

Clinical Officer Surgical Training in Africa COST-Africa Zambia

What is COST-Africa?

COST-Africa is a research project, funded under the European Union's FP7 research programme, which aims to demonstrate how Clinical Officers can become the cornerstone of surgical care at the district hospital in Africa. In Zambia, COST-Africa is a collaboration between the Surgical Society of Zambia, comprising Zambia's top surgical specialists, and Chainama College, where additional surgical training is provided to Clinical Officers undergoing post-graduate training as Medical Licentiates.

Internationally, it is a collaboration between Zambia (Surgical Society of Zambia), Malawi (College of Medicine), Ireland (Royal College of Surgeons in Ireland); and Netherlands (Radboud UMC in Nijmegen). The European Union is funding this 4-country consortium to implement and evaluate the health impact and cost-effectiveness of training Clinical Officers (Medical Licentiates in Zambia) to undertake a range of major surgical operations at district (Level 1) hospitals. The result will be *proof-of-concept that surgery can be delivered cost-effectively and safely by non-physician clinicians in district hospitals in Malawi and Zambia.*

COST-Africa objectives are to:

1. (a) Work with relevant Ministries, Health Professions Councils, and national training colleges to ensure that COST-Africa supports national policy priorities for surgical training of Clinical Officers/Medical Licentiates (COs/MLs) in Malawi and Zambia.
(b) Conduct a situational analysis to map district level surgical services; measure surgical capacity and identify gaps to be addressed prior to delivering surgery safely and effectively in district hospitals; and establish surgical information systems for measuring surgical outcomes in Zambia and Malawi.
2. Design and implement ethically reviewed surgical training interventions for COs/MLs, which include in-service training, supervision and quality control.
3. Measure the effectiveness and impact of the intervention at the levels of health worker, patient, health facility and district population in a randomised controlled trial (RCT).
4. Establish the cost-effectiveness of the intervention.
5. Support national and regional policy makers in developing career paths and retention strategies aimed at surgically trained Clinical COs/MLs and specialist surgeon-trainers.

COST-Africa in Zambia

Training: In Zambia, COST-Africa is supporting and has built on the Government-funded Medical Licentiate (ML) training programme for clinical officers, run by Chainama College, which is Zambia's national training college for COs/MLs. The ML programme provides experienced practicing COs with a three year programme – two year training and one year internship – covering the main clinical specialties: surgery, medicine, obstetrics & gynaecology, and paediatrics. The training includes 6 months front-loaded college-based theory, followed by 4 months practical training in each of the four clinical specialties, under the supervision of surgical specialists at provincial or other high volume (mission) hospitals. COST-Africa has also been supporting Chainama College in developing a BSc curriculum for Clinical Officers, which has been submitted to the University of Zambia for accreditation.

In 2012, COST-Africa supported surgical specialists from the University Teaching Hospital who provided 3 months of additional surgical skills-training at Chainama College to 35 Medical Licentiate students from the 2009 and 2010 cohorts. The training was in: (1) *Anaesthesiology*, (2) *Orthopaedics*, (3) *Traumatology*, (4) *Essential Surgical Skills Course*, (5) *Basic Trauma Care Course*, (6) *Ultrasonography* and (7) *Advanced Life Support in Obstetrics*. Training also covered *Basic Epidemiology, Management, Ethics* and *Professionalism*.

Policy maker support in a time of change: The COST-Africa research project has the full support of the Permanent Secretaries of (i) the Ministry of Community Development Mother and Child Health (CD-MCH), which has been given responsibility for the delivery of health services at the district and provincial levels in Zambia; and (ii) the Ministry of Health (MoH). These ministries welcome the contribution of COST-Africa towards implementing what is a national policy priority of bringing much needed surgical services to the rural areas.

The transition in national level responsibility between the ministries in late 2012 and early 2013, from MoH to CD-MCH, has been a difficult period for all concerned. However, the research team has established a good relationship and is working closely with senior ministry directors and directorate staff in the Ministry of Community Development MCH.

Survey and selection of district hospitals: the Zambia research team conducted a telephone survey of 59 Level 1 (district) hospitals across 7 provinces in January-February 2013, to identify hospitals where surgically trained MLs can use their new skills and where there is a population need for their services. Based on an analysis of the survey results and information from four provincial surgeons, the COST-Africa researchers developed criteria and prepared a shortlist of circa 25-30 eligible hospitals (an average 4-5 hospitals in each province). These are hospitals where the surgical skills of surgically trained MLs can best be utilised and where the impact and cost-effectiveness of the programme can be evaluated.

The results were shared firstly with the four provincial surgeons, who ranked the hospitals within each province for suitability. These surgeon specialists will play a key role in supervising the MLs (providing on-going in-service training, quality assurance and oversight of data collection), once the MLs are deployed to district hospitals for the COST-Africa evaluation. The results were then shared with the Ministry CD-MCH, which welcomed and endorsed the selection, but requested the addition of an additional Province.

A 10 day training programme in data collection, for which tools have been developed, was delivered by the COST-Africa research team to the 16 MLs from the 2009 cohort, who had completed their internships, at the end of June 2013. Despite committed efforts by the Ministry CD-MCH, supported by the evidence on need supplied by the COST-Africa research team, the process of getting approval from Treasury for the creation of new posts for MLs at district hospitals where their surgical skills can be used was slow, from July through to December 2013.

However, due to the excellent relationship established between the Zambia COST-Africa team, led by Dr John Kachimba, and senior ministry staff, 22 district (Level 1) hospitals were selected, which were paired and from which 11 have been randomly selected as intervention sites for the RCT; and a further 5 district hospitals were purposively selected, because they already had 'Treasury approved positions', to which a further 5 hospitals have been paired as comparator sites. Deployment of the 2009 cohort of MLs to intervention hospitals has started; and MLs from the second (2010) cohort will be deployed to the intervention hospitals in early 2014, following training in data collection.

The Evaluation design: as in Malawi, the district hospital in Zambia is the unit of analysis. The cluster controlled trial includes a total of 16 hospitals in each arm, of which 11 hospitals were randomly selected and 5 purposively selected to be intervention hospitals. The COST-Africa evaluation will be undertaken by comparing outcomes, impact and cost-effectiveness between intervention district hospitals that receive a COST-Africa trained ML with those that don't receive an additional ML.

Data collection has started including measurements of resource inputs (human resources, theatre equipment and supplies, finance); processes (division of labour in theatre), service outputs (volume of surgery by type); with measurements of surgical outcomes to follow, firstly at the Level 1 intervention hospitals. Data collection will be introduced to the Level 1 comparator (control) hospitals, as well as at selected Level 2/3 referral hospitals.

Data collection for the evaluation will be done at baseline, including retrospectively for a period of up to 12 months, using existing surgical registers. It will also be run prospectively over an 18 month period, for which data collection tools have been designed. Analysis of the outcomes will be done collaboratively across the four institutions, with RCSI (Ireland) guiding the impact analysis and Nijmegen (Netherlands) the economic evaluation.

Supervision: specialist surgeons will make regular visits to the COST-Africa intervention hospitals to supervise the surgical care and over-see data collection. A surgical oversight team has been established comprising of provincial surgeons. Supervision of MLs has begun in some hospitals in January 2014. Hospital audit committees will be established to review all adverse events, which will be reported to the provincial surgeons and COST-Africa team (researchers & surgeons), who will be responsible for taking any necessary action.

Ethics and Data safety: ethics approval for the study has been approved in Malawi, Zambia and Dublin and a Data Safety Monitoring Board (DSMB) has been established in each country, to which the provincial surgeons and researchers will report at 6 monthly intervals. Regular reports will also be made to the respective national ethics committees.

How Africa will benefit

COST-Africa will firstly bring benefits to the district and rural populations of Malawi and Zambia who lack easy access to urban centres and whose only hope of life-saving emergency surgery is if it can be delivered at the nearest district hospital. The outcome will be a fully tested model that will:

- a) Make a major and sustainable impact on Africa's Burden of Disease.
- b) Provide African countries with surgically trained, sustainable and retainable clinicians.
- c) Demonstrate the potential of a 3-fold role for Africa's highly trained but scarce surgeons, helping to retain specialist surgeons in Africa:
 - as specialists
 - as trainers (of doctors and clinical officers)
 - as supervisors and quality assurers of surgical services.

Interim results will be presented to the Ministries of Community Development MCH and Ministry of Health in late 2014; an update will be provided to COSECSA in December 2014, and wider dissemination will follow.

Contacts

For further information on the country study and surgical curriculum, contact the Zambia lead investigator: jskachimba@gmail.com. Enquiries about data collection tools and plans for global dissemination to the European coordinator: rbrugha@rcsi.ie. Given the importance of the success of this RCT to the future of surgical services in Africa, we request that anyone planning surgical interventions and/or research in Zambia first contact us.