective and its two specific objectives/outputs within the desired thematic areas.

IAG will also oversee all aspects of BSU-II university-wide research support. This group will integrate efforts from other collaborative projects at KCMUCo so as to maximize KCMUCo's capacity to perform high-quality research as outlined on the broad objective of BSU-II.

4. Key expectation to partners, other concerns and risks

Key KCMUCo expectations to Danish partners

Introduction

The development of the present proposal was mainly based on the KCMU College strategic plan (2006-2015), Enreca/Danida Program Assessment (2005) for capacity building in malaria research at KCMC/KCMU College to strengthen training at KCMU College, Evaluation of PhD training at KCMU College (MCDC report, 2010) and Joint Malaria Programme (JMP) strategic plan (2010 – 2015). All of these strategic documents point out the need for a strengthened postgraduate education programme at KCMU College in order to produce well trained health/biomedical research professionals (academicians, researchers) as promoters of research based education, high quality health research and health development. Priorities, which determine the expectations out of the second phase of the BSU program (BSU-II) build up on BSU-I priorities are have been carried up to the BSU-II setting so as to improve, and specifically meet these needs in a more efficient manner.

Key expectations

As introduced above, priority areas set in the current proposal are based on a needs assessment conducted by the South institution (KCMU College) with due consideration to existing institutional strategic plans and needs assessment reports. It is essential for KCMU College to strengthen the existing research infrastructure and postgraduate education programme in order to produce more, higher quality and well trained health research professionals (academicians, researchers) who will promote high quality health research, provide high quality education, appropriate decision making in the National and international health development framework. The envisaged outcome will be an academic environment in which PhD students and researchers are capable of applying enhanced research processes such as compliance to ethical guidelines, application of appropriate methodologies in research, scientific reporting/dissemination skills.

Relationships

The success of KCMU College-Danish partner academic/research collaboration should not be judged solely on the results of scientific research activities/infrastructure. It must be coupled with a learning approach to craft a sustainable, mutually beneficial working relationship that, apart from advancing science, must address inequity and put local priorities first, develop capacity with a long term perspective, and preserve the dignity of the local people by ensuring that the benefits of research improvement will truly uplift their status.

Key expectations

KCMU College expects the following key issues from the collaboration with the Danish partner

- The proposed activities will strengthen the existing collaboration between KCMU College and Danish partners
- Decide on the objectives together
- Build up mutual trust
- Establish long term research collaboration
- Development of new postgraduate courses
- Share information by developing networks together
- Share responsibility
- Create transparency
- Open opportunities for female researchers
- Jointly monitor and evaluate the collaboration
- Respect for ethical issues and values of partner institutions
- Respect for intellectual Property rights e.g. share the profits from discoveries, research findings equitably
- Increase research capacity (e.g funding, staff training and strengthened PhD training)
- The partners will build on achievements from BSU-II and propel forward

Assumptions and risks

- a) KCMU College has the capacity to take lead in the execution of the program
- b) Relevant Northern researchers will be available for active participation in the collaboration
- c) Availability of relevant KCMC staff/researchers for participation in the academic/scientific collaboration
- d) Policies and priority area of KCMU College are strengthened during and after the execution of the program

5. Process Action Plan for a three-month inception phase

The three months inception phase aims at creating the conditions for efficient cooperation among the project participants in the north and south. It is expected that the match-making process will be relatively faster because most of the possible collaborating institutions in Denmark were involve in BSU-I, hence drawing on the experience of South-driven research projects. At this phase activities will be anchored to so as to ensure smooth execution and success of the project. It will have to be clear whether the South partner will be working with one institution in the North or a consortium lead by one institution. The inception phase will have to address all concerns and for successful project execution. The inception phase and the match-making process will be facilitated by DFC and a process consultant. Communication was noted as a challenge in BSU-I. It is expected that the monitoring consultant will strive to establish an efficient communication plan between partners.

KCMUCo has developed a combination of small scale and long-term priority areas for collaboration. The south-driven research priorities cover both clinical and basic sciences/public health challenges. By involving the south institutions in the project planning phases, institutional capacity in terms of management competencies will be improved.

The implementation plan will have to be developed as a Gunnt chart with proper timelines. The following is a management list of activities for the inception phase;

- Establish a simple and flexible, management framework to facilitate detailed planning

- Perform anchoring with a focus on establishment of personal relations and effective communication practices
- Establish and implement management procedures from the beginning of the project execution
- Establish and maintain a project management file, logbook of activities, containing all project management relevant information
- Initiate activities on a manageable scale and develop further collaboration based on initial experiences
- Develop a detailed monitoring and evaluation (M&E) plan
- Establish and document financial management and accounting procedures and ensure that the necessary capacity exists

6. Indicative budget

Attached as an annex together with the logical framework

7. Annex: Overview of the University. Additional material can be obtained at <www.kcmuco.ac.tz>

The Medical College became operational on 1st October 1997 under the name of “*Kilimanjaro Christian Medical University College (KCMUCo)*”, a constituent college of Tumaini University Makumira (TUMA). KCMUCo is situated 4 kilometres north of Moshi Municipality on the slopes of the snow-capped Mount Kilimanjaro, Tanzania. The University College started with 16 medical students but since then the capacity has reached 1371 students (530 females and 841 males), and to-date we have graduated 1646 students. It was initially housed within the premises of the KCMC Hospital but now it has its own infrastructure and governance (the College Governing Board).

From the faculty of medicine it has now grown into Faculties and Directorates as shown below.

- (i) Faculty of Medicine (Diploma in Health Laboratory Sciences, Bachelor of Science in Health Laboratory Sciences and Doctor of Medicine)
- (ii) Faculty of Nursing (Diploma in HIV / AIDS and Bachelor of Science in Nursing)
- (iii) Faculty of Rehabilitation Medicine (Diploma in Occupational Therapy, Bachelor of Science in Prosthetics and Orthotics and Bachelor of Science in Physiotherapy)
- (iv) Directorate of Postgraduate Studies (Master of Public Health, Master of Science – 5 programmes, Master of Medicine – 11 programmes and Doctor of Philosophy)
- (v) Directorate of Research and Consultancies
- (vi) Directorate of Public Health

KCMUCo has 102 academic and 67 administrative staff and our financial turnover is in the tune of 5.4 billion Tanzanian shillings a year. Our key external partners include six national health universities e.g. Muhimbili University of Health & Allied Sciences (MUHAS), and Hubert Kairuki Medical Universities, national research organisations like National Institute for Medical Research (NIMR), five African universities e.g. Nairobi and Makerere Universities and over 15 Universities outside Africa e.g. Copenhagen, Southern Denmark (Odense), Duke, University College London, University of Bergen and Nijmegen. Worldwide, KCMUCO has continued to receive support from over 12 funding organisations such as Bill and Melinda Gates Foundation, NIH WHO and Wellcome Trust.