3.2.1 Project objectives

WP1 developing the workforce by training NPCs in more advanced obstetric care
Lead beneficiary: Ifakara Health Institute Trust (4)

1. To develop and implement a training/structured education programme for Non-Physician Clinicians (NPCs) who can diagnose, prescribe and perform surgery and through mentoring, support and resource turn this healthcare workforce into more advanced leaders in obstetric care.

2. To fully involve the local medical profession in the educational leadership and support of this workforce and in the research to evaluate the evidence.

3. To develop the clinical knowledge and skills coupled with training on the use of non-surgical treatments and technology that will enable this workforce to improve outcomes.

4. To produce clinical guidelines and pathways for NPCs that support clinical decision-making, audit and professional development.

5. To research the costs and benefits for continued clinical education on the job managerial training and structured continued professional development for NPCs.

6. To establish academic and managerial rigour in clinical service improvement in maternal and neonatal healthcare by training local medical profession and managers in this new discipline so they can undertake their own local monitoring and redesign to ensure continuous improvement.

WP2 Developing improved clinical guidelines and pathways for local African context and evaluation
Lead beneficiary: Karolinska Institutet (2)

1. Overall objective is to effectively adapt existing evidence-based clinical guidelines in maternal and newborn health to low-resourced health communities.

2. To determine appropriate clinical guidelines and pathways for the triage and treatment of emergency maternal and newborn cases.

3. To develop guidelines and systems in postnatal care that are grounded in the limitations of available resources and staffing and develop innovative local support mechanisms.

4. To design intervention studies and criterion-based audit to assess effect of application of guideline technology on clinical practice, perceptions and maternal and neonatal outcomes.

5. To evaluate the effect of guidelines training, clinical education and mentorship support of NPCs in changing practice.

6. To establish research and build research capacity in the evaluation of the effectiveness of this intervention programme.

WP3 Clinical education, leadership management training and creation of a professional support network
Lead beneficiary: The University of Warwick (1)

1. To improve maternal and perinatal morbidity and mortality by improving clinical education, leadership training and the creation of a professional support network.

2. To establish a culture of team working and engagement through training and shared educational resources.

3. To pilot a round-the-clock communications system to provide professional support for NPCs and outreach health workers in their delivery of emergency obstetric care in remote and rural areas.

4. To empower all healthcare professionals to improve reciprocal respect, reduce isolation, enhance standards and improve performance.

5. To effectively implement adapted clinical guidelines in maternal and newborn health with a low cost model of training and certification.

WP4 Dissemination and outreach
Lead beneficiary: The University of Warwick (1)

1. The objective of this Work Package is to disseminate evidence obtained by the project on the effectiveness and feasibility of strategies and interventions to promote maternal and newborn health to relevant African and international stakeholders by a range of appropriate methods for ensuring maximum outreach.

2. This will be achieved by ensuring the integration of the project into the fabric of the healthcare system in the partner countries and by ensuring the active collaboration of local and national governments as well as relevant international stakeholders. In this way, the sustainability of the approaches developed by the project will be ensured, developing the model as a beacon for educational development across the continent.

3. The project Co-Ordinator (Prof Peter Winstanley) will be responsible for the overall delivery of the WP, with substantive contributions from all project partners. Some deliverables relevant to the objectives of this WP will be achieved as part of the overall project management and are outlined in that WP.

WP5 Project Management
Lead beneficiary: The University of Warwick (1)

1. The objective of this Work Package is to create an organisational framework that facilitates the successful execution of the ETATMBA project. The framework will ensure that each partner institution is integrated equally into the decision-making and processes of the Consortium, and that the project remains sensitive to the needs of the NPCs and the results of medical interventions. The WP will also deliver the effective management of financial resources, communications and intellectual property.

2. The project Co-Ordinator (Prof Peter Winstanley) will be responsible for the overall delivery of the WP. Dr Paul O'Hare (Warwick) will assist the Project Co-Ordinator in quality assurance matters.

3.2.2 Progress and achievements

Work Package 1
Developing the workforce by training NPCs in more advanced obstetric care

a) Summary of progress towards objectives
In both Malawi and Tanzania considerable progress has been achieved in meeting the objectives of this Work Package while customising it to the needs of the individual healthcare systems. The progress and achievements will be described for each of the objectives.

Objective 1 – To develop and implement a training/structured education programme for NPCs who can diagnose, prescribe and perform surgery and through mentoring, support and resource turn this healthcare workforce into more advanced leaders in obstetric care

The ETATMBA project has delivered and is set to continue to develop and implement structured education programmes to meet the individual needs of NPCs and the healthcare systems in Malawi and Tanzania.

Across both countries 112 NPCs have been enrolled and retained (60 Tanzanian Assistant Medical Officers, 52 Malawi Clinical Officers). In Tanzania additional training has been provided to 58 Nurse Midwives who will perform part of a team to return to set up emergency obstetric surgery in their remote health centre.

The overall objective of creating local leaders in obstetric care is being met by developing programmes tailored to the stage of development and roles that NPCs undertake in each country. Curricula have been designed and developed, faculty recruited and trained and local clinicians engaged in the designs teaching and evaluation of the programmes.

It was clear from the outset of the project and the initial assessment made in Tanzania and Malawi that the training needs of the NPCs and their levels of clinical experience were different and needed separate training/education programmes. In Tanzania, after selection from secondary school, Medical Assistants undergo a three-year training course and after graduation work in rural dispensaries or health centres where their main roles are diagnosis, treatment of common diseases and referral, while the area of surgery is limited to minor procedures only.

In Tanzania the size and remoteness of many rural provinces is contributing to high maternal mortality and the project was designed to meet the training needs in those provinces with the highest maternal mortality as health centres are upgraded to provide emergency obstetric surgery. Tanzania differs from Malawi in some important aspects. Firstly, the size-whereby Tanzania is several times larger than Malawi, hence in order to show any effects, there is a need to train more NPCs in the former than the latter as originally depicted in the proposal. Secondly, transport difficulties are much more prominent in Tanzania due to the variable terrain. This is a major bottleneck in terms of transporting acute emergencies to places where life-saving surgery can be obtained. A policy of upgrading all rural health centres, which at the present are offering just basic emergency obstetric care to offer comprehensive cover is underway. This is in tandem with the project's objective of training and upgrading the NPCs so that they can work independently and be able to offer the expected services. This also means that supervision of the trained NPCs is a challenge; therefore there is a need to train NPCs even those who are currently working at District hospitals which at the moment are the main referral centres.

Transport bottlenecks should also be solved and NPCs must be able to plan and suggest alternative approaches to enable them refer cases which cannot be handled. The latter is also relevant in the observed shortage of essential materials such as gauze and antibiotics, for which a proper comprehensive plan of supply has to be in place. District and regional authorities are being encouraged to make sure that selected remote health centres are upgraded first and that supervision is undertaken on a regular basis. This will ensure that skills are maintained and that the NPCs are supported as far as is possible.

In Tanzania 62 NPCs have been selected and undertaken a 14 week course and hospital attachment at training centres in Ifakara and Kigoma with assessments to upgrade their skills in emergency obstetrics and their ability to diagnose, prescribe and perform surgery and to become leaders in obstetric care in their districts. This aspect of their training was met with a separate course on leadership training aimed at meeting the challenges of setting up and sustaining a service in the health centres they return to.

In Tanzania for the policy of extending maternal access to emergency obstetric surgery to succeed it was vital to train a nurse midwife in anaesthesia for all locations where surgery takes place. Fifty-eight have been trained with NPCs and will return in teams to the health centres. The benefit of training in teams shown in Tanzania has been adopted in Malawi.

Evaluations have been made during each course and post course evaluations are on-going to assess the effectiveness of the training and its sustainability and delivery in the health centres.

In Malawi after training all NPCs work in District or Missionary Hospitals and have been taught and practice emergency obstetric care including surgery. The reasons for the continuing high maternal mortality in Malawi is not simply lack of access to service but the need to ensure that these services are effective and that the workforce is supported and developed to provide sustainable delivery.

The key Malawian need was to train NPCs with more experience as leaders in obstetric care and to teach them to cascade training to all members of the team to improve the performance of the clinical service. To achieve this without interruption of the current clinical service, a modular design with in-service training and support has been developed. 50 NPCs have been enrolled in an accredited diploma programme that aims to build up to a degree. A Pilot module and two modules in emergency obstetric care and leadership have been completed and examined and assessed work within their districts on service improvement through audit continues.

In order to assess the effects of this intervention 8 districts in Central and Northern Malawi have been randomised to interventions and 7 to control and quantitative and qualitative data is being collected to assess the effects of the training on the maternal and neonatal mortality and morbidity.

Our objective is to support the University of Malawi in creating and sustaining a degree course. We have made very considerable progress and proposals have been put to senate. All this takes time, and in order rapidly to develop accredited education within the life of the project we managed to secure approval at the University of Warwick for an Advanced Diploma course. Application has been made to extend this to a degree course in order to ensure that our early clinical officer participants do not suffer by having participated before the Malawian degree course is accredited.

Objective 2 – To fully involve the local medical profession in the educational leadership and support of this workforce and in the research to evaluate the evidence

Key features in the delivery of the training modules have been the local involvement of the training Institute and clinicians in Tanzania who have worked from the outset with the Ministry of Health and the training is in tandem with their policy.

In Malawi a major drive and challenge has been the development of the Malawi obstetric faculty but this is clearly essential for sustainability. Capacity issues in Malawi with few specialist obstetric clinicians has meant that in the first modules there has been considerable reliance on Warwick staff both to design and to deliver. More active involvement of newly-identified clinician partners should allow for a more sustainable delivery for Module 3 and beyond.

In Tanzania delivery of post course assessments to the rural facilities remains a challenge and will be addressed before future expansion of training takes place.

Research to evaluate the evidence has involved Ministry of Health and College of Medicine in Malawi and will involve the NPCs and the qualitative research forms part of a PhD programme. Progress to developing research into the evaluation in Tanzania has been slowed by capacity and administrative issues but candidates have now been identified and it is still planned to begin a research programme.

Objective 3 – To develop the clinical knowledge and the skills coupled with training on the use of non-surgical treatments and technology that will enable this workforce to improve outcomes

In the training in Tanzania and Malawi, the key feature of the programme was not only the clinical knowledge and skills around surgery, but the appropriate use of vacuum extraction, use of misoprostol, condom tamponade in post-partum haemorrhage, treatment of eclampsia and effective neonatal resuscitation and care.

A recurring theme of training in both programmes is improving clinical decision making to move away from the technical role this cadre often find themselves in to provide specialist skills in non-surgical treatments. Providing effective leadership and team working are essential to this process and key modules on both programmes.

In Tanzania mentoring and direct observation was part of the initial clinical attachment and will happen during post course assessments in the workplace. In Malawi, as well as the mentoring and direct observation of skills during training modules NPCs are supported by

supervisory visits by a specialist who will mentor and directly observe clinical skills in the workplace.

Objective 4 – To produce clinical guidelines and pathways for NPCs that support clinical decision making, audit and professional development

Both training programmes have utilised national clinical guidelines for obstetric and neonatal care in training in clinical decision making and audit, reflections and documentation through proper record keeping and logbooks introduced as professional skills.

The understanding, evidence base, clarity and application of clinical guidelines and training of NPCs and in particular their active involvement in determining standards as part of their audit has been an essential common theme of the programmes and will be highlighted further in the Professional Project in the Malawi programme.

Objective 5 – To research the costs and benefits for continued clinical education, on the job managerial training and structured continued professional development for NPCs

This objective remains to be completed once data on costs of the training programmes including the support of on the job training and the costs of providing continued professional development through an active network become available.

In Malawi the cost of developing a BSc programme is undergoing a formal health economic analysis by the University of Antwerp working with the Royal College of Surgeons of Ireland in the COST-Africa FP7 programme and the plans are to work closely with this group in an analysis of the two degrees. These should form the cornerstone of sustainable training for specialist clinical officers for the future.

Objective 6 – To establish academic and managerial rigour in clinical service improvement in maternal and neonatal healthcare by training local medical profession and managers in this discipline so they can undertake their own local monitoring and redesign to ensure continuous improvement

Progress is being made on this objective in Tanzania and Malawi. Initial consultation has been reinforced through stakeholder meetings and direct meetings of faculty staff with local medical professionals and District Medical Officers to directly inform them of the key objective of the training to improve clinical systems.

Training NPCs as leaders at a district level and the active cascading of not only knowledge but also the active engagement of the team in audit, has led to improvement in local districts. District Medical Officers have been involved and supportive of the whole process.

In Malawi a course to provide direct training of District Medical Officers from the intervention districts, Senior Nurse Midwifes and Ministry Staff in Clinical Systems Improvement and Leadership took place in May 2012.

b) Significant results

- 112 NPCs have been enrolled and retained across both countries.
- Robust training programmes customised to each countries healthcare needs have been established.
- NPCs have been trained as local leaders in obstetric and neonatal care to improve clinical services.
- Additional training to 58 Nurse Midwives has been delivered in Anaesthesia in Tanzania.
- An accredited Advanced Diploma in Clinical Obstetrics and Leadership has been established for NPCs in Malawi and approval sought to extend this to a degree.
- A University of Malawi Degree for Specialist Clinical Officers is being developed by the College of Medicine.
- A randomised waiting list design controlled trial has been established to evaluate the training in Malawi and full course evaluations and post-course assessments are underway in Tanzania.

c) Deviations and corrective actions

In Malawi establishing a local faculty to deliver training has been challenging and the full involvement of the College of medicine and reduction in the responsibilities of the Ministry of Health has been the response to minimise the effect on the delivery of objectives. It has been necessary to use Warwick staff in design and delivery and this will need to be reflected in resource allocation but is achievable.

The need to deliver accreditation to degree level for this cadre was not anticipated and the challenge in moving all stakeholders towards this so that a sustainable future programme is established will require careful use of existing resources within the College of Medicine budget.

In Tanzania emphasis has been on training sufficient NPCs and supporting Nurse Midwifes to support the extension of skilled personnel to support emergency obstetric care in remote health centres. It is planned to extend training in the second phase of the project but to concentrate first on the post-course evaluation of the training. Problems faced by newly trained NPCs in their districts include severe shortage of essential equipment and provisions from the Medical Supplies Department and transport costs.

In Tanzania there has been slow progress to date in developing research around the evaluation and delays from capacity and bureaucracy in engaging the PhD students but the team hope to resolve this in due course.

In Malawi one candidate earmarked for research has not been able to work with sufficient quality to continue. One PhD student is enrolled with the College of Medicine and continues with joint supervision between Warwick and the College of Medicine in Malawi.

d) Progress towards critical objectives

All critical objectives of this work package have been met or are on schedule to be met.

With regard to resources, the capacity issues in Malawi are being met by training and recruitment of faculty but the need to involve Warwick staff in delivery will require some switching of resource between the College of Medicine and Warwick.

e) Statement on use of resources

Work Package 1

Participant number	Participant short name	Budgeted person-months per participant	Actual person-months per participant
1	Warwick	13.00	13.02
2	KI	16.00	5.00
3	MMOH	16.00	0.00
4	IHI	56.00	56.00
5	GE	0.00	0.00
6	UOM	41.00	24.00
	Total	**142.00**	**98.02**

No personnel costs claimed by MMOH.

Work Package 2

Developing improved clinical guidelines and pathways for local African context an d evaluation

a) Summary of progress towards objectives

Objective 1 – Overall objective is to effectively adapt existing evidence-based clinical guidelines in maternal and newborn health to low resourced health communities

Both in Tanzania and in Malawi it has been difficult to clearly establish existing "evidence-based clinical guidelines in maternal and newborn health", since different influential universities and professional circles tend to have "clinical guidelines" deviating from "official" guidelines established in the Ministry of Health. As a point of departure we have, however, chosen to use identified, officially-established guidelines in both Tanzania and Malawi and we have critically investigated those guidelines in order to perform the required adaptation to enhance their effectiveness and evidence base.

With the above-mentioned approach we have determined appropriateness of these guidelines and made necessary adjustments based on currently available best clinical evidence. These guidelines have their focus on both maternal and newborn care during pregnancy, child birth and the postnatal period. A specific problem has been the fact that the best available evidence implies a cost (drugs, emergency supplies, equipment etc), which many times impede the practical performance according to such guidelines. Hence, evidence-based guidelines must frequently be set aside due to lack of resources or lack of financial resources for needed material.

Evidence-based clinical guidelines for Tanzania and Malawi have been developed and adapted from existing guidelines working with the Ministry of Health. These have been placed on the project website (www.etatmba.org) as part of the deliverables. This needs to be a living document with further amendments and improvements subject to further discussion among experts.

Objective 2 – To determine appropriate clinical guidelines and pathways for the triage and treatment of emergency maternal and newborn cases

While guidelines exist, their immediate availability requires dissemination in a format that allows ease of access during any obstetric or neonatal emergency. For neonatal

emergencies, posters on resuscitation produced and disseminated by the Helping Babies Breathe Foundation have acted as exemplars for the need to have similar posters for obstetric emergencies. Training NPCs as leaders and teachers has highlighted these issues and the effective use and dissemination of guidelines form part of the project work for NPCs.

Objective 3 – To develop guidelines and systems in postnatal care that are grounded in the limitations of available resources and staffing and develop innovative local support mechanisms

The neonatal guidelines and guidelines for postnatal care are endorsed by Ministries and based on WHO recommendations by local paediatricians grounded in the limitations of available resources. Innovative local support mechanisms consist of the international initiative of the Helping Babies Breathe programme and discussions and research meetings trying to develop neonatal guidelines that could be available as text on mobile phones. Funding considerations continue to be the main barrier to this innovation that could have widespread application in sub-Saharan Africa.

Objective 4 – To design intervention studies and criterion-based audit to assess effect of application of guideline technology on clinical practice, perceptions and maternal and neonatal outcomes

We have introduced regular criterion-based audit sessions with tentative implementation of guidelines as part of ongoing in-service staff training. We have also developed focus on obstetric process indictors, like facility-based deliveries as a percentage of expected deliveries in an assumed catchment area, percentage of caesarean sections of all facility-based deliveries and also case fertility rates per morbidity. In Tanzania we have achieved a good archive of case notes and partograms, which constitute the very basis of clinical audit in all facilities where the project has been implemented.

Proficiency in the completion of audit is an essential part of training for the NPCs. It forms a cornerstone of their professional development and a major part of their assessment, engaging them with their healthcare setting. This development will include understanding the evidence base behind the guidelines and the choice of standards for audits. There is an essential need to drive systems improvement through the effective working of the audit cycle and the need in healthcare with limited resources to concentrate on what is practical.

Intervention studies on maternal and neonatal outcomes include the randomization of districts in Malawi to allow comparison of maternal and neonatal outcomes, and qualitative research into attitudes and perceptions of the training that forms part of a PhD.

We have compiled the new, adopted guidelines in two separate documents, one for Tanzania and one for Malawi (www.etatmba.org/guidelines).

Objective 5 – To evaluate the effect of guidelines, training, clinical education and mentorship support of NPCs in changing practice

In Tanzania the main evaluation will derive from the post-course assessment with continuous education (PCA/CE). The clinical guidelines, based on existing national guidelines, have served as guiding principles in these PCA activities allowing us to assess individually all course participants who have been through the training implemented in 2011. These PCA events have turned out to be very useful with practically-oriented, individual assessments of competence in emergency care in surgery in particular. Individual assessments of PCA/CA participants were carried out with very positive results, indicating the value of the PCA approach and the need to have CE as an educational method in the form of refresher courses for non-physician clinicians

In Malawi the evaluation is ongoing. Project work that all NPCs will undertake includes guideline application, audit reports as part of their accredited course and involvement in the research trial to evaluate the overall effect of the package.

Objective 6 – To establish research and build research capacity in the evaluation of the effectiveness of this intervention programme

Evaluation of the effectiveness of the intervention package is part of the research and the building of research capacity. In Malawi a research project that forms part of a randomized controlled trial across districts is underway and will involve the NPCs and a PhD student and the complex intervention will be assessed and analysed. Recruitment is underway in Tanzania for the planned research into the assessments of the effectiveness of the training programme and continuing education needs.

b) Significant results

- The first significant achievement has been to find the established guideline at the Ministry of Health level and to investigate to what extent these guidelines are known or

unknown at health facility level and whether or not they are applied and followed up regarding outcome in audit sessions. Guidelines that exist are poorly-disseminated with negligible revision.

- In both Tanzania and Malawi it is clear that the existing guidelines have not penetrated to hospitals, health centers and more remote health facilities to a desirable extent. In both countries there are problems with outreach and sensitization of health staff according to existing guidelines. Likewise, the follow-up of compliance among health workers to existing guidelines is deficient or even nonexistent. This is an important finding, indicating that not only upgrading to reach better quality of evidence is needed but also, and even more important, the dissemination of existing guidelines is vital in order to enhance their real utilization in maternal and neonatal health care.
- In both Malawi and Tanzania there is a virtual absence of regular audit to investigate substandard/poor maternal and neonatal care. In Malawi audit does take place but the results are not followed up. This is a key finding as it underpins our emphasis on completing intelligent audit cycles with change as the desired outcome. We have established action-oriented clinical audit with immediate feedback of findings to the staff involved in cases having been exposed to substandard care and have developed this professional skill in NPCs to encourage system improvement.

c) Deviations and corrective actions

We are aware that there is a considerable variability in quality of patient care in obstetric and neonatal practice and that poor clinical practices exist in both rural and urban areas in Tanzania and Malawi. We also recognize that major improvements can be made in service delivery by achieving standardisation of approach but that there is a need to define, analyse and refine clinical systems to improve reproductive health care. It is a fact that problems need to be solved locally by local professionals with their training in management and clinical leadership skills and also in the ability to safely innovate clinical performance.

Once existing guidelines on maternal and neonatal care were improved there was a process of review at the Ministry of Health level in order to confirm acceptance of such new guidelines and, in a second step, to design evaluation based on adopted guidelines. New guidelines have both clinical and financial implications and there may not be automatic consent among all influential circles in obstetrics and neonatology to make fundamental changes in clinical practice and to change the “know-do gap”. The perceptions (acceptance or reluctance) among staff of changes in guidelines in maternal and neonatal care have also to be confronted, discussed and analysed. These difficulties have yet to be overcome in order to have guidelines established that are customised and fully accepted by each country.

Intervention studies to evaluate changes have been developed to meet the needs of the training programmes in each country. In Tanzania these take the form of post-course assessments and in Malawi a research project is underway.

d) Progress towards critical objectives

The evaluation of "effective guidelines, training clinical education and mentorship support of NPCs in changing practice" is ongoing through post-course assessment in Tanzania though the establishment of research and research capacity building in Tanzania has been delayed. In Malawi the evaluation forms part of a research project and is underway.

In order to test the feasibility of one specific guideline on assisted vaginal delivery (AVD), we organized two workshops in the project on vacuum extraction, the first one in Mwanza May 21-22, 2012 in Bugando Medical Centre. This workshop was well attended by senior specialists and postgraduate students (residents and interns) from Bugando Medical Centre and Kilimanjaro Medical Centre and also from surrounding districts in Mwanza region. The objective of this workshop was to present current scientific evidence on the use of vacuum extraction in delayed second stage of labour. A second follow up workshop was organized in Muhimbili National Hospital on June 7, 2012 in which basically the same program was given with even more focus on criterion based audit of caesarean sections and vacuum extraction along with the established new guidelines in WP 2 in the project.

These two workshops provided good information and experience on the practical application of new guidelines, so far not applied and partly misunderstood, where our project can play a significant role of change to achieve best practice in a significant proportion (about 10%) of all deliveries in which currently caesarean section is the method of choice on poor scientific ground instead of justified vacuum.

More emphasis has been placed on the bottom-up approach whereby guidelines are respected, living instruments for service improvement. Given that due attention is paid to all stakeholders and ministries we are optimistic that we shall be able to reach out to remote areas with updated guidelines dully authorised and confirmed by the Ministry of Health in both Malawi and Tanzania.

e) Statement on use of resources

Work Package 2

Participant number	Participant short name	Budgeted person-months per participant	Actual person-months per participant
1	Warwick	2.00	1.20
2	KI	22.00	11.50
3	MMOH	6.00	0.00
4	IHI	36.00	0.00
5	GE	0.00	0.00
6	UOM	6.00	5.00
	Total	**72.00**	**17.70**

Comment from Ifakara Health Institute: activities not carried out using staff charged to the project so person months were difficult to calculate.

No personnel costs claimed by MMOH.

Work Package 3

Developing the workforce by training NPCs in more advanced obstetric care, clinical education, leadership management training and creation of a professional support network

a) Summary of progress towards objectives

Objective 1 – To improve maternal and perinatal morbidity and mortality by improving clinical education, leadership training and the creation of a professional support network

Our approach to bringing about change in clinical leadership in obstetric and neonatal care in Malawi and Tanzania has been to develop new and innovative training programmes for advanced leader NPCs. Teaching on obstetric and neonatal care in Malawi is comprised of modules accredited by University of Warwick at undergraduate level 4 with each module worth 30 CATS points. Accreditation is important because the NPCs in Malawi are required to attain degree-level training in order to progress within the Ministry of Health. There is a critical shortage of Malawian faculty able to develop and teach on this sort of course. However where possible the curriculum for each module has been developed with active contribution from partners in the College of Medicine. Currently, we have a strong faculty, mostly from University of Warwick, working with, and gradually handing over to, a Malawian faculty. We are also working closely with the College of Medicine to help them develop their own BSc Course for NPCs. Only the brightest and best COs will get onto the degree courses, but there will be recognition for their experience.

The ETATMBA training course in Malawi takes selected NPCs with a minimum of 3 years' experience working in obstetrics and runs three taught modules of one week at six-monthly intervals followed by a professional project and specific on-the-job training. It is hoped to accredit this for a full Warwick BSc award in due course. Following a successful pilot in Nkhotakota during May 2011 with half a dozen NPCs, a further 50 NPCs completed the first module in Lilongwe in November 2011. The focus of this module was emergency obstetrics and neonatal care in resource-limited setting with emphasis on the 'Big Five' killers: eclampsia, post-partum haemorrhage, anaemia, sepsis and neonatal asphyxia. Course assessment included an audit in one of these clinical areas. The learning outcomes for this course directly contribute to the achievement of ETATMBA project objectives. The module teaching was co-delivered by Malawi and Warwick faculty.

Teaching of obstetric and neonatal care in Tanzania has been targeted to NPCs at an earlier stage of experience. They have undertaken a twelve-week block release that will upgrade them to return to rural centres, enabling them to provide emergency obstetric care including caesarean section, anaesthesia and neonatal resuscitation. Clinical education concentrated on emergency obstetric and neonatal care together with the need to teach the management and skills to provide opportunities to gain operative experience under supervision during this attachment.

The ETATMBA training course in Tanzania at Ifakara and Kigoma has involved the team training nurse-midwives in anaesthesia and teaching NPCs the management of acute abdominal surgical emergencies that might present in obstetric practice.

Leadership training to produce professionals who will improve healthcare locally has been delivered in Malawi and Tanzania.

In Malawi, the second module 'Clinical service improvement and leadership in Emergency Obstetric and Neonatal Care' ran during May/June 2012 in Lilongwe. To promote inter-professional learning in this module, NPCs were trained alongside nurse midwives. This was introduced to the course in Malawi following the reports of beneficial team learning in Tanzania. The module took the students' clinical audits as the starting point and focused on clinical leadership and clinical systems improvement (CSI), evidence-based practice and values-based practice (V-BP) and change management to look closely at how audits can form the foundation of clinical service improvement. The innovative curriculum in Module 2 emphasised the need for new ways of thinking about problems in healthcare systems. CSI techniques that have proved successful in the NHS such as problem identification including '5 Whys', Plan-Do-Study-Act (PDSA) and value stream mapping were brought to Malawi possibly for the first time. These patient-centred approaches were combined with evidence-based practice and the new approach of values-based practice, a clinical skills-based approach for working with complex and conflicting values in healthcare. The whole module was set in the context of clinical leadership and the NHS Clinical Leadership Competency Framework (CLCF).

Learning outcomes from Module 2 further work towards achieving the objectives of Work Package 3. These are:

- Demonstrate self awareness by being aware of own values, principles, and assumptions, and demonstrate learning from experiences

- Demonstrate person-values centred practice by taking account of the needs and priorities of others in practice
- Learn through participating in continuing professional development and from experience and feedback, to improve obstetric and neonatal care
- Demonstrate processes of reasoning about values and apply these in an open, honest and ethical manner
- Develop networks by working in partnership with patients, carers and colleagues to deliver and improve services
- Build and maintain relationships by listening, supporting others, gaining trust and showing understanding
- Encourage contribution by creating an environment where others have the opportunity to contribute
- Promote enhanced team-working to deliver and improve services in obstetric and neonatal care including in emergencies
- Identify available and potential resources and demonstrate strategies for safe and effective clinical deployment.
- Identify service goals in obstetric and neonatal care and scope for personal contribute-on to achieving the goals
- Apply knowledge and evidence by using guidelines and gathering information to produce evidence-based improvements in obstetric and neonatal care
- Demonstrate quality improvement skills in acute obstetric and neonatal care in low-resource setting

It is important to note that Module 2 made extensive use of the clinical guidelines developed in work packages 1 and 2. This not only ensured a proper integration of activity between work packages 1, 2 and 3, but also grounded the clinical training in these modules to evidence-based practice.

The teaching was enthusiastically received by the NPCs and nurse midwives, who have been challenged to use their own clinical leadership self-assessment to develop a personal action plan, and evidenced portfolio of achievement based on the leadership framework. Again module teaching was co-delivered by Malawi and Warwick faculty with valuable contribution from GE Healthcare. Project partners from the Ifakara Health Institute observed the teaching in Lilongwe including the module assessment, so that the module can be trialled in Tanzania later in the project as part of scalability and sustainability of the ETATMBA course. Indeed during the development of the curriculum for these modules good

practice in assessment was shared between the Malawi/Warwick course and the Ifakara Health Institute clinical officer training course. In this way education standards and rigorous assessments can be benchmarked between both African partner sites.

In Tanzania, four courses in leadership training for 68 NPCs have been delivered between August 2011 and July 2012 at Ifakara and Kigoma. The CLCF has been adopted and adapted to meet the needs of NPCs working in Tanzania to improve clinical services. By setting this training in the context of the CLCF the key elements of leadership training in Tanzania and Malawi have been achieved. The training aims to ensure that NPCs and NPCs are competent in each of the five core leadership domains of:

1. Demonstrating personal qualities
2. Working with others
3. Managing services
4. Improving services
5. Setting direction.

Teaching methods have used the experience of the NPCs and nurse-midwives to teach themselves through group work, role play, leadership scenarios, lecture discussion and self-assessment portfolios.

Future development plans are to align self-assessment and assessment methods across leadership training in the ETATMBA project.

Objective 2 – To establish a culture of team working and engagement through training and shared educational resources

During training in Malawi and Tanzania a culture of team-working and engagement has been established among the NPCs, reinforced by translating the concept of shared leadership into audit and service improvement in their practice. Nurses have also been fully involved at both locations. We are also training NPCs to engage with policy makers so that they are able to communicate their objectives at the highest level. The learning outcomes and competencies of the training reflect this aim and have been met in the courses. Professional networks operate locally, nationally and internationally and the project's goal of enhancing the status of NPCs in the healthcare workforce should ensure that this objective continues to be met.

Educational resources between partners have been shared particularly around innovative programmes such as those developed for clinical systems improvement and leadership and in the area of assessment.

Objective 3 – To pilot a round-the-clock communications system to provide professional support for NPCs and outreach health workers in their delivery of emergency obstetric care in remote and rural areas

Pilot work on using text messages and smartphones to support neonatal guidelines, collaborating with organisations such as D-Tree in Malawi and Sony-Ericsson in Tanzania has been undertaken. This pilot work has been completed; costing and plans to work with partners to seek further funding are underway. To develop these ideas in a sustainable way would require funding on a scale that has not been conceived and further development grants working with new partners would need to be sought.

Capacity issues of senior clinicians to support a communications system are a major issue that limited attempts to set up this system. Professional support has been provided by a system of mentoring through email and phone by members of faculty for the NPCs on the courses dependent on their personal availability to provide advice and support. The professional network of NPCs has encouraged the provision of support from more senior NPCs to their more junior peers and the cascading of teaching extended these processes to other healthcare staff.

Objective 4 – To empower all healthcare professionals to improve reciprocal respect, reduce isolation, enhance standards and improve performance

The training courses in Malawi and Tanzania have been designed and delivered to achieve this objective. Mutual respect, team work and quality improvement in healthcare are all key parts of the CLCF that has been used for the framework of leadership training. By involving District Medical Officers and Nurse Midwives in this training, mutual respect and improved team work within a shared framework of values has been fostered. This has been translated to their local healthcare team through audit and project work designed to involve them. As leaders and specialists in emergency obstetric and neonatal care, NPCs have returned to their healthcare teams to enhance standards and improve performance. Specific efforts have been made in Tanzania and Malawi to forge collaboration not only with the Ministries of Health but with the existing senior staff in the district to encourage supervision as one of their major roles in order to support this.

In Malawi a major challenge for reciprocal respect to sustain among other health professionals is for this group of specialist clinical officers to be trained and accredited to degree standard. The project is actively engaged in pursuing this and involving the College of Medicine and Ministry of Health in working together to have a long-term solution that allows NPCs to progress to degree level as they train to be clinical specialists in Malawi.

In Tanzania, the project in bringing together NPCs has been a stimulus for them to begin to organise themselves into an organisation, become registered and develop more established structures for career advancement. The professional networks among the NPCs that have been established for those on the course in Malawi and Tanzania has formed a core for the development of National and Pan-African networks (eg www.malawinpcnetwork.org). Developing a professional association for NPCs involved in maternal and neonatal health that evolves from these networks and can be an agent of change to improve the quality, standards and performance of healthcare for mothers and babies in each country. A sub-Saharan Africa NPC network meeting has been arranged for November 2012 to further strengthen the links between NPCs in Malawi and Tanzania, and to spread good practice to other sub-Saharan countries.

Objective 5 – To effectively implement adapted clinical guidelines in maternal and newborn health with a low cost model of training and certification

The training programme for both Malawi and Tanzania are using the adapted clinical guidelines effectively and this has been described in Work Package 2.

The training programmes designed, developed and delivered in both countries have together far exceeded expectations for the numbers in training because they have utilised a low-cost model of training. The needs in both countries differ so that in Tanzania a model based on an initial twelve-week block release at an established centre of training has been cost-effective in producing NPCs who can undertake obstetric surgery and anaesthesia but further continuing education to support them in their health centres will be undertaken. In Malawi the service was unable to release the more senior NPCs for more than one week so a model building up modules with in-service 'on-the-job' training in their districts has been established. Due to severe capacity issues in Malawi there has been the need to use Warwick staff but involving Malawi faculty in the future should make this more cost-effective.

b) Significant results

- New and innovative training programmes for clinical leadership have been established in Malawi and Tanzania
- A professional support network has been created and is being extended
- A culture of team working and engagement among NPCs and 'shared leadership' has been initiated
- Educational resources around leadership, assessment, guideline development and systems improvement have been shared between partners.

c) Deviations and corrective actions

The original idea in objective 3 of a 'round the clock' communication system to support healthcare workers has been met in part by the pilot work using text messages and smartphones but this has not been able to progress because of the substantial funding that would be required. Funds have been sought and the collaborations are ongoing but the complexity of the issues involved only became apparent with the pilot.

Capacity issues in Malawi and Tanzania to support and sustain a communications system with a lack of trained obstetricians to provide manpower to sustain this service has been a major block to its development. We have tried to correct for this by providing professional support via email and phone from tutors to trainees on the courses when they return to the workplace. As NPCs are trained as specialists and through their professional association we will work to encourage senior staff to develop a communications system to support more junior colleagues needing advice in the workplace and will try to develop a system that can circumvent the capacity issue.

There have been no other deviations requiring corrective action.

d) Progress towards critical objectives

All other objectives of this work package have been met or are on schedule to be met.

e) Statement on use of resources

Work Package 3

Participant number	Participant short name	Budgeted person-months per participant	Actual person-months per participant
1	Warwick	12.60	10.19
2	KI	4.00	0.00
3	MMOH	6.00	0.00
4	IHI	36.00	0.00
5	GE	1.00	1.39

6	UOM	26.40	9.00
	Total	**86.00**	**20.58**

Comment from Ifakara Health Institute: activities not carried out using staff charged to the project so person months were difficult to calculate.
No personnel costs claimed by MMOH.

Work Package 4
Dissemination and outreach

a) Summary of progress towards objectives

Objective 1 – The objective of this Work Package is to disseminate evidence obtained by the project on the effectiveness and feasibility of strategies and interventions to promote maternal and newborn health to relevant African and international stakeholders by a range of appropriate methods for ensuring maximum outreach

and

Objective 2 – This will be achieved by ensuring the integration of the project into the fabric of the healthcare system in the partner countries and by ensuring the active collaboration of local and national governments as well as relevant international stakeholders. In this way, the sustainability of the approaches developed by the project will be ensured, developing the model as a beacon for educational development across the continent

and

Objective 3 – The project Co-Ordinator (Prof Peter Winstanley) will be responsible for the overall delivery of the WP, with substantive contributions from all project partners. Some deliverables relevant to the objectives of this WP will be achieved as part of the overall project management and are outlined in that WP

The project is on course to gather and disseminate the evidence on its interventions to promote maternal and newborn health to both African and international stakeholders. It forms part of an increasing awareness in the global community that the development and support of Non-clinician Physicians is the cornerstone of improving healthcare in Malawi and Tanzania and many other countries in sub-Saharan Africa.

To do this sustainably models that suit and are supported by the local health care systems have been developed and are being delivered. In Tanzania the involvement of national and district health care teams have aligned the project aims to developing a workforce that can take forward the national plan to upgrade health centres in remote areas and to equip and staff them so they can give access to mothers to specialist services with a practical and safe

distance. Outreach to local and national governments has resulted in good progress in deciding on the manpower issues and the design and delivery of courses.

Major challenges remain on the roll out of the Ministry's programme to upgrade health centre facilities and provide the resources to equip and sustain these facilities. These challenges have brought home to project leads that a key skill and attribute for NPCs will be that they themselves become agents for change and leaders within their healthcare setting to ensure material and neonatal care, do indeed improve. In Tanzania the training of 110 NPCs and nurse anaesthetists has led to the development of a network for them to evolve into a national group and to link with the Pan-African groups that are being developed. The leadership module and systems improvement have been expanded and focused to help NPCs tackle the issues that will arrive around the sustainability of their service.

b) Significant results

In June 2011 an African conference on educational development and training took place in Ifakara, Tanzania and included partners and expert educationists and has allowed contacts and networks to be established that has helped to sustain the development of the project and to bring together the common educational themes in the programmes in Malawi and Tanzania that will be applicable across Africa.

In Malawi much of the training has focused on the need for effective leadership involving all health workers to allow maternal and neonatal health services to improve. Despite many challenges the active involvement of the Ministry from Principal Secretary of Health to District Medical Officers and the involvement of all major stakeholders in the training of NPCs has been achieved. To develop NPCs as effective leaders in Malawi the need for accreditation of this group is essential to enhance the status and provide a structured training route that fits into the government determined structures of the Malawi Health Service.

A National Stakeholder meeting in May 2012 in Lilongwe, Malawi, brought together the key players from the Ministry of Health, College of Medicine, Medical Council of Malawi, Christian Hospitals Association of Malawi and funding organisations together with the ETATMBA team to plan and commit to a sustainable model of training for NPCs in Malawi that will involve developing accredited BSc programmes for NPCs in areas of specialist interest. The drive to achieve this has come from the ETATMBA training programme working in partnership with the COSTA EEC funded programme that is developing a surgical training programme for NPCs as a BSc.

Actions resulting from this meeting have been the redesign and remapping of programmes to fit a model that has been submitted to the University of Malawi and should form the basis for a sustainable training programme for NPCs as specialists for the Malawi Healthcare system for the future. While all parties were supportive providing future funding for these programmes will remain a major challenge.

In August 2011 the annual Gotland (Sweden) two-week advanced course *"Enhancing access to human resources for maternal and neonatal survival through task-shifting by training of non-physician clinicians for comprehensive emergency obstetric care in low-income countries: from scientific evidence to action"* was implemented with focus on topics and problems addressed in the ETATMBA project. Lecturers active in courses within WP1 in Tanzania and Malawi and specialists active in the work on Guidelines in WP2 were also actively participating in the Gotland course. The dissemination of methodology and results from the ETATMBA project to all participants was central in the course and this information reached out not only to participants from Tanzania and Malawi but also to those from a large number of other African countries.

In October 2011 Staffan Bergström was invited to Maputo to present methodology and preliminary results from the ETATMBA at the ECSAOGS (Eastern, Central and Southern Africa Association of Obstetrics and Gynaecological Societies) meeting. The specific ETATMBA focus on the crisis in human resources was given much attention as was the concept of "task-shifting" of major obstetric surgery to NPCs in the context of CEmOC (comprehensive emergency obstetric care).

The "2011 The 4th Global Health Supply Chain Summit", University of Southern California, Los Angeles invited Staffan Bergström in November 2011 to talk about the human resource crisis in maternal and newborn care and to discuss the ETATMBA project methodology against the background of the current NPC situation in Tanzania and Malawi. A broad multinational audience participated in this summit and the ETATMBA project attracted much interest.

In January 2012 Staffan Bergström was invited to lecture on the ETATMBA project at the University of Nairobi and at Aga Kahn University in Nairobi. The latter university had also inquired about sending midwifery tutors and clinical officer tutors to the Gotland course in August 2012. Like in Tanzania and Malawi there is a crisis in human resources for health in Kenya though initiatives to acknowledge and actively support policies of "task-shifting" are

lacking. There is, however, an interest to address the issue of delegation of CEmOC tasks to clinical officers, which is the NPC category existing in Kenya.

In July 2012 the Minister of Health in Mozambique, Dr Alexandre Manguele, invited Staffan Bergström to lecture at the MoH on the ETATMBA methodology and results and inquire about the possibilities to send Mozambican NPCs to the Gotland course. Mozambique has already (since 1984) a system of NPC training in surgery including CEmOC but do not have the principle of delegation to health centre level of CEmOC surgery, particularly caesarean sections. Dr Manguele wanted to have more dissemination of these results and expressed his intention to contact his Tanzanian colleague Dr Hassan Ali Mwinyi for such exchange of experiences.

Dr Godfrey Mbaruku attended the 2nd International Round table China-Africa Health collaboration-February 2011, Beijing China at which the project was discussed. He also reported on ETATMBA at the African Centres of Excellence in Research summit, Kampala, Uganda, in September 2011.

c) Deviations and corrective actions

This Work Package is continuing to develop and at this stage there are no significant deviations to report.

d) Progress towards critical objectives

A key means of dissemination and outreach has been the dedicated project website from 2011 that has allowed easy access to project reports, meeting minutes, guidelines, protocols and project progress as well as for signposting and delivery of teaching material and deadlines for NPCs and for posting papers and reports of interest to project members.

In Tanzania and Malawi the dissemination and outreach has been through the involvement and training of the health professionals that has been linked in both countries to active public awareness programmes with regular national coverage. As the project evolves and results are produced on the effectiveness of training, we plan to use this route of dissemination within both countries.

An international exchange of researchers, administrators and academics to build education capacity has been established with educational exchange visits to Warwick, Tanzania, Malawi and Gotland, Sweden. These visits have been fruitful and effective in achieving project objectives.

Warwick's communication office has produced regular press briefings across the academic community on the projects progress and made them available to local and national press.

To date an international conference presentation has been made and a further paper will be presented to the International Obstetrics Conference in November.

A publication strategy has been agreed and the first phase of producing the methodology paper for the evaluation trial is underway and further publication will follow once results are available at the end of the data collection period.

In workshops at the Association for Medical Education in Europe (AMEE) and the Association of Medical Educators (ASME) annual conferences in 2012, Professor Peile has made references to the values-based practice work in Malawi, which is described on the Warwick V-BP website. As a result of this other international collaborators have identified themselves for researching utility of V-BP in resource poor settings.

Warwick has hosted International Conferences on Global Health and in September 2012, under the Presidency of Professor Peter Winstanley, the Royal Society for Tropical Medicine will hold a conference on Global Health and this will offer a valuable platform for the dissemination and outreach of the ETATMBA project to an international target audience.

Key members of the consortium (e.g. Professor Staffan Bergström and Dr Godfrey Mbaruku) continue to engage at International Meetings on Global Maternal Healthcare in developing countries and to promote the need for the more advanced training of the Non-Physician Clinicians and the role of the ETATMBA project.

e) Statement on use of resources

Work Package 4

Participant number	Participant short name	Budgeted person-months per participant	Actual person-months per participant
1	Warwick	7.00	0.26
2	KI	0.00	0.00
3	MMOH	0.00	0.00
4	IHI	0.00	0.00
5	GE	0.00	0.00
6	UOM	0.00	1.00
	Total	**7.00**	**1.26**

It is anticipated that dissemination will be an activity for the second reporting period.

Work Package 5
Project management

a) Consortium management tasks and achievements

The management of the project has been challenging as there are considerable differences between the infrastructures and the training requirements of Tanzania and Malawi.

The Ifakara Health Institute in Tanzania is a well-established and prestigious research centre. There are staff trained in finance and management who have worked with EC grants in the past and the Centre has run training courses in the past. Thus there is a well-established administrative structure for running large-scale projects.

In contrast, the original sole beneficiary in Malawi, the Ministry of Health, had little experience with these projects and had less experienced staff. The addition of the University of Malawi College of Medicine did much to balance out this deficit and the administrative staff there are better used to large grant administration.

The addition of the College of Medicine required negotiation with the Principal, Dr Kenneth Maleta, the Dean Dr Mwapatsa Mipando and the registrar Mrs Chifundo Trigu. There was further negotiation with the EC to re-assign the budget as Warwick was required to provide more training than was initially anticipated. The addition of the College of Medicine has, as was hoped, provided considerable benefit to the project in terms of expertise and management in Malawi.

Even so, it soon became apparent that there was still insufficient staffing to provide any project support other than financial management. The College of Medicine, in consultation with Warwick, took the decision to employ a dedicated, full-time administrator and this has been invaluable for providing local liaison and assistance.

The Malawi beneficiaries required more assistance with the budget. Clear instructions were provided to the Ministry of Health but the local checking and authorisation procedures were inadequate, leading to overspend of their funds (see next section). This difficulty did not arise with the College of Medicine as the local procedures were carefully regulated and standardised. There was some management assistance with the budget but the College of Medicine has been able to re-develop the financial management according to their local needs and customs.

The training course in Malawi has been developed into a qualification of Advanced Diploma, a move brought about by the Clinical Officers themselves. In Malawi, there is great emphasis on the importance of qualifications as these are directly linked to the Ministry pay scales which govern their salaries. This situation does not occur in Tanzania, where the Assistant Medical Officers are satisfied with simply attending a course of training which assists them in their primary roles providing care where doctors are under-supplied. The development of a qualification for the Clinical Officers in Malawi has occasioned considerable debate in both the College of Medicine and the Malawi Medical Council, the body regulating and approving courses and qualifications.

Paul O'Hare has had extensive discussions regarding this matter. In February 2012 he and David Davies visited Malawi in order to meet key individuals in Blantyre and Lilongwe to discuss the development of the training and the aims of the project.

The consortium meets regularly every month by teleconference. These meetings can be difficult due to connection problems but are consistently well-attended by all partners. The progress of work packages together with local updates and planning are dealt with and followed up by email where necessary.

Communication between Warwick and Malawi has particularly been helped by a visit organised for the Malawian finance and project administrators. They came to Warwick for two days, following an intensive programme of meetings, briefings and training, which enabled them to see the project from the perspective of the co-ordinating institution as well as aiding them in the co-ordination of their own duties.

There have been two annual conferences. The first was held in Ifakara in June 2011 and the second in Lilongwe in May 2012. The project manager co-ordinated the logistics for both of these meetings. The opportunity to meet face-to-face is greatly valued by all members of the project and the annual conferences are an opportunity to discuss the financial and management aspects of the project as well as the progress of the deliverables. The third conference is planned for May/June 2013 in Tanzania again.

b) Problems – how they were/could be solved

It was apparent from early in the project that there were differences between the requirements of Tanzania and Malawi, which required that each country follow a slightly different route towards the same end. Tanzania was much more established as a training centre, with sufficient resources and staff to be able to start training clinical officers almost

from the outset. Malawi had few available staff and no existing infrastructure on which to build. In addition, the clinical officers in each country varied considerably in their levels of experience: Tanzania's NPCs had received their initial training but often had little opportunity to put it into practice if they happened to be stationed in a remote and poorly-resourced health centre. Thus their pressing need was for further development of clinical skills, leadership training and the opportunity for clinical practice. In contrast, the Malawian clinical officers were highly experienced but needed updating on their current skills and more advanced clinical development. As in Tanzania, leadership training was a significantly absent from their primary training and the ETATMBA courses aim to redress this balance in both countries.

The differences between the two countries led to a sense of separation: the feeling that each was fulfilling the project aims, but on parallel tracks rather than as a cohesive whole. Over the course of the first few months, and in particular following the first annual conference in June 2011, much work was undertaken by the ETATMBA team to manage this potential difficulty. Rather than focusing disproportionately on the differences, the team has aimed to strengthen and develop the similarities between the two countries. This has proved successful and the team felt much more cohesive by the time of the second annual conference in May 2012.

This success was achieved in the following way:

1. Development of assessments, in particular sharing OSCE resources and discussing the merits of different methods of examination and review. Dr Sidney Ndeki, one of the principle trainers on the Tanzania course, arranged to visit during the Module 2 Leadership training in Malawi and completed a report detailing how the Tanzanian training could benefit by incorporating the ideas and practices he had observed.

2. Incorporation of the principles of leadership training, developed for Malawi, into the Tanzanian course. Further sharing of ideas and resources is planned for later this year when Dr David Davies will visit Tanzania to teach the NPCs, making use of the materials from the Module 2 leadership training for the Malawi students.

3. Developing involvement in the newly-formed African NPC network, described in detail in WP3. This has provided a forum for common themes, aspirations and areas for practical development, all of which contribute to the sustainability of the advanced leadership model which is central to the ETATMBA study.

While all of these areas relate directly to individual work packages, they have also acted to bind the two countries into a more cohesive whole, making the management of the project more systematic and productive.

While there have been successes there have also been some difficulties. Principally these have involved the Malawi Ministry of Health, which has been affected by poor communication and ineffective financial management.

Dr Chisale Mhango, the original contact at the Ministry, retired from his role of Director of Reproductive Services but has been retained on a sessional basis by the College of Medicine. This occurred right at the beginning of the project and was one of the reasons for including the College of Medicine as a consortium member. It emerged after some weeks that the senior NPC co-ordinating the project for the Ministry had been making visits to supervise the trainees and requesting per diems at European, rather than local, rates. His requests were all clearly documented, but the Ministry officials who had approved them had done so without reference to whether there was scope in the budget to allow for the costs. Several applications of this nature led to the Ministry using up all their funds long before the end of the reporting period.

This occurred alongside very poor communication with the Ministry of Health. The Head of Finance was difficult to access and contact by email was erratic and unreliable.

The difficulty was dealt with in two ways:

1. The matter was reported to the Desk Officer in order to notify her of the problem and to request advice about how to manage this beneficiary in the future.

2. The Ministry employee was informed that there would be no further funding in the current reporting period. His superiors took a more active role in the project, and were made aware of the difficulties that had been encountered. This employee has been moved away from the project to other duties within the Ministry and the Deputy Director of Reproductive Services is now directly overseeing the Ministry budget.

Although this issue has been difficult to manage, it has in the long-term been helpful in highlighting the poor management practices in the Ministry and has made the project team more vigilant in specifying that standardised rates and procedures must be followed. The

financial impact of the overspend was minimal, as by this point the College of Medicine was in negotiation to join the project as a beneficiary. In anticipation of this, the full portion of the Malawi funds had not been disbursed to the Ministry: they had only a small budget of their own.

The other main challenge relating to the project was the need to build effective teamwork between partners. This was made more difficult by having to rely on teleconferencing for much of the project. The annual conferences, plus occasional visits by Malawian and Tanzanian faculty have helped to cement ties: as relationships and methods of working have developed, greater understanding and more effective teamwork has followed and the overall vitality of the project has been strengthened.

c) Changes in the consortium

Early in the project the possible addition of the University of Malawi College of Medicine to the Consortium was discussed. This was a move originally proposed by the Malawi Ministry of Health as a way of providing further support and professional esteem for the training of the clinical officers.

The issue was raised because there was insufficient staffing in Malawi to carry out the necessary teaching for the project and to deliver on Work Packages 1, 2 and 3. It was therefore necessary to supplement the Malawi team with clinical specialists (obstetricians and paediatricians) from the UK, to enable appropriate development and delivery of the curriculum to the non-clinician physicians. The late change was necessary because the extent of the limited capacity of local specialist expertise only became apparent with a site visit to Malawi in February 2011. It is important to emphasise that Warwick as co-ordinator has not gained any resources: all the funds from the Malawi budget have been transferred directly to provide the specialist support to Malawi in delivering Work Packages 1, 2 and 3. The description of work remained unchanged: it is simply that the initial training package is being delivered by UK rather than Malawi staff.

The specific amendments were as follows:

Ministry of Health. The Ministry of Health retained funds for salary costs for Marshal Lemerani, together with travel, PhD and accommodation costs for meetings and data collection.

College of Medicine. All other finance was transferred to the College of Medicine, with the exception of the funds necessary for Warwick staff to deliver courses in Malawi.

Clinical Officer Training. The training to be delivered by Warwick clinical staff working with and developing the Malawi faculty over the course of 12 months consists of successive teams of paediatricians, obstetricians and specialists in systems development and clinical leadership. Each team spends two weeks in Malawi, delivering four 5-day training courses. Each training course teaches 12 -15 NCPs.

Malawi continues to be fully involved in the project, with Dr Chisale Mhango providing regular support and advice, Dr Francis Kamwendo taking up the senior clinical fellowship and support from Fannie Kachale, Deputy Director of the Reproductive Health Unit at the Ministry of Health and Wanagwa Chimwaza from the College of Medicine. It should also be noted that this initial input from Warwick will only be required to facilitate the training of the first group of non-clinician physicians: thereafter, training will be delivered by this group to their own peers.

d) List of project meetings, dates and venue

All teleconference meetings were held in Warwick Medical School.

The agendas and approved minutes of meetings are published on the ETATMBA website.

Committee Meetings (by teleconference) held in Warwick Medical School (WMS)

Steering Committee	**Ethics Advisory Committee**	**External Advisory Board**	**Quality Management Committee**
10 Feb 2011	19 Sep 2011	10 Feb 2012	05 Jan 2012
10 Mar 2011	31 Oct 2011	06 Mar 2012	21 Jun 2012
14 Apr 2011	20 Feb 2011	12 Jun 2012	
10 May 2011	02 May 2011		
09 Jun 2011			
21 Jul 2011			
24 Aug 2011			
21 Sep 2011			
03 Nov 2011			
08 Dec 2011			
05 Jan 2012			
23 Feb 2012			
22 Mar 2012			
02 May 2012			
14 Jun 2012			
12 Jul 2012			

Trial design meetings (WMS)

To develop research outcomes study

Meetings
01 Mar 2011
07 Apr 2011
02 May 2011

Biomedical Research Ethics Committee (WMS)

For approval of research study.

Meeting
05 Oct 2011

Assessment group meetings (WMS)

Meetings
08 Nov 2011
21 Nov 2011
20 Oct 2011
21 Oct 2011
08 Nov 2011

Planning meetings for training courses (WMS)

Pilot course	**Module 1**	**Module 2**	**Module 3**
09 Mar 2011	13 Jul 2011	25 Oct 2011	10 Jul 2012
06 Apr 2011	24 Aug 2011	13 Jan 2012	
	04 Nov 2011	26 Mar 2012	
		16 Apr 2012	
		05 May 2012	

Study meetings and research preparation

Staff	**Location**	**Dates**
O'Hare, Davies, Ellard	WMS	19 Jan 2012
Paul O'Hare	Blantyre, Lilongwe	04 Feb – 10 Feb 2012
David Davies	Blantyre, Lilongwe	04 Feb – 10 Feb 2012
David Ellard	Lilongwe and district	04 Feb – 18 Feb 2012

Meetings with desk officer

Staff	Location	Dates
Brennan, O'Hare	Brussels	14 Feb 2012
Brennan, O'Hare	WMS	13 Jun 2012

Visit by Malawi staff

Staff	Location	Dates
Fannie Kachale, MoH, Malawi	WMS	16 Mar 2012
Chikayaiko Chiwandira, Nyasinga Kaunda	WMS	23 – 24 Apr 2012

Visit by Tanzanian staff

Staff	Location	Dates
Dr Sidney Ndeki	WMS	22 – 26 Oct 2011

ETATMBA Conferences	Location	Dates
1st Annual Conference	Ifakara Health Institute, Tanzania	22 – 23 Jun 2011
2nd Annual Conference	Malawi Institute of Management, Malawi	26 May 2012

e) Project planning and status

The project is on course.

Tanzania has trained 106 NPCs and nurse-midwives and a further course is underway; there will be 124 trained in total. Post-course assessment has taken place but further evaluation of the course has to be developed.

Malawi has trained 50 clinical officers who will continue to attend further training modules.

Module 3 “Born Too Soon” will take place in Blantyre, Malawi, in November 2012. In the meantime, students have audit assignments and log books to complete.

The professional support network will be further developed at a meeting planned in Arusha, Tanzania, in November 2012. Dr David Davies will attend, together with the African NPC group representatives from Malawi and Tanzania.

A 12-month post for an obstetric registrar, divided into two six-month periods, is underway. Dr Saliya Chipwete returned from Malawi in July 2012 and Dr Gregory Eloundou will take over in August 2012. The purpose of this post is to provide support for the clinical officers, continuing their education and development of leaders, within the environment of their local hospitals.

Module 4, the Professional Project, will take place from November 2012.

The next annual conference will take place in Tanzania in May/June 2013. A venue has not yet been decided.

An international conference is planned for the final year; venue has not yet been decided.

f) Impact of any deviations from planned milestones and deliverables

All deliverables are currently developing to plan. Two deliverables have been completed and submitted (D4.6, Development of website and D2.2, Development of clinical guidelines).

The milestones have shifted slightly: some have been achieved earlier, some will be achieved later and some are still in progress.

For example, MS2 covers both engagement with the local community, which was achieved in advanced of the delivery date of 6 months, and also establishing baseline data, contracts and agreements. This second part of the milestone was delayed as the addition of the College of Medicine was in negotiation. Some baseline data was collected, but not all.

Similarly, MS3, 4 and 5 were an organic process. Progress was rapid on MS3, designing a context-specific Advanced Leader model, but the design of a professional support network (MS4) has been modified in the light of the new Africa NPC network. For the purposes of sustainability it made much more sense to develop links with this network, while the local networks were built up in parallel.

There have been differences between Malawi and Tanzania in terms of focus on milestones. For example, Tanzania, with its more established infrastructure, has trained far in excess of the required target numbers (MS8), but has encountered difficulties recruiting suitable research students. Meanwhile Malawi, while still recruiting in excess of the target figures (MS8), has been more fortunate, with one PhD student able to start data collection for the evaluation of the project (MS5 and 6).

The differing structures of the courses in Malawi and Tanzania have affected the development of course material. In Tanzania, NPCs are able to be released for a four-month block of training, so in this case MS9 (Guidelines, curricula, content and assessment of all training) was completed early. In contrast, clinical officers in Malawi can only be released for a week at a time. Their learning is thus spread out over a longer period of time, supplemented with distance learning. The training in Malawi takes the form of modules, and each module is developed according to when the clinical officers will be able to attend. Thus milestones are still being achieved, simply to a different timescale. Audit (MS10) is central to training in Malawi and developed within and between modules and will form a major part in assessment. In Tanzania it is being included in the post-course assessments to evaluate change in the health centres.

MS11, Annual summary report of development of obstetric process indicators, was subsumed into D2.2 Improved clinical guidelines.

Faculty development programmes (MS12) are a basic premise of the training but resources are an on-going problem for both countries. Tanzanian NPCs return to poorly-supplied and often remote health centres; in addition there is not such a tradition of academic advancement in Tanzania compared to Malawi. In Malawi, there are few doctors, all of

whom are overstretched, but considerable effort and negotiation has been rewarded with some commitment from the College of Medicine faculty to assist in providing training. A basic lack of trust between doctors and clinical officers affects both countries. Doctors want to preserve the boundaries of their profession yet have had to acknowledge that there are too few of them to carry out medical care without the input of clinical officers.

g) Changes to legal status of any of the beneficiaries

There have been no changes to the legal status of any of the beneficiaries.

h) Development of the Project website

The project website is www.etatmba.org.

The website is intended to be used by staff, ETATMBA students and the general public. The basic structure was set up as soon as the project commenced in February 2011. It was developed in line with the first deliverable, and continues to evolve.

The front page of the website provides a short summary of the project aims and lists the consortium partners. There are links to the different sections:

Project documentation

Contains the Description of Work and the table of deliverables and milestones plus links to related reports and documents.

Protocols

Contains the protocol of the Malawi-based outcomes study, investigating whether the clinical officer training has any impact on neonatal mortality and the impact of the students' cascading of their learning to others. Relates to Deliverable 2.3.

Guidelines

Contains the national guidelines for Malawi and Tanzania, as required in Deliverable 2.2.

Committees

Contains a list of the project's committees and their members. Dates of meetings are posted, together with agendas and minutes.

Published papers and reports

This section is where papers and reports of interest are published. If a team member finds a particular paper of interest to the group, it is posted here.

Team meetings

Contains a list of the wider team meetings and annual conferences.

Training

This section will be developed with training materials and information for the students.

External collaborations

Contains a description of the collaborations with researchers developed out of the HIFA2015 and CHILD2015 message boards.

Dissemination

Contains details of presentations of the project.

i) Short comments and information on co-ordination activities

(e.g. communication between beneficiaries, possible co-operation with other projects/programmes etc).

1. The focus of ETATMBA on maternal and child health has similarities with other projects in sub-Saharan Africa. Doug Simkiss has explored some of these though the HIFA2015 and CHILD 2015 message boards and some collaborations have been established.
Dr Deb van Dyke of the Global Health Media Project has been developing clinical training videos for frontline health workers that 'bring alive' international clinical guidelines. There is a potential collaboration with Ifakara as field testing centres are required. In addition, the NPCS will benefit from the teaching materials which complements some of the training they have received through ETATMBA.

2. Some preliminary work has been undertaken with the mobile phone company Ericsson. Tanzania has a memo of understanding with Ericsson for the provision of mentorship on a weekly basis and there is interest in setting up a pilot study to test the feasibility of being on call. This could be developed into a tool to assist in ensuring referrals are appropriate, with senior clinical officers providing telephone advice.

3. Links have been developed with the new African NPC network. This is reported in more detail under WP3 but it is a significant collaboration which will greatly assist efforts to enhance the professional standing of the NPCs.

4. The Gotland course, developed by Staffan Bergström, continues to be an important source of ideas and training for the project.

k) Statement on use of resources

Work Package 5

Participant number	**Participant short name**	**Budgeted person-months per participant**	**Actual person-months per participant**
1	Warwick	30.00	12.62
2	KI	0.00	0.00
3	MMOH	8.00	0.00
4	IHI	18.00	24.00
5	GE	0.00	0.00
6	UOM	18.00	29.00
	Total	**74.00**	**65.62**

Comment from Ifakara: An employee was fully involved on the project management activities.
No personnel costs claimed by MMOH.